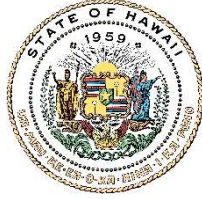


JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

P.O. BOX 621
HONOLULU, HAWAII 96809

October 13, 2023

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

Director
State of Hawai'i
Office of Planning and Sustainable Development
Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, HI 96813

RE: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT FOR THE "USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NON-NATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA'I"

Dear Director:

With this letter, the State of Hawai'i Department of Land and Natural Resources hereby transmits the final Environmental Assessment and Finding of No Significant Impact (EA-FONSI) for the "Use of Wolbachia-based Incompatible Insect Technique Technique for the Suppression of Non-native Southern House Mosquito Populations of Kaua'i" for publication in the next available edition of The Environmental Notice.

In addition to this letter, the online Environmental Review Program (ERP) Publication Form has been submitted through the ERP website.

Should you have any questions, please contact Paul Radley of the Division of Forestry and Wildlife at (808) 295-1123 or paul.m.radley.researcher@hawaii.gov.

Sincerely,

A handwritten signature in black ink, appearing to be "Dawn N. S. Chang".

Dawn N. S. Chang
Chair, Department of Land and Natural Resources

From: [State of Hawaii Webmaster](#)
To: [DBEDT OPSD Environmental Review Program](#)
Subject: New online submission for The Environmental Notice
Date: Monday, October 16, 2023 8:38:13 AM

Action Name

Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of non-native southern house mosquito populations on Kaua'i

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district
- (3) Propose any use within a shoreline area

Judicial district

Kaua'i - multiple districts

Tax Map Key(s) (TMK(s))

(4) 1-4-001:001;
(4) 1-4-001:003;
(4) 1-4-001:010;
(4) 1-4-001:011;
(4) 1-4-001:012;
(4) 1-4-001:013;
(4) 1-4-001:014;
(4) 1-4-001:019;
(4) 1-4-001:020;
(4) 1-4-001:999;
(4) 1-4-003:004;
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(4) 5-8-001:001;
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(4) 5-9-001:002;
(4) 5-9-001:003;
(4) 5-9-001:016;
(4) 5-9-001:017;
(4) 5-9-001:021;
(4) 5-9-001:023;

Action type

Agency

Proposing/determining agency

Department of Land and Natural Resources

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Yes

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[Map It](#)

Action summary

Populations of endangered Hawaiian forest birds have decreased substantially over the last 20 years, and at least two more species are predicted to be extinct in the next 2 to 10 years. The primary cause of declines in native forest birds is avian malaria, which is spread by the non-native southern house mosquito. This purpose of this project is to substantially suppress or eliminate these mosquitoes in threatened and endangered forest bird habitat on Kaua'i, thereby reducing the risk of their extinction and contributing to the recovery of these species. The proposed action consists of repeatedly releasing incompatible male mosquitoes to reduce the reproductive potential of wild mosquitoes. When conducted repeatedly over time, releases of incompatible mosquitoes would suppress the wild mosquito population by at least 90%. The primary tool proposed for release of mosquitoes on the landscape is drones and, to a lesser extent, helicopters, fixed-wing aircraft, and ground-based methods.

Reasons supporting determination

Please see Section 6.1, "Significance Criteria and Analysis", in the attached Draft EA

Attached documents (signed agency letter & EA/EIS)

- [ERP-letter_Kauai-FEA-FONSI_10132023-part-1-signed.pdf](#)
- [Kauai-Mosquito-Suppression-EA_Assembled_Final_09212023.pdf](#)

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- [ProjectArea_Kauai.zip](#)

Authorized individual

Paul Radley

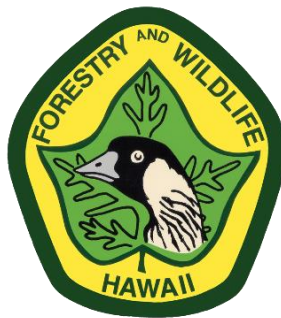
Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

SWCA

Final Environmental Assessment for Use of *Wolbachia*-based Incompatible Insect Technique for the Suppression of Non- native Southern House Mosquito Populations on Kaua‘i

OCTOBER 2023



PREPARED BY

**Hawai‘i Department of Land and Natural Resources,
Division of Forestry and Wildlife, U.S. Fish and Wildlife
Service, and SWCA Environmental Consultants**

**FINAL ENVIRONMENTAL ASSESSMENT FOR USE OF
WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE
FOR THE SUPPRESSION OF NON-NATIVE SOUTHERN
HOUSE MOSQUITO POPULATIONS ON KAUA‘I**

Prepared by

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and

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October 2023

SUMMARY

Project Name:	Environmental Assessment for use of <i>Wolbachia</i> -based Incompatible Insect Technique for the Suppression of Non-native Southern House Mosquito Populations on Kaua'i
Project Short Name:	Kaua'i mosquito suppression
Trigger(s):	Use of State or County lands or Use of State or County funds, use of Federal funds
Island(s):	Kaua'i
Judicial District(s):	Fifth Circuit
Tax Map Keys (TMKs):	1-4-001:001; 1-4-001:003; 1-4-001:010; 1-4-001:011; 1-4-001:012; 1-4-001:013; 1-4-001:014; 1-4-001:019; 1-4-001:020; 1-4-001:999; 1-4-003:004; 1-4-003:005; 1-4-003:006; 1-4-003:007; 1-4-003:008; 1-4-003:009; 1-4-003:010; 1-4-003:011; 1-4-003:012; 1-4-003:013; 1-4-003:014; 1-4-003:016; 1-4-003:017; 1-4-004:001; 1-4-004:002; 1-4-004:003; 1-4-004:004; 1-4-004:005; 1-4-004:006; 1-4-004:007; 1-4-004:008; 1-4-004:009; 1-4-004:010; 1-4-004:011; 1-4-004:012; 1-4-004:013; 1-4-004:014; 1-4-004:016; 1-4-004:017; 1-4-004:018; 1-4-004:019; 1-4-004:020; 1-4-004:021; 1-4-004:024; 1-4-004:027; 1-4-004:028; 1-4-004:029; 1-4-004:030; 1-4-004:031; 1-4-004:032; 1-4-004:033; 1-4-004:035; 1-4-004:036; 1-4-004:037; 1-4-004:038; 1-4-004:039; 1-4-004:040; 1-4-004:041; 1-4-004:042; 1-4-004:043; 1-4-004:044; 1-4-004:045; 1-4-004:046; 1-4-004:047; 1-4-004:048; 1-4-004:049; 1-4-004:050; 1-4-004:051; 1-4-004:052; 1-4-004:053; 1-4-004:054; 1-4-004:055; 1-4-004:056; 1-4-004:057; 1-4-004:058; 1-4-004:059; 1-4-004:060; 1-4-004:061; 1-4-004:062; 1-4-004:063; 1-4-004:064; 1-4-004:065; 1-4-004:066; 1-4-004:067; 1-4-004:068; 1-4-004:069; 1-4-004:070; 1-4-004:072; 1-4-004:073; 1-4-004:074; 1-4-004:075; 1-4-004:076; 1-5-001:001; 1-5-001:017; 1-7-001:001; 1-8-001:001; 3-8-001:001; 3-9-001:001; 4-2-001:002; 5-4-001:001; 5-7-001:001; 5-8-001:001; 5-8-002:002; 5-9-001:001; 5-9-001:002; 5-9-001:003; 5-9-001:016; 5-9-001:017; 5-9-001:021; 5-9-001:023
Joint Lead Agencies:	Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife, 1151 Punchbowl St., Room 325, Honolulu, HI 96813 U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office 300 Ala Moana Blvd, Room 3-122, Honolulu, HI 96850
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Contact Name, Email, Address	Michelle Clark, U.S. Fish and Wildlife Service, KauaiWolbachiaEA@fws.gov, 300 Ala Moana Blvd, Honolulu, HI 96850. Lainie Berry, Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife, mosquitocontrol@hawaii.gov, 1151 Punchbowl St., Room 325, Honolulu, HI 96813

PROJECT SUMMARY

Hawai‘i’s native forest bird species have undergone precipitous declines and extinctions since the arrival of humans to the archipelago, particularly Europeans; 39 of the 56 native Hawaiian honeycreepers have gone extinct and 11 of the remaining 17 species are endangered or threatened. Although several factors have led to declines of these remaining species, the main threat to Hawaiian honeycreepers is currently avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); non-endemic diseases that are principally spread by the non-native invasive southern house mosquito (*Culex quinquefasciatus*). Until recently, there were no viable means available to control mosquito vectors at the landscape scale within natural areas in Hawai‘i.

The Incompatible Insect Technique (IIT) is neither novel nor an experiment, but the application of an established method for controlling insect populations. Based on existing literature, IIT has been successfully implemented to control mosquitoes that are a human health concern in at least 17 countries worldwide including, but not limited to, New Caledonia, Fiji, Vanuatu, Australia, French Polynesia, Indonesia, Singapore, Malaysia, Vietnam, Thailand, Sri Lanka, India, China, Brazil, Columbia, Mexico and the United States (Florida, California, Puerto Rico, Texas, Kentucky and New York). The technique uses lab-raised male mosquitoes carrying a select strain of *Wolbachia*, a bacterium that naturally occurs in at least 65% of insect species. When male mosquitoes, which do not bite or transmit diseases, are released into a target habitat and mate with wild female mosquitoes that either contain different or no strains of *Wolbachia*, the eggs fail to develop owing to the cytoplasmic incompatibility of the differing *Wolbachia* strains of the male and female mosquitoes. The development of IIT for mosquito-borne diseases that affect humans presents a unique opportunity to use this tool to control mosquitoes that spread avian diseases to native forest bird species in Hawai‘i. This approach does not employ genetic engineering and does not involve or result in the genetic modification of either mosquitoes or bacteria.

The State of Hawai‘i Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposes employing IIT to reduce mosquito populations within approximately 59,204 acres (23,959 hectares) of forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i Wilderness areas of Kaua‘i to protect birds from mosquito-borne diseases in key higher-elevation native forest bird habitat. This effort is consistent with the statutory missions and responsibilities of the DLNR and USFWS. The multi-stakeholder project would raise and sequentially mass-release male mosquitoes that carry a strain of *Wolbachia* that is incompatible with natal females. Extensive pre- and post-release monitoring would be implemented to monitor the effectiveness of releasing incompatible male mosquitoes on the wild mosquito populations. A similar unconnected project has been proposed for implementation by the National Park Service and DLNR on the island of Maui¹. To comply with their respective obligations under the National Environmental Policy Act (NEPA) and Hawai‘i’s environmental review process pursuant to Hawai‘i Revised Statutes (HRS) Chapter 343, the USFWS and DLNR are preparing a joint environmental assessment (EA) to address the impacts of the release of male mosquitoes with incompatible *Wolbachia* in the Kōke‘e and Alaka‘i Wilderness areas.

¹ See: https://files.hawaii.gov/dbedt/erp/Doc_Library/2023-04-08-MA-FEA-Suppression-of-Mosquitoes-on-East-Maui.pdf

This EA provides background information concerning IIT and outlines the proposed action, potential impacts, and strategies to avoid and minimize potential negative effects of the proposed release of incompatible male mosquitoes within the project area on Kaua‘i.

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- Appendix H: Federal and State Preparatory Notice for Draft Environmental Assessment
- Appendix I: Responses to Substantive Public Comments on Environmental Assessment

ABBREVIATIONS AND ACRONYMS

4WD	four-wheel-drive
biocontrol	biological control
CI	Cytoplasmic Incompatibility
CIA	Cultural Impact Assessment
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DSP	Division of State Parks
EA	Environmental Assessment
HDOA	Hawai‘i Department of Agriculture
HRS	Hawai‘i Revised Statutes
IIT	Incompatible Insect Technique
KFBRP	Kaua‘i Forest Bird Recovery Project
KISC	Kaua‘i Invasive Species Committee
KRCP	Kōke‘e Resource Conservation Program
KWA	Kaua‘i Watershed Alliance
LZ	Landing Zone
NEPA	National Environmental Policy Act
SHPD	State Historic Preservation Division
TMK	Tax Map Key
TNC	The Nature Conservancy
UAS	Unmanned Aerial Systems
U.S.	United States
USFWS	U. S. Fish and Wildlife Service

1 INTRODUCTION

To comply with their respective obligations under the National Environmental Policy Act of 1969, as amended (NEPA), the Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR 1500-1508), Department of the Interior NEPA Regulations (43 CFR 46), and the Hawai‘i Revised Statutes (HRS) Chapter 343, the U.S. Fish and Wildlife Service (USFWS) and Hawai‘i Department of Land and Natural Resources (DLNR) are preparing a joint environmental assessment (EA) to address the release of male mosquitoes with incompatible *Wolbachia* (Incompatible Insect Technique, or IIT) in the Kōke‘e and Alaka‘i Wilderness areas on Kaua‘i (Figure 1). The NEPA and HRS Chapter 343 regulations state that an agency shall prepare an EA for a proposed action that is not likely to have significant effects or when the significance of the effects is unknown. Project area lands are managed by DLNR Division of Forestry and Wildlife (DOFAW), DLNR Division of State Parks (DSP), and private parties (see Table 1). The DLNR and USFWS are joint lead agencies for this EA. The USFWS is considering provisional financial assistance for aspects of the mosquito suppression project. For the conservation of listed forest birds, this agency is therefore joint lead agency for this EA.

This EA analyzes environmental consequences associated with the implementation of the proposed action and the no-action alternative. Additional alternatives considered but dismissed are described in Section 3.3. The proposed action presented in this EA is the suppression of the non-native and invasive southern house mosquito (*Culex quinquefasciatus*) in 23,959 ha (59,204 acres) of forest bird habitat on Kaua‘i (Figure 1) through the release of male, *Wolbachia*-incompatible southern house mosquitoes (hereafter referred to as incompatible male mosquitoes, described in Sections 2.4 and 2.5). Breeding interactions between released male and wild female mosquitoes are anticipated to result in a reduction of the mosquito population on this portion of Kaua‘i. This EA provides background information concerning IIT and outlines the proposed action, potential impacts, and strategies to avoid and minimize any negative effects of the proposed release of incompatible male mosquitoes within the project area on Kaua‘i. This document has been prepared consistent with the NEPA, NEPA implementing regulations, and the HRS Chapter 343 and provides compliance for project implementation under both Acts and associated regulations.

The no-action alternative evaluates conditions as they would occur in the foreseeable future if the DLNR did not release incompatible male mosquitoes to manage southern house mosquito populations in forest bird habitat on Kaua‘i. Current management strategies focused on larval habitat source reduction are limited to fencing to exclude ungulates, particularly feral pigs, that create wallows and hollows in tree fern stems that are utilized by mosquitoes as breeding habitats. This strategy, however, does not address other cryptic larval habitat over the landscape. The DLNR and USFWS assume that under the no-action alternative, no new actions to control non-native southern house mosquito would be implemented. DLNR and USFWS also assume that the southern house mosquitoes would continue to persist in forest bird habitat, including federally designated critical habitat for ‘akikiki (*Oreomystis bairdi*) and akeke'e (*Loxops caeruleirostris*) on Kaua‘i, and would continue to act as a vector for mosquito-borne diseases.

The DLNR manages 22 natural areas² comprising the most ecologically intact habitats on Kaua‘i with the intent of safeguarding these habitats and species, as well as the cultural heritage associated with them. The proposed project would occur on 34,921 acres (14,132 hectares) within 10 DLNR managed natural areas on the island (Table 1). These natural areas include forest reserves, natural area reserves, state parks, wildlife sanctuaries, and wilderness reserves. This project is consistent with the statutory missions and responsibilities of the DLNR. This EA has been prepared to comply with DLNR obligations under HRS Chapter 343.

Table 1. The Reserves that Comprise the Proposed Project Area

Name of Reserve	Land Management Agency	Total Size of Reserve (acres)	Acres within Project Area	Designation
Hā‘ena State Park	DSP	184	<1	State Park
Halele‘a Forest Reserve	DOFAW	14,994	1,206	Forest Reserve
Hono O Nā Pali Natural Area Reserve	DOFAW	3,570	3,570	Natural Area Reserve
Kōke‘e State Park	DSP	4,359	3,438	State Park
Kuia Natural Area Reserve	DOFAW	1,606	691	Natural Area Reserve
Līhu‘e-Kōloa Forest Reserve	DOFAW	10,845	598	Forest Reserve
Nā Pali Coast State Wilderness Park	DSP	4,883	4,619	State Wilderness Park
Nā Pali-Kona Forest Reserve	DOFAW	13,085	9,637	Forest Reserve
Nā Pali-Kona Forest Reserve/Alaka‘i Wilderness Preserve	DOFAW	9,940	9,940	Forest Reserve/ Preserve
Pu‘u Ka Pele Forest Reserve	DOFAW	13,973	1,222	Forest Reserve
Private	None	N/A	24,283	Private
Total	-	77,439	59,204	

² Sourced from:

<https://dlnr.hawaii.gov/ecosystems/nars/kauai-2/>

<https://dlnr.hawaii.gov/forestry/frs/reserves/kauai/>

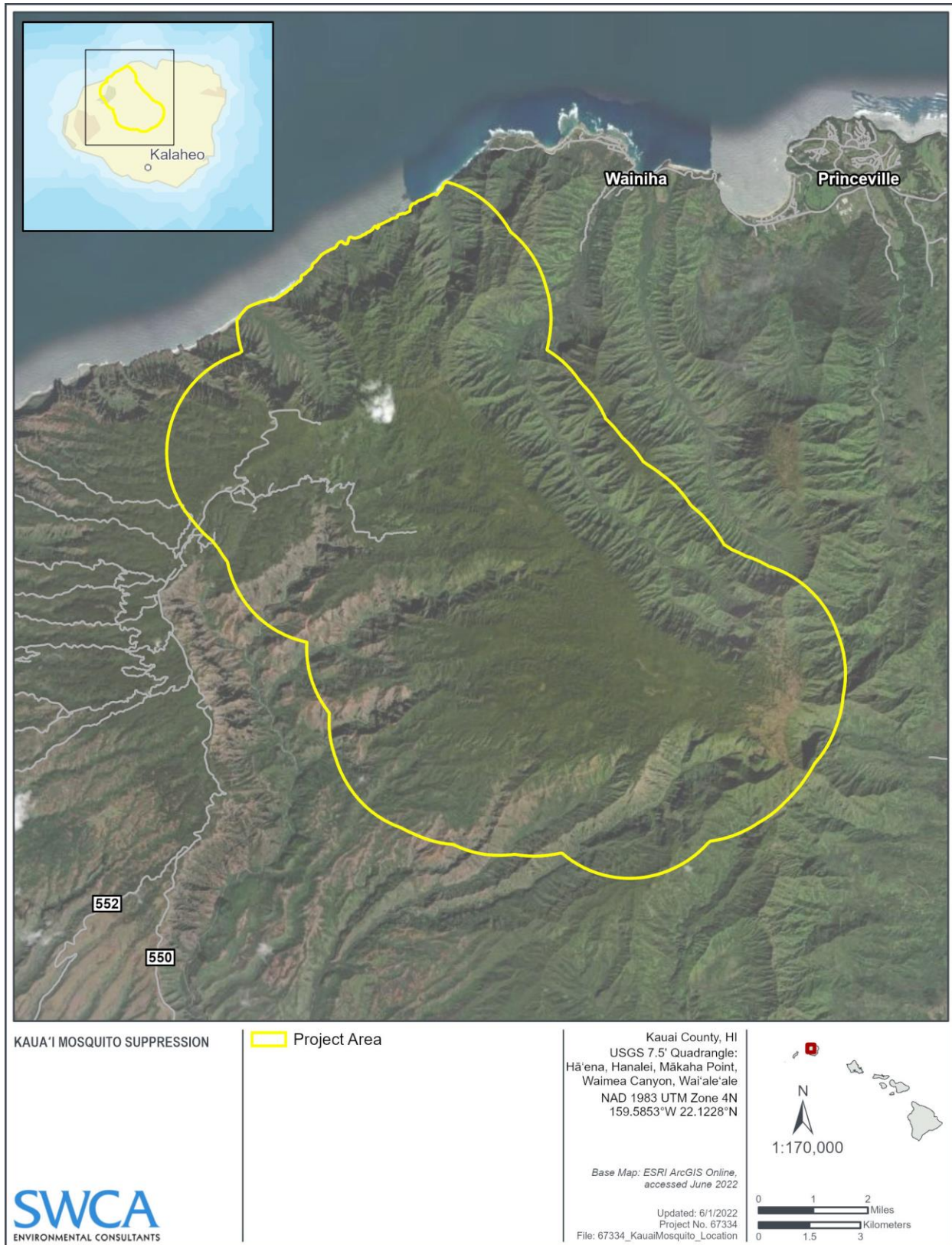


Figure 1. Project Area.

1.1 Applicable Laws, Executive Orders, and Supporting Guidelines

The suppression of non-native mosquito populations from the project area is consistent with several laws requiring resource managers to conserve and restore wildlife and habitats under their jurisdiction. The proposed action would be carried out in compliance with the various Federal and state laws listed below.

The USFWS mission is to work with others to “conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people” (USFWS 2023). The threat that introduced species pose to habitat and native wildlife makes addressing their impacts one of the USFWS’s top management priorities.

The mission of DOFAW is to protect, manage, and restore natural and cultural resources in collaboration with the people of Hawai‘i. The threat that invasive species pose to habitat and native wildlife makes addressing their impacts one of the DOFAW’s top management priorities.

1.1.1 Federal

Migratory Bird Treaty Act of 1918 (MBTA), as amended. The MBTA prohibits the incidental take of MBTA-protected bird species, a list of which may be found at 50 C.F.R. §10.13. Under the MBTA, “take” means to “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect” (50 CFR 10.12). Bird species can be protected under the MBTA even if they do not migrate, and no matter their origin.

National Environmental Policy Act of 1969 (NEPA), as amended. NEPA requires that Federal agencies evaluate the impacts of their proposed actions on the human environment, that these impacts be considered by the decision maker(s) prior to implementation, and that the public be informed of these impacts. This EA was prepared in compliance with NEPA (42 USC Section 4231, *et seq.*), the CEQ NEPA Regulations, 40 CFR Section 1500 – 1508, and the DOI NEPA Regulations (43 CFR 46).

The Fish and Wildlife Act of 1956 (16 U.S.C. 742a–742j, not including 742 d–l, 70 Stat. 1119), as amended, gives general guidance requiring the Secretary of the Interior to take steps "required for the development, management, advancement, conservation, and protection of fish and wildlife resources."

Endangered Species Act of 1973, as amended (16 U.S.C. 1531–1544, 87 Stat. 884). The Endangered Species Act (ESA) requires that all Federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2[c]).

Presidential Executive Order 13112 on Invasive Species (February 3, 1999). Section 2(a)(2), on Federal agency duties, states: “Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (1) prevent the introduction of invasive species; (2) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner;

(3) monitor invasive species populations accurately and reliably; (4) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (5) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (6) promote public education on invasive species and the means to address them.” Executive Order 13112 defines “invasive species” as “an alien species [a species that is not native with respect to a particular ecosystem] whose introduction does or is likely to cause economic or environmental harm or harm to human health.”

Presidential Executive Order 13751 on Invasive Species (December 5, 2016). This order amends [Executive Order 13112](#) and directs actions to continue coordinated Federal prevention and control efforts related to invasive species. This order maintains the National Invasive Species Council (Council) and the Invasive Species Advisory Committee; expands the membership of the Council; clarifies the operations of the Council; incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into Federal efforts to address invasive species; and strengthens coordinated, cost-efficient Federal action.

National Historic Preservation Act of 1966 (NHPA), as amended (U.S.C. 470 et seq.). The primary Federal law governing the preservation of cultural and historic resources in the United States. Section 106 of the NHPA requires that Federal agencies consider the effects of their undertakings (including funding, licensing, or permitting the undertakings of other entities) on historic properties and stipulates that affected American Indian tribes and Native Hawaiian organizations must be consulted.

1.1.2 State

Hawai'i Environmental Policy Act (Hawai'i Revised Statutes [HRS] Chapter 343). HRS Chapter 343 was passed to “integrate the review of environmental concerns with existing planning processes of the State and Counties and alert decision makers to significant environmental effects, which may result from the implementation of certain actions” (HRS Section 343-1). Nine triggers are defined for when a proposing or approving agency must prepare an EA. This EA was prepared in compliance with HRS Chapter 343.

Hawai'i Revised Statutes Chapter 195D. The purpose of HRS Chapter 195D is “to insure the continued perpetuation of indigenous aquatic life, wildlife, and land plants, and their habitats for human enjoyment, for scientific purposes, and as members of ecosystems.” A list of Endangered and Threatened species is defined under the Hawai'i Administrative Rules, including several of Kaua'i's forest birds described in this EA. HRS Chapter 195D-5 explains that all state agencies would carry out conservation programs that further the protection of such species.

In 2017, the Hawai'i Invasive Species Council (HISC) passed Resolution 17-2 “Supporting Evaluation and Implementation of Technologies for Landscape-scale Control of Mosquitoes, With a Focus on Mitigating Both Human and Wildlife Health Risks”
<https://dlnr.hawaii.gov/hisc/files/2013/02/HISC-Reso-17-2-Mosquitoes.pdf>

1.2 Purpose and Need of the Environmental Assessment

The purpose of the proposed action is to prevent extinction of Hawaiian forest birds on Kaua‘i by reducing avian disease caused by non-native southern house mosquitos (avian malaria). To achieve this, the abundance of non-native southern house mosquito populations must be substantially suppressed in threatened and endangered forest bird habitat on the island of Kaua‘i. The need for Southern House Mosquito suppression is evidenced by Hawaiian forest bird recovery plans and documented by research showing that the ‘akeke‘e and ‘akikiki would be driven to extinction within the next decade unless immediate action is taken (USFWS 2006, USFWS 2021, Paxton et al. 2022). Southern house mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species. This expansion of non-native mosquitoes and the diseases they carry and transmit, is contributing to the rapid decline of endangered species and their inability to recover. Immediate management actions are needed to prevent the extinction of listed Hawaiian forest birds on Kaua‘i.

The proposed action will be implemented by the State and its contractors. The USFWS will provide technical assistance during implementation and, in accordance with applicable law, process applications for funding proposed action implementation. Potential funding sources for the proposed action may include, but are not limited to, Recovery Challenge grants, Section 6 funds, State Wildlife Grants, Bipartisan Infrastructure Law, Inflation Reduction Act fund, Stewardship grants, Migratory Bird Conservation Act grants, America the Beautiful Challenge grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications Program, and other similar funding programs.

1.3 Project Location and Description

The project area is comprised of 59,204 acres (23,959 hectares) of Kaua‘i (Figure 1). This area encompasses the Kōke‘e State Park, Hono o Nā Pali Natural Area Reserve, Ku‘ia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alaka‘i Wilderness Preserve, and private lands (Table 1, Figure 2). The Kōke‘e State Park, Nā Pali-Kona Forest Reserve, and the Alaka‘i Wilderness Preserve overlap with extant native forest bird habitat, including critical habitat for ‘akeke‘e and ‘akikiki on the island of Kaua‘i (Paxton et al. 2016; species accounts provided below). The project area was developed collaboratively between USFWS, University of Hawai‘i-Pacific Cooperative Studies Unit-Kaua‘i Forest Bird Recovery Project (KFBRP) and the DLNR. The project area includes a buffer zone to account for mosquito dispersal and incorporates lower elevation areas outside the current range of forest birds to target mosquitoes that may emigrate from these lower elevation areas into this forest bird habitat.

1.4 Resource Issues to be Analyzed

The resources considered in this EA are threatened and endangered species, wildlife, vegetation and cultural resources, public health and safety, recreation and wilderness air quality, greenhouse gas emissions and climate change, and environmental justice. These resources were selected

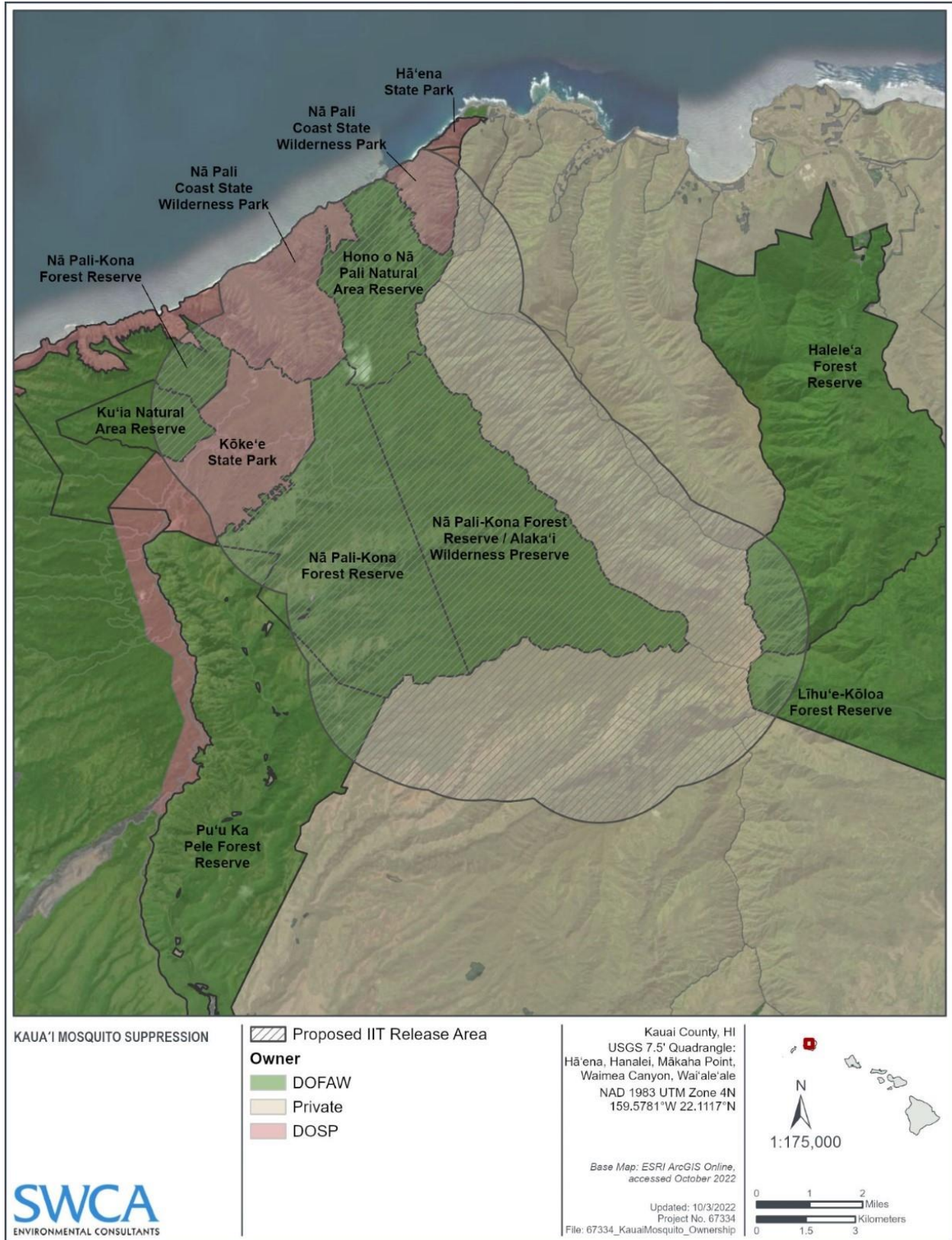


Figure 2. Land ownership in the project area.

based on their potential to be impacted by the proposed action or no-action alternative. Consistent with NEPA and HRS Chapter 343, potential direct, indirect, and cumulative impacts to these resources are described for the proposed action and no-action alternative. Resources considered but excluded from further consideration are presented in Appendix A.

2 PROJECT BACKGROUND

The following section provides background information on Kaua‘i forest birds and their cultural importance along with mosquito ecology and avian diseases.

2.1 Kaua‘i Forest Birds

The Hawaiian archipelago is the most isolated landmass on Earth. This isolation, combined with the geographical diversity and enormous range of ecosystems, resulted in the wide-scale evolution of genera and species of plants and animals that are found nowhere else (known as endemic) (Ziegler 2002). One of the most spectacular examples of the evolutionary process of adaptive radiation (related species that evolve to fill separate ecological niches) in Hawai‘i is that of the Hawaiian honeycreepers, an endemic lineage of forest birds. Honeycreepers constitute approximately 56 species evolved from a single species of rosefinch that reached either Ni‘ihau or Kaua‘i approximately 5.7 million years ago (Lerner et al. 2011), a relatively short span of time in evolutionary terms. The striking diversity of feeding preferences and bill morphology within Hawaiian honeycreepers is thought to have evolved in response to the array of ecosystems present within the archipelago. As a result, each honeycreeper species specializes in feeding on either nectar, fruits, seeds, snails, or insects, while other species have generalist diets that incorporate a range of food sources (Pratt 2005).

Like many isolated island archipelagos, the pre-human biota of Hawai‘i evolved in the absence of terrestrial mammals and numerous lineages of plants, insects, and diseases that are present on continental landmasses. As such, much of the native flora and fauna of Hawai‘i was poorly adapted for the habitat alterations and rapid and mass introduction of alien species that followed the arrival of humans to the archipelago, particularly the Europeans. Wide-scale extinction and declines of Hawaiian honeycreepers is the result of the combined impact of the loss of lowland forest habitat; the introduction of avian malaria- and avian pox-carrying mosquitoes, particularly the southern house mosquito; the invasion of predators such as ship rats (*Rattus rattus*) and feral cats (*Felis catus*); competition from introduced birds; and the ongoing spread of invasive plants and feral ungulates (e.g., feral pigs [*Sus scrofa*]) (Pratt 2005). Today, only 17 of the original estimated 56 honeycreeper species persist (39 species are extinct). Of these 17, the USFWS lists 10 as endangered and one as threatened (Atkinson and LaPointe 2009, USFWS 2022).

On Kaua‘i, six honeycreeper species (the Kaua‘i endemics ‘akeke‘e [*Loxops caeruleirostris*], ‘akikiki [*Oreomystis bairdi*], ‘anianiau [*Magumma parva*], and Kaua‘i ‘amakihi [*Chlorodrepanis stejnegeri*], as well as ‘apapane [*Himatione sanguinea*], and ‘i‘iwi [*Drepanis coccinea*]); one endemic thrush (puaiohi [*Myadestes palmeri*]); and one endemic flycatcher species (Kaua‘i ‘elepaio [*Chasiempis sclateri*]), are restricted to intact areas of native forest in higher elevation areas of the island. ‘Akeke‘e, ‘akikiki and puaiohi are federally endangered, ‘i‘iwi is threatened

(USFSW 2022), and these species as well as the non-listed ‘anianiau and Kaua‘i ‘amakihi are undergoing declines in population size and range owing to the upward elevational range increase of southern house mosquito and the avian diseases they vector (Paxton et al. 2016, 2020).

Current management of montane native forest birds and their habitat on Kaua‘i is primarily carried out by the KFBRP, the Kaua‘i Watershed Alliance (KWA), Kōke‘e Resource Conservation Program (KRCP), Kaua‘i Invasive Species Committee (KISC) and DOFAW. The KWA is a partnership of 11 government and private organizations, including The Nature Conservancy, Kamehameha Schools, and the National Tropical Botanical Garden. Management activities include the monitoring of native forest bird populations, ungulate control through public hunting, eradication of feral ungulates within fenced management units, invasive plant control, habitat restoration via outplanting, and trapping of invasive rodents and cats. KFBRP carries out species specific management actions for the forest birds such as rodent control, monitoring, and research. DOFAW and KWA members manage ecosystem-level actions such as fencing, ungulate control, outplanting, and invasive plant control.

2.1.1 Cultural Importance of Forest Birds

From a Native Hawaiian worldview, each native forest bird species is unique and precious. Not only do they play an essential role in maintaining the native ecosystem, but they also factor prominently into several aspects of traditional Hawaiian customs, practices, and beliefs. Native forest birds are woven into the creation stories of the islands and appear in numerous traditional songs, sayings, and stories as representations of natural, spiritual, and human phenomena. Native forest birds are regarded as conduits for *akua*, the divine, functioning as the *kinolau*, or physical manifestations of deities. Among some families, they are *‘aumakua* or family gods (Paxton et al. 2022).

The ethnohistorical literature associated with native birds, *kia manu* (birdcatchers), and the project area is extensive (see Appendix B: Cultural Impact Assessment). Numerous oral traditions describe *kia manu* who lived and gathered feathers within the project area (Wichman 1998). Traditional place names within and near the project area are additionally rich in references to native birds, indicating the presence of particular bird resources and their significance (Gomes 2016).

Traditional Hawaiian featherwork exemplifies the importance of native forest birds to traditional Hawaiian society. Forest bird feathers were used for creating regal garments and accessories such as *‘ahu‘ula* (capes), *mahiōle* (helmets), *kāhili* (standards), and *lei hulu* (feather garlands) donned by Hawaiian nobility. Their brilliant feathers linked the chiefly *ali‘i* class with the upland realm of the gods, the *wao akua* (Appendix B). Though feather work practitioners no longer use the feathers of native birds, the knowledge of producing feather creations still exists and is still practiced. Contemporary Hawaiian feather workers use their creations to bring attention and awareness to the plight of native forest birds (see Appendix B).

Although many of Hawai‘i’s native forest birds have gone extinct, one way they remain relevant to contemporary Hawaiian culture is through classic and beloved *mele* (songs that preserve their legacy). The *mele Manu ‘Ō‘ō* is one example. The ‘ō‘ō bird has long been presumed extinct but the memory of the bird lives on with this song, which has become a Hawaiian music and hula classic (Appendix B).

As evidenced in Hawaiian language newspaper articles of the nineteenth century, Native Hawaiians noticed declining native bird populations and were very concerned for the survival of native bird species. One such writer, Penukahi, anthropomorphized native birds by referring to them as, “the natives of the uplands” and relating that they were childhood playmates (T.N. Penukahi *Ke Au Okoa* June 29, 1871). Translation assumed to be Mary Kawena Pukui, Hawaiian Ethnological Notes Newspapers). The interviewees of the current project’s Cultural Impact Assessment (CIA) speak about native forest birds in a similar manner, regarding them as equal members of our island communities, deserving of every right to live as humans do.

2.2 Mosquito Ecology

Mosquitoes are a group of 3,600 species of small flies (Order Diptera) in the family Culicidae that collectively play important ecological roles as pollinators, food sources for vertebrate and invertebrate predators, and as vectors for human and wildlife diseases (Becker et al. 2020). Species within this family are either native or have been accidentally introduced to every major landmass except Antarctica (Mullen and Durden 2009). While it is believed that several thousand mosquito species feed on the blood of animals, only a small proportion of mosquito species are known to act as vectors of human and wildlife diseases (Mullen and Durden 2009). For example, only 12 of the 200 species of mosquitoes known to occur within the continental U.S. and its territories are disease vectors (CDC 2022a). Of these biting species, only females possess proboscises that allow them to blood feed. By contrast, male’s proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease.

Six biting species of mosquitoes have been accidentally introduced to Hawai‘i by humans, beginning with the southern house mosquito to Lahaina on Maui in 1826 (Dine 1904). The southern house mosquito and the floodwater mosquito (*Aedes vexans nocturnus*) are night-biting, while the remaining four species are active during the day: yellow fever mosquito (*Aedes aegypti*), Asian tiger mosquito (*Aedes albopictus*), the bromeliad mosquito (*Wyeomyia mitchellii*), and the Asian bush mosquito (*A. japonicus japonicus*) (Leong and Grace 2009). The target species of this proposed project, the southern house mosquito, is native to West Africa but has been introduced throughout tropical and warm temperate regions of the world by humans (Belkin 1962, Vinogradova 2000). Southern house mosquitoes are typically found within and near human settlements but will naturalize in remote natural areas on tropical and subtropical oceanic island systems such as Hawai‘i (Becker 1995, LaPointe et al. 2009). The species has significant global impacts on human and wildlife health owing to its role as the primary vector of lymphatic filariasis, West Nile Virus (*Flavivirus* sp.), avian malaria (*Plasmodium relictum*), and avian pox (*Avipoxvirus* spp.) (LaPointe et al. 2012, Samy et al. 2016).

The southern house mosquito is present on all the main Hawaiian Islands as well as Midway Atoll in the Northwestern Hawaiian Islands. Although the species was detected on Kure Atoll in 2016 following a high wind event, a collaborative control effort by DLNR and Department of Health Vector Control Branch staff resulted in its eradication from the atoll in 2019. On the main Hawaiian Islands, this species occurs from sea level to approximately 4,921 feet (1,500 meters) elevation (LaPointe 2000). Population densities vary across this elevational gradient with high, more stable densities of mosquitoes occurring at lower elevations and lower densities at mid

(approximately 1,968-3,280 feet [600-1,000 meters]) and higher elevations (approximately 4,265-4,921 feet [1,300-1,500 meters]) that are subject to seasonal fluctuations (LaPointe 2000).

In lowland areas of Hawai‘i, population densities of southern house mosquito have been shown to expand with increasing land development and associated breeding sites (McClure et al. 2018). Within higher elevation areas that principally contain native forest and shrubland, southern house mosquitoes lay their eggs in feral animal wallows, water-filled cavities in native tree ferns (*Cibotium* spp.) that are created by feral pigs, natural tree holes, and in pools in intermittent streams (Goff and van Riper 1980, Aruch et al. 2007, Reiter and LaPointe 2009, Atkinson et al. 2014). The ability of southern house mosquito to survive within a wide range of habitats across a diversity of altitudinal gradients has resulted in this mosquito species acting as the primary vector for avian malaria and avian pox, which was likely transmitted from infected non-native bird species following the introduction of this mosquito to Hawai‘i (Warner 1968).

2.3 Avian Diseases

Forest birds on Kaua‘i, the oldest of the main Hawaiian Islands, are particularly vulnerable to the combined effects of climate change, disease, and other invasive species as almost all areas of the island occur below ~5,000 feet (1,500 meters). Historically, mosquito breeding and disease development was rare above ~3,300 feet (1,000 meters) on Kaua‘i because upland forests on the island experienced approximately 3°C (5.4°F) cooler temperatures compared to similar elevations on Maui and Hawai‘i Island (LaPointe et al. 2010). Recent analysis of long-term survey data for seven of the eight native forest bird species on Kaua‘i, however, found that six species had significantly declined in abundance over the past 25 years within the uppermost elevations of their available habitat on Kaua‘i (Paxton et al. 2016), concurrent with increases in prevalence of mosquitoes and avian malaria in forest bird habitat (Atkinson et al. 2014). The two rarest of these species, ‘akikiki and ‘akeke‘e, have undergone dramatic declines in recent years and are at risk of imminent extinction (Paxton et al. 2022). Future increases in temperature within forest bird habitat on Kaua‘i may also further degrade habitat through the increased upward expansion of invasive plants (e.g., strawberry guava; *Psidium cattleianum*) and invasive animals (e.g., pigs and rats).

Avian malaria and pox have been particularly devastating to Hawaiian honeycreepers as these birds evolved in the absence of these diseases. The results of studies that have experimentally infected honeycreeper species with avian malaria provide the clearest evidence regarding the impacts of these avian diseases. For example, Atkinson et al. (1995) demonstrated that 90% of ‘i‘iwi exposed to a single infected mosquito bite died, while Atkinson et al. (2000) found that 65% of Hawai‘i ‘amakihi (*Chlorodrepanis virens*) died following a single mosquito bite. Those Hawaiian honeycreepers with low resistance to both avian malaria and pox, such as ‘i‘iwi, are now primarily limited to forests above ~3,300 feet (1,000 meters) on Kaua‘i, and ~5,000 feet (1,500 meters) elevation on Maui and Hawai‘i Island. The cooler temperatures above these elevations act to constrain mosquito breeding and malaria development (Atkinson and LaPointe 2009). The results of modelling studies, however, suggest that these high elevation refugia are at risk from the upslope movement of disease transmitting mosquitoes due to rising mean temperatures resulting from climate change (Atkinson et al. 2014, Benning et al. 2002, Fortini et al. 2015, Liao et al. 2015).

2.4 Management of Mosquitoes Using the *Wolbachia*-based Incompatible Insect Technique

Wolbachia is a genus of bacteria that naturally occurs within the cells of approximately 65% of all insect species (Hilgenboecker et al. 2008). A unique feature of *Wolbachia* is that if individuals of the same insect species that contain different strains of the bacteria mate, or if the female supports no *Wolbachia*, the sperm of the male may be unable to fertilize the egg of the female insect (technically called cytoplasmic incompatibility) (Kozek and Rao 2007).

As discussed in Section 2.2, the southern house mosquito is currently present across Hawai'i and already naturally carries a strain of *Wolbachia*. The strain of the *Wolbachia* bacterium used to generate incompatible male mosquitoes for this project likewise occurs naturally in the Asian tiger mosquito. No new organisms would therefore be introduced to Hawai'i by this project. *Wolbachia* cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). Residents of Hawai'i are commonly bitten by the Asian tiger mosquito, which is distributed statewide and has remained one of the most abundant mosquitoes at lower elevations since its establishment in the islands in 1896. Residents of Hawai'i are also commonly bitten by the southern house mosquito, which likewise naturally carries *Wolbachia* and occupies both lower elevation and upper elevation habitats across the state. People in Hawai'i therefore are regularly bitten by mosquitoes containing *Wolbachia*, including the strain that would be used in the proposed action. No adverse effects have ever been reported in humans, nor is there a biological mechanism allowing adverse effects to occur.

There is no indication that mosquitoes released as a part of this project would be any better at transmitting disease to humans or wildlife than those mosquitoes already present on the landscape (Popovici et al. 2010). The southern house mosquito does not transmit any human diseases in Hawai'i. In contrast, the southern house mosquito is already a remarkably efficient vector of the avian malaria parasite, with an estimated 85–97% of southern house mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005). Increasing the vector competence (i.e., the ability to transmit disease) of the southern house mosquito is therefore highly unlikely and ecologically insignificant when compared to the known risk of allowing these mosquitoes to continue to proliferate on the landscape.

The southern house mosquitoes that currently occur in Hawai'i carry a strain of *Wolbachia* referred to as wPip and different populations of the Asian tiger mosquito carry strains called wAlbA and wAlbB. To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of *Wolbachia*. This was accomplished through a multi-step process that involved rearing Hawai'i mosquitoes in the lab and removing the wPip *Wolbachia* from their bodies with common antibiotics. The wAlbB strain of *Wolbachia* was then transferred into the eggs of these *Wolbachia*-free Hawai'i mosquitoes. The resulting mosquitoes are a Hawai'i line of southern house mosquitoes containing wAlbB *Wolbachia*, which are reared for several generations and carefully tested. All this work was done in sterile laboratory conditions.

The success of the suppression program is predicated on releasing only male southern house mosquitoes. As *Wolbachia* is maternally inherited, no local establishment of wAlbB southern

house mosquitoes is likely to occur. Regardless, as no organisms (mosquito or *Wolbachia*) used in this proposed project are novel to Hawai'i, local establishment would not constitute introduction of any foreign species.

Wolbachia-induced cytoplasmic incompatibility was first used to control populations of mosquitoes (*Culex pipiens fatigans* now: *C. quinquefasciatus*) in a village in Myanmar (Burma) in the 1960s (Laven 1967). Since this initial research, IIT has been developed and can be applied via the mass rearing and release of males of an insect species that contain a strain of *Wolbachia* that is either not present or is a different strain from those present within wild females. Small-scale field trials have demonstrated that when sufficiently large numbers of laboratory-raised male insects are released, the wild population of the target insect species decline because mating events result in no offspring. The release of *Wolbachia*-infected male mosquitoes has no effect on humans (see Section 4.5) or native wildlife because male mosquitoes are exclusively pollinators and do not bite.

Insectivorous native Hawaiian taxa may opportunistically consume mosquito species (including southern house and Asian tiger mosquitoes). There is no evidence that the *Wolbachia* species consumed would cross the gut barriers and survive in the hemolymph or blood or recombine with *Wolbachia* from other prey consumed. *Wolbachia* cannot live in vertebrates and thus cannot affect the 'ope'ape'a (Popovici et al. 2010). Hawai'i's native fauna evolved over millions of years and thus species of native Hawaiian wildlife did not historically rely on mosquitoes as part of their prey base. The suppression of southern house mosquito would not deplete the mosquitoes available for prey given the coexistence of *Aedes* mosquitoes.

It is important to note that IIT as a technique does not involve any genetic engineering and therefore does not result in any "genetically modified organisms" (GMOs). No part of the genome of either mosquitoes or the *Wolbachia* bacteria would be modified, and GMOs would not be released on Kaua'i in any form. According to the U.S. Environmental Protection Agency (EPA), a GMO is "a plant, animal, or microorganism that has had its genetic material (DNA) changed using technology that generally involves the specific modification of DNA, including the transfer of specific DNA from one organism to another"; this process is often referred to as genetic engineering. The EPA does not regulate or recognize IIT as producing genetically engineered products or GMOs.

For discussion of unintended release of incompatible female mosquitoes, horizontal transfer of *Wolbachia*, and horizontal gene transfer, please refer to Appendix A: Issues and Potential Impact Topics.

2.4.1 Incompatible Insect Technique

There is a substantial body of data that demonstrate the the IIT approach is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atyame et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The potential benefits of IIT in the management against human diseases and their insect vectors have led to a growing body of research on the utility of *Wolbachia* for population control in mosquito-borne diseases. While this project is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation purposes, and

the first time the approach would be used in Hawai'i, it is an established method for controlling insect populations (e.g., Laven 1967; Moreira et al. 2009; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). Crawford et al. (2020) trialed the use of incompatible yellow fever mosquitoes in a proof-of-concept study in Fresno County, California. They released 14.4 million male mosquitoes within a 724-acre (293-hectare) area. This release resulted in, on average, a 95% reduction in the mosquito population during the peak mosquito breeding season.

Mains et al. (2016) developed multiple *Wolbachia* strains to artificially infect Asian tiger mosquitoes that were released at a field site in Lexington, Kentucky. The researchers monitored mosquito populations before and after the release of *Wolbachia*-infected mosquitoes. The release of these incompatible male mosquitoes resulted in a considerable reduction of mosquito egg hatch rates in treated compared to untreated areas, suggesting that the release of *Wolbachia*-infected mosquitoes was effective at reducing mosquito populations during the experiment. O'Connor et al. (2012) released *Wolbachia*-infected male Polynesian tiger mosquitoes (*Aedes polynesiensis*) on Toamaro Island in French Polynesia and compared results with nearby Horea Island. The release of the incompatible male mosquitoes resulted in a 24% reduction in fertile eggs at the treatment site (Toamaro Island) compared to the non-treatment or control site (Horea Island).

2.5 Potential use of the *Wolbachia*-based Incompatible Insect Technique in Hawai'i

Until now there was no feasible method for controlling southern house mosquitoes at the landscape level within natural areas in Hawai'i. Existing management strategies have been limited to installing fencing that excludes ungulates, particularly feral pigs, that create wallows and hollows in tree fern stems, which are subsequently used by mosquitoes as breeding habitat, and small-scale Bti (*Bacillus thuringiensis israelensis*) broadcast. The use of IIT for the control of mosquitoes within native forest bird habitat as part of the proposed action therefore has the potential to reverse the decades of population declines recorded for the remaining native forest bird species and bolster the available habitat for these species. The successful implementation of this novel technique could potentially reduce the populations of southern house mosquitoes, which transmit mosquito-borne avian diseases in native forest bird species and would represent a paradigm shift for DLNR's management of mosquitoes within forest bird habitats.

IIT is neither novel nor an experiment, but the application of an established method for controlling insect populations. This method has been used for decades to protect human health in at least 17 countries worldwide including, but not limited to, New Caledonia, Fiji, Vanuatu, Australia, French Polynesia, Indonesia, Singapore, Malaysia, Vietnam, Thailand, Sri Lanka, India, China, Brazil, Columbia, Mexico and the United States (Florida, California, Texas, Kentucky, New York and Puerto Rico); it is not being "tested" in Hawai'i. IIT is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. What is new about this proposed project, however, is that it has not previously been employed in Hawai'i, nor for the purpose of wildlife conservation. As such, protocols would be developed for its use in Kaua'i's native forest and other local conditions.

The IIT method requires consistent releases of incompatible male mosquitoes to maintain suppression of mosquito populations; this method can be used on a landscape-scale over long periods of time. This repetition is by no means unusual, as it is common for management projects to require repeated actions over long periods to maintain the success and meet the goals of the project. For example, fencing to keep out invasive hoofed mammals (e.g., goats, pigs, and deer) from sensitive habitats requires regular inspection and maintenance, and rat control requires continuous trapping and/or bait applications. Controlling weeds or invasive insects similarly requires repeated visits to affected sites, sometimes for many decades after an infestation is discovered. In general, conservation and resource management in Hawai‘i can be labor intensive, costly, and takes time.

In recognition of the potential of IIT to benefit native forest bird populations, the Birds, Not Mosquitoes Project, a collaboration between state, federal, university, and non-profit partners, was established to evaluate planning and implementation for landscape level control of mosquitoes in Hawai‘i. The specific purpose of the Birds, Not Mosquitoes Project is to coordinate and advance efforts to develop, permit, test, register, and implement a *Wolbachia*-carrying southern house mosquito for population suppression to reduce disease prevalence in native forest birds, as well as to advance the approach such that it can also be used for the benefit of human health in Hawai‘i. Collaborators on the project are listed in Table 2.

Table 2. List of project collaborative government agencies, universities, and non-governmental organizations.

American Bird Conservancy	National Park Service
Coordinating Group on Alien Pest Species	Office of Native Hawaiian Relations
Hawai‘i Department of Agriculture	Pacific Rim Conservation
Hawai‘i Department of Health	The Nature Conservancy
Hawai‘i Department of Land and Natural Resources	U.S. Geological Survey
Island Conservation	University of Hawai‘i
Kaua‘i Forest Bird Recovery Project	University of Kentucky
Maui Forest Bird Recovery Project	U.S. Fish and Wildlife Service
Michigan State University	

The use of IIT for mosquito control has been recommended by both executive and legislative branch leadership across the state.

In 2017, the Hawai‘i Invasive Species Council (HISC) passed Resolution 17-2 “Supporting Evaluation and Implementation of Technologies for Landscape-scale Control of Mosquitoes, With a Focus on Mitigating Both Human and Wildlife Health Risks”
<https://dlnr.hawaii.gov/hisc/files/2013/02/HISC-Reso-17-2-Mosquitoes.pdf>

In 2019, House Resolution (HR) 297, later Act 106, passed the Hawai‘i State Legislature and directed the “[Department of Agriculture] to review the *Aedes aegypti* mosquito with *Wolbachia* bacteria, including *Aedes aegypti* mosquitoes originating from Hawai‘i stock that could be imported for landscape scale mosquito control, and render a determination to place it on the

appropriate animal import list.” The resolution required the DOH, HDOA and DLNR to collaborate on a report to the Legislature with recommendations for appropriate vector control programs. https://www.capitol.hawaii.gov/slh/Years/SLH2019/SLH2019_Act106.pdf

In 2021, House Resolution (HR) 95 subsequently passed the Hawai‘i State House urging DLNR, HDOA, DOH and UH to implement a mosquito control program using *Wolbachia* to reduce mosquito population levels throughout the state:
https://www.capitol.hawaii.gov/sessions/session2021/bills/HR95_HD1_.htm

On September 7, 2022, the Kaua‘i County Council passed Resolution No. 2022-31 “Resolution Urging Federal, State, and County Elected Officials to Support the Funding and Implementation of the Use of Mosquito Birth Control to Bring Kaua‘i’s Native Forest Birds Back From Near-Extinction and Towards Abundance.”
<https://www.kauaigovonline.org/WebLink/DocView.aspx?id=3280034&dbid=0&repo=LF-IMAGING>

On May 12, 2023, the Kaua‘i County Council passed Resolution 2023-43, “Resolution Urging Federal, State, and County Elected Officials to Support Funding and Implementation of Mosquito Birth Control Measures to Mitigate the Rapid Decline of Native Bird Species.”

Funding for the proposed action is expected to be provided by state, Federal, and private organizations including DLNR, American Bird Conservancy, USFWS, National Fish and Wildlife Foundation, and the Hawai‘i Invasive Species Council.

2.5.1 Required Permits and Approvals

In June 2022, the State of Hawai‘i Board of Agriculture approved the addition of the southern house mosquito to the Chapter 4-71, Hawai‘i Administrative Rules (HAR) “Non-Domestic Animal Import Rules” list of restricted animals (Part A) and set permit conditions to allow the importation and field release of male southern house mosquitoes containing incompatible strains of *Wolbachia* bacteria. In October 2022, the Hawai‘i Department of Agriculture (HDOA), Plant Quarantine Branch issued a permit to DLNR to allow for the import and release of southern house mosquitoes for mosquito control projects.

The Environmental Protection Agency (EPA) regulates incompatible male mosquitoes as a “biopesticide” product. The EPA defines biopesticides as “naturally occurring substances that control pests (biochemical pesticides), microorganisms that control pests (microbial pesticides), and pesticidal substances produced by plants containing added genetic material (plant-incorporated protectants) or PIPs.” Many biopesticides registered by the EPA can be used in and around lands cultivated for certified organic food production if the ingredients also meet U.S. Department of Agriculture standards.

A Federal Insecticide Fungicide Rodenticide Act (FIFRA) Section 18 application was submitted by the HDOA to the EPA, in collaboration with the USFWS and DLNR, to request an emergency exemption from Section 3 pesticide registration, given the imminent extinction risks to threatened and endangered forest bird species. The Section 18 process results in temporary product registration and a label that identifies appropriate product use, application rates, restrictions, safety, and quality control requirements. On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB

in *Culex quinquefasciatus* (DQB Strain) (Appendix C: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and U.S. EPA Letter of Authorization). As control projects are initiated for the southern house mosquito, HDOA, DLNR and USFWS would then collect and share post-application monitoring data with the EPA to contribute towards a formal Section 3 pesticide registration package.

3 ALTERNATIVES

This chapter describes the No-action Alternative (Alternative 1) and the Proposed Action (Alternative 2) for reducing mosquito populations and, thus, avian malaria transmission to threatened and endangered forest birds in the Kōke‘e and Alaka‘i Wilderness areas of Kaua‘i. Avoidance and minimization conservation measures are included in the proposed action. Other potential alternatives were identified during internal and public scoping but were dismissed from detailed analysis in this EA as described in Section 3.3: “Alternatives Considered but Dismissed from Detailed Analysis”.

3.1 Alternative 1 (No-Action Alternative)

Under the no-action alternative, releases of incompatible male mosquitoes would not occur. Although ongoing conservation and other management activities would continue in the project area (e.g., fencing, construction of field camps, removal of non-native ungulates and predators, and invasive plant control), native forest birds would continue to be adversely affected by their primary threat, avian malaria, because the mosquitoes that carry this disease would remain uncontrolled and are anticipated to continue to spread into the remaining forest bird habitat. Under the no-action alternative, the ‘akikiki is predicted to go extinct by 2025 and the ‘akeke‘e by 2034 (Paxton et al. 2022). The ‘akikiki and ‘akeke‘e have experienced 11% and 15% yearly declines, respectively, since the 1980s and currently have very limited ranges, and therefore could be extinct sooner than projected (Paxton et al. 2020; Paxton et al. 2022).

3.2 Alternative 2 (Proposed Action)

DLNR and the other partners are proposing the sequential and continued release of lab-raised male southern house mosquitoes that carry a strain of *Wolbachia* that is incompatible with those strains that are present within the wild mosquito population. It is important to note that male mosquitoes do not bite humans or animals. The southern house mosquito is typically most active at dusk through to the middle of the night (Subra 1981). The mosquitoes would be released from the ground and air within 59,204 acres (23,959 hectares) on Kaua‘i (Project Area; Figure 1). The section below describes the proposed action with sufficient detail necessary to analyze the impacts that may occur from the action.

3.2.1 Goals and Objectives of the Project

The overarching goals of the project are to:

- Suppress breeding of southern house mosquitoes within the project area.

- Reduce the populations of southern house mosquitoes to prevent the extinction of some native forest bird species within the project area, and to promote the recovery and health of native forest bird species within the project area.

The objectives of the project are to:

- Implement releases of incompatible male mosquitoes within the project area.
- Conduct pre- and post-release monitoring to assess changes in southern house mosquito populations and integrate data to inform project planning and future releases.
- If applications of incompatible male mosquitoes are determined to be effective in suppressing southern house mosquito populations, integrate releases of incompatible males into long-term management of the project area, using adaptive management to maintain or adjust efficiency and efficacy.

3.2.2 *Environmental Compliance*

The project would comply with all applicable Federal laws, regulations, Executive Orders, state statutes, and administrative rules, such as those pertaining to management of Forest Reserves, Natural Area Reserves, the Alaka‘i Wilderness Area, State Parks, and threatened and endangered species. Additional Federal and state permits and processes that would be required for the proposed action are listed in Table 3.

Table 3. Required Relevant Permits and Approvals

Permit or Approval	Responsible Agency
Section 7, Endangered Species Act	USFWS
Section 106, HRS 6E, Historic Preservation	USFWS and DLNR-SHPD
Import Permit	HDOA
Section 18 Approval/Section 3 Registration	EPA
DLNR-Division of State Parks Special Use Permit	DLNR-DSP
HEPA and NEPA	USFWS and DLNR

3.2.3 *Mosquito Procurement*

Incompatible male mosquitoes would initially be raised in the continental U.S. and then transported to Hawai‘i, with shipping frequency depending on the project release schedule. To ensure that Hawai‘i’s mosquito genetics are >99% contained within an incompatible male mosquito, only males that have been backcrossed over at least seven generations with a population of mosquitoes originating from Hawai‘i stock would be used for this project. Southern house mosquitoes originating from Hawai‘i have been collected and provided to partners on the continental U.S. to establish incompatible lines for use in Hawai‘i. In October 2022, DLNR was granted a permit by the Hawai‘i Department of Agriculture, Plant Quarantine

Branch to import incompatible male southern house mosquitoes, and DLNR must adhere with all relevant import permit conditions, as well as State of Hawai‘i administrative rules and statutes relating to restricted animals and microorganisms. Approval for DLNR to import and complete direct releases of incompatible male mosquitoes into the environment has been approved by the State of Hawai‘i Board of Agriculture (June 2022). DLNR is also exploring future options for establishing a state-run incompatible mosquito-rearing facility in Hawai‘i. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.

3.2.4 Release Area Prioritization

No new roads, trails, or helicopter landing zones (LZs) would be created to support this project; only existing facilities and access points would be used. Release areas would be prioritized based on ease of access, availability of support resources, presence of southern house mosquitoes, and proximity to core endangered forest bird populations. Project management units would be demarcated by access roads and trails, and vegetation types. In terms of ease of access, some higher priority areas would include accessible fence lines, roads, trails (Figure 3), and field camps used for other resource management activities (described below in Section 3.2.4.1). Field camps accessible by road may be of higher priority than those accessible by helicopter. Available times to occupy camps would be coordinated through the appropriate management agency.

3.2.4.1 FIELD CAMPS

There are several established field camps in the project area that are used regularly by KWA, KFBRP, and DLNR staff to support ongoing forest bird recovery and management activities. These field camps are small, situated on flat sites, and are primarily located within forest habitat. Some of these field camps are accessible by roads and trails, while access to more remote camps requires helicopter transport. Wai‘alae cabin in the Alaka‘i Wilderness Preserve is available for public use and is occasionally used by resource management and research staff. Additional field camps would likely be developed to support the construction of ungulate exclusion fences within Mōhihi Watershed, and for upgrades to fences within the Drinking Glass and Koai‘e units. Established field camps and these potential additional field camps may be used to support the release of incompatible male mosquitoes into remote areas. No new field camps would be created solely for this project. Wai‘alae cabin may be used occasionally, but no other publicly available cabins or campsites are anticipated to be used.

Available times to occupy field camps would be coordinated through the appropriate management agency. The proposed action would increase the frequency of use of some of these field camps because the camps that support forest bird recovery and management activities are typically used most in the spring and summer seasons, whereas mosquito releases would occur year-round. All foreign material brought into the camps would be removed when exiting the camp.

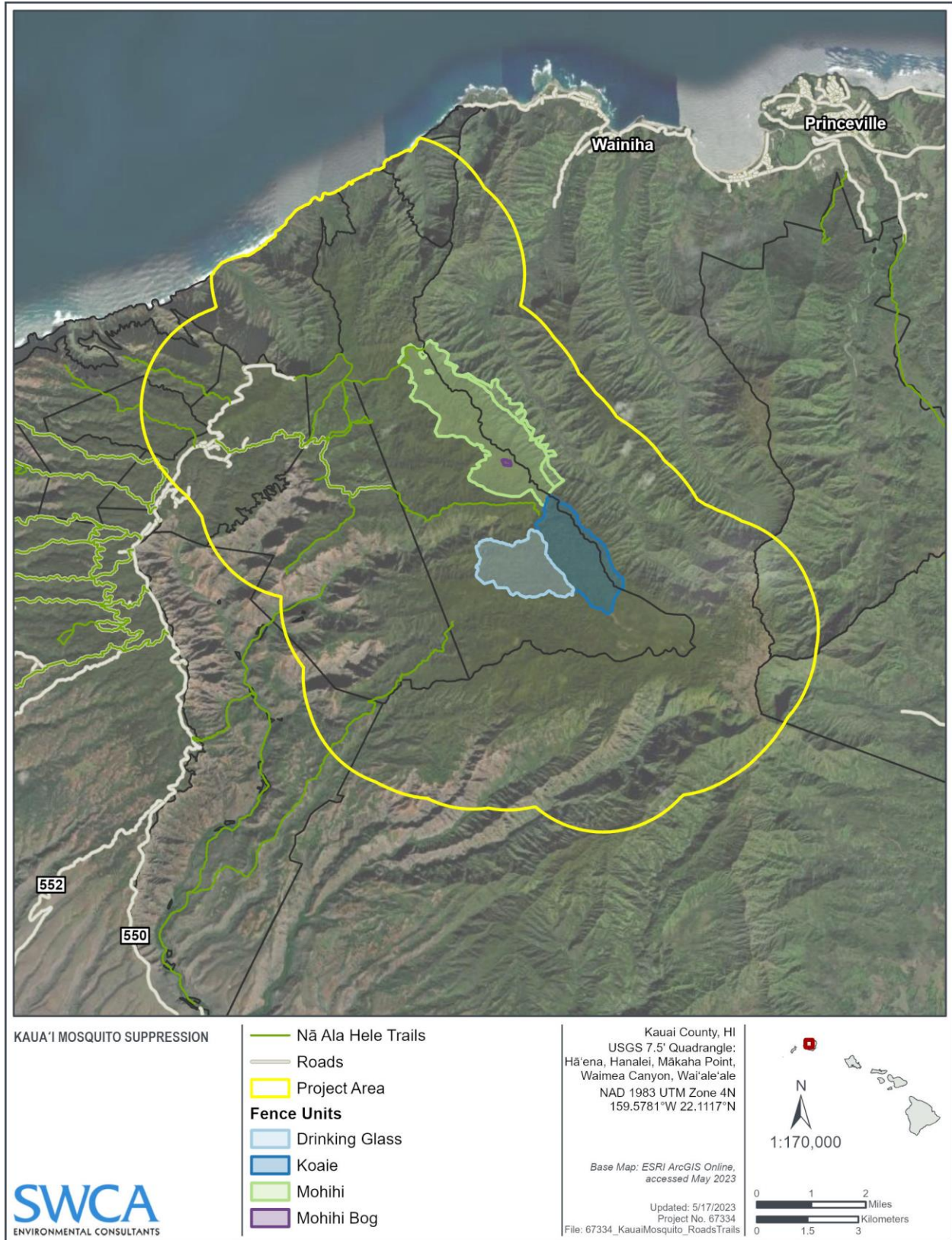


Figure 3. Project area roads and trails.

3.2.5 Frequency, Application Rate, and Timing of Release

The goal of the proposed action is to reduce the distribution and abundance of the mosquito population within the project area to reduce avian disease and contribute to the stabilization and recovery of threatened and endangered avian species on Kaua'i. Many previous successful IIT projects resulted in mosquito population declines of 90% or more (Beebe et al. 2021, Crawford et al. 2020, and Zheng et al. 2019). A similar decline would ensure that there would be very few remaining mosquitoes capable of biting and infecting threatened or endangered forest birds with avian malaria. Population densities of mosquitoes are dependent on precipitation patterns, habitat availability, and temperature. Adults, eggs, and larvae develop faster and in higher densities within warmer low-elevation areas (Ahumada et al. 2004). Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014). Estimates assume an equal sex ratio of males to females; therefore, the number of prescribed incompatible male mosquitoes released would be based on approximately one-half of the estimated mosquito population. Incompatible males would need to outcompete wild males; thus, it is desirable to release males in such numbers as to “overflow” the wild males. Statistical models suggest that 10 to 20 incompatible males for every wild male mosquito in the population may be required to achieve population suppression (McClure 2020).

The timing and volume of releases of incompatible male mosquitoes would be determined by mark release recapture research completed in advance of control applications and in compliance with the FIFRA Section 18 Specific Emergency Use Directions (Appendix C). Subsequent release actions and frequency would be based on the results of mosquito population monitoring (described below), including overflooding ratios observed on the landscape as calculated based on pre- and post-release trapping data. Releases may occur weekly to monthly in the project area. Releases may be more frequent initially, with the interval between releases increasing depending on the season and efficacy of applications. The quantity of incompatible mosquitoes released for this project would likely be less than other IIT mosquito projects that have occurred in urban areas throughout the world (involving yellow fever mosquitoes) because the southern house mosquito population density on Kaua'i is believed to be lower than yellow fever mosquito population densities in these urban areas. In addition, the uppermost elevations in the project area may have even fewer mosquitoes than estimated by Samuel et al. (2011) and population suppression in these areas may only require infrequent releases of incompatible mosquitoes. Alternatively, suppression at lower elevations may be sufficient to reduce or eliminate the threat of disease at the higher elevations by eliminating the individuals that could disperse uphill.

3.2.6 Release Methods

Four methods would be used to release the incompatible male mosquitoes within the project area depending on available technology and factors such as weather and staff capacity:

1. Pedestrian release
2. Helicopter aerial release
3. Fixed-wing aircraft aerial release

4. Drone aerial release

It is anticipated that 1,300 feet (400 meters) between release points may be sufficient to achieve mosquito suppression, however, data gathered during initial applications (see Section 3.2.7 below) would be used to inform the release program. These release methods are described in more detail below.

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact with the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. The material used would have been heat treated during the manufacturing process, which reduces the likelihood of introduction of any foreign contaminants or invasive species, similar to other plant-based media products commonly used in forestry/reforestation projects. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely, and the biodegradable material would decompose quickly, and are expected to pose no risk to the environment.

From a visitor experience standpoint, the release packages are unlikely to be observed by members of the public. The appearance of these packages is not yet entirely known and would depend on how they are designed to fall and land (i.e., on the ground or in trees). To fit into a release mechanism employed by a drone, the release packets would likely only be a few inches wide and light in mass. The visibility of the packages to members of the public would depend on two primary factors, 1) public access to the project area, and 2) spacing of releases. Most of the project area is not publicly accessible. Public users are unlikely to encounter release packages because the package is biodegradable and the proposed 1,300 feet (400 meter) spacing between release points would make encountering packages very unlikely. Chances of the public finding the remainder of a release packages before degradation would be equivalent to finding an object only a few inches wide within an area of dense forest approximately the size of 30 football fields. The rate of decay of the packages will dictate how many packages within an area one could observe at any given moment, but this decay rate is likely very high given the typical rainfall patterns in the project area, making the chance of observing multiple packages unlikely.

3.2.6.1 PEDESTRIAN RELEASE

Pedestrian release of incompatible male mosquitoes would occur along existing roads via four-wheel-drive (4WD) vehicles or via pedestrian hiking trails and fence line corridors. The appropriate DLNR permit process would be followed, where necessary. Most trails, access roads, and LZs would not require vegetation maintenance in addition to what is already maintained to support the KFBRP and other ongoing DLNR programs. Vegetation clearing around infrastructure, camps, trails, fence lines, and LZs is a standard management practice approved under DLNR Chapter 343 exemptions filed with the Hawai'i Office of Planning and Sustainable Development³. No new roads or trails would be created for this project.

All helicopter operations would be conducted by contracting a private helicopter company and would utilize existing LZs, some of which would require small amounts of vegetation

³ See: http://oeqc2.doh.hawaii.gov/Agency_Exemption_Lists/State-Department-of-Land-and-Natural-Resources-Exemption-List-2020-03-03.pdf

maintenance of these areas, as for other resource management purposes. Existing remote campsites (described in Section 3.2.4.1) would be utilized for field crews and require routine maintenance or vegetation clearance, as for other resource management purposes.

For each release event, which is anticipated to last one day, efforts would be made to minimize traffic (the number of technicians and vehicles or helicopter flights) required to travel to the release sites and field camps. An established camp would be used if an overnight stay is required.

3.2.6.2 HELICOPTER AERIAL RELEASE AND FIXED-WING AIRCRAFT AERIAL RELEASE

The helicopter aerial release and fixed-wing aircraft aerial release methods are still under development in Hawai‘i and elsewhere and have not, to date, been used in practice. The intent of these methods is to provide improved access to remote parts of the project area. The methods deployed would be informed by known similar operations. Although helicopter aerial release has been used to apply highly targeted micro-doses of liquid pesticide for the control of invasive pines, miconia, and little fire ants on the island of Maui; Australian tree fern on Kaua‘i; and native seed dispersal for reforestation projects, the release mechanism has yet to be developed for deployment of incompatible male mosquitoes.

Helicopters would be used to aid in the dispersal of incompatible male mosquitoes in inaccessible areas of the project area by flying predetermined transects spaced from 328–1,640 feet (100–500 meters) within the project area with a helicopter fitted with a mosquito release mechanism. The release mechanism would be attached to the aircraft by ground teams at the airport or at a temporary helibase. The helicopter would then fly to the release areas where incompatible male mosquito releases would occur at a minimum of 50 feet (15 meters) above the tree canopy; release would be triggered remotely by either the pilot or a spotter. The helicopter would likely spend 15 seconds or less hovering over each mosquito release location. The helicopter could complete up to three operations per day. It is assumed that repeat visits to any given area would not likely occur more than twice per week, and this schedule would be refined over time based on monitoring of mosquito populations.

For the fixed-wing aircraft aerial release, an airplane carrying a mosquito release mechanism would release mosquitoes from a system compatible with the aircraft. Incompatible male mosquito releases would be informed by mark release recapture data, ongoing monitoring, and aircraft performance and terrain characteristics. The specific release method is still under development.

3.2.6.3 DRONE AERIAL RELEASE

Unmanned Aerial Systems (UAS) or “drones” (the preferred term used in this document) may be used to disperse mosquitoes across the project area via a release mechanism compatible with the craft. Although the specific mosquito release mechanism is still under development, it is expected that it may be available by the time the project is ready for implementation. All Federal Aviation Administration (FAA) regulations and DLNR Best Management Practices for drones would be followed.

Drones would be launched from existing locations such as LZs, campsites, and access points where infrastructure is preexisting and/or where resource management operations already occur. No vegetation clearing would be conducted for drone release, other than routine maintenance of trails, campsites, fence corridors, and trails. Operators of these drones would be positioned in areas where they can safely and effectively operate drones and maintain compliance with FAA regulations. Drones would be flown on a prescribed route, releasing incompatible male mosquitoes at pre-determined release locations. It is estimated that drones would fly approximately 50–100 feet (15–30 meters) above the tree canopy during mosquito releases but no higher than 500 feet (~150 meters) Above Ground Level (AGL).

The drone operator would ensure that the drone and release mechanism are operating correctly and safely during each flight at an estimated speed of 22 mph (following Bouyer et al. 2020) during mosquito releases and 62 miles per hour while in fixed wing mode when ferrying to and from release locations. Proposed release locations would be spaced 1,300 feet apart, so a drone flying at 22 mph would be able to release incompatible mosquitoes at 24 release locations in a 15-minute period. At 62 miles per hour, the ferry times for the various parts of the core area vary widely. For example, a drone would only need to travel for approximately 1.5 minutes to reach some release locations in State Park lands but would need more than 5 minutes to reach more remote natural areas in the project area.

The exact drone model(s) to be used is undetermined and depends on environmental conditions, agency approvals, and other factors. The choice of drone model affects the release rate as different models have varying flight speed capabilities and battery capacities. Available convertible fixed wing/multirotor drone models that could be used for this project can fly approximately 15 minutes in multirotor mode or 90 minutes during fixed wing mode before battery life is expended with a maximum payload (carrying weight). An example of a drone considered for the project includes the *Freefly Alta-X*, which the U.S. Forest Service uses to deploy aerial ignition pods across a landscape to fight wildfires. There is considerable overlap and similarities between other UAS payload operations, like aerial ignition, which would inform UAS mosquito release development.

This project would utilize aircraft with similar capabilities and further develop capacity for the mosquito deployment use-case. For example, the [Freefly Alta-X paired with the Drone Amplified IGNIS release mechanism](#) is rated to cover 4,500 acres in 8 hours, dropping one ignition sphere per acre. The drone batteries are continuously charged and replaced to power the aircraft for the duration required. The Alta-X is rated to fly for approximately 30 minutes with a 10-pound payload allowing it to fly back and forth from the staging site to the treatment area as needed to refresh power and complete the dispensing mission. The flight speeds possible during releases of incompatible male mosquitoes depend on drone model used, weather conditions (e.g., wind speed) and optimal speeds for the release mechanism, which are still to be determined. The drones would likely spend 15 seconds or less hovering over each mosquito release location, and it is possible that drones would be able to release the mosquitoes without pausing.

The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Table 4) (Schaffer et al. 2021). Most consumer-grade drones are far quieter than helicopters with some being up to 40 dBA quieter than a manned helicopter at roughly 328 feet AGL (Airborne Drones 2020). For this project, drones would fly at approximately 50–100 feet above the tree canopy (likely approximately 100–200 feet AGL)

during mosquito releases. When multiple drones are in use, they would likely be releasing in different areas rather than releasing close to each other. Therefore, it is not anticipated that noise impacts would be compounded using multiple drones.

When ferrying to and from release locations, drones would fly no higher than 500 feet AGL. Drone noise levels for various heights above ground are presented in Table 4 and are based on a decrease of 6 dB for every doubling of distance from a sound perceiver. Along the same lines, the noise produced by a drone would likely blend in with the existing ambient noise levels of the project area at a lateral distance of approximately 0.25–0.5 mile depending on the height of flight (Airborne Drones 2020, Schaffer et al. 2021). Notably, the noise levels presented in this section are not actual measured noise levels; actual noise levels during mosquito releases would vary during specific operations depending on altitudes, topography, vegetation, speed, and drone power settings.

Table 4. Drone noise levels in decibals (dBA) at ground level and various Altitudes.

Drone type	Height in Feet Above Ground Level (AGL) from Source			
	25 ft AGL	100 ft AGL	200 ft AGL	500 ft AGL
Consumer Multirotor	~ 68–75 dBA	~ 58–65 dBA	~ 52–59 dBA	~ 44–52 dBA
Small, fixed wing drone	~ 63–70 dBA	~ 53–60 dBA	~ 47–54 dBA	~ 40–47 dBA
Quiet Commercial Multirotor	~ 57–68 dBA	~ 47–58 dBA	~ 41–52 dBA	< 44 dBA

3.2.7 Pre- and Post-Release Monitoring

Pre- and post-release monitoring are important components of the mosquito suppression project because they inform dispersal methods for ensuring the highest success. The cost of production, sorting, quality control and shipping of incompatible male mosquitoes is high. Monitoring to determine the most effective rate of application is critical to both ecological effectiveness and financial sustainability of the control program. Baseline mosquito monitoring has been conducted by U.S. Geological Survey and KFBRP personnel in the project area (Kōke‘e State Park, Alaka‘i Wilderness Preserve, Hono o Nā Pali Natural Area Reserve and Nā Pali-Kona Forest Reserve) since 2016 per the DLNR Chapter 343 Exemption List (revised November 10, 2020). Pre-release monitoring is currently being undertaken by KFBRP personnel who are using 4–8 Biogents Traps (BGs) and occasionally Biogents Gravid *Aedes* Traps (BG-GATs) at a variety of sites across the project area. Traps are placed along trails and other easily accessible areas and are being monitored nightly for up to a week at each site.

In 2021 and 2022, three sites within the project area were sampled by KFBRP for relative mosquito abundance for 8-10 six-night periods per site. The mosquito abundance data collected are currently being used by USFWS ecologists to develop a Bayesian model to assess the potential spread of incompatible males, spatial coverage of releases, effective overflooding ratios, and overall effectiveness of suppression efforts. Mosquito sampling has and would also be undertaken to conduct stable isotope and genomic studies to determine the migration patterns of mosquitoes across elevational gradients, and genetic screening for the avian malaria parasite, *Plasmodium relictum*. Larval habitat was and continues to be surveyed on dedicated routes for

each visit to each of those sites, and opportunistically as KFBRP staff accessed different areas in the Alaka'i Plateau for field work.

Ongoing monitoring following the release of incompatible male mosquitoes would likely utilize the same methods and trap types as the pre-release monitoring described above. Dedicated monitoring would be increased from pre-release monitoring levels during the initial trial phase of releases. Prior to and during the second phase of releases, monitoring would increase substantially with 50 traps placed in a control site and 100 traps in a treatment site. In addition to easily accessible areas, some of these traps would be placed in more remote backcountry sites. Each of the 150 total traps would be run one time per week during each week of monitoring.

A monitoring plan will be developed and include measures of success and certain provisions seeking unanticipated outcomes, such as unintended release of females. Monitoring would occur in a control area representative of forest bird habitat and the treatment site. At the conclusion of a given trapping interval (1–4 nights), specimens may be transported to a laboratory for analysis, and traps would either be redeployed or moved to another survey location. Although traps would target male and female southern house mosquitoes, limited bycatch of native and non-native dipterans and other flying arthropods could also occur (bycatch released alive when possible).

While the methods and objectives are similar, post-release monitoring would differ from pre-release monitoring in that mosquito traps would be deployed simultaneously over a larger area, would be serviced with greater frequency, and would be required for as long as control efforts are ongoing. All monitoring data collected would be analyzed to improve project efficiency, serve as quality control for mosquito applications across the landscape, and to evaluate the success of suppression efforts by determining if the overflooding release ratio of wild to released mosquitoes described in Section 3.2.5 was achieved. Future mosquito releases will be based on monitoring results.

3.2.8 *Implementation Schedule*

After the NEPA and HRS Chapter 343 processes are completed, DOFAW anticipates moving forward with releases using the pedestrian method as quickly as possible. Implementation of the proposed action would be contingent on the availability of funding, resources, and personnel.

3.2.9 *Avoidance and Minimization Measures*

Table 5 summarizes the measures that would be implemented to avoid and minimize potential impacts on each resource from the project. Table 6 summarizes species-specific measures recommended by USFWS. Please see Appendix D, USFWS Avoidance and Minimization Measures and Biosecurity Protocols. All measures, recommendations, and protocols would be followed and adhered to under the proposed action (e.g., DOFAW 2011b; Loope 2016). Additionally, any activity with a DLNR permit will have all conditions prescribed by the permit followed, including following all rapid 'ōhi'a death (ROD) protocols, cleaning all equipment and apparel off-site, avoiding damage to potentially sensitive botanical, wildlife, or archaeological features, and prohibiting littering and open fires.

Table 5. Avoidance and Minimization Measures by Resource

Resource	Avoidance and Minimization Measures
Flora and Fauna (General Botany and Wildlife, includes other non-native and native non-listed species)	<p>Forest bird nesting season (February to June) would be considered for air-based releases and known nests would be avoided by ground personnel and aircraft whenever possible.</p> <p>In some highly sensitive areas, restrictions/limitations may be placed on helicopter use during the forest bird nesting season (February to June); alternative landing zone locations may be used to avoid known nesting sites.</p> <p>The use of ground transportation and aircraft would be minimized to the greatest extent possible to reduce disturbance to native fauna.</p> <p>All FAA rules for drone, helicopter, and fixed-wing aircraft operation would be followed and operators will hold all necessary certificates and licenses.</p> <p>Project personnel would, to the greatest extent possible, avoid the creation of stagnant water habitat.</p> <p>Project personnel would avoid activities that could increase the risk of wildfires and spread of ROD and invasive species.</p> <p>Existing biosecurity SOPs would be followed by trained and experienced project personnel.</p> <p>Drone and helicopter operations will follow best practice protocols established by the National Wildfire Coordinating Group.</p> <p>Following the Land Fire Protection Law, Chapter 185, Hawai'i Revised Statute, DOFAW would cooperate with the Hawai'i Fire Department and take measures to prevent, control, and extinguishment of wildland fires in the case of downed crewed aircraft or drone.</p>
Threatened and Endangered Species	<p>In addition to the general flora and fauna measures outlined above, the following guidelines would also be followed:</p> <p>Follow State of Hawai'i regulations concerning endangered species (Chapter 195D) and reserve lands (Chapter 183), as well as all regulations for state parks and wilderness preserves.</p> <p>Where possible, avoid known locations of Threatened and Endangered species.</p> <p>Communicate the location of threatened and endangered species populations on the margins of trails and landing zones to project personnel.</p> <p>Train personnel in the identification of all threatened and endangered species that are likely to be encountered within the project areas (e.g., avoid crushing rare plants).</p>

Resource	Avoidance and Minimization Measures
	<p>Ensure that all project personnel follow USFWS Avoidance and Minimization Measures when working near threatened and endangered species.</p> <p>Avoid damage to arthropod host plants during the clearance of vegetation along trails and at landing zones.</p> <p>Existing biosecurity SOPs would be followed by trained and experienced project personnel.</p>
Public Health and Safety	<p>Outreach campaigns/press releases, such as the ongoing Birds, Not Mosquitoes campaign, would be developed and supported as needed to address public comments or concerns received on the project.</p> <p>DOFAW would use established methods (e.g., posting flyers at trailheads and other publicly accessible sites within the project area, use of social media) to educate the public about the project and to address associated health and safety concerns.</p>
Recreation	<p>Provide public notice (e.g., signs at trailheads or other publicly accessible sites) of any changes in recreational use or access.</p> <p>The use of ground transportation and aircraft would be minimized to the greatest extent possible to reduce disturbance to recreationists.</p> <p>DOFAW would notify commercial helicopters of program activities (especially aircraft use) and recommended avoidance areas so that the aircrafts do not impact each other.</p>
Cultural Resources (including historic sites)	<p>The use of ground transportation, helicopters, fixed-wing aircraft, and drones would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners.</p> <p>DOFAW would continue to provide notice of any changes in use or access to DOFAW-managed areas, including areas frequented by cultural practitioners, through social media announcements or updates on the DOFAW website. DOFAW also maintains a hunter email list that could be used to notify hunters about any changes to access or use of public hunting areas. If changes in public access do arise, DOFAW would consult with the 'Aha Moku representative for the area to ensure that dispersal and monitoring efforts are coordinated with cultural practitioners who may be using those areas to gather forest plants, hunt, or carry out other cultural practices.</p> <p>Due to the nature of the proposed project activities, it is anticipated that no cultural and historic sites will be physically impacted by project activities. Project personnel would avoid impacts to cultural sites by staying on designated roads and trails. Project related activities would</p>

Resource	Avoidance and Minimization Measures
	be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project.

Table 6. USFWS Avoidance and Minimization Measures for Federal and State Threatened and Endangered Species that are Known to Occur within the Project Area

Species	Threat Status	Avoidance and Minimization Measures
Puaiohi (<i>Myadestes palmeri</i>), 'Akikiki (<i>Oreomystis bairdi</i>), Akeke'e (<i>Loxops careuleirostris</i>)	Endangered (Federal and State)	Project personnel will avoid conducting activities within forest bird habitat that: Promote the spread or survival of invasive species Increase mosquito populations or stagnant water habitat Increase wildfire threat to montane forest habitats
'I'iwi (<i>Drepanis coccinea</i>)	Threatened (Federal); Endangered (State)	Remove tree cover during peak breeding season between January 1 and June 30.
Nēnē (Hawaiian goose; <i>Branta sandvicensis</i>)	Threatened (Federal); Endangered (State)	Nēnē would not be approached, fed, or disturbed. If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), a biologist familiar with nēnē nesting behavior will survey for nests in and around the project area prior to resumption of any work. Project personnel will cease work and contact the Service if a nest is discovered within a radius of 150 feet of the project, or a previously undiscovered nest is found within 150-foot radius after work begins. In areas where nēnē are known to be present, reduced speed limits would be implemented, and project personnel and contractors would be informed about the potential presence of endangered species on-site.

Species	Threat Status	Avoidance and Minimization Measures
Koloa maoli (Hawaiian duck; <i>Anas wyvilliana</i>)	Endangered (Federal and state)	<p>In areas where waterbirds are known to be present, reduced speed limits would be implemented, and project personnel and contractors would be informed about the presence of endangered species on-site.</p> <p>If a nest is observed, a 100-foot buffer would be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged.</p>
'Akē'akē (band-rumped storm-petrel; <i>Hydrobates castro</i>); 'ua'u (Hawaiian petrel; <i>Pterodroma sandwichensis</i>)	Endangered (Federal and State)	<p>DLNR would undertake all aircraft flights during daylight hours, thereby avoiding interactions with night-flying seabirds.</p> <p>Project personnel will fully shield all outdoor lights at campsites so the bulb can only be seen from below.</p>
'A'o (Newell's shearwater; <i>Puffinus auricularis newelli</i>)	Threatened (Federal and State)	
'Ōpe'ape'a (Hawaiian hoary bat; <i>Lasiurus cinereus semotus</i>)	Endangered (Federal and State)	<p>Project personnel would not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).</p> <p>DLNR would undertake all aircraft flights during daylight hours, thereby avoiding interactions with night-flying 'ōpe'ape'a.</p> <p>Hovering in one place during drone operations would be minimized to limit the risk of disturbing day roosting 'ōpe'ape'a</p> <p>Where possible, helicopters would avoid rotor wash of the forest canopy.</p>
Newcomb's snail (<i>Erinna newcombi</i>) (aquatic invertebrate)	Threatened (Federal and State)	Pedestrian activities would be limited to established trails and stream crossings in and around any aquatic environments.
Hawaiian picture-wing fly (<i>Drosophila musaphilia</i>)	Endangered (Federal and State)	Project personnel will avoid clearing forest vegetation within 200 feet of a site potentially occupied by endangered <i>Drosophila</i>

3.3 Alternatives Considered but Dismissed from Detailed Analysis

3.3.1 *Application of conventional pesticides/adulticides*

Of the six conventional pesticide spray formulations currently registered in Hawai'i and labeled for control of mosquitoes in non-agricultural areas, none are labeled for use against mosquitoes in conservation areas, forests, bogs or waterways. More notably, the use of conventional pesticide products containing active ingredients that kill arthropods are unacceptable for use in natural areas due to the presence of native insect species. There are over 1,400 described arthropod species that are endemic to the island of Kaua'i. The natural areas that serve as the last refuges for native forest birds also support a diversity of the remaining endemic arthropods, including federally listed endangered and threatened species. For example, *Drosophila musaphilia* is endemic to Kaua'i and its known range and critical habitat is in Kōke'e within the proposed application area. Furthermore, the repeated application of pesticides within the proposed project area could potentially contaminate soil and water due to pesticide runoff or drift, as well as the potential development of pesticide resistance within target and non-target insects.

3.3.2 *Application of conventional larvicides*

Similar to conventional spray formulations, conventional larvicides containing active ingredients with modes of action known to broadly impact arthropods; these are also unacceptable for application in natural areas. Rare native arthropod species occur within the proposed application area, and larvicides could threaten species outside of the project area if run-off or pesticide drift occurs. The remote high elevation habitat in which endangered forest birds persist is additionally inaccessible and challenging to traverse, therefore surveying for cryptic larval habitat and applying larvicides to achieve comprehensive control is logistically unfeasible. Even if pursued, this method is also unlikely to be successful given that the proposed project area receives extensive rainfall, which would dilute and disperse chemicals outside of intended target areas.

3.3.3 *Application of bacterial larvicides*

There are at least 11 products registered in Hawai'i and labeled for control of mosquitoes in the larval stage that use the bacteria *Bacillus thuringiensis israelensis* (Bti) as the active ingredient. While many of these products can be used in natural areas, including bogs and waterways, there are significant constraints on locating larval habitat and applying the larvicide in remote, inaccessible areas. Bti is not effective in controlling late instar mosquito larvae, which could still emerge as adult mosquitoes. This approach is also quickly rendered ineffectual in high rainfall environments where Bti is likely to be quickly diluted after application.

3.3.4 *Cultural controls*

Management in natural areas can help to decrease the presence of larval habitat, but it cannot completely eliminate it. To prevent the degradation of native forests and the creation of larval habitat by introduced hoofed animals, activities such as fencing and ungulate control are

essential. These measures, however, do not address the breeding of larvae in areas with natural standing water, such as tree cavities, bogs, and streamside pools.

There are also actions that can be taken to reduce the availability of larval habitat created by humans. These actions include filling potholes on roads and removing man-made materials that may hold water. Regardless, these measures are not effective in achieving area-wide control of mosquitoes.

3.3.5 Biological control

Biological control of mosquitoes has been undertaken using *Toxorhynchites* mosquitoes, which are natural predators of mosquito larvae in aquatic habitat (Steffan 1968). While they are generalist predators, *Toxorhynchites* have been documented to prefer mosquito larvae. Two *Toxorhynchites* species (*T. brevialpis* and *T. amboinensis*) were released to control mosquitoes and have established self-sustaining populations in Hawai‘i (in 1950 and 1953, respectively) (Steffan 1968). While the two species may contribute to localized control, they appear incapable of providing effective area-wide suppression of southern house mosquito populations (Nakagawa 1963).

3.3.6 Application of males sterilized by irradiation

The application of incompatible males for fruit fly control and eradication programs has been highly successful worldwide. The process of releasing male mosquitoes sterilized by irradiation would be logistically similar to the application of incompatible male southern house mosquitoes (*Culex quinquefasciatus*). Previous studies, however, indicate that irradiation levels required to sterilize male mosquitoes reduce their competitiveness in locating and mating with female mosquitoes, when compared to wildtype males (Bellini et al. 2013, Yamada et al. 2014).

3.3.7 Self-limiting genetically modified mosquitoes

Self-limiting, genetically modified (GM) mosquitoes are being used in other places around the world (Florida, California, Brazil, Panama) to achieve mosquito control, with the goal of reducing arboviral disease transmission for public health and safety (Waltz 2016, EPA 2021). The release of GM mosquitoes requires similar logistics to the use of incompatible male mosquitoes or irradiated sterile male mosquitoes. Such technology, however, has not yet been developed for southern house mosquito and concerns have been expressed by communities in Hawai‘i relating to the safety of genetically engineered or modified organisms (GMOs), and GM mosquitoes in particular.

3.3.8 Other Mosquito Control Methods

In 2017 a group of biologists, entomologists, biotechnology experts, and public health specialists met over three days to discuss the possible solutions to the problem of mosquito-borne diseases in Hawai‘i (<https://reviverestore.org/the-plan-to-restore-a-mosquito-free-hawaii/>). The group identified the sterile insect technique (SIT; i.e., sterilizing mosquitoes with radiation), IIT using the *Wolbachia* bacteria, and self-limiting insect approaches using next generation gene tools (i.e., “gene drive”) as possible options. At the time, SIT research had not yielded promising results for area-wide mosquito control programs. Concerns with gene drive technology, similar to those

identified for self-limiting genetically modified mosquitoes above, were also acknowledged. Furthermore, there was no existing gene drive approach developed for mosquito control nor was there an accompanying regulatory pathway for such a tool to be registered and utilized. *Cordyceps* or other fungus species were not identified as tools for suppressing mosquito populations, and there is no fungus that is effective at suppressing populations of the southern house mosquito. New technology as it becomes available will be explored as potential options in the future.

3.3.9 Reforestation and Habitat Restoration

Reforestation and habitat restoration have occurred in the past and are ongoing actions in and around the project area and are expected to continue. While these efforts contribute significantly to the long-term restoration of suitable habitat throughout endangered forest bird critical habitat on Kaua'i, these efforts alone will not prevent the extinction of the species.

Loss of suitable habitat has been extensive in the Hawaiian Islands and is a significant threat to forest birds generally. Introduced and established mosquitoes, however, are also a threat because forest birds on Kaua'i are highly susceptible to mosquito-borne diseases and are not expected to persist in areas where mosquitoes are present. Restoration of suitable habitat through reforestation of areas in which mosquitoes are present is therefore not expected to be an effective alternative strategy to prevent the extinction of forest bird species. Restoration of suitable habitat in higher elevation areas where mosquitoes are expected to become prevalent as global temperatures rise, is an important part of recovery efforts. However, restoration alone does not constitute an effective alternative to mosquito control at this time because, 1) the acreage of potential suitable habitat at those higher elevations is vanishingly small, and 2) restoration of suitable habitat in those areas takes decades and cannot be completed before the projected extinction timeline of the affected species. Lastly, reforestation and habitat restoration would not remove the southern house mosquito from the project area and therefore not abate the spread of avian malaria.

As previously mentioned, the proposed action would be part of a suite of management actions designed, at least in part, for the preservation of native forest birds. The U.S. Fish and Wildlife Service (USFWS) detailed a long-term conservation and recovery plan for several taxa of endangered Hawaiian forest birds, including the remaining populations of 'akikiki and 'akeke'e on Kaua'i (USFWS 2006). The plan prioritized measures to improve and restore degraded habitat through invasive species control and reforestation. Population viability models, however, predicted time to extinction of both the 'akikiki and 'akeke'e as soon as 2023 (Paxton et al. 2022), which further demonstrates the urgency for implementing mosquito suppression techniques in both current and previously occupied ranges where habitat restoration and invasive species control are ongoing.

3.3.10 Restoration of Natural Water Flow

Although it is true that human infrastructure in streams in Hawai'i can create additional larval habitat for the southern house mosquito, the abundance of mosquitoes in high elevation habitat on Kaua'i is not caused by stream diversions or other human-caused water flow disturbances. Mosquitoes breed in various natural water sources including, but not limited to, tree cavities, pig

wallows, natural depressions, and streamside pools. Restoration of natural water flow throughout relevant habitat on Kaua‘i would therefore not decrease or eliminate the presences of southern house mosquitoes on the island, nor decrease the spread of avian malaria in forest bird habitat.

3.3.11 Application of Mosquito Fish as a Biological Control

The dispersal of mosquito fish into aquatic habitat can be an effective tool to reduce mosquito populations under certain conditions. Mosquito fish predate the larval stage of mosquitoes and have been used historically in Hawai‘i as a part of an integrated pest management strategy for mosquito vector control in urban and suburban areas (Seale 1905). To be effective, the fish must be introduced, or disperse, to available habitat where mosquitoes are breeding. In natural areas, such as those included in the proposed project area, southern house mosquitoes often breed in ephemeral larval habitat (e.g., standing water on roadsides, tree cavities, pig wallows and intermittent streams). The lack of waterway connectivity throughout core forest bird habitat on Kaua‘i would limit the mosquito fish’s ability to control mosquitoes in all areas where endangered forest birds exist. Locating and distributing mosquito fish to such larval habitat on Kaua‘i would not be logistically feasible. Furthermore, mosquito fish are generalist predators and do not target mosquitoes exclusively. As a result, they are documented having significant adverse impacts on native invertebrate fauna. In lowland waterways, mosquito fish consume native arthropods (such as the endangered *Megalagrion* damselflies and anchialine pond shrimps *Vetericaris chaceorum* and *Procaris hawaiiana*) and crustaceans causing major declines of native biota in waterways and pools where they are present.

3.3.12 Application of Avian Vaccine for At-risk Forest Birds

At present there is no vaccine available for avian malaria. DLNR and FWS will evaluate all available tools, including the use of a vaccine if one becomes available and would consider the most efficient methods for its deployment. Researchers are investigating the causes of malaria resistance in ‘amakihi, and project that is in progress and for which results are not yet available.

4 AFFECTED ENVIRONMENT AND IMPACTS

Following guidelines provided by the Council on Environmental Quality (CEQ), agencies must compare the impacts of the proposed action and alternatives with the existing and expected future conditions of the affected environment in the absence of the action, which is referred to as the no-action alternative. The CEQ guidelines for implementing NEPA state that agencies “may contrast the impacts of the proposed action and alternatives with the current and expected future conditions of the affected environment in the absence of the action, which constitutes consideration of a no-action alternative” (85 FR 43323). The current state of the environment, environmental consequences, and the potential effects of the proposed action and the no-action alternatives on each resource category are outlined in this chapter. Additional issues and impacts that were considered but dismissed from detailed analysis are provided in Appendix A.

The code of Federal Regulations (40 CFR § 1508.1(g)) defines effects or impacts as “changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may

include effects that are later in time or farther removed in distance from the proposed action or alternatives.” The implementation of NEPA requires an evaluation of direct impacts, indirect impacts, cumulative impacts and ecological impacts as a part of the decision-making process. The description of the affected environment and analysis of impacts follow the CEQ NEPA regulations, as amended in May of 2022 and the DOI NEPA regulations.

Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts refer to the effects on the environment resulting from the incremental impact of the action when combined with other past, present, and foreseeable future actions, regardless of the agency or person undertaking those actions [40 CFR 1508.1(g)(3)]. Ecological impacts (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effects would be beneficial.

For this analysis, direct, indirect, and cumulative impacts were determined for several resources: threatened and endangered species, wildlife resources, vegetation resources, cultural resources, public health and safety, recreation and wilderness, air quality, greenhouse gas emissions and climate change, and environmental justice. The analysis identified ongoing or foreseeable future projects within the project area and incorporated them into the assessment, as summarized in Appendix E.

4.1 Threatened and Endangered Species

4.1.1 Affected Environment

Species that are listed under the Endangered Species Act (1973) and/or the Hawai'i Revised Statutes (Chapter 195D) are at risk of extinction over some or all their distributional range. In addition, the Migratory Bird Treaty Act (MBTA) prohibits the take of listed migratory bird species without prior authorization from the USFWS. The following section only includes impacts analyses for listed species that have potential to be impacted by the no-action alternative and proposed actions. For brevity, listed species that were considered but are unlikely to be impacted by the no-action alternative and proposed action are not included here. A list of these species is provided in Appendix F.

Based on a search of the USFWS rare plants database, 66 federally endangered and two threatened plant species have been recorded within the project area (Appendix F)⁴. Twenty-three of the endangered species are being actively managed as part of the Plant Extinction Prevention

⁴ See Figure 1 for the project area. The area of analysis for the proposed action aligns with this project area except for bird and bat species that range beyond the project area. For these species, the wider island of Kaua'i is the analysis area.

Program (PEPP). The remaining species potentially benefit from landscape-level management actions such as the installation of ungulate-proof fences and invasive species control efforts.

In addition to the three endangered (‘akeke‘e, ‘akikiki and puaiuhi) and one threatened (‘i‘iwi) native forest bird species that have been previously mentioned, the following endangered fauna (Appendix F) are also recorded within the proposed project area: the two seabirds ‘akē‘akē (*Hydrobates castro*) and ‘ua‘u (*Pterodroma sandwichensis*); koloa maoli (*Anas wyvillania*); nēnē (*Branta sandvicensis*); ‘ōpe‘ape‘a (*Lasiurus cinereus semotus*); one Hawaiian picture wing fly species (*Drosophila Musaphilia*), and the aquatic Newcomb’s snail (*Erinna newcombi*) (DLNR 2009a,b, 2011, DLNR 2014, PBR Hawaii 2018). The threatened Newell’s shearwater (*Puffinus auricularis newelli*) has additionally been recorded in the project area (DLNR 2011).

Federally designated critical habitat for Newcomb’s snail, and lowland wet, lowland mesic, montane mesic, montane wet, wet cliff, and dry cliff forest ecosystems (Appendix F) overlaps the project area. This includes critical habitat for two bird species (‘akikiki and ‘akeke‘e), one Hawaiian picture wing fly species (*Drosophila musaphilia*), and 117 native vascular plant species (Figures 4 and 5 below).

4.1.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, conditions would remain the same or like those that presently occur within the proposed project area. Current management actions within the project area would continue to be ineffective at controlling southern house mosquitoes and the avian diseases they transmit and carry. In the absence of meaningful interventions, the upslope migration of disease-vectoring southern house mosquito due to climate change is predicted to lead to the gradual loss and eventual elimination of safe habitat for listed forest bird species that are vulnerable to avian malaria and avian pox. Without the direct management of southern house mosquitoes, it is likely that the ‘akeke‘e and ‘akikiki would be driven to extinction within the next decade (Paxton et al. 2022). Populations of the threatened ‘i‘iwi would probably be extirpated on Kaua‘i but would still likely persist in remnant populations on Maui and Hawai‘i Island at the end of the century (Fortini et al. 2015).

The continued decline of Hawaiian honeycreeper species that serve as pollinators and seed dispersers of threatened and endangered native plants could result in declines for native plant species due to lowered reproduction and seed dispersal. ‘I‘iwi, for example, is potentially the most important extant native bird pollinator as it has the longest bill and is therefore capable of pollinating larger flowered native species (Pender 2013). Numerous plant species (for example, many species of hāhā [*Cyanea* spp.] and ‘ōhā wai [*Clermontia* spp.]) are now reliant on this species of bird because of the size of their flowers, which prevent all the remaining native and non-native bird species from effectively pollinating them. In general, however, predicting which species are most threatened from mutualistic breakdowns is complicated by a limited understanding of pollination and seed dispersal networks in Hawai‘i (Barton et al. 2021).

Ongoing management of the reserves that comprise the proposed project area by DOFAW and its partners, in addition to recreational activity by the general public within the project area, has the potential to unintentionally damage or disturb threatened and endangered plant and animal species. These activities include the construction and maintenance of ungulate exclusion fences, the control of feral ungulates in and outside of these fences, recreational hunting, ongoing

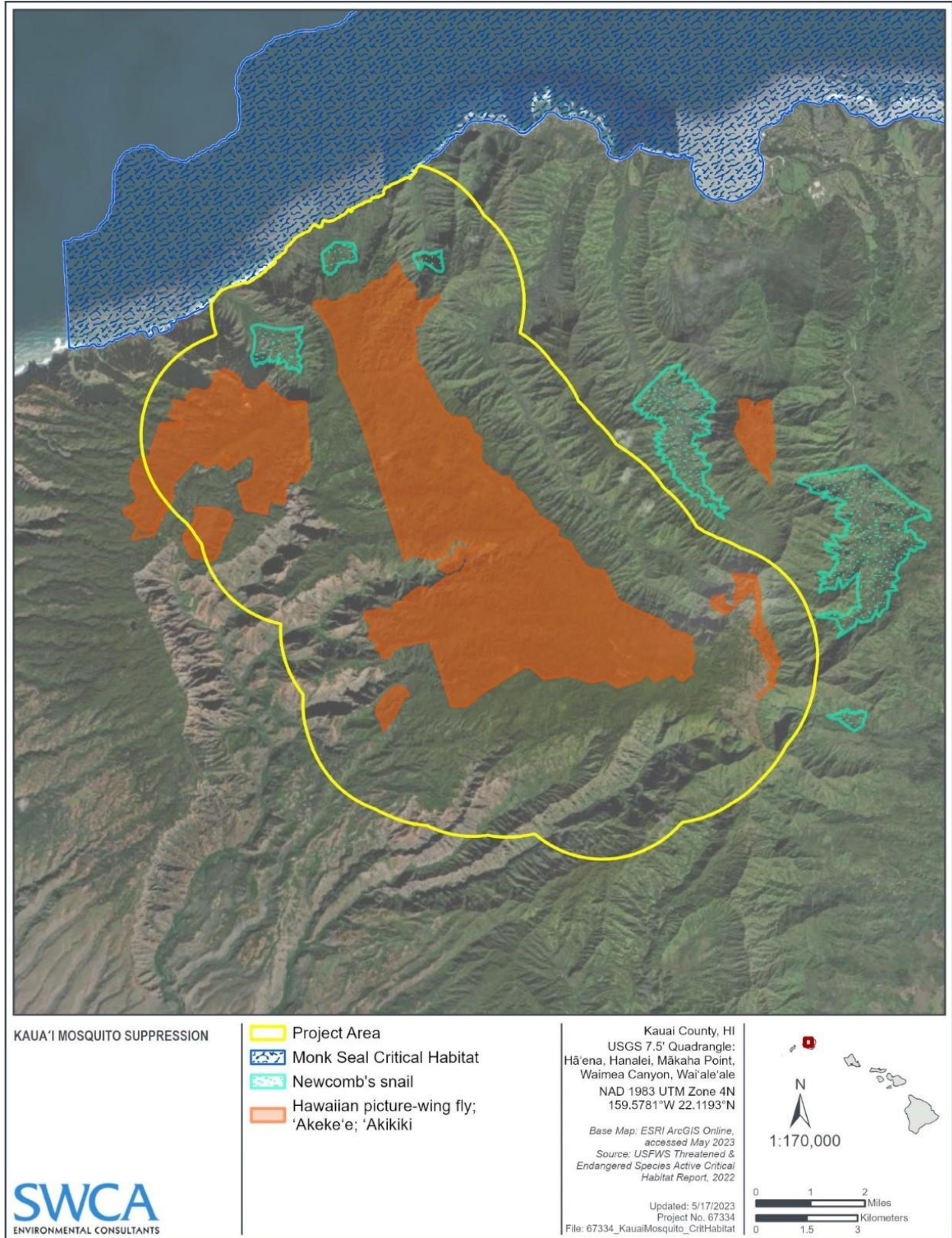


Figure 4. Federally designated critical habitat for fauna in and near the project area.

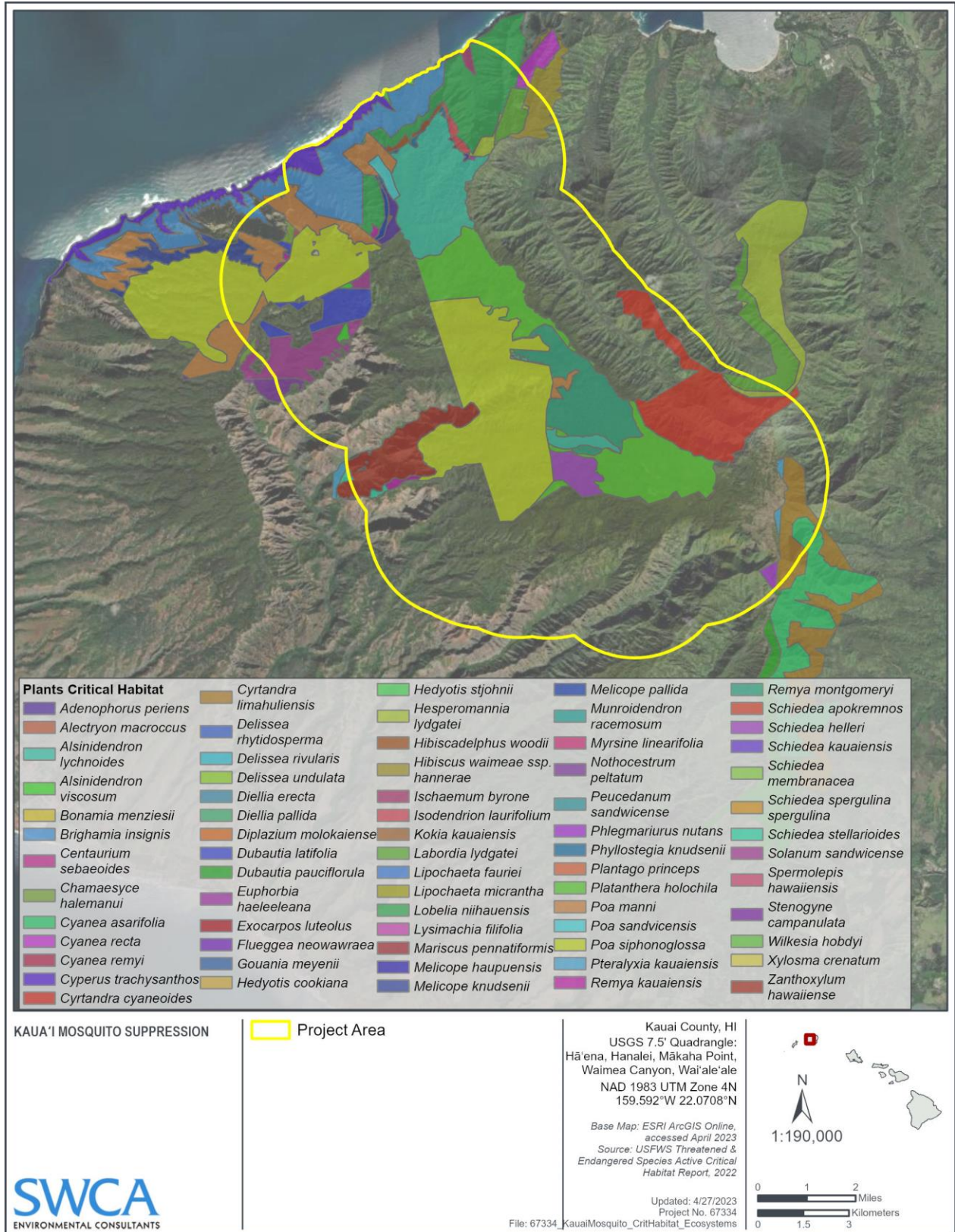


Figure 5. Federally designated critical habitat for plants in and near the project area.

monitoring of populations of threatened and endangered species, invasive plant control, wildfire management, and recreational hiking. Due to the lack of 4WD roads and trails, most of the proposed project area is accessed by DOFAW and its partners by helicopters that land at designated landing zones. Some of these landing zones also have campsites or permanent shelters and toilets (DLNR 2011). The use of helicopters has the potential to disturb wildlife through noise and damage native plants through rotor wash, including those that are threatened and endangered. All land management agencies that work within the reserves that comprise the proposed project area follow existing state and Federal biosecurity SOPs (Appendix D) to ensure that management activities limit the spread of invasive species to, within, and among the reserves (DOFAW 2011b).

4.1.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.1.2 for the no-action alternative with the addition of the effects and impacts of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action are summarized below.

The control of southern house mosquito within the project area are expected to reduce populations of this non-native mosquito species and lower the incidence of avian malaria and avian pox transmission to listed Hawaiian birds, including the two endangered (‘akeke‘e and ‘akikiki) and one threatened (‘i‘iwi) Hawaiian honeycreeper species that occur within the proposed project area. Successful mosquito control through released incompatible mosquitoes has been successfully implemented in 15 countries throughout the world to control mosquitoes that carry human diseases, including five locations in the United States (O’Conner et al. 2012, Hoffmann et al 2014, Mains et al 2016, Schmidt et al. 2017, Crawford et al. 2020).

If all other limiting factors are simultaneously managed (e.g., competition with non-native bird species, genetic impacts associated with small population sizes, mammalian predation, and habitat degradation from feral ungulates) (Freed et al. 2008, Camp et al. 2010, Mounce et al. 2015, Banko et al. 2019), the release of incompatible male mosquitoes and the resulting population reductions of disease-vectoring southern house mosquitoes could potentially stabilize populations of ‘akeke‘e, ‘akikiki, and other honeycreepers and avian species of concern over sustained periods of time. This could prevent the global extinction of these species and allow their populations to expand within suitable habitat on Kaua‘i. Likewise, sustaining viable habitat where mosquitoes are suppressed for Kaua‘i honeycreepers would allow populations of these species to expand and, with available habitat on Maui and Hawai‘i Island, would ensure that these species maintain evolutionally and ecologically viable populations over the coming decades if all other limiting factors are also managed.

Tangible reductions in southern house mosquito and the incidence of avian malaria/avian pox, would have positive impacts including increased listed as well as native bird populations and thereby partial restoration of mutualisms (pollination and seed dispersal) for threatened and endangered plant species that are reliant on bird pollination and seed dispersal. The i‘iwi, for example, are potentially the most important extant native bird pollinator for large-flowered plant species. Increases in populations of this species may benefit the reproduction of listed bird pollinated plant species. An increase in pollination and seed dispersal of listed and other native

plant species could potentially increase populations of these plant species if pollination and seed production are currently limited by the loss or drastic decline of avian mutualists.

Avian malaria is occasionally recorded in seabirds on Kaua‘i and has been implicated in the death of at least one threatened Newell’s shearwater (Molly Bache, Save Our Shearwaters, 2022 pers. comm.). Although avian malaria appears to be rare in seabirds on Kaua‘i (André Raine, Archipelago Conservation and Research, 2022 pers. comm.), the control of southern house mosquitoes within the project area may reduce the limited cases of this disease that are recorded in the three threatened and endangered seabird species that occur within the project area.

Listed seabirds are active during the dusk to dawn hours (nighttime) when they may be in flight or outside of their burrows. The sounds and visual effects of the delivery methods that are proposed to occur during the daylight after dawn and before dusk are not expected to impact seabirds in their burrows.

Reductions in southern house mosquito populations within the proposed project area are unlikely to tangibly impact foraging resources for ‘ōpe‘ape‘a. This bat species has a generalist diet comprised of a diverse range of insect orders, principally feeding on larger insects such as beetles and moths, rather than tiny mosquitoes (Pinzari et al. 2019) because the bat did not evolve in an ecosystem that included mosquitoes as an available food resource.

The impacts of vegetation disturbance on endangered Hawaiian picture wing fly species are likely negligible. *Drosophila musaphilia* feeds on fungi and bacteria on decomposing plant material that is more likely to be on the forest floor and *D. musaphilia* breeds in the sap fluxes from koa trees. As koa is common within the landscape, any trimming or damage of koa is unlikely to impact this picture wing fly species (USFWS 2012).

The impacts of the control of southern house mosquitos on the population dynamics of other non-native mosquitoes within and near the project area are unknown. There is very little existing research concerning the population dynamics of non-target mosquito species following the control or eradication of one or more mosquito species within an area. Any increase in the populations of non-target mosquito species in the project area resulting from the control of southern house mosquito would likely be due to increases of available habitat and resources for the non-target species. However, it is probable that the mosquito species, and particularly the females of the species present within the project area, are more likely limited by lack of blood hosts than by available habitat. Lafferty et al. (2018) found that Asian tiger mosquito went extinct on Palmyra Atoll following the eradication of black rats (*Rattus rattus*) while the ornithophilic (i.e., preferring birds) southern house mosquito persisted, suggesting that black rats were sustaining the persistence of the Asian tiger mosquitoes.

4.1.3.1 PEDESTRIAN RELEASE AND MONITORING

The pedestrian release of incompatible male mosquitoes and subsequent monitoring of the mosquito population may impact listed species from the following activities:

- The trampling and disturbance of listed native plants and invertebrates, and the disturbance of native forest birds within transport corridors such as roads, trails or fence-lines, or at discrete sites such as campsites, long-term monitoring sites, and LZs due to vehicle or personnel movement

- Secondary impacts from the dispersal and establishment of invasive species as a result of proposed project activities

Because of their relative scarcity across the landscape, there is a low risk that listed native insects, snails, or plants would be trampled or damaged by project vehicles or personnel within the project area. All releases of incompatible male mosquitoes and monitoring would be undertaken from existing transport corridors and sites. This increases the chances of avoiding species that are vulnerable to trampling (e.g., native gastropods, non-volant insects, and plants) by limiting activity within established corridors and sites. In addition, as these transport corridors and sites are frequently used by DOFAW and partner staff, the location of populations of listed plants and non-volant fauna species are often known and can be avoided during the project. Any unintentional damage or death of listed species as a result of trampling will be avoided by employing qualified personnel who adhere to SOPs (Tables 5 and 6 and Appendix D) regarding the use of vehicles, trails, and other backcountry infrastructure. If these measures are taken, the impacts of elevated foot and vehicle traffic are expected to be negligible.

Vehicles and personnel within the project area may disturb wildlife during the project, particularly listed forest birds. This may result in brief flight responses but are unlikely to cause lasting impacts to these bird species due to the relative infrequency of the pedestrian field operations. These disturbances will be short duration and are unlikely to result in significant adverse impacts to these birds.

The release and monitoring of incompatible male mosquitoes would temporarily increase human and vehicle traffic within the proposed project area, which can transport invasive microorganisms (e.g., spores and soil containing bacterial cells), plant propagules (seeds and vegetative sections), and eggs or live individuals of animals either into or between sites in the project area. The potential impacts of spreading invasive species to the project area are varied, ranging from nominal effects such as the dispersal of ruderal weeds along the margins of existing trails through to consequential impacts such as the accidental spread of the fungal pathogens that cause rapid 'ōhi'a death, which could negatively impact listed native plant species in the subcanopy. However, implementation of existing biosecurity SOPs by qualified personnel during project implementation, would be expected to negate the risk of spreading invasive species.

4.1.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Helicopters and fixed-wing aircraft are proposed for use to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. The potential impacts for listed species from the use of these aircraft are as follows:

- Disturbance of listed native birds from helicopter rotor wash, visual detection, and noise from helicopter and fixed-wing aircraft
- Collision of listed and other wildlife with helicopters and fixed-wing aircraft
- Death or injury of listed terrestrial invertebrates or plants due to crushing by helicopter skids and personnel, and helicopter rotor wash and exhaust within the immediate vicinity of LZs
- Potential dispersal of invasive species by helicopters and the personnel and equipment that they transport

- Potential death or injury of listed and other wildlife, or destruction of habitat, by wildfire caused by helicopters

Noise-related impacts from helicopter operations could potentially disturb threatened and endangered native birds, particularly forest birds. The average sound volume of a Hughes 500 helicopter, the most common model used for natural area access in Hawai‘i, ranges from 76 to 90 decibels when passing 150 ft/45 meters at 85-125 knots above ground level (the zone in which helicopter longline operations would occur) (Newman et al. 1984). Noise from the helicopter, however, would be present within a particular area for relatively short periods of time (15 seconds or less). Studies of the effects of helicopters on native and non-native forest birds in Hawai‘i found that helicopter noise volumes of 75 decibels or greater impacted bird vocalizations (Gallardo Cruz et al. 2021), implying that the bird species could potentially be affected by helicopter operations that occur over sustained periods of time. Due to the operating height of the helicopter, rotor wash is unlikely to impact the forest canopy during flight and would instead be limited to the margins of LZs during take-off and landing during loading and personnel transport operations. This would greatly reduce any potential areas of impact for listed native wildlife from helicopter rotor wash to the immediate areas around LZs.

The duration and frequency of helicopter use will be the minimum necessary to complete aerial releases when drone-based or pedestrian releases are not a viable option. Minimizing flight times would reduce any potential adverse effects to native wildlife (both listed and non-listed) including noise and/or visual disturbances, rotor wash, or collisions, and is also crucial for fiscal and logistical project planning and implementation. There is a low potential that fixed-wing aircraft would disturb listed native wildlife (principally native birds) during take-off, flight, and landing within both the proposed project area and wider analysis area (wider island). These impacts are anticipated to elicit only short-term avoidance responses (i.e., flight) from listed and non-listed birds to the noise of the aircraft during flight operations. However, there is also a low possibility of listed bird species colliding with fixed-wing aircraft, particularly during aircraft take-off and landing (FAA 2021).

The potential for listed and non-listed bird species to collide with helicopters during dispersal and transport operations is extremely low due to the relative speeds at which helicopters fly. Similarly, there is also a low probability that listed and non-listed bird species would collide with fixed-wing aircraft either within the proposed project area or analysis area. Despite this low probability, collisions with larger bird species such as the threatened nēnē cannot be totally ruled out. For example, data from the FAA bird strike database (<https://wildlife.faa.gov/search>) for Līhu‘e Airport between 1990 and the end of 2022 indicate that bird strikes involving listed species are rare (~ 2% of the 1,164 strikes that identified the impacted species); aircraft collisions with koloa maoli and Newell’s shearwater accounted for all but one strike, which killed a nēnē. In addition, collisions between aircraft and birds also have the low potential to cause injury or death of personnel and material damage or loss of aircraft (See Section 4.5.3.2 for more detail). The project is therefore not anticipated to impact listed and non-listed species through bird strike due to the extremely low likelihood of occurrence, daytime only flight schedule, and infrequency of the actual project flights.

Listed and non-listed invertebrates and plants may also be killed or injured by personnel that are transported to LZs by helicopters and by the helicopter rotor wash, exhaust, and skids within and

on the margins of LZs. The effects of these impacts are likely to be limited to occasional disturbances in discrete areas within the immediate vicinity of the LZs. However, these impacts would be reduced to negligible by employing qualified personnel who receive training regarding the listed species and host plants that are present within the proposed project area.

The dispersal of incompatible male mosquitoes throughout the project area would require the use of LZs for landing and taking off. Although no native vegetation is proposed for removal from the margins of the LZs, there is a low risk that threatened and endangered native plant species would be impacted by trampling and crushing by personnel within and immediately adjacent to these LZs, and from helicopter downdraft when approaching/departing LZs from low altitudes.

Helicopters and the project personnel and equipment that they transport could also potentially spread invasive microorganisms, plants, and animals into and within the project area on helicopter skids and contaminated footwear, clothing, and equipment. Through the implementation of avoidance and minimization measures and biosecurity SOPs (Tables 5 and 6 and Appendix D), the effects of these adverse impacts would however be negligible.

The potential disturbance to listed native wildlife from helicopter and fixed-wing aircraft operations as part of the project would likely occur infrequently over short periods, which would reduce the potential lasting impacts for listed native flora and fauna. The indirect impacts to listed native species from accidentally dispersing invasive species during helicopter operations would effectively be avoided by the adoption of biosecurity SOPs (Appendix D). Overall, the impacts of helicopter and fixed-wing aircraft operations during the proposed project could be greatly minimized through limiting their use in favor of other dispersal measures. For helicopter operations specifically, the adoption of existing biosecurity SOPs would greatly reduce the potential dispersal of invasive species to and within the project area. If these measures are followed, the impacts from these operations would be greatly minimized.

Although helicopters and fixed-wing aircraft could ignite backcountry wildfires that could kill native wildlife and/or destroy critical habitat on which they rely, the potential for this is very low and does not exceed risks posed by standard resource management actions currently ongoing in the proposed project area. All crewed aircraft will be operated adhering to guidance and policies established by the FAA. Helicopter operations will additionally follow the best practice protocols established by the National Wildfire Coordinating Group, which provides guidance detailed in the Interagency Helicopter Operation Guide (NWCG 2016). DOFAW is mandated under the Land Fire Protection Law, Chapter 185, Hawai‘i Revised Statute to take measures for the prevention, control, and extinguishment of wildland fires within all forest reserves and natural area reserves on Kaua‘i (DOFAW 2018). This agency is statutorily required to cooperate with county and Federal government fire control agencies to develop plans for wildfire prevention. The Kaua‘i County Fire Department, in coordination with the DOFAW Fire Management Program, will respond to any on-site emergency, including downed helicopters and fixed-wing aircraft to ensure that there is no risk of wildfire.

4.1.3.3 DRONE RELEASE

Drones could be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. Like the pedestrian

release and monitoring described in section 4.1.3.1, the following impacts could occur during the drone operations:

- Crushing or trampling of listed plant or invertebrate species within and on the margins of 4WD roads by vehicles and pedestrians, and by project personnel on trails, campsites, and in and on the margins of LZs
- Disturbance of listed native wildlife, particularly native forest birds, from drone visual detection and noise and onsite presence of project personnel
- Collisions of listed and other species of wildlife with drones
- Potential dispersal of invasive species by project vehicles, personnel, and equipment
- Potential death or injury of listed and other wildlife, or destruction of habitat, by wildlife caused by drones

Species of listed native invertebrates and plants could potentially be disturbed, injured, or killed by pedestrians and vehicles within and on the margins of 4WD roads, pedestrian trails, campsites, and LZs during drone operations. These impacts, however, are likely to be limited and can be effectively managed as outlined in Tables 5 and 6 and Appendix D.

The use of drones could disturb listed diurnal fauna during release operations. Listed native forest birds are at the greatest risk of disturbance because they are active during daylight hours and occur within or near the forest canopy. No studies have been undertaken to determine how drones impact native forest bird behavior in Hawai'i. A recent study of helicopter noise found that the aircraft didn't impact bird vocalizations when sound levels were below 75 decibels (Gallardo Cruz et al. 2021). As drones are considerably quieter than helicopters, this study implies that their use would avoid significant adverse impacts to the behavior of listed native forest birds. Due to the height above canopy at which drones would operate, and the intermittent nature of these operations with drones spending very short periods of time in one area, the agencies do not anticipate negative impacts from the sight or sound of drone operations.

Although the potential for collisions between drones and threatened and endangered fauna (principally birds) is very low, it cannot be fully ruled out (Rebolo-Ifrán et al. 2019). Species that fly well above the canopy in seasonal flocks, such as endangered nēnē during the summer months, are potentially at the greatest risk of colliding with drones due to the flock creating a larger collision area and the increased risk of distress responses (e.g., evasive flying maneuvers) within flocks. In the rare instance that a drone collides with a transiting bird, active avoidance measures would be used by pilots, which could include manually slowing forward flight to a stationary hover, manually decreasing altitude, or initiating an automated return home command to the aircraft.

Similar to the helicopter aerial releases described in Section 4.1.3.2, personnel and equipment involved with drone operations could potentially spread invasive organisms to and within the project area. These invasive organisms could have detrimental impacts on threatened and endangered native wildlife within the project area. These impacts, however, would be greatly reduced through adherence to avoidance and minimization measures and biosecurity SOPs (see Appendix D).

Additionally, drones could ignite backcountry wildfires that could kill native wildlife and/or destroy critical habitat on which they rely. However, the likelihood of this occurring is extremely low. All drones will be closely monitored by the operator and field teams while adhering closely to the guidance and policies established by the FAA. Drone operators under DOFAW operational control will follow DLNR’s Aviation Policy and the Kaua‘i DOFAW branch aviation safety plan and will be required to hold an up-to-date FAA 14 CFR Part 107 Remote Pilot Certificate and FAA Certificate of Waiver or Authorization. All drone operations will additionally follow best practice protocols established by the National Wildfire Coordinating Group, which provides guidance detailed in the Interagency Helicopter Operation Guide (NWGS 2016). As discussed in Section 4.1.3.2, DOFAW is required by law to take measures to prevent, control, and extinguish wildland fires within all forest reserves and natural area reserves on Kaua‘i (DLNR, DOFAW 2018). The agency must cooperate with county and Federal fire control agencies to develop wildfire prevention plans and DOFAW’s Fire Management Program will coordinate with Kaua‘i County Fire Department to respond to any on-site emergency, including downed drones, to ensure that there is no risk of wildfire.

4.1.4 Cumulative Impacts

Foreseeable future activities within the project area (see Appendix E) include professional, subsistence and recreational hunting of feral ungulates, the management of other invasive mammals (primarily rats [*Rattus* spp.]) and invasive plant species, the installation and maintenance of ungulate proof fences, trail maintenance, camping for recreational and natural resource management purposes, tree harvesting along roadways, collection of material for cultural and research purposes, hiking, and the ongoing management of natural resources by organizations that partner with DOFAW (e.g., Kaua‘i Forest Bird Recovery Project, The Nature Conservancy). As described in Appendix E, these activities would continue to occur in the future at existing or slightly increased levels.

4.1.4.1 PLANTS

Considering the past, present, and foreseeable future activities described in this section, the no-action alternative would not contribute additional impacts to rare or listed plants. Trends and impacts to the plants would be expected to remain the same. This includes the potential extirpation or extinction of native forest bird species due to uncontrolled avian malaria, which could potentially have a detrimental impact on native Hawaiian plants, including listed plants and plant species at risk due to the loss of pollinators. Compared to the no-action alternative, the proposed actions taken to suppress mosquito populations that carry avian malaria would support recovery of listed native Hawaiian birds, reducing the likelihood for extirpation or extinction of these species. This could potentially have a beneficial impact on the native Hawaiian plants that rely on native forest birds for pollination. The proposed alternative would potentially have an adverse impact on listed plant species, designated critical habitat, and plant species at risk from vegetation clearing and trampling and increased risk of invasion or spread of invasive plants or pathogens. However, with implementation of minimization and avoidance measures described in Table 5 and Appendix D, adverse impacts under the proposed alternative would be negligible for plants.

4.1.4.2 ANIMALS

Considering the past, present, and foreseeable future activities described in this section, the no-action alternative would not contribute additional impacts to rare or listed animal species. Trends and impacts from planned foreseeable actions would be expected to remain the same or similar to what is currently occurring. Under the no-action alternative, continued declines of rare and listed forest birds species is expected, potentially leading to extirpation or extinction of such species.

Compared to the no-action alternative, the proposed alternative could result in rare and listed wildlife being exposed to adverse impacts primarily in the form of noise or visual disturbance to wildlife from drones, helicopters, and pedestrian activities; indirect impact of increased risk of invasive species introduction from failed biosecurity during field operations; potential for trampling of invertebrate species, and an increased risk of wildlife collision. The most pronounced risk of impacts from noise disturbance, risk of collision, or biosecurity lapses would occur in the vicinity of LZs, helibases, campsites, fence lines, roads, and trails. Adverse impacts would be intermittent and of short duration and would infrequently affect individual birds and other wildlife.

The impacts from the proposed action and the foreseeable actions can be effectively reduced to negligible levels using the avoidance and minimization measures outlined in Tables 5 and 6, and Appendix D. Although there would be temporary and localized impacts to wildlife from mosquito release activities, the population and health of rare and listed species and their habitats would improve or remain stable. As previously described, the proposed action would directly reduce mortality of listed Hawaiian forest bird species due to the suppression of mosquitoes that spread avian malaria. The proposed action along with other planned foreseeable state and private management actions, including invasive plant control, feral ungulate control, and fence maintenance, would enhance survival of native forest bird species by reducing stressors. Over time, the populations of these listed bird species may increase due to the combined actions of the agencies and private partners to manage for avian malaria and other threats. Therefore, the overall cumulative increment of the proposed action would be substantially beneficial.

4.2 Wildlife Resources

4.2.1 *Affected Environment*

The project area⁵ provides ecologically important habitat for non-listed native wildlife and non-native game animals and other non-native species. Non-listed native bird species that occur within the project area include the forest bird species ‘apapane, ‘aniau, Kaua‘i ‘amakihi, and Kaua‘i ‘elepaio, black-crowned night heron (‘auku‘u; *Nycticorax nycticorax hoactli*), the Hawaiian short-eared owl (pueo; *Asio flammeus sandwichensis*), and the native seabird species black noddy (noio; *Anous minutus*), brown booby (noio kōhā; *Sula leucogaster*), great frigatebird (‘iwa; *Fregata minor palmerstoni*), red-tailed tropicbird (koa‘e ‘ula; *Phaethon rubicaudai*

⁵ See Figure 1 for the project area. The area of analysis for the proposed action aligns with this project area except for bird and bat species that range beyond the project area. For these species, the wider island of Kaua‘i is the analysis area.

melanorhynchos) and white-tailed tropicbird (koa‘e kea; *Phaethon lepturus dorothea*) (DLNR 2009a,b, 2011, 2014).

The natural areas that comprise the project area provide habitat for a range of non-listed invertebrates including four pinao (damselfly) species (*Megalagrion heterogamies*, *M. oresitrophum*, *M. orobates*, and *M. vagabundum*), the rare fabulous green sphinx moth (*Tinostoma smaragditis*), the moth *Omiodes monogramma*, moths in the genus *Hyposmocoma*, seed bugs in the genus *Nysius*, spiders in the genus *Tetragnantha*, and a long-legged fly *Sigmatineurum napali* (Gillespie 1992, Evenhuis et al. 1994, Parnham 2008, DLNR 2009a, Schmitz and Rubinoff 2010 a, b). The proposed project area is likely to provide habitat for many additional native insect and snail species.

Non-native game animals that are present within the project area include three feral ungulate species (Columbian black-tailed deer [*Odocoileus hemionus columbianus*], goats [*Capra hircus*], and pigs) (DLNR 2009a, b, 2011, PBR Hawaii 2018). Recreational hunting of these game animals within State-managed lands is overseen by DOFAW’s Wildlife Program under the auspices of HRS Title 13, Chapter 123.

Other invasive, non-native mammals that are present within the project area include cats (*Felis catus*), rats (Norway rat [*Ratus norvegicus*], Pacific rat [*R. exulans*], and black or ship rat [*R. rattus*]), and mice (*Mus musculus*) (DLNR 2009a, b, 2011, 2014, PBR Hawaii 2018). Feral dogs (*Canis familiaris*) may also be present.

Non-native game birds that likely occur within suitable habitat in the project area include ring-necked pheasant (*Phasianus colchicus*), green pheasant (*Phasianus versicolor*), white-winged pheasant (*Phasianu colchicus chrysomelas*), Erckels’ francolin (*Francolinus erckelii*), Japanese quail (*Coturnix japonica*), chukar partridge (*Alectoris chukar*), gray francolin (*Francolinus pondicerianus*), black francolin (*Francolinus francolinus*), zebra dove (*Geopelia striata*), and spotted dove (*Streptopelia chinensis*) (DLNR 2011, 2014). The recreational hunting of these game birds on DLNR-managed land is administered by DOFAW’s Wildlife Program according to HRS Title 13, Chapter 122.

A range of other non-native bird species also occur within the project area. These include species listed under the Migratory Bird Treaty Act (MBTA) of 1918 such as barn owl (*Tyto alba*), cattle egret (*Bulbulcus ibis*), house finch (*Haemorhous mexicanus*), and northern cardinal (*Cardinalis cardinalis*). Other non-native species that occur within the project area include Chinese hwamei (*Garrulax canorus*), common myna (*Acridotheres tristis*), house sparrow (*Passer domesticus domesticus*), Japanese bush warbler (*Cettia diphone*), scaly-breasted munia (*Lonchura punctulata*), red-crested cardinal (*Paroaria coronata*), warbling white-eye (*Zosterops japonicus*), and white-rumped shama (*Copsychus malabaricus*) (DLNR 2009b, 2011, 2014).

The isolated, higher elevation streams within the project area provide habitat for ‘ōpae kala‘ole (*Atyoida bisulcata*), an endemic native shrimp species, and four fish species: ‘o‘opu ‘akupa (*Eleotris sandwicensis*) and three goby species: ‘o‘opu nakea (*Awaous stamineus*), ‘o‘opu ‘alamo‘o (*Lentipes concolor*), ‘o‘opu nōpili (*Sicyopterus stimpsoni*) (DLNR 2009b, Parham et al. 2008). Introduced rainbow trout (*Oncorhynchus mykiss*) occur within the project area (DLNR 2014). In addition, two non-listed mollusk species, hīhīwai (*Neritina granosa*) and *Lymnaea*

aulacospira, have been recorded within the Hono O Nā Pali Natural Area Reserve and may also occur elsewhere within the proposed project area (DLNR 2011).

4.2.2 Potential Impacts from No-Action Alternative

As outlined in Section 4.1.2, the upslope migration of disease-vectoring southern house mosquito due to climate change is predicted to lead to the gradual loss and eventual elimination of disease-free habitat for vulnerable native forest bird species. Three non-listed forest bird species present within the proposed project area are vulnerable to avian malaria and avian pox: ‘apapane, ‘anianiau, and Kaua‘i ‘amakihi. Populations of these species are expected to slowly decline by 2100 due to a drastic reduction of mosquito-free habitat (Benning et al. 2002, Fortini et al. 2015). Small populations of some species (e.g., ‘apapane and Kaua‘i ‘amakihi) may however persist in lower numbers due to potential disease resistance (Woodworth et al. 2005, Atkinson et al. 2013).

The ongoing impacts of this non-native mosquito species on native and non-native wildlife, other than forest birds (native and non-native birds, fish, freshwater invertebrates, and non-native mammals) are unknown.

The ongoing management and recreational activities within the reserves that comprise the proposed project area are summarized in Section 4.1.4.

4.2.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.2.2 for the no-action alternative except for the effects of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action for non-listed wildlife are the same as for the proposed action described in Section 4.1.3. For brevity, only potential impacts that differ from those described in that section are summarized below.

The interactions between non-native mosquitoes and native insects and other non-avian native animals (fish, snails, bats) in Hawai‘i are poorly understood. It is possible that native and introduced fish eat mosquito larvae, but the reduction in this mosquito species is unlikely to impact fish species due to the presence of other mosquito species and the abundance of introduced aquatic invertebrates (i.e., native fish and introduced trout are unlikely to be food limited).

4.2.3.1 PEDESTRIAN RELEASE AND MONITORING

As addressed in Section 4.1.3.1, incompatible male mosquitoes would be released on foot in accessible areas of the project area. Trailheads would be accessed using 4WD vehicles and all-terrain vehicles (ATVs). The potential impacts and mitigation measures for this increased pedestrian traffic for native wildlife are the same as described in Section 4.1.3.1.

4.2.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

As outlined in Section 4.1.3.2, helicopters would be used to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. Helicopters

are also likely to be used to ferry project personnel throughout the project area. The potential impacts and mitigation measures for native wildlife from the use of helicopters and fixed-wing aircraft during the course of the proposed project are the same as described in Section 4.1.3.2.

4.2.3.3 DRONE RELEASE

As outlined in Section 4.1.3.3, drones would be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. The potential impacts and mitigation measures for native wildlife from the use of drones to disperse incompatible male mosquitoes during the proposed project are the same as described in Section 4.1.3.3.

4.2.3.4 CUMULATIVE IMPACTS

As described in Section 4.1.4, considering the past, present, and foreseeable future activities, the no-action alternative would not contribute additional impacts to the wildlife species beyond that of the ongoing and future known activities already occurring. Trends and impacts from planned foreseeable actions would be expected to remain the same of similar to what is currently occurring.

The proposed action would result in similar or identical cumulative impacts as described in section 4.1.4 for federal and state listed wildlife. The proposed action would result in limited adverse cumulative impacts to wildlife resources that would result from the presence of people, drones, or helicopters used for implementation of the proposed action. These proposed actions would be short lived and intermittent in nature. The impacts from the proposed action and the past, present, and foreseeable future actions can be effectively reduced to negligible levels using the avoidance and minimization measures outlined in Tables 4 and 5 and Appendix D, and the implementation of existing SOPs as described for listed species. Although the project would cause negligible, periodic and short-term adverse impacts (e.g. increased air and foot traffic), success of the project would reduce the prevalence of non-native *Culex* mosquitoes in the Kaua‘i wilderness environment. Suppression of non-native populations in turn, indirectly impacts the rate of avian malaria. The indirect impact would result in long-term beneficial indirect impacts to general wildlife or wildlife habitat. Successful implementation of the proposed action would result in cumulative impacts that are overwhelmingly beneficial for wildlife resources that occur within the proposed project area.

4.3 Vegetation Resources

4.3.1 Affected Environment

Approximately half the project area (30,275 acres/12,251 hectares) contains montane native wet forest and shrubland that primarily comprises a canopy of ‘ōhi‘a (*Metrosideros polymorpha*) and to a lesser extent koa (*Acacia koa*) that occurs between 730 and 5,220 ft elevation (222 – 1,591 m). These areas of forest typically contain a dense understory of native trees and shrubs such as kōlea lau nui (*Myrsine lessertiana*), ‘ōhi‘a hā (*Syzygium sandwicensis*), and ‘ōlapa (*Cheirodendron* spp.); sedges such as *Gahnia vitiensis* subsp. *kauaiensis* and ‘uki (*Machaerina angustifolia*); and ferns, principally uluhe (*Dicranopteris linearis*) (Gon et al. 2006, DLNR

2011). Close to a third of the project area (16,258 acres/6,580 hectares), primarily at lower elevations (sea level to 4,700 ft; 0 – 1,432 m), contains non-native forest and shrubland (10 – 5,080 ft; 3 – 1,548 m). The remaining vegetation and landcover types include smaller areas of native dry forest and shrubland (560 – 4,310 ft; 170 – 1,313 m) (2,316 acres/937 hectares), native vegetation on wet and dry cliffs (670 – 5,190 ft; 204 – 1,581 m) (6,916 acres/2,798 hectares), non-native grassland (70 – 4,120 ft; 21 – 1,255 m) (860 acres/348 hectares), and unvegetated areas (30 – 5,080 ft; 9 – 1,548 m) (2,252 acres/911 hectares).

4.3.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, there would be no new impacts to vegetation within the project area and conditions would continue to be the same or very similar to their current state. However, if avian malaria and avian pox continue to cause the decline of Hawaiian honeycreeper species that serve as pollinators and seed dispersers of certain native plants, there could be longer term population declines for native plant species due to lowered reproduction and seed dispersal. Despite this general assumption, predicting which species are most at threat from mutualistic breakdowns is complicated by our limited understanding of pollination and seed dispersal networks in Hawai'i (Barton et al. 2021). The ongoing management and recreational activities that impact or protect native vegetation within the natural areas that comprise the proposed project area are summarized in Section 4.3.4.

4.3.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.3.2. for the no-action alternative with the addition of the beneficial effects of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action are summarized below.

The release and monitoring of incompatible male mosquitoes through the proposed action would result in an increase in human, vehicle, and helicopter traffic within the proposed project area. This increased traffic could potentially transport invasive microorganisms (e.g., spores and soil containing bacterial cells), plant propagules (seeds and vegetative sections), and eggs or live individuals of animals either into or between sites in the project area. The potential impacts of spreading invasive species to the project area are varied, ranging from nominal effects such as the dispersal of ruderal weeds along the margins of existing trails, to consequential impacts such as the accidental spread of the fungal pathogens that cause rapid 'ōhi'ā death. Increased foot, vehicle, and aircraft traffic would also result in damage to native vegetation within and on the immediate margins of hiking trails, fence lines, four-wheel-drive roads, campsites, and helicopter LZs due to trampling, and in the case of helicopter LZs, downdraft from the helicopter rotors when flying at very low altitudes. This may lead to the localized damage or death of native plants within and on the margins of this transport infrastructure. Potential effects from introducing or spreading invasive species will be avoided by implementation of Biosecurity Protocols (See appendix D).

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact when reaching the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. The material

used would have been heat treated during the manufacturing process, which reduces the likelihood of introduction of any foreign contaminants or invasive species, like other plant-based media products commonly used in forestry/reforestation projects. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely and the biodegradable material would decompose quickly given the typical rainfall patterns in the project area, making the chance of observing multiple packages unlikely. Based on the degradable nature of the delivery packages and diffuse nature, the impacts on plant habitat are negligible.

Should the proposed action result in tangible reductions in southern house mosquitos and avian malaria/avian pox, we expect a beneficial impact from increasing native bird populations and the partial restoration of mutualisms (pollination and seed dispersal) for native plants. Potential increases in populations of 'anianiau, 'apapane, and Kaua'i 'amakihi, for example, could benefit the reproduction of 'ōhi'a and smaller-flowered species of native plants. An increase in native bird populations of species such as Kaua'i 'amakihi would likewise benefit the dispersal of native plant seeds as native bird species overwhelmingly forage on these plants compared to non-natives (Wu et al. 2014, Kaushik et al. 2018). An increase in pollination and seed dispersal of native plant species could potentially increase the resiliency of ecosystems to encroachment from invasive species as well as the persistence of those native plant species that are being pollinated or dispersed.

4.3.3.1 PEDESTRIAN RELEASE AND MONITORING

As stated in Section 4.1.3.1, the proposed action would result in increased foot traffic within existing trail systems, fence lines, campsites, and helicopter LZs. There is potential under the proposed action for minimal adverse impacts to vegetation from localized plant removal or disturbance along trails, fence lines, and at landing zones and camps by ground crews. These impacts would be temporary in nature and largely occur in previously disturbed locations. In addition, these activities have been approved through previous environmental compliance of the State. To minimize any vegetation or ground disturbance, monitoring efforts and the dispersal of incompatible mosquitoes via ground-based pedestrian releases would be conducted on existing resource management trails and fence lines to avoid disturbance of soils and plant communities. Additionally, best management practices (Appendix D) would be implemented to reduce or remove the threat of introducing invasive plants within the project area; however, a risk of introduction still exists. Crews would be trained to follow best management practices to minimize this risk (Table 5 and Appendix D). The potential impacts to and avoidance and minimization measures for native vegetation from this increased pedestrian traffic are the same as described in Section 4.1.3.1.

4.3.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

As stated in Section 4.1.3.2, helicopters and fixed-wing aircraft are proposed for use to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. Helicopters would also be used to ferry project personnel throughout the remote parts of the project area and would require the use of LZs for landing and taking off. The potential impacts and mitigation measures for native vegetation from the use of helicopters during the proposed project area are the same as described in Section 4.1.3.2. No impacts to native vegetation are likely to result from aerial releases of incompatible male mosquitoes using fixed-

wing planes as these aircraft would take off and land outside of the project area. The impacts of these aircraft on the wider analysis area (wider island) are addressed in Section 4.1.3.2.

4.3.3.3 DRONE RELEASE

As outlined in Section 4.1.3.3, drones would be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. The potential impacts and mitigation measures for native vegetation from the use of drones to disperse incompatible male mosquitoes during the proposed project are the same as described for listed plant species in Section 4.1.3.3.

4.3.4 Cumulative Impacts

As outlined in Section 4.1.4, the proposed action would result in limited cumulative impacts to native vegetation that would be short lived and intermittent in nature. There is potential under the proposed action, existing actions, and foreseeable future actions for minimal adverse impacts to vegetation from localized plant removal or disturbance along trails, fence lines, and at landing zones and camps by ground crews. These impacts would be temporary in nature and largely occur in previously disturbed locations. In addition, these activities have been approved through previous environmental compliance of the State. To help minimize any vegetation or ground disturbance, monitoring efforts and the dispersal of incompatible male mosquitoes via ground-based pedestrian releases would be conducted on existing resource management trails and fence lines to avoid disturbance of soils and plant communities. Additionally, best management practices (Appendix D) would be implemented to reduce or remove the threat of introducing invasive plants within the project area; however, a risk of introduction still exists. Crews would be trained to follow best management practices to minimize this risk (Table 5 and Appendix D). The impacts from the proposed action and the foreseeable actions can be effectively reduced to negligible using the avoidance and minimization measures outlined in Tables 5 and 6, and Appendix D. Projects that may occur in the project area in the future would also be expected to follow federal and state avoidance and minimizations during implementation. The implementation of these measures would result in cumulative impacts that are overwhelmingly beneficial for native vegetation within the proposed project area.

4.4 Cultural Resources

This section describes the potential impacts of the proposed action on cultural resources (archaeological remains, places of cultural significance, and other traditional cultural resources), as well as contemporary cultural practices and beliefs).

As part of the environmental assessment process, a Cultural Impact Assessment (CIA) was conducted to assess the potential impacts of the proposed action on traditional cultural resources, practices, and beliefs, as well as on any current cultural practices being undertaken within the project area. This CIA (Traub et al. 2023, Appendix B of this EA), conducted by SWCA Environmental Consultants, was prepared in accordance with the methodology outlined in the Office of Planning and Sustainable Development's *Guidelines for Assessing Cultural Impacts*.

The information presented below provides a summary of the findings of the CIA (Appendix B), where this information is presented in greater detail with references.

4.4.1 Affected Environment

4.4.1.1 ARCHAEOLOGICAL RESOURCES

Although most of the project area has not been the subject of a formal archaeological survey, some locations within the area potentially impacted by incompatible male mosquito releases are known to contain Native Hawaiian cultural sites. During the pre-contact and early post-contact periods, habitation and intensive cultivation were concentrated in valleys and along the coast, while the high elevation forests and wetlands that comprise the majority of the terrain within the project area were not heavily utilized by Native Hawaiians. Many of the activities that took place in the uplands left little to no trace on the archaeological record. People did travel through the uplands to hunt birds, visit sacred sites, harvest trees for lumber, or gather other natural resources. These visitors to the area constructed temporary shelters and places of worship and created some of the trails that are still in use today (Yent 2004).

Nearly all previously recorded archaeological sites occur within Kalalau Valley in the northwestern section of the project area. Native Hawaiian communities in Kalalau built homes, practiced intensive irrigated agriculture, and constructed several *heiau* (temples) along the coastal trail (Major and Carpenter 1999). Some of the *heiau*, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located very near or even on trails used by modern hikers and hunters.

4.4.1.2 CULTURAL RESOURCES

The project area is rich in cultural resources that include places of traditional cultural significance as well as traditionally-gathered natural resources such as medicinal and ceremonial plants and trees such as ‘ōhi‘a lehua and koa used in house and canoe construction. Several of these resources are collected and used by contemporary cultural practitioners. Not least among the culturally significant natural resources present within the project area are the native forest birds that the current project is intended to protect.

Native forest bird species play a unique and significant role in traditional and contemporary Hawaiian cultural customs, practices, and beliefs. References to forest birds are woven into the *mele* (chants and songs) and *mo‘olelo* (stories and traditions) of the islands. They are regarded as *kinolau* (physical manifestations of the gods) and *‘aumakua* (family ancestral deities). Their feathers were used to decorate the *‘ahu‘ula* (capets), *mahiolo* (helmets), *kāhili* (standards) and *lei hulu* (feather garlands) of the Hawaiian *ali‘i* (chiefs and chiefesses) (Rangi Hīroa 1957: 215-217).

Frederick B. Wichman’s *Kaua‘i Ancient Place-Names and Their Stories*, one of the most comprehensive Kaua‘i place name resources, describes a place named Halemanu near the project area where Native Hawaiian birdcatchers had a permanent camp.

A few miles above Pu‘ukāpele is Hale-manu, “bird house,” where bird catchers lived while they hunted Kaua‘i’s unique bird family, the brilliantly colored honeycreepers that lived in the ‘ōhi‘a lehua forests. Especially prized were the

yellow-green ‘amakihi and ‘anianiau, the bright yellow ‘akialoa and nukupu‘u, the orange-red ‘i‘iwi or olokele, and the deep crimson ‘apapane (Wichman 1998: 15-16).

Today, native forest birds are viewed as a link connecting contemporary Hawaiians with the natural environment of their islands. *Hula* (traditional dance) practitioner and *haku mele* (composer) Ms. Sally Jo Keahi Manea recently composed a mele in honor of Kaua‘i and Maui’s native birds. The mele that speaks of the ‘ākohekohe, kiwikiu, ‘akikiki and ‘akeke‘e, describing their habitat, the colors of their feathers, and the characteristic peculiar to each bird (Appendix B). As the composition of this mele illustrates, Kaua‘i’s native forest birds remain a source of inspiration to contemporary cultural practitioners.

4.4.2 Potential Impacts from No-Action Alternative

If no-action is taken, the warming climate will likely result in the continued migration of southern house mosquito populations and avian disease upslope into the higher elevations of the project area. It is predicted that avian malaria and avian pox will eventually result in the extinction of both the ‘akeke‘e and ‘akikiki, the loss of ‘i‘iwi populations on Kaua‘i, and the reduction of other native honeycreeper species (Paxton et al. 2022, Fortini et al. 2015). Given the cultural significance of these bird species, reduction of their populations and/or extinction would represent a tangible loss to Hawaiian culture.

In addition, native forest birds form part of the larger native ecosystem and play an active role in preserving that ecosystem. Native honeycreeper species serve as pollinators and seed dispersers for certain native plants. Their decline or loss could contribute to longer term population declines of native plant species, adversely impacting the contemporary cultural practices that make use of and depend on those species.

4.4.3 Potential Impacts from the Proposed Action

The potential physical impacts that the proposed action would have on the landscape, both archaeological and cultural, would be minimal and no greater than the current level of use by the public and by DOFAW and its management partners in maintaining the State Parks, Forest Reserves, and Natural Area Reserves located within the project area.

Incompatible male mosquito releases, monitoring, and other project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other management activities. No new roads, trails, landing zones, or camps would be created to support this project. Most of the known archaeological sites and culturally significant places within the project area are located far from the trails and areas where the project activities would take place. Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located near trails used by modern hikers and hunters. These trails, however, would not be used for the current project-related access and therefore the sites in Kalalau would not be impacted by the project. No archaeological or cultural sites have been recorded near planned project access routes, landing zones, or field camps. As has previously been mentioned, archaeological surface structures are relatively rare in the forested uplands where most incompatible male mosquito

releases would occur. For these reasons, it is expected that the project would have no adverse impact on archaeological sites or culturally significant places.

Given that not all of the project area has been archaeologically surveyed, it is possible that previously unrecorded sites could be present in the vicinity of the access routes where project activities would take place. To avoid and minimize effects, project personnel would stay on designated roads and trails. Project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project (see the cultural resources section of Table 5).

The findings of the CIA (Appendix B) indicate that the proposed action is unlikely to adversely impact cultural resources, practices, and beliefs. While cultural practitioners may make use of roads or trails within the project area to gather forest plants, hunt, or to carry out other cultural practices, incompatible male mosquito releases and monitoring activities are unlikely to interfere with their access.

One of the primary impacts of the proposed action on cultural resources is the anticipated positive outcome that reduced mosquito populations would have toward protecting and preserving native forest bird populations. Their existence and presence within the forest environments they inhabit are important for maintaining cultural continuity between traditional and contemporary cultural customs, practices, and beliefs.

4.4.3.1 PEDESTRIAN RELEASE AND MONITORING

Overall, no impacts to archeological resources are anticipated to result from the proposed action. Much of the project area has not been surveyed, but no new ground disturbance would result from the proposed action. Pedestrian mosquito release would be limited to existing routes of travel (fence line corridors, trails, and roads) and field camps already utilized for other natural resource management activities. This would avoid potential effects to historic properties, such as unrecorded archaeological sites, and minimize impacts to culturally significant locations. The use of ground transportation would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners and recreationists. The impact to established trails, some of which form part of the Nā Ala Hele trail network (Figure 3) and may be of traditional age, would not be substantially greater than that associated with current use.

Although no changes in public use or access are anticipated to be required for project operations, DOFAW would continue to provide notice of any changes in use or access to DOFAW-managed areas, including areas frequented by cultural practitioners, through social media announcements or updates on the DOFAW website. DOFAW also maintains a hunter email list that could be used to notify hunters about any changes to access or use of public hunting areas. If changes in public access do arise, DOFAW would consult with the 'Aha Moku representative for the area to ensure that dispersal and monitoring efforts are coordinated with cultural practitioners who may be using those areas to gather forest plants, hunt, or carry out other cultural practices.

4.4.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Some auditory impacts would be associated with all aerial operations, and helicopter and fixed-wing aircraft operations would constitute the greatest auditory disturbance. While helicopter and fixed-wing use could potentially act as a distraction to subsistence hunters and/or cultural practitioners carrying out cultural activities within the project area, these distractions would be minor and temporary. Project related aerial activities and the noise generated by them is not anticipated to be significantly greater than the current existing levels. The auditory impacts associated with the proposed project would be within the approximate background noise range of those generated from commercial helicopter tourism and would not be anticipated to result in significant noise impacts. It should also be noted that none of the interviewed participants noted noise as an impediment to cultural practice. The use of helicopter and fixed-wing aircraft would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners.

Helicopter operations would utilize existing, previously disturbed landing zones. These existing areas (trails, fence lines, and landing zones or camps) have been cleared through previous state environmental compliance. Cultural impacts from use of helicopters and established LZs is considered discountable.

4.4.3.3 DRONE RELEASE

Drones would be launched from existing facilities and access points where infrastructure is preexisting and/or where resources management operations already occur. This would minimize the potential impact to previously unrecorded archaeological sites and culturally significant locations.

Auditory impacts associated with drone releases could potentially affect subsistence hunters and/or cultural practitioners carrying out cultural activities within the project area, though these distractions would be minor and temporary. Noise produced by drone operations would be at substantively lower levels than helicopter and fixed-wing auditory impacts. The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Schäffer et al. 2021). Most consumer-grade drones are far quieter than helicopters with some being up to 40 A-weighted decibels (dBA) quieter than a manned helicopter at roughly 328 feet above ground level (AGL) (Airborne Drones 2020). Drones would likely spend 15 seconds or less hovering over each mosquito release location, and it is possible that drones would be able to release the mosquitoes without pausing. The use of drones would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners. Again, it should also be noted that none of the interviewed participants noted noise as an impediment to cultural practice. The acoustic impacts to ethnographic resources and traditional cultural practices would likely be temporary at any given location, though releases would likely occur over the long term. In addition, reduction of avian malaria as proposed would conserve numerous rare birds important to Native Hawaiian culture providing a beneficial impact.

4.4.4 Cumulative Impacts

Considering past, present, and foreseeable future activities, the no-action alternative would have the same impacts as noted in Section 4.4.2 regarding the potential decline and possible

disappearance of native forest bird species and the resulting loss of their presence as a living component of Hawaiian culture.

Trends and impacts from planned foreseeable actions would be expected to remain the same as, or similar to what is currently occurring. Ongoing or reasonably foreseeable activities identified in Appendix E are expected to have a minimal and temporary adverse impact on cultural places, traditions, practices, and beliefs. The proposed action does not measurably increase the frequency or intensity of other ongoing or future activities in the project area. Known ongoing and future activities follow DLNR SOPs, and avoidance and minimizations in Tables 5 and 6 and Appendix D. Based on this, the cumulative impacts of the proposed action in addition with known past, ongoing, and future activities are not expected to appreciably increase adverse impacts in the project area. The overall cumulative impact of successful implementation of the proposed action would be expected to be largely beneficial on Hawaiian cultural practices and resources in the form of helping Hawaiian forest bird recovery.

The proposed use of incompatible male mosquitoes to suppress wild mosquito populations and reduce the incidence of avian malaria and avian pox transmission to native forest bird species is but one component of a much larger effort to *mālama* (take care of) the native environment of the project area (see Appendix E). The intent of this and other current and proposed stewardship efforts is to preserve and protect this unique natural and cultural landscape. The threatened and endangered native forest bird populations are a culturally significant element of this landscape, and their continued survival would serve to perpetuate the rich cultural heritage associated with them.

4.5 Public Health and Safety

4.5.1 *Affected Environment*

Mosquito-transmitted diseases can lead to serious illness in individuals and therefore pose a threat to public health and safety. The Hawai‘i Interagency Biosecurity Plan (Hawai‘i Invasive Species Council, 2016) identifies mosquitoes as high-risk taxa and calls for expanded control of disease-carrying mosquitoes as a priority and objective for the protection of human health, as well as increased education and public awareness of mosquito-borne diseases. The only mosquito-borne diseases that have been reported in Hawai‘i to-date are dengue, Zika, and chikungunya, and none of these viruses are endemic to Hawai‘i but were introduced by travelers who were exposed outside of the state (DOH 2022a, 2022b, 2022c). Dengue, Zika, and chikungunya are transmitted by the day-biting yellow fever mosquito and Asian tiger mosquito and are not transmitted by the southern house mosquito, which is the target species of the proposed action (DOH 2022d).

Diseases transmitted to humans by the southern house mosquito include West Nile virus, St. Louis encephalitis, and lymphatic filariasis (University of Florida 2019). Of these, West Nile virus is the most widespread mosquito-transmitted disease in the continental US but has not yet been detected in Hawai‘i; neither has St. Louis encephalitis nor lymphatic filariasis (CDC 2022b, 2022c, DOH 2022e). Hawai‘i’s status as a travel destination, however, puts it at a high-risk for the introduction of mosquito-transmitted diseases; this, combined with the wide distribution of southern house mosquitoes on all Hawai‘i’s main islands, indicates that the state is at particular

high risk for the introduction of West Nile virus. For these reasons, health and wildlife agencies in Hawai'i are actively working to prevent the introduction and spread of West Nile virus to the state (DOH 2022e). West Nile virus causes symptoms for about 1 in 5 people infected, and about 1 in 150 infected people develop severe symptoms that can be fatal (CDC 2022b). The CDC's guidance document, *West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control*, emphasizes the importance of implementing proactive measures that maintain vector populations at low levels to minimize the risk of transmission to humans (CDC 2013).

Human populations that utilize the public portions of the project area and that may be subject to health and safety effects of mosquito-transmitted diseases include recreationists in parks and preserves, cultural practitioners, and land management staff. The portion of the project area that is private land is remote and undeveloped and therefore is not expected to incur much human use. There is no evidence that the release of incompatible male mosquitoes on Kaua'i would have human health impacts. Existing efforts to manage mosquito populations within the project area are implemented by state agencies and conservation groups who are primarily focused on monitoring and mitigating mosquito-related risks to wildlife and habitat. Mosquito monitoring plots and traps are currently implemented by KFBRP in the Alaka'i Wilderness Preserve, and ungulate management activities (i.e., exclusion fences, hunting, and trapping) that reduce mosquito larval habitat are currently implemented by DOFAW and TNC throughout the project area (see Appendix E).

4.5.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, existing public health and safety concerns associated with mosquito-transmitted diseases would remain as described under the affected environment, and the state of Hawai'i would remain at high-risk for the introduction and spread of new diseases (e.g., West Nile virus) that are not already present in Hawai'i but, if introduced, could be transmitted by the widespread southern house mosquito. Although existing ungulate management strategies that limit the amount of available mosquito breeding habitats would continue to be implemented, these strategies have not been effective in substantially suppressing or eliminating non-native mosquito populations, as evidenced by their recent expansion into higher elevation habitat. Continued implementation of existing management strategies would therefore have a negligible effect on public health and safety concerns associated with mosquito-transmitted diseases.

4.5.3 Potential Impacts from Proposed Action

The proposed action aims to reduce populations of southern house mosquitoes in the project area. This action could benefit recreationists, cultural practitioners, and land management staff who utilize the project area by reducing abundance of southern house mosquitoes, which is a nuisance species. There would likely be a short-term increase in the number of male mosquitoes in localized release areas after each release event, but the release of *Wolbachia*-infected incompatible male mosquitoes would have no adverse effects on public health and safety as male mosquitoes do not bite and therefore, cannot transmit diseases through biting. A reduction in southern house mosquito numbers will have no effect on populations of other nuisance mosquito species.

The magnitude of future public health and safety benefits from the proposed action would depend on the success of IIT treatments at reducing mosquito populations, which cannot be known until post-release monitoring is conducted. However, results of previous field-based trials of IIT (see Section 2.4) indicate that the treatments can be highly effective at reducing mosquito populations (up to 95% reductions). The level of mosquito population declines achieved by the proposed action would have a commensurate and beneficial effect on public health and safety by reducing the likelihood that human arboviruses could be spread by southern house mosquitoes.

Given the short lifespan of mosquitoes, the beneficial effects on public health and safety from declining mosquito populations could be realized relatively quickly after incompatible male mosquito releases begin (e.g., within months). Success of the proposed release of IIT mosquitoes would be determined through post-release monitoring. Short and potentially long-term public health benefits would be expected should the releases be effective.

Public perceptions surrounding mosquitoes and mosquito-borne diseases may lead to public concerns about the proposed action’s effect on health and safety, which would warrant the need for project-specific public education and outreach. Members of the public may, for example, be unaware of the differences between mosquito species and sexes, leading them to believe that the release of mosquitoes could put them at an increased risk of being bitten. To facilitate better public understanding of the proposed action’s potential benefits to public health and safety, DLNR, USFWS, and project partners would provide support for education and outreach efforts such as public outreach campaigns, informational flyers at trailheads, or the use of social media to educate the public about the project and associated health and safety benefits (see Table 5). These efforts would be consistent with and would reinforce the state’s overarching Interagency Biosecurity Plan, which identifies public education about mosquito-borne diseases and other pest related issues as a critical issue for the state. A public meeting was held for the project on Kaua‘i during the public comment period of this EA where the public was provided informational materials and an opportunity to ask questions and voice concerns.

4.5.3.1 PEDESTRIAN RELEASE AND MONITORING

Pedestrian release methods would not result in any additional public health and safety effects beyond what is described in section 4.1.3.1. Monitoring activities (i.e., data collection and analysis) would not directly affect public health and safety but would indirectly affect public health and safety by influencing the success and duration of IIT treatments. Monitoring activities would be implemented with the goal of maximizing the efficacy of IIT treatments, which in turn could support the long-term use of these treatments, thereby increasing the duration and magnitude of associated benefits to public health and safety from declining mosquito populations.

4.5.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

The use of helicopters for incompatible male mosquito releases is not expected to result in any additional public health and safety effects beyond what is described in section 4.1.3.2. The use of helicopters would follow all FAA rules and guidelines, which would ensure all aviation hazards are properly avoided. As discussed in Sections 4.1.3.2 and 4.1.3.3, wildlife strikes with aircraft may occur and could result in human fatalities or injuries in extreme cases (FAA 2021). Most wildlife strikes, however, do not result in human injury or fatality and the number of damaging

strikes has been decreasing since the 1990's, likely due to the increasing awareness in the aviation community and increased implementation of avoidance and minimization measures to reduce the risks of wildlife strikes at airports. Of the total 232,320 wildlife strikes reported to FAA from 1990-2019, 16 (0.007%) resulted in human fatalities and 251 (0.1%) resulted in human injuries (FAA 2021).

4.5.3.3 DRONE RELEASE

The use of drones for incompatible male mosquito releases is not expected to result in any additional public health and safety effects beyond what is described in section 4.1.3.3. All FAA and DLNR safety-related guidelines for drones would be followed.

4.5.4 Cumulative Impacts

Ongoing mosquito monitoring and ungulate management activities (Appendix E) would continue to occur in the future at current or slightly increased levels. As described under Section 4.5.2, existing ungulate management strategies have not been effective in substantially suppressing or eliminating non-native mosquito populations. These activities would therefore likely continue to have a negligible effect on public health and safety concerns associated with mosquito-transmitted diseases. However, if increased levels of ungulate management are more successful at reducing mosquito populations in the future, this would result in a beneficial effect to public health and safety by reducing the risk of southern house mosquitoes associated diseases being introduced and spread in the project area. None of the other ongoing or reasonably foreseeable activities identified in Appendix E are expected to impact public health and safety. When combined with the effects of the proposed action, the overall cumulative effect on public health and safety would be beneficial.

4.6 Recreation and Wilderness

4.6.1 Affected Environment

Several state-managed recreational areas occur within the project area, including 12,663 acres (21%) of Forest Reserves, 9,940 acres (17%) of Forest Reserve/Wilderness Reserve, 4,261 acres (7%) of Natural Area Reserves, 4,619 acres (8%) of State Wilderness Parks, and 3,438 acres (6%) of State Parks (see Table 1). Recreational uses that occur within each of these designations are summarized in Table 7 and further described below. Uses associated with cultural practitioners (e.g., plant gathering and hunting) are addressed in Section 4.4 of this EA as well as the project's CIA (Appendix B). Aerial helicopter tours are also a common occurrence in the area, with at least 10 or more air tour businesses located on Kaua'i that offer daily tours.

Table 7. Recreational Uses within Project Area

Recreational Area	Recreational Uses	Permit/ Fee Requirements	Management Priorities/Objectives
Hā'ena State Park	Beach use and hiking. Camping not allowed.	Requires advance parking and entry reservation for non-residents.	Cultural, historic, natural and scenic resources, recreational and education opportunities.
Halele'a Forest Reserve	Hunting and hiking. Camping not allowed.	Permits required for hunting and commercial uses.	Management of Okolehau Trail, monitoring invasive plants/animals, enhancement of native rare plant resources, maintenance of <i>Pritchardia</i> enclosure(s), and management of pig hunting.
Hono O Nā Pali Natural Area Reserve	Hiking, bird watching, hunting, volunteer service trips and guided hikes. Commercial uses allowed with SUP. Camping not allowed.	Permits required for hunting, commercial uses, or groups of 10 or more. Parking fee for non-residents.	Habitat protection, weed control and habitat restoration, rare species monitoring and collecting, education and outreach.
Kōke'e State Park	Hiking, camping, hunting, picnicking, wildlife viewing, fishing,	Entrance and parking fees for non-residents. Permit required for camping.	Recreational activities and natural resources.
Ku'ia Natural Area Reserve	Hiking and hunting. Camping not allowed.	Permits required for hunting, commercial uses, or groups of 10 or more. Parking fee for non-residents.	Habitat protection through game management and weed control
Līhu'e-Kōloa Forest Reserve	Hunting, hiking, horseback riding, fishing, four-wheel driving, and commercial ecotourism. Camping not allowed.	Permits required for hunting and commercial uses.	Maintain the area for multiple uses, including watershed protection, recreation, maintenance of the Keāhua Arboretum, and possible timber and/or biomass plant production.

Recreational Area	Recreational Uses	Permit/ Fee Requirements	Management Priorities/Objectives
Nā Pali Coast State Wilderness Park	Hunting, hiking, camping, boating, wildlife viewing.	Requires advance parking and entry reservation or camping permit.	Outdoor recreation and heritage opportunities.
Nā Pali-Kona Forest Reserve	Hunting, hiking, horseback riding, fishing, biking, camping, picnicking	Permits required for camping, hunting, and commercial uses.	Watershed values, native ecosystems, Threatened, Endangered, and rare species management, resource protection, invasive species control, game management, commercial activity, and public activity.
Nā Pali-Kona Forest Reserve/Alaka‘i Wilderness Preserve	Hiking, camping, hunting	Permits required for camping, hunting, and commercial uses.	Protection of high-quality native ecosystems and rare and endangered endemic plants and animals; outdoor recreation is heavily restricted.
Pu‘u Ka Pele Forest Reserve	Hunting, hiking, camping, picnicking, bird watching, fishing, horseback riding, biking	Permits required for camping, hunting, and commercial uses.	Native species conservation, recreational hunting, forestry, and other recreational activities

Sources: DLNR 2018, 2022a, 2022b, 2022c; DOFAW 2009a, 2009b, 2011a, 2013, 2022a, 2022b, 2022c

4.6.1.1 FOREST PRESERVES/WILDERNESS PRESERVE

DOFAW manages forest preserves for multiple uses, including recreational and hunting opportunities, aesthetic benefits, watershed restoration, wildlife habitat protection and management, cultural resources, and fire protection among many other things (DOFAW 2022d). Forest preserves within the project area include Halele‘a Forest Reserve, Līhu‘e-Kōloa Forest Reserve, Nā Pali-Kona Forest Reserve, and Pu‘u Ka Pele Forest Reserve. Recreational uses that occur within these forest reserves include hunting, hiking, camping, picnicking, horseback riding, fishing, bird watching, four-wheel driving, and commercial ecotourism. Hunting and hiking are allowed within all forest preserves in the project area; other uses are only allowed in certain forest preserves as shown in Table 7.

The Alaka‘i Wilderness Preserve is situated within the boundaries of the Nā Pali-Kona Forest Reserve and is managed as a sub-unit of the forest preserve; these two areas collectively make up 33% of the project area. Most of the recreational use in the Nā Pali-Kona Forest Reserve occurs outside of the wilderness area due to a greater number of roads and trails making it more accessible to the public. Recreational use of the wilderness preserve occurs to a lesser degree due

to limited access and more restrictive policies in place to protect its high-quality native habitat and associated rare and endangered endemic species.

4.6.1.2 NATURAL AREA RESERVES

DOFAW manages natural area reserves primarily for the protection of unique native ecosystems, geologic features, and rare and endemic species. Public access and recreational uses are heavily regulated to protect sensitive resources. Commercial recreational uses may be allowed subject to Special Use Permit (SUP) approval (DOFAW 1997).

4.6.1.3 STATE PARKS/WILDERNESS PARKS

Hawai'i State Parks and Wilderness Preserves are managed for outdoor recreation and heritage opportunities. State Parks are easily accessible and generally include more visitor amenities than at Forest Reserves or Natural Area Reserves (e.g., restrooms, picnic tables, water fountains, trash cans). Visitor use (including both day use and overnight use) is managed through a system of fees and permits.

4.6.1.4 RELEVANT ASPECTS OF VISITOR USE AND EXPERIENCE

Except for air tours, all other land-based recreational uses in the project area tend to be concentrated near established roads, trails, public campsites, day use areas, and other established facilities, all of which are distributed throughout the public portions of the project area. Hiking outside of designated trails is generally discouraged in all recreational use areas due to the potential for natural hazards.

All of the recreational use areas identified within the project's footprint are within unique native ecosystems that provide visitors with an experience of wild and scenic natural beauty; the levels of remoteness, however, vary throughout the project area, with more accessible areas in Kōke'e State Park and less accessible areas at higher elevations in the Alaka'i Wilderness Preserve. Commercial helicopter tour flights and helicopters used by natural resource managers frequently fly over the entire project area daily. Visitors seeking solitude may experience slightly increased noise levels associated with aerial release. To the greatest extent possible, pedestrian releases will occur in areas that are not heavily used by visitors, to reduce the potential for disturbance to visitors.

Given the high-quality habitat conditions in the project area (see Section 4.1.1), bird watching is an activity provided by all recreational use areas. In addition, biting mosquitoes are generally considered a nuisance by visitors. Night-biting species such as the southern house mosquito are primarily a nuisance for overnight campers who are present in the night and early morning hours. Hunters with dogs who camp overnight are also uniquely vulnerable to southern house mosquitoes since they can transmit heartworm (*Dirofilaria immitis*) to dogs. Reducing the abundance of southern house mosquitoes would be a benefit to recreational users of these areas.

4.6.2 *Potential Impacts from No-Action Alternative*

Under the no-action alternative, recreational uses that occur within the project area would continue as described in the affected environment section 4.6.1, subject to future changes resulting

from management actions and the influence of other socioeconomic factors (e.g., tourism industry).

4.6.3 Potential Impacts from Proposed Action

The proposed action would have both beneficial and adverse effects on wilderness and recreation. The project would adversely affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). The sections below discuss how these adverse effects on various user groups would vary by release strategy.

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact with the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely, and the biodegradable material would decompose quickly given the typical rainfall patterns in the project area, making the chance of observing multiple packets unlikely. Based on the degradable nature of the delivery packages and diffuse nature of release locations, the impacts on recreationalists and the wilderness would be negligible.

The release of the male mosquitoes would not be expected to cause additional bites or nuisance to recreationalists and users of the wilderness resources. Unlike female mosquitoes that consume blood, male mosquitoes consume nectar and thus, would not be attracted to humans or pets. Localized concentrations of male mosquitoes could be expected to occur in the immediate vicinity (1 to 2 feet) of the release package as the mosquitoes emerge, but the mosquitoes would be expected to disperse within minutes.

The trails, campsites, and landing zones are typically managed by established and ongoing maintenance plans and follow State and USFWS avoidance and minimization measures (Table 5 and 6, Appendix D). Minimal additional vegetation clearing along established trails and LZs would be expected under the proposed action. Any additional trimming of vegetation that would be needed as a result of the proposed action would follow the same State and USFWS avoidance and minimization measures used by the established maintenance crews (Tables 5 and 6 and Appendix D). Based on this, the proposed action would have a minimal effect on the trails, campsites, and LZs.

No changes in public use or access to state-managed recreational areas are anticipated to be required for project operations.

Beneficial effects to land-based recreationists would include reduced female mosquito populations and associated nuisances for overnight users and hunters with dogs, as well as the potential for increased populations of native forest bird species to provide improved bird watching opportunities. This project would not have an impact on the day biting *Aedes* mosquitoes, which also pose a nuisance to visitors.

4.6.3.1 PEDESTRIAN RELEASE AND MONITORING

Pedestrian releases would be implemented by technicians and would involve the use of 4WD trucks and all-terrain vehicles. These activities would result in temporary and localized increases in human activity and noise, which may be noticeable to visitors in the immediate area. These effects would be most noticeable for visitors in more remote areas where visitation and human sources of noise are less common and unexpected. The noise effects of pedestrian releases would be less severe than those associated with aerial releases.

All adverse effects to recreationists from increased human activity and noise would be localized, temporary, and intermittent in nature since releases would be implemented in different locations throughout the project area on a weekly, bi-weekly, or monthly basis. Although adverse effects from pedestrian releases would therefore likely be noticeable to recreationists in the immediate area where releases occur, they are not expected to result in any long-term, meaningful declines to the overall visitor experience, especially when considering the countervailing beneficial effects of mosquito reductions and rebounding native bird populations.

Monitoring activities would have similar adverse effects on the visitor experience for land-based recreationists as described for pedestrian releases (see Section 4.1.3.1) since monitoring would involve the same types of vehicles, a similar number of technicians, and would occur at similar frequency and in the same locations as release sites. Implementation of monitoring, however, would also benefit recreationists by ensuring the maximum effectiveness of the ITT treatments and associated mosquito declines and rebounding native bird populations.

4.6.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Helicopter releases would adversely affect the visitor experience for recreationists through increased noise. The noise effects resulting from helicopter releases would be higher than with pedestrian releases. Although pedestrian releases may involve the use of helicopters for access, helicopter releases would take longer, making the duration of noise effects longer. Although the use of helicopters would also increase the overall number of aircraft operating in the project area, commercial air tour agencies are not authorized to fly their helicopters at the low altitudes necessary for release of incompatible male mosquitoes by the project. Tour operators would therefore fly well above the height or altitude necessary for project operations. Helicopter pilots, including those that would be involved in releases, also routinely communicate their locations and altitudes on a shared radio frequency for the purpose of safety. There would be no adverse effects to commercial helicopter air tour flight routes. Helicopter release methods would only be used to the extent necessary to enable access to remote locations and would not be implemented until the release mechanism technology has been fully developed and tested. Prior to aerial releases, DOFAW would notify commercial helicopter operators of program activities and recommended avoidance areas to avoid user conflicts and safety hazards.

4.6.3.3 DRONE RELEASE

Drone releases would adversely affect the visitor experience for recreationists through increased noise, although at significantly lower levels than helicopter use. The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Schäffer et al. 2021). Most consumer-grade drones are far quieter than

helicopters with some being up to 40 A-weighted decibels (dBA) quieter than a manned helicopter at roughly 328 feet AGL (Airborne Drones 2020). The use of the drones themselves would not create any conflicts with air tours as they would operate below the minimum allowed altitude for helicopters (500 feet AGL [14 CFR Part 91, subpart B, Section 91.119]). The use of drones would not be implemented until the release mechanism technology has been fully developed and tested. Prior to aerial releases, DOFAW would notify commercial helicopter operators of program activities (including drone use) and recommended avoidance areas to avoid user conflicts and safety hazards. All FAA rules and DLNR Best Management Practices for drones would be followed.

4.6.4 Cumulative Impacts

Existing recreational uses in the project area would continue to occur in the future, and there are no reasonably foreseeable changes to the types of use or levels of use that are allowed to occur within the project area (see Appendix E). Ongoing and reasonably foreseeable conservation activities (i.e., ecological research, monitoring, and management) would continue to have both beneficial and adverse effects for recreational users. The project would adversely affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). Adverse effects would result from localized increases in noise and human activity when those activities are implemented in proximity to public spaces. Camping associated with project activities has the potential to have minor and infrequent overlap with public camping reservations at Wai'alaie cabin. Timing and frequency is not yet finalized and may change depending on level of mosquito control and monitoring needed. Estimated use of parking spaces at Kōke'e State Park would be restricted to a few spots in low-use areas and would be infrequent (KFBRP). Because of the low use, the impacts to the public are expected to be negligible. The proposed action could cause intermittent, but temporary increases in overall number of aircraft operating in the project area. Commercial air tour agencies, however, are not authorized to fly their aircraft at the low altitudes necessary for release of incompatible male mosquitoes in the project area. Rather, tour operators would fly well above the height or altitude necessary for project operations. Helicopter pilots, including those that would be involved in releases, also routinely communicate their locations and altitudes on a shared radio frequency for safety. There would be no adverse effects to commercial helicopter air tour flight routes expected to occur. There would be the possibility of visual effects for air tours if the air tour helicopter was to be present during mosquito releases. Depending on the occupants of the air tour, this may be perceived as adverse or fascinating.

Beneficial effects to existing and future recreationalists and wilderness users would result from the long-term contribution of the mosquito suppression. The suppression would be expected to improve the wilderness experience of users through the reduction of southern house mosquito bites, increased native avian wildlife and improved pollinator services. The proposed action is not expected to have adverse effects on ongoing or future hunting or resource collection activities within the project area.

4.7 Air Quality, Greenhouse Gas Emissions and Climate Change

The contemporary understanding and agreement among the scientific community is that anthropogenic sources of greenhouse gasses have been the primary cause of global temperature

increases since the mid-20th century (IPCC 2023). Regional effects of climate change are evident in the Hawaiian archipelago, and after a minor lull in the rate of climactic change in the early 2000s, a rapid warming trend appears to have resumed in 2014 (McKenzie et al. 2019). Some climate change models suggest that the mean temperatures in Hawai‘i may increase by 3°–4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014).

4.7.1 *Affected Environment*

The project area and its lower elevation buffer zones include the highest elevation areas of Kaua‘i, comprised of State Parks, Natural Area Reserves, Wilderness Preserves and some private lands. The project area is relatively removed from many sources of air pollution other than intermittent vehicular travel, aerial tours, and resource management operations. Hawai‘i has an established statewide monitoring network to measure ambient air concentrations of pollutants, which ensures that national air quality standards are met. Monitoring stations are maintained and data are collected by the Air Quality Monitoring Section of the State Laboratories Division; the State maintained 20 air monitoring stations on four islands in 2019. Although Kaua‘i has one monitoring station, it is primarily used to measure the air quality impacts from cruise ships (State of Hawai‘i Annual Air Quality 2019 Data). Air quality in the project area is typically very good, and Kaua‘i meets National Ambient Air Quality Standards (EPA 2021). The National Ambient Air Quality Standards (NAAQS) can determine whether a region is in an air quality attainment or nonattainment area. An area is considered to be in attainment if it meets the federal standard for all criteria pollutants. Subsequently, an area is in nonattainment if it does not meet (or contributes to ambient air quality in a nearby area that does not meet) the standard. When this occurs, states must submit implementation plans to the EPA discussing programs to improve air quality within that region. The project area is currently in an area of attainment for all NAAQS.

4.7.2 *Potential Impacts of the No-Action Alternative*

Under the no-action alternative, no additional contribution to greenhouse gas emissions would occur beyond what is already occurring in the project area and from future foreseeable actions (Appendix E).

4.7.3 *Potential Impacts from Proposed Action*

Incompatible male mosquito transport to Kaua‘i from the incompatible male mosquito production facility would utilize existing commercial air transport services and would not be expected to increase or otherwise contribute to greenhouse gas emissions. There are several release methods included as part of the proposed action that would produce greenhouse gas emissions. These actions include motor vehicle transport of personnel for release and monitoring activities, helicopter transport of personnel for pedestrian release to remote sites, and helicopter or fixed wing release of incompatible male mosquitoes. Greenhouse gas emissions associated with each of these modes of transport would be intermittent and temporary in nature in the

project area. Releases by fixed wing aircraft, if deployed as an application method has the potential to be the most efficient release option for the project area, resulting in diminished fossil fuel consumption and a sizable, reduced amount of time needed for applications. However, important factors such as incompatible male mosquito viability using this release method are still under development and testing.

Helicopter release would be used when other options such as pedestrian or drone release are not available to meet release needs or these alternate release methods could not be used to access the release sites. The flight time of the helicopter conducting releases would not be expected to exceed three flights during a day. Mosquito release flights would be limited to daytime hours and helicopters or fixed-wing aircraft. The proposed action would initially rely on pedestrian and helicopter or fixed-wing aircraft release, but over time would be expected to pivot to the use of drones as the primary incompatible male mosquito release method based on monitoring. Drones, which are battery powered, do not directly burn fossil fuel and do not generate fuel emissions. Helicopters, however, would still be needed to transport monitoring and support staff to some remote locations that are inaccessible by vehicle, and for occasional incompatible male mosquito release. Effects resulting from this relatively limited number of flights would be negligible compared to ongoing daily commercial (air tour) flights on Kaua'i, and well below federal reporting requirements for greenhouse gases (25,000 metric tons of CO₂ emitted annually, 74 FR 56260).

4.7.4 Cumulative impacts

The project area has ongoing and foreseeable management actions that produce greenhouse gases. In addition, air tours frequently fly over the area, though their frequency is variable because of weather, FAA regulations, demand, and other factors that may limit or affect flight operations. Although some management actions would result in emissions of criteria pollutants pursuant to the Clean Air Act, the greenhouse gas contributions resulting from the use of helicopters, fixed wing, and other motorized vehicles, would be extremely low and would lead to impacts on air quality and greenhouse gas emissions below nominal levels. Consistent with the interim National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change issued January 9, 2023 (88 FR 1196), the USFWS was guided by the rule of reason in developing this analysis commensurate with the (low) quantity of projected greenhouse gas emissions associated with the proposed action. Conducting an in-depth, quantitative analysis of emissions was not considered proportionate to the insignificant quantity of emissions that the proposed action would be expected to contribute. The additional contribution to the cumulative greenhouse gas emissions to the existing and foreseeable future projects in the area would be expected to be negligible.

Though climate change and associated adverse impacts have and will continue to affect specific resources on Kaua'i and within the project area (Alexander et al. 2016, Pauchard et al. 2016), greenhouse gases from helicopter, fixed wing aircraft and motor vehicle emissions associated with the proposed action are not expected to have a measurable effect on global climate change or local climatic conditions. Although, for example, the release of incompatible male mosquitoes would result in some fossil fuel consumption, the associated greenhouse gas emissions would be negligible because of the comparatively limited number of flights anticipated, compared to ongoing daily commercial (air tours) flights on Kaua'i. Based on the considerations discussed

above, air quality, greenhouse gas emissions, and climate change were dismissed from detailed analysis as an impact topic.

4.8 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898 and supplemental Executive Order 14096 are Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.” A minority population exists within an affected area when either the minority population exceeds 50%, or the minority population is meaningfully greater than the minority population of the general population (CEQ 1997).

According to EJScreen, EPA’s Environmental Justice Screening and Mapping Tool, census block groups (environmental justice communities) within and around the project area on Kaua‘i are comprised of populations where at least 50% of the population is considered a minority. Therefore, environmental justice communities exist in the study area.

4.8.1 Potential impacts from No-Action Alternative

Under the no-action alternative, residents (including environmental justice communities) that use or reside within the project area and its buffer zone would continue to experience a decrease in native bird species and presence of southern house mosquitoes, and ongoing and future activities resulting from management actions and air tour management actions.

4.8.2 Potential impacts from Proposed Alternative

The proposed action involves the use of pedestrians, drones, helicopters, and fixed-wing aircraft to release incompatible mosquitoes for the purpose of suppressing non-native mosquitoes and the spread of avian malaria. The mosquitoes that would be released provide no threat to the public as they would be male mosquitoes, which do not bite and do not transmit disease to humans.

While the suppression of avian malaria should result in a positive overall impact on the project area ecosystem on Kaua‘i, mosquito release methods would involve the use of aircraft, which could adversely impact the public who are utilizing public and private lands during project implementation. These potential impacts would mostly be due to the daytime noise or visual disturbance from aircraft. Aerial operations associated with ongoing maintenance and management already occur on state and private lands on Kaua‘i. Areas that have high recreational use and are accessible by vehicles would use pedestrian release methods to deploy mosquitoes, which would reduce the potential for noise and visual disturbance from aircraft. Increase in noise and visual impacts would primarily affect only those members of the environmental justice community that are actively utilizing the project area or those residing near the project area that may hear or see the intermittent implementation of the proposed action.

Helicopter use and drone use associated with the proposed release actions would occur during daytime hours and would not occur at night.

The intent and expected outcome of this project is to avoid the extinction of Hawaiian forest birds, which is identified as an important ecological and cultural resource by the Native Hawaiian community. Native Hawaiians identify forest birds as ‘ohana (family), kūpuna (ancestors), and ‘aumākua (familial gods), and their unique habitats are revered as sacred places for the cultural ecological services they provide. The preservation of these species has been identified as a priority by Native Hawaiian community leaders (Paxton et al. 2022). For this reason, the proposed action would have a beneficial impact to the environmental justice community.

4.8.3 Cumulative impacts

Although the release of incompatible male mosquitoes would result in increased human activity and noise (e.g., air, vehicle and pedestrian traffic), the project area is remote, away from residential communities, limited in access and does not incur much human use. Additionally, there is no evidence to suggest the release of incompatible male mosquitoes on Kaua‘i would have impacts to the human health of the environmental justice community. Expected benefits to the environmental justice community from long-term mosquito suppression include improved recreational use through the reduction of southern house mosquito bites, reduced likelihood of mosquito-borne disease transmission, increased native avian wildlife and improved pollinator services. When combined with the effects of the proposed action, the overall cumulative effect on environmental justice communities would be beneficial. Native forest bird populations are a culturally and economically significant element of Kauai’s forests, and their continued survival would enrich and perpetuate the intrinsic value of the natural and cultural landscape. Based on this, the cumulative impacts of the proposed action in addition with known past, ongoing, and future activities are not expected to appreciably increase adverse impacts to environmental justice communities in the project area.

5 CONSISTENCY WITH EXISTING LAND USE, PLANS, AND POLICIES

5.1 National Environmental Policy Act

The NEPA process requires evaluation of federally funded actions including assessing alternatives (e.g., proposed and no-action alternatives). NEPA also requires the disclosure to the public of impacts on the human environment as a result of the alternatives considered. This process is documented in the environmental analysis presented in an EA or EIS. This EA has been prepared in compliance with NEPA, current CEQ (40 CFR 1500-1508) and DOI NEPA Regulations (43 CFR Part 46), and USFWS directive manual 550 FW 1-3 and 505 FW 1-5. Pursuant to NEPA and associated implementing regulations and USFWS policy, this EA presents the analysis of the proposed project and alternatives including the no-action alternative. This EA evaluates impacts anticipated from all alternatives to inform decision makers and the public using an interdisciplinary approach to address all aspects of the human environment

relevant to the potential impacts of the proposed project. The direct, indirect, and cumulative impacts of the proposed project are analyzed and presented within the document.

5.2 Section 106 of the National Historic Preservation Act

Compliance with Section 106 of the National Historic Preservation Act is conducted in consultation with the Hawai‘i State Historic Preservation Division (SHPD), Native Hawaiian Organizations, and individuals with familial/traditional ties to Kaua‘i and the project area. Pursuant to 36 CFR § 800.2(c)(4), USFWS has authorized DOFAW to initiate and conduct Section 106 consultation with the State Historic Preservation Officer (SHPO) and others but remains legally responsible for all findings and determinations (Appendix G). As part of this procedure, DOFAW will initiate the Section 106 process, identify historic properties and produce an assessment of potential adverse effect (36 CFR §§ 800.3 through 800.5) to the SHPD.

Registered historic properties that occur in the project area range from traditional Native Hawaiian habitation sites to Civilian Conservation Corps-era rustic cabins (Table 8). As outlined in Section 4.4, although most of the project area has not been archaeologically surveyed, habitation and intensive cultivation were concentrated in valleys and along the coast during the pre-contact and early post-contact periods. The high elevation forests that comprise the majority of the project area were not intensively utilized by Native Hawaiians. Many of the activities that took place in the uplands were temporary, ephemeral, and left little to no trace on the archaeological record. Nearly all documented archaeological sites within the project area are located in Kalalau Valley. Two registered historic properties are located in Kōke‘e State Park within the project area: Camp Sloggett, located southwest of HI 550 and the Civilian Conservation Corps Camp along HI 550.

Table 8. Registered Historic Properties in the Project Area.

Site Name	SIHP Number	Restricted Access
Nā Pali Coast Archaeological District	50-30-02-03200	Yes
Waimea Valley Complex	50-30-06-00035	No
Camp Sloggett, Kōke‘e	50-30-06-09395	No
Civilian Conservation Corps Camp, Kōke‘e	50-30-06-09392	No

The potential physical impacts that the proposed project would have on these sites, both archaeologically and culturally, would be no greater than that caused by the current level of use by the public and by DOFAW and its project partners in maintaining the State Parks, Forest Reserves, and Natural Area Reserves within the project area. All activities associated with the project would be located well away from known cultural sites and no ground-disturbing activities would occur. It is therefore anticipated that no cultural and historic sites will be physically impacted by the project. Given that not all of the project area has been archaeologically surveyed, it is possible that previously unrecorded sites could be present in the vicinity of the access routes where project activities would take place. Potential impacts to cultural and historic

sites would be effectively avoided and minimized through the implementation of the measures outlined in Table 5 and Appendix B.

5.3 Endangered Species Act

The Endangered Species Act (ESA) provides broad protection for plants, fish, and wildlife that have been listed as threatened or endangered in the United States or elsewhere and conserves ecosystems on which these species depend (16 United States Code 1531–1544). The USFWS has participated in the development of this EA and provided input on the development of alternatives, impacts to threatened and endangered species, and mitigation measures to minimize species impacts. Formal intra-Service ESA Section 7 consultation would occur once a formal application for funding for the selected alternative is submitted to the USFWS. The proposed action has the potential to stabilize and assist in the recovery of listed and non-listed Hawaiian honeycreeper species. The proposed action would also potentially benefit the recovery of listed native plant species that depend on these avian species for pollination and seed dispersal. Any potential adverse impact on listed native plant and animal species would be avoided and minimized through the measures outlined in Tables 5 and 6 and Appendix D. Take of listed species is therefore not reasonably certain to occur.

5.4 Migratory Bird Treaty Act

The MBTA prohibits the take of migratory birds. A list of birds protected under MBTA regulations is provided in 50 CFR 10.13. Unless permitted by regulations, it is unlawful under the MBTA to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product. The USFWS does not currently have a comprehensive program under the MBTA to permit the take of migratory birds by otherwise lawful activities. Conservation measures proposed by DLNR to avoid or minimize impacts to MBTA species are included in Appendix D. The proposed action could potentially stabilize populations of six Hawaiian honeycreeper species that are listed under the MBTA. The proposed action may benefit native seabirds (e.g., koa'e kea, white-tailed tropicbird [*Phaethon lepturus*]) and other impacted native bird species that are included within the MBTA by reducing adverse interactions with southern house mosquitoes. Although the proposed action will potentially adversely impact MBTA species, significant adverse impacts will be avoided and minimized through the implementation of the measures outlined in Tables 5 and 6 and Appendix D.

5.5 State Regulations

5.5.1 Hawai'i Coastal Zone Management Program (HRS 205A)

The Hawai'i Coastal Zone Management (CZM) Program (HRS Chapter 205A) was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. Hawai'i's CZM area encompasses the entire state, including all marine waters seaward to the extent of the state's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. The purpose of the SMA permit is to ensure that uses, activities, and operations within the SMA are carried out in compliance with the state's CZM law (HRS 205A).

SMA permits regulate permissible land uses that are already allowed by land use policies, taking into account zoning designations, county general plans, and community plans. Although the project is located within the Special Management Area (SMA), no development or ground disturbance will occur.

5.5.2 *Hawai'i Revised Statutes, Chapter 343*

The State of Hawai'i EIS law, HRS Chapter 343, was developed “to establish a system of environmental review that would ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations” (HRS 343-1). This chapter requires the development of an EA or EIS that discloses the effects of a proposed action, including the cumulative and overall effects, relative to an established set of 13 significance criteria, as defined in 11 HAR 200-12. HRS 343 also mandates that state agencies consider the potential effects of a proposed action on cultural practices as part of the environmental review process. Act 50 of the Session Laws of Hawai'i (A Bill for an Act Relating to EISs) clarifies that “the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights” and stresses the need to include consideration of cultural resources, customs, practices, and beliefs as part of the EA and EIS process. As part of the project's approval process, this Final EA has been prepared in accordance with HRS Chapter 343, as required under Revised Ordinances of Honolulu (ROH) Chapter 25.

6 DETERMINATION FOR HRS CHAPTER 343 COMPLIANCE

6.1 Significance Criteria and Analysis

The following is the list of applicable “significant criteria” used by the State of Hawaii, Department of Land and Natural Resources, in accordance with HEPA HAR Chapter 11-200.1, to determine if the proposed action would have a significant effect on the environment:

- 1. No irrevocable commitment to loss or destruction of any natural or cultural resource would result.* The project is not expected to irrevocably commit to the loss or destruction of any natural or cultural resources. SOPs would be implemented to avoid or minimize potential impacts to natural or cultural resources.
- 2. The proposed action would not curtail the range of beneficial uses of the environment.*
- 3. The proposed action would not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343, Hawai'i Revised Statutes.* The project would be in conformance with the State's long-term environmental policies and goals expressed under HRS 343.
- 4. The proposed action would not substantially affect the economic or social welfare of the community or State.* The project is not anticipated to cause substantial, adverse effects to the economic or social welfare of the community or State.
- 5. The proposed action would not affect public health.*

6. *No substantial secondary impacts, such as population changes or effects on public facilities, are expected.* The project is not expected to result in substantial secondary impacts to population or public facilities.
7. *No substantial degradation of environmental quality is expected due to the proposed action.* The project is not anticipated to cause substantial degradation of environmental quality.
8. *No cumulative effect on the environment or commitment to larger actions would be involved.* The project is not anticipated to have adverse cumulative environmental effects and it is not linked to any larger action.
9. *No rare, threatened, or endangered species or their habitats would be adversely affected.* The project has the potential to reverse the population declines and likely global extinction of two endangered and one threatened Hawaiian honeycreeper species. The recovery of these bird species would potentially benefit the reproduction and recovery of mutualist-dependent listed native plant species. Adverse effects of the proposed action would be effectively mitigated through the implementation of mitigation measures.
10. *The proposed action would not detrimentally affect air or water quality, or ambient noise levels.* The project is not anticipated to result in significant adverse impacts to air or water quality. However, there would be a temporary, short-term adverse impact for recreational users within the accessible areas of the project area due to the intermittent and short-term increase in noise from helicopters and fixed-wing aircraft. These adverse impacts would be minimized to the greatest extent possible by limiting the use of helicopters and fixed-wing aircraft in favor of less intrusive drones within accessible sections of the project area. The impacts of noise from aircraft on native wildlife would be managed through the implementation of the mitigation measures in Tables 5 and 6 and Appendix D.
11. *The proposed action would not detrimentally affect environmentally sensitive areas such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters, or coastal waters.* The project is not anticipated to adversely affect environmentally sensitive areas such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters, or coastal waters.
12. *The proposed action would not substantially affect scenic vistas and view planes identified in county or state plans or studies.* The project would not adversely impact scenic vistas and view planes.
13. *There would be no requirement for substantial energy consumption.* The project would not require substantial energy consumption.

6.2 Final Determination

Based on a review of the above significance criteria in HRS Chapter 343, and HAR Section 11-200.1-13, it is anticipated that the project would not result in significant adverse effects on the natural or human environment.

7 CONSULTATION

On October 21, 2022, the DLNR and USFWS issued a preparatory notice requesting consultation for the draft EA. The notice, which included a detailed description of proposed project activities and maps of the project area, was emailed to 91 recipients and sent as hard copy letters to 22 individuals or offices. Represented in this request for consultation were at least 33 State or Kaua‘i governmental offices, 14 Federal governmental offices representing the USFWS, Department of Defense, U.S. Department of Agriculture and USGS, 49 non-governmental/non-profit organizations that included 14 cultural, 29 environmental, six civic entities, and 11 for profit organizations or companies. A copy of the preparatory notice is included in Appendix H.

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Appendix A:
Issues and Potential Impact Topics

Table A-1. Affected Environment Resources that are Considered Unlikely to be Impacted by the No-Action Alternative and Proposed Action.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Geological disturbance and soil erosion	Existing roads and trails	Implementation of the project would result in nominal increases in vehicle and pedestrian traffic within existing transport infrastructure. The impacts of this increased traffic on soil erosion within this transport infrastructure will be minimized due to incompatible male mosquito release and monitoring being undertaken in appropriate weather to minimize damage to trails. Soil erosion resulting from vehicle and pedestrian movement is likely to be very localized and negligibly greater than the existing conditions with ongoing and future use. No additional geological or soil disturbance would be expected across the broader proposed project area.
Presence of <i>Wolbachia</i> -infected mosquitos	Southern house mosquito; other non-native mosquito species	If successful, populations of non-native southern house mosquito would be reduced to low levels within the proposed project area. This would result in a net benefit for native flora and fauna within the affected area. The risk of novel strains of <i>Wolbachia</i> being transmitted to other non-native mosquito species via hybridization or horizontal gene flow was evaluated but deemed to be of negligible risk.
Surface and ground water	Water quality and quantity	No impacts on water quality are anticipated from the proposed action.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Disturbance or degradation of aquatic habitats (wetlands, marshes, streams, rivers, fishponds, and anchialine ponds)	Water quality and quantity, aquatic flora and fauna in and on the margins of aquatic habitats	Disturbance of freshwater features is anticipated to be limited to monitoring southern house mosquito populations within these habitats. This monitoring is presently being undertaken within the proposed project area and is expected to have no impacts on water quality, quantity, or the habitat that these features provide for flora and fauna. Pedestrian release of incompatible male mosquitoes would have negligible impacts on aquatic environments because crossing of streams would be limited to designated crossings on the established trails within the project area.
Coastal features (beaches, estuaries, coastal waters)	Coastal geology and sediments, water quality, coastal flora and fauna habitat, recreational sites (e.g., surfing sites, boating, diving)	It is unlikely that project personnel would access coastal sections of the proposed project area during the project. Similarly, no project equipment would be placed near or within this zone.
Lightscapes	Project area and surrounding line of site locations	No impacts to lightscapes are anticipated to result from the proposed action. All work would be conducted during daylight hours. This issue was considered and dismissed from further analysis.
Land Use	Project area	No impacts to land use are anticipated to result from the proposed action. All current land uses would continue as is under the proposed action. This issue was considered and dismissed from further analysis.
Viewsheds	Natural features visible within line-of-sight	Helicopters, fixed-wing aircraft, and drones would be visible intermittently during from elevated vantage points throughout the proposed project area. However, the visual intrusion of these aircraft would be limited in extent (seconds to minutes) and will have no permanent impact on the viewsheds.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Soundscapes	Disturbance of the natural acoustic environment from human-generated sounds	Helicopters, fixed-wing aircraft, drones, motor vehicles, and personnel will be present intermittently within the proposed project area. However, the audible presence of project associated aircraft, vehicles, and personnel would occur only intermittently and for short time periods. By minimizing the use of aircraft and vehicles, this increase is unlikely to meaningfully contribute to the overall soundscape beyond existing levels.
Wilderness (including visitor experiences)	Visual and audible disturbance of wilderness experience for humans recreating within proposed project area	See Viewsheds and Soundscapes in this Table and Wilderness section in this appendix.

OTHER POTENTIAL ENVIRONMENTAL IMPACTS

Unintended Release of Female Mosquitoes

Although the inadvertent release of female incompatible mosquitoes (i.e., “female contamination”) would negatively impact the project’s tool effectiveness to suppress southern house mosquito populations on Kaua’i, this presents no more risk to humans or animals than the mosquitoes that currently occur on the island. Such inadvertent releases of females likewise would not increase the population of mosquitoes on Kaua’i.

Owing to the importance of only releasing male incompatible mosquitoes, sorting out and removing females is vital. In similar IIT programs, sex sorting was accomplished several ways and with varying rates of success. A primary method to separate and remove females uses sieves, or another similar physical separation method, taking advantage of the fact the female pupae are larger than those of males (Kittayapong et al. 2018, Crawford et al. 2020, Zeng et al. 2022). This method alone is estimated to remove >95% of all females, and various additional methods have been used to eliminate the remaining females or render them sterile (e.g., exposure to radiation). The proposed action will employ sorting methods consistent with Crawford et al. 2020. This highly technical process relies on physical separation of pupae followed by imaging and sorting of emerged adults via artificial intelligence (AI) programs that remove any remaining females (Crawford et al. 2020). An iterative process of vetting AI scanned images is then used to further reduce the risk of female presence in any given batch of mosquitoes bound for release. While

Crawford et al. (2020) achieved a low female contamination rate of 1 in 900 million with yellow fever mosquitoes, the proposed action would use southern house mosquitoes, a different species of mosquito. Although the methodology is the same and very precise, the estimated number of females released as part of the proposed action is expected to differ. Following the methods described by Crawford et al. (2020), Beebe et al. (2021) did not detect any released females (or larvae containing control *Wolbachia*) during their project in Australia. Following a different method, Zeng et al. (2022) estimated a female contamination rate of <1% and saw no local establishment of *Wolbachia*-infected mosquitoes in their study site in Hunan, China. The Crawford et al. (2020) sex sorting employed in this project would result in a female contamination rate that is several orders of magnitude smaller than reported in Zeng et al. (2022).

As discussed above, southern house mosquitoes release as part of this project would be transinfected with the wAlb *Wolbachia* strain, while wild mosquitoes in Hawai'i are naturally infected by the wPip *Wolbachia* strain (Atkinson et al. 2016). Should a wAlb female be released, she would be compatible with the released wAlb male mosquitoes and could produce viable offspring. This, however, is detrimental to the project's suppression goals and every effort would be made to reduce or eliminate female contamination of released male mosquitoes. For local establishment of a wAlb population of southern house mosquitoes to occur, females would first need to be released and survive long enough to reproduce (i.e., mate, find a blood meal, and lay eggs). If overflooding rates of released males are correctly calculated, it is possible that a released female could find a compatible male with which to mate. Although southern house mosquitoes are bidirectionally incompatible between wAlb and wPip strains, both pairings of wAlb males and wPip females and pairings of wPip males and wAlb females are incompatible. Should a released female mate with a wild type wPip male, no offspring would therefore be produced. If a released female successfully produces offspring with a released male, all resulting offspring would be infected with the wAlb *Wolbachia* strain. These offspring, however, would need to mate with other wAlb southern house mosquitoes to continue the reproductive cycle, as would all successive generations. Meanwhile, any mating events with wPip wild type mosquitoes would suppress any developing wAlb population. Successful establishment of a wAlb population would therefore be the product of a series of extremely unlikely events. Should local establishment by chance be detected, halting releases of wAlb males will allow the local wild type wPip mosquitoes to reinvade a portion of treatment area and eliminate the wAlb population. Deliberately releasing wild type wPip male mosquitoes could similarly accomplish the same objective.

Horizontal Transfer of *Wolbachia*

As previously discussed, *Wolbachia* (wPipV) is already present in the southern house mosquito and *Wolbachia* (wAlbA and wAlbB) strains are already found in the Asian tiger mosquito (*Aedes albopictus*) in Hawai'i. It is highly improbable that incompatible male mosquitoes, which cannot reproduce and would perish in the environment in under a week after release, are more likely to undergo horizontal transmission of *Wolbachia* than the existing populations of southern house mosquitoes that have been reproducing across the islands for the last 125–200 years. Compounding this improbability, *Wolbachia* is already common among native Hawaiian insects (Bennett et al. 2012).

Wolbachia is an endosymbiotic organism (i.e., it exists within the cells of another organism) that is maternally inherited or is passed down from a mother to her offspring. This process of passing *Wolbachia* from mother to offspring is referred to as “vertical transfer” (Weeks et al. 2002). Alternatively, “horizontal transfer” would be the transmission of *Wolbachia* from one organism to another via a non-maternal route (Ding et al. 2020). The mechanism for such a transfer in *Wolbachia* is not known, would only occur following a series of extremely unlikely events, and would require *Wolbachia* bacteria to live outside of their host cells for a period of time (Ding et al. 2020). In a laboratory setting, maintaining living *Wolbachia* outside of host cells requires precise conditions to preserve these bacteria in a cell-free medium for even short periods of time (Rasgon et al. 2006); numerous environmental factors would severely limit the lifespan of *Wolbachia* outside of their host cells (e.g., pH, UV radiation) in a natural setting. This technique is in fact required for the process of creating the incompatible mosquitoes to be used in this project. Tolley et al. (2019) asserted or implied that the ability to preserve *Wolbachia* outside of cells in a laboratory setting (Rasgon et al. 2006) represents evidence that *Wolbachia* can live extracellularly in nature. There is, however, no known evidence or example in the literature of free-living (extracellular) *Wolbachia*. The mechanism for horizontal transmission of *Wolbachia* remains unknown, but the hypotheses for how this has occurred in the past have little relevance to the system in the proposed project. Tolley et al. (2019) has suggested that horizontal transfer in ants could have occurred through social interactions or predation, but again there remains no direct evidence of this and this hypothesis is purely speculative.

Regarding the second point, both the Asian tiger mosquito and the yellow fever mosquito (*A. aegypti*) live in the same environments in many parts of the world, including on Hawai'i Island. While the Asian tiger mosquito is nearly always naturally infected with *Wolbachia* (the same strain that would be used in the proposed project), the yellow fever mosquito is naturally uninfected by *Wolbachia* (Klassen et al. 2009) and there is no evidence of horizontal transfer of the bacteria between these two species. There is likewise no evidence that the strain of *Wolbachia* found in southern house mosquitoes has been transmitted to the Asian tiger mosquito (or any other mosquito), or vice versa, in Hawai'i (or anywhere else) despite co-occurrence for >130 years (Atkinson et al. 2016). There is additionally no evidence of transfer of *Wolbachia* from mosquitoes to other arthropods, including native Hawaiian insects (Bennett et al. 2012). The low rate of horizontal transfer among related species, such as Asian tiger and yellow fever mosquitoes, suggests that the rate of transfer among unrelated arthropods would be lower still.

Horizontal Gene Transfer

While horizontal transfer of *Wolbachia* would involve the non-heritable movement of the *Wolbachia* bacterium between insect species, “horizontal gene transfer” would be the theoretical movement of genetic material (DNA) from the *Wolbachia* bacterium into the genome of the southern house mosquito (Klassen et al. 2009). Horizontal gene transfer is a natural process that has occurred innumerable times throughout evolutionary history. Scientists have found segments of DNA within numerous eukaryotic (e.g., animal) organisms that can be traced back to a prokaryotic (i.e., bacterial) organism, often in parasite-host interactions (Klassen et al. 2009, Dunning Hotopp 2011). This may in fact be an important evolutionary process that is just now being realized. The process of horizontal gene transfer itself, however, is not a concern. More pertinent is whether such a transfer includes transcriptional phenotypic traits that could be acted

on by selective pressures that allows for beneficial traits to be developed. A segment of DNA does not necessarily contain all the required information to be transcribed or read and conferred into new traits or functions of the individual organism. Much of a genome in fact contains sequences of non-coding DNA, often referred to as “junk DNA.” The likelihood that such an event could somehow alter the genome of the mosquito in a meaningful way is therefore exceptionally low. Further, the horizontal transfer of genes between *Wolbachia* and a mosquito would by no means constitute the creation of a new species of mosquito.

It has been suggested that Klassen et al. (2009) had purported to show evidence of horizontal gene transfer between *Wolbachia* (wPip) and the yellow fever mosquito. These authors found several sequences of DNA within the typically *Wolbachia*-free yellow fever mosquito's genome that had previously been identified from the *Wolbachia* genome. Klassen et al. (2009) do acknowledge, however, that while the most likely direction of transfer was from the *Wolbachia* to the mosquito, it could not be determined for certain the transfer did not occur in the opposite direction. Importantly, these examples of gene transfer occurred as a result of a natural evolutionary event(s), not as a result of any human-caused process (such as in the proposed project); the timescale required for these transfer events is therefore unknown. Given that the wPip strain of *Wolbachia* has co-evolved with the southern house mosquito for likely millions of years, it is considerably more likely that horizontal gene transfer may have occurred naturally between these species than between the transinfected wAlb and the southern house mosquito.

Lastly, concerns such as horizontal gene transfer are predicated on the establishment of a reproducing population of southern house mosquitoes infected with wAlb strain of *Wolbachia*. The very purpose of the proposed project is to suppress the population of southern house mosquitoes within the project area on Kaua'i, not to augment them. Local establishment of wAlb southern house mosquitoes would work against that goal and extreme care would be taken to avoid that scenario.


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Appendix B:
Cultural Impact Assessment



Cultural Impact Assessment of Using *Wolbachia*-based Incompatible Insect Technique for the Suppression of Southern House Mosquito Populations on Kauaʻi

MAY 2023

DRAFT

PREPARED FOR

**State of Hawaiʻi Department of Land
and Natural Resources Division of
Forestry and Wildlife**

PREPARED BY

SWCA Environmental Consultants

**CULTURAL IMPACT ASSESSMENT OF USING *WOLBACHIA*-
BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE
SUPPRESSION OF SOUTHERN HOUSE MOSQUITO
POPULATIONS ON KAUA'I**

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May 2023

EXECUTIVE SUMMARY

At the request of the State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW), SWCA Environmental Consultants (SWCA) has prepared the following Cultural Impact Assessment (CIA) to assess the potential cultural impacts of the use of *Wolbachia*-based Incompatible Insect Technique to reduce mosquito populations within approximately 59,204 acres (23,959 hectares) of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i Wilderness areas of Kaua'i. The goal of the Kaua'i mosquito suppression project is to protect native forest birds in critical higher-elevation habitats by disrupting the breeding of southern house mosquitoes (*Culex quinquefasciatus*) within the project area. The CIA was prepared to assist DOFAW in complying with its responsibilities under State of Hawai'i Revised Statute Chapter 343, which requires state agencies to take into account the potential effects of a proposed project on traditional cultural resources, practices, and beliefs as part of the environmental assessment process.

In preparing this CIA, SWCA followed the *Guidelines for Assessing Cultural Impacts* provided by the Hawai'i State Office of Environmental Quality Control (now the Office of Planning and Sustainable Development). Archival research was undertaken into the cultural history of the project area and into the previous archaeological studies conducted in the vicinity in an attempt to determine the traditional cultural use and significance of the project area. This research was followed by community consultation and informant interviews undertaken to identify any cultural resources, practices, and beliefs, both traditional or contemporary, associated with the project area.

One of the principal impacts of the proposed project on cultural resources is the anticipated reduction of mosquito populations. As *Culex quinquefasciatus* mosquitoes are carriers of avian malaria and avian pox, their suppression would reduce the threat of these diseases and contribute to the long-term protection and preservation of surviving native forest bird populations. As these birds play a significant role in Hawaiian culture, their existence and presence within the forest environments they inhabit are important to maintaining cultural continuity between traditional and contemporary cultural customs, practices, and beliefs.

The ethnohistorical literature associated with native birds, *kia manu* (birdcatchers), and the project area is extensive. Numerous oral traditions describe *kia manu* who lived and gathered feathers within the project area. Additionally, traditional place names within and near the project area are rich in references to native birds. Native bird species factor prominently in traditional Hawaiian cultural practices, customs, and beliefs.

As part of the CIA process, five individuals knowledgeable concerning the project area and the cultural significance of native birds were interviewed. All of the interviewees shared a great concern for the declining native bird populations and stressed the importance of native birds to Hawaiian culture; past, present, and future. Each spoke to the cultural significance of the project area and the numerous cultural resources, *wahi pana* (storied places), and culturally significant biological communities found within it. All of the interviewees supported the project and expressed their hope that it would succeed and accomplish what it is intended to do. One interviewee was cautiously wary of the project because of the failures of past biological interventions throughout the history of the Hawaiian Islands. Interview participants recommended close monitoring of both mosquito populations and of native forest bird populations.

The findings of the CIA indicate that the proposed project is unlikely to adversely impact cultural resources, practices, and beliefs. Instead, the proposed project is expected to enhance traditional cultural resources and beliefs as well as contemporary cultural practices.

Efforts, such as the proposed use of *Wolbachia*-based Incompatible Insect Technique (IIT), that are designed to reduce the incidence of avian malaria and avian pox transmission among native forest bird species would result in positive outcomes for the species themselves and the cultural heritage associated with them. The potential long-term beneficial impacts to the conservation of native forest birds would enhance cultural resources, practices, and beliefs.

Under the no-action alternative, avian malarial and avian pox will continue to impact native bird species, likely resulting in more extinctions and the loss of these significant cultural resources. Under the proposed action, the suppression of southern house mosquitos would result in increases in populations of native forest birds within the project area which would in turn enhance the cultural heritage represented by these native forest birds.

Reference Citation:

Traub, Wainani, Hattie Gerrish, and Rowland Reeve. 2023. Cultural Impact Assessment of Using *Wolbachia*-based Incompatible Insect Technique for the Suppression of Southern House Mosquito Populations on Kaua'i. Report prepared for the State of Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife by SWCA Environmental Consultants, Hawai'i.

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1 INTRODUCTION

On behalf of the State of Hawaiʻi, Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), SWCA Environmental Consultants (SWCA) has prepared the following Cultural Impact Assessment (CIA) to assess the potential cultural impacts of the proposed use of *Wolbachia*-based Incompatible Insect Technique (IIT) in the suppression of mosquito populations and the protection of critical high-elevation native forest bird habitat within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōkeʻe and Alakaʻi Wilderness areas of Kauaʻi (Figure 1).

The proposed project area encompasses a large portion of Kauaʻi's surviving native rainforest, a landscape imbued with cultural significance. The several wahi pana (storied places) found within these areas are integrated cultural and natural landscapes strongly associated with Hawaiian cultural traditions, practices, and beliefs. As the project is designed to protect surviving native bird populations, this CIA is particularly concerned with recording the past and present historical and cultural significance of native forest birds and the environment they inhabit.

1.1 Project Area

The proposed project area covers a substantial portion of northwestern Kauaʻi, stretching from the coast up into the mountains. It encompasses the *ahupuaʻa* (traditional land divisions) of Waimea, Wainiha, Makaweli, Hanakāpīʻai, Hanakoa, Pōhakuao, Kalalau, and Honopū (Figure 2). The project area also includes some high elevation areas of Lumahaʻi, Hanalei, Wailua, Hanamāʻulu, and Hanapēpē Ahupuaʻa. These ahupuaʻa are situated within the *moku* (districts) of Kona, Nāpali, Haleleʻa, and to a lesser extent, Puna. This area encompasses the Kōkeʻe State Park, Hono o Nā Pali Natural Area Reserve, Kuʻia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alakaʻi Wilderness Preserve, and private lands (Figure 3).

The boundaries of the project area were established through coordination between the U.S. Fish and Wildlife Service (USFWS), the Kauaʻi Forest Bird Recovery Program (KFBRP), and the DLNR. The area covered accounts for mosquito dispersal as well as target areas outside of the existing safe forest bird habitat to prevent mosquitoes from moving into the core habitat from lower elevations where mosquito densities are significantly higher.

1.2 Project Background

The native forest birds of Kauaʻi face several threats to their survival. Already, 10 of the 16 native honeycreepers of Kauaʻi have gone extinct, and 3 of the remaining 6 species are endangered or threatened. Although several factors contribute to the continuing decline in native bird populations, the main threats to Hawaiian forest birds are avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); diseases principally spread by the nonnative southern house mosquito (*Culex quinquefasciatus*). Despite the danger that these diseases pose to native forest birds, there has not, until recently, been a viable method to control mosquito populations within natural areas in Hawaiʻi.

The Incompatible Insect Technique (IIT) has been successfully used in numerous cities in the U.S. and throughout the world to control mosquitoes that carry human diseases. The technique utilizes lab-raised male mosquitoes that carry a select strain of *Wolbachia*, a bacteria that naturally occurs in at least 65% of insect species, and that is naturally found in native and introduced arthropods in Hawaiʻi. When *Wolbachia*-carrying male mosquitoes, which do not bite or carry diseases, are released into a target

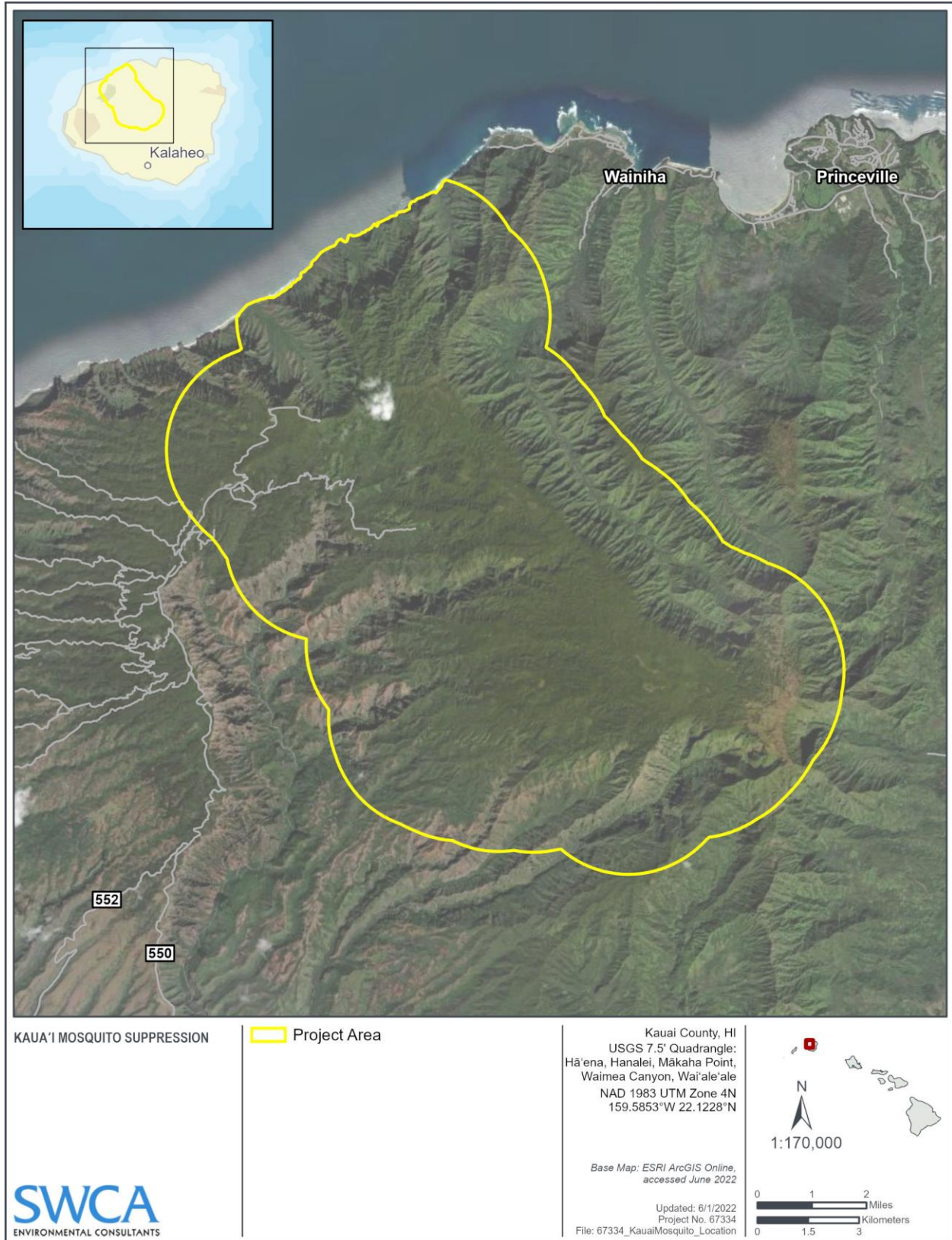


Figure 1. The boundaries of the proposed project area.

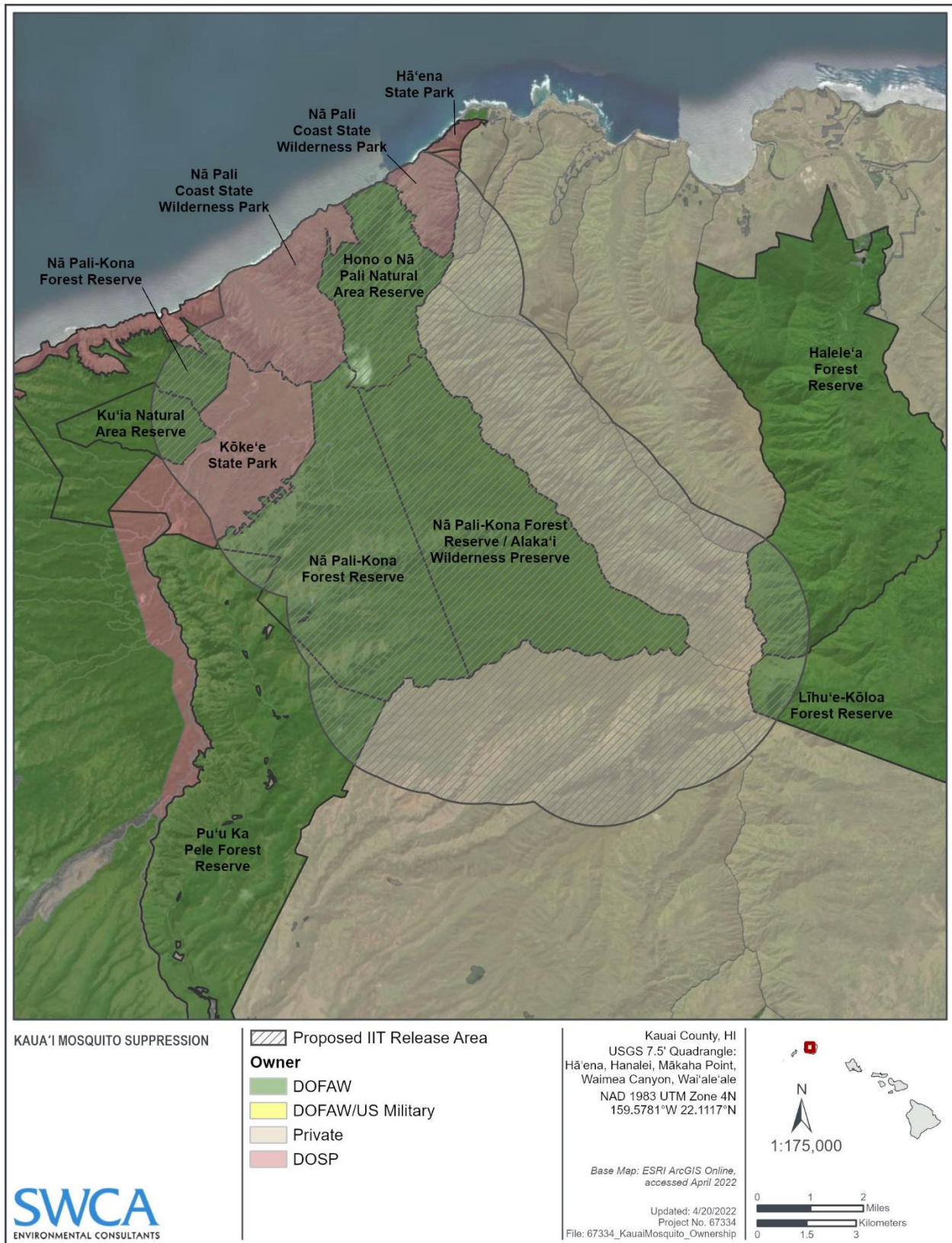


Figure 2. State Parks, Forest Reserves, and Natural Area Reserves within and overlapping the project area.

habitat and mate with female mosquitoes, the *Wolbachia* bacteria prevents the healthy development of resulting eggs, and they do not hatch. This causes a general decline in the mosquito population within the target area.

The development of IIT to combat mosquito-borne diseases that affect humans presents a unique opportunity to further develop the technique to control mosquitoes that spread avian diseases to native forest bird species in Hawai'i. The mosquito species targeted in this process are also a vector of human diseases, such as West Nile Virus and lymphatic filariasis, and can transmit heartworm to pets. It is notable that this technique does not use any genetically modified organisms or involve genetic engineering of bacteria or mosquitoes.

1.3 Project Description

The DLNR and its project partners are proposing the sequential release of lab-raised male southern house mosquitoes that carry a strain of *Wolbachia* that is incompatible with the strain that is present within the wild female southern house mosquito population. The mosquitoes would be released from the ground and air within 23,959 ha/59,204 acres of the highest elevation areas of Kaua'i (Figure 1). The Kōke'e State Park, Nā Pali-Kona Forest Reserve, and the Alaka'i Wilderness Preserve overlap with the extant native forest bird habitat, including critical habitat for 'akekee and 'akikiki, on the island (Paxton et al. 2016; species accounts provided below) (Figure 3). Ongoing monitoring of mosquito populations and native forest birds would be undertaken prior to and during the project.

1.3.1 Mosquito Release

The lab-raised incompatible male mosquitoes are planned to be released from both the ground, along established roads trails, and fence line corridors, and the air, from helicopters, fixed-wing aircraft, or unmanned aerial vehicles (UAS "drones"). For more a more detailed description of mosquito release methods, see section 3.2.6 of the EA.

For ground release, only existing routes of travel would be used, and no new roads, trails, or helicopter landing zones would be created to support this project; only existing facilities and access points would be used. Release areas would be prioritized based on ease of access, availability of support resources, presence of southern house mosquitoes, and proximity to core endangered forest bird populations. Project management units would be demarcated by access roads and trails, and vegetation types. In terms of ease of access, some higher priority areas would include accessible fence lines, roads, trails, and field camps used for other resource management activities. Field camps accessible by road may be of higher priority than those accessible by helicopter. Available times to occupy camps would be coordinated through the appropriate management agency.

For the pedestrian release method, incompatible male mosquito releases would occur along existing roads via four-wheel-drive (4WD) vehicles or via pedestrian hiking trails and fence line corridors. The appropriate DLNR permit process would be followed, where necessary. Most trails, access roads, and LZs would not require vegetation maintenance in addition to what is already maintained to support the KFBRRP and other ongoing DLNR programs. Vegetation clearing around infrastructure, camps, trails, fence lines, and LZs is a standard management practice approved under DLNR Chapter 343 exemptions filed with the Hawai'i Office of Planning and Sustainable Development¹. No new roads or trails would be created for this project.

¹ See: http://oeqc2.doh.hawaii.gov/Agency_Exemption_Lists/State-Department-of-Land-and-Natural-Resources-Exemption-List-2020-03-03.pdf

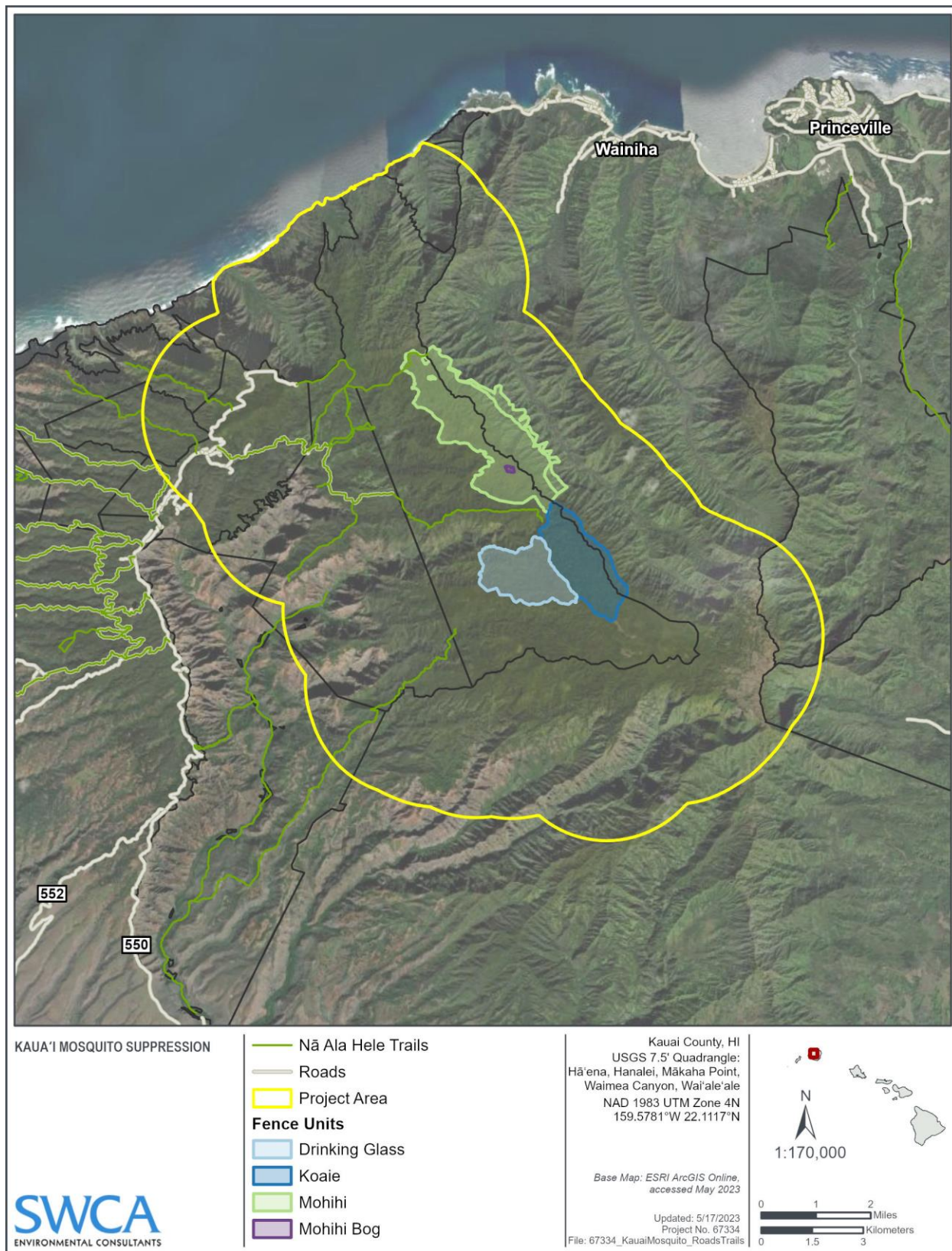


Figure 3. Roads and trails within the boundaries of the project area.

All helicopter operations would be conducted by contracting a private helicopter company and would utilize existing LZs, some of which would require small amounts of vegetation maintenance of these areas, as for other resource management purposes. Existing remote campsites (described in Section 3.2.4.1) would be utilized for field crews and also require routine maintenance or vegetation clearance, as for other resource management purposes.

For each release event, which is anticipated to last one day, efforts would be made to minimize traffic (the number of technicians and vehicles or helicopter flights) required to travel to the release sites and field camps. An established camp would be used if an overnight stay is required.

1.4 Regulatory Framework

To comply with its obligations under the National Environmental Policy Act (NEPA) and Hawai'i Revised Statutes (HRS) Chapter 343, the DLNR, DOFAW is preparing an environmental assessment (EA) to address the proposed release of incompatible male mosquitoes with *Wolbachia*. The environmental assessment, of which this CIA is a part, provides background information concerning IIT and outlines the proposed action, potential impacts, and strategies to avoid, minimize or mitigate the effects of the proposed release of incompatible male mosquitoes within the project area.

This CIA has been prepared to assist the DLNR in complying with its regulatory responsibilities under the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements law, and was developed in accordance with the State of Hawai'i Office of Environmental Quality Control (OEQC) (now the Office of Planning and Sustainable Development) *Guidelines for Assessing Cultural Impacts* as adopted by the Environmental Council, State of Hawai'i, on November 19, 1997.

1.4.1 Hawai'i State Statutes, Regulations, and Guidelines

Articles IX and XII of the Hawai'i State Constitution, as well as other state laws, and court decisions, impose on government agencies a duty to promote and protect the cultural beliefs, practices, and resources of native Hawaiians, as well as other ethnic groups. One means of ensuring these protections is through the preparation of Cultural Impact Assessments.

Under the State of Hawai'i environmental review process, as stipulated under State of Hawai'i Revised Statute (HRS) Chapter 343 (Environmental Impact Statements—Implemented through Hawai'i Administrative Rules (H.A.R.) § 11-200), requires state agencies to take into account the potential effects of a proposed project on traditional cultural resources, practices and beliefs as part of the environmental assessment process. This involves the preparation of a CIA to be included within the Environmental Assessment for a project under review.

The Hawai'i State Constitution, Article XII, Section 7 affirms that the state “shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes.” Each state agency has the responsibility to ensure the effective stewardship of any cultural resources that may be affected by their actions. HRS § 343 mandates that environmental review be integrated into state and county planning processes, and that state agencies consider the potential effects of a proposed action on cultural practices as part of the environmental review process. Act 50 of the Session Laws of Hawai'i (A Bill for an Act Relating to Environmental Impact Statements) clarifies that “the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights” and stresses the need to include consideration of cultural resources, customs, practices, and beliefs as part of the environmental assessment (EA) and environmental impact statement (EIS) process.

To address concerns regarding the potential impacts of state projects on cultural resources, customs, practices, and beliefs, the Hawai'i State Office of Environmental Quality Control (now the Office of Planning and Sustainable Development) established *Guidelines for Assessing Cultural Impacts* (Hawai'i State Office of Environmental Quality Control and Environmental Council 1997) that were adopted by the State of Hawai'i Environmental Council in November 1997. These guidelines recommend that preparers of CIAs adopt the following protocols for analyzing potential cultural impacts as part of the EA process.

Identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices, and beliefs found within the broad geographical area (e.g., district or *ahupua'a* [traditional land division]).

Identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action.

Receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area.

Conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research.

Identify and describe the cultural resources, practices, and beliefs located within the potentially affected area.

Assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures on the cultural resources, practices, and beliefs identified.

The State of Hawai'i Environmental Council recommends that an assessment of cultural impacts should address, but not necessarily be limited to, the following:

A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations that might have affected the quality of the information obtained.

A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.

Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted and any constraints or limitations that might have affected the quality of the information obtained.

Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.

A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations, or biases.

A discussion concerning the cultural resources, practices, and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

An explanation of confidential information that has been withheld from public disclosure in the assessment.

A discussion concerning any conflicting information in regard to identified cultural resources, practices, and beliefs.

An analysis of the potential effect of any proposed physical alteration on cultural resources, practices, or beliefs; the potential of the proposed action to isolate cultural resources, practices, or beliefs from their setting; and the potential of the proposed action to introduce elements that may alter the setting in which cultural practices take place.

A bibliography of references and attached records of interviews that were allowed to be disclosed.

This CIA report addresses each of the elements of the State of Hawai'i Environmental Council's Guidelines.

1.5 Report Organization

The following report has been structured to fulfill the statutory requirements discussed above. The **Introduction** section includes background information on the project, its location, purpose, and area of potential effects, as well as a discussion of the relevant government statutes and regulations related to the project. The **Environmental Setting** section provides information on the natural environment of the project area. The **Methods** section describes the methodology followed in undertaking archival research and conducting community consultation and informant interviews. The **Cultural and Historic Background** section presents the results of archival research into the available cultural and historical documents relating to the project area and to the traditional activities known to take place there. This cultural and land use history extends from the pre-Contact period up through the recent post-Contact period. The **Cultural Resources, Practices, and Beliefs** section provides a summary of the cultural resources, customs, practices and beliefs found to be associated with the project area. The **Previous Archaeological Studies** section details the results of archaeological studies in the project area. The **Previous Cultural Studies** section details the results of cultural studies undertaken within and surrounding the project area. The **Community Consultation** section includes a discussion of the efforts made to contact organizations and individuals knowledgeable about the project area as well as the results of community outreach and informant interviews. The **Summary and Recommendations** section presents an overview of efforts, findings, and recommendations from this study. The **Glossary of Hawaiian Words Used in the Text** section provides a list of Hawaiian words used and their definitions, while the **References Cited** section lists the references cited in the report.

The data appendices that support the report include:

- Appendix A. Request for Information Letter
- Appendix B. Table of Individuals and Organizations Contacted
- Appendix C. Interview Consent Forms
- Appendix D. Interview Transcripts

2 ENVIRONMENTAL SETTING

The island of Kaua'i is the most biologically diverse of the main Hawaiian islands due to its age, isolation, and unique topography (Mitchell et al. 2005). The project area encompasses a significant amount of the islands' landmass and includes some of the greatest proportion of intact native ecosystems on the island. The natural vegetation in the Kōke'e State park area consists of mesic forest dominated by 'ōhi'a lehua (*Metrosideros polymorpha*) and koa (*Acacia koa*). The Alaka'i Wilderness Preserve is the largest upland bog in Hawai'i and the second largest wetland. The Hono o Nā Pali Natural Area Reserve includes perennial streams, riparian and ridgeline habitat, and lowland and montane forests. The Ku'ia Natural Area Reserve includes lowland and montane vegetation.

2.1 Traditional Environmental Zones

The traditional inhabitants of Kaua'i recognized and gave names to the various natural habitats that existed within their island home. These traditionally recognized environmental zones stretched from the *kahakai* (the shoreline) to the *wao kele* (the remote and rainy forested uplands). While the entire project area covers a number of these traditional zones, proposed project activities would be focused within the higher elevation inland regions that are the home to the Island's native forest birds. These lands are located within the *wao*, or realms, of traditionally uninhabited wilderness.

Native Hawaiians recognize and named many divisions within the *wao*: *wao lā'au* (lowland forest), *wao kele*, or *wao ma'u kele* (rain forest), etc. The areas highest in elevation are regarded as the *wao akua*, or the realm of the gods, understood to be places of profound spiritual and cultural significance. The *wao kele* and the *wao akua*, the zones of undisturbed forest, served as aquifers and resource banks for native biodiversity. These remote forest zones, which were beyond the area of pre-Contact human resource management and extraction, were dominated by indigenous plant communities. These were areas of the forest where "the monarchs of the forest grow" (Malo 1951:17). Below the *wao kele* and the *wao akua* was the *wao nāhele*, a stretch of relatively undisturbed forest that was a prime habitat for native birds. During the pre-Contact period, this upland forest zone was accessed by *kia manu* (birdcatchers) seeking to capture forest birds for their colorful feathers, which were used to decorate chiefly cloaks (*ahu'ula*), helmets (*mahiōle*), and standards (*kāhili*). These upland forest zones were originally dominated by native *koa* (*Acacia koa*) and 'ōhi'a lehua (*Metrosideros polymorpha*), with an understory of indigenous forest plants.

Below these undisturbed forests is the *wao lā'au*. This was the zone where timber and other forest products were traditionally gathered. Massive *koa* logs were felled to serve as the hulls of canoes and 'ōhi'a timbers were cut down to be used as house posts. These and other native hardwoods were used for a range of purposes from digging sticks and other daily tools to carved temple images. Trees, vines, and shrubs, both natives and Polynesian introductions, were harvested for use as firewood, cordage, and weaving materials, medicines, and dyes, as well as ceremonial and personal adornment. The *wao lā'au* was a managed forest ecosystem supplying important forest resources to the inhabitant of the *ahupua'a*. Some of these resources, particularly dye and medicinal plants, are still harvested and used today by contemporary cultural practitioners.

Still further downslope was the *wao kānaka*. This area at the lower edge of the forest was most heavily encroached on by human activity. Within it were scattered house sites and fields where upland *kalo* (taro, *Colocasia esculenta*) or *mai'a* (banana, *Musa x paradisiaca*) were grown. This zone was used as needed to augment availability of food resources grown in the inhabited valleys and coastal areas.

2.2 Ua (Rains)

In Native Hawaiian oral traditions, winds and especially rains were acutely observed and oftentimes assigned names. Oral traditions such as *oli* (chants), *mele* (songs) and *mo'olelo* (stories and traditions) preserve the memory of these names as well as the characteristics and traits that a wind or rain possessed. Traditional rain and wind names are evidence of the intimate connections Native Hawaiians have to the forces of nature and the value attached to these forces. Some of the rain names associated with the project area are discussed below.

2.2.1 Noelehua

The *Noelehua* rain is associated with Wai'ale'ale, Kaua'i. "Noe lehua" translates to "lehua mist." "*Ka ua Noelehua o Wai'ale'ale*," is a traditional saying meaning, "the Noelehua rain of Wai'ale'ale." Mary Kawena Pukui says that the Noelehua is "the rain of Wai'ale'ale that moistens the lehua blossoms there" (as cited in Akana and Gonzalez 2015:211).

The Noelehua and Nāulu rains are mentioned in the following excerpt of a *mele inoa*, or name chant, for Albert Ka Haku O Hawai'i by his uncle, Kamehameha V.

*Kapu ka luna o Wai'ale'ale i ka ua Noelehua
Lehua, 'o ka lehua maka noe
Ua nonohe wale i Haua'iliki
I'iliki 'ia e ka Noe luna o Alaka'i
Ka'i 'āuna lākou a Kawaikini a Kawaikōi
I Kahelekua, i hele hiō i ke ala kīpapa a Ola
E ola i ka wai ua a ka Nāulu*

Translation:

The upland of Wai'ale'ale is sacred with the Noelehua rain
Lehua, the lehua maka noe shrub
Very attractive at Haua'iliki
Poured down upon by the Noe atop Alaka'i
They moved like a flock to Kawaikini, to Kawaikōi
At Kahelekua, going along the sloped, paved path of Ola
Live by the waters of the Nāulu rain
(Akana and Gonzalez 2015:211)

2.2.2 Nāulu

The Nāulu rain is associated with several places including the Kona Moku of Kaua'i. The Nāulu rain is described as a sudden shower. It is also the name of a shower cloud and a wind (Akana and Gonzalez 2015:187).

Mention of the Nāulu rains can be found in a chant originally composed for his royal highness Lunalilo and inherited by king Kalākaua. This portion of the *mele* was composed by Nāmāhana (Hawaiian source: *Na Mele Aimoku*, Kalākaua 1886:151, English translation by Akana and Gonzalez 2015).

*Hana ua wai Nāulu 'o Kona
Hana ua wai Nāulu 'o Mānā
I ho'onani 'ia e piha Keālia wai
Wai Kahelu, ua piha Kalanamaihiki*

*Na ka wai ua Kaunalewa
Maika'i iho i ka wai Lolomauna*

Translation:

Kona produces the Nāulu rainwater
Mānā produces the Nāulu rainwater
That enhances and fills the spring of Keālia
The waters of Kahelu, Kalanamaihiki is filled
By the rainwater of Kaunalewa
Beautified by the water of Lolomauna
(Akana and Gonzalez 2015:199)

2.2.3 Makako'i

The rain specific to the Halele'a District was the Makako'i rain (Akana and Gonzalez 2015:170). "*Ka ua Makako'i o Halele'a*" is a traditional saying meaning, "the Adz-edged rain of Halele'a." Pukui describes the Makako'i rain as, "a rain so cold that it feels like the sharp edge of an adz on the skin." (Pukui 1983:172).

3 METHODS

The cultural assessment for the Kaua'i Mosquito Suppression Project was developed through a combination of archival research and community consultation following the *Guidelines for Assessing Cultural Impacts* laid out by the Hawai'i State Office of Environmental Quality Control (now the Office of Planning and Sustainable Development) and Environmental Council. The study was undertaken under the overall supervision of Principal Investigator Rowland Reeve, M.A. Background research was conducted by Wainani Traub, M.S., and Hattie Gerrish, B.A. Community consultation and informant interviews were conducted by Wainani Traub.

3.1 A Brief Historic Context for Traditional Hawaiian Cultural Knowledge

In any sensitive discussion of Native Hawaiian culture, one must understand the role of colonization in eroding traditional cultural knowledge systems. Native Hawaiian culture —past and present— exists in close partnership with its natural environment. Changes in the traditional land tenure system and the adoption of western concepts of land ownership in the nineteenth century had significant direct and indirect impacts on traditional cultural practices and beliefs tied to *'āina* (land). The privatization of land resulted in the loss and destruction of many significant cultural resources and denied Native Hawaiian cultural practitioners access to lands previously used for traditional cultural purposes. As an example of this, one of the informants interviewed for this cultural assessment recalls when he and other hunting families had hunting rights on private lands taken away leaving only the public lands available for hunting (Bill DeCosta 2022 see appendix D).

The loss of traditional Hawaiian cultural knowledge during the nineteenth and early twentieth centuries was further compounded by the devastating decline in the native population resulting from the introduction of foreign diseases to which the Hawaiian people had no developed immunity. Changes in traditional life ways resulting from the migration of younger people from the country districts to growing economic centers such as the port of Honolulu, as well as the shift from subsistence agriculture to the commercial cultivation of crops such as pineapple and sugar, contributed to a loss of cultural memory.

With the passing of the last custodians of specialized cultural knowledge, that knowledge was lost forever.

Not until 1978 was the Hawai'i constitution amended to protect and preserve the traditional customary rights of Native Hawaiians, and not until 1995 did the Hawai'i Supreme Court confirm Native Hawaiian rights to access undeveloped and under-developed private lands (State of Hawaii Environmental Council 1997:1). These actions came much too late to prevent irretrievable loss of traditional cultural knowledge.

With this in mind, it is important to note that an absence of evidence is not evidence of absence. The authors of this cultural assessment recognize that the loss of Hawaiian traditional cultural knowledge likely applies to the current project area. It is probable that there are place names whose meaning has been lost or which themselves have been forgotten, and traditions no longer passed on. We also recognize that, while we have made a good faith effort to address the cultural resources, practices, and beliefs associated with the project area, it is possible that there may be place names missed, traditional history misinterpreted, or *kūpuna* (elder) voices not heard.

As this cultural assessment shows, however, despite the enduring legacies of colonialism, there are many individuals who possess cultural knowledge, and efforts to revitalize cultural resources, practices, and beliefs are growing. Considering a significant part of the project area are public lands, the Native Hawaiian community has had uninterrupted access to these lands which has enabled a continuity of cultural use of these lands.

3.2 Archival Research

3.2.1 *Limitations*

The *Guidelines for Assessing Cultural Impacts* indicate that a cultural assessment report should include a discussion of constraints and limitations relevant to the study. The research conducted for this report was constrained to some extent by the language proficiency of the SWCA cultural resources team. Although our primary ethnographer is a Hawaiian language speaker, their fluency in reading historic documents written in the Hawaiian language is more rudimentary, limiting our capacity to capture the nuances of Native Hawaiian perspectives held within the vast repository of existing Hawaiian language sources, particularly Hawaiian language newspapers of the nineteenth and twentieth centuries. The task of identifying newspaper articles of relevance to this cultural assessment and then translating the contents was beyond the current Hawaiian language capabilities of the SWCA cultural resources staff. The same holds true for any foreign language sources. All major immigrant groups to Hawai'i printed newspapers in their native language. We recognize the valuable potential insights that lie in these sources but were unable to fully access them.

The research conducted for this cultural assessment was completed outside of Kaua'i and so does not include any records held in archives on Kaua'i. Additionally, while several of the individuals interviewed were residents of Kaua'i, none of the oral history interviews included in this assessment were held in person on Kaua'i. The oral history interviews were constrained to a virtual format using video conferencing technology.

3.3 Community Consultation

SWCA undertook to identify and consult with individuals possessing knowledge of the project area and its cultural significance, including the cultural resources, customs, practices, and beliefs associated with the area as well as any current cultural practices that are being conducted within the project area. To

initiate this process, SWCA compiled a list of cultural consultation contacts that included government agencies, Native Hawaiian Organizations (NHOs), community groups, and individuals identified as having a potential interest in the project including individuals referred to in previous cultural studies conducted within the vicinity of the project area.

In compiling this list SWCA included all NHOs listed on the U.S. Department of Interior's *Native Hawaiian Organization Notification List* whose geographical purview is Kaua'i Island and whose stated mission relates to environment and or culture. The list also included select NHOs with a statewide purview whose stated mission relates to environment and or culture. SWCA prepared a request for information letter, a copy of which was sent out to each of the contacts on the cultural consultation contact list. The request for information letter delineated the area of the project, described the project and its potential impacts, and requested assistance in:

- Identifying *kama'āina* (long term residents), *kūpuna* (elders), and other individuals who might be willing to share their cultural knowledge of the project area
- Providing information on the present and past land use of the project area
- Providing information on place names and cultural traditions associated with the project area
- Providing information on cultural sites which may be impacted by reconstruction work within the project area
- Providing knowledge of traditional gathering practices within the project area, both past and ongoing
- Indicating any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area

The text of the request for information letter is provided in Appendix A of this report. A copy of the cultural consultation contact list has been included as Appendix B of this report.

4 CULTURAL AND HISTORIC BACKGROUND

This section presents the past and present historical and cultural significance of the project area and the native Hawaiian forest birds that inhabit this environment. Particular attention is paid to the ways native forest birds appear in the ethnohistorical literature associated with the project area. Considering that the proposed project will not involve any ground disturbing activities, less emphasis has been placed on providing a detailed history of land use for the entire project area. The following historic and cultural background research is intended to be sufficient to the extent appropriate to assess the potential project impacts on cultural resources practices and beliefs.

4.1 Place Names and Land Use

The island of Kaua'i, is the oldest of the larger main Hawaiian Islands. Historically, Kaua'i was divided into several distinct political units, which in ancient times were subject to various chiefs—sometimes independently and at other times in unity with the other districts. These early moku included Nāpali, Halele'a, Ko'olau, Puna, and Kona (Buke Mahele, 1848). The current project area extends into all but one of Kaua'i's five moku, covering portions of Kona, Nāpali, Halele'a, and to a lesser extent, Puna (Figure 2).

In traditional Hawaiian society, land was not owned. Instead, the *maka'āinana* (commoners) worked individual plots of land, providing tribute in goods and services to the local *ali'i* (chiefs), who held the land in trust for the *ali'i 'ai moku* (the chief who eats the island/district), who in turn held the land in trust

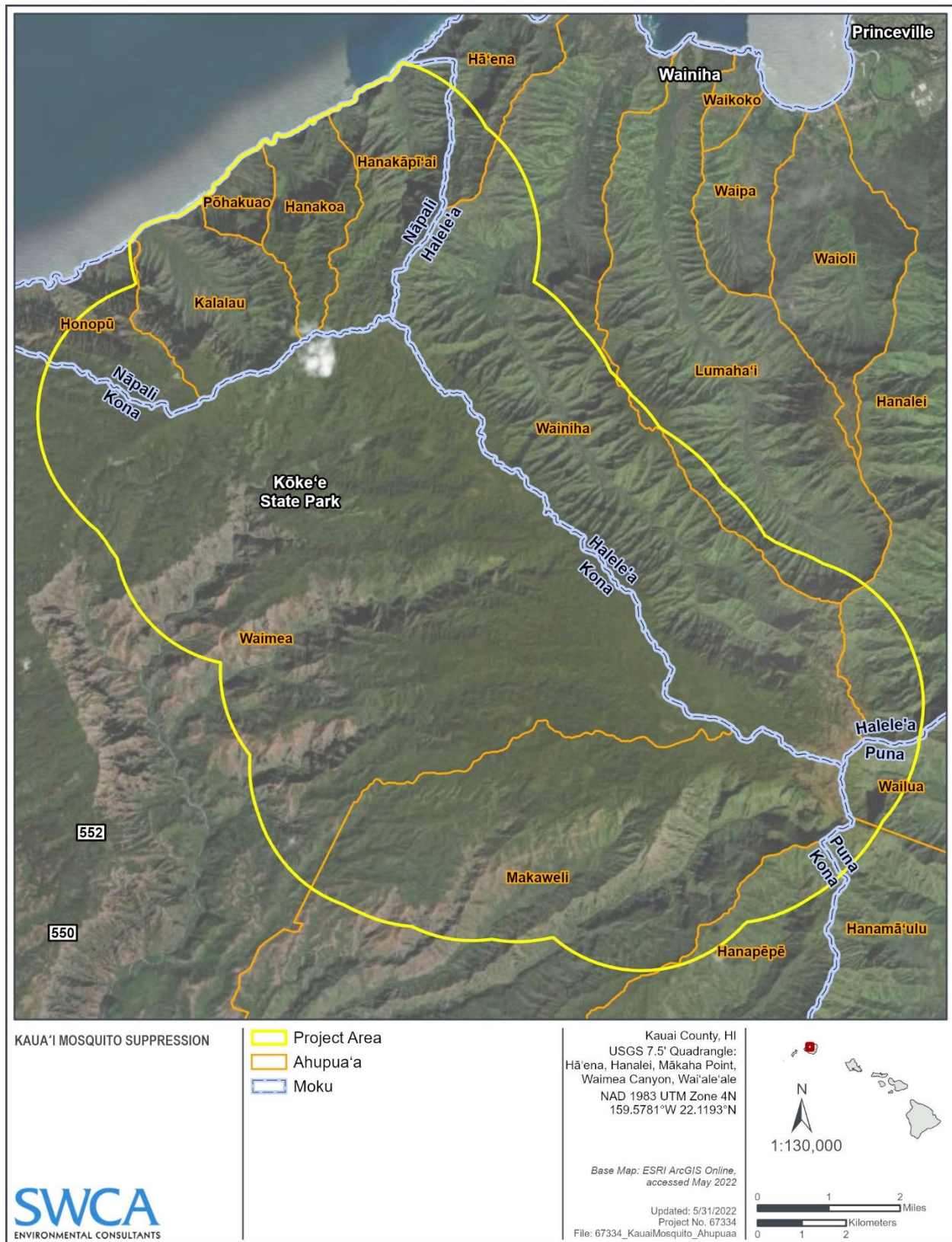


Figure 4. The ahupua'a and moku resting within the project area boundaries.

for the gods. The title of aliʻi ʻai moku ensured rights and responsibilities to the land but did not confer absolute ownership. The aliʻi ʻai moku kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs.

A moku contained smaller land divisions (ahupuaʻa), which customarily stretched inland from the ocean into the mountains. Extended household groups living within the ahupuaʻa were, therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each ahupuaʻa to be somewhat self-sufficient, supplying needed resources from different environmental zones (Lyons 1875:111).

Much of the project area consists of high elevation and remote inland areas of Kauaʻi. These upland areas were primarily utilized as resource gathering zones, rather than as areas of permanent habitation or agriculture (Yent 2004:6). Some inland areas of Waimea, Makaweli, Olokele and Hanapēpē, however, possess evidence of well-terraced and cultivated areas (McGuire et al. 2000:12). Particular varieties of kalo known as *haʻo kea* and *nā kalo a ʻOla*, are associated with these inland areas (Handy and Handy 1972:397). Generally speaking, traditional habitation within the project area was concentrated to the Nā Pali coastline where there is extensive archaeological evidence of habitation sites and agricultural terracing.

The following subsections briefly discuss the history of the landscape and settlement of the lands that comprise the project area as well as some of the meanings behind prominent place names (Figure 5). Much of the information in the following subsections is taken from Frederick B. Wichman's *Kauaʻi Ancient Place-Names and Their Stories*, one of the most comprehensive Kauaʻi place name resources (Wichman 1998). The *Cultural Impact Assessment for Kōke ʻe and Waimea Canyon State Parks* (Chiogioji et al. 2004) includes an oral history interview with Wichman.

4.1.1 Place names associated with native birds

Traditional place names in and around the project area are rich in references to birds. These place names could indicate the presence of particular kinds of bird resources in the area (Gomes 2016:41-42). Root words such as *manu* (bird) and *hulu* or *huluhulu* (feathers) indicate associations to native birds (Table 1).

4.1.1.1 NĀPALI MOKU

The project area covers the majority of Nāpali Moku. It includes the entirety of Kalalau, Pōhakuao, and Hanakoa Ahupuaʻa; the majority of Hanakāpīʻai Ahupuaʻa; and the inland half of Honopū Ahupuaʻa. Nāpali is the smallest of the five moku of Kauaʻi. Nāpali, “the cliffs,” is so named for its many tall cliffs and narrow valleys. The ahupuaʻa boundaries of this moku generally correspond with each of its valleys.

Nāpali is known for excellent deep-sea fishing areas along its coast. The upland forests of Nāpali were once full of the brightly colored native honeycreepers whose feathers were made into magnificent cloaks, capes, helmets, and wreaths. *Kia manu* hunted the forests of Nā Pali for three months out of the year trapping birds for their feathers (Wichman 1998:134).

4.1.1.2 HONOPŪ AHUPUAʻA, NĀPALI

Within Nāpali Moku is the ahupuaʻa of Honopū. Wichman describes the various techniques that *kia manu* employed in catching birds around Kainamanu peak in Honopū:

The uplands of Honopū are dominated by *Ka-ina-manu*, “sound of birds in the distance,” a 4,100-foot peak at the top of Kala-wao, “to proclaim through the wilderness,” the western valley and stream. It joins Kapaka Stream to form the Honopū River. *Kia manu* (birdcatchers) smeared gum made from the resin of breadfruit trees onto branches of

Table 1. Place names within and near the project area with references to birds

Place Name	Translation	Description	Source
Halemanu	Bird house	*outside of project area (see Figure 5) Peak and stream in Waimea ahupua'a. Place where bird catchers had a permanent camp.	Pukui et al. 1974:38
Kahōluamanu	The sled of birds	The highest cliff of Waimea Valley.	Pukui et al. 1974:65
Kainamanu	The sound of birds in the distance	A peak at the top of Kalawao	Wichman 1998:150
Kaleinakolekoleā	Leap like a plover's	A dangerous high peak makai of the Kalou trail	Wichman 1998:144
Kamanu	The bird	A peak	Wichman 1997:114
Kanaloahuluhulu	huluhulu can be a <i>kaona</i> (hidden meaning) for bird feathers or the abundance of the forest	A meadow associated with the mo'olelo of Kanaloahuluhulu	NeSmith 2022; Wichman 1985:114-117
Kūkalaanāmanu		A place name referenced in a <i>mele māka'ika'i</i> (song recalling a visit) for Queen Emma	As cited in Nogelmeier 2001:90-91
Nā Keiki o Nā 'I'iwi / Nā Keiki o Nā'iwi	The children of Nā'iwi or the children of the 'I'iwi	Ridge on the path to Kalalau marked by two stone pillars said to be the two children of Nā'iwi who were turned to stone	Wichman 1998:146
Pueoinu	Drinking owl	A resting place along a trail in Pōhaku'au Ahupua'a	Wichman 1998:141
Waiahulu Stream	Water of feathers	An 'ili and stream located within Waimea Ahupua'a	U.S. Geological Survey 1960

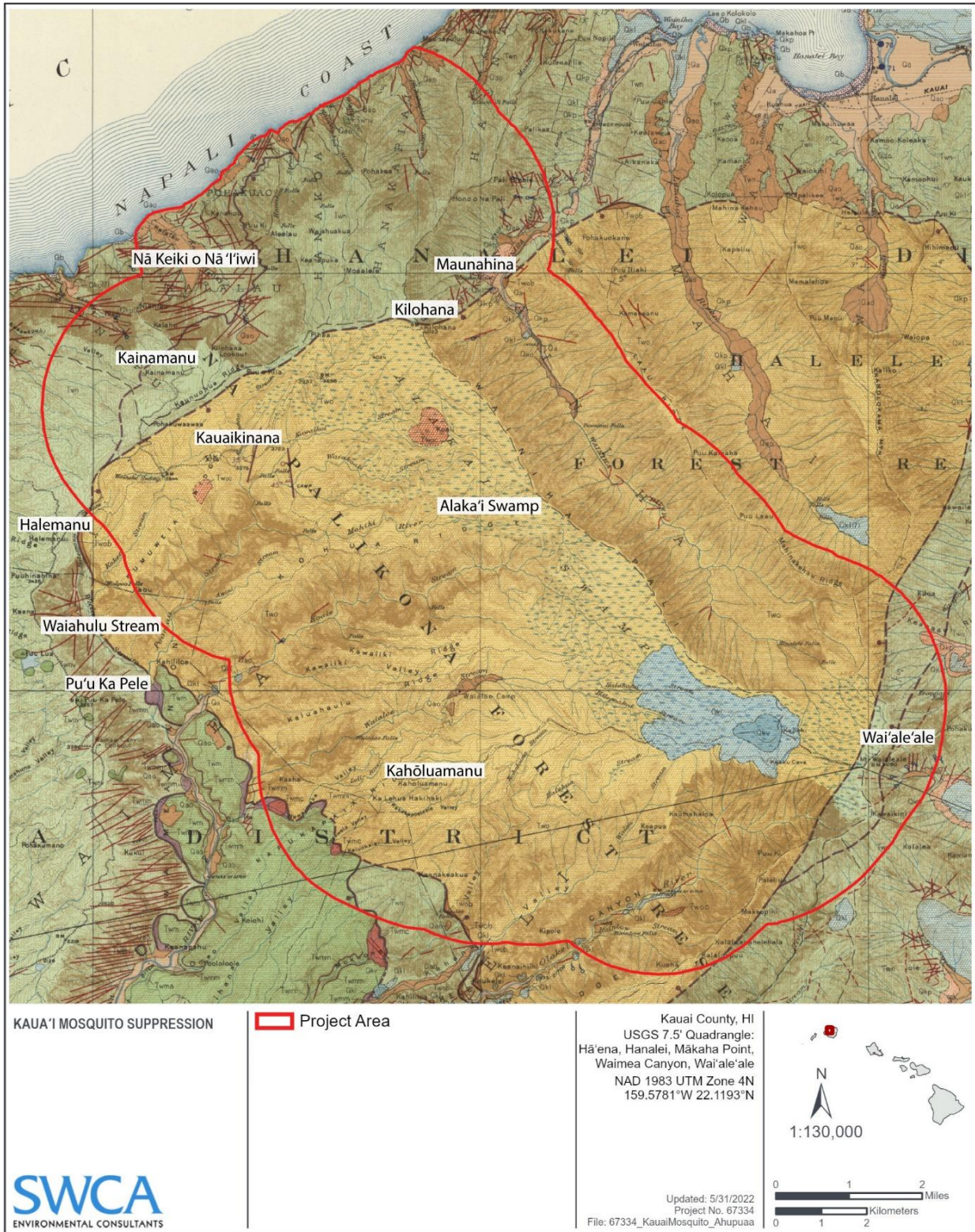


Figure 5. Traditional place names referenced in the text (U.S. Geological Survey 1960)

flowering 'ōhi'a lehua trees, a favorite source of nectar for the little birds. The bird would perch on the branch and become stuck. *Kia manu* also trapped birds by stretching nets between trees. A highly skilled catcher could hold a nectar-laden lobelia flower in his hands and catch the long-beaked bird in his fingers as it thrust into the tubular blossom. Birdcatchers operated only three months of the year, leaving the bird population time to rebuilt itself (Wichman 1998:150).

4.1.1.3 KALALAU AHUPUA'A, NĀPALI

Kalalau is the largest of the Nāpali ahupua'a. There are two possible meanings given for Kalalau and both are associated with a mo'olelo. Kalalau meaning the "the wanderer" refers to the giant named Puni who was a friend to the Menehune and wandered over the island with them. Puni, who traveled faster than his Menehune friends, would pass the time waiting for his friends by shaping the cliffs at Kalalau into what looked like curtains of tapa (Wichman 1998:142). An alternate pronunciation is Kalālau meaning, "to seize." This interpretation of the place name is associated with the mo'olelo of Kukua-o-Kalālau a thief who seized taro fields, fish nets, youngsters, and anything else that did not belong to him (Wichman 1998:143). Remains of house sites, *heiau* (temples), and wetland taro patches attest to a once large and productive population within this ahupua'a. At least three trails led into the valley enabling the movement of people in and out of Kalalau.

4.1.2 Halele'a Moku

The project area covers the inland reaches of Halele'a Moku. It includes the majority of Wainiha ahupua'a, and overlaps the innermost reaches of Hanalei, Lumaha'i, and Hā'ena ahupua'a. In Lumaha'i, the project area overlaps the Mahinakehau ridge. Hale-le'a literally translates to "house of happiness." This moku is cited in several mo'olelo and chants for its beauty. A fertile land, its many rivers irrigated extensive agricultural fields of kalo and the abundant rainfall supported forests of native trees such as *kou* (*Cordia subcordata*), *milo* (*Thespesia populnea*) and *hala* (*Pandanus tectorius*) (Wichman 1998:106)

Within this moku is the peak HaehaekamanuaKānealohike'alemaineikawai, which translates to, "tear the bird, Kānealohi, for the water is rippling." The story associated with this name is discussed in the ethnohistorical literature section further on in this report.

4.1.2.1 HANALEI AHUPUA'A

Hanalei once consisted of four ahupua'a which suggests the abundance of this land in the traditional period. There are a few interpretations of the meaning of Hanalei, one of which is "crescent bay." According to Wichman, however, "wreath making" and "lei valley" are closer to the original intent. Wichman explains that, "the wreaths are the rainbows that appear in the upper valley from the constant rainshowers" (Wichman 1998:108). Several rain names are associated with this ahupua'a. The project area overlaps a small section of the innermost reaches of Hanalei.

4.1.3 Kona Moku

Kona is the largest of Kaua'i's five moku. The majority of the project area falls within the inland areas of the Kona moku.

4.1.3.1 WAIMEA AHUPUA'A

Waimea, which translates to "red water," was named for "the color of the dirt carried by the river in flood." (Wichman 1998:7). Waimea is the largest ahupua'a on the island of Kaua'i and likely supported

the largest coastal settlement on the southwest side of Kaua'i in pre-contact times. Some of the places within this ahupua'a, such as Nu'alolo, may have at one time been separate ahupua'a.

Alaka'i, located within the ahupua'a of Waimea in the moku of Kona, is a primary source of the island's freshwater. Its high elevation forests filter rainwater into subterranean aquifers that feed Kaua'i's seven main rivers. These rivers flow into the lowlands and irrigate fields of kalo (Joesting 1984:5).

The ethnohistory of Waimea focuses on the engineering feats that made the agricultural abundance of the ahupua'a possible. Early Western explorers to Hawai'i noted Waimea was well cultivated with kalo fields. Waimea was an ideal place for foreign vessels to re-provision their ships as the ahupua'a was abundant in food resources and fresh water and the harbor was deep enough for ships to anchor safely. (McGuire 2000:10).

4.1.3.1.1 Halemanu

Within the ahupua'a of Waimea is located Halemanu, which is closely associated with bird hunting.

A few miles above Pu'ukāpele is Hale-manu, "bird house," where bird catchers lived while they hunted Kaua'i's unique bird family, the brilliantly colored honeycreepers that lived in the 'ōhi'a lehua forests. Especially prized were the yellow-green 'amakihi and 'anianiau, the bright yellow 'akialoa and nukupu'u, the orange-red 'i'iwi or olokele, and the deep crimson 'apapane. (Wichman 1998: 15-16)

"Family lore stated that the Hawaiian bird catchers used a grass house at Halemanu while on their feather-gathering expeditions" (Duensing 2006:3).

In the forest above Halemanu is a small clearing known as Kaumuiaiea. Here, in the forest of Miloli'i on the ridge of Kaumuohua, was located the heiau of Kaumuiaiea (also referred to as Kaunuaiea or Kaunuohua). All that remains today are a few stones in a rough line, that do not form a platform or definite outline (Bennett 1931:104, Hammatt & Shideler 2008:12). The folklorist Thomas Thrum, writing in 1906, described this heiau as a small shrine and says that no platform remains to indicate its location (Thrum 1907:64). "Ka-unu-aiea is a small shrine in the dense koa forest of Milolii. It was only an "unu," or shrine, for the shifting population of the forest belt. There is no platform left to indicate its existence." (Thrum 1907:64).

The top of Nāpali is marked by a row of hills stretching from Wainiha Valley to Pu'uokiha. From there to Halemanu, overlooking Waimea Canyon, is the ridge Ka-unu-o-Hua, "altar of Hua," which divides Nāpali from the swamps of 'Aipō and Alaka'i. It takes its name from a small shrine in the ahupua'a of Miloli'i near the beginning of the Kōke'e State Park. This shrine was built to commemorate the end of the war Ka-welewele-iwi, "stripping of flesh from bones," which was fought in the mid-fourteenth century (Wichman 1998:136).

4.1.3.2 MAKAWELI AHUPUA'A

Makaweli translates to "fearful eyes." The 'ōlelo no 'eau (proverb or wise saying), "Ho'olele ka uila o Makaweli" offers some insight into a possible meaning of the place name. Mary Kawena Pukui translates the 'ōlelo no 'eau as, "sending the lightning of Makaweli flying." Pukui explains that "maka-weli" is a play on words, literally translated it means "terrifying eyes," though it is also an expression referring to the sending of a god on an errand of destruction (Pukui 1983:117). At one time, Makaweli might have been known for this particular kind of sorcery or perhaps *akua lele* (flying gods) were commonly seen in this region. Specific information regarding this seems to have been lost over time (McGuire 2000:11).

Another more recent interpretation of Makaweli is, “red or burning eyes,” referring to the fine red dirt of Makaweli that when blown by the wind irritates one’s eyes (McGuire 2000:11).

4.1.4 Puna Moku

A small part of the project area is located within the moku of Puna. The project area overlaps Wai‘ale‘ale summit in the moku of Puna in the ahupua‘a of Wailua. At Wai‘ale‘ale is the Ka‘awakō heiau or shrine.

4.2 Ethnohistorical Literature: Selected Mo‘olelo

The Hawaiian word mo‘olelo is a single concept that conveys multiple meanings, encompassing what in English would be considered history, traditional accounts, legend, and myth. While in the English language these terms are distinct from one another, mo‘olelo are fluid products of a long history of oral tradition and are too culturally complex to be reduced to any single Western term (Brown 2016:8; Nogelmeier 2010:132).

A sample of mo‘olelo associated with native birds, birdcatchers, and the project area have been included in this section. These mo‘olelo construct a unique history and reveal the richness of the oral traditions that continue to hold significance to this region of Kaua‘i. Additionally, these mo‘olelo are evidence of the traditional significance of native forest birds.

In these mo‘olelo native forest birds often are associated with akua and ali‘i. Speaking on the occurrence of birds in Hawaiian mythology, Martha Beckwith explains that native forest birds, “appear in myth as kindred and servants of gods who are worshipped as family guardians, or the god himself may manifest himself on earth in bird form and be worshipped under the name of his particular manifestation” (Beckwith 1970:92). As Beckwith explains, Hawaiian gods may take the form of a bird. This detail reinforces the significance of birds in traditional Hawaiian society. The mo‘olelo of “Lepe, the Bird Maiden” (Knudsen 1946:63-69) is about the discarded egg-child of Chief Keahua of Kaua‘i who is raised by her grandparents on O‘ahu. Lepe takes the form of both a beautiful colorful bird and a young lovely girl adorned with tapa and a wreath of green feathers.

In the following selection of mo‘olelo, Maunahina in Wainiha Valley is mentioned as a home to birdcatchers. Lauhaka and Kāne‘alohi a nephew and uncle pair of birdcatchers and the birdcatcher brothers Wa‘awa‘aikina‘auao and Wa‘awa‘aikina‘aupō are all said to have lived at Maunahina in Wainiha Valley. One could speculate that perhaps Maunahina was once a place favored by birdcatchers to live and or to catch birds.

The island of Kaua‘i figures prominently in the oral traditions of the menehune. Menehune are depicted in mo‘olelo as a group of mythical people, small in stature, prolific and skilled in engineering. A defining characteristic of menehune is they complete impressive construction feats from start to finish in just one night. It has been proposed that the menehune were possibly a distinct group of early settlers to Hawai‘i perhaps originally from the Marquesas Islands (Joesting 1984: 19-21). The historian and folklorist Abraham Fornander notes that the term “manahune” was used in Tahiti as the name for the laboring class, what would be the equivalent of the traditional Hawaiian *maka‘āinana* or commoners (Fornander 1969:55). Some of the selected mo‘olelo included in this section have menehune characters.

Many of these mo‘olelo are condensed versions of mo‘olelo compiled in Frederick B. Wichman’s *Kauai Tales* and *More Kaua‘i Tales*. The mo‘olelo compiled by Wichman come from several sources including the Hawaiian traditions documented by William Hyde Rice, Abraham Fornander, Hofgaard, and Nathaniel Emerson, while some were told to Wichman by Jacob Maka of Hā‘ena (Wichman 1985:155).

The plethora of mo'olelo associated with the project area reinforce its significance as a *wahi pana* (storied place).

4.2.1 Māui

The following brief mo'olelo comes from *Legends of Ma-ui A Demi God of Polynesia and His Mother Hina* by William D. Westervelt. It tells of how the pan-Polynesian hero Maui first made birds visible.

One of the old native Hawaiians says that in the long, long ago the birds were flying around the homes of the ancient people. The flutter of their wings could be heard and the leaves and branches moved when the motion of the wings ceased and the wanderers through the air found resting places. Then came sweet music from the trees and the people marvelled. Only one of all mankind could see the winged warblers. Maui, the demi-god, had clear vision. The swift flying birds covered with red or gold he saw. The throats tinted many colors and reflecting the sunlight with diamond sparks of varied hues he watched while they trembled with the melody of sweet bird songs. All others heard but did not see. They were blind and yet had open vision

Sometimes the iiwi (a small red bird) fluttered in the air and uttered its shrill, happy song, and Maui saw and heard. But the bird at that time was without color in the eyes of the ancient people and only the clear voice was heard, while no speck of bird life flecked the clear sky overhead.

At one time a god from one of the other islands came to visit Maui. Each boasted of and described the beauties and merits of his island. While they were conversing, Maui called for his friends the birds. They gathered around the house and fluttered among the leaves of the surrounding trees. Soon their sweet voices filled the air on all sides. All the people wondered and worshiped, thinking they heard the fairy or menehune people. It was said that Maui had painted the bodies of his invisible songsters and for a long time had kept the delight of their flashing colors to himself. But when the visitor had rejoiced in the mysterious harmonies, Maui decided to take away whatever veil shut out the sight of these things beautiful, that his bird friends might be known and honored ever after. So he made the birds reveal themselves perched in the trees or flying in the air. The clear eyes of the god first recognized the new revelation, then all the people became dumb before the sweet singers adorned in all their brilliant tropical plumage.

The beautiful red birds, iiwi and akakani, and the birds of glorious yellow feathers, the oo and the mamo, were a joy to both eye and ear and found high places in Hawaiian legend and story, and all gave their most beautiful feathers for the cloaks and helmets of the chiefs. (Westervelt 1910:112-114)

A variation of this story can be found in Mary Kawena Pukui and Caroline Curtis' *Tales of the Menehune*. Like the Westervelt version, it shows how birds were held in high regard by Native Hawaiians

Long ago birds were invisible. Men could hear the whir of their wings and listen to their songs, but the birds themselves no one could see —no one but Māui.

One day a visitor came from another island and challenged Māui to a boasting contest. A crowd gathered and listened with delight as each man boasted of his island —its mountains, waterfalls, and forests.

“I must win!” Thought Māui, and aloud he said, “I’ll prove to you that we have something here that you have never dreamed of.” Secretly he called the birds. They lighted all about on trees and bushes and filled the air with song.

The boastful visitor was silent while the crowd listened in wonder. “Spirits!” they whispered.

At last, using his mighty power, Māui caused them all to see the little feathered singers. The boastful man exclaimed, “O Māui, you have won! In my island there is no such wonder.”

Ever since that day birds may be seen as well as heard. (Pukui and Curtis 1985:33)

4.2.2 *Ka Ho‘okolokolo o ‘Elepaio*

The ‘*elepaio* (**monarch flycatcher, genus *Chasiempis***) has a reputation for being curious and mischievous. There are many variations of a well known mo‘olelo about a curious ‘elepaio poking a hole into a man’s water gourd causing all of the water within it to pour out. The man, angry and frustrated with ‘elepaio, throws a rock at ‘elepaio hurting his leg. ‘Elepaio, oblivious to his own wrong-doings, calls on all the birds in the forest to sympathize with him and yet they all side with the man and tell ‘elepaio that he was wrong to peck a hole in the gourd. ‘Elepaio realizes that he has only himself to blame for his injured leg and no one should pity him for his own wrong-doing (Wichman 1997:120-123).

From this story comes the ‘*ōlelo no ‘eau* or proverb, “ho‘okolokolo aku i ka nui manu,” literally translated it means, “go inquire of the other birds” the intention being, to go and consult others (Pukui 1983:116).

4.2.3 *Lauhaka and Kāne‘alohi*

The bird catcher Lauhaka appears in several Kaua‘i mo‘olelo and is sometimes named Lahi. In some mo‘olelo he is described as a young man who would eat only birds, and traveled to the top of Kilohana (a lookout at the edge of the Alaka‘i Swamp) where the ‘*ua ‘u* (also spelled ‘*uwa‘u*, Hawaiian petrel, *Pterodroma sandwichensis*) nested to satisfy his hunger (Rice 1923 as cited in Yent 2004:6).

The following is a condensed version of Wichman’s retelling of Lauhaka. This mo‘olelo contains several details of the methods used by *kia manu* to trap birds and the rituals associated with their profession (Wichman 1985:119-124).

Lauhaka was raised by his uncle Kāne‘alohi a bird catcher at Maunahina in Wainiha. The only thing Lauhaka possessed of his parents was a feathered helmet given to his mother by his father. Kāne‘alohi trained Lauhaka in bird catching and for many months of the year they lived in the *lehua* (*Metrosideros polymorpha*) forests of Kōke‘e gathering bird feathers. Lauhaka was taught to make the proper offerings to Kūhuluhulumanu, god of the bird catchers. He learned to imitate the birds’ calls to draw them to perch on branches smeared with the sticky sap of the kukui tree. With the bird’s feet stuck to the branch, Lauhaka would carefully pluck a few colorful feathers and then release the bird. Lauhaka learned to be very patient and could remain motionless for many hours holding a tubular flower between his fingers waiting for a honeycreeper to dip its beak into the flower.

Lauhaka and Kāne‘alohi lived beside a pool at the top of the cliffs where the trail that led into Wainiha began and the trail of logs across Alaka‘i swamp ended. As soon as anyone stepped on the log path across the swamp Lauhaka and Kāne‘alohi would see ripples in the pool and know someone was approaching. Lauhaka and Kāne‘alohi ate the ‘ua‘u birds unaware that the Waimea chief Hakau expected tribute and taxes. Hakau was a harsh ruler who did not hesitate to kill anyone for any wrong-doing. On learning of the pair of birdcatchers who ate the prized ‘ua‘u birds without paying him tribute, Hakau sent his soldiers to retrieve Lauhaka and Kāne‘alohi, but this first attempt to capture them was unsuccessful. Lauhaka and Kāne‘alohi noticed the ripples in the pool and escaped before they could be captured. A few days later Hakau and a large group of soldiers attempted again to capture the bird catchers. Noticing the ripples in the pond, Lauhaka told his uncle to tear the ‘ua‘u bird he was roasting into pieces. This place is so named Haehae-ka-manu-a-kāne‘alohi-ke-‘ale-mai-nei-ka-wai (tear the bird of Kāne‘alohi for the water is rippling).

Without enough time to escape the army, Lauhaka put on his feather helmet and waited to be approached. Hakau recognized the helmet as belonging to him. Realizing that Lauhaka might be his son, Hakau told Lauhaka that he would build him a meeting house and when it was finished, he would send for him. Hakau was angry and humiliated that a backwoods birdcatcher had not only defeated him in battle but also claimed him as his father. He was not convinced that Lauhaka was his son and plotted to kill him. When the meeting house was finished, Hakau sent a message inviting Lauhaka and Kāne‘alohi to come down to join him within it. At Hakau’s order, a deep hole with sharpened spears at the bottom had been dug into the center of the meeting house floor concealed under a *lau hala* (pandanus leaf) mat. Suspicious that no one was seated in the center of the meeting house. Lauhaka threw his spear into the center of the room and it tore through the mat revealing the pit full of spears. A fight broke out and Hakau fell into the trap he had intended for his son. When the people of Waimea were told of Lauhaka’s parentage and of his father’s treachery, they happily accepted Lauhaka as their new chief. Kāne‘alohi returned alone to the mountains. Some time later Lauhaka acknowledged that he did not feel fit to be a chief and returned to the mountains admitting that he is “a birdcatcher, nothing more” (Wichman 1985:120-124). Wichman may have incorporated elements of other mo‘olelo into his retelling of Lauhaka. Some of the details regarding Lauhaka’s parentage is similar to the mo‘olelo of ‘Umi a Līloa.

The mo‘olelo of Lauhaka gave rise to a poetical saying. Mary Kawena Pukui includes “Haehae ka manu, ke ‘ale nei ka wai,” in the text, of *‘Ōlelo No‘eau: Hawaiian Proverbs and Poetical Sayings*.

Haehae ka manu, ke ‘ale nei ka wai.

Tear up the birds, the water is surging.

Let us hurry, as there is no time for niceties. Kane‘alohi and his son lived near the lake of Halulu at Wai‘ale‘ale, Kaua‘i. They were catchers of ‘uwa‘u birds. Someone falsely accused them of poaching on land belonging to the chief of Hanalei, who sent a large company of warriors to destroy them. The son noticed agitation in the water of Halulu and cried out a warning to his father, who tore the birds to hasten cooking. (Pukui 1983:50)

The same expression also appears in the name of the place where the events occurred.

Near the lake is the peak Haehae-ka-manu-a-Kāne‘alohi-ke-‘ale-mai-nei-ka-wai, “tear the bird, Kāne‘alohi, for the water is rippling,” on the edge of a high cliff just above the waterfall Halulu, “rumbling.” Kāne‘alohi, a bird catcher, lived in this part of the mountains with his nephew Lauhaka. Their camp was on the cliff side of the Alaka‘i Swamp beside an open bit of water. The water of this pool rippled whenever anyone stepped into the swamp miles away. Inadvertently, they were breaking the new rules of Ka-lā-kāne-hina, the Waimea chief, who had forbidden the catching of ‘ua‘u birds, the dark-rumped petrel, which was good eating. Kalākānehina sent some warriors to kill the

two bird catchers, but they were warned by the rippling water as they broiled a petrel over their fire. Lauhaka called out to his uncle to tear the bird apart so they could eat it before the warriors reached them— hence the name. (Wichman 1998:110)

4.2.4 *Waʻawaʻaikinaʻauao and Waʻawaʻaikinaʻaupō*

Many stories are told of a pair of bird catcher brothers named Waʻawaʻaikinaʻauao and Waʻawaʻaikinaʻaupō who lived with their *tūtū* (grandmother) at Maunahina in Wainiha Valley. Their *tūtū* was named Nāhulu and she is described as the most skillful feather lei maker in all Kauaʻi.

Waʻawaʻaikinaʻauao was clever and found it amusing to trick his gullible brother into doing difficult tasks. When their *tūtū* asked them to catch wild chickens, Waʻawaʻaikinaʻauao said he would keep the chickens with two holes in their beaks while Waʻawaʻaikinaʻaupō got to keep those with one hole and the brother with fewer chickens must pluck the feathers and grill the birds. Not knowing that all chickens have two holes in their beaks, Waʻawaʻaikinaʻaupō inevitably had to pluck and grill the birds. *Tūtū Nāhulu* explained to Waʻawaʻaikinaʻaupō that his brother had tricked him. To get back at his brother, Waʻawaʻaikinaʻaupō covered himself in feathers to look like *Kūhuluhulumanu*, the god of the bird catchers. When Waʻawaʻaikinaʻauao least suspected, Waʻawaʻaikinaʻaupō leaped out from hiding and terrified his brother. That night, it was Waʻawaʻaikinaʻauao who had to cook dinner (Wichman 1997:114-117).

Another *moʻolelo* about these two brothers describes a banana contest and how the kindness of Waʻawaʻaikinaʻaupō gets rewarded.

Waʻawaʻaikinaʻauao went into the mountains to find the very best bunch of bananas to enter a contest. He only gathered what he thought to be the very best-looking bunches of the very best varieties of banana. Waʻawaʻaikinaʻaupō went along with his brother to help but he did not care about the contest. While out in the forest, Waʻawaʻaikinaʻaupō picked the *iholena* and *puapua nui* varieties of banana. These were among the few varieties of banana that women were allowed to consume. Waʻawaʻaikinaʻaupō picked them for his *tūtū* knowing that she should appreciate them. Waʻawaʻaikinaʻauao did not consider these varieties for the contest and continued to pick other bananas. The next morning, Waʻawaʻaikinaʻauao proudly displayed all of his bunches of bananas for the chief to inspect. To the surprise of Waʻawaʻaikinaʻauao and everyone else who entered the contest, the *aliʻi* conducting the contest was a woman. To her disappointment none of the bananas entered into the contest were of the varieties women could consume. Defeated, the *aliʻi wahine* turns to leave but is stopped by *Tutu Nāhulu* who shows her the two bunches Waʻawaʻaikinaʻaupō picked for her. The *aliʻi* was charmed by the kindness of Waʻawaʻaikinaʻaupō and rewarded *Tūtū Nāhulu* and her grandsons with free access to harvest bird feathers in all of *Hāʻena* and *Nāpali*. (Wichman 1997:126-131)

4.2.5 *Nā Keiki a Nā-ʻiwi*

In the wet upland forest of Kalalau lived *Nā-ʻiwi* with his two children *Kuapōhaku* and *Hikimaunalei*. *Nā-ʻiwi* was named after the *ʻiwi* birds that surrounded their home. *Nā-ʻiwi* and his children were *Mū* people, related to the *menehune*, they were small and could only come out of their cave at night because sunlight turned them to stone. *Kuapōhaku* and *Hikimaunalei* longed to play with the children of Kalalau but never were able to because the children went to sleep at night and *Kuapōhaku* and *Hikimaunalei* could only come out at night. On a bright full moon night *Kuapōhaku* and *Hikimaunalei* heard the children of Kalalau play and they excitedly joined them. The children played all night and lost track of time. As *Kuapōhaku* and *Hikimaunalei* noticed the sun was about to rise over the mountains, they hurried home. However, it was too late. As the two children were climbing the cliffs to their home, the sun rose and they

were turned to stone. The two stones on the path to Kalalau are known as Nā Keiki a Nā'iwi, the children of Nā'iwi (Wichman 1985:126-132).

4.2.6 Kanaloahuluhulu

The following mo'olelo is an account of how the grassy meadow in which the present day Kōke'e State Park Headquarters is located came to be.

A big and hairy giant named Kanaloa was terrorizing lost travelers on the Kōke'e trail making it unsafe for anyone to cross. Determined to restore safety to the trail, the hero Kauahoa sought out Kanaloa. The giant lived in a grove of lehua trees in a small boggy place. It was there that Kauahoa confronted Kanaloa. He was only slightly taller than Kauahoa and was covered in a great mass of hair that grew everywhere on his body. Unintimidated by the giant, Kauahoa said to him "I shall call you Kanaloa-huluhulu, the very hairy one." Kauahoa continued to insult Kanaloa saying things like, "this trail was built for the use of everyone at all times. It belongs to no one person, not even an ugly, hairy fool like you." Kanaloa enraged by these comments, started to fight Kauahoa. In the chaos trees and plants were uprooted and trampled. Kauahoa swung his *pīkoi* (tripping club), which wrapped around Kanaloa's knees causing him to fall. Kauahoa then leaped on the giant's back and used his dagger to cut off the giant's head. Kauahoa took Kanaloa's head to Kilohana and tossed it over a cliff where the giant would not be able to find it to put his head and body back together. The headless Kanaloa tore up the lehua trees and stamped about trying to find his head and in doing so crushed all the remaining trees and shrubs in the bog. When the sun set, the body of Kanaloa lost its life and fell to the ground. Where the lehua grove had been was nothing but a dusty plain. To this day, the area is a grassy clearing without trees and is named Kanaloahuluhulu, after the hairy giant (Wichman 1985:114-117).

4.2.7 Kahōluamanu

Kahōluamanu is the highest cliff of Waimea Valley (Pukui et al. 1974:65). A mo'olelo is associated with this place name which can be roughly translated as the *hōlua* slide (sledding path) of Manu. This first version is summarized from *Tales of the Menehune* compiled by Mary Kawena Pukui and Caroline Curtis.

A boy named Manu became tired of sliding down the small and short slopes where he lived. They were too slow to excite him any longer. Manu climbed a steeper slope but saw that his parents had placed two rocks on the slide to prevent him from going down the dangerous slope. This did not stop Manu, he slid around the first rock and leaped over the second. Manu hurt himself jumping over the second rock, so he climbed to it and rolled it into the Waimea Stream and then did the same with the smaller rock. It is said that these two rocks remain where they fell into the Waimea Stream. Manu then went looking for a slope his parents did not know about so he could slide without worrying his parents. Manu found a cliff that satisfied his need for adventure. It was the steepest cliff of Waimea Valley. Sliding down this cliff Manu truly felt as though he were a bird. The cliff of the canyon wall is so named Holua Manu the slide of the bird (Pukui and Curtis 1985:70-71).

Wichman's *Kaua'i Tales* contains another interpretation of the same mo'olelo. Some details between the two versions overlap and it is noteworthy that in both interpretations of this mo'olelo, birds are not a part of the mo'olelo. Manu is simply the name of the boy or young man. In Wichman's version, Manu is so named because he was "full of energy and flew from place to place" (Wichman 1985:62).

Manu lived with his parents where Ōpaewela valley joins 'Ōma'o valley. In this version of the mo'olelo Manu's parents possess the ability to lift and move rocks in the air and send freshets of water rushing down the stream at will. Manu's parents used their special powers in cruel ways. They found it amusing

to drop rocks on unsuspecting travelers and send freshets to tumble them off their feet into the stream. They would also subject Manu to these cruel acts. The couple were extremely lazy and never built themselves a taro patch. Instead, they ordered Manu to go out to gather food for them each day. Gathering food from wild sources and then preparing the food each day consumed all of Manu's time leaving no time to himself to pursue any of his desires like that of hōlua sledding. One evening as Manu was returning home from gathering wild taro he came on a new hōlua slide. As he stood admiring the slide a rider on a tiny *papa hōlua* (sled) came sliding down. The rider hit a pebble and flew off his *papa hōlua*. Manu caught the rider in mid-air, saving him from death. Manu put him down and the small man darted off into the bushes before Manu could say anything to him. The small man didn't bother to pick up his broken sled so Manu decided to take it home with him thinking that by repairing this one he could learn how to build himself a *papa hōlua*. Manu's parents thought it was selfish of him to spend his time repairing the *papa hōlua* when he could be gathering more food for them. Frustrated with his parents' laziness and dissatisfaction at all that he does for them, Manu pleaded with his parents to allow him just one day to himself to slide down the hōlua. Manu's parents agreed to allow Manu one day to himself if he could accomplish all the following things in three days time: fill a large *imu* (earth oven) with food, build a *lo'i* (irrigated field of wetland taro), and plant a patch of sugarcane and banana. Manu's parents said these things jokingly as they knew it was an impossible task.

Manu repaired the sled and left it at the top of the hōlua to be found by its rider. As Manu made his way back late in the afternoon the little bearded man appeared before him suddenly holding the repaired sled. The little man came to thank Manu for saving his life and for repairing his sled. To show his gratitude, he prepared a meal for them to share. Manu could not recall a time someone had ever prepared food for him. The little man asked Manu why he spent all his time searching for wild foods and why he did not go sledding. Manu expressed that he would like nothing more than to go sledding but first he needed to build a taro patch and garden so he would not need to travel so far to find food. The little man offered to take him sledding but Manu declined as he knew his parents were waiting for their dinner and would be angry with him if he were late. When Manu got home his parents were angry with him and sent him out again to find more 'ōpae (shrimp) for them to eat. As Manu went searching for 'ōpae in the stream his parents sent down a freshet which tumbled Manu in its rapids. The shouts of his parents' laughter echoed from the hills. Unbeknownst to Manu and his parents, others were watching them, and they were not amused.

When the family awoke the next morning, they were astonished to see all the outrageous requests that Manu's parents had asked for were completed. Beside their house was a taro patch connected to a ditch from the stream above. There was also a garden of sugar cane and banana and there were also many calabashes set on the lau hala mat filled with food still warm from the imu. The little man Manu saved was a menehune chief and he and his people worked through the night building all of this so that Manu could go hōlua sledding (Wichman 1985:62-70).

4.2.8 *Pu'u Ka Pele*

Excerpted below is the ghost story of Pu'u Ka Pele, as told to Eric Knudsen by an old Hawaiian man from Waimea. It is one of several tales compiled in *Teller of Hawaiian Tales* by Knudsen.

Many hundreds of years ago, an old Hawaiian named Papu went from Pokii to Kalalau to visit friends, and after a long stay he made a large pack of dried fish and, climbing the cliffs, started home again to Pokii.

A few days later some young men arriving in Kalalau inquired for Papu. "Why, he went some days ago," said his friend.

Since the old man had not returned to his home, they suspected trouble and at once started back in search of him. Finally they found his body lying in the brush, his head

crushed and his pack gone. Sadly they buried him where he had been killed, and returned to Pokii.

Now every year the spirit of the old man comes back to the spot where he was murdered, and sits by the side of the road, with a pack of dried fish on his back, and in revenge he kills the first man who passes that night. (Knudsen 1946:24)

Knudsen goes on to give two accounts of encounters with the ghost of Pu'u Ka Pele, one of which is his own. In both accounts the smell of dried fish is a sign indicating Papu's presence. Knudsen ends with the advisory to not travel that trail at night.

4.2.9 Kaluaiko'olau and Pi'ilani

The story of Kaluaiko'olau (also known as Ko'olau) and his wife Pi'ilani is an example of a historic mo'olelo. It plays out in the isolation of Kalalau valley. In 1893 Ko'olau and his son Kaleimanu were discovered to have leprosy and directed to be confined and taken to the Kalawao leprosy settlement on the isolated Makanalua peninsula of Moloka'i. As quarantine was the only proven method of disease prevention at the time, isolating those afflicted with the disease was believed to be necessary to prevent the spread of leprosy. The leprosy settlement had been created in 1866 and operated under a policy of compulsory segregation. With no viable treatments and no known cure, many patients bound for Kalawao considered it a death sentence (Inglis 2013:71-72).

At the time that Ko'olau was diagnosed, the political climate of Hawai'i was undergoing significant changes. In 1893 the Hawaiian monarchy had been overthrown and a provisional government established. At the same time, the Board of Health had become more forceful in removing leprosy patients to Kalawao without allowing *mea kokua*, or helpers, typically a spouse or other family member to accompany them (Inglis 2013:71).

Ko'olau agreed to go to Kalawao only if his wife Pi'ilani could accompany him and his son Kaleimanu. When authorities denied his request, the family sought refuge in Kalalau valley intent on evading the authorities who would tear their family apart. Deputy Sheriff Louis Stolz, also known by the name "Lui," along with provisional government soldiers pursued Ko'olau with the instructions that "Koolau should be taken alive, if possible, but if it could not be done without shedding blood, to shoot him dead." In the end, Lui did not leave the valley alive (Inglis 2013:71-72). The family remained hidden in Kalalau for approximately three years. Kaleimanu died first of leprosy and then Kaluaiko'olau about a year later. Pi'ilani saw to the proper burial of both her son and husband and then emerged from the valley to return to her home in Kekaha (Inglis 2013:95-96).

4.3 Native Birds in Traditional Hawaiian Society

From a Native Hawaiian worldview, each native forest bird species is unique and precious. Not only do they play an essential role in maintaining the native ecosystem, they also factor prominently into several aspects of traditional Hawaiian customs, practices, and beliefs. In his *Mo'olelo Hawai'i*, the early Hawaiian historian David Malo describes in detail various of the native forest birds, the color of their feathers, and how they were caught (Malo 1951:38-39). The depth of understanding that the early Hawaiians had regarding forest birds can be seen in Malo's description of the *ula*; "The *ula* is a bird with black feathers, but its beak, eyes, and feet are red. It sits sidewise on its nest (he punana moe aoao kona). This bird is celebrated in song. While brooding over her eggs she covers them with her wings, but does not sit directly on them" (Malo 1951:39).

4.3.1 *Canoe making*

The behavior of birds were observed for practical reasons. In accounts of *kahuna kalai wa'a* (canoe builders), it is said that “when a tree had been selected for a canoe hull, the workmen first watched for the coming of the ‘elepaio, a useful bird, because when it alighted on a koa tree it searched for insects. If the bird soon flew away the Hawaiians assumed the tree was sound and not infected with damaging insects” (Joesting 1984:2). This knowledge is captured in the following ‘*ōlelo no ‘eau* or descriptive proverb.

Ua ‘elepaio ‘ia ka wa‘a.

The ‘elepaio has [marked] the canoe [log].

There is an indication of failure. Canoe makers of old watched the movements of the ‘*elepaio* bird whenever a *koa* tree was hewed down to be made into a canoe. Should the bird peck at the wood, it was useless to work on that log, for it would not prove seaworthy. (Pukui 1983:306)

4.3.2 *Kia Manu (Bird Catchers) and Featherwork*

Traditional Hawaiian featherwork exemplifies the importance of native forest birds to traditional Hawaiian society. *Kia manu* captured small native forest birds primarily for their vibrant feathers, which were used for creating chiefly garments and accessories that were symbols of rank and prestige such as ‘*ahu‘ula* (capes and cloaks, Figure 6)), *mahiōle* (helmets, Figure 7), *kāhili* (standards) and *lei hulu* (feather garlands) donned by Hawaiian nobility. Their brilliant feathers linked the ali‘i class with the upland realm of the gods, the *wao akua*.

An immense amount of effort went into making these symbols of chiefly status. Each feather had to be tied individually onto the woven fabric net that formed the base of the cloak. In discussing the



Figure 6. ‘Ahu ‘ula presented by Kamehameha IV to Surgeon Sloggett, HMS *Calypso*, 1858. Returned to Hawai‘i by Lieut. General Sir Arthur Sloggett, British Army, to his nephew, Digby Sloggett, Līhu‘e, Kaua‘i, 1927 (Hawai‘i State Archives)



Figure 7. Feathered helmet of King Kaumuali'i (Hawai'i State Archives)

Kia manu understood the behaviors and environments of the birds, and they used a variety of techniques to attract and capture them (Marzan and Gon 2015:26). Kia manu captured forest birds during the moulting season. One of the several methods used by the kia manu to trap birds involved applying a tacky lime made from breadfruit gum (*kepau*) or kukui tree gum (*pilali*) onto tree branches where the birds would land and be unable to fly away due to the sticky substance. This gentle method of trapping the bird allowed kia manu to pluck the desired feathers without harming the birds. Kia manu did not believe in killing birds that grew golden feathers. Trapping and plucking the golden feathers of the 'ō'ō (*Moho *Acrulocerus nobilis**) and the *mamo* (*Drepanis pacifica*) was done without damage to the birds so they could be set free to grow more feathers. Some 'ō'ō were, however, killed for their black body feathers. In describing the 'ō'ō and mamo, David Malo states that:

Their feathers are made up into the large royal *kahili*. Those in the axillae and about the tail are very choice, of a golden color, and are used in making the feather cloaks called *ahu-ula* which are worn by (the *alii* as well as by) warriors as insignia in time of battle (and on state occasions of ceremony or display -Translator). They were also used in the making of *lei* (necklaces and wreaths) for the adornment of the female chiefs and women of rank, and for the decoration of the Makahiki idol. These birds have many uses, and they are captured by means of bird lime and the pole. (Malo 1951:39)

The 'i'iwi (*Vestiaria coccinea*) and the 'apapane (*Himatione sanguinea*), too extensively covered with red feathers to survive plucking, were killed, skinned, and eaten (Rangi Hīroa 1957:4). The feathers of larger fowl were used in the making of *kāhili* (standards).

While not always documented, most likely some sort of bird hunting was practiced in virtually every ahupua'a (Gomes 2016:39). Even in the mid-to-late 1800s there were still many different traditional forms of bird hunting that were practiced by Hawaiians (Gomes 2016:34). The differences in technique varied according to the kind of bird being hunted (Marzan and Gon 2015:26, Emerson 1895).

The available ethnohistorical literature on kia manu describes their profession as a lonely one. During the months spent in the upland forests gathering feathers, they had only themselves and maybe one or two

companion bird catchers for company (Wichman 1985:126). Spending a significant amount of time in the uplands, they possessed detailed knowledge of upland boundaries and were among those most familiar with upland areas.

4.3.3 Bird Hunting for Subsistence

Traditional Hawaiian bird hunting was not undertaken solely to acquire feathers for ali'i regalia. For the *maka āinana*, the common people, larger birds such as the 'ua'u and *nēnē* (Hawaiian goose, *Nosochen sandwicensis*) were utilized as a source of wild meat (Gomes 2016:33-35). The feathers were harvested and the birds were usually eaten. Harvested feathers were rarely trimmed, although large flight feathers would be split in two to create a greater quantity of usable material. 'Ua'u chicks are commonly said to have been a delicacy reserved for ali'i in ancient times (as cited in Gomes 2016:48). The mo'olelo of Lauhaka and Kāne'alohe supports this fact as they were persecuted for eating 'ua'u.

An analysis of land boundary commission testimonies found that on Hawai'i island "there is a correlation between ahupua'a with large land holdings and bird catching for meat" (Gomes 2016:40), suggesting that the importance of bird hunting as a traditional source of wild meat may have influenced the shape and size of some ahupua'a. The "correlation between the size and shape of an ahupua'a and the importance of wild birds as a major food source" (Gomes 2016:49) suggests that makaainana belonging to large ahupua'a probably relied heavily on wild bird meat as a food source (Gomes 2016:40-41).

4.3.4 Spiritual Significance of Native Birds

Native forest birds are woven into the creation stories of the islands. The Kumulipo, one of the great cosmological and genealogical chants that tell of the forming of the islands and its creatures speaks of the birth of the 'apapane, the 'ō'ō, the mamō and other forest birds (Beckwith 1972:72 and 195). They appear in numerous traditional songs, sayings, and stories as representations of natural, spiritual, and human phenomena. Native forest birds are regarded as conduits for *akua*, the divine, functioning as the *kinolau*, or physical manifestations of deities. Among some families, they are 'aumakua or family gods.

4.4 Mid-1800s Declining Native Bird Populations

Native Hawaiians of the nineteenth century noticed declining bird populations and were very concerned for the survival of native bird species. In a letter to *Ke Au Okoa* printed June 29, 1871 T. N. Penukahi asks the editor and readers to consider the plight of native birds.

To the Au Okoa, greetings:

I have a present to lay on your level space, if the captain and editor permits me to and you will carry it to the shores of islands so that my fellow readers of the newspaper will see the title, "The natives of the [land of the] Tuahine Rains are lost." They have not been seen for more than ten years.

My friends must be wondering who these lost natives are and think perhaps that they are our old men. No, not they. Some have gone on the usual way of all earthly beings and we knew of their going. These natives that I am talking about, we know not where they are gone. It is this, the native of our upland, the iiwi, the o-u, the akakane, the amakihi, the oolomao, the elepaio, these are the natives that are lost. Some of you may ask, "what is the reason for their being lost?" I will tell you, it is because of the increase of the bad birds from foreign lands on our plains, mountains, mountain tops, vallies, cliffs, forest, taro patch borders, shores and streams...

(T. N. Penukahi *Ke Au Okoa* June 29, 1871. Translation assumed to be Mary Kawena Pukui, Hawaiian Ethnological Notes (HEN) Newspapers)

Penukahi was likely writing from O'ahu as the Tuahine rain is associated with Mānoa, O'ahu (Akana and Gonzalez 2015:252).

Penukahi goes on to share childhood memories of interacting with native birds.

...They were small birds with beautiful voices and feathers. We enjoyed watching them when we were children. When a gale blew here, the birds of the mountains came out and gathered before the doors of the houses. It was fun to see the leaves of the ilima move when we were little and these were our playmates when we were small children. Before, when the other birds had not come, there were many iiwi, amakihi, akakane, o-u, oolokela, and elepaio right around here, on the cannas, on the hau trees, on the small noni trees and farther up there were flocks of them among the blossoms of the mountain apples, on the low lehua trees and on the tall ohia trees. They were the interesting things of the upland but now, they are lost. Perhaps they are driven away by these bad birds.

(T. N. Penukahi *Ke Au Okoa* June 29, 1871. Translation assumed to be Mary Kawena Pukui, Hawaiian Ethnological Notes (HEN) Newspapers)

Penukahi anthropomorphizes native birds by referring to them as, “the natives of the uplands” and relating that they were childhood playmates. The individuals interviewed for this cultural assessment speak about native forest birds in a similar manner, regarding them as equal members of our island communities, deserving of every right to live as humans do.

While Penukahi attributes the disappearance of native birds to the introduction of “the bad birds from foreign lands”, these introduced avian species were not the only contributors to the decline in native bird populations. The introduction of invasive species like mongoose and cats decimated numerous native bird species (Caldeira et al 2015:254). The mosquito, another post-Contact introduction, has brought foreign diseases like avian malaria and avian pox that have further reduced the number of native forest birds.

4.5 Queen Emma visits Alaka'i in 1871

One of the significant historical accounts of travel into the Alaka'i swamp is associated with Queen Emma Kaleleonālanī's visit to the area in 1871. This important event is remembered and celebrated today by the people of Kaua'i in the way of the hula festival, *Eō e Emalani i Alaka'i*. The hula festival is discussed further in the Cultural Resources, Practices, and Beliefs section of this CIA.

Queen Emma was fond of travel and adventure. She traveled to Kaua'i often to visit with family, to see her property there, and to fulfill her chiefly responsibilities to her people (Nogelmeier 2001:65). A few years after the devastating loss of her husband Alexander Liholiho Kamehameha IV and their son Prince Albert, the Queen traveled to Kaua'i to regain her health and spirit of adventure. The Queen wanted to see the famous Alaka'i swamp and Wai'ale'ale for herself. She would have heard about these places from Prince Lot Kapuāiwa through his hunting stories (Nogelmeier 2001:65).

The Queen's journey into Alaka'i is celebrated and remembered in part because it was such a daring trip especially for a queen to embark on. Many people tried to dissuade her from going because of all the dangers it posed (Nogelmeier 2001:65). At the time very few people were familiar with the old and overgrown trail. Vladimir Knudsen recommended Kaluahi, an elderly Hawaiian man to guide the Queen and her company. Though it had been several years since he walked the trail, Kaluahi agreed to guide the group. In all, approximately 100 people formed the Queen's procession. They included men, women,

children, dancers, musicians, and retainers. The procession started their journey on horseback (Joesting 203-204). At the edge of the valley of Kauaikinana the trail stopped, and they had to leave the horses and proceed on foot. Here, Queen Emma paused to admire the view toward the Alaka'i and called on her dancers and musicians to perform. Following the performance, they descended the *pali* (cliff) and continued toward the Alaka'i (Joesting 1984: 204).

On the queen's return to Waimea, a grand feast was organized in her honor on January 29, 1871. Mele and oli celebrating her journey to Kōke'e and Alaka'i were recited, including one which Queen Emma recalled in a letter:

Lilikalani told the story to the country folk of the pleasure of being together in the uplands and how they had to bear the cold, something to brag about for all the people who were on the trip to the mountains with their beloved queen (Forbes 1970:7)

Mele composed for this event preserve the memory of the landscape as it was at that time. For instance, certain pōhaku are mentioned that were once along the trail and have since been moved as a result of road construction during World War II (Hammatt 2008:57).

4.5.1 Mele Māka'ika'i

The two mele presented here are among several *mele māka'ika'i* or travel chants composed in honor of Queen Emma's adventure into Alaka'i. These mele document the memorable moments of the journey. Some lines describe the cold of the mountains and how the travel party stayed warm by fire. The kindness of Queen Emma is conveyed in the lines, "I ka heahea 'ana mai, "Ma hea mai 'oukou lā?," "Ma 'ane'i, ma ka mehana" which describes Queen Emma inviting her fellow travelers to come closer to warm themselves by the fire. Many lines speak to the difficulty of traveling through the rugged terrain and how the travel party held hands while crossing narrow ridges. The landscape views would have been rewarding moments of the journey, these moments are captured in the several mentions of place names. One line reads *E lālama e ka nui manu*, the birds flitted about. This line of the mele can be interpreted in the literal sense, however, the birds are also a reference to Emma's fellow travelers (Nogelmeier 2001:91).

Untitled

He nenelu ke ala e hiki aku ai lā	Marshy is the pathway on which to arrive
He 'ūlika launa 'ole maila	Unmatched in its claylike stickiness
Ho'ā' o i nā lepo pīlali lā	Attempt the soils, sticky like breadfruit gum
Kohu lepo ho'i o Kawainui lā	Like the mud of Kawainui swamp
Kūkalaakamanu aku ia lā	But indeed it is Kūkalaakamanu
He ihona aku o Kawaikōi lā	A descent of the rushing waters
Ko'i kua 'ino i ka loa lā	An adze that cuts the expanse of the land
'Aikena, ua mā'opa'opa lā	Overwhelmed, tired and aching
He hanahanai Halepa'akai lā	Halepa'akai rises like the brow of a hill
Ke unihi mai 'Aipōnui lā	And great 'Aipō seems to draw near
Ka nahele ho'i o 'Aipōnui lā	The forest itself of great 'Aipō
Kaleleonālani he inoa lā.	For Kaleleonālani, a name song

(Source: MS SC Roberts 3.5, p. 86. Contributed by Hanohano Makea, Hanapēpē. Translation by Puakea Nogelmeier. As cited in Nogelmeier 2001:84)

Untitled

A Kilohana 'o Kalani	The heavenly one was at Kilohana
Nānā iā Hanalei	Looked down on Hanalei

I ke one o Mahamoku	On the sands of Mahamoku
Me ka wai o Lumaha'i	And the waters of Lumaha'i
A nā lae hale o Naue	To the hala-covered sea cape of Naue
Ālai 'ia e ka noe	Was screened from view by the fog
Maunahina ka i luna	Maunahina stood above
I ke ala kuikui lima	The trail where all held hands
Puni 'ia i ke 'ala	Surrounded by the fragrance
Ke 'ala o ka waokele	The fragrance of the damp forest
Ui a'e nei 'Emalani	'Emalani turned to say
“E huli ho'i kākou lā”	“Let us now go back”
I ke ala wai 'ōhi'a	By the mountain-apple trail
Ala Kīpapaola	And the paved path of Ola
Keawako'o ka i lalo	Keawako'o lies below
Naele o Alaka'i	The wilderness of Alaka'i
Le'a kūlou 'o 'Emalani	Emmalani bowed herself down
I ke anu o 'Aipō	In the cold of 'Aipō
Pū'ili lālā i ke ahi lā ē	Twigs were gathered for a fire
A i kapa no ia uka lā	To warm her in that upland
Ka leo ka mea aloha	How we loved that dear voice
I ka heahea 'ana mai	As she called out to us
“Ma hea mai 'oukou lā?”	“Where, indeed, are you all?”
“Ma 'ane'i, ma ka mehana”	“Come here where it is warm”
I ka pi'ina o nei ikiiki	Difficult was the ascent
O Kūkalaanāmanu	Up Kūkalaanāmanu
Ho'omaha aku 'o Kalani	The heavenly one rested
I ka lehua makanoe	Among the stunted lehua
Lehua lei 'āpiki lā	The wondrous lehua made into leis
Paukū me ka pa'iniu	Interwoven with pa'iniu
E lālama e ka nui manu	The birds flitted about
I ka 'ohi hua mokihana	To gather mokihana berries
I lei no ka wahine lā	To make a lei for the woman
No 'Emalani nō he inoa lā.	Emalani is her name.

(Source: MS SC Roberts 5.4, p. 113b. Several other sources. Translation assumed to be Mary Kawena Pukui. (As cited in Nogelmeier 2001:90-91)

4.6 History of Recreation and Conservation

Kaua'i pioneer Valdemar Knudsen was a prominent figure in establishing the Kōke'e area as a recreational mountain retreat in the late 1800s. Originally from Norway, Knudsen was well traveled prior to settling on Kaua'i. In 1852 on his way to California crossing the Isthmus of Panama he contracted malaria and had a rough recovery. Heeding the advice of a doctor to seek a warmer climate, Knudsen, on a whim, boarded a ship bound for Hawai'i ending up on Kaua'i in 1854 (Joesting 1984:198-199). On Kaua'i, Knudsen established himself as a successful rancher raising Longhorn cattle and horses at Waiawa (Joesting 1984:201).

Knudsen was fascinated with the Halemanu area and built himself a hut using nearby and accessible resources. He would later import lumber to build a more permanent dwelling at Halemanu for his family to enjoy as a mountain retreat. The Knudsens lived at their Halemanu house through the summer to escape the hot and dry summers at their Waiawa home (Duensing 2006:3).

Knudsen passed his estate onto his sons Augustus and Eric. Under Augustus's leadership Kōke'e became well known as a camp site and recreational area. Augustus Knudsen also responded effectively to environmental problems at Kōke'e. Herds of wild cattle had invaded the native forests, ate the underbrush, and trampled the roots of native trees causing devastating deforestation. Knudsen saw to the removal of the cattle to protect the native forests as well as the watershed. Their relentless hunting had nearly eliminated the wild cattle problem by 1882. Once the cattle were gone the native koa began regenerating. Knudsen also led reforestation efforts, planting nonnative trees such as Australian koa and ironwood (Duensing 2006:6).

The recreational residences of the Kōke'e Camps and Pu'u ka Pele Lots played a unique role in Hawai'i's recreational and conservation history (Duensing 2006:22). At the beginning of the twentieth century, the ability to pursue leisure activities or to travel was enjoyed primarily by people of significant economic means. This was true of the sort of people who like the Knudsen's would retreat to Kōke'e. Between 1918 and 1951, more than 100 rustic cabins were built on three tracts of lots at Kōke'e, Halemanu, and Pu'u ka Pele (Figure 8). These rustic cabins were mountain retreats for well-to-do Hawai'i residents eager to escape hot and dry summers. Numerous references are made to the refreshing climate of Kōke'e.



Figure 8. Lessees cottages ca. 1960s Kōke'e State Park (Hawai'i State Archives)

The most important objective of the Koke'e Camps, was to escape the hot summer days of the seaside towns in favor of the cool "bracing" air, rushing streams, songs of upland birds, and scenic beauty of the mountains and Waimea Canyon (Duensing 2006:5).

The Kōke'e Camps and Pu'u ka Pele Lots hold the unique distinction of being the only summer homes permitted on public land in Hawai'i (Duensing 2006:1).

The Koke'e Camps and Pu'u ka Pele Lots differed from other islands' summer regions as these tracts were formally planned and were built within publicly owned forest reserves. The camps, which were modeled after recreational residences built in the U.S. National Forests, were significant as they were a contemporary and local expression of a national trend. (Duensing 2006:22)

The first applicants for the Kōke'e Camps were from Kaua'i's most prominent families or who with ties to the Knudsen family already had permanent camp structures at Kōke'e. Camp site leases were overpriced which excluded many local families from enjoying the camps. Camp permits issued to clubs however made the camps more available to the general public (Figure 9).



Figure 9. Kōke'e State Park rental cabin ca. 1960s (Hawai'i State Archives)

4.6.1 *Trout Fishing and Plum Picking*

Trout fishing and plum picking were recreational activities uniquely associated with Kōke'e during the twentieth century. Trout fishing began as early as 1921 and was a popular annual activity during the summer months. The territorial government would seasonally stock Kōke'e streams, as it did in 1940 with 25,520 trout eggs supplied by the U.S. Bureau of Fisheries. Kaua'i forester A. J. MacDonald began

planting plum trees along Kōke'e's trails and roads around 1930. The Civilian Conservation Corps enrollees stationed at Kōke'e during the Great Depression planted additional trees. An estimated 18,000 trees were eventually planted in Kōke'e. At some point, plum picking became so popular that the territory implemented a 'plum season' each year, which restricted plum picking to specified dates and decreed strict limits on the amount of fruit each person could harvest from government land (Duensing 2006:20).

4.6.2 *The Civilian Conservation Corps and WWII period activities*

During the 1930s the Civilian Conservation Corps (CCC) had a camp near Kanaloahuluhulu. The CCC were tasked with improving public lands, forests, and parks. They engaged in several conservation activities including reforesting eroded cliffs at Pu'u ka Pele. Most of these efforts involved planting alien species such as haole koa (*Leucaena sp.*), silver wattle (*Acacia podalyriifolia*), eucalyptus (*Eucalyptus ps.*), and ironwood (*Casuarina equisetifolia*). The CCC's most notable projects, perhaps, were planting an experimental fruit orchard at their camp and assisting in planting Methley plums throughout the region (Duensing 2006:21).

During WWII martial law strictly limited access to Kōke'e which was occupied by the U.S. military. During this time, the military improved and extended the road which made the camps accessible all year round. Prior to the road improvements, the dirt road was impassable during the winter rainy season. (Duensing 2006:22).

4.7 Present Land Use

The Kōke'e and Waimea state parks play a significant role in maintaining cultural traditions. Readers should refer to the *Cultural Impact Assessment for Kōke'e and Waimea Canyon State Parks* (Chiogioji et al. 2004) for a comprehensive discussion of cultural resources, practices, and beliefs associated with the Kōke'e and Waimea Canyon Parks. Similarly, for a comprehensive discussion of the cultural resources, practices, and beliefs associated with the Alaka'i Swamp area readers should refer to the *Cultural Impact Assessment for the Alaka'i Protective Fence Project* (Hammatt 2008). Lastly, for a comprehensive discussion of cultural resources, practices, and beliefs associated with the Nāpali coast readers should refer to "*Hana Ka Lima, 'Ai Ka Waha*" *A Collection of Historical Accounts and Oral History Interviews with Kama'āina Residents and Fisher-People of Lands in the Halele'a-Nāpali Region on the Island of Kaua'i* (Maly and Maly 2003).

5 CULTURAL RESOURCES, PRACTICES, AND BELIEFS

The following is an overview of traditional and contemporary cultural resources, practices, and beliefs associated with the project area and with its native forest birds. This overview is the result of archival research and interviews with individuals knowledgeable about contemporary cultural practices undertaken within the project area or associated with native forest bird species.

The project area encompasses a large portion of Kaua'i's surviving native rainforest, a landscape imbued with cultural significance. The several wahi pana (storied places) found in these areas contain numerous cultural resources strongly associated with Native Hawaiian cultural traditions, practices, and beliefs. These resources include traditionally gathered natural resources such as medicinal and ceremonial plants, and trees. Several of these resources are collected and used by contemporary cultural practitioners. Considering a significant part of the project area are public lands, the Native Hawaiian community has had uninterrupted access to these lands which has enabled a continuity of their cultural use.

This section also discusses cultural resources, practices, and beliefs associated with native forest birds. The practice of Hawaiian featherwork for example, is symbolically linked to the wellbeing of native forest birds as they are a source of inspiration to the continuation of the heritage practice.

Two of the previously mentioned Cultural Impact Assessments, those for the Kōke'e and Waimea Canyon State Parks (Chiogioji et al. 2004) and the Alaka'i Protective Fence Project (Hammatt 2008), cover large parts of the present project area. Cultural resources, practices, and beliefs identified and described in these two previous studies remain largely unchanged, and present cultural practitioners use these areas in much the same ways as described in these two previous CIAs. Hunters are hunting the same animals and hula and *lā'au lapa'au* (traditional medicine) practitioners are gathering the same plant resources.

5.1 Native Forest Birds: Biocultural Connections

As critical players within the native ecosystem, native forest birds have a role in maintaining natural processes and the balance of the native forest. They provide critical services such as pollination to dozens of endangered native plants. Hawai'i is renowned for all the examples of tightly coevolved flower-pollinator systems. The distinct crescent-shaped beak of the 'i'iwi is uniquely adapted to pollinate certain native plants. The 'akeke'e has a specially adapted bill that allows it to pry open 'ōhi'a buds to forage for invertebrates. The Puaiohi and Kaua'i 'amakihi are important seed dispersers. Puaiohi is the largest native forest bird in Kaua'i and therefore plays a pivotal role in dispersing the larger seeded native plant species where it is still present. In these ways, the existence of native forest birds supports and nurtures the existence of other native species, which are themselves culturally significant components of the native ecosystem.

5.2 Native Plant Resources: Lā'au lapa'au, lei, woodworking

The project area contains numerous plant resources used for cultural purposes. Hawaiian spiritual beliefs and customs that rely on plant resources continue to be honored and practiced in the project area. *Lā'au lapa'au* practitioners continue to access the project area to gather native plants used to make medicines. Several cultural practitioners and the local community gather plant resources in the project area for seasonal events like May Day and graduation. Unfortunately, many of the most popular plant resources used to make lei for these seasonal events are in scarce supply. Many factors contribute to the scarcity of these popular native plant resources. Indiscriminate gathering practices, invasive species, and changing weather conditions in recent years have created conditions where these highly sought after plants are not as abundant as they once were. As a result, cultural practitioners sometimes choose not to gather these resources and opt for more widely available native plants.

5.3 Cultural and Historic Sites

Numerous cultural and historic sites are found within the project area ranging from traditional Native Hawaiian habitation sites to CCC era rustic cabins. Due to the nature of the proposed project activities, it is anticipated that no cultural and historic sites will be physically impacted by project activities.

5.3.1 Trails

The movement of goods and people within the project area in traditional times took place along an established system of footpath trails. These ala hele (trails) extended both laterally along the shoreline and mauka to makai. The coastal trails were referred to as ala kahakai (ala meaning "path, road, trail" [Pukui

and Elbert 1971:14], and kahakai meaning “beach, seashore” [Pukui and Elbert 1971:103]). They served to connect the coastal settlements strung along the shoreline and also linked adjacent ahupua‘a, allowing for travel, trade, and exchange to take place on a broader level.

The trails that ran inland were referred to as ala pi‘i (ala meaning “path, road, trail” [Pukui and Elbert 1971:14], and pi‘i meaning “to go inland” [Pukui and Elbert 1971:301]). They were also known as “ala pi‘i uka” or “ala pi‘i mauna” (uka meaning “inland, upland, towards the mountain” [Pukui and Elbert 1971:337], and mauna meaning “mountain” [Pukui and Elbert 1971:223]). The ala pi‘i gave the area’s residents access to the upper slopes where crops such as ‘uala (sweet potato, *Ipomoea batatas*), uhi (yam, *Dioscorea spp.*), and dryland kalo were grown.

In his book *Kaua‘i Tales*, Wichman makes the observation that mo‘olelo convey important information useful to navigating the network of trails on Kaua‘i.

It is possible, using these stories, to generally reconstruct where the ancient roads and trails went. In order to get to Kōke‘e from Hanalei, for instance, it was necessary to go up Wainiha valley to Maunahina before climbing to Kilohana, a trail that was used by army engineers during World War II. In order to climb down into Kalalau from Kōke‘e it was helpful to know the rocks of the Nā‘iwi family and use them as guideposts. On a smaller scale, it was easier to remember the place names along Waioli stream in Hanalei if you could link these places to a romantic story of a young man’s search for the woman of his dreams. (Wichman 1985:155)

Kia manu or bird hunters would have used these networks of trails to access the forest to collect bird feathers. These trails would also have provided access into forest for traditional gathering of culturally significant plant resources.

There were at least three trails into Kalalau. The most frequented in traditional times was the Kalou trail, a footpath that followed the ridge on the western side of Kalalau Valley, leading from the mountains to the sea (Wichman 1998:144). Kalou trail is completely overgrown today and extremely dangerous (Wichman 1998:146). Some place names along the network of trails in this area reference the many dangers along their path.

5.4 Hunting

For an in-depth discussion of hunting practices within the Waimea and Kōke‘e State Parks refer to the cultural impact assessment for that area (Chiogioji et al. 2004). According to Bill DeCosta, an interviewee for this CIA, the hunting practices described in Chiogioji et al. 2004 remain unchanged. Hunters continue to hunt primarily pig, goat, and black-tailed deer in the project area. For more information on the cultural significance of contemporary hunting practices, refer to the full interview transcript with Bill DeCosta included in Appendix D.

5.5 Hawaiian Featherwork

Hawaiian featherwork is an example of a cultural practice that has adapted and evolved in reaction to changing circumstances and the availability of materials. The profession of the *kia manu* is no longer practiced, and there are stringent state and Federal regulations in place regarding the gathering of traditional feathers in Hawai‘i (Caldeira et al. 2015:26). Featherwork practitioners today source their feathers from manufactured feather suppliers. Though featherwork practitioners no longer use the feathers of native birds, the knowledge of producing feather creations still exists and is still practiced. Contemporary Hawaiian featherworkers use their creations to bring attention and awareness to the plight of native forest birds.

5.5.1 *Lei Hulu*

As shown in Figures 10 and 11, lei hulu practitioners of the 1930s were using nonnative bird feathers (peacock and pheasant) in their creations. Similar lei hulu, made in the traditional style, are still being created today.



Figure 10. Minnie Maioho sewing a pheasant feather *lei humupapa* ca. 1935 (Hawai'i State Archives)

5.6 Native Forest Birds in Mele, Oli, and Hula

A respondent to the request for information letter for the current CIA shared that there is an area below Alaka'i where *kumu hula* (hula teachers) would test their student's chanting abilities. The kumu would then interpret the elemental signs which would indicate what kind of chanter the student would become. When Mary Kawena Puku'i was tested by her teacher Keahi Luahine the mist surrounded Alaka'i, telling Keahi that her student who didn't have a strong voice, would be a teacher.

5.6.1 *Mele*

Mele are Hawaiian poetic compositions performed as chants or dances. Composing mele is both an art and an ancient tradition. Although both the art and the traditions of its use have continued until today, many changes through time have altered the form of the poetry and the functions of mele in Hawaiian culture (Nogelmeier 2001:1).

Although many of Hawai'i's native forest birds have gone extinct, they continue to hold relevance to contemporary Hawaiian culture because their legacy is preserved in classic and beloved *mele* or songs.



Figure 11. Lau hala hat with a peacock feather *lei pāpale* (hat band) ca. 1935 (Hawai'i State Archives)

The mele *Manu 'Ō'ō* is one example. The 'Ō'ō bird has long been presumed extinct but the memory of the bird lives on with this song which has become a Hawaiian music and hula classic.

Manu 'Ō'ō

'O ka manu 'ō'ō i Malama
A he nani kou hulu ke lei 'ia
Mūkīkī ana 'oe i ka pua lehua
Kāhea ana 'oe i ka nui manu

The black honey-eater at Mālama
Your beautiful and soft feathers are worn as a lei
You sip the nectar of lehua blossoms
And beckon to the flocks of birds

Hui:
Hō mai 'oni mai
Ko aloha ma nēia kīhene lehua

Chorus:
Share with me, come to me
Pour your love on the lehua cluster

No Hilo ē ka ua Kanilehua
Popohe lehua a i Hanakahi
Ho'okahi a'u mea nui aia 'oe
'O kou aloha ka i hiki mai
(Huapala.org translation by Huapala and Wainani Traub)

The Kanilehua rain of Hilo
Decorative lehua of Hanakahi
One greatest thing I love is you
For you love has come here to me

Native forest birds continue to inspire contemporary *haku mele* (composers). Two of the interviewees for this cultural assessment have composed mele in honor of native forest birds. The compositions of present

and future haku mele are intangible cultural expressions and contributions to a long legacy of reverence for native birds.

5.6.2 Eō e Emmalani i Alakaʻi Hula Festival

Since the 1980s an annual hula festival, Eō e Emmalani i Alakaʻi, has been held at Kōkeʻe State Park in the Kanaloahuluhulu Meadow. The hula festival honors Queen Emma who in 1871 (as described above) ventured into the wilderness of the Alakaʻi swamp. Kumu Hula Roselle Bailey and Marsha Erickson, director of the Kōkeʻe Natural History Museum, started the festival to attract local people and visitors to Kōkeʻe in celebration of Hawaiian culture and hula. Each year the festival begins with a historical reenactment of Queen Emma and her entourage riding into Kanaloahuluhulu meadow on horseback as the royal party did in 1871. The free event included performances by *hālau hula* (hula schools) from across the state, exhibits, and craft demonstrations.

Since its inception, the festival has been a catalyst for kumu hula and *ʻōlapa* (dancers) to learn, research, and create. The festival inspires kumu hula to revive the mele mākaʻikaʻi written for Queen Emma and to compose mele of their own. Through their performances, hālau bring to life the mele compositions written about Queen Emma’s adventure, the wahi pana of Kauaʻi, the beloved plants and animals, and much more. Unfortunately, the future of the festival is uncertain as past funding sources may no longer be available. The event was held virtually in 2020.

Two interviewees for this cultural assessment, Sabra Kauka and Keahi Manea, spoke of the importance of the event.

Hui o Laka used to sponsor Eō e Emalani i Alakaʻi an annual hula festival held in October. Hālau from all over the State come and perform during a one day event celebrating Queen Emma’s trek into Alakaʻi... very important. They’re not doing it anymore. The pandemic basically shut them down and I guess they decided they weren’t going to do it anymore. It’s a lot of work, a lot of work. And without help from the Hawaiʻi Tourism Authority I believe it would have been difficult for them to put it on. Groups that do public events like that, cultural events, in order to keep the event affordable to the participants outside funding is needed. That was a very important, a very important cultural festival. I think it should be included in your research. Because hālau came from all over the state and experienced the Kōkeʻe forest and atmosphere. Many of them stay at the CCC camp up at Kōkeʻe or in cabins that they had association with up there. So that was important. That also motivated and inspired Kumu hula to create chants, dances, oli, mele and mele related to Queen Emma’s trek and related to the area Alakaʻi. And of course, plants, birds, place names were preserved because of the inspiration that kumu hula had, yeah. It all works to preservation, yeah.

If you have a performance. You know this. When you know you have a performance, you knuckle down right, you knuckle down, but also you open your mind, right. You do your research and find out about the place, and you learn about the place names, and you find out about what happened there, and who went there, and what they did and why they did it. All that stuff. So, the Eō e Emalani Festival was an inspiration. A motivating event for a lot of people for many, many years. (Manea 2022)

Ms. Kauka expressed her sadness over the festival not happening in 2022.

So many hālau. I have so many friends, kumu hula. [thinking] Oh god, the hula, beautiful. You know I’m a little disappointed this year because we’re not doing the Queen Emma Festival. It’s the first time in probably over 25 years that we’re not going to. Well, last year we went digital. And the year before... I don’t know. Anyway, Kōkeʻe

Natural History Museum is no longer sponsoring that event. Which makes me a little sad because it's about honoring Queen Emma. Honoring her love for the forest and her trek over a hundred years ago to the Alaka'i swamp all the way to Kilohana. Several of the hula that were created to honor that event include verses about birds. The birds that they saw and experienced. I want my students, I want my grandchildren to continue to see and experience those as well. Those places and all the creatures that inhabit that zone of the forest and the mountains. (Kauaka 2022)

Ms. Kauka spoke about the challenges the festival organizers face in carrying on the festival.

There's no guarantee it will go on. The museum is understaffed and it's a lot of work for just a handful of people. Even though many of us with hālau have offered to kōkua. You still need that driving force in there. And I don't want to sit on their board. I'm on too many boards already. We had a director here Marsha Erickson from Volcano. I met her when she was head of Volcano Art Center. And then after Volcano Art Center she was hired to be our director here at Kōke'e Museum. She along with Kumu hula Roselle Keli'ihonipua Bailey from Maui. Roselle was living here at the time. They initiated the Queen Emma, Eō e Emalani Festival. After the hurricane, Roselle and her husband moved back to Maui and retired and Marsha Erickson retired from the Kōke'e Museum. And we have a new director and she's good but [thinking] very much involved with hula and very committed to it. So, we'll see what we can do. It was a great opportunity for hālau from all over Hawai'i to come to this island to learn about Kōke'e, our forest, our birds, our place names, and our hula. (Kauka 2022)

6 PREVIOUS ARCHAEOLOGICAL STUDIES

6.1 Archaeological Findings in the Project Area

Although most of the project area has not been archaeologically surveyed, some Native Hawaiian cultural sites have been archaeologically recorded within the project area. It is worth noting that these cultural sites correlate with traditional Native Hawaiian land use. Habitation and intensive cultivation were concentrated in valleys and along the coast, while the high elevation forests and wetlands that comprise the majority of the terrain within the project area were not heavily utilized by Native Hawaiians. Many of the activities that took place in the uplands left little to no trace on the archaeological record. People did travel through the uplands to hunt birds, visit sacred sites, harvest trees for lumber, or gather other natural resources. These visitors to the area constructed temporary shelters and places of worship and created some of the trails that are still in use today (Yent 2004:6).

A few sites related to these activities, such as part of a shelter near Waimea Canyon Lookout (SIHP # 50-30-06-707), have been documented outside of the project area, but the only upland site recorded within the project area is Ka'awakō, a small heiau at the summit of Wai'ale'ale (Hammatt and Shideler 2008:10, 15-16, 21).

The folklorist Thomas Thrum, writing in 1906, described the heiau of "Kaawako" as:

A long stone set on edge on bank of the Waialeale pool, on the summit of the mountain which derives its name therefrom. A very sacred place on which offerings are laid to this day.

Later archaeologists described it as a somewhat more substantial structure.

Kaawako is a small rectangular structure about five by seven feet and two feet high, made of smooth lava slabs, on the summit of Waialeale, between two knolls, in the open country near the pond. This is very sacred; to this day you must throw on it the most valuable thing you have with you—money, food, tools, or whatnot, --to propitiate the gods of the mist lest they envelop you and you lose your way in that tangle of woods and gulches and level plateaus of the interior of Kauai. (Hammatt & Shideler 2008:10)

-The site measures approximately 4.5 m long N/S by 4.2 m long E/W with a facing approximately 4 boulders long on two sides and a height of approximately 80 cm. Because the site was almost certainly situated on a much eroded hummock determining where nature ends and culture begins is not clear-cut. There appeared to be a boulder alignment extending off of the shrine for approximately 4 m. (Hammatt & Shideler 2008:21)

This significant cultural site is not located near any access routes that will be utilized for the project and therefore will not be impacted by the project.

Nearly all recorded archaeological sites within the project area are located in Kalalau Valley. Native Hawaiian communities in Kalalau built homes, practiced intensive irrigated agriculture, and built several heiau along a coastal trail. Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located very near or even on trails used by modern hikers and hunters (Major and Carpenter 1999). These trails, however, will not be used for project related access and therefore the sites in Kalalau should not be impacted by the project.

7 PREVIOUS CULTURAL STUDIES

The following previous cultural studies have been conducted for lands within the project area. Recorded oral histories also contain mentions of cultural practices and changing land use in northwestern Kaua'i through the 20th century. Summarized and excerpted below are several of the studies with information most relevant to the assessment of the current project area.

7.1.1 *“Hana Ka Lima, ‘Ai Ka Waha” A Collection of Historical Accounts and Oral History Interviews with Kama‘āina Residents and Fisher-People of Lands in the Halele‘a-Nāpali Region on the Island of Kaua‘i (Maly and Maly 2003)*

The primary focus of this study was the conducting of oral history interviews with individuals familiar with the Halele‘a-Nāpali region of Kaua‘i. Nearly all the interviewees in this study are tied to families with generations of residency in the Halele‘a-Nāpali region. All but one of the interviewees were brought up in families that worked the lands and fished using traditional Hawaiian techniques, observed traditional customs and beliefs, and fished for subsistence.

The present CIA is not concerned with fishing practices as the proposed project activities will not occur along coastal areas and will not impact fishing practices. The preparers of the present CIA mention this study (Maly and Maly 2003) to show that the coastal regions of the present project area contain numerous cultural resources, practices, and beliefs and these are discussed at length in Maly and Maly 2003.

7.1.2 *Cultural Impact Assessment for Kōke'e and Waimea Canyon State Parks (Chiogioji et al. 2004)*

The purpose of this cultural impact assessment was to consider the effects future development of the Kōke'e and Waimea Canyon State Parks may have on Native Hawaiians, their culture and their right to practice traditional customs. The assessment focused on historical and archaeological research, and information-gathering interviews with kūpuna and *kama'āina* (native born residents) knowledgeable of the Kōke'e and Waimea Canyon State Parks project area, and cultural resources, practices and beliefs within the encompassing ahupua'a of Waimea (Chiogioji et al. 2004:1).

The following 20th century activities within the parks and their impacts on traditional Hawaiian culture are discussed at length in this study: the presence of cattle during the first decades of the century, the opening of leased cabin sites at Kōke'e beginning in 1919, the planting of tree stands and construction of new trails by the Civilian Conservation Corps during the 1930s and 40s, the construction of military and communications facilities beginning in the 1960s, and the development of the parks themselves beginning in the late 1940s (Chiogioji et al. 2004:17).

The findings of the *Cultural Impact Assessment for Kōke'e and Waimea Canyon State Parks* show that the park lands are used for several traditional cultural and customary purposes. Kumu Roselle, an interviewee for the study, sees the parks as “not just for recreation” but as “a living area of a living culture” (CIA2004:52).

In regard to future development within Kōke'e and Waimea Canyon State Parks, Chiogioji et al. had the following recommendation:

As a precautionary measure, personnel involved in the design and implementation of future development within Kōke'e and Waimea Canyon state parks should be informed of the traditional Hawaiian cultural practices and resources identified with the parks area. Future development should complement and enhance the Hawaiian traditions associated with the parks area. Additionally, personnel should be made aware of the possibility of inadvertent cultural finds, and made aware of the appropriate notification measures to follow. (Chiogioji et al. 2004:147-148)

The present proposed project will not involve development of the park areas. The proposed project would retain and strengthen the native bird populations thereby enhancing Native Hawaiian traditions associated with the parks by preserving the culturally significant resources that are the native birds.

7.1.3 *Cultural Impact Assessment for the Alaka'i Protective Fence Project (Hammatt 2008)*

The purpose of this cultural impact assessment was to provide information pertinent to the assessment of the construction of a feral pig and goat proof fence across the Alaka'i Plateau from Wainiha Pali south-east to the Summit Bog Fence and its impacts to cultural practices. This project was implemented with the intention to preserve the ecological integrity and hydrologic function of the Alaka'i, Kaua'i's watershed core. In order to abate further habitat destruction from invasive plant species and feral ungulates such as pigs and goats the protective fence was implemented as a solution that removed these threats.

This cultural impact assessment identified several general cultural concerns expressed by the community. These concerns focused on the preservation and care of natural and cultural resources within the project area. The recommendations provided by cultural practitioners interviewed for this cultural assessment included the following; involving local cultural practitioners and the community in training and

educational sessions about the management of the project area; the need for cultural monitors during certain project activities; the need for public outreach and education; ensuring continued access to the project area for cultural purposes; the need for personnel involved with the construction of the fence to follow proper protocols and procedures to ensure the safety of native plants and cultural resources.

8 COMMUNITY CONSULTATION

As part of the present CIA, SWCA contacted government agencies, Native Hawaiian Organizations (NHOs), community groups, and individuals to ask for assistance in identifying individuals and organizations knowledgeable concerning the past and contemporary cultural use of the project area.

8.1 Request for Information Letters

SWCA sent request for information letters to a total of 63 organizations and individuals. This list was developed through a review of the Department of Interior's (DOI) Native Hawaiian Organization (NHO) notification list, a review of those groups and individuals referred to in previous cultural studies conducted within the project area, and those stakeholders known to the DOFAW. A detailed list of the organizations and individuals contacted is included in Appendix B of this report.

These request for information letters explained the project's purpose and requested assistance with the following aspects of the study:

- Help in identifying kama'āina, kūpuna, and other individuals who might be willing to share their cultural knowledge of the project area
- Information on the present and past land use of the project area
- Information on place names and cultural traditions associated with the project area
- Information on cultural sites which may be impacted by construction work within the project area
- Knowledge of traditional gathering practices within the project area, both past and ongoing
- Information on any current cultural practices being carried out within the project area
- Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area

8.2 Community Responses

Of the 63 organizations and individuals contacted, 13 responded. Four respondents recommended individuals as possible interview subjects. One respondent shared information related to the cultural history of the project area in an email response but did not elaborate further about the information shared. Five individuals agreed to be interviewed.

8.3 Interviews

The following interviewees are individuals knowledgeable about contemporary and past cultural practices undertaken within the project area or knowledgeable concerning contemporary and past cultural practices associated with the species of native forest birds this project is intended to impact in beneficial ways. The interviewees use several Hawaiian words and expressions in their speech. So as not to interrupt the flow of the interview, definitions of these words and expressions have not been included in interview

transcriptions and interview quotations presented in the text. Readers should refer to the glossary for translations.

In the process of conducting oral history interviews, it is impossible to record all of the knowledge or information that the interviewees possess. The main objective of the oral history interview process is to record the ideas and sentiments personally held by the interviewees as accurately and respectfully as possible, without judgment. Adhering to these standards ensures both the quality and quantity of information obtained from individual interviewees and facilitates the recording of information that will be of benefit to present and future generations. Furthermore, it provides a means of capturing meaningful dialogue with individuals representative of their community in a form that is respectful of cultural values.

These oral history interviews are glimpses into the lives of the interview participants. As would be expected, participants in oral history interviews sometimes have different recollections of history. Diversity in the stories told or opinions held by the interviewees should be seen as something that will enhance interpretation, preservation, and long-term management of natural and cultural resources. Every effort has been made to accurately relay the recollections, thoughts and recommendations of the people who shared their personal histories in this study. The interview transcripts presented in Appendix D of this report have been reviewed and approved by the individual interviewee (copies of consent forms are included in Appendix C).

Readers are asked to respect the interviewees and their families. If specific points of information from the interviews are quoted, it is the responsibility of the individual/organization citing the material to do so in the context as originally spoken by the interviewee. The larger interviews should not be cited without a full citation and direct permission from the interviewees or their descendants.

8.3.1 *Bill DeCosta Interview*

Mr. DeCosta was born and raised on the west side of Kaua'i. His father's family has resided on Kaua'i for four generations. Mr. DeCosta's familiarity with the project area extends back to his childhood and young adulthood spent hunting the area with his father and uncles. Additionally, as an environmental sciences teacher working in the public school system on Kaua'i Mr. DeCosta frequented Kōke'e with his students. Mr. DeCosta is presently a Kaua'i county councilman where he advocates for supporting systems of food sovereignty by supporting farmers, fishermen, and hunters, among other initiatives.

8.3.1.1 HUNTING

Mr. DeCosta discussed the importance of hunting as a cultural practice and as a means for the food security of local families. Mr. DeCosta elaborated on the importance of maintaining the public lands within the project area for hunting. Mr. DeCosta feels that the hunting within the project area is not as good as it used to be and attributes that in part to extensive fencing in recent years. Mr. DeCosta expressed his frustration with the lack of fence maintenance and explained that the large enclosures disrupt the natural movement patterns of wild animals. Mr. DeCosta believes that smaller targeted fencing can be better maintained and monitored.

Mr. DeCosta shared a contemporary place name used within the hunting community.

There is one area named after my uncle, George Rapozo, they called him Jungaro, but his name was actually George, and this place is called Jungaro Puka. Rapozo Puka actually is the more common term now. It's a hole in the mountain between Alaka'i Swamp and Wainiha Valley.

Mr. DeCosta recalls when private landowners restricted hunters from accessing private lands, leaving only the public lands for hunters to use. Mr. DeCosta explains that after losing access to the private lands, Jungaro Puka became known as a reliable place for hunting.

So what happened is in the... gosh I'm not sure if I have my timeline correct, but I know the stories. Before the plantations unionized, I believe somewhere around the 1940s maybe the 1950s. There was some pushback by certain people. The Robinson family and the rest of the large landowners took away the harvesting rights of the people to go hunting on private lands. So the people could not go and catch the pig or the goat they needed to feed their families. There's a lot of people who fed their families for generations on wild meat. It's hard to fathom you know it's hard to come to realization that families use that much meat but when you have a very small paycheck and you are able to buy flour to bake bread or rice to subsidize your meat dish a lot of the wild meat was very financially able to subsidize the lifestyle. So when the private landowners took away hunting rights people were forced to go and learn the public lands that was left to hunt. That's when that area Rapozo Puka became a very popular place to go catch a pig to feed the family. It was almost like the icebox, a guarantee spot especially during the winter months. That whole back summit, Alaka'i Bog, Rapozo Puka is actually inside the Alaka'i Bog and Camp 10 Flats overlooking Wainiha Rim. Wainiha Valley is also owned by the Robinsons and the pigs migrate from in Wainiha. In the summertime they're in Wainiha for the mango and mountain apple and they migrate up into the Alaka'i Bog during the wintertime for the guava. So we had really good hunting. It's not like that anymore. A lot of the pigs cannot migrate.

8.3.1.2 CONCERNS

Mr. DeCosta spoke about his concern for biological interventions having the potential to lead to unforeseen environmental consequences or otherwise create more problems than beneficial outcomes. He also shares recollections of past environmental interventions failing to accomplish desired outcomes.

Real quickly, that one area I told you about Hanakoa it stretches along the Nā Pali trail. DLNR has spent much time eradicating the goats in that area removing goats because the goats would nibble on some of the rare plants that are in that area. We've told them many times that the goats tend to be a weed controller, and yes, they do nibble on some of the native tress, but it's better to lose three native trees out of 12 and still keep 8 or 9 growing because the goats do a good job of keeping the large invasive grasses down. Now, because the goats were eradicated, those grasses have grown 5-6 feet tall and they have sucked out the life of all those little shrub native plants. So we try to do one environmental technique and it creates a larger havoc.

We learned that on the Big Island with the palila bird and the māmane tree. The sheep would nibble on the māmane tree and it would take away all the undergrowth of the tree and only leave the top where the sheep couldn't reach. So they were thinking that if there were no sheep the māmane tree would grow much larger and would have more birds nesting in the tree. Which is true. But now the grasses got so tall because the sheep doesn't only nibble on the māmane tree they nibble on the grass. Now the grass is taller than the trees and the rats and mice can climb up the blades of grass and can eat the eggs in the nest, and also it's a fire hazard, and thirdly, when the baby māmane seeds drop on the ground they no longer have the area to catch the sunlight and propagate because the grass has choked out all the area. So, we create a larger havoc. I just thought we would have learned our lesson cause that was done back in the 1990s and it seems like we haven't.

8.3.1.3 COMMUNITY RELATIONS

Mr. DeCosta spoke generally about his desire for better collaboration and working relationships between the local community and the scientific community implementing projects on Kaua'i. Mr. DeCosta asserts that professionals educated outside of Hawai'i need to be more receptive to the knowledge, wisdom, suggestions, and recommendations of the local community who possess generational knowledge and familiarity with the project area. In Mr. DeCosta's words, "they owe it to us generations who came before them to listen to some of the things we have to say."

Mr. DeCosta hopes that the project does what it is intended to do.

Prior to your mosquito introduction the big thing according to the environmentalists was to protect their native flora from the pigs uprooting it and also to protect the native birds from the mud wallows that the pigs would roll in causing the oil from their skin to seal the mud which held water for mosquitoes to breed their larva. So now that you introduce these male mosquitos and hopefully it does its job the way it should. We don't have to worry about those wallows holding mosquitoes anymore so maybe those large fences to keep pigs out can be something of the past. And I would like to see smaller protective enclosures around our rare trees and plants. I think it's a win-win because when you have smaller enclosures you know exactly where to go and look at the perimeter to see if any fallen branches or any wild pigs uprooted that fence. And pigs can go around a fence if they have another route to get to where they want to go. If it's a straight-line fence cutting off their natural pathway to migrate, they will find a way to uproot that fence. We are putting skirts now on the ground that goes out 4-6 feet so the pigs cannot dig but that metal skirt is galvanized it's on the forest floor which is wet and eventually that galvanized skirt will rot and I don't know if we have the funding to remove those rotten fences one day. This mosquito intervention could be a much better solution than what we have tried in the past. The sad part about it is we spend so much money fencing out wild pigs because they create the wallows for these mosquitos to breed and now we have a better solution.

8.3.1.4 BIRDWATCHING

Mr. DeCosta mentioned that many people enjoy birdwatching within the project area.

I know many people enjoy watching birds. It's very tranquil to observe these birds in their natural state and watch them take the nectar out of the native flora with their certain beak that they have. It's amazing.

8.3.1.5 ADDITIONAL COMMENTS

Mr. DeCosta spoke about his concern for the maintenance of the large fenced-in enclosures.

This past weekend I took a walk into Miloli'i towards Nu'alolo. I did some hunting around the enclosures some very large enclosures in the Ku'ia Reserve. I took some videos and pictures of the fence because it's in desperate need of repair. The pigs and deer are all in the area of the fence because the wood fenceposts are all rotten. It just breaks my heart that we spend you know possibly a million dollars or more to put in these enclosures. Which I spoke against. I support small enclosures around the native flora that needs to be protected. I don't like large enclosures that cannot be maintained. I specifically told DLNR we don't have the manpower to go inspect the fence for damage from fallen trees. The pigs tend to lift the fence with their snouts and create a hole that they can go in and out. Once a pig gets into a fenced area with their herd they can create

quite a bit of damage. But no one listened to me. They put up these large enclosures and now there's a lot more game in the enclosures than there is outside. We do have hunters that DLNR allow to go into the fenced area but it's not enough it's a poor way of protecting our natural native flora that is endangered. We need to create smaller enclosures to protect the rare plants. Maybe two acre by two acre or five acre by five acre. Right now, they're enclosing hundreds and hundreds of acres up to a thousand acres and we have no funding to maintain it so what happens when a branch in a windstorm lays down the fence and then the deer take it over.

The project area is a very special place that demands respect and care.

I want to advocate for all the families that do these cultural practices in the bog area where you guys going to introduce the mosquito across this very delicate ecosystem. We only would bring people that would respect the forest to go in to harvest with us. Whether it was the pig or the maile or the mokihana.

8.3.2 Dr. Samuel M. 'Ohukani'ōhi'a Gon III Interview

Dr. Gon was born and raised on O'ahu where he still currently resides. He has family ties to O'ahu, South Kona Hawai'i, and a grandmother from Waimea Kaua'i. Dr. Gon is a multidisciplinary expert on Hawai'i's natural environment and cultural traditions. Dr. Gon integrates Hawaiian cultural values and knowledge into his work as a conservation biologist with the Nature Conservancy of Hawai'i. Dr. Gon is also a kumu hula and kumu oli. He along with co-kumu Māhealani Wong lead the hālau in residence at the Bishop Museum. Dr. Gon co-authored a chapter in the book *Royal Hawaiian Featherwork: Nā Hulu Ali'i* and has authored several other pieces of writing on native birds and Hawaiian culture. Dr. Gon's work as a conservation biologist has taken him to Kaua'i's forests, including locales within the current project area, several times. As someone who has dedicated his life's work to protecting Hawai'i's native forests, he has a deep and intimate knowledge and appreciation for native forest birds, their habitat, and their significance to traditional Hawaiian culture past and present.

8.3.2.1 FEATHERWORK

...the 'i'iwi is the last of the birds that remain alive, that were used in the highest level of Hawaiian featherwork. There were other feathers that were used, feathers of seabirds and roosters, and the like. But the ones that are pure yellow and red and black, and, to a lesser extent dark green, those were made out of birds that are no longer with us except for the 'i'iwi.

8.3.2.2 SUPPORT FOR THE PROJECT

Dr. Gon expressing the importance for this project to Native Hawaiian culture.

Although the birds that are the main focus of this Kaua'i project are not the birds of featherwork, it's clear to me that the mosquito suppression project is going to benefit all of the forest birds, including 'i'iwi. Kaua'i is one of the last strongholds of 'i'iwi on the main islands. So that connection in itself would be enough to underscore important cultural significance of what is being done and what stands to be lost, and why any Hawaiian who has aloha for our material culture as well as the intellectual and other aspects of culture, should be interested in this. And, once you understand what the risks and the benefits are, should be supportive of this mosquito project.

8.3.2.3 NATIVE BIRDS IN MO'OLELO, OLI, AND MELE

Dr. Gon spoke extensively on the significance of birds in Hawaiian history and culture citing several examples.

The role of birds in the non-material side of things that is also a fascinating thing. *Manu* of many kinds are mentioned all the way back to the *Kumulipo*, and all the way forward through *mele* that are popular today. *Ipo Lei Manu*, *Kapi'olani's* love song to *Kalākāua* directly mentions the 'i'iwi pōlena and compares *Kalākāua* to an 'i'iwi. That's a logical comparison since the 'i'iwi and the feathers of the 'i'iwi would have been in the royal featherwork that would mark a high chief, such as *Kalākāua*. So the fact that the bird connection is not just in material culture, but also in the intellectual and spiritual underpinnings is really important to understand. You can go through the *mele* and the *oli* and the *pule* and find mention of Hawaiian birds throughout. Some of the best romances like *Lā'ieikawai* have *akua wahine* or *ali'i wahine* raised by birds and sheltered in houses thatched with feathers. And so the idea that birds were really fundamentally important as a positive and royal presence is very clear to me and many others I'm sure. And that's the kind of thing that we stand to lose if we don't do something.

Dr. Gon spoke about native birds as the *po'e* (individuals/people) of the forest and as *kini akua* or physical manifestations of *akua* (deities).

It's important right. It's not only things that breathe and have eyes like us, but also all the mosses and everything that's up there. You talk with folks like *Kekuhi Kanahahele*, she's always talking about them in terms of being individuals that coexist with us. That is the *kini akua*. The whole concept of *kini akua*-- the physical manifestations of the different *akua* expressed in all of the living things, even clouds and stones and the like-- demands that you look at every living element of the uplands as one of their manifestations. So you know, if the birds are of the uplands, the birds occupy the *wao akua* and are themselves *akua* then it stands to reason that to put a cape of that over yourself is to imbue yourself with that. With the *mana* of those *akua*. So that connection is a real, important one to bear in mind. And the fact that we still have *mele* that take you all the way to today.

When you look at *Ka Pilina*, right. I think it was *Frank Hewett* that composed that one. That talks about, at first, the 'elepaio and then the 'i'iwi and then alludes to the *wahine* carried about by birds. So it's obviously an allusion to *Lā'ieikawai*. Although he never mentions it, and that's what makes the poetry so beautiful is that if you don't know that story it's still nice. But if you know the story, then suddenly you say, *aha!* I know what you're alluding to. And he is essentially extending that long tradition into a song of today.

8.3.2.4 COMMENTS ON THE HISTORY OF EXTINCTION

Dr. Gon speaking on the history of extinction of native forest birds and the role that mosquitoes play in their decline.

I've seen five different birds that were in existence when I was younger go extinct. Birds like *po'ouli* and 'ō'ū, *Maui nukupu'u* and the like. So, it's kind of a sad statement that within one person's lifetime so many of them would go extinct, and we know just from the history of birds since the turn of the twentieth century many of them have gone. And it's due to a combination of things, certainly, but the main factor is disease. And if we think of birds as the *po'e* of the forest, as beings that have every much a right to exist as any Hawaiian would, then we're allowing for this kind of pandemic or genocide to occur. It's been happening to them for a century. So yeah, if you think about the mosquitoes,

introduced in 1826, and then songbirds that carry malaria thereafter, and then the ornithologists noticing the evidence of disease and then the disappearance of birds from the lowlands. All of that points pretty much to disease as a major factor in their loss. We can certainly, you know, point to the fact that all the lowland forests were converted to sugarcane and other forms of agriculture as well. But the combination of the two certainly was really important.

Dr. Gon gives the example of disease-bearing mosquitoes contributing to the decline in the 'ō'ō of Waiaanae.

We know that, for example, the 'ō'ō of Wai'anae would feed from the lehua of the uplands. When the lehua were in bloom in the summertime, and then come down to Kalaeloa and drink nectar from the naio shrublands that were down there. And once you have birds that are doing this upland lowland alternation over the seasons, and the lowlands become infested with disease-bearing mosquitoes you're signing their death warrant, because every year when they come down to the lowlands and are exposed to them. And they haven't for the large part evolved any kind of resistance. So, 'apapane and 'amakihi, two of the most common birds, and [ones that] had populations high enough that they could be taken down through that bottleneck and then emerge with resistant populations. But any birds that started as rare would be taken down to a bottleneck that essentially went to zero. So you know, folks that understand this see how desperate the situation is, and how much we need to do this kind of thing.

8.3.2.5 PLANT RESOURCES

Dr. Gon speaking about the kinds of plant resources that cultural practitioners gather in the locales of the project area.

Kōke'e is famous for maile and mokihana both. I would probably expand that to any plants that might be good for lei making that might be up there. And certainly the lā'au lapa'au community. I don't know that the state parks folks interviewed any of them but there is certainly a huge resource of plants to be found up in Kōke'e.

8.3.2.6 MELE AND HULA

Dr. Gon spoke about the various ways hula practitioners connect to native birds in their hula practice and how hula practitioners use the project area and forested areas in general for inspiration and to connect to the imagery and places that traditional mele, oli, and pule speak about.

...if you're familiar with Kau ka hali'a, which is my favorite forest entrance chant, it talks about how you're awakened out of sleep by the sound of birds on the ridges in the uplands and that it's a sign for you to get up into Laka's realm again and be a sharing companion in that realm. I have no doubt that many hula people go up to Kōke'e for that kind of inspiration. To be surrounded by the kini akua to gain inspiration via what you see and hear and experience up there. That's the kind of thing that's not going to show up as material culture right? You're not going up there necessarily to gather lei or even if you are, the fact that you're surrounded by the same kinds of images that we find in the mele and the oli and the pule means that kind of benefit and resource is just as real as the material resource.

So the non-material, right? The hula folks would be the ones that would benefit most from that kind of thing. Whenever I'm composing mele or an oli of entrance, I'm always thinking about what kinds of sights and sounds, and feelings, and the like, do I experience when I'm surrounded by that kind of thing. And then you weave it into your mele.

Dr. Gon describes his hālau's touching performance of the *mele* (song), Manu Po'ouli.

...when the po'ouli was declared extinct, or when at least the last observed individuals were seen in 2006 or so, Keola Donaghy composed a mele about the po'ouli and called it Manu Po'ouli, and Kenneth Makuakāne turned it into a song. It was a fairly obscure song, one of the songs on one of his albums, and nobody really thought about it that much. A few years ago, our hālau was involved in a series of concerts at the Mission Houses Museum, and one of them, the theme was Aloha. Over the course of the four concerts that were given in the year. One of the themes was aloha 'āina. And so in that particular one we chose to choreograph for the first time a hula to Manu Po'ouli, and we invited Ken Makuakāne to be there to sing the song while it was being danced. And I had the opportunity to tell the audience about the story of the po'ouli, how it was only discovered in the 1970s, and how it was given a name by Mary Kawena Pukui, and then how we watched over the years as the population declined. I was lucky enough to see six po'ouli in one visit on the ridge that was informally called Po'ouli Ridge, because most of the po'ouli that were seen were to be found on that ridge. And how much of a sense of loss there was when it was finally decided that they are no longer. Years of repeatedly going back to the places where they knew they were and not hearing or seeing them. So I was able to give that talk to the audience then, and then we performed the hula with Ken Makuakāne and Aaron Mahi, and other folks doing the musical backup and we had only three dancers because it's a short song, three verses. At the end of each verse one of the dancers would quietly leave the stage until there was just one dancer left and at the end of the song, falls to her knees and spreads her arms out onto the ground.

While discussing mele and the differences between traditional and contemporary compositions, Dr. Gon explains that contemporary compositions have far fewer references to native forest plants and animals than do older compositions. Dr. Gon offers an explanation for why that is.

You have to go far and make an effort in order to be surrounded by completely native forest and see our native birds firsthand. So stands to reason that it's harder to do that. It's just sad to me that kind of connection is not so easily achieved. So that's another important point to make about the need to protect these birds.

8.3.2.7 PROJECT CONCERNS AND RECOMMENDATIONS

When asked about any concerns or recommendations Dr. Gon has for the project, he said the following.

I think that any time you're using a new technology there will be many people that are concerned. And I think that it would be really important to monitor the results. Both in the suppression of mosquitoes and the response of the birds. A lot of times in conservation we find a new tool, and we jump right on it and we try it out but the follow up on seeing whether or not it's actually effective is usually lacking. Because people realize there's so many things to do in conservation and monitoring is one of the most difficult and time-consuming things to do when you could be for instance, killing more weeds or fencing more forests, things like that. So, I am concerned that this project really needs good monitoring and follow up. I'm also concerned that if the project is not successful in the first attempt that people would just give up on it. And that's not necessarily the best course. You want the thing to be successful, and you don't necessarily want to just throw your hands up and say, well, that didn't work and then move on, because we know full well that this is the first time that something's being tried in a really complex place. So I'm concerned that people will point to any kind of snags or failures as a reason to stop. I'm also concerned that there's a lot of misinformation flying around already about what this project is and is not. So, that is certainly a concern.

8.3.2.8 ADDITIONAL COMMENTS

Dr. Gon shared his thoughts on how the project will also be of benefit to humans.

Because the control of high elevation mosquitoes is the first step, and then, if that's successful and the birds can be saved, then the next step is how can we get rid of mosquitoes everywhere in the islands. Not only as a boon to native birds, but also because of global warming and the spread of tropical diseases like dengue and the like up into our latitudes. A boon to human health as well.

It is ironic that humanity or human community would be more interested in it if there was a clear threat to people. For instance, if dengue became a yearly thing and we really needed to control mosquitoes in order to get rid of dengue. Everybody would be all for it. Oh, yeah, let's find a tool to get rid of mosquitoes and the diseases that they carry. But most of them don't even think for a moment that for a century our birds have been suffering the same kind of threats. And if they were viewed as part of our communities that we would not tolerate the fact that they've been declining and been driven into extinction over the last 100 years.

Dr. Gon envisions a future where Hawai'i's native birds beg for french fries at McDonald's.

I always said that if mosquitoes were controlled, my goal would be to see native birds begging for french fries at McDonald's [chuckles]. It's a weird image... we want them to be back in our lives again. That was triggered by the fact that when I visited the Galapagos and I was in the grocery store looking for something. I was in the aisle in which the rice was found and there, amidst the rice bags and rice grains that had fallen out of the bags onto the floor were Galapagos finches hopping around eating rice in the isles of the grocery store in the Galapagos. And I was like, whaaatt?! [chuckles] We're so used to, you know, native birds being found far away from where people are. But then, you know that thought it just struck me. That would be amazing if we could have, our native birds just around us in the lowlands.

8.3.3 *Sabra L. Kauka Interview*

Sabra Kauka is a well known and respected cultural practitioner, teacher, and kumu hula. Ms. Kauka teaches Hawaiian cultural studies at Island School in Līhu'e, Kaua'i. Ms. Kauka also serves the public schools of Kaua'i through her involvement with the Department of Education's Hawaiian studies kupuna program. Ms. Kauka is also involved in surveying efforts of native sea birds on Kaua'i.

8.3.3.1 COMMENTS ON THE DECLINE OF NATIVE BIRDS

Ms. Kauka spoke about her deep concern over the decline of native birds on Kaua'i.

Gosh, so many fond memories of the birds there. I have a deep concern that the forest is becoming quiet. I don't see nearly the number of birds that I did 5, 10, 15 years ago. So I'm concerned. I also have a cabin in Kōke'e that I share with several other friends. The last time we were up there was just a few weeks ago. There should be a lot of chatter in the trees but it's becoming quiet. So that disturbs me.

Ms. Kauka underscores how important it is to do all we can to protect native birds.

If we do nothing and the numbers continue to decline to the point of extinction. I don't want to carry that burden. I don't want to be blamed for that. I want us to be proactive. I want us to do everything we can to save these species. I think their importance goes far

beyond. They're so very much a part of the cycle of life on our islands, in our mountains, in our forests. I think that it's vitally important that we do everything we possibly can to save our native species.

8.3.3.2 SUPPORT FOR THE PROJECT

Ms. Kauka expressed strong support for the project.

I am in strong support of this mosquito control effort. I have a passion for native birds. I have a deep aloha for Hawaiian culture and the importance of these birds to our culture and our history, even today.

8.3.3.3 APPRECIATION FOR THE SCIENTIFIC COMMUNITY

Ms. Kauka shared her appreciation for the scientific and conservation community on Kaua'i.

I support the work that many of my scientist friends here on this island are doing to try and save as many bird species as possible. Both birds and plants. I appreciate their work very much.

Ms. Kauka shared an experience doing night time surveying of birds in Nu'alolo Kai.

I just spent the weekend in Nu'alolo Kai on the Nā Pali coast with some extraordinary bird scientists. Two of them from the American Bird Conservancy and some other folks. They had these two binoculars I had never used before. One was a thermal binocular the other was an avian binocular that could see at night. When I was on a work trip in June the cliffs were silent and it greatly saddened me. I'm used to hearing the chicks being loud, raucous at night. Calling their parents cause they're hungry. But they asked me if it was a full moon and so I looked back on my notes and yes it was a full moon. So they explained to me the birds are quiet on the full moon. They don't make nearly as much noise. I didn't know that. So when we looked through the thermal binoculars it was amazing what we could see. There were hundreds more birds flying in the sky. I was greatly heartened by that.

Ms. Kauka shares her delight in seeing black noddies in Nu'alolo Kai.

In June we counted the black noddies in Nu'alolo Kai. I would sit there with my students between 4 and 6 o'clock and count birds. Just count them as they fly pass returning to their chicks. The professional birders, you know, gave me their binoculars and they told me to look out on the horizon and I did and oh my gosh I could see hundreds of them! I was so happy. I am so grateful for their expertise, their experience, and their knowledge that they share with us.

8.3.3.4 RECOMMENDATIONS

Ms. Kauka recommended more surveying of native bird populations using a variety of methods including using thermal binoculars at night.

I would like to see more surveys out on the Alaka'i. I'd like to see more surveys, particularly at night when maybe you can see a little more through the thermal binoculars than you can during the day or than you can through hearing. When I go hiking up there nowadays I send my students all the way to Kilohana. Three and a half miles I think it is. I love to sit in the forest and just look, watch, and listen. But like I said the forests are becoming silent.

8.3.3.5 NATIVE PLANTS

Ms. Kauka shared her concern for native plants including maile.

I'll tell you what, the forest has been so dry lately. It's not as abundant as it [maile] once was. For graduation this year I went to some places where I normally pick maile and it was so dry. They were nonexistent. They dried up. So I've increased the maile that I'm growing around my cabin. But you know, we're not up there all the time. It hasn't rained that much on the west side. There has been such a change in the forest. The invasive strawberry guava coming in and underneath it it's bare. The changes in the forest with the kahili ginger and all those things that I've seen over the past 35-40 years that I've been home. The changes in the forest that I see are very sad. But I really appreciate the work that the Kōke'e Resource Conservation Project people have done and are doing. There just needs to be more of it. We need to be more cognizant and we need to have more effort in keeping the forest as native as possible. The more native plants we have growing in the forest, the more native species, avian species and other species, can exist there.

8.3.3.6 ADDITIONAL COMMENTS

When asked, "could you share some experiences you've had with native birds up close and what that means to you?" Ms. Kauka replied, "It means the world" and then went on to describe an experience.

About three years ago we were hiking through Alaka'i swamp. The kids they just took off and were way ahead of me. I was just taking my time looking all around. I wanted to see everything I could. We had already gone all the way out to Kilohana and back and I was just taking my time because I wanted to observe everything I could. Off in the distance I saw a bird with black feathers and yellow under the tail. I was like OMG is that an 'ō'ō?! I thought they were extinct. I saw two of them. I just had my phone I didn't have a really good camera with a long lens so I didn't get a picture of them. I only told a few people because I didn't want people to think I was crazy or just imagining things. But I saw a couple of birds that looked like manu 'ō'ō. None of my bird photographer friends have seen them. None of my hiking friends have seen them. [thinking] Oh man, was I just imagining things? Or are they really still alive? I want them to live. I want them to be a part of the forest and a part of the world. They've been here longer than humans have on these islands.

8.3.4 Sally Jo Keahi Manea Interview

Sally Jo Keahi Manea moved to Hawai'i with her family in 1956 when she was 13 years old. Ms. Manea has had a lifelong passion for hula and Hawaiian culture. Even before moving to Hawai'i, she started learning hula at the age of 8 from a navy officer's wife. Ms. Manea has been a dedicated student to Kumu hula Roselle Bailey for several years. Ms. Manea is an active member of Ka 'Imi Na'auao o Hawai'i Nei Institute which is an organization formed in 1976 by Roselle Bailey with the purpose of preserving and perpetuating Native Hawaiian culture through hula. Within the institute there are several hālau distributed across Hawai'i and beyond. In addition to the network of hula hālau, the institute reaches a broad global audience through various publications, theater performances, and cultural exchanges. The institute has a close relationship with the Kaua'i Forest Bird Recovery Project. For the past 11 years, Ka 'Imi Na'auao o Hawai'i Nei Institute has led the Kaua'i Forest Bird Recovery Project in an annual blessing ceremony to mark the beginning of their research season.

8.3.4.1 PLANT RESOURCES

Ms. Manea spoke about a plot of land that she and other members of Ka 'Imi Na'auao o Hawai'i Nei Institute steward and how caring for that piece of land strengthens their hula practice.

Our institute [Ka 'Imi Na'auao o Hawai'i Nei] adopted a place up in Kōke'e in the forest, where we clean and remove the alien species. It's about a 2-acre site up there that we maintain. We clean out the invasive species and plant the natives. So that's how we continue our traditions here...

...we call it the classroom. We call it that because when we were young hula students our Kumu took us to this spot and taught us. This is palapalai, it's different from this other one don't make the mistake of gathering the other one and think it's palapalai because it's gonna die. It's not the right one, you know. She would tell us, these are the birds, these are the plants that you need to know for hula and this is how we maintain we pull the weeds. Over many years we've been doing that. So we see, we're there with our hands in the dirt pulling out the guava and the blackberry and the honeysuckle, the aliens pulling them out. And watching the small little maile sprouts growing. For the first time in my decades of living on Kaua'i and working up there we saw new Mokihana shoots sprouting in this area because we cleaned things out. So, being there, having our hands in the dirt and seeing how the forest has changed so drastically over the years on the ground. Our group was more concerned with the plants, right, because that's just what hula people do. You know. You think about the plants.

We didn't have the knowledge that we needed about the birds, and the interrelationship between the birds and the plants. And so, you know, once in a while we go, "oh, there's an 'elepaio, oh, there's an 'i'iwi," but not like now with our association with Cali and the other people from the Bird Recovery Project. We didn't notice that there weren't as many birds because we're looking at the ground, you know. I think other hula people are more concerned. Seems like. Well, I should only speak for us, but I think this might be true of others that they're focused on the plants, and they're not really realizing the interconnection, you know, that you gotta have it all because if you don't have 'ōhi'a you don't have a lot of birds that live with 'ōhi'a as their food source and shelter.

Being there, going up there and digging into the dirt it connects us to the plant aspect real firmly, but it wasn't until we opened ourselves up to the Forest Bird Recovery project people, until we collaborated with them, and opened ourselves up to this different aspect. It took that collaboration for us to really understand the larger picture. And I have a feeling that there are other hula groups that are like us, that they think about the plants, but not so much the birds and the relationship of it all.

Ms. Manea spoke about her concern over the spread of invasive plant species and how the institute's stewardship over a small area is a reminder to be hopeful for the revitalization of native species.

And, you know, when we come out from cleaning our spot up there. We look at the all the encroachment of all the weeds, and all the you know how there's so much guava, and there's so much other bad stuff. The mosquitoes are just a new example. And we think well, we just have our little itty bitty tiny little dot that we worked on here that we put our few hours in, and we pulled a few weeds here in this little spot. But we are able to see those new sprouts coming up. The new natives thriving after we pulled out all the bad guys. But when you walk out you look and you see all this vast huge forest that's endangered. It's not just the birds that are endangered, the forest is endangered. It's disheartening. It's kind of overwhelming. So you have to focus back in on the little square acre that you worked on and think about that. So that's kind of how I see this mosquito

project. That it's one small thing, but if it saves a couple of species, a few species, then it's a huge thing. And I think the researchers are dealing with that every single day. They're sad because they see their little friends dying, and feel like they can't do enough fast enough in order to stop it. It's very sad to think that we will lose a whole species. That extinction will happen before we can get the job done.

8.3.4.2 CONCERNS

8.3.4.2.1 Concerns over plant resources

You know, our group we don't go and gather maile because it's to the point now where it's not easily available. People take it indiscriminately, and they don't harvest it properly. Maybe that's a place that needs to be a focus. School kids, especially kids that are at Kekaha School, or Waimea Canyon or Hilo, or places where people traditionally go into the forest to gather maile. Even hula schools. They destroy it. They pull down branches, break branches in order to get maile from up there to pull it down. They don't harvest the right way. Those practices are not taught properly. It's disappointing. And it's hula people! After Merrie Monarch, after Prince Lot hula festival. In the past, you go up into Kōke'e and you see the place just trampled. Those are my concerns and recommendations. Really not related to the forest birds, but related to the forest. We're not doing a good enough job of teaching the real nitty gritty of conservation to our young people. We're not doing a good enough job.

Kumu hula need to encourage. Perhaps yours did. Mine did. From early on we were told you plant palapalai in your yard. You don't go to the forest, you plant kupukupu you get yourself an 'ōhi'a tree. You don't depend on the forest. That's not difficult, it's not hard to do that. That's another thing that we need to do as practitioners is to encourage growing your own stuff so you don't have to go mauka. We're fortunate on Hawai'i Island and Kaua'i especially we still have a lot of forest area.

8.3.4.3 MELE

On the topic of native forest birds as a source of inspiration to contemporary Hawaiian *haku mele* (composers), Ms. Manea shared that she wrote a song honoring native forest birds.

Because of the mosquito project and the materials that the Maui and Kaua'i Forest Bird Recovery Project people have put out related to 'ākohekohe, kiwikiu, 'akikiki and 'akeke'e, I wrote a song! Just as you speak, it's a song for today, and it's a song about these four birds. My idea was, you know the song Nā Moku 'Ehā? It goes like, [singing] Hanohano Hawai'i lā lei ka lehua lā kuahiwi nani lā 'o Mauna Kea. Four islands, the name of the island, the name of the flower, and the name of the mountain. So I did that with the birds. I did the name of the bird, the habitat, a characteristic of the feathers, and then another characteristic peculiar to that bird. It has five verses total. One verse about each bird, and the hā'ina. Our music group is practicing it. The song had its debut at the Lehua Island Restoration Art show opening on Kaua'i a couple of weeks ago. The Island Restoration people sponsored the opening of an art show in Kukui Grove Center for our Kaua'i society of artists. We were part of the entertainment there. So we debuted the song that evening. Kumu Roselle's daughter Sharon did the melody. I did the words. She sees the native birds as kind of flitting, flying back and forth [waves hands in the air]. You know, kind of like that. So she did a melody that's really lively. So there's an example of what you're talking about.

Ms. Manea shares how Ka 'Imi Na'auao o Hawai'i Nei perform mele about native birds in partnership with the activities of the Kaua'i Forest Bird Recovery Project.

So one of the performances that we did for the Kaua'i Forest Bird Recovery Project... When they wanted to go into the forest to catch the remaining family of 'akikiki in one particular area in Halepa'akai. They wanted to catch them, to take them over to Maui to be in captivity. They asked us to do some kind of a ceremony or blessing before that. So we took bird verses from five different songs. In Hawaiian music a lot of times a song will only have one verse about a bird. So we found different songs, and we took the bird verses, and we put them into a medley. And one of them is a song that Diana Aki wrote. It's called Manu Mele. One of the primary verses in this five verse mele is from her song that's a favorite for a lot of us who live here on Kaua'i.

8.3.4.4 HULA

Ms. Manea and interviewer Wainani Traub discusses how as hula practitioners they are taught to acknowledge traditional place names, native plants, and animals. And how doing so heightens their engagement with cultural places.

WT: In my experience with hālau there's power to just speaking these place names, and the plants and animals. It's like they're just kind of hanging out waiting for someone to activate them. And once you do, you know, amazing things do happen.

SJM: Yeah, exactly. Our group is very fortunate that we have a lease on a property up there. Roselle and her husband Jim acquired a part interest in this cabin in the seventies when they moved to Kaua'i. When they left Kaua'i they turned it over to Ka 'Imi Na'auao so now we manage that cabin up there. So we have a place up there. It has all the photos and the memorabilia from years and years of hula. Because we have a place, it enables us access yeah, access to the forest. So whenever we go up there we always go up to Kalalau, the upper lookout, the lower lookout. We go to all the spots. And usually when we go to Kalalau, it's our natural reaction to oli, [chanting] O Kalalau pali 'a'ala. Yeah, that particular oli. And whoever's there, it engages them instantly. You know, it's what you say, it's what you're saying. Just speaking the history, and the place names in that fashion engages everybody that's surrounding us whether it's visitors from the mainland or whether it's local people who are there. If it's Eō e Emalani time in October then there are usually other hālau people there and sometimes they join in. Just everybody becomes one thought, and it goes in the same direction. It's exactly what you were talking about.

We're fortunate, we're grateful every single day for what we have here on Kaua'i. And yet, sad that we can't do more.

8.3.4.5 'IWI ENCOUNTERS

When asked about any experiences Ms. Manea has had up close with native forest birds she shared the following story.

...on Hawai'i Island I go and visit my friend who lives in Volcano every year... Her lanai is surrounded by 'ōhi'a. It's a stop-over spot for 'i'iwi. So one of my favorite things to do when I'm with Lorna is in the early morning and in the late afternoon to just sit on the lanai there and quietly watch all the birds as they fly around. And it seems like what they're doing is, in the afternoon especially, it's like they're reporting in. You know, they're coming in and they're resting on the very top branches and some more birds come and they're talking to each other and then that one goes up this way and that one goes up

this way, and somebody else comes it's like they're like, [narrates birds' conversation] "oh, yeah we were over by the so and so, and there were lots of 'ōhi'a, there were lots of berries over there, lots of insects in this particular tree, and you might check it out tomorrow." You know what I mean? Reporting in on their activities during the day. Where everybody went, what they saw, and what they did before they go home to rest. So that's one of my experiences. But it's not here [on Kauaʻi]. You know... For me it's only been, "oh, look! There's an 'elepaio! Oh, look! There's an 'i'iwi. Or you heard that, that's a [native bird]," you know. And not more than that for me.

8.3.5 Dr. Keao NeSmith Interview

Dr. Keao NeSmith was born and raised on Kauaʻi. Dr. NeSmith has a deep grasp of the Hawaiian language and has contributed extensively to Hawaiian language revitalization efforts. Unlike the majority of Hawaiian language speakers today who acquired the language in a school setting, Dr. NeSmith learned to speak the Hawaiian language at home growing up surrounded by kupuna who spoke fluently in Hawaiian. Dr. NeSmith has been involved in community preservation efforts of heiau and other cultural sites on Kauaʻi for several years. Currently, Dr. NeSmith is an independent researcher and consultant supporting archaeology in the public and private sectors.

8.3.5.1 PLACE NAMES

Dr. NeSmith spoke about some of the place names in the project area including those with associations to birds.

There are many place names, all across the top. The high elevations up over there with bird names... figure out how that came to be. How those names came about. What's the story associated with the area and then what's the relevance and significance culturally for those names and those birds... 'I'iwi polena is one of the places. Lots of bird names associated with the ridges going down Nāpali side.... Wai'alae, 'alae is a bird name... Kilohana is called that because it's a vantage point when you get to the top of it you can turn 360 and you can see the different gulches in the different directions.

8.3.5.1.1 Kanaloahuluhulu

Dr. NeSmith clarified the potential *kaona* or hidden meanings for the place name Kanaloahuluhulu.

WT: I initially thought that Kanaloahuluhulu was a reference to birds. But then I read one version of a mo'olelo that explained that huluhulu refers to a hairy beast.

KN: Right. But it could also be *kaona* for hulu manu. Huluhulu is rarely used to mean hulu manu. So that was intentional. That kind of play in meaning is intentional. Kanaloahuluhulu, which is interesting because Kanaloa is often associated with ocean. But Kanaloa has connections with forests, and also with Kāne. Since there are springs in the area there is Kāne involved, but Kāne is almost always paired together with Kanaloa and together they produce springs. Huluhulu in this case actually refers to the foliage. The forest itself. Same for up Mauna Kea. Pu'u Huluhulu is that crater, that hill where everybody gathers during the protests. So it's the same reference. That's a kīpuka. It's all lava fields all around, except for that one area which is a kīpuka hulu nahelehele forest. So the reference is to the vegetation on the hill. The honua is the body and the huluhulu is the vegetation growing on the body.

8.3.5.1.2 Nā Keiki a Nā 'I'iwi

Dr. NeSmith tells the mo'olelo to which the place name Nā Keiki a Nā 'I'iwi derives. One version of this mo'olelo is discussed in the ethnohistorical literature section of this cultural impact assessment.

Nā keiki a 'i'iwi. It's rendered a couple of different ways. Nā keiki a nā 'i'iwi, nā keiki a Nā'iwi. When you're on the ocean looking up or on the big beach of Kalalau looking up, there is a couple of rock features or points going up the ridge. They are associated with the menehune. The menehune kids came down to play with the kids of Kalalau but they took too long, and in the morning when the sun was rising, as they were trying to make it home, they turned to stone when the sun hit them. And so they became known as Nā keiki a Nā'iwi. That's also kaona, a play on words because Nā'iwi or Nā'i'iwi as in the birds.

8.3.5.2 HULA

Dr. NeSmith describes a wahi pana within the project area where hula was performed ceremonially.

Some of the most sacred hula that would be performed on heiau for ritual ceremony are either composed up over there or performed up over there. For example, Pōhaku Wa'awa'a. When you go pass Kanaloahuluhulu and you take the highway, and it winds up further, and then you hit that stretch that goes up to the second Kalalau lookout. There is a place you can stop on the side of the road and walk through the forest and on the edge of that ridge is actually a heiau, and there's a rock over there in the shape of Kaua'i. I've been to it a number of times. That spot is the point that divides different ahupua'a going down. It's a merging point. That area also has a bird name too. I'm trying to remember. Right next to that rock, only several walking steps from that rock, there's a heiau. The remains of a heiau. It looks like a platform and that's the kind of place where hula would be performed because it's prominent it's up there considered a leyline and so it's super sacred for that. That's the kind of place where these hula would be performed, and the association with birds is that you're high up in the forest, and that's where these birds are. They [birds] associate with the gods and that's what the intent of the hula is for.

8.3.5.3 GATHERING PLANT RESOURCES

Dr. NeSmith shared his thoughts on gathering maile and mokihana.

Yeah. Locals aren't doing well in taking care and respecting the growth cycle. It's unfortunate. I would encourage maile farming instead of raiding the forest. I wish DLNR would start a campaign to encourage farming. It's a big deal on the Big Island. Maile farming is a big deal. In Panaewa and Hilo. I have friends over there with their backyard just loaded with maile. So, instead of having to go into the forest and cause all kinds of destruction. A lot of locals go in there and just shred the maile rip it apart and then it dies, or it never grows well again. For someone who wants to make a lei, you want nice long strands. You can't find nice long strands anymore. It's hard to find. You find only tiny branches here and there that are not suitable for making lei. And when people do find nice long ones they just go ahead and shred the whole thing, and don't consider you know you have to leave some. Mokihana same story.

Mokihana doesn't get shredded like maile gets shredded because maile is a vine. But Mokihana, the berries and stuff like that. People take more than they need. Just because it's May and close to graduation, you know. People will just go absolutely raid because they get desperate. So graduation comes and everybody goes and raids all the maile. It's

greedy. People get greedy and they have no consideration for the next people coming after them. For myself, I prefer to find my nice long strands, and I cut them off. I cut them off and take them home and then do the stripping instead of strip on the plant, because sometimes you pull on the thing and you pull out the whole plant roots and all. You gotta get it right. You gotta get a nice firm grip. Sometimes the bark is woody. When it's woody that means it's too old and if you try shred it off it'll just lift up the whole plant. Another problem is people don't get a good grip, and instead of getting a nice straight pull it breaks apart at different points and it's not usable so it gets tossed to the ground and in the meantime they left the plant mangled.

Dr. NeSmith describes the revitalization of wood carving using kauwila wood.

Lately people have been getting into old but new types of Hawaiian crafts like wood carving. Kauwila is one type of wood. Another problem is that Kōke'e is a state parks so you cannot just harvest that kind of thing. You cannot just take out a chain saw and cut down kauwila because you want the wood for carving. You have to get permissions. It's very difficult. For cultural practitioners there should be that kind of access, and that access should be made easy not difficult. It should be registered so we know how much of it is going on. Poaching should be regulated. But then, for those who want to have access should have access. The answer can't be no just cause it's a State Park. That should not be the answer that shuts it down, it should be the answer that makes it possible.

8.3.5.4 COMMENTS

Dr. NeSmith spoke about the threats native birds face and their importance culturally.

If the mosquitoes keep rising and keep dominating the forest, we're going to lose the birds and then the imported birds will take over. Egrets in particular because they're so aggressive. Barn owls are also super aggressive. I've seen barn owls attack native pueo because they're larger. In midair they'll just attack them, and they'll have a big fight. So sometimes you'll see pueo missing an eyeball and stuff like that from encountering barn owls.

So if we lose those things then everything will just fall to textual knowledge, you know. Mele talking about animals that the new generations will never have seen. There already are many that this generation has never seen that are mentioned in mele. Stuff like that. So they are integral to Hawaiian culture. We don't choose to lose them. We would never do that. They're national treasures. So if they're lost it's because of some catastrophe, some kind of accident. We didn't choose to let them die out. I guess the biggest threats right now would be climate change and the warming temperatures and deforestation. If there was more forestation and more forestation of native trees coming down the mountain theoretically it'll bring the cloud levels back down. Which would bring back more rain. We need those things.

8.3.5.5 NATURAL CYCLES

Dr. NeSmith explains the interconnectedness of the health of the forest and speaks about his concern over the spread of invasive species.

...one thing leads to another. We need to be able to control invasive plants. You control invasive plants, then you allow native plants to grow back. And that's what attracts the native birds and so feeds the cycle. It's the native plants that feed the whole cycle. They

also feed our culture. They feed our mele. They feed our identity. So if we allow things like the black wattle and albizia to take over, then, what's the point in saving the birds. One of the biggest natural catastrophes that's happened on Kaua'i is allowing the farming of albizia down below in Kōloa side because it spreads super fast, it grows super fast, and the seeds have spread all the way up to the top of Kawaikini so we actually see that kind of the spread of albizia way up there. That had never been seen before, and the way they grow they spread out and just cover the ground which eliminates the possibility for native plants to grow. I think the biggest mismanagement to have happened is to not realize that things grow in a cycle. The trees provide living sustenance for the birds. The birds thrive and have their role because they're also pollinators and then that goes back into the cycle and allows further propagation of native plants. It's all connected. So if we allow for these intrusive plants then that breaks that cycle and creates another cycle.

8.4 An Overview of Interviewee Comments and Recommendations

While each interviewee has a unique connection and association with the project area, the following paraphrased topics, comments, concerns, and recommendations is a distilled list that reflects the most commonly shared sentiments of the interview participants.

Overall, the interviewees were supportive of the project. Although one interviewee was cautiously wary of the project because of the failures of past biological interventions in Hawai'i's history.

Each interviewee hopes the project succeeds and accomplishes what it is intended to do.

The urgency with which we need to respond to the decline of the native forest bird populations. Interview participants do not want to lose any more bird species to extinction.

A desire for better collaboration between scientists and the local community.

Positive relationships between the scientific community and local community does exist but they would like to see more mutually beneficial partnerships.

Appreciation for the present conservation efforts that are ongoing while also acknowledging that even more support is needed.

Hunting is an important cultural practice for contemporary 'ohana (families).

While good beneficial partnerships do exist, generally speaking, there is a "gap" between the local people and non-local researchers. Each can learn from one another but there needs to be a desire and openness on both sides to do so.

Many people experience profound positive impacts to their wellbeing from watching and listening to native forest birds.

The project area is a very significant and special place that demands respect and care.

The value of composing new hula and mele about native forest birds to tell contemporary stories.

Two interviewees referenced the Eō e Emmalani i Alaka'i annual hula festival and the significance of that event in bringing together community and sparking interest in the history, cultural places, and biological communities of the project area.

There is a cohesive whole of the forest. The health of native plants are necessary for the health of native birds and so on.

The importance of providing opportunities for young people to participate in conservation efforts.
Desire to see local children and young adults pursue careers in conservation and preservation.
Desire to provide future generations the opportunity to experience and interact with native forest birds.

8.4.1 *Concerns*

All interviewees shared a great concern for the declining native bird populations and stressed the importance of native birds to Hawaiian culture past, present, and future.

Some interviewees are concerned that the project will take a while to implement.

Some interviewees shared concerns over misinformation associated with the proposed project.

Plant resources such as maile and mokihana are not as abundant as they once were. Invasive species (guava, kahili ginger, albizia) choking out the forest, unsustainable gathering practices, and the dry weather are all contributing factors. Concerns over invasive plant species choking the native plants from the forest.

Mr. DeCosta discussed the importance of hunting as a cultural practice and as food security for local families. He noted that, as hunting rights on private lands have been taken away, families depend more on hunting within public lands.

8.4.2 *Recommendations*

The feedback from interviewees knowledgeable about contemporary cultural practices undertaken within the project area or associated with native forest bird species resulted in the following recommendations.

Interviewees underscored the importance of a monitoring program for the success of the project. Interview participants recommended close monitoring of both mosquito populations and of native forest bird populations.

Some interviewees spoke about the existing positive relationships between the scientific community and local community. While these relationships do exist, the interviewees expressed a desire for there to be more mutually beneficial partnerships and opportunities for the scientific community and local community to engage with each other.

Interviewees recommended strong public messaging and public education for the project.

Interviewees recommended exploring options to expedite the project.

9 **SUMMARY AND RECOMMENDATIONS**

The findings of the CIA indicate that the proposed action is unlikely to adversely impact cultural resources, practices, and beliefs. Instead, the implementation of the project would enhance traditional cultural resources, practices, and beliefs as well as contemporary cultural practices.

9.1 **Potential Project Impacts**

The purpose of the present CIA is to assess the potential impacts of the proposed project on traditional cultural resources, customs, practices, and beliefs, as well as on any current cultural practices being

undertaken within the proposed project area. From the research gathered through this CIA, the proposed project is unlikely to adversely impact cultural resources, practices, and beliefs.

As the project is designed to protect surviving native bird populations, one of the primary impacts of this project is the anticipated positive outcome that a reduced mosquito population would have toward protecting and preserving natural and cultural resources, particularly native forest birds. As these birds are cultural resources themselves, their existence and presence within the forest environments they inhabit are important to maintaining cultural continuity between traditional and contemporary cultural customs, practices, and beliefs.

9.1.1 Cultural Resources

The project area is rich in cultural resources. Not least among these are the native forest birds that the current project is intended to protect. Several other cultural resources found within the project area are frequently used and accessed by cultural practitioners.

9.1.2 Archaeological Remains

Although most of the project area has not been archaeologically surveyed, some Native Hawaiian cultural sites have been recorded. Habitation and intensive cultivation were concentrated in valleys and along the coast, while the high elevation forests and wetlands that comprise the majority of the terrain within the project area were not as heavily utilized by Native Hawaiians. Many of the activities that took place in the uplands left little to no trace on the archaeological record. People did travel through the uplands to hunt birds, visit sacred sites, harvest trees for lumber, or gather other natural resources. These visitors to the area constructed temporary shelters and places of worship and created some of the trails that are still in use today.

Nearly all recorded archaeological sites within the project area are located in Kalalau Valley. Native Hawaiian communities in Kalalau built homes, practiced intensive irrigated agriculture, and built several heiau along a coastal trail (Major and Carpenter 1999). Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located very near or even on trails used by modern hikers and hunters.

9.1.3 Potential Impacts to Cultural Sites

The potential physical impacts that the proposed project would have on the land, both archaeologically and culturally, would be minimal and no greater than the current level of use by the public and by DOFAW and its project partners in maintaining the State Parks, Forest Reserves, and Natural Area Reserves located within the project area.

It is expected that the project would have no impact to the physical condition of constructed cultural sites (archaeological sites). Mosquito release and other project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project. The intent is for the proposed project to have as little physical impact on the landscape as possible.

The impact to established trails, some of which form part of the Nā Ala Hele trail network (Figure 4) and may be of traditional age, will not be substantially greater than that associated with current use.

The activities associated with the project would be located well away from known cultural sites. No archaeological sites have been recorded near planned project access routes, landing zones, or field camps. Many of the known archaeological sites within the project area such as Ka‘awakō are far from the trails and areas where the project activities will take place. Therefore, these sites will not be impacted by the project. Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located near trails used by modern hikers and hunters (Major and Carpenter 1999). These trails, however, will not be used for project related access and therefore the sites in Kalalau should not be impacted by the project.

9.1.4 *Hunting*

Hunting as an important cultural practice for many local ‘ohana who depend upon it for their subsistence. With the growing restrictions on hunting on private lands, these families have come to depend more and more on access to public lands, such as those within the project area. In his interview, Mr. Bill DeCosta noted that past efforts to reduce mosquito populations have involved the construction of large fences to keep wild pigs out certain natural areas, as the mud wallows that the pigs create hold water for mosquitoes to breed their larva. He feels these straight-line fences cut off the natural migration pathways of wild pigs and have a negative impact on the subsistence hunting of these animals. Mr. DeCosta’s feeling was that the proposed action could be a much better solution to the problem of reducing mosquito populations than spending money fencing wild pigs out of forest areas. He sees it as “a win-win” for both subsistence hunters and native bird populations.

9.1.5 *Potential Auditory Impacts*

Some auditory impacts would be associated with aerial operations and pedestrian teams conducting project activities. The levels of noise disturbances would vary with release method. Helicopter and drone release methods would constitute the greatest auditory disturbance. While helicopter and drone use could potentially act as a distraction to subsistence hunters and/or cultural practitioners carrying out cultural activities within the project area, these distractions would be minor and temporary. Project related aerial activities and the noise generated by them is not anticipated to be significantly greater than the current existing levels. The auditory impacts associated with the proposed project would not be greater than existing noise conditions generated from commercial helicopter tourism. It should also be noted that none of the interviewed participants noted noise as an impediment to cultural practice.

9.1.6 *Potential Positive Impacts*

The potential long-term beneficial impacts to the conservation of native forest bird species would enhance cultural resources, practices, and beliefs.

Of greater consideration to the natural and cultural environment of the project area would be the consequences of not taking action to decrease mosquito populations. If mosquito populations are not controlled and decreased, then the twin threats of avian malaria and avian pox will continue to impact native bird species, likely resulting in more extinctions. The real impacts to be considered therefore will be to the resources, the birds and the ecosystem that supports them and that they in turn support.

The control of southern house mosquito within the project area would potentially reduce the incidence of avian malaria and avian pox transmission to the six most vulnerable native forest bird species. Although the reduction of southern house mosquitos would benefit all six species, the four species that are endemic to the island, ‘akekee, ‘akikiki, ‘aniauia, and Kaua‘i ‘amakihi, are of the greatest concern as the loss of these species would result in their global extinction. Of these four species, ‘akekee and ‘akikiki are at imminent risk of extinction within the next decade (Paxton et al. 2022). Therefore, the successful

management of southern house mosquitos and the diseases they vector would, if all other limiting factors are also managed (e.g., mammalian predators, genetic impacts associated with small population sizes), allow these populations to successfully recover. To not undertake a project of this type would potentially result in the loss of more native bird species.

As has been demonstrated throughout this CIA, native bird species factor prominently in traditional Hawaiian cultural practices, customs, and beliefs. Efforts, such as the proposed use of *Wolbachia*-based Incompatible Insect Technique (IIT), that are designed to reduce the incidence of avian malaria and avian pox transmission to native forest bird species would result in positive outcomes for the species themselves and the cultural heritage associated with them.

The proposed project would have an advantageous outcome for cultural resources, practices, and beliefs associated with the project area. If no measures are taken to reduce mosquito populations, it is likely that the prevalence of disease-carrying mosquitoes would continue to increase jeopardizing the health and wellbeing of native forest birds.

9.1.7 *Potential Impacts from No Action Alternative*

Under the no action alternative, there would be severe consequences to the natural and cultural environment of the project area. If mosquito populations are not controlled and decreased, the twin threats of avian malaria and avian pox would continue to impact native bird species, likely resulting in more extinctions. As native forest birds are themselves cultural resources, their extinction would represent the loss of a cultural resource.

In addition, native forest birds form part of the larger native ecosystem and play an active role in preserving that ecosystem. Native honeycreeper species serve as pollinators and seed dispersers for certain native plants. Their decline or loss could contribute to longer term population declines of native plant species, adversely impacting the contemporary cultural practices that make use of and depend on those species.

9.2 **Recommended Mitigation Measures**

The following suggested mitigation measures are recommended to reduce project impacts.

9.2.1 *Cultural Sites*

Considering that much of the project area has not been archaeologically surveyed, previously unrecorded cultural sites are likely to be present within the project area. Such sites are, however, less likely to be present in the uplands where the majority of the project related activities would take place.

Due to the nature of the proposed project activities, it is anticipated that no cultural and historic sites will be physically impacted by project activities. Project personnel would avoid impacts to cultural sites by staying on designated roads and trails. Project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project.

9.2.2 Cultural Practices

Although no changes in public use or access are anticipated to be required for project operations, DOFAW would continue to provide notice of any changes in use or access to DOFAW-managed areas, including areas frequented by cultural practitioners, through social media announcements or updates on the DOFAW website. DOFAW also maintains a hunter email list that could be used to notify hunters about any changes to access or use of public hunting areas. If changes in public access do arise, DOFAW would consult with the ʻAha Moku representative for the area to ensure that dispersal and monitoring efforts are coordinated with cultural practitioners who may be using those areas to gather forest plants, hunt, or carry out other cultural practices. The use of ground transportation and aircraft would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners and recreationists.

9.2.3 Community Engagement and Education

Since 2018, the Birds, Not Mosquitoes Project has worked collectively to inform, engage, inspire, and connect people with Hawaiian forest birds, their conservation crisis, and the tools being pursued to protect these unique and irreplaceable parts of Hawaiʻi. Partners of the Birds, Not Mosquitoes Project have conducted over 66 “Talk Stories” (small, targeted meetings) with elected officials, community leaders, cultural practitioners, and internal stakeholders. Partners have also given over 100 larger presentations at conferences, classrooms, workshops, and conservation gatherings. The Birds, Not Mosquitoes Project is working to highlight the cultural importance of the honeycreepers by working with hālau to celebrate Hawaiian forest birds.

Partners, including DOFAW, have also created and distributed materials, print, and video, that capture the story of the forest birds and how *Wolbachia* IIT will help us protect endemic Hawaiian honeycreepers from avian malaria. The Birds, Not Mosquitoes Project social media and website are actively maintained to share information and updates about the project with the public. The Birds, Not Mosquitoes Project, in collaboration with educational partners, engages K-12 students across the state in a native bird and civics curriculum through championing a “Hawaiian Honeycreeper Day” resolution at the state legislature. Educational efforts to explain the proposed action are continuing and build on prior work in this area. Strong public messaging and public education is ongoing, including but not limited to continued communication with cultural stakeholders regarding the progress and success of the proposed program.

In addition, the Birds, Not Mosquitoes Project collaborates with ʻĀhuimanu, a group creating new biocultural expressions (oli, mele, hula, moʻolelo, ʻōlelo noʻeau) to communicate about the native Hawaiian forest birds, the extinction crisis, and possible solutions. Activities include composition, use, and sharing of *O ka lele a nei ʻāuna* (a chant which pairs the native birds of Hawaiʻi with guardians from the land and sea to guide the birds back into abundance), ʻaha (ceremonies that celebrate and uplift the native birds of Hawaiʻi) and a Manu Podcast in collaboration with *Ka Leo o ka Uluau* to highlight the manu in the mele *O ka lele a nei ʻāuna*.

10 GLOSSARY OF HAWAIIAN WORDS USED IN THE TEXT

<i>ahupua'a</i>	traditional land division usually extending from the mountains to the sea and encompassing a range of environmental zones that were known and used by the land's early Hawaiian residents. It was "so called because the boundary was marked by a heap (<i>ahu</i>) of stones surmounted by an image of a pig (<i>pua'a</i>), or because a pig or other tribute was laid on the altar as tax to the chief" (Pukui and Elbert 1971:8).
<i>'ahu 'ula</i>	feather cloak or cape, symbols of chiefly status
<i>'āina</i>	land
<i>ala hele</i>	trail, pathway, route, road, <i>ala</i> meaning trail, <i>hele</i> meaning to go or to walk, walking trail
<i>'alalā</i>	Hawaiian crow (<i>Corvus tropicus</i>)
<i>ala pi'i</i>	inland trail, <i>mauka</i> to <i>makai</i> trail, <i>ala</i> meaning trail, <i>pi'i</i> meaning to go inland. Also known as " <i>ala pi'i uka</i> " or " <i>ala pi'i mauna</i> " (<i>uka</i> meaning "inland, upland, towards the mountain," and <i>mauna</i> meaning "mountain"), these trails connected areas of coastal habitation with more inland settlements and planting areas
<i>ali'i</i>	chief, individual of chiefly blood
<i>ali'i nui</i>	high chief
<i>'ahu 'ula</i>	feather cloak or cape
<i>'elepaio</i>	(<i>Chasiempis sclateri</i>)
<i>hālau hula</i>	hula school
<i>heiau</i>	traditional temple or shrine
<i>hō'a'ilona</i>	sign, symbol
<i>hōlua</i>	a wooden sled used for sport, also the sledding course, usually a grassy slope or a created stone paved ramp
<i>hula</i>	the traditional Hawaiian dance form
<i>iholena</i>	a favorite and common native variety of banana
<i>'ili</i>	traditional land division, smaller in size and next in importance to an <i>ahupua'a</i> , usually a subdivision of an <i>ahupua'a</i>
<i>ilina</i>	burial site, grave, tomb, cemetery
<i>imu</i>	earth oven
<i>inoa</i>	name
<i>'iole</i>	hawaiian rat (<i>rattus exulans Hawaiiensis</i>)
<i>kāhili</i>	feathered standards signifying chiefly status

<i>kahuna</i>	priest, expert in any profession
<i>kalo</i>	taro (<i>Colocasia esculenta</i>)
<i>kama 'āina</i>	native born resident of an area, literally “land child.”
<i>kāne</i>	male, man
<i>kaukau ali 'i</i>	a lower order of chiefs who served the ali 'i nui
<i>kia manu</i>	birdcatcher
<i>kini akua</i>	physical manifestations of akua; the countless spirits and gods
<i>konohiki</i>	land stewards, sometimes minor ali 'i
<i>kuahiwi</i>	mountain
<i>kula</i>	plain or open country
<i>kumu</i>	teacher
<i>kumu hula</i>	hula teacher
<i>kumu oli</i>	teacher of traditional Hawaiian chant
<i>lā 'au lapa 'au</i>	traditional healing
<i>laukahi</i>	a herbaceous plant native to O'ahu and Kaua'i (<i>Plantago grayana</i>)
<i>lau hala</i>	leaf of the <i>hala</i> or Pandanus tree (<i>Pandanus tectorius</i>). Traditionally these leaves were often stripped of their thorns and woven into mats, baskets and other domestic items
<i>lei hulu</i>	feather garland (lei)
<i>lei humupapa</i>	a style of lei (garland) typically made of feathers sewn to a backing
<i>lei pāpale</i>	hatband
<i>lo 'i</i>	irrigated terrace typically used for cultivating wetland taro
<i>loko i 'a</i>	fishpond
<i>loko kuapa</i>	shoreline fishponds
<i>luna</i>	plantation overseer
<i>mahiolo</i>	wicker helmets decorated by feathers and worn by chiefs in battle
<i>maka 'āinana</i>	common people
<i>makai</i>	toward the sea

<i>mea kokua</i>	helper, typically a spouse or other family member who accompanied a leprosy patient to confinement at the Kalawao leprosy settlement on Moloka'i
<i>mele</i>	song, chant, poem of any kind
<i>mele māka'ika'i</i>	travel chant
<i>moi</i>	a delicacy fish (<i>Polydactylus sexfilis</i>)
<i>moku</i>	district, land section, or island
<i>mo'o</i>	water spirit or lizard goddess
<i>mo'olelo</i>	story, tradition, legend, history
<i>mo'o āina</i>	a parcel of land, smaller than an ili, and typically used in agriculture
<i>'ōhi'a lehua</i>	indigenous forest tree (<i>Metrosideros polymorpha</i>).
<i>'ōlapa</i>	dancer
<i>'ōlelo no'eau</i>	traditional Hawaiian proverbs and poetical sayings
<i>oli</i>	a chant that was not danced to, to chant
<i>'ōpae</i>	shrimp
<i>pa'akai</i>	sea salt
<i>papa hōlua</i>	wooden sled with two runners
<i>pīkoi</i>	tripping club, of wood or stone with a rope attached
<i>po'e</i>	people, population; plural marker
<i>pōhaku</i>	stone
<i>puapua nui</i>	a variety of banana
<i>pule</i>	prayer
<i>tūtū</i>	grandmother
<i>'uala</i>	sweet potato (<i>Ipomoea batatas</i>)
<i>'ua'u</i>	(sometimes spelled 'uwa'u) Hawaiian petrel (<i>Pterodroma sandwichensis</i>)
<i>uhi</i>	yam (<i>Dioscorea spp.</i>)
<i>wahi inoa</i>	place names
<i>wahi pana</i>	storied place, those places about which there is a story or tradition
<i>wao</i>	realms of traditionally uninhabited wilderness

<i>wao akua</i>	wilderness of the gods
<i>wao kānaka</i>	the forest realm of human activity
<i>wao kele</i>	the remote and rainy forested uplands (also <i>wao ma'u kele</i>)
<i>wao lā'au</i>	timber and forest area
<i>wao nāhele</i>	inland forest

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APPENDIX B1

Request for Information Letter



Re: Cultural Consultation for the Environmental Assessment of using *Wolbachia*-based Incompatible Insect Technique for the suppression of Southern House Mosquito (*Culex quinquefasciatus*) populations in the Kōkeʻe and Alakaʻi Wilderness areas of Kauaʻi

Aloha,

On behalf of the State of Hawaiʻi Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), SWCA Environmental Consultants (SWCA) is conducting a cultural impact assessment (CIA) for the proposed use of *Wolbachia*-based Incompatible Insect Technique (IIT) in the suppression of mosquito populations and protection of critical high-elevation native forest bird habitat within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōkeʻe and Alakaʻi Wilderness areas of Kauaʻi. The project area encompasses the ahupuaʻa (traditional land divisions) of Waimea, Wainiha, Makaweli, Hanakāpīʻai, Hanakoa, Pōhakuao, Kalalau, and Honopū. The project area also includes some high elevation areas of Lumahaʻi, Hanalei, Wailua, Hanamāʻulu, and Hanapēpē ahupuaʻa. These ahupuaʻa are within the moku (districts) of Kona, Nāpali, Haleleʻa, and to a lesser extent, Puna.

The native forest birds of Kauaʻi face several threats to their survival. Already, 10 of the 16 native honeycreepers of Kauaʻi have gone extinct, and 3 of the remaining 6 species are endangered or threatened. Although several factors contribute to the continuing decline in native bird populations, the main threats to Hawaiian forest birds are avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); diseases principally spread by the non-native southern house mosquito (*Culex quinquefasciatus*). Despite the danger that these diseases pose to native forest birds, there has not, until recently, been a viable method to control mosquito populations within natural areas in Hawaiʻi.

The Incompatible Insect Technique (IIT) has recently been successfully tested in numerous cities in the U.S. and throughout the world to control mosquitoes that carry human diseases. The technique utilizes lab-raised male mosquitoes that carry a select strain of *Wolbachia*, a bacteria that naturally occurs in up to 70% of insects, and that is naturally found in native and introduced arthropods in Hawaiʻi. When *Wolbachia* carrying male mosquitoes, which do not bite or carry diseases, are released into a target habitat and mate with female mosquitoes, the *Wolbachia* bacteria prevents the healthy development of resulting eggs. This causes a general decline in the mosquito population in the target area. The development of IIT to combat mosquito-borne diseases that affect humans presents a unique opportunity to further develop the technique to control mosquitoes that spread avian diseases to native forest bird species in Hawaiʻi. The mosquito species targeted in this process are also a vector of human diseases, such as West Nile Virus and lymphatic filariasis, and can transmit heartworm to pets. The IIT approach is also being considered for implementation by the National Park Service to control species in forest bird critical habitat on the island of Maui. It is notable that this technique does not use any genetically modified organisms or involve genetic engineering of bacteria or mosquitoes.

The DLNR proposes to employ IIT to reduce mosquito populations within the Kōkeʻe and Alakaʻi Wilderness areas of Kauaʻi. This effort is consistent with the agency's statutory missions and responsibilities. The project would involve mass-rearing and releasing of male mosquitoes that carry a strain of *Wolbachia* that is

incompatible with existing female mosquitoes in the area. The mosquitoes would be released from both the ground, along established roads and trails, and the air, from helicopters or drones (when the appropriate technology becomes available). Only existing routes of travel will be used, and no new roads, trails, or helicopter landing pads will be constructed to support this effort. There will be no additional maintenance or vegetation removal beyond normal management program operations along the routes of travel. Noise disturbances from project actions will be nominal and not greater than existing noise conditions.

The release will take place within 59,204 acres of northwestern Kaua'i (Figure 1). This area includes portions of the Kōke'e State Park, Hono o Nā Pali Natural Area Reserve, Ku'ia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alaka'i Wilderness Preserve, as well as privately owned lands (Figure 2). The Kōke'e State Park, Nā Pali-Kona Forest Reserve, and the Alaka'i Wilderness Preserve overlap with the extant native forest bird habitat, including critical habitat for 'akeke'e and 'akikiki, on the island. Extensive pre- and post-release monitoring would be implemented to determine the impacts of releasing the Wolbachia infected male mosquitoes on the local mosquito population.

The project area encompasses a large portion of Kaua'i's surviving native rainforest, a landscape imbued with cultural significance. The several wahi pana (storied places) found in these areas are integrated cultural and natural landscapes strongly associated with Native Hawaiian cultural traditions, practices, and beliefs. As the project is designed to protect surviving native bird populations, this CIA is particularly concerned with recording the past and present cultural significance of native forest birds and the environments they inhabit.

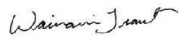
The purpose of the present CIA is to assess the potential impacts of the proposed releases of male mosquitoes with incompatible Wolbachia and the various activities associated with it on traditional cultural resources, customs, practices, and beliefs, as well as on any current ongoing cultural practices within the project area.

As part of this study, SWCA is attempting to identify and consult with individuals and organizations possessing knowledge of the past and present cultural uses of the project area, as well as the cultural practices and beliefs associated with the native forest birds that will be beneficially impacted by the project. We are seeking your kōkua and mana'o regarding the following aspects of our study:

- Help identify kama'āina, kūpuna, and other individuals who might be willing to share their cultural knowledge of the project area and its cultural resources
- Information on the present and past land use of the project area
- Information on place names and cultural traditions associated with the project area
- Information on cultural resources that may be impacted by project activities
- Knowledge of traditional gathering practices within the project area, both past and ongoing
- Information on any current cultural practices being carried out within the project area
- Any other cultural concerns the community might have related to cultural practices within or in the vicinity of the project area

We appreciate any information you would be willing to share regarding the project area and those individuals knowledgeable about its past and present cultural uses. Please contact us at Wainani.Traub@swca.com or by phone at (808) 646-6309. We look forward to hearing from you.

Mahalo no kou kōkua 'ana mai,



Wainani Traub
Staff Anthropologist

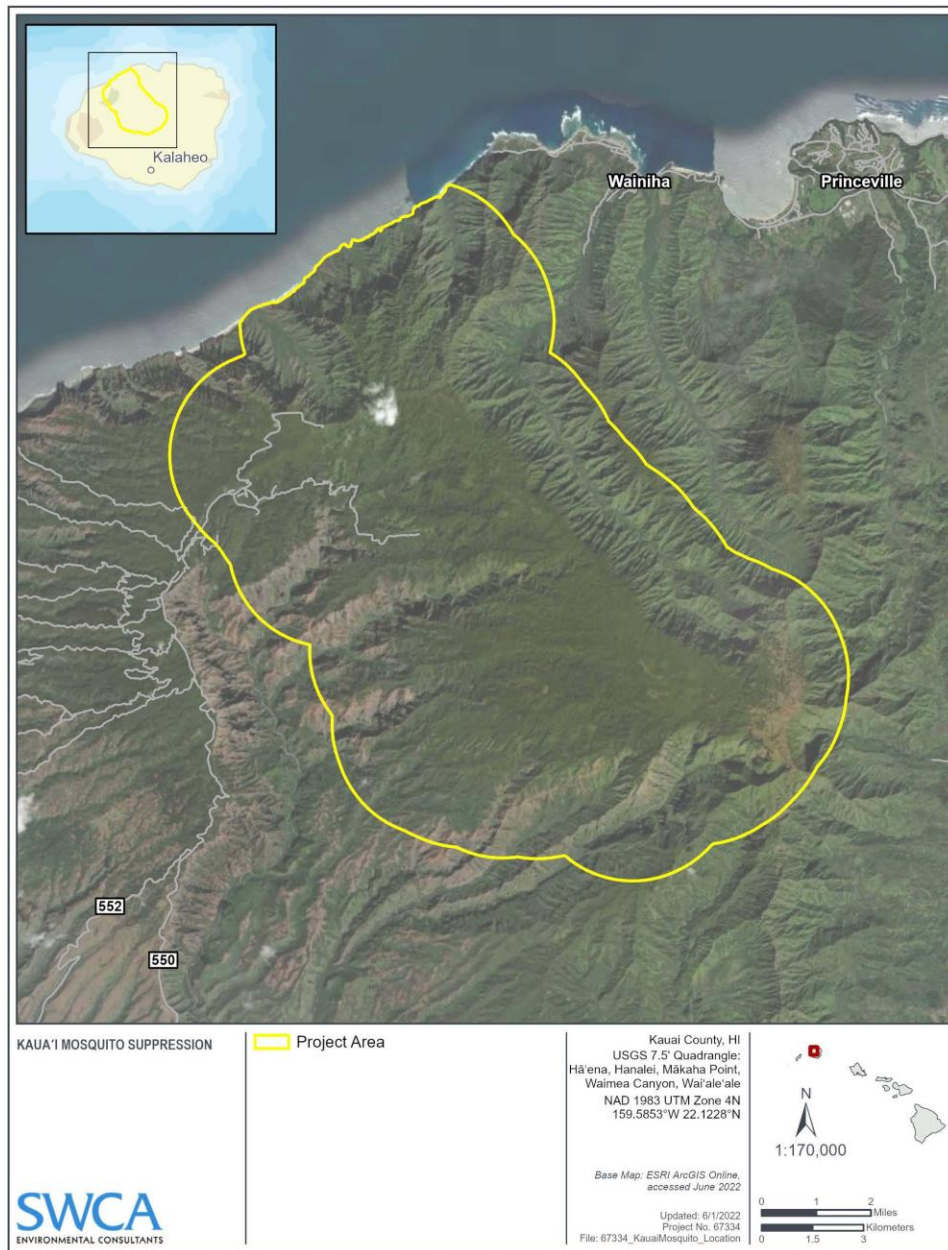


Figure 1. Boundaries of the project area.

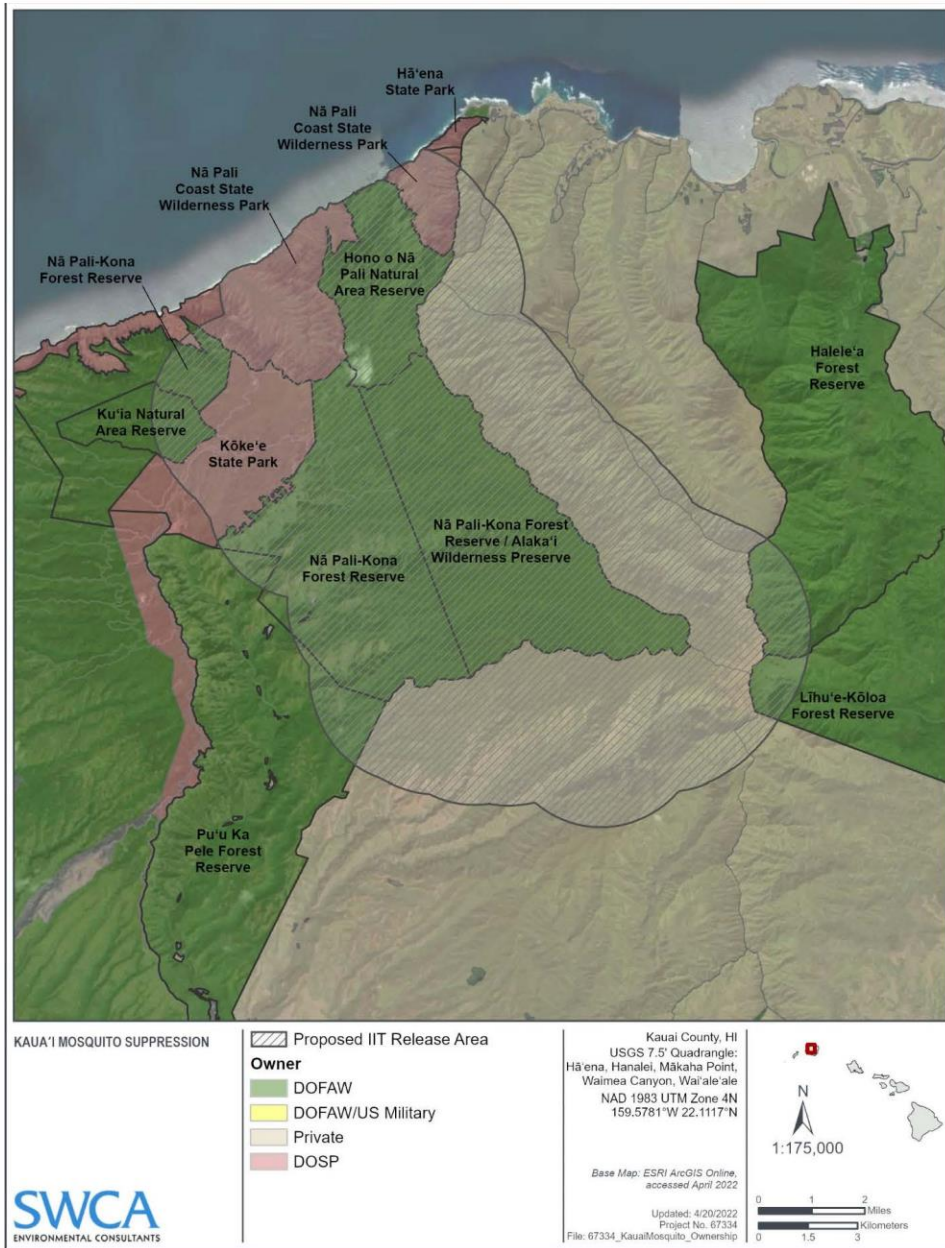


Figure 2. State Parks, Forest Reserves, and Natural Area Reserves within and overlapping the project area.

APPENDIX B2

Table of Individuals and Organizations Contacted

Contact	Title	Agency, Organization, or Affiliation	Initial Outreach (date)	Contact Response (date)	Response Details
S. Ka'āhiki Solis	Cultural Historian (Oahu, Kauai, and Niihau)	State Historic Preservation Division	6/27/2022	6/28/2022	Recommended organizations and individuals to contact. Provided a CIA checklist
Kauanoë Hoomanawanui	Burial Sites Specialist (Kauai and Niihau)	State Historic Preservation Division	6/27/2022		No response
David Buckley	Kauai Lead Archaeologist	State Historic Preservation Division	6/27/2022		No response
Dr. Tamara Luthy	Ethnographer	State Historic Preservation Division	6/27/2022		No response
Carol Lovell	Kawaihau Representative	Kaua'i Ni'ihau Island Burial Council	6/27/2022	7/5/2022	Recommended individuals and a book
Ka'āina S. Hull	Director	County of Kaua'i Planning Department	6/27/2022		No response
Dale Cua	Regulatory Planning Chief	County of Kaua'i Planning Department	6/27/2022		No response
		Kauai Historic Preservation Review Commission	6/27/2022		No response
		Kaua'i County Council	6/27/2022		Received auto reply. Interviewed councilman Bill DeCosta
Dan Ahuna	Kaua'i and Ni'ihau Trustee	Office of Hawaiian Affairs	6/27/2022		No response
Sylvia M. Hussey Ed.D.	Ka Pouhana, Chief Executive Officer	Office of Hawaiian Affairs	6/27/2022	6/27/2022	Forwarded the email to OHACompliance@oha.org with message
Casey K. Brown	Ka Pou Nui, Chief Operating Officer	Office of Hawaiian Affairs	6/27/2022		No response
Ramona Hinck	Ka Pou Kihī Kanaloa, Resource Management Director and Chief Financial Officer	Office of Hawaiian Affairs	6/27/2022		No response
Lisa Watkins-Victorino	Ka Pou Kihī Kāne, Research Director	Office of Hawaiian Affairs	6/27/2022		No response
Alice Silbanuz	Ka Pou Kihī Lono, Community Engagement Director (Interim)	Office of Hawaiian Affairs	6/27/2022	6/27/2022	Forwarded the email to others in OHA (Capsun Poe and Casey Brown)
Kalani Fronda	Land Assets Director	Office of Hawaiian Affairs	6/27/2022		No response
Mr. Noa Mau-Espirito		Na Mookupuna o Wailua	6/27/2022		No response
Ms. Kanoe Ahuna	President and Director	EAO Hawaii Inc.	6/27/2022		No response

Kamealoha Hanohano Pa-Smith	Program Administrator	Hanalei River Heritage Foundation	6/27/2022		No response
Mr. Kamealoha Smith	Board Member	Mahamoku Ohana Council	6/27/2022		No response
Sherrí Cummings	President	Malama Anahola	6/27/2022		No response
Ms. Mililani Trask	Convenor	Na Koa Ikaika Ka Lahui Hawaii	6/27/2022		No response
Ms. Donna Kaliko Santos		Nā Kuleana o Kānaka ʻŌiwi	6/27/2022		No response
Lance Kamuela Gomes	Konohiki Chief	Wahiawa Ahupuaa LCA 7714B Apana 6 RP 7813	6/27/2022		No response
ʻĀnela Jackson	President	ʻAha Mālama, Corp.	6/27/2022		No response
Mr. Hailama Farden	President	Association of Hawaiian Civic Clubs	6/27/2022		No response
Mr. Joseph Kūhiō Lewis	Chief Executive Officer	Council for Native Hawaiian Advancement	6/27/2022		No response
Mr. Adrian Nakea Silva	Chairman	Hui Huliāu Inc.	6/27/2022		No response
Ms. Dreanalee Kalili	Treasurer	Imua Hawaii	6/27/2022		No response
Ms. Taffi Wise	Executive Director	Kanu o ka ʻĀina Learning ʻOhana	6/27/2022		No response
Naʻunānikinau Kamaliʻi		Kawaileo Law A Limited Liability Law Company	6/27/2022		No response
Ms. Mililani Trask	Convenor	Na Koa Ikaika Ka Lahui Hawaii	6/27/2022		No response
Mr. Dennis W. Ragsdale	Advocate General	Order of Kamehameha I	6/27/2022		No response
Ms. Sheri-Ann Daniels Ed.D.	Executive Director	Papa Ola Lokahi	6/27/2022		No response
Mr. Jan E. Hanohano Dill	President and COB	Partners in Development Foundation	6/27/2022		No response
Mr. Laʻakea Sukanuma	President	The Mary Kawena Pūkuʻi Cultural Preservation Society	6/27/2022	6/30/2022	Replied with story about Keahi Luahine testing the chanting ability of Mary Kawena Pukui at a place below Alakaʻi.
Walter Ritte	Executive Director	ʻĀina Momona	6/27/2022		No response
Trisha Kehaulani Watson	Vice President	ʻĀina Momona	6/27/2022		No response
		Na Pali Coast ʻOhana	6/27/2022		No response
Sam ʻOhu Gon		The Nature Conservancy of Hawaii, Cultural Practitioner, BLNR, etc.	6/27/2022	8/17/2022	Interview conducted on 8/22/2022
Leināʻala Pavao Jardín	Kumu Hula	Hālau Ka Lei Mokihana O Leināʻala	7/11/2022		No response
Lahela Spencer	Kumu Hula		6/27/2022		No response
		Kauaʻi Museum	6/27/2022		No response
Leilani Darryl		Kauaʻi Cultural Center	6/27/2022		No response

Kiersten Faulkner	Executive Director	Historic Hawai'i Foundation	6/27/2022		No response
Randy Wichman	Interim President	Kaua'i Historical Society	6/27/2022		Received auto reply
Chris Faye		Hui o Laka - Koke'e Natural History Museum	6/27/2022		No response
Lucas Behnke	Kauai TNC Director	The Nature Conservancy	6/27/2022		No response
Ms. Sabra Kauka	Cultural practitioner, ethnobotanist, teacher	Na Pali Coast 'Ohana; Na Kahu Hikina A Ka La	6/27/2022	8/22/2022	Interview conducted on 8/24/22
Hob Osterlund	Writer and Photographer	Kauai Albatross Network; Kauai Wildlife Coalition	6/27/2022		No response
Maka'ala Ka'auomoana		Hanalei Watershed Hui; Kauai Wildlife Coalition; Hui Ho'omalua i ka 'āina	6/27/2022		No response
Aletha Kaohi		Interviewee from previous CIA	7/8/2022		No response
Presley Wann	President	Hui Maka'āinana o Makana	7/7/22	7/28/2022	Expressed interest initially. Did not respond to follow up emails
Dr. Keao NeSmith	Board member	Friends of King Kaumuali'i	7/7/22		Interview conducted on 10/6/22
Maureen Fodale		Friends of Kaumualii	7/7/22	7/8/22	Talked with Wainani on the phone 7/8 Maureen will forward the RFI letter to Aletha Kaohi, Keao NeSmith, Mike DeMotta, Cali Crampton, and others. Aletha's family story about uncle with Hansen's hid in forest communicated with family using bird calls
		Kauai Community College Hawaiian Studies Department	6/28/2022		No response
		Hanalei Canoe Club	6/28/2022		No response
Bill DeCosta	Councilman	Kauai County Council	6/27/2022	7/1/2022	Interview conducted on 7/5/22
Keahi Manea	Kumu	Ka 'Imi Na'auao o Hawai'i Nei Institute	7/11/2022	7/19/2022	Interview conducted on 8/24/22
Kēhaulani Kekua	Kumu Hula	Hālau Palaihiwa o Kaipuwai	7/11/2022		No response
Kāhealani Hāmākua	Kumu		7/11/2022		No response
Dr. Mehana Blaich Vaughan	Associate Professor	Department of Natural Resources and Environmental Management, UH Mānoa	7/11/2022		No response
Julia Diegmann	Outreach Specialist	Kauai Forest Bird Recovery Project	7/8/2022	7/8/2022	Recommended organizations and individuals

APPENDIX B3

Interview Consent Forms

SWCA INFORMED CONSENT FORM, INTERVIEWS

KAUA'I MOSQUITO SUPPRESSION EA (CIA

Date of Interview(s): 7/5/2022 Project Name/Number: COMPONENT) (0067334-000-HON)

Name of Interviewee: Bill DeCosta

Name of SWCA Interviewer: Wainani Traub Project Proponent: DLNR DOFAW

Both the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) and SWCA are very grateful to you for your participation in this information gathering process and for sharing your mana'o with us. We value and respect your knowledge regarding the traditional cultural history, resources, customs, practices, and beliefs associated with the proposed project area, as well as any contemporary cultural practices taking place there, and wish to accurately convey this information in the Cultural Impact Assessment being prepared for the project. For this reason, we are requesting that you allow us to share the information obtained during our discussions.

When signing below, I show that:

- I have been informed about this project and know that I will be asked my opinion about places of traditional or cultural importance that may be impacted by the project. I also feel comfortable asking for further information about any parts of the project that are not yet clear to me.
- I fully understand that my participation in the study is voluntary and that I am free to withdraw my consent and discontinue participation at any time.
- I understand that, if at any time during our talk, I feel uncomfortable answering a question, that I can let the interviewer know, and that I do not have to answer it.
- I am providing information about this area with the understanding that SWCA may provide this information to the project proponent to advise them regarding the appropriate treatment of these lands and any important cultural places or practices related to it.
- I understand that the treatment of any human remains on these lands will be handled sensitively, and that State Guidelines will be followed by the appropriate Agency and the landowners.

Yes No I have given my permission for the interviewer to record our conversation about this project so that my words will be as accurately noted as possible in the report.

Yes No I have given my permission for this, and additional, interviews and/or field visits to be recorded on videotape.

Yes No I have given my permission for photograph(s) to be taken of me for this project.

Yes No If any audio, video, or photographs are made of me, I wish to be sent copies of these.

Yes No I would like my name to appear in the report acknowledging my contribution to this work (If not, I understand that my name will remain in the contracting agency's files).

Yes No If photographs are used of me in any project work, I wish that I be identified by name in the caption. (This way, later generations will be able to identify me in the photos).

Yes No May this information be used in other future projects? (If not, my permission is required if the information obtained from this interview or field visit is used for any other project besides this one)

Please note any stipulations or clarifications of these points you might have on the back of this page.

Interviewee's Signature: 

SWCA Interviewer's Signature: 

Thank you very much for your participation in this process.

Please note below any other stipulations or clarifications regarding your participation in this project.

SWCA INFORMED CONSENT FORM, INTERVIEWS

Date of Interview(s): 8/22/2022 **Project Name/Number:** Kaua'i Mosquito Suppression CIA component

Name of Interviewee: Samuel M. 'Olu Gon III, PhD

Name of SWCA Interviewer: Wainani Traub **Project Proponent:** DLNR DOFAW

Both the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) and SWCA are very grateful to you for your participation in this information gathering process and for sharing your mana'o with us. We value and respect your knowledge regarding the traditional cultural history, resources, customs, practices, and beliefs associated with the proposed project area, as well as any contemporary cultural practices taking place there, and wish to accurately convey this information in the Cultural Impact Assessment being prepared for the project. For this reason, we are requesting that you allow us to share the information obtained during our discussions.

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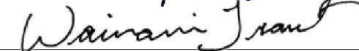
Yes No I would like my name to appear in the report acknowledging my contribution to this work (If not, I understand that my name will remain in the contracting agency's files).

Yes No If photographs are used of me in any project work, I wish that I be identified by name in the caption. (This way, later generations will be able to identify me in the photos).

Yes No May this information be used in other future projects? (If not, my permission is required if the information obtained from this interview or field visit is used for any other project besides this one)

Please note any stipulations or clarifications of these points you might have on the back of this page.

Interviewee's Signature: 

SWCA Interviewer's Signature: 

Thank you very much for your participation in this process.

Please note below any other stipulations or clarifications regarding your participation in this project.

SWCA INFORMED CONSENT FORM, INTERVIEWS

Kaua'i Mosquito Suppression Project CIA
component

Date of Interview(s): 8/24/2022 Project Name/Number: _____

Name of Interviewee: Sabra L. Kauka

Name of SWCA Interviewer: Wainani Traub Project Proponent: DLNR DOFAW

Both the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) and SWCA are very grateful to you for your participation in this information gathering process and for sharing your mana'o with us. We value and respect your knowledge regarding the traditional cultural history, resources, customs, practices, and beliefs associated with the proposed project area, as well as any contemporary cultural practices taking place there, and wish to accurately convey this information in the Cultural Impact Assessment being prepared for the project. For this reason, we are requesting that you allow us to share the information obtained during our discussions.

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- Yes ___ No I have given my permission for photograph(s) to be taken of me for this project.
- Yes ___ No If any audio, video, or photographs are made of me, I wish to be sent copies of these.
- Yes ___ No I would like my name to appear in the report acknowledging my contribution to this work (If not, I understand that my name will remain in the contracting agency's files).
- Yes ___ No If photographs are used of me in any project work, I wish that I be identified by name in the caption. (This way, later generations will be able to identify me in the photos).
- Yes ___ No May this information be used in other future projects? (If not, my permission is required if the information obtained from this interview or field visit is used for any other project besides this one)

Please note any stipulations or clarifications of these points you might have on the following page.

Interviewee's Signature: Sabra L. Kauka

SWCA Interviewer's Signature: Wainani Traub

Thank you very much for your participation in this process.

Please note below any other stipulations or clarifications regarding your participation in this project.

SWCA INFORMED CONSENT FORM, INTERVIEWS

Kaua'i Mosquito Suppression Project CIA

Date of Interview(s): 8/24/2022 Project Name/Number: component

Name of Interviewee: Sally Jo Keahi Manea

Name of SWCA Interviewer: Wainani Traub Project Proponent: DLNR DOFAW

Both the Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) and SWCA are very grateful to you for your participation in this information gathering process and for sharing your mana'o with us. We value and respect your knowledge regarding the traditional cultural history, resources, customs, practices, and beliefs associated with the proposed project area, as well as any contemporary cultural practices taking place there, and wish to accurately convey this information in the Cultural Impact Assessment being prepared for the project. For this reason, we are requesting that you allow us to share the information obtained during our discussions.

When signing below, I show that:

- I have been informed about this project and know that I will be asked my opinion about places of traditional or cultural importance that may be impacted by the project. I also feel comfortable asking for further information about any parts of the project that are not yet clear to me.
- I fully understand that my participation in the study is voluntary and that I am free to withdraw my consent and discontinue participation at any time.
- I understand that, if at any time during our talk, I feel uncomfortable answering a question, that I can let the interviewer know, and that I do not have to answer it.
- I am providing information about this area with the understanding that SWCA may provide this information to the project proponent to advise them regarding the appropriate treatment of these lands and any important cultural places or practices related to it.
- I understand that the treatment of any human remains on these lands will be handled sensitively, and that State Guidelines will be followed by the appropriate Agency and the landowners.
- Yes ___ No I have given my permission for the interviewer to record our conversation about this project so that my words will be as accurately noted as possible in the report.
- Yes ___ No I have given my permission for this, and additional, interviews and/or field visits to be recorded on videotape.
- Yes No I have given my permission for photograph(s) to be taken of me for this project.
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- Yes ___ No If photographs are used of me in any project work, I wish that I be identified by name in the caption. (This way, later generations will be able to identify me in the photos).
- Yes ___ No May this information be used in other future projects? (If not, my permission is required if the information obtained from this interview or field visit is used for any other project besides this one)

Please note any stipulations or clarifications of these points you might have on the following page.

Interviewee's Signature: Sally Jo Manea

SWCA Interviewer's Signature: Wainani Traub

Thank you very much for your participation in this process.

no further comments noted. SVM.

SWCA INFORMED CONSENT FORM, INTERVIEWS

Date of Interview(s): 10/6/2022 Project Name/Number: Kauai Mosquito Suppression EA (CIA component) (0067334-000-HON)

Name of Interviewee: Keao NeSmith

Name of SWCA Interviewer: Wainani Traub Project Proponent: DLNR DOFAW

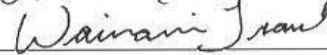
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Interviewee's Signature: 

SWCA Interviewer's Signature: 

Thank you very much for your participation in this process.

APPENDIX B4

Interview Transcripts

Cultural Consultation Interview Concerning State Mosquito Suppression Efforts in Kōkeʻe and Alakaʻi Wilderness Areas of Kauaʻi

Zoom video conference on July 5, 2022

Interviewee: Bill DeCosta [BD]

Location: Kauaʻi

Interviewer: Wainani Traub [WT]

Location: Kāneʻohe, Oʻahu

Transcript

WT: Describe your connection to the project area, how long have you been on Kauaʻi?

BD: Local boy. Four generations. Portuguese on my dad's side, Spanish from my mom's side. Dad was a sugar plantation superintendent. Mom was a pineapple worker in her younger days when they had the pineapple factories and then ended up being a nurse aide at the care home for elderly people. I grew up on the West side of the island and I went to high school at a public high school. I grew up hunting on the Robinson terrain which is one of the private landowners. Very good hunting. Goats, pigs. Now, there's deer that have migrated over. I went to California for college got a bachelor's degree from Humboldt State University in business economics.

In 2000 I decided to be a teacher when we had a teacher shortage statewide. I taught for ten years at a high school and then I applied to be the environmental teacher. I don't believe I was the most qualified with the curriculum base but I knew the teacher before me. He was my high school teacher, and he was very smart. He knew a lot about the birds and the forest and the native flora so he taught me a lot. I thought I could carry on his legacy a lot better than any other candidate, so I took the job for the Department of Education, and I worked for 11 years up in Kōkeʻe hiking every and any trail all the way into the Alakaʻi wilderness, the bog, overlooking the Waimea rim, Awaʻawapuhi, Nuʻalolo, Waipoʻo Falls. I got to see and experience many of our native birds.

I grew up hunting in that swamp lands with my dad guys. Alakaʻi swamp and the Camp 10 rim area overlooking Mōhihi and where they call the bird house in the back of Camp 10 flats. Certain time of the year we would go on the Robinson land. Other times we would go Alakaʻi bog area in the Camp 10, Camp 8, Camp 7 area. Those are all the areas in the back of the summit on state land exactly where they are currently doing the fencing and now the mosquito introduction.

There is one area named after my uncle, George Rapozo, they called him Jungaro, but his name was actually George, and this place is called Jungaro Puka. Rapozo Puka actually is the more common term now. It's a hole in the mountain between Alakaʻi Swamp and Wainiha Valley. Actually, that hole where you overlook Wainiha Ridge in the backside of Alakaʻi bog overlooking the north side of the island, if you're facing 12 o'clock, at 10 o'clock there's a valley called Hanakoa. Hanakoa is the north side of the island. You have Hanakāpiʻai and it wraps around 11 miles to Kalalau. Hanakoa is your middle about 5 miles in. That valley during the summertime get a lot of wild pig because of the mango and mountain apple. During the wintertime the animals migrate up towards the summit of Alakaʻi and go to where they call Rapozo Puka and into the Alakaʻi Bog. We would get really good hunting cause they would come for the guava the strawberry pineapple guava the red and yellow small guava and then they would return back in the spring around February April when the guava would end and head back down to Hanakoa. That's where they would live out their summertime until July when they had mango and mountain apple and then make the same journey back up again in October when the forest had its winter crop of guava.

Now, there's a whole bunch of fences that cut off the migration between Hanakoa and the Alaka'i Swamp area. I've been very involved with DLNR trying to explain to them if they did those things to protect the native forest and cut off the wild boar from migrating they would create a larger havoc in Hanakoa because now the pigs spend all year round in there. There is no hunting with dogs in Hanakoa there's only bow and arrow. Archery hunters are known to be very selective. They go after trophy pigs, and they have only one arrow and one shot. They're not going to waste it on a small pig. I'm a firm believer of using hunting dogs in areas to keep the pig population down. I may sound inhumane when I tell you this, but it comes with four generations of experience. Hunting dogs tend to kill off the baby pigs quicker than they do the adult pigs which help control the amount of babies that survive each year. Pigs are worse than rats and they breed twice a year 4 to 12 babies and anywhere from 6 to 8 is a good survival rate so if you don't kill off some of the babies you can end up with 20 pigs. I just told DLNR that I think they need to open the floor twice a year in the June and July months and let the pig hunters go in with the dogs to better control the population in those areas. But I don't think they listen to me.

WT: Before we get too far off. I wanted to circle back to the hole in the mountain. It was named after your uncle?

BD: Uncle. George Rapozo. Cousin to my dad guys. It's like a deep valley a deep crack that ended up sinking in so it looks like a valley. It's in the Alaka'i area.

WT: Is that a place where he hunted?

BD: So what happened is in the... gosh I'm not sure if I have my timeline correct, but I know the stories. Before the plantations unionized, I believe somewhere around the 1940s maybe the 1950s. There was some pushback by certain people. The Robinson family and the rest of the large landowners took away the harvesting rights of the people to go hunting on private lands. So the people could not go and catch the pig or the goat they needed to feed their families. There's a lot of people who fed their families for generations on wild meat. It's hard to fathom you know it's hard to come to realization that families use that much meat but when you have a very small paycheck and you are able to buy flour to bake bread or rice to subsidize your meat dish a lot of the wild meat was very financially able to subsidize the lifestyle. So when the private landowners took away hunting rights people were forced to go and learn the public lands that was left to hunt. That's when that area Rapozo Puka became a very popular place to go catch a pig to feed the family. It was almost like the icebox, a guarantee spot especially during the winter months. That whole back summit, Alaka'i Bog, Rapozo Puka is actually inside the Alaka'i Bog and Camp 10 Flats overlooking Wainiha Rim. Wainiha Valley is also owned by the Robinsons and the pigs migrate from in Wainiha. In the summertime they're in Wainiha for the mango and mountain apple and they migrate up into the Alaka'i Bog during the wintertime for the guava. So we had really good hunting. It's not like that anymore. A lot of the pigs cannot migrate. And there were a few other families that knew of the area. The Parubru family was another old time family that knew of the area.

WT: According to the 2004 CIA for Kōke'e and Waimea State Parks, hunters back then were hunting pig, goat, black tailed deer, and game birds. Would you say that's what people are still hunting today?

BD: Yes. Still hunting today. Also another family name that used the Alaka'i Rim besides the Parubru family besides Dusty was this gentleman named George Perreira. He enjoyed going down into that Wainiha Rim area. I believe his hunting crew now they're older than me, they're in their 70s. A gentleman named Cesar Jardin was one, Michael Pereira, Scottie Vidinah those are all men in their 70s who hunted that area quite frequently. Now with all the fencing going on I don't believe their sons, who are a little younger than I am, find it very profitable to go back there anymore because of the lack of the harvesting ratio. You know, you like to catch a pig, right, when you go

hunting. You don't want to waste a weekend cause you got to go back to work Monday through Friday.

So those family names are very important because those are the families that kept the population under control in those areas. So that was the Parubru, Perreira, George Pereira, Dusty Perubru, Caesar Jardin, Scottie Vidinah. Those are all old-time men that enjoyed those areas besides my family the DeCostas and Rapozos.

You know I wanted to tell you this past weekend I took a walk into Miloli'i towards Nu'alolo. I did some hunting around the enclosures some very large enclosures in the Ku'ia Reserve. I took some videos and pictures of the fence because it's in desperate need of repair. The pigs and deer are all in the area of the fence because the wood fenceposts are all rotten. It just breaks my heart that we spend you know possibly a million dollars or more to put in these enclosures. Which I spoke against. I support small enclosures around the native flora that needs to be protected. I don't like large enclosures that cannot be maintained. I specifically told DLNR we don't have the manpower to go inspect the fence for damage from fallen trees. The pigs tend to lift the fence with their snouts and create a hole that they can go in and out. Once a pig gets into a fenced area with their herd they can create quite a bit of damage. But no one listened to me. They put up these large enclosures and now there's a lot more game in the enclosures than there is outside. We do have hunters that DLNR allow to go into the fenced area but it's not enough it's a poor way of protecting our natural native flora that is endangered. We need to create smaller enclosures to protect the rare plants. Maybe two acre by two acre or five acre by five acre. Right now, they're enclosing hundreds and hundreds of acres up to a thousand acres and we have no funding to maintain it so what happens when a branch in a windstorm lays down the fence and then the deer take it over.

WT: Thank you for sharing. I was going to ask about your concerns and recommendations. Getting back to the mosquito project, for this project there will be no fencing. I saw that there was a CIA done for the Alaka'i fence project. I'll see if anyone interviewed for that CIA had the same concerns you're expressing now. Still, thank you for sharing, this is something to take note of and know that this is on the hunters' minds. I don't know that this project could address these concerns directly.

BD: Prior to your mosquito introduction the big thing according to the environmentalists was to protect their native flora from the pigs uprooting it and also to protect the native birds from the mud wallows that the pigs would roll in causing the oil from their skin to seal the mud which held water for mosquitoes to breed their larva. So now that you introduce these male mosquitos and hopefully it does its job the way it should. We don't have to worry about those wallows holding mosquitoes anymore so maybe those large fences to keep pigs out can be something of the past. And I would like to see smaller protective enclosures around our rare trees and plants. I think it's a win-win because when you have smaller enclosures you know exactly where to go and look at the perimeter to see if any fallen branches or any wild pigs uprooted that fence. And pigs can go around a fence if they have another route to get to where they want to go. If it's a straight-line fence cutting off their natural pathway to migrate, they will find a way to uproot that fence. We are putting skirts now on the ground that goes out 4-6 feet so the pigs cannot dig but that metal skirt is galvanized it's on the forest floor which is wet and eventually that galvanized skirt will rot and I don't know if we have the funding to remove those rotten fences one day. This mosquito intervention could be a much better solution than what we have tried in the past. The sad part about it is we spend so much money fencing out wild pigs because they create the wallows for these mosquitos to breed and now we have a better solution.

This is my own opinion, and you can quote me. Mankind think they can solve every problem in mother nature. You know who's the biggest problem? We are. We are the biggest problem. Our

biggest problem is not mankind venturing into the forest, our biggest problem is mankind trying to fix the forest without doing their proper homework first to figure out the proper solution. The trouble with all of our environmentalists is they get their education from universities abroad and study all of the different techniques in the different ecosystems but Hawai'i is so unique, unlike any place else in the world. We are the most unique place. The only statistical data we can gather that is worth anything is from our island itself. We gotta go back to the people who have been here for generations to assist the ones who are here currently with the degree. I've had no success sharing my mana'o with these younger educated environmentalists. It seems like they have blinders on and they think they know everything. I've had some success and much respect for a local girl named Mapuana she's in DLNR. Kamehameha girl, very bright, very respectful. She has taken my comments and my suggestions to heart but it's hard when she's not in charge. So, I want a better relationship with DLNR. I think they owe it to us, the generations who came before them, to listen to some of the things we have to say. Oh, wow I sound like a state senator! I know you thinking man, this uncle kinda one smart guy [chuckles].

WT: [chuckles] Of course, yeah. I mahalo you for taking the time to talk with me and I'm writing down exactly what you're saying. Your input will make it into the report. This is exactly the intention of the study, to listen to the older generations who know their stuff and who know that environment and how it works, all of its systems like how you describe the way the pigs move and all that.

BD: Real quickly, that one area I told you about Hanakoa it stretches along the Nā Pali trail. DLNR has spent much time eradicating the goats in that area removing goats because the goats would nibble on some of the rare plants that are in that area. We've told them many times that the goats tend to be a weed controller, and yes, they do nibble on some of the native tress, but it's better to lose three native trees out of 12 and still keep 8 or 9 growing because the goats do a good job of keeping the large invasive grasses down. Now, because the goats were eradicated, those grasses have grown 5-6 feet tall and they have sucked out the life of all those little shrub native plants. So we try to do one environmental technique and it creates a larger havoc.

We learned that on the Big Island with the palila bird and the māmane tree. The sheep would nibble on the māmane tree and it would take away all the undergrowth of the tree and only leave the top where the sheep couldn't reach. So they were thinking that if there were no sheep the māmane tree would grow much larger and would have more birds nesting in the tree. Which is true. But now the grasses got so tall because the sheep doesn't only nibble on the māmane tree they nibble on the grass. Now the grass is taller than the trees and the rats and mice can climb up the blades of grass and can eat the eggs in the nest, and also it's a fire hazard, and thirdly, when the baby māmane seeds drop on the ground they no longer have the area to catch the sunlight and propagate because the grass has choked out all the area. So, we create a larger havoc. I just thought we would have learned our lesson cause that was done back in the 1990s and it seems like we haven't.

WT: Yes, especially with all this biological stuff there's so much to take into account and weigh all the potential impacts so it's good that you're asking all these questions. Have we looked into everything that could possibly go wrong or that could possibly go right and weighed all the pros and cons. That's what the environmental assessment is supposed to do but it's good to have all of this mana'o also in the cultural impact assessment because all of that has cultural impacts as well to our hunters and to the species that are in our forests that our culture practitioners interact with.

Getting back to specifically this project. Do you have any knowledge of cultural practices and beliefs associated with the native forest birds on Kaua'i?

BD: Well, I don't think anybody goes out to take yellow and red feathers to make cloaks anymore.

WT: Right. Yea.

BD: I know many people enjoy watching birds. It's very tranquil to observe these birds in their natural state and watch them take the nectar out of the native flora you with their certain beak that they have. It's amazing. You know I shared this story once before and I'm not sure that it got much recognition. I believe our native birds like the 'i'iwi have migrated a little lower. We've always said that they are up on the 4,000 feet 5,000 feet elevation but I've seen them down at the 3,500 feet elevation around the Miloli'i area towards Nu'alolo. I'm not sure if over the generations they have become acclimated to the temperatures and have relocated where there's some 'ōhi'a where they can nest and feed on the blossoms. In the 1970s and 1980s they were not in that area so I'm not sure if the birds are just adjusting or whether there's just a larger population now.

It seems like we have only spoken about the damage that all these invasive species have done to the forests. We've never done any work as far as looking at...[thinking] Ok, so if there is some invasive species here and there or everywhere are these birds acclimating to different areas or are they able to relocate and do well. Have we gone to the Robinson summit where it touches Wai'ale'ale and because they're not apart of the watershed alliance how do we know that they don't have a very vibrant native bird population on their summit in their mountains.

WT: One point I did want to let you know about is that there's going be monitoring before they implement this project and after so we will have the data that we want. So this project will provide us with Hawai'i-specific data.

BD: So do you guys have a plan to have those males [mosquitoes] removed incase it's not successful? Or if it has a negative impact on some other species?

WT: I'm not too sure. That's a good point. I can ask that question and get back to you on that.

BD: You know, I can't help but look at your background [zoom background image]. You see where the W is in SWCA that's Punalu'u that whole area used to have a lot of goats before. I used to climb up with my mules down the Waimea valley, tie up and then we would hunt all around there. Such good hunting. I'm not sure what happened but the goats haven't been there for quite a while. Over a decade. We're not sure what's happening. We don't know the cause of their disappearance. I don't think it's over hunting cause the younger kids today enjoy their electronic devices more than hunting. I think the state has a lot to do with it. When it's not managed correctly or too many fences. All the goats have relocated. So the hunting is not as good as it used to be. People don't really look at hunting as being a cultural practice. Environmentalists they like to think its a hobby but it's not, it's a cultural practice.

WT: Of course it is. Yes, definitely it's cultural continuity that's how generations before fed themselves and keeping that alive is important to culture and identity.

BD: Covid. Covid taught us a big thing right. If we're cut off from the rest of the world, can we survive? Hawai'i can. And I believe it's because of the cultural practitioners, the hunters, the fishermen, the people laying net in the ocean or throw net, the ones that go out to the forest. It's amazing.

My grandma used to pick liliko'i up in Kōke'e to make liliko'i jam and liliko'i butter and we would pick the yellow pineapple guava and we would make jam and jelly. The honey bees love that nectar. Love it, love it, love it. I heard that we're trying to introduce some kind of something to combat the strawberry guava something to kill off the guava. They did it on the Big Island now they want to do it in Kōke'e. I was thinking how beneficial is it to go off killing the guava that our mountain honey bees polinate. Then what? They gonna just relocate to someplace else? I didn't understand. I had a hard time grasping what the environmentalists were thinking. I know we may have too much of it but at the same time if you're going to introduce something that's

going to eradicate the guava do we have another thing in place for the honey bees cause where do they go now. Unless you're an avid outdoorsman like myself you see the honeybees all over the mountain you know how important the honey bees are not only for taking nectar from the guava for honey but they propagate the flowers and different fruit trees and that's what allows you to have an abundance of avocado and mango and lychees. It's all because of the honeybees.

WT: Yeah on this I also wanted to ask you about what plant species are collected in that area nowadays. This previous study says the most popular plants gathered in this area were maile and mokihana. When we last spoke, you mentioned something about maile.

BD: Still yet. Maile and mokihana are the most sought after native flora that people go and gather. Also, a little bit of the pūkiawe. Pūkiawe has some really beautiful almost reddish color Christmas berries look like on it. They use it for wreaths during Christmas. I know some cultural practitioners still today who go harvest the 'a'ali'i wood which back in the day Hawaiians would use to make tako spear and use on the reef. That 'a'ali'i wood is kind of a blackish hard very straight wood and they would use that as their spear. I know the ulupua. It's like a black olive. It's good for lotion. Not too many people know that. It's related to the olive family. It produces purplish black olives in the fall and those olives make a really good lotion. Palapalai fern is very important during Merrie Monarch. And there are some really nice areas where they still can go and get some in Kōke'e.

Also watercress was very prevalent throughout our streams at one time and I don't see much of it anymore and it's because it's not being cared for by the cultural practitioners who probably have all passed. I know my dad and my grandpa had an area where they had their own watercress that they could go and get watercress from in the cold water streams. I know where it is still today but I haven't cared for it. It's kind of sad actually cause you go and buy a bundle of watercress from your farmer today and it can be kind of costly.

So, it's more than just the hunt, Wainani, you can see that it all ties together. From harvesting pig or goat, to picking watercress, to getting liliko'i to make juice and jelly or butter. You can get a lot of resources from the forest for your everyday life. Let's not forget about a place to go to find peace of mind and relaxation. You know I believe this. Wainani, you ready for this one, this is my philosophy.

WT: [chuckles] ready.

BD: I'm not Hawaiian so I don't want to speak for Hawaiians, but my wife is Hawaiian and my sons are, and you are. So here's my philosophy about Hawaiians. They lost their lands to all these large white land owners it's obvious on every island... Alexander Baldwin, Robinson family, Parker Ranch, etc. When we became a state the state lands were designated for those Hawaiians that did not have family kuleana lands where they could go to harvest natural resources. The state said now we have all these leftover lands that we are going to manage for you not only Native Hawaiians but also for you locals here on the islands for you to enjoy. It kind of hurts our feelings when we go to the forest and we see all these educated environmentalists from other parts of the world who are not vested in our community come and tell us exactly what needs to be done and tell us this is what they studied at university. And they get all this statistical data using some tropical climate country and they think they can do the same in Hawai'i and it's gonna work. They do that instead of asking the generations here before them. Hey, what do you guys think? Can we work together? Can we solve this problem? Can they share their knowledge from the textbook and us from the generational mindset that was thought from when we were little kids from our kupuna. That's all. It's pretty basic you know it doesn't take rocket science.

BD: Do you have a graduate degree?

WT: I'm finishing up my master's in historic preservation.

BD: Good girl. K. Here's my thing. I think everybody who has a doctorate degree or a master's degree think they're smarter than the person with a bachelor's degree and the bachelor's degree think they're smarter than the person with a high school diploma and the high school diploma think they're smarter than the person who flunk out of high school. My dad he only finished freshman year and then he dropped out to work. The point I want to make, and I saw you shaking your head so I know you relate to what I'm gonna say. Education is not based on a piece of paper you got at a university it's based on how comprehensive we can be with everyone's information and can put it together to create that masterpiece. That's the highest level of intelligence. When you can take everybody's constructive information, piece it together and create that masterpiece.

WT: I'm trying to do that. I believe that my job is to listen to people like you who are from there who know the landscape because I am not kama'aina to that place at all. No matter how well I research it I'm never going to reach the understanding that you have that's built on generations of being there and growing up there. So mahalo for sharing all of your mana'o with me.

BD: Before you say goodbye before we close. I wanted to advocate for all the families that do these cultural practices in the bog area where you guys going to introduce the mosquito across this very delicate ecosystem. We only would bring people that would respect the forest to go in to harvest with us. Whether it was the pig or the maile or the mokihana.

Only now only recently have environmentalists put out these stations to clean your boots so the seeds and weeds don't travel in or out. I want you to know that when we were growing up we had different shoes we would use for the different areas we went to go hiking and hunting. We were 'akamai about that. And only now your environmentalists are trying to come up with something that we had generations of knowledge about.

And when you guys put those fences up, here's the full circle, Wainani, when you put those fences up you guys created one natural path for people to explore the interior of the forests. So, now, not only the generations of families that I mentioned to you who used to know the trails to go into the back of the forest, now you guys have a fence line from Alaka'i all the way to Wai'ale'ale that people can walk along the fence and go experience everything that only a few families could before. DLNR has made an available trail with their fence and people now can hike different areas of Kaua'i and carry different seeds of weeds into the interior of Kaua'i. We don't know the devastation this will do to our forests in the next 10 years.

WT: That's a good point.

BD: Did you think of that? Did that come to your mind? Was that covered in class 101 of environmental ecosystems at Stanford University.

WT: That's why we gotta talk to people like you who are practical and think that way about project impacts.

Thank you. You brought up several things that I didn't find in my research so I appreciate all your mana'o. It was nice talking with you. I think we covered everything. Mahalo for taking the time to talk with me today. Keep doing the good work at the county council.

BD: Thank you Wainani. Aloha, bye.

WT: Aloha.

Cultural Consultation Interview Concerning State Mosquito Suppression Efforts in Kōkeʻe and Alakaʻi Wilderness Areas of Kauaʻi

Zoom video conference on August 22, 2022

Interviewee: Sam ʻOhu Gon [SOG]

Location: Nuʻuanu, Oʻahu

Interviewer: Wainani Traub [WT]

Location: Kāneʻohe, Oʻahu

Transcript

WT: Aloha good morning

SOG: Aloha

WT: Mahalo for agreeing to speak with me this morning and making the time for this. I really appreciate it. Let's start off with some biographical information.

WT: Where are you from? Where's your family from? How do you identify yourself and maybe your connection to the project area?

SOG: Yeah. So, my name is Sam ʻOhu Gon. I was born in Nuʻuanu Valley on Oʻahu, raised there and still live there, perched on the edge of Nuʻuanu on Alewa Heights. Family ties go all over the place. I have a grandmother who was from Waimea Kauaʻi. I also have relatives all over Oʻahu and in South Kona on Hawaiʻi. I am a kumu oli. A teacher of chant. I ʻūnikiʻd from Kumu John Keolamakaʻāinana Lake. Before he passed, he gave me the kuleana and the kaumaha to continue his chant classes, and with my co-kumu Māhealani Wong we are the hālau in residence at the Bishop Museum nowadays, and we conduct our classes there at Atherton Hālau and in the hālau waʻa, right next to Atherton.

My work as a conservation biologist has taken me across the island chain. Kōkeʻe has been one of the places that I've visited many many times. Although my Kauaʻi family did not spend much time up in the mountains, I certainly do. So I'm quite familiar with many of the birds that were once common there. I've seen all of the birds that are being considered in this mosquito control project in the days when they were more abundant. So that connection and my interest in Hawaiian chant and the role that birds play in Hawaiian culture all of that is what made me agree to be interviewed today.

WT: When people think of birds they automatically think of ʻahu ʻula and these cultural practices that contain elements that are no longer practiced in the same way. Obviously, no one's gathering feathers like they did 300 years ago. But the knowledge and the practice of things like lei hulu lives on. Could you speak to what does it mean for us to retain what small populations of our native forest birds that remain. What does that symbolically represent to traditional cultural practitioners who maintain knowledge of those arts of, traditional featherwork.

SOG: You may or may not know that I, with Hanalei Marzan co-authored a chapter in the book *Royal Hawaiian Featherwork*.

WT: I have it right here on my desk.

SOG: Oh, my gosh! So of course you know, we reviewed in there not only the birds of featherwork, but Hanalei did a nice summary of the methods in which the feathers were put together. That's one of the awesome things about being the hālau in residence at the Bishop Museum is that we have access to the collections, the archives, and all of that, and we get to work with the staff on projects such as that.

My work as a conservation biologist has taken me into the last remaining habits of our native birds. Like the 'i'iwi that's on my background here [zoom background]. I tell people that the 'i'iwi is the last of the birds that remain alive, that were used in the highest level of Hawaiian featherwork. There were other feathers that were used, feathers of seabirds and roosters, and the like. But the ones that are pure yellow and red and black, and, to a lesser extent dark green, those were made out of birds that are no longer with us except for the 'i'iwi.

SOG: Although the birds that are the main focus of this Kaua'i project are not the birds of featherwork, it's clear to me that the mosquito suppression project is going to benefit all of the forest birds, including 'i'iwi. Kaua'i is one of the last strongholds of 'i'iwi on the main islands. So that connection in itself would be enough to underscore important cultural significance of what is being done and what stands to be lost, and why any Hawaiian who has aloha for our material culture as well as the intellectual and other aspects of culture, should be interested in this. And, once you understand what the risks and the benefits are, should be supportive of this mosquito project.

The role of birds in the non-material side of things that is also a fascinating thing. Manu of many kinds are mentioned all the way back to the Kumulipo, and all the way forward through mele that are popular today. Ipo Lei Manu, Kapi'olani's love song to Kalākaua directly mentions the 'i'iwi pōlena and compares Kalākaua to an 'i'iwi. That's a logical comparison since the 'i'iwi and the feathers of the 'i'iwi would have been in the royal featherwork that would mark a high chief, such as Kalākaua. So the fact that the bird connection is not just in material culture, but also in the intellectual and spiritual underpinnings is really important to understand. You can go through the mele and the oli and the pule and find mention of Hawaiian birds throughout. Some of the best romances like Lā'ieikawai have akua wahine or ali'i wahine raised by birds and sheltered in houses thatched with feathers. And so the idea that birds were really fundamentally important as a positive and royal presence is very clear to me and many others I'm sure. And that's the kind of thing that we stand to lose if we don't do something.

I've seen five different birds that were in existence when I was younger go extinct. Birds like po'ouli and 'ō'ū, Maui nukupu'u and the like. So, it's kind of a sad statement that within one person's lifetime so many of them would go extinct, and we know just from the history of birds since the turn of the twentieth century many of them have gone. And it's due to a combination of things, certainly, but the main factor is disease. And if we think of birds as the po'e of the forest, as beings that have every much a right to exist as any Hawaiian would, then we're allowing for this kind of pandemic or genocide to occur. It's been happening to them for a century. So yeah, if you think about the mosquitoes, introduced in 1826, and then songbirds that carry malaria thereafter, and then the ornithologists noticing the evidence of disease and then the disappearance of birds from the lowlands. All of that points pretty much to disease as a major factor in their loss. We can certainly, you know, point to the fact that all the lowland forests were converted to sugarcane and other forms of agriculture as well. But the combination of the two certainly was really important.

We know that, for example, the 'ō'ō of Wai'anae would feed from the lehua of the uplands. When the lehua were in bloom in the summertime, and then come down to Kalaeloa and drink nectar from the naio shrublands that were down there. And once you have birds that are doing this upland lowland alternation over the seasons, and the lowlands become infested with disease-bearing mosquitoes you're signing their death warrant, because every year when they come down to the lowlands and are exposed to them. And they haven't for the large part evolved any kind of resistance. So, 'apapane and 'amakihi, two of the most common birds, and [ones that] had populations high enough that they could be taken down through that bottleneck and then emerge with resistant populations. But any birds that started as rare would be taken down to a bottleneck

that essentially went to zero. So you know, folks that understand this see how desperate the situation is, and how much we need to do this kind of thing.

WT: Yes, mahalo. You touched on a lot that has come up in my research, but I hadn't made the sort of connections that you have. You mentioned the connection between birds raising ali'i wahine. In some of the selected mo'olelo that I've chosen to include in this CIA, I do see that as a common theme but I hadn't really noticed it or made that connection in my mind so mahalo for bringing that up. And I also like how you say the birds are the po'e of the forest. I like that imagery.

SOG: It's important right. It's not only things that breathe and have eyes like us, but also all the mosses and everything that's up there. You talk with folks like Kekuhi Kanahale, she's always talking about them in terms of being individuals that coexist with us right. That is the kini akua. The whole concept of kini akua-- the physical manifestations of the different akua expressed in all of the living things, even clouds and stones and the like-- demands that you look at every living element of the uplands as one of their manifestations. So you know, if the birds are of the uplands, the birds occupy the wao akua and are themselves akua then it stands to reason that to put a cape of that over yourself is to imbue yourself with that. With the mana of those akua. So that connection is a real, important one to bear in mind. And the fact that we still have mele that take you all the way to today.

When you look at Ka Pilina, right. I think it was Frank Hewett that composed that one. That talks about, at first, the 'elepaio and then the 'i'iwi and then alludes to the wahine carried about by birds. So it's obviously an allusion to Lā'ieikawai. Although he never mentions it, and that's what makes the poetry so beautiful is that if you don't know that story it's still nice. But if you know the story, then suddenly you say, aha! I know what you're alluding to. And he is essentially extending that long tradition into a song of today.

WT: Yes, that's an idea I am exploring as well. What do we stand to lose? What potentially iconic mele could the present generation or future generations create because they visit the forest and they hear these remaining native forest birds?

SOG: Alternately, what sadness there would be if you could not do that. Right. So, speaking of sadness, when the po'ouli was declared extinct, or when at least the last observed individuals were seen in 2006 or so, Keola Donaghy composed a mele about the po'ouli and called it Manu Po'ouli, and Kenneth Makuakāne turned it into a song. It was a fairly obscure song, one of the songs on one of his albums, and nobody really thought about it that much. A few years ago, our hālau was involved in a series of concerts at the Mission Houses Museum, and one of them, the theme was Aloha. Over the course of the four concerts that were given in the year. One of the themes was aloha 'āina. And so in that particular one we chose to choreograph for the first time a hula to Manu Po'ouli, and we invited Ken Makuakāne to be there to sing the song while it was being danced. And I had the opportunity to tell the audience about the story of the po'ouli, how it was only discovered in the 1970s, and how it was given a name by Mary Kawena Pukui, and then how we watched over the years as the population declined. I was lucky enough to see six po'ouli in one visit on the ridge that was informally called Po'ouli Ridge, because most of the po'ouli that were seen were to be found on that ridge. And how much of a sense of loss there was when it was finally decided that they are no longer. Years of repeatedly going back to the places where they knew they were and not hearing or seeing them. So I was able to give that talk to the audience then, and then we performed the hula with Ken Makuakāne and Aaron Mahi, and other folks doing the musical backup and we had only three dancers because it's a short song, three verses. At the end of each verse one of the dancers would quietly leave the stage until there was just one dancer left and at the end of the song, falls to her knees and spreads her arms out onto the ground.

WT: Wow, that must have been a really amazing performance.

SOG: Yeah, we made Ken Makuakāne cry. So that kind of expression. It would be really sad if that is the only kind of expression that we could give to the birds in the future is dirging about their passing.

I always said that if mosquitoes were controlled, my goal would be to see native birds begging for french fries at McDonald's [chuckles]. It's a weird image.

WT: [chuckles] Right. Yeah. But I get it, we want them to be that prevalent.

SOG: Yeah, we want them to be back in our lives again. That was triggered by the fact that when I visited the Galapagos and I was in the grocery store looking for something. I was in the aisle in which the rice was found and there, amidst the rice bags and rice grains that had fallen out of the bags onto the floor were Galapagos finches hopping around eating rice in the isles of the grocery store in the Galapagos. And I was like, whaaatt?! [chuckles] We're so used to, you know, native birds being found far away from where people are. But then, you know that thought it just struck me. That would be amazing if we could have, our native birds just around us in the lowlands.

I'm lucky enough to live at 900 feet right next to the forest at Kamehameha Schools. I have a big 'ōhi'a tree taller than my house and when it blooms the 'amakihi come out of the forest and feed on the flowers of the tree. So I'm lucky enough to get daily reminders and visits by our native birds. The fact that they're part of my personal life is a gift that most people have to hike long and hard, or go to a special place in order to see. So the reality of it, and the potential of it is very real to me. It's not like oh, you know if this happens then maybe we'll see this. I already see and hear what could be everywhere at lower elevations all the way down to sea level if we're successful in this kind of thing. Because the control of high elevation mosquitoes is the first step, and then, if that's successful and the birds can be saved, then the next step is how can we get rid of mosquitoes everywhere in the islands. Not only as a boon to native birds, but also because of global warming and the spread of tropical diseases like dengue and the like up into our latitudes. A boon to human health as well.

It is ironic that humanity or human community would be more interested in it if there was a clear threat to people. For instance, if dengue became a yearly thing and we really needed to control mosquitoes in order to get rid of dengue. Everybody would be all for it. Oh, yeah, let's find a tool to get rid of mosquitoes and the diseases that they carry. But most of them don't even think for a moment that for a century our birds have been suffering the same kind of threats. And if they were viewed as part of our communities that we would not tolerate the fact that they've been declining and been driven into extinction over the last 100 years.

WT: Right. Yes, that's a very profound point. And this project does benefit humans as well.

SOG: And that should not be failed to be mentioned. You don't have to go into detail but you can say in a sentence or two that the same kind of disease threats that we're seeing with global warming to human communities have been affecting our birds for a century.

WT: Yes, that's a good point.

SOG: The Department of Health is one of the members in the Birds Not Mosquitoes effort. So it's not that far-fetched to say, we recognize the potential human benefits of this project.

WT: How familiar are you with the project area? The Kōke'e and Alaka'i Swamp area.

SOG: I've worked in Kōke'e for years. There was a time when our family actually had a timeshare in one of the Kōke'e cabins, and we would go up there and enjoy the forest on a regular basis when school was out. And in my work of course, as a conservation biologist, I've been up working with the Kōke'e folks. And so, you know, tromping around in the Alaka'i along the main trails there, or helicoptering up close to the summit of Wai'ale'ale and enjoying the forest up there. Yes, I

have direct experience in those places back in the day. It saddens me to think about Dave Boynton. Have you ever heard of his name?

WT: No, no I haven't.

SOG: Dave Boynton was a powerful advocate for conservation of native plants and animals and ecosystems and was an educator. He created essentially the Kōke'e environmental education center that's up there. Whenever I was up in Kōke'e and had a chance to go hiking with him, I would. He was the one that showed me various places where birds like 'akeke'e and the like could still be found. So when he had a major hiking accident and fell off a huge cliff and died I remember composing a kanikau for him and offering it at his ho'olewa up in Kōke'e.

SOG: Have you spoken with Sabra Kauka?

WT: Yes, I've reached out to her but haven't gotten through yet. I'll keep trying because several people have recommended her.

SOG: She does work with birds. Although mostly sea birds and their rehabilitation and release. But I know she's also up in Kōke'e a lot, and has a lot of aloha for our native forest birds up there. She might not have much direct conservation experience with them but she would also be able to tell you how important birds are in our Hawaiian cultural legacy.

SOG: So get in touch with her again, and tell her that you've also spoken with me, and that I recommended you chat with her.

WT: I will do that.

SOG: So are there other questions that you have?

WT: Yes, I would like to ask, in your opinion, if some of what was documented in previous CIAs still holds true today. A 2004 CIA done for the State Parks, Kōke'e and Waimea Canyon, identified the cultural practices that were ongoing at that time. I don't know how familiar you are with the hunting practices around there. But this study said that at that time the animals being hunted were pig, goat, black tail deer, and a variety of game birds. Would you say that's still what's being hunted?

SOG: Yes, those are the primary ones. We have folks in the Nature Conservancy offices on Kaua'i in particular, Nicolai Barca, who is not only up in the remote areas all the time but his primary job is ungulate control on the Alaka'i flats. So he is really familiar with the hunting community, and he himself is a member of that community and also a member of the conservation community which makes him a really interesting dual presence. He's often on the, I don't know if you're familiar with the Hawai'i conservation Facebook group.

WT: No, but I will look into that.

SOG: Yeah, he's often there engaged in discussions about the importance of hunting versus total exclusion of animals, and where total exclusion is important. And where community hunting can provide both for sustenance subsistence food as well as control of ungulates in areas where you don't need to be at zero. He's also looked into the Hawaiian language newspapers for the earliest references to hunting in the conventional style of today and mention of pigs and native forests and things like that. So if you're interested in that aspect of it, he would be a good person to chat with. And of course I'm sure he has seen many of the native and rare birds that are up there.

WT: [asks for contact information] Ok, mahalo.

SOG: Yeah. You can tell him that you have chatted with me, and that I recommended that you talk with him about hunting on Kaua'i.

- WT: I also wanted to talk with you about gathering of plants. This 2004 study said that maile and mokihana were the most sought after.
- SOG: Probably. I mean, you know, those are lei material. The folks that gather for medicinal work, or for hula would be going for more than just that, right. But certainly, you know, Kōkeʻe is famous for maile and mokihana both. I would probably expand that to any plants that might be good for lei making that might be up there. And certainly the lāʻau lapaʻau community. I don't know that the state parks folks interviewed any of them but there is certainly a huge resource of plants to be found up in Kōkeʻe.
- WT: Going back to hula folks. How do you see the hula community using that area?
- SOG: I think mostly, you know, if you're familiar with Kau ka haliʻa, which is my favorite forest entrance chant, it talks about how you're awakened out of sleep by the sound of birds on the ridges in the uplands and that it's a sign for you to get up into Laka's realm again and be a sharing companion in that realm. I have no doubt that many hula people go up to Kōkeʻe for that kind of inspiration. To be surrounded by the kini akua to gain inspiration via what you see and hear and experience up there. That's the kind of thing that's not going to show up as material culture right? You're not going up there necessarily to gather lei or even if you are, the fact that you're surrounded by the same kinds of images that we find in the mele and the oli and the pule means that kind of benefit and resource is just as real as the material resource.
- So the non-material, right? The hula folks would be the ones that would benefit most from that kind of thing. Whenever I'm composing mele or an oli of entrance, I'm always thinking about what kinds of sights and sounds, and feelings, and the like, do I experience when I'm surrounded by that kind of thing. And then you weave it into your mele. That's what kind of saddens me about many of the modern compositions today is that they have nothing of that. It is all conceptual stuff. Aloha and ʻohana things like that, without any mention of the plants and animals that used to inspire some of the best songs.
- WT: Do you think that is because people aren't interacting with the plants and animals.
- SOG: Yes, it's very clear. They interact much more with the ocean, right? Because the ocean is so much easier to get to. You have to go far and make an effort in order to be surrounded by completely native forest and see our native birds firsthand. So stands to reason that it's harder to do that. It's just sad to me that kind of connection is not so easily achieved. So that's another important point to make about the need to protect these birds.
- WT: Yes, that's a great observation about our contemporary Hawaiian music. I hadn't thought about that.
- SOG: Yeah, pick your four favorite pieces of Hawaiian language compositions that were done in the last five years, and I doubt that you'll get much more than maybe lehua if you're lucky. Probably because lehua and rapid ʻōhiʻa death have been in the forefront of people's minds for the last five years. But try to find anything else, and then compare that to some of the early works in which you have so many different plants and animals named, you know.
- Take, for example, Waikā. One of my favorite songs. Just in the first lines it names a wind and a rain, and then talks about the ʻōhāwai, the Clermontia of the goddess Uli, who is a forest goddess. And then the bud of the koaiʻe tree and the yellow face of the koʻokoʻolau. All in the first verse! Like, Wow! And then when you go up into the forest of Waikā, you can see all of those plants. I mean that's the cool thing, is that they're still there. They're not singing about a place that was turned into sugar cane fields a hundred years ago. So that's why that's one of my favorite songs. Emerson tried to translate Waikā. Waikā ia a modern song based on an ancient chant. So you can find the words to Waikā in Emerson's... the one that he did on hula.

WT: Unwritten Literature.

SOG: Yes, Unwritten Literature. In Unwritten Literature, luckily one of the indexes is on first lines of chants, right. So you could try to find kū aku la 'oe i ka malanai and see whether or not that's in there. That's supposed to be a chant of the Kīpu'upu'u warriors and has been turned into a beautiful song but it's really interesting that that part of it has been converted in that way. And it is really interesting that a song about warriors would mention so many beautiful plants in the very first verse.

WT: I just love all this. I've been out of hālau for too long I miss researching mele.

SOG: Yeah that's really that's an important part of hula as far as I'm concerned. I remember being honored by Kihei De Silva when he wrote his essay on Waikā he actually cited me in talking about the 'ōhāwai, because if you look at Emerson's translation he doesn't know what the heck an 'ōhāwai is. He translated it into "tinkling of water droplets in an upland pool" or something. It's like, what?!

WT: Oh yes, I don't always trust translations. I oftentimes will write my own translations.

SOG: So when I suggested that Emerson just didn't get it right and wasn't familiar with native plants, and suggested that nolu ka maka, right, bruised is the bud of the 'ōhāwai a Uli is so easy. Especially when the line before talks about how niniau 'eha ka pua o ke koai'e, right, so that the flowers of the koai'e are hurt. Nolu ka maka o ka 'ōhāwai fits right in with that previous line. In that it is the same kind of action on a different plant. Yeah, it's just neat. So the fact that Kihei saw the little mini essay that I wrote, I think, for Moanalua Gardens Foundation, and acknowledged that was kind of a neat thing.

WT: Yeah, I just love to see our contemporary kanaka scholars revisiting those old materials and offering fresh new interpretations that were first interpreted by Western scholars who may not have got it quite right.

SOG: You know, there's often no way to really concisely and elegantly convert into English some of the things that are expressed in 'ōlelo. But you try to come close because not everybody speaks ['ōlelo Hawai'i] right.

[SOG asks WT if she's familiar with the Facebook Group 365 Days of Aloha and explains that the group page contains a lot of interesting native bird content, resources, and information]

Kiwikiu probably wont be [on the 365 Days of Aloha Facebook page] because of the recency of that name right.

WT: What do you mean by that? It was named not too long ago?

SOG: Yeah, it used to be the Maui Parrotbill.

WT: Oh, I didn't know that.

SOG: Yeah. I worked with Larry Kimura to put together the name kiwikiu for the Maui Parrotbill. And then I composed a mele inoa for it.

SOG: So, other questions?

WT: I think we covered most everything. Oh, in the sort of closing chapters of the report, there'll be a place for recommendations and concerns. So if you want to state any specific concerns you may have, or you probably have more recommendations.

SOG: Well, you know. I think that any time you're using a new technology there will be many people that are concerned. And I think that it would be really important to monitor the results. Both in the suppression of mosquitoes and the response of the birds. A lot of times in conservation we

find a new tool, and we jump right on it and we try it out but the follow up on seeing whether or not it's actually effective is usually lacking. Because people realize there's so many things to do in conservation and monitoring is one of the most difficult and time-consuming things to do when you could be for instance, killing more weeds or fencing more forests, things like that. So, I am concerned that this project really needs good monitoring and follow up. I'm also concerned that if the project is not successful in the first attempt that people would just give up on it. And that's not necessarily the best course. You want the thing to be successful, and you don't necessarily want to just throw your hands up and say, well, that didn't work and then move on, because we know full well that this is the first time that something's being tried in a really complex place. So I'm concerned that people will point to any kind of snags or failures as a reason to stop. I'm also concerned that there's a lot of misinformation flying around already about what this project is and is not. So, that is certainly a concern.

WT: Mahalo. Those are good points. Anything else you would like to share?

SOG: No, except that I think that this, your part, is a good way to open the door to people to get more familiar with just how important birds are in Hawaiian culture. People don't appreciate them as much as they should.

WT: It's definitely a very interesting project to work on it's not your typical CIA that's looking at land development and impacts of development. It's very different from the other projects I've worked on. Mahalo nui for sharing all your mana'o and 'ike. I'll be following up just to make sure that I'm conveying what you said here accurately in the report. There will be a full transcription of our interview in the report if you're okay with that.

SOG: I'm okay with that. and I'm also pleased, because so many times when I'm interviewed I look at the transcription, and because the people weren't fluent they get stuff horribly wrong [chuckles] and I'm not going to be as worried about that with you.

SOG: I need to jump onto another meeting but I've really enjoyed chatting with you. And I hope you do follow up with some of the folks I recommended.

WT: I will. Mahalo nui. Aloha.

SOG: Aloha.

Cultural Consultation Interview Concerning State Mosquito Suppression Efforts in Kōkeʻe and Alakaʻi Wilderness Areas of Kauaʻi

Facetime video conference on August 24, 2022

Interviewee: Sabra Kauka [SK]

Location: Kauaʻi

Interviewer: Wainani Traub [WT]

Location: Kāneʻohe, Oʻahu

Transcript

WT: I want to hear your manaʻo on this project. You were highly recommended by several people. So maybe let's start with where are you from, who's your family, how do you identify yourself?

SK: Ok, well my name is Sabra Kauka I live here on the island of Kauaʻi and I am in strong support of this mosquito control effort. I have a passion for native birds. I have a deep aloha for Hawaiian culture and the importance of these birds to our culture and our history, even today.

WT: Yes. Mahalo. What's your familiarity with the project area? Kōkeʻe and the Alakaʻi?

SK: Oh, many many years, decades of hiking there. Taking my students there. Gosh, so many fond memories of the birds there. I have a deep concern that the forest is becoming quiet. I don't see nearly the number of birds that I did 5, 10, 15 years ago. So I'm concerned. I also have a cabin in Kōkeʻe that I share with several other friends. The last time we were up there was just a few weeks ago. There should be a lot of chatter in the trees but it's becoming quiet. So that disturbs me.

WT: Mmh. Yes, we definitely understand the urgency for this action to be taken. Do you have concerns or recommendations for this project?

SK: I think we have to put a stop to the spread of the invasive mosquito as soon as we can before we have no native birds left.

WT: Mmhm.

SK: I just spent the weekend in Nuʻalolo Kai on the Nā Pali coast with some extraordinary bird scientists. Two of them from the American Bird Conservancy and some other folks. They had these two binoculars I had never used before. One was a thermal binocular the other was an avian binocular that could see at night. When I was on a work trip in June the cliffs were silent and it greatly saddened me. I'm used to hearing the chicks being loud, raucous at night. Calling their parents cause they're hungry. But they asked me if it was a full moon and so I looked back on my notes and yes it was a full moon. So they explained to me the birds are quiet on the full moon. They don't make nearly as much noise. I didn't know that. So when we looked through the thermal binoculars it was amazing what we could see. There were hundreds more birds flying in the sky. I was greatly heartened by that.

So, I would like to see more surveys out on the Alakaʻi. I'd like to see more surveys, particularly at night when maybe you can see a little more through the thermal binoculars than you can during the day or than you can through hearing. When I go hiking up there nowadays I send my students all the way to Kilohana. Three and a half miles I think it is. I love to sit in the forest and just look, watch, and listen. But like I said the forests are becoming silent.

- WT: You mentioned students. Who are your students?
- SK: I teach Hawaiian studies and hula at Island School. I have two jobs. One is teaching at Island School Hawaiian studies and hula. Kindergarten through fifth grade Hawaiian studies and high school 9-12 hula. I have 15 girls in my hālau this year and I have about 140 students in elementary. My second job is working with the Department of Education as the coordinator for the Hawaiian Studies kūpuna component on Kauaʻi and that includes working with all the people teaching Hawaiian Studies from Hanalei to Kekaha. All the schools. I love that job. I've been in that job for many years. I love both jobs and working in both areas. Actually our focus this year in DOE Hawaiian studies is the native birds. We're going to be pulling out all sorts of things in storage, in the library, and reviving them.
- WT: I hear that you've done work with sea birds. And though this project is geared towards benefitting the forest birds, do you see this benefitting sea birds?
- SK: I don't think the sea birds have been as negatively impacted by avian malaria by mosquitos as the forest birds have... I was so happy to see as many birds as we did this past weekend. Being with the scientists was very helpful to me too.
- In June we counted the black noddys in Nu'alolo Kai. I would sit there with my students between 4 and 6 o'clock and count birds. Just count them as they fly pass returning to their chicks. The professional birders, you know, gave me their binoculars and they told me to look out on the horizon and I did and oh my gosh I could see hundreds of them! I was so happy. I am so grateful for their expertise, their experience, and their knowledge that they share with us.
- WT: Could you speak to cultural impacts of this project? Positive or negative. What do we stand to lose culturally if no action is taken or what do we potentially stand to gain culturally?
- SK: Oh my gosh. If we do nothing and the numbers continue to decline to the point of extinction. I don't want to carry that burden. I don't want to be blamed for that. I want us to be proactive. I want us to do everything we can to save these species. I think their importance goes far beyond. They're so very much a part of the cycle of life on our islands, in our mountains, in our forests. I think that it's vitally important that we do everything we possibly can to save our native species.
- WT: Did you mention hālau, are you a kumu hula?
- SK: I teach hula as well. It's my high schoolers that I take along on hikes. It's my high schoolers that I take into Nu'alolo Kai. It's my high schoolers that I take to my cabin in Kōke'e. So many of them have graduated this year. Gosh, I'm going through a little bit of withdrawals cause some of these girls have been with me for four years, the young men maybe only two years. But I'm so happy to see them going on. One of them is quite interested in Hawaiian studies. She's going to U.H. Mānoa. Others are interested in science and have gone onto colleges in North America. There's one several years ago who graduated and went to U.H. Hilo and now she's graduated from U.H. Hilo. She's in the Kanaka'ole hālau. I keep reminding her, okaayy sweetie when are you coming home? We need you here. And by the way I'm putting my grandson through this private school [Island School] and I told everybody when he graduates, I graduate [retire from the school]. And I remind her of that, and I tell her, I hope you're home by then because I've been grooming her for umpteen years. You know, go away, get your degrees, study all you can, and then come home.
- WT: Yes. Definitely. We need our own people doing the work, right.
- SK: Yeah.

- WT: Could you share some experiences you've had with native birds up close and what that means to you?
- SK: Oh golly. It means the world. About three years ago we were hiking through Alaka'i swamp. The kids they just took off and were way ahead of me. I was just taking my time looking all around. I wanted to see everything I could. We had already gone all the way out to Kilohana and back and I was just taking my time because I wanted to observe everything I could. Off in the distance I saw a bird with black feathers and yellow under the tail. I was like OMG is that an 'ō'ō?! I thought they were extinct. I saw two of them. I just had my phone I didn't have a really good camera with a long lens so I didn't get a picture of them. I only told a few people because I didn't want people to think I was crazy or just imagining things. But I saw a couple of birds that looked like manu 'ō'ō. None of my bird photographer friends have seen them. None of my hiking friends have seen them. [thinking] Oh man, was I just imagining things? Or are they really still alive? I want them to live. I want them to be a part of the forest and a part of the world. They've been here longer than humans have on these islands.
- WT: Mahalo for sharing that. That must have been really special.
What sort of cultural activities do you or groups you know about engage in in that area?
- SK: In the area of hiking, in the area of hula, in the area of making feather lei. There's so many people here. There's so many people on Kaua'i. So many hālau. I have so many friends, kumu hula. [thinking] Oh god, the hula, beautiful. You know I'm a little disappointed this year because we're not doing the Queen Emma Festival. It's the first time in probably over 25 years that we're not going to. Well, last year we went digital. And the year before... I don't know. Anyway, Kōke'e Natural History Museum is no longer sponsoring that event. Which makes me a little sad because it's about honoring Queen Emma. Honoring her love for the forest and her trek over a hundred years ago to the Alaka'i swamp all the way to Kilohana. Several of the hula that were created to honor that event include verses about birds. The birds that they saw and experienced. I want my students, I want my grandchildren to continue to see and experience those as well. Those places and all the creatures that inhabit that zone of the forest and the mountains.
- WT: Yeah, a few other people I've spoken with have also mentioned the Queen Emma Festival. Sad that it's not happening this year. Hopefully there will be funding in the future and support for it because it seems like it has definitely made an impression on people. A gathering and exchange of ideas and hula and mele like you say.
Are you familiar with gathering practices? Hunting or gathering of plant resources taking place around that area?
- SK: Well, maile. Picking maile. But I'll tell you what, the forest has been so dry lately. It's not as abundant as it once was. For graduation this year I went to some places where I normally pick maile and it was so dry. They were nonexistent. They dried up. So I've increased the maile that I'm growing around my cabin. But you know, we're not up there all the time. It hasn't rained that much on the west side. There has been such a change in the forest. The invasive strawberry guava coming in and underneath it it's bare. The changes in the forest with the kahili ginger and all those things that I've seen over the past 35-40 years that I've been home. The changes in the forest that I see are very sad. But I really appreciate the work that the Kōke'e Resource Conservation Project people have done and are doing. There just needs to be more of it. We need to be more cognizant and we need to have more effort in keeping the forest as native as possible.

The more native plants we have growing in the forest, the more native species, avian species and other species, can exist there.

WT: Mmhm. Definitely.

Any other thoughts that you want to share?

SK: I support the work that many of my scientist friends here on this island are doing to try and save as many bird species as possible. Both birds and plants. I appreciate their work very much. Thank you for your support of our native birds and our native forests.

WT: Yeah. Of course. Have to.

SK: You better let me know if you ever make it over here.

WT: [chuckles] Yes, I want to very much. Maybe for the next Queen Emma Festival.

SK: Oh, don't wait that long. Come sooner. There's no guarantee it will go on. The museum is understaffed and it's a lot of work for just a handful of people. Even though many of us with hālau have offered to kōkua. You still need that driving force in there. And I don't want to sit on their board. I'm on too many boards already. We had a director here Marsha Erickson from Volcano. I met her when she was head of Volcano Art Center. And then after Volcano Art Center she was hired to be our director here at Kōke'e Museum. She along with Kumu hula Roselle Keli'ihonipua Bailey from Maui. Roselle was living here at the time. They initiated the Queen Emma, Eō e Emalani Festival. After the hurricane, Roselle and her husband moved back to Maui and retired and Marsha Erickson retired from the Kōke'e Museum. And we have a new director and she's good but [thinking] very much involved with hula and very committed to it. So, we'll see what we can do. It was a great opportunity for hālau from all over Hawai'i to come to this island to learn about Kōke'e, our forest, our birds, our place names, and our hula. So, ok Wainani do you have any other questions for me?

WT: No, I think we touched on everything I wanted to. Mahalo again for your time. I'll be contacting you to make sure I get the transcript right.

SK: I get such a kick out of these transcripts! The automatic kine. Especially Hawaiian words. It's hilarious. The hamajang stuff that comes out. Alright Wainani, mahalo nui.

WT: Mahalo nui.

SK: Aloha. A hui hou.

WT: A hui hou. Mālama pono.

Cultural Consultation Interview Concerning State Mosquito Suppression Efforts in Kōkeʻe and Alakaʻi Wilderness Areas of Kauaʻi

Zoom video conference on August 24, 2022

Interviewee: Sally Jo Manea [SJM]

Location: Kauaʻi

Interviewer: Wainani Traub [WT]

Location: Kāneʻohe, Oʻahu

Transcript

SJM: Hi! hi! hello!

WT: Aloha, good morning. Mahalo for making time to meet with me today. I'll start with introducing myself. I'm Wainani Traub from Kona Hawaiʻi. I'm a product of kula kaiapuni. Growing up, attending Hawaiian immersion and dancing hula from a very young age all that instilled in me a value driven commitment to serve my community and the way that I do that in my professional life is through historic preservation and being an advocate for our historic places, and cultural heritage tied to place. I'm almost done with my master's degree in historic preservation through the University of Oregon. Before that I received a bachelor's in pacific history from UH Hilo. I've worked as a cultural anthropologist at SWCA Environmental Consultants for a little over a year now primarily doing archival research and writing cultural and archaeological compliance reports. So that's a little bit about myself. Can you introduce yourself?

SJM: Sure. My full name is Sally Jo Manea. I was born in Ohio. My father got stationed at Pearl Harbor. He was a navy officer, got stationed at Pearl Harbor in 1956. So, at the age of 13 I moved to Hawaiʻi with the rest of my family. My father eventually retired from the navy, and we stayed in Hawaiʻi. So I've lived in Hawaiʻi since then. I'm 79 now, so that's a lot of years living here. I graduated from Punahou. I graduated from University of Hawaiʻi with a nursing degree.

WT: My mom is a Punahou grad.

SJM: Oh, yeah, is her name Traub?

WT: Her maiden name is Tokunaga.

SJM: Oh, so mixed huh? [chuckles]

WT: [chuckles] yup.

SJM: So from age 8 on the mainland on a navy base I started learning hula and fell in love with it. A navy wife was our teacher. Hawaiian woman, married to a navy officer. She was our hula teacher. After I moved here, after the family moved here, I continued with hula continued with interest in Hawaiian language. Started learning Hawaiian at U.H. It was my language of choice. In those days the options were Spanish, French and Hawaiian so I studied Hawaiian language from that time, and have continued my study until now of both hula and Hawaiian language and music. My kumu hula is Roselle Bailey from Maui. She lived here on Kauaʻi from the early 1970s until the mid 1990s. So I'm a student of hers and have continued my study until now. I taught hula for 10 years, but I haven't taught for several years, mostly because of physical disability, but also because I just wanted to retire from that and become a musician, and a singer rather than a hula dancer.

I continue with our cultural organization Ka ʻImi Naʻauao o Hawaiʻi Nei, under which, is our hula hālau. Our group here on Kauaʻi has a long standing association with the Kauaʻi Forest Bird Recovery Project. We've done annual blessings for their research season for the last 11 years.

We've learned a lot about our native birds from them and they've learned a lot about cultural traditions from us.

Our institute [Ka 'Imi Na'auao o Hawai'i Nei] adopted a place up in Kōke'e in the forest, where we clean and remove the alien species. It's about a 2-acre site up there that we maintain. We clean out the invasive species and plant the natives. So that's how we continue our traditions here. The Forest Bird Recovery Project staff have encouraged us to create music and chants, and hula related to our work with them. So they have really been an inspiration and motivation to us as we have been to them. So it's been a great association, so our group continues to help them in as many ways as we can within the limits of what we can do right. So that's me.

WT: That's awesome. It is so good to hear that you folks are creating mele and hula and using that space in those ways, and just the great relationship that your hui has with the Forest Bird Recovery Project. They're the ones who recommended that I reach out to you.

SJM: I need to tell you one other thing. Our Kumu Roselle Bailey has encouraged the people in our Institute to become what you have become. Archivist, and you know, preservationists. The next time I talk with her I'm going to tell her about you, because she will be delighted to hear that there is a young woman, cultural practitioner, involved in this work. Because this is something that she has continuously made known to us that she desired to have just what you're doing. So you're the manifestation and the fulfillment of a dream for our kumu, even though you don't know each other.

WT: Aww. Mahalo. I keep hearing that from people especially when I interview people. It's nice to be reassured that I'm in the right space and doing the good work.

I would love to hear what your thoughts are with regard to cultural practices and beliefs associated with native forest birds up there. Just any thoughts along those lines.

SJM: Well, you know, because we go clean and maintain this one spot. We call it the classroom. We call it that because when we were young hula students our Kumu took us to this spot and taught us. This is palapalai, it's different from this other one don't make the mistake of gathering the other one and think it's palapalai because it's gonna die. It's not the right one, you know. She would tell us, these are the birds, these are the plants that you need to know for hula and this is how we maintain we pull the weeds. Over many years we've been doing that. So we see, we're there with our hands in the dirt pulling out the guava and the blackberry and the honeysuckle, the aliens pulling them out. And watching the small little maile sprouts growing. For the first time in my decades of living on Kaua'i and working up there we saw new Mokiha shoots sprouting in this area because we cleaned things out. So, being there, having our hands in the dirt and seeing how the forest has changed so drastically over the years on the ground. Our group was more concerned with the plants, right, because that's just what hula people do. You know. You think about the plants.

We didn't have the knowledge that we needed about the birds, and the interrelationship between the birds and the plants. And so, you know, once in a while we go, "oh, there's an 'elepaio, oh, there's an 'i'iwi," but not like now with our association with Cali and the other people from the Bird Recovery Project. We didn't notice that there weren't as many birds because we're looking at the ground, you know. I think other hula people are more concerned. Seems like. Well, I should only speak for us, but I think this might be true of others that they're focused on the plants, and they're not really realizing the interconnection, you know, that you gotta have it all because if you don't have 'ōhi'a you don't have a lot of birds that live with 'ōhi'a as their food source and shelter.

WT: Yes, I'm intrigued by the nature/culture connections. One is how the birds disperse the seeds of the native plants, and so they engage in the continuation of those native species.

SJM: For us for the group that I'm involved with. Being there, going up there and digging into the dirt it connects us to the plant aspect real firmly, but it wasn't until we opened ourselves up to the Forest Bird Recovery project people, until we collaborated with them, and opened ourselves up to this different aspect. It took that collaboration for us to really understand the larger picture. And I have a feeling that there are other hula groups that are like us, that they think about the plants, but not so much the birds and the relationship of it all. You know what I mean, so I don't know if that answered your question.

WT: Certainly, it did.

SJM: The other, the inspiration part of it too yeah. Because we knew that we were going to do a cultural ceremony with them related to forest conservation. It inspired and motivated us to look, pull it more closely into the language and to get our creative juices going.

So, you know the researchers are usually, the majority of the researchers are haole. From the mainland, from other places. Sometimes there are interns that are local folks, but a lot of the researchers are mainland people. So there's a gap. There's a gap between... which you are helping to fill. Thank you very much. But there's a step between the haole researcher and the local people that are working, doing the work on the ground. So this association for us has really been beneficial on both sides. I think. But you gotta open yourselves up, you know. Gotta answer the invitation, and then open yourself up, for how can we together to benefit the big picture.

And, you know, when we come out from cleaning our spot up there. We look at the all the encroachment of all the weeds, and all the you know how there's so much guava, and there's so much other bad stuff. The mosquitoes are just a new example. And we think well, we just have our little itty bitty tiny little dot that we worked on here that we put our few hours in, and we pulled a few weeds here in this little spot. But we are able to see those new sprouts coming up. The new natives thriving after we pulled out all the bad guys. But when you walk out you look and you see all this vast huge forest that's endangered. It's not just the birds that are endangered, the forest is endangered. It's disheartening. It's kind of overwhelming. So you have to focus back in on the little square acre that you worked on and think about that. So that's kind of how I see this mosquito project. That it's one small thing, but if it saves a couple of species, a few species, then it's a huge thing. And I think the researchers are dealing with that every single day. They're sad because they see their little friends dying, and feel like they can't do enough fast enough in order to stop it. It's very sad to think that we will lose a whole species. That extinction will happen before we can get the job done.

WT: Right. While we're on this sad track. What are your thoughts regarding what we stand to lose culturally if no action is taken to protect native forest birds?

SJM: Oh, more of the same. We've seen so many go. How could we not take action? That's my attitude. How could we not? If we know that there's something we can do. Mosquitoes are not native! They're not native to Hawai'i. Why would we not try this.

WT: Umhm.

SJM: Just like the rats on Lehua. Getting rid of the rats on Lehua. Rats aren't native they're aliens. Why not? We have to.

The cultural significance? I don't know if I can speak to the cultural significance. Maybe, Wainani you would be better at that than me. If there's something you can do, you gotta do it. You gotta try and do it. I don't know if that's cultural. That's just me, just my attitude.

WT: I like that attitude. Definitely.

One thing that I was discussing with Sam the other day we were discussing the potential for more cultural expression. And there have been folks who have written songs mourning the loss of these

birds, and so that would be a sad scenario right? If that's to be the cultural legacy of all this right. But if we spin it a more positive way, imagine all the potential mele, oli, hula that people of the future might create, once they go into the forest and they interact with these birds. If we're successful in retaining their populations and growing those populations right? So that's how I'm thinking about the sort of cultural side and benefits of this project is all the future, potential and present, potential for cultural practitioners to be inspired to create because of the birds existing.

SJM: You want an example? I have an example for you.

WT: Mhm! [nodding]

SJM: So because of the mosquito project and the materials that the Maui and Kaua'i Forest Bird Recovery Project people have put out related to 'ākohekohe, kiwikiu, 'akikiki and 'akeke'e, I wrote a song! Just as you speak, it's a song for today, and it's a song about these four birds. My idea was, you know the song Nā Moku 'Ehā? It goes like, [singing] Hanohano Hawai'i lā lei ka lehua lā kuahiwi nani lā 'o Mauna Kea. Four islands, the name of the island, the name of the flower, and the name of the mountain. So I did that with the birds. I did the name of the bird, the habitat, a characteristic of the feathers, and then another characteristic peculiar to that bird. It has five verses total. One verse about each bird, and the hā'ina. Our music group is practicing it. The song had its debut at the Lehua Island Restoration Art show opening on Kaua'i a couple of weeks ago. The Island Restoration people sponsored the opening of an art show in Kukui Grove Center for our Kaua'i society of artists. We were part of the entertainment there. So we debuted the song that evening. Kumu Roselle's daughter Sharon did the melody. I did the words. She sees the native birds as kind of flitting, flying back and forth [waves hands in the air]. You know, kind of like that. So she did a melody that's really lively. So there's an example of what you're talking about.

WT: Yeah, I love that, mahalo for sharing.

Let's see, another question I have is do you have any concerns or recommendations for this project?

SJM: It seems like it's going to take a while before the actual mechanics of the mosquito release can happen. You know, to get the Wolbachia out there might take a couple of years. I don't know. It seems like the recovery project staff are doing the best they can to, you know, catch birds, and hold them in captivity until it can happen. No, I don't really have any recommendations... If there's a way to speed things up if there's any way to speed things up. More money, more people, more whatever it takes. Going to the legislature... whatever it takes. Maybe if there's a way to use the windfall of money that's coming down from the Federal Government for Native Hawaiian issues. If there's any way to use that to get some kind of grant or some kind of funding award to help get more staff to speed things up, then go that direction. These folks are really good at writing proposals and getting grant funding.

I don't know. Maybe getting more students involved. There's so much curricula for especially the immersion schools. I know that their list of what they have to teach is so long that adding in conservation issues might be difficult. Well, how did you get motivated? At what point in your education did you hear somebody talk about archiving or conservation that changed your mind and guided you into this? So think about that, and where we collectively should try to insert influence into the education system so more young Hawai'i folks go into conservation so that the gaps between the haole researcher and the local pig hunter... so those gaps are reduced.

WT: Yes, those are good thoughts, definitely. And it's something that I'm thinking about too. In my own experience, I just had really good mentors and internships that led me down this path. So now that I'm in the position I am in, it's time for me to return the favor. Pay it forward, right. So

I'm thinking about how I can do that. Perhaps there is an opportunity for DOFAW to get some interns out in the field helping with this work. I'll include that recommendation. Mahalo.

Going back to hula practitioners because that's who I am, too. Right. I love to talk hula. What other plant resources, you've already mentioned maile and mokihana and palapalai, what other plants do hula practitioners gather there?

SJM: 'Ōhi'a, of course. 'Ōhi'a lehua, halapepe, 'ie'ie. You know there's a conference on Maui. It has become an annual conference that began a few years ago at the Kā'anapali Beach Hotel. Gayle...what's her last name... anyways, she facilitates fiber weaving. I'm a lau hala weaver and I've been going to Ka Ulu Lauhala o Kona [weaving conference] for years and years. It used to be the only conference, except for one in Hilo every five years or so. But a few years ago on Maui, this other lau hala conference opened, but they expanded it, and they now include 'ie'ie fiber weaving. But 'ie'ie is so rare that they don't use 'ie'ie they use the mechanics of 'ie'ie weaving, but they use... ah, what you call it, the same material that they use for wicker, so that they don't strip the forest. People don't go up and take stuff. So that's just FYI there's more interest in all that. And olonā, there are people that are trying to figure out how to cultivate and how to use olonā the way it used to be used in fishing nets and stuff. I mean, we use plastic cause that's what we got now, right. It's available, and we got it. What else? [thinking]

You know, our group we don't go and gather maile because it's to the point now where it's not easily available. People take it indiscriminately, and they don't harvest it properly. Maybe that's a place that needs to be a focus. School kids, especially kids that are at Kekaha School, or Waimea Canyon or Hilo, or places where people traditionally go into the forest to gather maile. Even hula schools. They destroy it. They pull down branches, break branches in order to get maile from up there to pull it down. They don't harvest the right way. Those practices are not taught properly. It's disappointing. And it's hula people! After Merrie Monarch, after Prince Lot hula festival. In the past, you go up into Kōke'e and you see the place just trampled. Those are my concerns and recommendations. Really not related to the forest birds, but related to the forest. We're not doing a good enough job of teaching the real nitty gritty of conservation to our young people. We're not doing a good enough job.

WT: Yes, those same points, were mentioned in other studies. A 2004 Cultural Impact Assessment report done for Kōke'e and Waimea State parks mentioned the unsustainable gathering practices of maile and mokihana, because those are the most sought after, or at least they were at the time, and people were concerned, even back then that people were taking too much and not giving back to reforestation.

So I have a lot of aloha for people, like you were saying earlier, who are retaining the knowledge of the 'ie'ie weaving. They're using the method of the 'ie'ie weaving, but not using the 'ie'ie. I think that's very beautiful to you know we can adapt our cultural practices and it doesn't water it down at all in my opinion. In fact, it makes it that much more part of the story of why we need to mālama our plants in the forest. We're honoring the plant by not using the plant.

SJM: Kumu hula need to encourage. Perhaps yours did. Mine did. From early on we were told you plant palapalai in your yard. You don't go to the forest, you plant kupukupu you get yourself an 'ōhi'a tree. You don't depend on the forest. That's not difficult, it's not hard to do that. That's another thing that we need to do as practitioners is to encourage growing your own stuff so you don't have to go mauka. We're fortunate on Hawai'i Island and Kaua'i especially we still have a lot of forest area. We got mauka areas that still have things in them whereas O'ahu suffers and I don't know about Maui because I don't live there. I don't know that much about Maui maybe they have a lot of resources as well. But it's even more important for people who live in urban areas. You can have a plant. You can have a pot of palapalai on your lanai. In Hawaiian studies in public school why can't that be a part of the curriculum? Add it to all the other stuff you have to

have in the curriculum. Not just learning about kings and queens and chiefs, but more practical ecological issues. Not just one semester of Hawaiian history, but more what we're talking about.

WT: Yeah, definitely... So this group Ka 'Imi Na'auao that you're involved in. Is it a hālau? Could you clarify?

SJM: Okay, I'll explain it more. So, Ka 'Imi Na'auao o Hawai'i Nei, is a 501(c)(3) tax exempt organization that was formed in 1976 by our Kumu hula Roselle Bailey and a group of people surrounding her. It is the Hawaiian cultural umbrella organization whose purpose is to preserve and perpetuate Native Hawaiian culture through hula. So that's the overall goal of this. For all these decades we have maintained the 501(c)(3) cultural organization status. Under the umbrella organization is our Maui hālau, we also have an O'ahu hālau, our hālau here on Kaua'i. Roselle's daughter Poha, who is now deceased, had a hālau in Samoa when she was living there. There's also a branch in California. So, Ka 'Imi [Na'auao o Hawai'i Nei] is the umbrella. And about 10 years ago Roselle decided that she wanted "institute" put on the end of the name. She wanted, "institute" added, because she saw the 501(c)(3) as an institute of learning, which included publication. Going to a larger global audience. Theater performances, hula theater, travel and cultural exchange. A larger thing than the typical things a hula hālau does. And that's when she began to talk about internships and scholarships for people like you to get Native Hawaiian men and women interested in archival work and preservation work and conservation work. So we never really did accomplish that but we've talked about it for many, many years. So we're really happy that it's happening in other ways. Through these decades we have traveled to many different places and performed different programs different types of programs. If you go to kaimi.org our institute's website. You'll see, it's all there. We've published, we've written songs, we've choreographed hula, we've done different things that have greater exposure and publication and that's where the "institute" comes in.

WT: Mahalo for explaining that for me. So this plot of land. It's in Kōke'e?

SJM: Yes. It's just part of the forest. It's a flat area close to one of the dirt roads. We don't really tell people about it. We don't go regularly now we haven't really gone regularly since the lockdown since the pandemic hit. We've been out there just once since 2020. Part of it is because I'm usually the organizer and I just had back surgery about 10 weeks ago, and so I wasn't able to do the work. So we kind of let it go. It's just a spot in the forest. Many years ago, we got a permit with Department of Land and Natural Resources state parks to go and clean this area and we just renew it annually. It's just one small spot. And I'm sure the next time we go we're gonna have lots of weeds to clean because we haven't been there for 2 or 3 years. So the blackberry and the guava and everything all comes back.

WT: Mmhmm. Are you familiar with other groups who use that area? And keep in mind the project area is very large. It's not just Kōke'e it goes all the way to Wai'ale'ale, the Alaka'i swamp area, and even the Nā Pali coastline but I think the efforts will be concentrated in the higher elevation areas. Do you know of other sort of groups or individuals who use those areas in a cultural way?

SJM: Not formalized. The Discovery Center, I believe, is a DOE camp area up there. So the DOE teachers and school groups can use it for various reasons. Hui o Laka used to sponsor Eō e Emalani i Alaka'i an annual hula festival held in October. Hālau from all over the State come and perform during a one day event celebrating Queen Emma's trek into Alaka'i. Are you familiar with that?

WT: Yes, yes. It came up in my research. Yes, of course. Oh, that's interesting.

SJM: Yeah, very important. They're not doing it anymore. The pandemic basically shut them down and I guess they decided they weren't going to do it anymore. It's a lot of work, a lot of work. And without help from the Hawai'i Tourism Authority I believe it would have been difficult for them

to put it on. Groups that do public events like that, cultural events, in order to keep the event affordable to the participants outside funding is needed. That was a very important, a very important cultural festival. I think it should be included in your research. Because hālau came from all over the state and experienced the Kōke'e forest and atmosphere. Many of them stay at the CCC camp up at Kōke'e or in cabins that they had association with up there. So that was important. That also motivated and inspired Kumu hula to create chants, dances, oli, and mele related to Queen Emma's trek and related to the area Alaka'i. And of course, plants, birds, place names were preserved because of the inspiration that kumu hula had, yeah. It all works to preservation, yeah.

If you have a performance. You know this. When you know you have a performance, you knuckle down right, you knuckle down, but also you open your mind, right. You do your research and find out about the place, and you learn about the place names, and you find out about what happened there, and who went there, and what they did and why they did it. All that stuff. So, the Eō e Emalani Festival was an inspiration. A motivating event for a lot of people for many, many years.

WT: Yeah. Just in my experience with hālau there's power to just speaking these place names, and the plants and animals. It's like they're just kind of hanging out waiting for someone to activate them. And once you do, you know, amazing things do happen.

SJM: Yeah, exactly. Our group is very fortunate that we have a lease on a property up there. Roselle and her husband Jim acquired a part interest in this cabin in the seventies when they moved to Kaua'i. When they left Kaua'i they turned it over to Ka 'Imi Na'auao so now we manage that cabin up there. So we have a place up there. It has all the photos and the memorabilia from years and years of hula. Because we have a place, it enables us access yeah, access to the forest. So whenever we go up there we always go up to Kalalau, the upper lookout, the lower lookout. We go to all the spots. And usually when we go to Kalalau, it's our natural reaction to oli, [chanting] O Kalalau pali 'a'ala. Yeah, that particular oli. And whoever's there, it engages them instantly. You know, it's what you say, it's what you're saying. Just speaking the history, and the place names in that fashion engages everybody that's surrounding us whether it's visitors from the mainland or whether it's local people who are there. If it's Eō e Emalani time in October then there are usually other hālau people there and sometimes they join in. Just everybody becomes one thought, and it goes in the same direction. It's exactly what you were talking about.

We're fortunate, we're grateful every single day for what we have here on Kaua'i. And yet, sad that we can't do more.

WT: Hmm. Have you had experiences up close with any of the native forest birds and can speak to that experience?

SJM: You know. Not here. But on Hawai'i Island I go and visit my friend who lives in Volcano every year. Generally every year I go and visit her before going to the Kona Weaving Conference. I go to Volcano for a few days, and then Waimea where my sister lives, stay with her for a while, and then we go down to Kona together to go to the lau hala conference. So, anyway Lorna lives in Volcano and her lanai is surrounded by 'ōhi'a. It's a stop-over spot for 'i'iwi. So one of my favorite things to do when I'm with Lorna is in the early morning and in the late afternoon to just sit on the lanai there and quietly watch all the birds as they fly around. And it seems like what they're doing is, in the afternoon especially, it's like they're reporting in. You know, they're coming in and they're resting on the very top branches and some more birds come and they're talking to each other and then that one goes up this way and that one goes up this way, and somebody else comes it's like they're like, [narrates birds' conversation] "oh, yeah we were over by the so and so, and there were lots of 'ōhi'a, there were lots of berries over there, lots of insects in this particular tree, and you might check it out tomorrow." You know what I mean? Reporting

in on their activities during the day. Where everybody went, what they saw, and what they did before they go home to rest. So that's one of my experiences. But it's not here [on Kaua'i]. You know... For me it's only been, "oh, look! There's an 'elepaio! Oh, look! There's an 'i'iwi. Or you heard that, that's a [native bird]," you know. And not more than that for me.

WT: Yeah, I mean, even that alone is more than what most people get to experience, you know. Cause they are in these remote places that people just don't go to or get the opportunity to go to very often.

SJM: Maybe that's what we need to do. We need to get groups of kids out more, you know. Field trips out into the forest. When you were in school did you have field trips into the forest?

WT: In school I got to go to Volcanoes National Park several times. Growing up in Kona was really neat, and I didn't really appreciate it at the time, but we do have a lot of historic sites like heiau there in Kona that are still around. Being in Hawaiian immersion, they valued field trips a little bit more than maybe public schools do. So yeah, I feel like I got a lot of field trips.

SJM: Did you know Diana Aki? Was she a teacher of yours?

WT: Of course I know of her. My mom actually works a lot with the Miloli'i community. So I know of Diana Aki of course. But I don't think I ever met her in person.

SJM: So I was fortunate on two different occasions she stayed with me here in my home on Kaua'i. The first time was in the late 1970s when Diana and the Volcano Hawaiian Band came over and did a concert at Kilohana here. I don't even remember how it happened, but they ended up at my house playing music into the wee hours of the morning and just ended up sleeping on my floor [chuckles]. That was one time, and then another time, later on, when I was teaching hula, we did choreography to one of her songs and Roselle suggested that I invite her over for our hō'ike and she came. So she stayed with me. Oh, those are treasured memories for me!

So one of the performances that we did for the Kaua'i Forest Bird Recovery Project... When they wanted to go into the forest to catch the remaining family of 'akikiki in one particular area in Halepa'akai. They wanted to catch them, to take them over to Maui to be in captivity. They asked us to do some kind of a ceremony or blessing before that. So we took bird verses from five different songs. In Hawaiian music a lot of times a song will only have one verse about a bird. So we found different songs, and we took the bird verses, and we put them into a medley. And one of them is a song that Diana Aki wrote. It's called Manu Mele. One of the primary verses in this five verse mele is from her song that's a favorite for a lot of us who live here on Kaua'i.

Roselle's group actually visited Miloli'i in the early days. Diana hosted them in the early seventies. They went there and danced there, did a cultural exchange with the Miloli'i folks. So how cool, you can tell your mom or ask some of the folks that are still living down there if they remember that. I remember seeing pictures of it but I didn't go, I wasn't there. These connections go way back multi-generational.

WT: Yeah, love all that.

I don't really have any more questions for you. Do you have anything else you'd like to share?

SJM: No, I don't think so. It's been a pleasure. I've really enjoyed talking with you.

WT: I enjoyed it as well. Mahalo nui. I will be following up just to make sure that I get everything right, and that I convey all your ideas and thoughts and what you shared here accurately in the report. So I'll be contacting you again.

SJM: You know, I was just thinking, you asked about recommendations. I wonder if there is a way that we could advocate mandating some kind of conservation education for a certain grade level in

public school. That this kind of conservation education somehow becomes a requirement in public school and charter school curriculum.

WT: Yeah, that's a great idea. I'd be all for it, of course. Yeah, we need it because our environment needs it.

SJM: Not just forests but also the sea. My grandson's wife is a high school teacher at Kamehameha. She took a year off and got her master's degree in Hawaiian language, so that she could develop a curriculum in Hawaiian for marine biology at the tenth and eleventh grade level. So she has 2 classes, and they're electives. She's been doing it now for three years. So that's wonderful to me. Another young person that's doing the job and getting it done.

WT: Yeah, that's great. Well, mahalo for what you do with the Ka 'Imi Na'auao o Hawai'i Nei Institute. Keep doing the amazing work. Mahalo again for taking some time out of your day to talk with me and contribute to this Cultural Impact Assessment. I wish you good luck and healing with your back.

SJM: Thank you. A hui hou. Until whenever it is we meet again. I'm sure we will.

WT: Mahalo.

SJM: A hui hou.

WT: A hui hou.

Cultural Consultation Interview Concerning State Mosquito Suppression Efforts in Kōkeʻe and Alakaʻi Wilderness Areas of Kauaʻi

Zoom video conference on October 6, 2022

Interviewee: Keao NeSmith [KN]

Location: Oʻahu

Interviewer: Wainani Traub [WT]

Location: Honolulu, Oʻahu

Transcript

KN: How's it.

WT: Hi.

KN: Aloha. I'm outdoors so it's a little bit noisy but not too bad.

WT: Okay, no worries. Mahalo for making time to talk with me today I really appreciate it. I'll start with just quickly introducing myself. I'm Wainani. I'm from Kona Hawai'i. I've worked as a cultural anthropologist at SWCA Environmental Consultants for a little over a year now primarily doing archival research and writing cultural and archaeological compliance reports. So that's a little bit about myself. Could you please introduce yourself?

KN: Aloha my name is Keao NeSmith I'm from Kaua'i. I don't know what to call myself. I'm a freelance researcher and consultant I do cultural ethnohistoric research, stuff like that.

WT: Are you on Kaua'i right now?

KN: No, Oʻahu.

WT: Ah, me too. Have you had any experiences up close with our native forest birds and can speak to that experience?

KN: Any place in particular?

WT: Well, the project area is the Kōkeʻe, Alakaʻi wilderness, Nāpali areas. But just in general about native forest birds wherever you have encountered them.

KN: Forest birds [thinking]. Not specifically. I've encountered them along the way. It's always amazing. But I'm not an expert in any way.

WT: Okay. How about the project area? Did you get a chance to look at the map? It's a pretty large part of Kaua'i that they've identified as the project area.

KN: As far as my personal experience with birds. I've had many sightings and been near them of course. 'Apapane, pueo, 'elepaio, 'ōma'ō. There's a couple more that I've encountered as well that stand out in my memory. Other than that, my experiences relating the ethnohistory to birds as far as the lore is concerned, and also place names. So, for example, there are many place names, all across the top. The high elevations up over there with bird names, and so my job would be to figure out how that came to be. How those names came about. What's the story associated with the area and then what's the relevance and significance culturally for those names and those birds.

WT: Yes, that's come up a lot in my research. Does any particular place name stand out to you?

KN: Halemanu. That one is pretty obvious. Let me see I don't have the map in front of me right now, cause I could just look at the map and just point to all the places and names up on top the forest walk. [thinking] Sheesh, I'm drawing a blank right now all these different bird names up over there. There's

a lot, you know, including Moho as a place name reference. Did you want a list I could produce one for you.

WT: No. That's alright. I'll bring up my list and name some of the ones I've found and maybe that will trigger something for you. I have a table going of place names with references to manu. I'm just skimming through my report trying to find it.

I initially thought that Kanaloahuluhulu was a reference to birds. But then I read one version of a mo'olelo that explained that huluhulu refers to a hairy beast.

KN: Right. But it could also be kaona for hulu manu. Huluhulu is rarely used to mean hulu manu. So that was intentional. That kind of play in meaning is intentional. Kanaloahuluhulu, which is interesting because Kanaloa is often associated with ocean. But Kanaloa has connections with forests, and also with Kāne. Since there are springs in the area there is Kāne involved, but Kāne is almost always paired together with Kanaloa and together they produce springs. Huluhulu in this case actually refers to the foliage. The forest itself. Same for up Mauna Kea. Pu'u Huluhulu is that crater, that hill where everybody gathers during the protests. So it's the same reference. That's a kīpuka. It's all lava fields all around, except for that one area which is a kīpuka Hulunahalehele forest. So the reference is to the vegetation on the hill. The honua is the body and the huluhulu is the vegetation growing on the body.

WT: Ohhh, interesting. This is why I wanted to speak with you. Because you have such a deeper understanding of the language than I do. So huluhulu is the abundance of the forest and do you think that also includes birds because they were very much a part of that, too.

KN: Yeah. 'I'iwi polena is one of the places. Lots of bird names associated with the ridges going down Nāpali side.

KN: For example, Nā keiki a 'i'iwi. It's rendered a couple of different ways. Nā keiki a nā 'i'iwi, nā keiki a Nā'iwi. When you're on the ocean looking up or on the big beach of Kalalau looking up, there is a couple of rock features or points going up the ridge. They are associated with the menehune. The menehune kids came down to play with the kids of Kalalau but they took too long, and in the morning when the sun was rising, as they were trying to make it home, they turned to stone when the sun hit them. And so they became known as Nā keiki a Nā'iwi. That's also kaona, a play on words because Nā'iwi or Nā'iwi as in the birds.

WT: Right, right. I came across that mo'olelo in my research. I was about to ask you about that one, too.

Kaleinamanu ridge is another one that came up in my research. I also noticed as I was researching all these mo'olelo that Maunahina was often said to be a place where birdcatchers lived.

KN: Yeah that's more on the Hanalei side.

WT: Hmm.

KN: But the ridge above Limahuli Manoa Valley up in there is supposed to be another area like that.

WT: Okay.

KN: The people over there at Limahuli would have information about that, too.

WT: Are you familiar with any of these kia manu mo'olelo?

KN: I've only come across a couple of them. Fred Wichman, he has a couple of books out on Kaua'i stories and he writes about a couple of them.

WT: Yes, yes, I've check out all of his books.

KN: Oh, good.

WT: He has one on place names as well.

KN: Yeah. Good. He's a good source.

WT: Another interesting thing that came up in my research was Queen Emma's huaka'i to Alaka'i and Wai'ale'ale.

KN: Yeah.

WT: There were so many mele māka'ika'i written for that event and still people today composing mele about that event for the hula festival right? Are you familiar with those mele?

KN: Yeah that's where you get the mele lei. They talk a lot about the four famous mele hula lei each one a lei something. [thinking] What's that one mele about Kamaile over in Nu'alolo is one of them. But actually there's way more than four. But as far as the different hālau are concerned, these four mele hula lei are recognized as part of the standard traditional hula that hālau should learn. And they stem from that story of Emma.

WT: Right. Right.

KN: So you might want to consult with Kumu hula about what those mele lei are.

WT: Actually, there is a book of Emma mele

KN: Oh yea you're right.

WT: So I've selected two mele from there to include in the CIA.

KN: That's good. Amy Stillman wrote about stuff like that, too.

WT: Hmm. [pause] What are your thoughts regarding what we stand to lose culturally if no action is taken to protect these native forest birds?

KN: Yeah. If the mosquitoes keep rising and keep dominating the forest, we're going to lose the birds and then the imported birds will take over. Egrets in particular because they're so aggressive. Barn owls are also super aggressive. I've seen barn owls attack native pueo because they're larger. In midair they'll just attack them, and they'll have a big fight. So sometimes you'll see pueo missing an eyeball and stuff like that from encountering barn owls.

So if we lose those things then everything will just fall to textual knowledge, you know. Mele talking about animals that the new generations will never have seen. There already are many that this generation has never seen that are mentioned in mele. Stuff like that. So they are integral to Hawaiian culture. We don't choose to lose them. We would never do that. They're national treasures. So if they're lost it's because of some catastrophe, some kind of accident. We didn't choose to let them die out. I guess the biggest threats right now would be climate change and the warming temperatures and deforestation. If there was more forestation and more forestation of native trees coming down the mountain theoretically it'll bring the cloud levels back down. Which would bring back more rain. We need those things.

WT: Yeah, definitely. Do you have any concerns or recommendations for this project?

KN: Yeah, I mean, one thing leads to another. We need to be able to control invasive plants. You control invasive plants, then you allow native plants to grow back. And that's what attracts the native birds and so feeds the cycle. It's the native plants that feed the whole cycle. They also feed our culture. They feed our mele. They feed our identity. So if we allow things like the black wattle and albizia to take over, then, what's the point in saving the birds. One of the biggest natural catastrophes that's happened on Kaua'i is allowing the farming of albizia down below in Kōloa side because it spreads super fast, it grows super fast, and the seeds have spread all the way up to the top of Kawaikini so we actually see that kind of the spread of albizia way up there. That had never been seen before, and the

way they grow they spread out and just cover the ground which eliminates the possibility for native plants to grow. I think the biggest mismanagement to have happened is to not realize that things grow in a cycle. The trees provide living sustenance for the birds. The birds thrive and have their role because they're also pollinators and then that goes back into the cycle and allows further propagation of native plants.

WT: Right. Yes, it's all connected.

KN: It's all connected. So if we allow for these intrusive plants then that breaks that cycle and creates another cycle.

WT: Mhmm. Do you know of any stories from the older generations whether they have stories about their experiences with native forest birds that are still around or extinct?

KN: Yeah, that's where Randy Wichman comes in particularly well. [thinking] Manini family...trying to remember his name right now he actually works for DLNR. He's been working up there most of his life since he was a teenager. Manini family from Waimea. They come to mind right away. Another one is Jardine family. Sean Jardine he's a hunter also knows the top of the mountains super well and his family is from Kalaheo side. They know the area super well and can tell you all kind of things. They're connected with other hunters who also know stuff. The hunters are really good at this because they get off the trails and they just wander and they'll camp out and can tell you all kinds of things.

WT: Yeah, I spoke with Billy DeCosta. He comes from a hunting family. When I interviewed him, he was just rattling off all the place names.

KN: Yeah. And when you get the hunters together, they all kind of rattle off in that same sort of way. You can cross reference them and triangulate and that's what makes them super valuable.

Yeah. So Kilohana is a big hill back way up Makaweli. A lot of hunters go up that area. Wai'alaie, 'alaie is a bird name. Kilohana is called that because it's a vantage point when you get to the top of it you can turn 360 and you can see the different gulches in the different directions.

WT: What sort of cultural practices and beliefs do you know are associated with native forest birds on Kaua'i?

KN: Mele hula. Some of the most sacred hula that would be performed on heiau for ritual ceremony are either composed up over there or performed up over there. For example, Pōhaku Wa'awa'a. When you go pass Kanaloahuluhulu and you take the highway, and it winds up further, and then you hit that stretch that goes up to the second Kalalau lookout. There is a place you can stop on the side of the road and walk through the forest and on the edge of that ridge is actually a heiau, and there's a rock over there in the shape of Kaua'i. I've been to it a number of times. That spot is the point that divides different ahupua'a going down. It's a merging point. That area also has a bird name too. I'm trying to remember. Right next to that rock, only several walking steps from that rock, there's a heiau. The remains of a heiau. It looks like a platform and that's the kind of place where hula would be performed because it's prominent it's up there considered a leyline and so it's super sacred for that. That's the kind of place where these hula would be performed, and the association with birds is that you're high up in the forest, and that's where these birds are. They [birds] associate with the gods and that's what the intent of the hula is for.

WT: Shifting to plant resources. What do you see cultural practitioners going to the forest for? What sort of concerns do you have? Others spoke about the declined in the abundance of things like maile.

KN: Yeah. Locals aren't doing well in taking care and respecting the growth cycle. It's unfortunate. I would encourage maile farming instead of raiding the forest. I wish DLNR would start a campaign to encourage farming. It's a big deal on the Big Island. Maile farming is a big deal. In Panaewa and Hilo. I have friends over there with their backyard just loaded with maile. So, instead of having to go into the forest and cause all kinds of destruction. A lot of locals go in there and just shred the maile rip it

apart and then it dies, or it never grows well again. For someone who wants to make a lei, you want nice long strands. You can't find nice long strands anymore. It's hard to find. You find only tiny branches here and there that are not suitable for making lei. And when people do find nice long ones they just go ahead and shred the whole thing, and don't consider you know you have to leave some. Mokihana same story.

Mokihana doesn't get shredded like maile gets shredded because maile is a vine. But Mokihana, the berries and stuff like that. People take more than they need. Just because it's May and close to graduation, you know. People will just go absolutely raid because they get desperate. So graduation comes and everybody goes and raids all the maile. It's greedy. People get greedy and they have no consideration for the next people coming after them. For myself, I prefer to find my nice long strands, and I cut them off. I cut them off and take them home and then do the stripping instead of strip on the plant, because sometimes you pull on the thing and you pull out the whole plant roots and all. You gotta get it right. You gotta get a nice firm grip. Sometimes the bark is woody. When it's woody that means it's too old and if you try shred it off it'll just lift up the whole plant. Another problem is people don't get a good grip, and instead of getting a nice straight pull it breaks apart at different points and it's not usable so it gets tossed to the ground and in the meantime they left the plant mangled. So it's real bad.

Lately people have been getting into old but new types of Hawaiian crafts like wood carving. Kauwila is one type of wood. Another problem is that Kōke'e is a state park so you cannot just harvest that kind of thing. You cannot just take out a chain saw and cut down kauwila because you want the wood for carving. You have to get permissions. It's very difficult. For cultural practitioners there should be that kind of access, and that access should be made easy not difficult. It should be registered so we know how much of it is going on. Poaching should be regulated. But then, for those who want to have access should have access. The answer can't be no just cause it's a State Park. That should not be the answer that shuts it down, it should be the answer that makes it possible.

WT: Mmhm. Right. Going back to the project impacts. I'm not the biologist who understands how this wolbachia works but it is backed up by a lot of science. Do you have any concerns about using a biological intervention to address this problem?

KN: Yeah. That's a tough one. I've said this a few times among friends. If I could design a net or an aphid or something that would just attack albizia and nothing else and then would die when all the albizia is all gone I would absolutely let it loose. But that's a hypothetical. But it's always you know so they get this wasp that attacks the wiliwili so they get this other bug to take care of the wasp, and then after they've done their job with the wasp on the wiliwili. Now what? We're stuck with that kind of problem. We have no idea. There's no guarantee. There's no way to know. Mongoose is the classic go-to story. The next problem animal could be the skunk because it seems that they keep finding them over at the piers at the docks.

WT: Kaua'i still doesn't have mongoose yeah?

KN: Kaua'i no more. Well, there are reports. I got friends who work at the docks and they see them scurrying around in the warehouse. So they usually catch them in there. The skunks. Yeah, that's been on the news recently, Kaua'i, O'ahu, Maui.

WT: Oh, I missed that.

KN: Yeah, several times.

WT: Do you have any other thoughts you'd like to share?

KN: No, nothing else. I have to get going here.

WT: Okay, mahalo for talking with me.

KN: Mahalo nui.

Appendix C:

**Federal Insecticide, Fungicide, and Rodenticide Act Section 18
Specific Emergency Use Label for Incompatible Insect Technique
Application and US Environmental Protection Agency Letter of
Authorization**

Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

FIFRA Section 18 Specific Emergency Use Directions.

DQB Males

The wAlbB *Wolbachia* bacterium prevents the development of *Culex quinquefasciatus* mosquito eggs in wild type *Cx. quinq.* females mated with *Cx. quinq.* males with wAlbB

ACTIVE INGREDIENT:

Wolbachia pipientis wAlbB, contained in live adult *Culex quinquefasciatus* males (DQB strain) >0.002% w/w*

* Contains a minimum of 0.7 copies *Wolbachia pipientis* wAlbB per copy of *Cx. quinq.* male mosquito DNA

For Distribution to and use only in the State of Hawaii for use in conservation of Hawaiian native birds.

This specific emergency exemption is effective from April 25, 2023 until April 25, 2024.

EPA File Symbol: 23HI01

Contains live male mosquitoes

[male release container] NET UNIT CONTENTS: *Wolbachia pipientis* wAlbB, contained in 1,000 adult male

Culex quinquefasciatus mosquitoes.

Contains Units of male release containers. Net minimum weight active ingredient in each container is 1.58x10⁻⁶ oz. (0.045mg).

[male transfer container] NET UNIT CONTENTS: *Wolbachia pipientis*, wAlbB, contained in 1,000 adult male

Culex quinquefasciatus mosquitoes.

Contains Units of male transfer containers. Net minimum weight active ingredient in each container is 1.58x10⁻⁶ oz. (0.045 mg).

[male release containers] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp.

Manufactured by:

Verily Life Sciences LLC

269 E Grand Ave., South San Francisco, CA 94080

EPA Company No. 92643

Batch Code:

email support: dqb-support@debug.com

EPA Registration No. Unregistered Pesticide

EPA Est. No.: 92643-CA-1

Filling

Timestamp:

Ref: DQB-Label-0.11 (FINAL) 2023-04-11

Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For use only

by Verily Life Sciences LLC.; persons under direct contract with Verily Life Sciences LLC for the purpose of

application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

INSECTS SUPPRESSED:

DQB Males selectively suppress populations of *Cx. quinquefasciatus*. (*Cx. quinq.*) where the wAlbB *Wolbachia pipientis* is incompatible with wild-type *Cx. quinq.*, resulting in inviable eggs and reduced hatch rates. If used in accordance with this label to achieve a sufficient excess of DQB males over wild-type males, DQB Males are expected to suppress female *Cx. quinq.* mosquito populations.

RESTRICTIONS

- For Distribution to and use only in the State of Hawaii for the conservation of Hawaiian native birds.
- For outdoor use only.
- [male release container] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp.
- Do not use mosquito adulticide sprays in the same location as DQB Male releases within 48 hours of DQB Male releases.
- This specific exemption labeling must be in possession of the user at the time of application.

Notification Requirements: Applicators must notify Hawaii Department of Agriculture (HDOA) at least

seven (7) days prior to intended application Notification must include the following information:

- Name of applicator(s)
- Employer's name
- Phone number
- E-mail address (if applicable)
- Location (address, Tax Map Key, or GPS coordinates)
- Estimated amount of mosquitos to be released
- Estimated date of application

Completed Use Reports: Applicators must submit a completed use report to HDOA within sixteen (16)

days of application via email or hardcopy through mail. Completed use reports will be submitted on forms provided by HDOA. Contact HDOA to acquire the necessary forms.

HDOA Contact: Applicators can contact HDOA at hdoa.sec18@hawaii.gov or at 808-973-9415.

APPLICATION RATE

- Releases of male mosquitoes are to be performed at least once per week at a release rate adequate to maintain an overflooding ratio of DQB:Wild type male *Cx. quinq* >10:1 or, in the absence of trapping data, a minimum of 150 males/acre/week. Male mosquitoes are released to Ref: DQB-Label-0.11 (FINAL) 2023-04-11

Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

the air and fly away to mate with indigenous females. If multiple containers are used, mosquito releases should be distributed as evenly as possible over the treatment area with release points spaced less than 1 km apart to ensure consistent coverage within the treatment area. To ensure highest possible efficacy adhere to this regimen until the end of the mosquito season (where applicable).

- Application rates are based on the area to be treated: each container (1000 DQB Males) is sufficient to treat 6 acres based on initial treatment rates of 150 males per acre per week. Multiple containers per week are required to achieve minimum treatment rates for most areas.
- For ongoing programs involving multiple releases per week over landscape scale (>500 acres) the applicator may use the nominal container fill (e.g. 1000 males) to compute release rates. For smaller programs the applicator will confirm the number of males in each container by entering the container barcode and batch number at <https://count.debugproject.com>
- Use trapping data in treatment areas or appropriate proxy locations (as reviewed by the Hawaii Department of Land and Natural Resources) to adjust release rates as required to maintain desired overflooding ratio of DQB:Wild type male *Cx. quinq.* of >10:1 and to compensate for estimated higher levels of *Cx. quinq.* in treatment areas as appropriate.
- Overflooding ratio is determined by comparing the pre- and post-release average male trap counts in treatment areas or by using molecular methods on males sampled from treatment areas (to differentiate wAlbB males from Wild Type see Crawford et al 2020₁ for similar methods). For treatment areas inaccessible for regular trapping the Hawaii Department of Land and Natural Resources may approve appropriate proxies. Contact Verily Life Sciences for more information on how to determine overflooding ratio.

METHOD OF APPLICATION

- Releases may be conducted using [male release containers] and [male transfer containers]

- [male release container] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp
- If receipt of a shipment of DQB male containers is delayed (by more than 48 hours for [male release containers], or 24 hours for [male transfer containers]) contact Verily Life Sciences.
- Keep container closed until ready to release the DQB males
- Releases may be conducted from on foot (by hand) from the ground or aurally. Male mosquitoes should fly vigorously away from the container after release.
- If males do not fly or appear damaged, contact Verily Life Sciences.
- A single release point treats an area with a radius of about 500m (~200 acres) centered around the release point.
- To cover most areas, multiple releases and containers/week are required. Release points should be <1 km apart and as evenly spaced as feasible to achieve consistent treatment.
- For point releases by hand
 - Transport containers to the predetermined release site
 - Point opening of container away from face and open
 - Gently shake or rotate the container until DQB males have dispersed
- For aerial releases

¹ Crawford, J.E., Clarke, D.W., Criswell, V. et al. (2020). Efficient production of male Wolbachia-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations. *Nat Biotechnol* 38, 482–492. doi: <https://doi.org/10.1038/s41587-020-0471-x>

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Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

- Aerial releases are to be performed using Verily aerial mosquito release systems.
- Aerial releases may be conducted by either helicopter or other aircraft, including UAV, equipped with Verily aerial mosquito release systems.
- Load aerial release equipment with the desired number of male containers to achieve the desired treatment rate over the treatment area.
- Plan aerial releases by mapping container release points evenly across the treatment area at sufficient density to achieve the desired treatment rate when considering the overall number males released per week into the treatment area.
- Aerial releases may be initiated manually by the user or automatically by the release equipment, as the aircraft reaches designated release points along the release routes, accounting for aircraft speed, altitude and any wind.
- Contact Verily Life Sciences for more information on aerial release planning, and to enable automated releases.
- As an example release planning calculation: A treatment area of 3,000 acres at a target of 150 males/acre per week would require 450,000 males/week, which is 225 containers/week at nominal 1000 DQB male fill. Even distribution requires at least 15 evenly spaced release points, though more (and closer) points will enable more even and consistent treatment (each point can treat ~200 acres based on a 500m treatment radius). At 2 releases per week, each release with this minimum set of points should involve ~15 containers/point/release (225 containers per week/150 release points/2 releases per week) to gain appropriate coverage. Increasing the number of release points by decreasing the spacing between points will enable more even and consistent treatment.
- For maximum efficacy the user should ensure consistent application to all areas to be treated throughout the *Cx. quinq.* mosquito season (if applicable).

USE IN INTEGRATED VECTOR MANAGEMENT PROGRAMS

DQB Males can be used as part of an integrated vector management program. This includes the use of larvicides, adulticides, and source reduction. Any integration of mosquito adulticiding must be timed to minimize negative effects on the DQB Males that are released into the same or nearby treatment areas. Consult the pesticide label of the adulticide to determine the most appropriate timing of release of DQB Males between pesticide treatments.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE

Keep container closed until ready to use. Keep in original container unless refilling a male release container from a male transfer container according to instructions provided with the Verily field loading device. Keep male transfer containers cool (35-45°F) prior to use. Store DQB Males out of direct sunlight and at moderate temperatures 45 °F - 95 °F (7 °C - 28 °C).

PESTICIDE DISPOSAL

Release all living DQB Males present in male release containers as soon as possible and within 48 hours of receipt by applicator or after refilling from transfer containers. Male transfer containers must be used (released or transferred to release containers) within 24 hours of the filling timestamp. Discard Ref: DQB-Label-0.11 (FINAL) 2023-04-11

Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

dead individuals in trash. If not released or if the males are damaged, kill males by freezing or allow them to die by keeping inside closed container for a minimum of 7 days, then discard dead mosquitoes in trash.

CONTAINER HANDLING

Do not reuse this container for any other purpose. Return to point of sale by calling [Support phone number] for instructions on returning the empty container, or for the approved process to dispose of in trash, or in a sanitary landfill.

Instructions for refilling [mosquito release container]:

If refilling manually: inside a containment cage e.g. bugdorm, open the [mosquito transfer container] and empty its contents into an open [mosquito release container], re-sealing both immediately to prevent loss of contents.

If refilling using a Verily field loading device: load clean, empty [mosquito release containers] into the loading device in the locations indicated for “release containers,” ensuring they are engaged and sealed in the device. Load the corresponding number of Mosquito transfer containers into the loading device in the locations labeled “transfer containers”, ensuring that the Mosquito transfer containers are fully sealed in the loading device. Activate the loading device by engaging the “start” mechanism as indicated. Operate loading device until the mosquitoes are transferred and the loading operation is completed. Visually inspect mosquito release containers to ensure they have been filled. Unload the (filled) mosquito release containers from the loading device, and (empty) mosquito transfer containers. User may optionally confirm the number of DQB males in the mosquito release containers by entering the corresponding transfer container barcode and batch at <https://count.debugproject.com>. Return empty male transfer container(s) to the manufacturer.

WARRANTY STATEMENT CONDITIONS

The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Verily Life Sciences. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES

Verily Life Sciences makes no other warranties, express or implied, of merchantability or of fitness that extend beyond the statements made on this label. No agent of Verily Life Sciences is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. Verily Life Sciences disclaims any liability whatsoever for damages resulting from the mis-use or mis-handling of this product.

LIMITATIONS OF LIABILITY

The exclusive remedy of the user or buyer for any and all losses, injuries, or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Verily Life Sciences' election, the replacement of product.

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Wolbachia pipientis wAlbB in *Culex quinquefasciatus* (DQB Strain)

Not on main label: website <https://count.debugproject.com>

Ref: DQB-Label-0.11 (FINAL) 2023-04-11



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

Hawaii Department of Agriculture
Pesticides Branch
1428 South King Street
Honolulu, HI 96814

Effective Date: April 25, 2023

Expiration Date: April 25, 2024

Report Due: October 25, 2024

File Symbol: 23HI01

Attn: Esther Reichert and Greg Takeshima

The Environmental Protection Agency hereby issues a specific exemption under the provisions of Section 18 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended, to the Hawaii Department of Agriculture (HDOA) for the use of *Wolbachia pipientis* DQB strain (wAlbB) contained in live adult male *Culex quinquefasciatus* mosquitoes on up to 20,000 acres of State, Federal, and private lands to control mosquitoes (*Cx. quinquefasciatus*). This specific exemption is subject to the conditions set forth in your request dated, October 25, 2022, the label submitted April 11, 2023, as well as the following conditions and restrictions:

1. The HDOA is responsible for ensuring that all provisions of this specific exemption are met. It is responsible for providing information in accordance with 40 CFR 166.32(b). Accordingly, a report summarizing the results of this program must be submitted to EPA headquarters and EPA Region 9 within six months following the expiration date or prior to requesting a subsequent specific exemption for this use. An interim summary report may be submitted, in the later instance. In accordance with 40 CFR 166.32(a) these offices shall also be immediately informed of any adverse effects resulting from the use of this pesticide in connection with this exemption.
2. The unregistered product, DQB Males (*Wolbachia pipientis* (wAlbB) contained in live adult male *Culex quinquefasciatus* mosquitoes, active ingredient <0.3% w/w of adult male mosquitoes), manufactured by Verily Life Sciences, may be applied. All applicable directions for use, restrictions, and precautions on the container label submitted April 11, 2023, must be followed, unless otherwise modified in this authorization document.
3. DQB Males may be released by ground or aerial application at a release rate adequate to maintain an overflooding ratio of >10:1 DQB:Wild-type male *Cx. quinquefasciatus* mosquitoes, or in the absence of trapping data, a minimum of 150 males per acre per week. A maximum of 156 applications may be made per release site per year, based on an anticipated maximum of 3 releases

per week. The total amount of DQB Males to be applied per year to treat conservation lands throughout Hawaii is up to 3,000,000 male mosquitoes per week or 156,000,000 males per year. The maximum amount of *Wolbachia pipientis*, DQB strain, to be applied per year is up to ~1.83g/week or 95g/year.

4. DQB Males is for distribution to and use only in the State of Hawaii by Verily Life Sciences LLC; persons under direct contract with Verily Life Sciences LLC for the purpose of application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

5. A maximum of 20,000 acres of State, Federal, and private lands may be treated in the counties of Honolulu, Hawaii, Kauai, Niihau, and Maui in the State of Hawaii.

6. DQB Males is for use only by Verily Life Sciences LLC; persons under direct contract with Verily Life Sciences LLC for the purpose of application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

7. Use of DQB Males in public health programs is prohibited.

8. Do not use mosquito adulticide sprays in the same location as DQB male releases within 48 hours of DQB Male releases. If an adulticide treatment is expected to have a residual effect lasting longer than 48 hours, consult the pesticide label of the adulticide to determine the most appropriate timing of release of DQB Males between pesticide treatments.

9. This product is not for uses on food or feed.

10. Six weeks from the start of releases, quarterly monitoring for wAlbB-infected *Cx. quinquefasciatus* eggs or larvae must occur within a 10-km radius of release area. Sampling for egg rafts or larvae will be conducted from a minimum of 10 oviposition traps or larval breeding pool samples at each of at least 2 monitoring sites. A representative sample of at least 93 egg rafts, larvae, or any combination of the two, that are collected from these sites (or all collected egg rafts and/or larvae if fewer than 93 are collected across sites) must be evaluated for wAlbB in *Cx. quinquefasciatus* using PCR assays described as part of the *Wolbachia* infection Quality Control.

If wAlbB-infected *Cx. quinquefasciatus* offspring are detected in any of the samples from a site, then monitoring will be increased to monthly at that site, and monthly monitoring will be initiated no later than 45 days from the date of the confirmed detection of wAlbB-infected *Cx. quinquefasciatus* offspring. Monthly monitoring samples should be collected approximately every 30 days, but monthly samples will be collected no later than 45 days from the previous sample date. If monthly monitoring at a site cannot be conducted within 45 days of the date of detection or the previous sample, then releases at that site will be suspended until monthly monitoring can be conducted. If $\geq 10\%$ of *Cx. quinquefasciatus* eggs or larvae sampled from a site per visit are confirmed positive for wAlbB in two consecutive visits (with the subsequent visits conducted monthly as defined above), then cessation of releases within 3km of the positive site must occur. Releases may resume if an additional sterilization method is used or once $< 10\%$ of *Cx.*

quinquefasciatus eggs or larvae are positive for wAlbB during subsequent monthly monitoring. Once no wAlbB-infected *Cx. quinquefasciatus* eggs or larvae are detected at the positive site during monthly monitoring, quarterly monitoring may resume.

11. Any unused, unregistered product must either be returned to the manufacturer or distributor (unopened containers) or disposed of in accordance with the label following the expiration of the emergency exemption.

This is the first year that an emergency exemption has been requested under section 18 for use of DQB Males on Hawaii's conservation lands. The industry partner, Verily Life Sciences, has indicated they intend to work toward registration under section 3 of FIFRA in the future. Therefore, progress toward registration is adequate at this time.

In the event that the HDOA requests this use pattern next year in connection with an emergency exemption, EPA is making a preliminary determination that this use is eligible for the re-certification program (40 CFR 166.20(b)(5)).

Any future correspondence in connection with this exemption should refer to file symbol: 23HI01

If you have any questions with respect to this authorization, please contact Emergency Response Team member, Anna Katrina Briley at (202) 566-1210; briley.anna-katrina@epa.gov or Eric Bohnenblust at (202) 566-2506; bohnenblust.eric@epa.gov, Chief of the Minor Use and Emergency Response Branch.

Ed Messina, Esq., Director
Office of Pesticide Protection
cc: USEPA Region 9- Regional and Tribal Coordinator, Fabiola Estrada

Appendix D:

**USFWS Avoidance and Minimization Measures and Biosecurity
Protocols**

Avoidance, Minimization, and Conservation Measures for Listed Plants in the Pacific Islands

Project activities may affect listed plant species by causing physical damage to plant parts (roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat that may result in reduction of germination, growth, and/or reproduction. Cutting and removal of vegetation surrounding listed plants could potentially alter microsite conditions (e.g., light, moisture, temperature), thereby damaging or destroying the listed plants and increasing the risk of invasion by non-native plants, which can result in higher incidence or intensity of fire. Activities such as grazing, use of construction equipment and vehicles, and increased human traffic (i.e., trails, visitation, monitoring), can cause ground disturbance, erosion, and/or soil compaction, which decrease absorption of water and nutrients and damage plant root systems and may result in reduced growth and increased mortality of listed plants. Soil disturbance or removal may negatively impact the soil seed bank of listed plant species if such species are present or historically occurred in the project area.

In order to avoid or minimize potential adverse effects to listed plants that may occur on the proposed project site, we recommend minimizing disturbance outside of existing developed or otherwise modified areas. When disturbance outside existing developed or modified sites is proposed, a botanical survey for listed plant species should be conducted within the project action area, defined as the area where direct and indirect effects are likely to occur. Surveys should be conducted by a knowledgeable botanist with documented experience in identifying native Hawaiian and Pacific Islands plants, including listed plant species. Botanical surveys should optimally be conducted during the wettest part of the year (typically October to April) when plants and identifying features are more likely to be visible, especially in drier areas. If surveys are conducted outside of the wet season, the USFWS may assume plant presence.

The boundary of the area occupied by listed plants should be marked with flagging by the surveyor. To avoid or minimize potential adverse effects to listed plants, we recommend adherence to buffer distances for the activities described in Table C-1 below.

If listed plants are found to occur in a project area, the avoidance buffers are recommended to reduce direct and indirect impacts to listed plants from project activities. However, where project activities will occur within the recommended buffer distances, additional consultation is required. The impacts to plants of concern within the buffer area may be reduced by placing temporary fencing or other barriers at the boundary of the disturbance, as far from the affected plants as practicable.

The above guidelines apply to areas outside of designated critical habitat. If project activities occur within designated critical habitat unit boundaries, additional consultation is required.

All activities, including site surveys, risk introducing non-native species into project areas. Specific attention is necessary to ensure that all equipment, personnel, and supplies are properly checked and are free of contamination (weed seeds, organic matter, or other contaminants) before entering project areas. Quarantines or management activities occurring on specific priority invasive species proximal to project areas need to be considered and adequately addressed. This information can be acquired by contacting local experts such as those on local invasive species

committees (Kauai: <https://www.kauaiisc.org/>; Oahu: <https://www.oahuisc.org/>; Maui Nui: <https://mauiinvasive.org/>; and Hawaii: <https://www.biisc.org/>).

Table D-1. Recommended Buffer Distances to Minimize and Avoid Potential Adverse Impacts to Listed Plants from Management Activities

Action		Buffer Distance (feet (meters)) - Keep Project Activity This Far Away from Listed Plant	
		Grasses/Herbs/Shrubs and Terrestrial Orchids	Trees and Arboreal Orchids
Walking, hiking, surveys		3 feet (1 m)	3 feet (1 m)
Cutting and removing vegetation by hand or hand tools (e.g., weeding)		3 feet (1 m)	3 feet (1 m)
Mechanical removal of individual plants or woody vegetation (e.g., chainsaw, weed eater)		Greater of 3 feet (1 m) or height of removed vegetation	Greater of 3 feet (1 m) or height of removed vegetation
Removal of vegetation with heavy equipment (e.g., bulldozer, tractor, "bush hog")		2x width equipment + height of vegetation	820 feet (250 m)
Use of approved herbicides (following label)	Ground-based spray application; hand application (no wand applicator; spot treatment)	10 feet (3 m)	Crown diameter
	Ground-based spray application; manual pump with wand, backpack	50 feet (15 m)	Crown diameter
	Ground-based spray application; vehicle-mounted tank sprayer	50 feet (15 m)	Crown diameter
	Aerial spray (ball applicator)	250 feet (76 m)	250 feet (76 m)
	Aerial application – herbicide ballistic technology (individual plant treatment)	100 feet (30 m)	Crown diameter
	Aerial spray (boom)	Further consultation required	Further consultation required
Use of insecticides (pollinators, seed dispersers)		Further consultation required	Further consultation required
Ground/soil disturbance/outplanting/fencing (hand tools, e.g., shovel, `ō`ō; small mechanized tools, e.g., auger)		20 feet (6 m)	2x crown diameter
Ground/soil disturbance (heavy equipment)		328 feet (100 m)	820 feet (250 m)
Surface hardening/soil compaction	Trails (e.g., human, ungulates)	20 feet (6 m)	2x crown diameter
	Roads/utility corridors, buildings/structures	328 ft (100 m)	820 feet (250 m)
Prescribed burns		Further consultation required	Further consultation required
Farming/ranching/silviculture		820 feet (250 m)	820 feet (250 m)

Definitions (Wagner et al. 1999)

Crown: The leafy top of a tree.

Herb: A plant, either annual, biennial, or perennial, with the non-woody stems dying back to the ground at the end of the growing season.

Shrub: A perennial woody plant with usually several to numerous primary stems arising from or relatively near the ground.

Tree: A woody perennial that usually has a single trunk.

Avoidance and Minimization Measures for Animal Species

Endangered ‘ōpe‘ape‘a (Hawaiian hoary bat, *Lasiurus cinereus semotus*): The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).

Endangered ‘ua‘u (Hawaiian petrel, *Pterodroma sandwichensis*), Threatened ‘a‘o, (Newell’s shearwater, *Puffinus newelli*), and Endangered Hawai‘i Distinct Population Segment of the ‘akē‘akē (band-rumped storm-petrel, *Hydrobates castro*):

Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.

Threatened nēnē (Hawaiian goose, *Branta (Nesochen) sandvicensis*): Nēnē are found on the islands of Hawai‘i, Maui, Moloka‘i, and Kaua‘i. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize potential project impacts to nēnē we recommend you incorporate the following measures into your project description:

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the project area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Endangered koloa maoli, (Hawaiian duck, *Anas wyvilliana*):

Hawaiian ducks are known to utilize montane streams on Kaua‘i for nesting.

To avoid and minimize potential project impacts to the Hawaiian duck we recommend you incorporate the following applicable measures into your project description.

- In areas where ducks are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species’ biology conduct nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:

- o Contact the Service within 48 hours for further guidance.
- o Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

Endangered Hawaiian forest birds (puaiohi, *Myadestes palmeri*; ‘akikiki, *Oreomystis bairdi*; akeke‘e, *Loxops caeruleirostris*; and threatened ‘i‘iwi, *Drepanis coccinea*):

Hawaiian forest birds’ current ranges are predominately restricted to montane forests above 3,500 feet in elevation due to habitat loss and threats at lower elevations. Hawaiian forest bird habitat has been lost due to development, agriculture, grazing, wildfire, and spread of invasive habitat-altering species. Forest birds are also affected by mosquito-borne diseases. Mosquitoes are not native to Hawai‘i; their occurrence increases in areas where ungulate presence results in small pools of standing water. Actions such as road construction and development increase human access and result in increased wildfire and invasive species threats. Grazing results in

reductions in woody vegetation and increased grass cover, which reduces forest habitat quality and results in increased wildfire risk on the landscape.

Avoid conducting activities within forest bird habitat that:

- Promote the spread or survival of invasive species.
- Increase mosquito populations or stagnant water habitat.
- Increase wildfire threat to montane forest habitats.
- Remove tree cover during the peak breeding season between January 1 and June 30.

Endangered picture-wing flies (*Drosophila musaphilia*):

Picture-wing flies live in montane forest habitat and are restricted to single islands. Larvae of each species are dependent on a single or a few related plant species. The flies are threatened by destruction of habitat from non-native ungulates and invasive weeds, and also directly threatened by a variety of introduced invertebrates, including yellow jackets, crane flies, and several ant species.

- Avoid clearing forest vegetation within 200 feet of a site potentially occupied by endangered *Drosophila*.

Aquatic invertebrates in Hawai'i: Newcomb's snail (*Erinna newcombi*):

Newcomb's snail is restricted to fast-flowing freshwater streams on Kaua'i, where it feeds on vegetation growing on submerged rocks. Threats to the species include reduced stream flow from drought, water diversion projects, or other natural and human causes; predation by introduced snails, flies, and aquatic species; and small population dynamics.

MIGRATORY BIRD TREATY ACT

NATIONWIDE STANDARD CONSERVATION MEASURES

Listed below are effective measures that should be employed at all project development sites nationwide with the goal of reducing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures may be updated through time. We recommend checking the [Conservation Measures](#) website regularly for the most up-to-date list.

1. GENERAL MEASURES

- a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the Service webpage on [Regulations and Policies](#) for more information on regulations that protect migratory birds.

- b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit.
 - i. See the [Service Nest Destruction Policy](#)
- c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit. Please visit the [Service permits page](#) for more information on permits and permit applications.
- d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the [EPA Non-Hazardous Waste](#) website.
- e. Report any incidental take of a migratory bird, to the [local Service Office of Law Enforcement](#).
- f. Consult and follow applicable [Service industry guidance](#).

2. HABITAT PROTECTION

- g. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).
- h. Consult all local, State, and Federal regulations for the development of an appropriate buffer distance between development site and any wetland or waterway. For more information on wetland protection regulations see the Clean Water Act sections [401](#) and [404](#).
- i. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).
- j. Implement standard soil erosion and dust control measures. For example:
 - i. Establish vegetation cover to stabilize soil
 - ii. Use erosion blankets to prevent soil loss
 - iii. Water bare soil to prevent wind erosion and dust issues

3. STRESSOR MANAGEMENT

3.1 STRESSOR: VEGETATION REMOVAL

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Conservation Measure 1: Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local bird species; or,

contact local Service Migratory Bird Program Office for breeding bird information.

Conservation Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

- 1) Generally, the surveys should be conducted no more than five days prior to scheduled activity.
- 2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.
- 3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged or the nest fails or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional Service office.
- 4) When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly, or in part, until the fence is satisfactorily repaired.
- 5) When establishing a buffer zone, a qualified biologist will be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.
- 6) If establishing a buffer zone is not feasible, contact the Service for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. Active nests may only be removed if you receive a permit from your local Migratory Bird Permit Office. A permit may authorize active nest removal by a qualified biologist with bird handling experience or by a permitted bird rehabilitator.

Conservation Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

3.2 STRESSOR: INVASIVE SPECIES INTRODUCTION

Conservation Goal: Prevent the introduction of invasive plants.

Conservation Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.

Conservation Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Conservation Measure 3: Consider creating vehicle wash stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Conservation Measure 4: Remove invasive/exotic species that pose an attractive nuisance to migratory birds.

3.3 STRESSOR: ARTIFICIAL LIGHTING

Conservation Goal: Prevent increase in lighting of native habitats during the bird breeding season.

Conservation Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.

Conservation Measure 2: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low intensity energy saving lighting (e.g. low pressure sodium lamps) will be used.

Conservation Measure 3: Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.

Conservation Measure 5: Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps should *not* be used.

3.4 STRESSOR: HUMAN DISTURBANCE

Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.

Conservation Measure 1: Restrict unauthorized access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

3.5 STRESSOR: COLLISION

Conservation Goal: Minimize collision risk with project infrastructure and vehicles.

Conservation Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility through appropriate marking and design features (e.g., lighting, wire marking, etc.).

Conservation Measure 2: On bridge crossing areas with adjacent riparian, beach, estuary, or other bird habitat, use fencing or metal bridge poles (Sebastian Poles) that extend to the height of the tallest vehicles that will use the structure.

Conservation Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging road kill on the roadway.

Conservation Measure 4: Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.

Conservation Measure 5: Avoid planting “desirable” fruited or preferred nesting vegetation in medians or Rights of Way.

Conservation Measure 6: Eliminate use of steady burning lights on tall structures (e.g., >200 ft).

3.6 STRESSOR: ENTRAPMENT

Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nesting in project areas that may endanger them.

Conservation Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch
2. Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.
3. Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.

Conservation Measure 2: Use the appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally , between April and August, depending on the geographic location), potential nesting surfaces should be monitored at least once every three days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.
2. If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.

3.7 STRESSOR: NOISE

Conservation Goal: Prevent the increase in noise above ambient levels during the nesting bird breeding season.

Conservation Measure 1: Minimize an increase in noise above ambient levels during project construction by installing temporary structural barriers such as sand bags

Conservation Measure 2: Avoid permanent additions to ambient noise levels from the proposed project by using baffle boxes or sound walls.

3.8 STRESSOR: FIRE

Conservation Goal: Minimize fire potential from project-related activities.

Conservation Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use spark arrestors on power equipment, avoid driving vehicles off road).

Conservation Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with a palate of low-growing, sparse, fire resistant native species that meet with the approval of the County Fire Department and local FWS.

Invasive Species Biosecurity Protocols

Project activities may introduce or spread invasive species, causing negative ecological consequences to new areas or islands, resulting in potential impacts to fish, wildlife, and their habitat. For example, seeds of invasive plant species (e.g., *Chromolaena odorata*, *Senecio madagascariensis* or *Miconia calvescens*) can be inadvertently transported on equipment from a previous work site to a new site where the species are not present. Equipment used in an area infected with a pathogen or insect pest that can have ecological consequences (e.g., rapid 'ōhi'a death [*Ceratocystis* spp.], black twig borer [*Xylosandrus compactus*], or naio thrips [*Klambothrips myopori*]), if not properly decontaminated, can likewise serve as a vector to introduce the pathogen into a new area. Vehicles must also be properly inspected and cleaned to ensure vertebrate or invertebrate pests do not stowaway and spread to other areas. These are just a few examples of how even well-intended project activities may inadvertently introduce or spread invasive species.

To avoid and minimize the potential impacts of invasive species to fish, wildlife, and their habitats, we recommend incorporating general biosecurity protocols into project planning (see protocols below). The proposed project also occurs in a geographic area and/or involves activities that risk spreading the fungi that cause rapid 'ōhi'a death (ROD). For these reasons, the biosecurity protocol for ROD is also provided below.

The following biosecurity protocol is recommended to be incorporated into planning for the project to avoid or minimize transportation of invasive species with potential to impact fish, wildlife, and their habitat. Cleaning, treatment, and inspection activities are the responsibility of the equipment or vehicle owner and operator. However, it is ultimately the responsibility of the action agency to ensure that all project materials, vehicles, machinery, equipment, and personnel are free of invasive species before entry into a project site. Please refer to the resources listed below for current removal/treatment recommendations that may be relevant to the project.

1. Cleaning and treatment:

Project applicants should assume that all project materials (i.e., construction materials, or aggregate such as dirt, sand, gravel, etc.), vehicles, machinery, and equipment contain dirt and mud, debris, plant seeds, and other potential vectors of invasive species, and therefore require thorough cleaning. Treatment for specific pests, for example, trapping and poison baiting for rodents, or baiting and fumigation for insects, should be considered when applicable. For effective cleaning we offer the following recommendations prior to entry into a project site:

- a. Project materials, vehicles, machinery, and equipment must be pressure washed thoroughly (preferably with hot water) in a designated cleaning area. Project materials, vehicles, machinery, and equipment should be visibly free of mud and dirt (excluding aggregate), seeds, plant debris, insects, spiders, frogs (including frog eggs), other vertebrate species (e.g., rodents, mongoose, feral cats, reptiles, etc.), and rubbish. Areas of particular concern include bumpers, grills, hood compartments, wheel wells, undercarriage, cabs, and truck beds. Truck beds with accumulated material are prime sites for hitchhiking invasive species.

- b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food, which can attract pests (i.e., rodents and insects). The interiors of vehicles and the cabs of machinery should be vacuumed clean particularly for any plant material or seeds.
2. Inspection:
 - a. Following cleaning and/or treatment, project materials, vehicles, machinery, and equipment must be visually inspected by its user and found to be free of mud and dirt (excluding aggregate), debris, and invasive species prior to entry into a project site. For example, careful visual inspection of a vehicle's tires and undercarriage is recommended for any remaining mud that could contain invasive plant seeds.
 - b. Any project materials, vehicles, machinery, or equipment found to contain invasive species (e.g., plant seeds, invertebrates, rodents, cats, reptiles, etc.) must not enter the project site until those invasive species are properly removed/treated.
 3. For all project site personnel:
 - a. Prior to entry into the project site, visually inspect and clean all clothes, boots or other footwear, backpack, radio harness, tools and other personal gear and equipment for insects, seeds, soil, plant parts, or other debris. We recommend the use of a cleaning brush with sturdy bristles. Seeds found on clothing, footwear, backpacks, etc., should be placed in a secure bag or similar container and discarded in the trash rather than being dropped to ground at the project site or elsewhere.
 4. Additional considerations:
 - a. Avoid unnecessary exposure to invasive species at a particular site (to the extent practical) to reduce contamination and spread. For example, if the project involves people or equipment moving between multiple locations, plan and organize timelines so that work is completed in native habitat prior to working in a disturbed location to reduce the likelihood of introducing a pest into the native habitat.
 - b. Maintain good communication about invasive species risks between project managers and personnel working on the project site (e.g., conduct briefings and training about invasive species). Ensure prevention measures are communicated to the entire project team. Also consider adding language regarding biosecurity into contracts or permitting mechanisms to provide clarity to all involved in the project.

Species-Specific Biosecurity Protocols

Rapid ‘Ōhi‘a Death

ROD is caused by a fungal pathogen (*Ceratocystis* spp.) that attacks and kills ‘ōhi‘a trees. ‘Ōhi‘a is endemic to the Hawaiian Islands and is the most abundant native tree species, making up approximately 80% of Hawai‘i’s remaining native forests.

For more information about ROD including its current distribution, ROD science updates, and the latest on ROD protocols, please visit www.rapidohiadeath.org.

To reduce the risk of spreading ROD, the following best management practices and decontamination protocol are recommended:

Best Management Practices for ROD

1. Never transport any part of an ‘ōhi‘a tree between different areas of an island or to a different island.
2. Do not use equipment from ROD-infected islands on another island unless it is very specialized equipment and follows the decontamination protocol described below.
3. Avoid wounding ‘ōhi‘a trees and roots with mowers, chainsaws, weed eaters, and other tools. If an ‘ōhi‘a receives a minor injury like a small broken branch, give the injury a clean, pruning-type cut (close to the main part of the trunk or branch) to promote healing, and then spray the entire wounded area with a pruning seal.
4. Always report suspect ROD ‘ōhi‘a trees observed within your project area. ROD is a wilt disease that cuts off the supply of water and nutrients to the tree. The primary symptom to look for is an entire canopy or a large branch with dying leaves or red discolored leaves. Please record the global positioning system (GPS) coordinates and location and take a picture of the tree if possible. Please report suspected ROD ‘ōhi‘a trees on Kaua‘i to KISC: 808-821-1490 (kisc@hawaii.edu).

ROD Decontamination Protocol

1. Clothes, footwear, backpacks, and other personal equipment
 - a. Before leaving the project site, remove as much mud and other contaminants as possible. Use of a brush with soap and water to clean gear is preferred. Footwear, backpacks, and other gear must be sanitized by spraying with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
2. Vehicles, machinery, and other equipment
 - a. Vehicles, machinery, and other equipment must be thoroughly hosed down with water (pressure washing preferred) and visibly free of mud and debris, then sprayed with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. Use of a “pump-pot” sprayer is recommended for the solution and a hot water wash is

- preferred. Be sure to thoroughly clean the undercarriage, truck bed, bumpers, and wheel wells.
- b. If non-decontaminated personnel or items enter a vehicle, then the inside of the vehicle (i.e., floor mats, etc.) must be subsequently decontaminated by removing mud and other contaminants and sprayed with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
3. Cutting tools
 - a. All cutting tools, including machetes, chainsaws, and loppers, must be sanitized to remove visible mud and other contaminants. Tools must be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. One minute after sanitizing, an oil-based lubricant may be applied to chainsaw chains or other metallic parts to prevent corrosion.

NOTE: When using a 10% bleach solution, surfaces should be cleaned with a minimum contact time of 30 seconds. Bleach must be mixed daily and used within 24 hours, as once mixed it degrades. Bleach will not work to disinfect surfaces that have high levels of organic matter such as sawdust or soil. Because bleach is corrosive to metal, a water rinse after proper sanitization is recommended to avoid corrosion.

REFERENCES CITED

Wagner, W.L., S. Sohmer, and D.R. Herbst. 1999. *Manual of the Flowering Plants of Hawaii*, revised edition. Honolulu, Hawaii. University of Hawaii and Bishop Museum Press.

Appendix E:

**Present and Reasonably Foreseeable Future Management Actions
within the Proposed Project Area**

Table E-1. Present and Reasonably Foreseeable Future Management Actions within the Project Area

Activity	Present Activities				Future Activities			
Hunting	Reserve	Hunting Unit	Dates	Game Type/Method	Hunter Trips (July 2021 – June 2022)			
			Pu'u Ka Pele, Nā Pali-Kona Forest Reserve	B		Year round; Friday, Saturday, Sunday, Monday and state holidays	Pig; all methods ⁶	407
						May through August; Friday, Saturday, Sunday, Monday	Goat; all methods	
						September through October, Friday, Saturday, Sunday, Monday	Deer; all methods	
Kōke'e State Park	D	December through May; Saturday, Sunday, and state holidays	Pig; archery, dog, and knife	197				
		June through August; Saturday, Sunday, and state holidays	Deer and pig; archery					

⁶ All methods: rifle, shotgun, muzzleloader, archery, dogs, and knife.

Activity	Present Activities			Future Activities
Nā Pali-Kona, Alaka‘i Wilderness Preserve	E1	Year round; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, and deer; all methods	254
	E2	Year round; Daily	Pig, goat, and deer; all methods	296
Kōke‘e, Nā Pali-Kona, Ku‘ia Natural Area Reserve	H	December through July; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, and deer; all methods	1,182
		August through November; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, deer; all methods except dogs	
Nā Pali Coast Wilderness Preserve, Hono Nā Pali Natural Area Reserve	G	Year round; daily	Goat and pig; archery	< 50
Halele‘a Forest Reserve, Līhu‘e-Kona Forest Reserve	C	August through November; Friday, Saturday, Sunday, Monday, and state holidays	Goat and pig; all methods	810

Activity		Present Activities	Future Activities
Traps and Bait Stations	Organization	Current Trapping Operations	
	DOFAW (including DOFAW Natural Area Reserves System)	Pacific Rim Conservation has a trap line along the Alaka'i Boardwalk within Alaka'i Wilderness Preserve. Tomahawk traps and A24s in Kuia and Hono o Nā Pali Natural Area Reserves (NARs).	No current plans for DOFAW to add additional traps. More traps could be added to Mōhihi management unit if additional fences are constructed.
	State Parks	Kōke'e State Park, Nā Pali Coast Wilderness Park, Wailua River State Park.	No changes.
	KFBRP	One plot of 125 A24 rat traps in Nā Pali Kona Forest Reserve and one plot of 200 A24s in Alaka'i Wilderness Preserve. These plots are checked every 4 months.	Current plan to increase size, number, and density of A24 trap grids.
	TNC	Pig traps, cat traps, and mosquito traps in the Alaka'i Wilderness Preserve. Access various sites within Alaka'i Wilderness Preserve every other week to check snares, fences, traps, etc.	No changes.
Animal traps	Organization	Current Trapping Operations	
	DOFAW – Natural Area Reserves System	Staff manage snares in NARs. Snares have been removed from units that are ungulate free.	Hunting and deployment of snares is planned within recently completed and future fence units.
	TNC	Network of snares in the Alaka'i Wilderness Preserve for ungulate removal. Sites are accessed every other week to check snares, fences, traps, etc. Snares are removed from units that are ungulate free.	
	Organization	Current Trapping Operations	

Activity	Present Activities		Future Activities	
Fences and Fence Supply Caches	DOFAW – Forestry and TNC	The fenced units on the Alaka'i Plateau include: East Alaka'i (1,972 acres), Halehaha-Halepa'akai (1,352 acres), Koaie (1,064 acres), and Drinking Glass (877 acres). Drinking Glass and Halehaha-Halepa'akai are entirely within Alaka'i Wilderness Preserve. The East Alaka'i and Koaie units are partially state-owned and partially private land (Wainiha Wilderness Preserve). Approximately 5,000 forest reserve acres are fenced in total.	Discussions regarding enlarging the Mōhihi enclosure (in the Alaka'i Wilderness Preserve) are ongoing. This fence would encompass the headwaters of the Kawaikoi and Waikoali streams (2,000 acres).	
	DOFAW – Natural Area Reserves System	Hono O Nā Pali Boundary fence (approximately 3.3 miles) with additional strategic fences (approximately 1.4 miles combined). Ku'ia NAR has several smaller fences (approximately 4.2 miles, enclosing 131.7 acres in total).	No changes.	
Camping	Agency Department	Reserves	Usage	An additional \$10 processing fee will be charged for camping within Forest Reserves.
	DOFAW	Na Pali Kona Forest Reserve (5 campgrounds: Waialae Cabin, Waikoali, Kawaikoi, Sugi Grove, Lonomea)	2022: 2,475 people over 1,366 nights, 870 permits. So far in 2023: 1,464 people over 772 nights, 478 permits.	
	State Parks	Nā Pali Coast State Wilderness Park Polihale State Park Kōke'e State Park	All three sites are accessed daily by the public and campers. Nā Pali Coast State Wilderness Park allows 60 campers per night during summer and 30 campers per night during winter.	
Collecting	Agency Department	Action	Usage	No changes.

Activity	DOFAW	Present Activities	2022: 25 in Nā Pali Kona Forest Reserve. None in Pu'u Ka Pele Forest Reserve. So far in 2023: 18 personal collection permits for Nā Pali Kona Forest Reserve. None in Pu'u Ka Pele Forest Reserve.	Future Activities
	State Parks		Kōke'e State Park and Nā Pali Coast Wilderness Park have current collection permits. Access is the same as for the public.	
Commercial Harvest	Agency Department	Harvest Activity	Activity	No changes.
	DOFAW	Hazardous trees that cross or have the potential to fall on or cross access roads.	2022: Two salvage harvests on Camp 10 road. So far in 2023: None.	

Activity	Present Activities		Future Activities
Access	Agency Department	Reserve	Trail or Road
	DOFAW Nā Ala Hele	Nā Pali-Kona Forest Reserve	Awa‘awapuhi Trail, Nu‘alolo Cliff Trail, Nu‘alolo Trail, Miloli‘i Trail, Mākaha Ridge Road, Kauhao Ridge Road, Pihea Trail, Alaka‘i Swamp Trail, Kawaikōi Stream Trail, Mōhihi-Camp 10 Road, Po‘omau Canyon Vista Trail, Mōhihi-Wai‘alae Trail, Kohua Ridge Trail, Pu‘u Ki-Wai‘alae Trail, Koaie Canyon Trail.
		Pu‘u Ka Pele Forest Reserve	Pu‘u Ki-Wai‘alae Trail.
		Alaka‘i Wilderness Preserve	Pihea Trail, Alaka‘i Swamp Trail, Kawaikōi Stream Trail, Mōhihi-Camp 10 Road, Po‘omau Canyon Vista Trail, Mōhihi-Wai‘alae Trail, Kohua Ridge Trail, Pu‘u Ki-Wai‘alae Trail.
		Ku‘ia NAR	Awa‘awapuhi Trail, Nu‘alolo Cliff Trail, Nu‘alolo Trail.

Activity		Present Activities	Future Activities
	State Parks	Kōke‘e State Park	<p>Official trails: Po‘omau Canyon Vista Trail, Kaluapuhi Trail, Halemanu-Kōke‘e Trail, Kumuwela Trail, Berry Flats-Water Tank Trail.</p> <p>Unofficial trails: Kālepa Ridge-Airplane Trail, Honopū Trail.</p> <p>Kōke‘e Resource Conservation Program (KRCP) does periodic trail maintenance.</p>
Administrative Trails	Organization	Location and Use	
	DOFAW/TNC	Alaka‘i Wilderness Preserve: Located within fenced units. TNC accesses sites within preserve every other week to check snares, fences, traps, etc.	No changes.
	KFBRP	Alaka‘i Wilderness Preserve: KFBRP uses the unofficial trails weekly from February through July, and about once a month for the rest of the year.	
Trails Tool Caches	Organization	Location	
	State Parks	Nā Pali Coast State Wilderness Park (Kalalau Trail).	No changes.

Activity		Present Activities	Future Activities
Research Shelters	<p>Organization</p> <p>KFBRP</p>	<p>Present Use of Shelters</p> <p>Two forest bird research shelters in Nā Pali-Kona Forest Reserve and one in the Alaka'i Wilderness Preserve. Used daily from February through June and monthly the rest of the year by crews of two to six people per shelter.</p>	<p>A new research shelter may be built in the future near Mōhihi Bog; however, this is dependent on the installation of a fence around the perimeter of the Mōhihi watershed. The installation of the shelter will increase camping and mosquito monitoring within this area.</p>
	<p>Organization</p>	<p>Existing Monitoring Activities within Project Area</p>	

Activity	Organization	Present Activities	Future Activities
Monitoring Transects and Research Plots	KFBRP	<p>Hawai‘i Forest Bird Surveys: Monitor transects every 5 years with a crew of two people for 4 months within Ku‘ia NAR, Nā Pali-Kona Forest Reserve, and Alaka‘i Wilderness Preserve. Transects will be monitored again in 2023.</p> <p>Two forest bird monitoring plots in Nā Pali-Kona Forest Reserve, and one in Alaka‘i Wilderness Preserve. Plots are surveyed daily between February and June and monthly the rest of the year by crews of two to six people per plot.</p> <p>Three mosquito monitoring plots of 16 traps each (one in Ku‘ia NAR, one in Kōke‘e State Park, and one in Nā Pali Kona Forest Reserve). Monitored every 6 weeks. Larval transects (1–2 kilometers long) on two to three streams in Nā Pali Kona Forest Reserve and two to three streams in Alaka‘i Wilderness Preserve.</p>	Additional monitoring associated with mosquito release.
	TNC	<p>Fourteen vegetation and ungulate monitoring transects within Alaka‘i Wilderness Preserve. Monitoring is undertaken once per year (older transects in ungulate-free units are monitored less frequently).</p>	
Stream and Rainfall/Weather Monitoring Stations	Organization	Existing Monitoring Activities within Project Area	
	KFBRP	One weather monitoring station in Nā Pali Kona Forest Reserve and one in Alaka‘i Wilderness Preserve.	Planning to add a network of 12 stream sensors.
	USGS		
	State Parks	Hanakāpī‘ai Valley (Nā Pali Coast State Park) and Kōke‘e State Park.	

Activity		Present Activities	Future Activities
Research Shelters	Organization	Present Use of Shelters	
	KFBRP	Two forest bird research shelters in Nā Pali-Kona Forest Reserve, and one in the Alaka‘i Wilderness Preserve. Used daily from February through June and monthly the rest of the year by crews of two to six people per shelter.	A new research shelter may be built in the future near Mōhihi Bog; however, this is dependent on the installation of a fence around the perimeter of the Mōhihi watershed. The installation of the shelter will increase camping and mosquito monitoring within this area.
Helicopter Operations	Organization	Current Operations	
	DOFAW (including Natural Area Reserves System, Kaua‘i Invasive Species Committee)	DOFAW – Forestry: One trip every other month on average (approximately 5 hours flying time per month). DOFAW – NARS: Locations throughout the NARs (approximately 5 hours flying time per month).	No changes.
	State Parks	Operations conducted monthly in Kōke‘e State Park, Nā Pali Coast State Park, Waimea Canyon State Park, Hā‘ena State Park.	No changes.
	USGS	USGS flies into their stream and rain gauges quarterly (located in Nā Pali Kona Forest Reserve, private land, Hono o Nā Pali NAR)	No changes.
	TNC	Operations conducted in Alaka‘i Wilderness Preserve (approximately 4 hours flying time/month).	No changes.

Activity	Present Activities	Future Activities
KFBRP	Alaka'i Wilderness Preserve: Weekly flights from March through June. Nā Pali Kona Forest Reserve: Flights all year. Flight times average 5.75 hours per month from March to June and 3.25 hours per month for the rest of the year.	Mosquito monitoring will likely increase the number of helicopter flights.
KRCP (including Kaua'i Invasive Species Committee)	Alaka'i Wilderness Preserve: minimum of seven camping trips or fence checks per year. Hono o Nā Pali NAR: Between zero and six operational trips per year. Līhu'e-Kōloa Forest Reserve and Nā Pali Coast State Park: Occasional operations. Total of approximately 26 flight hours in 2022.	No changes.
Landing Zones	Reserve Name	Number of Landing Zones
	Halele'a Forest Reserve	2
	Hono O Nā Pali Natural Area Reserve	6
	Kōke'e State Park	2
	Līhu'e-Kōloa Forest Reserve	1
	Nā Pali Coast State Wilderness Park	3
	Nā Pali-Kona Forest Reserve	8
	Nā Pali-Kona Forest Reserve/Alaka'i Wilderness Preserve	38
	Outside Reserves	4
	Wainiha Preserve (TNC)	30
	Total	94
	DOFAW Partners	State Parks partners
		No changes.

Activity	Present Activities	Future Activities
DOFAW/partner activities, management stewardship	KFBRP KRCP: invasive species control TNC: watershed management in Alaka'i Wilderness Preserve	KRCP Hui o Laka – Kōke'e Museum Friends of the Kalalau Trail Kaua'i Invasive Species Committee Pacific Islands Fish and Wildlife Office

Appendix F:

**Threatened and Endangered Species and Critical Habitats in the
Project Area**

Table F-1. Federal Threatened and Endangered Species that would be Considered Unlikely to be Impacted by the No-Action Alternative and Proposed Action.

Species	Threat Status	Justification for not Including within Impacts Analysis
Newcomb's snail (<i>Erinna newcombi</i>) (aquatic invertebrate)	Threatened (Federal and state)	Pedestrian activities would be limited to established trails and stream crossings Incompatible mosquitos are unlikely to interact with Newcomb's snails.
Hawaiian monk seal (<i>Monachus schauinslandi</i>)	Endangered (Federal and state)	Aerial and pedestrian dispersal of incompatible male mosquitos unlikely to occur near lowland coastal habitats and nearshore coastal waters.
Green sea turtle (<i>Chelonia mydas</i>)	Threatened (Federal and state)	Other project activities are unlikely to occur within lowland coastal environments.
Hawksbill sea turtle (<i>Eretmochelys imbricata</i>)	Endangered (Federal and state)	Interaction between the listed marine species and mosquitos are likely to be minimal to non-existent.
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered (Federal and state)	
Loggerhead sea turtle (<i>Caretta caretta</i>)	Threatened (Federal and state)	
Olive ridley sea turtle (<i>Lepidochelys olivacea</i>)	Threatened (Federal and state)	
Humpback whale (<i>Megaptera novaeangliae</i>) and five other endangered baleen whale species	Endangered (Federal and state)	
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered (Federal and state)	
False killer whale (<i>Pseudorca crassidens</i>)	Endangered (Federal and state)	

Table F-2. Federally Listed Threatened and Endangered Plant Species Recorded within the Project Area

Scientific Name⁷	Common Name	USFWS Threat Status
<i>Adenophorus periens</i>	pendent kihi fern	Endangered
<i>Alectryon macrococcus</i> var. <i>macrococcus</i>	Mahoe	Endangered
<i>Asplenium dielpallidum</i>	no common name	Endangered
<i>Astelia waialealae</i>	pa'iniu	Endangered
<i>Bonamia menziesii</i>	no common name	Endangered
<i>Brighamia insignis</i>	'ōlulu	Endangered
<i>Canavalia napaliensis</i>	'āwikiwiki	Endangered
<i>Cyanea recta</i>	Hāhā	Endangered
<i>Cyanea rivularis</i>	Hāhā	Endangered
<i>Cyrtandra kealiae</i> subsp. <i>kealiae</i>	ha'iwale	Endangered
<i>Cyrtandra paliku</i>	ha'iwale	Endangered
<i>Dryopteris glabra</i> var. <i>pusilla</i>	Hohiu	Endangered
<i>Dubautia latifolia</i>	Koholāpehu	Endangered
<i>Dubautia pauciflorula</i>	na'ena'e	Endangered
<i>Dubautia waialealae</i>	na'ena'e	Endangered
<i>Euphorbia halemanui</i>	'akoko	Endangered
<i>Euphorbia remyi</i> var. <i>kauaiensis</i>	'akoko	Endangered
<i>Euphorbia remyi</i> var. <i>remyi</i>	'akoko	Endangered
<i>Exocarpus luteolus</i>	Heau	Endangered
<i>Geniostoma helleri</i>	Kāmakahala	Endangered
<i>Geranium kauaiense</i>	Nohoanu	Endangered
<i>Hibiscadelphus distans</i>	Kaua'i hau kuahiwi	Endangered
<i>Hibiscus clayi</i>	Clay's hibiscus	Endangered
<i>Ischaemum byrone</i>	Hilo ischaemum	Endangered
<i>Isodendrion longifolium</i>	Aupaka	Threatened
<i>Joinvillea ascendens</i> subsp. <i>ascendens</i>	'ohe	Endangered

⁷ Records within this table are from the DLNR rare plants database.

Scientific Name⁷	Common Name	USFWS Threat Status
<i>Keysseria helenae</i>	Mt. Wai'ale'ale island-daisy	Endangered
<i>Lobelia nīhauensis</i>	Ni'ihau lobelia	Endangered
<i>Lysimachia daphnoides</i>	lehua makanoē	Endangered
<i>Lysimachia pendens</i>	no common name	Endangered
<i>Melicope degeneri</i>	Alani	Endangered
<i>Melicope haupuensis</i>	Alani	Endangered
<i>Melicope pallida</i>	Alani	Endangered
<i>Melicope paniculata</i>	Alani	Endangered
<i>Melicope puberula</i>	Alani	Endangered
<i>Melicope rostrata</i>	Alani	Endangered
<i>Myrsine fosbergii</i>	Kōlea	Endangered
<i>Myrsine knudsenii</i>	Kōlea	Endangered
<i>Myrsine linearifolia</i>	Kōlea	Endangered
<i>Myrsine mezii</i>	Kōlea	Endangered
<i>Nothoctrum latifolium</i>	'aiea	Endangered
<i>Nothoctrum peltatum</i>	'aiea	Endangered
<i>Peucedanum sandwicense</i>	Makou	Threatened
<i>Phyllostegia helleri</i>	Mt. Kāhili phyllostegia	Endangered
<i>Phyllostegia renovans</i>	red-leaf phyllostegia	Endangered
<i>Pittosporum napaliense</i>	hō'awa	Endangered
<i>Platanthera holochila</i>	Hawai'i bog orchid	Endangered
<i>Poa mannii</i>	Mann's bluegrass	Endangered
<i>Poa sandwicensis</i>	Hawaiian bluegrass	Endangered
<i>Poa siphonoglossa</i>	no common name	Endangered
<i>Polyscias racemosa</i>	no common name	Endangered
<i>Pritchardia viscosa</i>	loulu	Endangered
<i>Psychotria grandiflora</i>	Kōpiko	Endangered
<i>Psychotria hobdyi</i>	Kōpiko	Endangered
<i>Pteralyxia kauaiensis</i>	Kaulu	Endangered
<i>Ranunculus mauiensis</i>	Makou	Endangered

Scientific Name ⁷	Common Name	USFWS Threat Status
<i>Remya kauaiensis</i>	Kaua‘i remya	Endangered
<i>Schiedea helleri</i>	no common name	Endangered
<i>Schiedea lychnoides</i>	Kuawawaenuhu	Endangered
<i>Schiedea membranacea</i>	no common name	Endangered
<i>Schiedea spergulina</i>	no common name	Endangered
<i>Schiedea viscosa</i>	no common name	Endangered
<i>Sesbania tomentosa</i>	‘ohai	Endangered
<i>Solanum sandwicense</i>	pōpolo ‘aiakeakua	Endangered
<i>Spermolepis hawaiiensis</i>	no common name	Endangered
<i>Stenogyne kealiae</i>	Keal’s stenogyne	Endangered
<i>Wilkesia hobydi</i>	dwarf iliau	Endangered
<i>Xylosma crenatum</i>	no common name	Endangered

Table F-3. Federally Listed Threatened and Endangered Animal Species in the Project Area

Scientific Name	Common Name	USFWS Threat Status
<i>Myadestes palmeri</i>	Puaiohi, Small Kaua‘i Thrush	Endangered
<i>Oreomystis bairdi</i>	‘Akikiki	Endangered
<i>Loxops careuleirostris</i>	Akeke‘e	Endangered
<i>Drepanis coccinea</i>	‘I‘iwi	Threatened
<i>Branta sandvicensis</i>	Nēnē, Hawaiian Goose	Threatened
<i>Anas wyvilliana</i>	Koloa maoli, Hawaiian Duck	Endangered
<i>Lasiurus cinereus semotus</i>	‘Ōpe‘ape‘a, Hawaiian Hoary Bat	Endangered
<i>Hydrobates castro</i>	‘Akē‘akē, Band-rumped Storm-petrel	Endangered
<i>Erinna newcombi</i>	Newcomb’s Snail	Endangered
<i>Drosophila musaphilia</i>	Hawaiian Picture-wing Fly	Endangered

Table F-4. Federally Designated Critical Habitats and Associated Species in the Project Area

Critical Habitat Unit	Species
Kaua‘i Lowland Wet Ecosystem Unit 1	<i>Charpentiera densiflora</i> , <i>Cyanea eleeleensis</i> , <i>Cyanea kolekoleensis</i> , <i>Cyanea kuhihewa</i> , <i>Cyrtandra oenobarba</i> , <i>Dubautia imbricata</i> ssp. <i>imbricata</i> , <i>Euphorbia remyi</i> var. <i>kauaiensis</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Melicope paniculata</i> , <i>Melicope puberula</i> , <i>Phyllostegia renovans</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Polyscias flynnii</i> , <i>Stenogyne kealiae</i>
Kaua‘i Lowland Wet Ecosystem Unit 2	<i>Charpentiera densiflora</i> , <i>Cyanea eleeleensis</i> , <i>Cyanea kolekoleensis</i> , <i>Cyanea kuhihewa</i> , <i>Cyrtandra oenobarba</i> , <i>Dubautia imbricata</i> ssp. <i>imbricata</i> , <i>Euphorbia remyi</i> var. <i>kauaiensis</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Melicope paniculata</i> , <i>Melicope puberula</i> , <i>Phyllostegia renovans</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Polyscias flynnii</i> , <i>Stenogyne kealiae</i>
Kaua‘i Lowland Wet Ecosystem Unit 3	<i>Charpentiera densiflora</i> , <i>Cyanea eleeleensis</i> , <i>Cyanea kolekoleensis</i> , <i>Cyanea kuhihewa</i> , <i>Cyrtandra oenobarba</i> , <i>Dubautia imbricata</i> ssp. <i>imbricata</i> , <i>Euphorbia remyi</i> var. <i>kauaiensis</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Melicope paniculata</i> , <i>Melicope puberula</i> , <i>Phyllostegia renovans</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Polyscias flynnii</i> , <i>Stenogyne kealiae</i>
Kaua‘i Lowland Wet Ecosystem Unit 4	<i>Charpentiera densiflora</i> , <i>Cyanea eleeleensis</i> , <i>Cyanea kolekoleensis</i> , <i>Cyanea kuhihewa</i> , <i>Cyrtandra oenobarba</i> , <i>Dubautia imbricata</i> ssp. <i>imbricata</i> , <i>Euphorbia remyi</i> var. <i>kauaiensis</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Melicope paniculata</i> , <i>Melicope puberula</i> , <i>Phyllostegia renovans</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Polyscias flynnii</i> , <i>Stenogyne kealiae</i>

Kaua‘i Lowland Wet Ecosystem Unit 5	<i>Charpentiera densiflora</i> , <i>Cyanea eleeleensis</i> , <i>Cyanea kolekoleensis</i> , <i>Cyanea kuhihewa</i> , <i>Cyrtandra oenobarba</i> , <i>Dubautia imbricata</i> ssp. <i>imbricata</i> , <i>Euphorbia remyi</i> var. <i>kauaiensis</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Melicope paniculata</i> , <i>Melicope puberula</i> , <i>Phyllostegia renovans</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Polyscias flynnii</i> , <i>Stenogyne kealiae</i>
Kaua‘i Lowland Mesic Ecosystem Unit 1	<i>Canavalia napaliensis</i> , <i>Charpentiera densiflora</i> , <i>Doryopteris angelica</i> , <i>Dubautia kenwoodii</i> , <i>Euphorbia eleanoriae</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Pittosporum napaliense</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Psychotria hobdyi</i>
Kaua‘i Lowland Mesic Ecosystem Unit 2	<i>Canavalia napaliensis</i> , <i>Charpentiera densiflora</i> , <i>Doryopteris angelica</i> , <i>Dubautia kenwoodii</i> , <i>Euphorbia eleanoriae</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Pittosporum napaliense</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Psychotria hobdyi</i>
Kaua‘i Lowland Mesic Ecosystem Unit 3	<i>Canavalia napaliensis</i> , <i>Charpentiera densiflora</i> , <i>Doryopteris angelica</i> , <i>Dubautia kenwoodii</i> , <i>Euphorbia eleanoriae</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Pittosporum napaliense</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Psychotria hobdyi</i>
Kaua‘i Lowland Mesic Ecosystem Unit 4	<i>Canavalia napaliensis</i> , <i>Charpentiera densiflora</i> , <i>Doryopteris angelica</i> , <i>Dubautia kenwoodii</i> , <i>Euphorbia eleanoriae</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Pittosporum napaliense</i> , <i>Platydesma rostrata</i> , <i>Polyscias bisattenuata</i> , <i>Psychotria hobdyi</i>
Kaua‘i Montane Mesic Ecosystem Unit 1	<i>Asplenium dielmannii</i> , <i>Drosophila sharpi</i> , <i>Euphorbia remyi</i> var. <i>remyi</i> , <i>Labordia helleri</i> , <i>Loxops caeruleirostris</i> , <i>Melicope knudsenii</i> , <i>Myrsine knudsenii</i> , <i>Myrsine mezii</i> , <i>Oreomystis bairdi</i> , <i>Platydesma rostrata</i> , <i>Polyscias flynnii</i> , <i>Psychotria grandiflora</i> , <i>Stenogyne kealiae</i>

Kaua‘i Montane Mesic Ecosystem Unit 2	<i>Astelia waialealae, Drosophila sharpi, Dryopteris crinalis</i> var. <i>podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi</i> var. <i>remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora</i>
Kaua‘i Montane Mesic Ecosystem Unit 3	<i>Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi</i> var. <i>remyi, Labordia helleri</i>
Kaua‘i Montane Wet Ecosystem Unit 1	<i>Astelia waialealae, Drosophila sharpi, Dryopteris crinalis</i> var. <i>podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi</i> var. <i>remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora</i>
Kaua‘i Montane Wet Ecosystem Unit 2	<i>Astelia waialealae, Drosophila sharpi, Dryopteris crinalis</i> var. <i>podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi</i> var. <i>remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora</i>
Kaua‘i Wet Cliff Ecosystem Unit 2	<i>Cyanea dolichopoda, Cyrtandra oenobarba, Cyrtandra paliku, Dubautia plantaginea</i> ssp. <i>magnifolia</i>
Kaua‘i Dry Cliff Ecosystem Unit 2	<i>Euphorbia eleanoriae, Lysimachia scopulensis, Schiedea attenuata, Stenogyne kealiae</i>
Newcomb's Snail Unit 1 Kalalau Stream	<i>Erinna newcombi</i>
Newcomb's Snail Unit 1 Hanakapi‘ai Stream	<i>Erinna newcombi</i>
Newcomb's Snail Unit 1 Hanakoa Stream	<i>Erinna newcombi</i>
Kaua‘i Unit 1 Kōke‘e	<i>Drosophila musaphilia</i>

Kaua‘i Plants Unit 11

Adenophorus periens, *Alectryon macrococcus*, *Asplenium dielpallidum*, *Schiedea viscoa*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Euphorbia halemanui*, *Ctenitis squamigera*, *Cyanea recta*, *Cyanea remyi*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Cyanea rivularis*, *Delissia kauaiensis*, *Dubautia latifolia*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Kadua cookiana*, *Kadua st. johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus waimeae ssp. hannerae*, *Isodendrion laurifolium*, *Isodendrion longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lobelia niuhauensis*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Polyscias racemosum*, *Myrsine linearifolia*, *Nothoestrum peltatum*, *Peucedanum sandwicense*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea spergulina* var. *spergulina*, *Schiedea stellarioides*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Wilkesia hobdyi*, *Xylosma crenatum*, *Zanthoxylum hawaiiense*

Kaua‘i Plants Unit 10

Adenophorus periens, *Bonamia menziesii*, *Cyanea asarifolia*, *Cyanea remyi*, *Cyanea undulata*, *Cyrtandra limahuliensis*, *Dubautia pauciflorula*, *Exocarpos luteolus*, *Hesperomannia lydgatei*, *Isodendrion longifolium*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lysimachia filifolia*, *Myrsine linearifolia*, *Huperzia nutans*, *Plantago princeps*, *Pteralyxia kauaiensis*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*.

Appendix G:

**Federal Authorization for National Historical Preservation Act
Section 106 Consultation**



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2023-0004317-01

June 2, 2023

Mr. Alan Downer, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707

Subject: Authorization of Hawai'i Division of Forestry and Wildlife to Initiate and Conduct NHPA Section 106 Consultations for the Use of *Wolbachia*-based Incompatible Insect Technique for the Suppression of Southern House Mosquito Populations on Kaua'i Project

Dear Mr. Downer:

The U.S. Fish and Wildlife Service (Service) in partnership with the Hawai'i Division of Forestry and Wildlife (DOFAW) is developing an environmental assessment to analyze the release of *Wolbachia*-based incompatible male southern house mosquitoes in the Kōke'e and Alaka'i Wilderness areas to reduce avian disease and prevent extinction of threatened and endangered forest bird species on Kaua'i. The Service's need is to consider the provision of appropriated funds for invasive mosquito control in furtherance of the conservation and recovery of federally threatened and endangered species. The Service is therefore the Federal Agency responsible for compliance with Section 106 consultation requirements for this project under the National Historic Preservation Act, as amended (16 U.S.C. 470(f)).

Pursuant to 36 CFR § 800.2(c)(4), the Service will authorize DOFAW to initiate and conduct Section 106 consultation with the State Historic Preservation Officer (SHPO) and others but remains legally responsible for all findings and determinations. This letter serves to notify the Hawaii SHPO of this authorization.

As part of this process, DOFAW will initiate the Section 106 process, identify historic properties and an assessment of adverse effect (36 CFR §§ 800.3 through 800.5) to the SHPO. DOFAW will seek to secure concurrence or disagreement with the finding from the SHPO in writing.

PACIFIC REGION 1

IDAHO, OREGON*, WASHINGTON,
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS

*PARTIAL

Mr. Alan Downer

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To ensure that the Service agrees with DOFAW, the parties have decided to work together during consultation by following the terms below:

1. Prior to distributing any correspondence, DOFAW will provide the Service an opportunity to review documents to ensure all regulatory requirements are satisfied.
2. Prior to issuing a finding of effect, the Service be given an opportunity to review and concur.
3. DOFAW will provide the Service with all responses and correspondence received from consulting parties.

Additionally, the DOFAW will notify the Service whenever:

1. The SHPO believes that the criteria for adverse effect pursuant to 36 CFR § 800.5 applies to the project.
2. There is a disagreement between DOFAW and SHPO about the area of potential effects, identification, and evaluation of historic properties, and/or the assessment of effects.
3. There is an objection from a consulting party or the public regarding its involvement in the review process established by 36 CFR Part 800, findings and determinations, or implementation of agreed- upon resolution.
4. There is the potential for foreclosure or anticipatory demolition as defined under 36 CFR § 800.9(b) and (c).

Please contact Michelle Clark at (808) 457-7276 or by email at michelle_clark @fws.gov if you have any questions on this matter.

Sincerely,

**MICHELLE
BOGARDUS**

Digitally signed by MICHELLE
BOGARDUS
Date: 2023.06.01 21:28:23
-10'00'

Michelle Bogardus,
Deputy Field Supervisor - Geographic Operations

cc: David Smith, DOFAW
Lainie Berry, DOFAW
Sherri Mann, DOFAW

Appendix H:
**Federal and State Preparatory Notice for Draft Environmental
Assessment**



United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850



State of Hawai‘i
DEPARTMENT OF LAND AND
NATURAL RESOURCES
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, Hawai‘i 96813

In Reply Refer To:
2023-0004317

October 21, 2022

Subject: Preparatory Notice for draft Environmental Assessment for the proposed “Use of Wolbachia-based Incompatible Insect Technique for the suppression of Southern House Mosquito (*Culex quinquefasciatus*) populations in the Kōke‘e and Alaka‘i areas of Kaua‘i”

Dear Reader:

This letter serves for the Hawai‘i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) and the U.S. Fish and Wildlife Service (Service), collectively referred to herein as the “Resource Agencies”, to provide notice and solicit initial comments and recommendations for the proposed “Use of Wolbachia-based Incompatible Insect Technique for the suppression of Southern House Mosquito (*Culex quinquefasciatus*) populations in the Kōke‘e and Alaka‘i areas of Kaua‘i”.

The State of Hawai‘i DLNR proposes employing Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres (23,959 hectares) of forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i areas of Kaua‘i to suppress mosquitoes known to vector diseases to native forest birds in critical higher-elevation native forest habitat. The proposed project is a joint project of the Resource Agencies; and in order to comply with each agencies’ obligations under the National Environmental Policy Act (NEPA) and Hawai‘i Revised Statutes (HRS) Chapter 343, DOFAW and the Service are preparing an environmental assessment (EA) to address the release of male mosquitoes with incompatible *Wolbachia* in the Kōke‘e and Alaka‘i areas shown in Figures 1 and 2 below.

The IIT approach is also being evaluated for implementation by the National Park Service (NPS) and DLNR to control species in forest bird critical habitat on the island of Maui. The EA entitled “Suppression of non-native mosquito populations to address the impacts of avian malaria on threatened and endangered forest birds on East Maui” will satisfy NEPA and HRS Chapter 343 compliance. Any public comments submitted to NPS for the East Maui EA will be independent from any comments submitted to DLNR regarding the Kauai IIT mosquito EA identified in this pre-notification letter.

The native forest birds of Kaua‘i face several threats to their survival. Already, 10 of the 16 native honeycreepers of Kauai have gone extinct, and 3 of the remaining 6 species are endangered or threatened. One native thrush (puaiohi) and one native flycatcher (Kauai elepaio) also still occur within intact areas of native forest in higher elevation areas of the island. Although several factors contribute to the continuing decline in native bird populations, the main

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threats to Hawaiian forest birds are avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); diseases principally spread by the non-native southern house mosquito (*Culex quinquefasciatus*). Despite the danger that these diseases pose to native forest birds, there has not, until recently, been a viable method to control mosquito populations within natural areas in Hawai'i.

The IIT has been successfully implemented in over ten countries throughout the world to control mosquitoes that carry human diseases, including four cities in the United States. The technique uses lab-raised male mosquitoes which carry a select strain of *Wolbachia*, a bacterium that naturally occurs in up to 70% of insects. When male mosquitoes, which do not bite or transmit diseases, with this select strain of *Wolbachia* are released into a target habitat and mate with wild female mosquitoes that either contain different strains of *Wolbachia* or no strains, the eggs fail to develop due to the cytoplasmic incompatibility of the *Wolbachia* strains of the male and female mosquitoes. The mosquito species targeted for control in this process are also a vector of human diseases, such as West Nile Virus and lymphatic filariasis, and can transmit heartworm to pets. The development of IIT for mosquito-borne diseases that affect humans presents a unique opportunity to use the technique to control mosquitoes that spread avian diseases to native forest bird species in Hawai'i. This approach does not employ genetic engineering and does not involve or result in either mosquitoes or bacteria being genetically modified organisms.

The DLNR proposes to employ IIT to reduce mosquito populations within the Kōke'e and Alaka'i areas of Kaua'i (figures 1 and 2 below). This effort is consistent with the agency's statutory missions and responsibilities. The project would involve mass-rearing and releasing of male mosquitoes that carry a strain of *Wolbachia* that is incompatible with existing wild female mosquitoes in the area. The male mosquitoes would be released from the ground, along established roads and trails. Additionally, release mechanisms are currently being developed which could enable the use of helicopters or drones to release mosquitoes from the air. Only existing routes of travel will be used, and no new roads, trails, helicopter or drone landing zones will be constructed to support this effort.

The release of incompatible male mosquitoes would take place within 59,204 acres (23,959 hectares) of northwestern Kaua'i. This area includes portions of the Kōke'e State Park, Hono o Nā Pali Natural Area Reserve, Ku'ia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alaka'i Wilderness Preserve, as well as privately owned lands. The Kōke'e State Park, Nā Pali-Kona Forest Reserve, and the Alaka'i Wilderness Preserve overlap with the extant native forest habitat, including critical habitat for 'akeke'e (*Loxops caeruleirostris*) and 'akikiki (*Oreomystis bairdi*), on the island. Extensive pre- and post-release monitoring would be implemented to determine the impacts of releasing the incompatible male mosquitoes on the local mosquito population.

It is anticipated that the Service will provide federal funding for the implementation of this action through congressionally allocated funds for the conservation and recovery of federally threatened and endangered species and/or the control of invasive species, including but not limited to potential funding through Recovery Challenge grants, Section 6 funds, State Wildlife Grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications program, or other similar funding programs. The Service's purpose and need for the project is to provide aid for the implementation of activities that would contribute to the recovery and conservation of several federally listed species, including the 'akeke'e, 'akikiki, puaiohi

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(*Myadestes palmeri*), and 'i'iwi (*Drepanis coccinea*), as well as other avian species showing concerning declines in population and range.

Transmitted for your review and comment is information on the above-referenced project. Please see enclosed maps of the project area and submit any comments to Cynthia King at cynthia.b.king@hawaii.gov by the internal deadline of October 24, 2022 to November 22, 2022. If no response is received by the indicated due date, we will assume your agency has no comments at this time. Should you have any questions about this request, please contact Cynthia King at cynthia.b.king@hawaii.gov. General information regarding the project can also be found on the www.birdsnotmosquitoes.org website. Information on the HEPA process can be found at <https://planning.hawaii.gov/erp/>

Sincerely,

Earl Campbell, Ph.D.
Field Supervisor
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service

David G. Smith
Forestry and Wildlife Administrator
Division of Forestry and Wildlife
State of Hawaii Department of Land and
Natural Resources

enclosures

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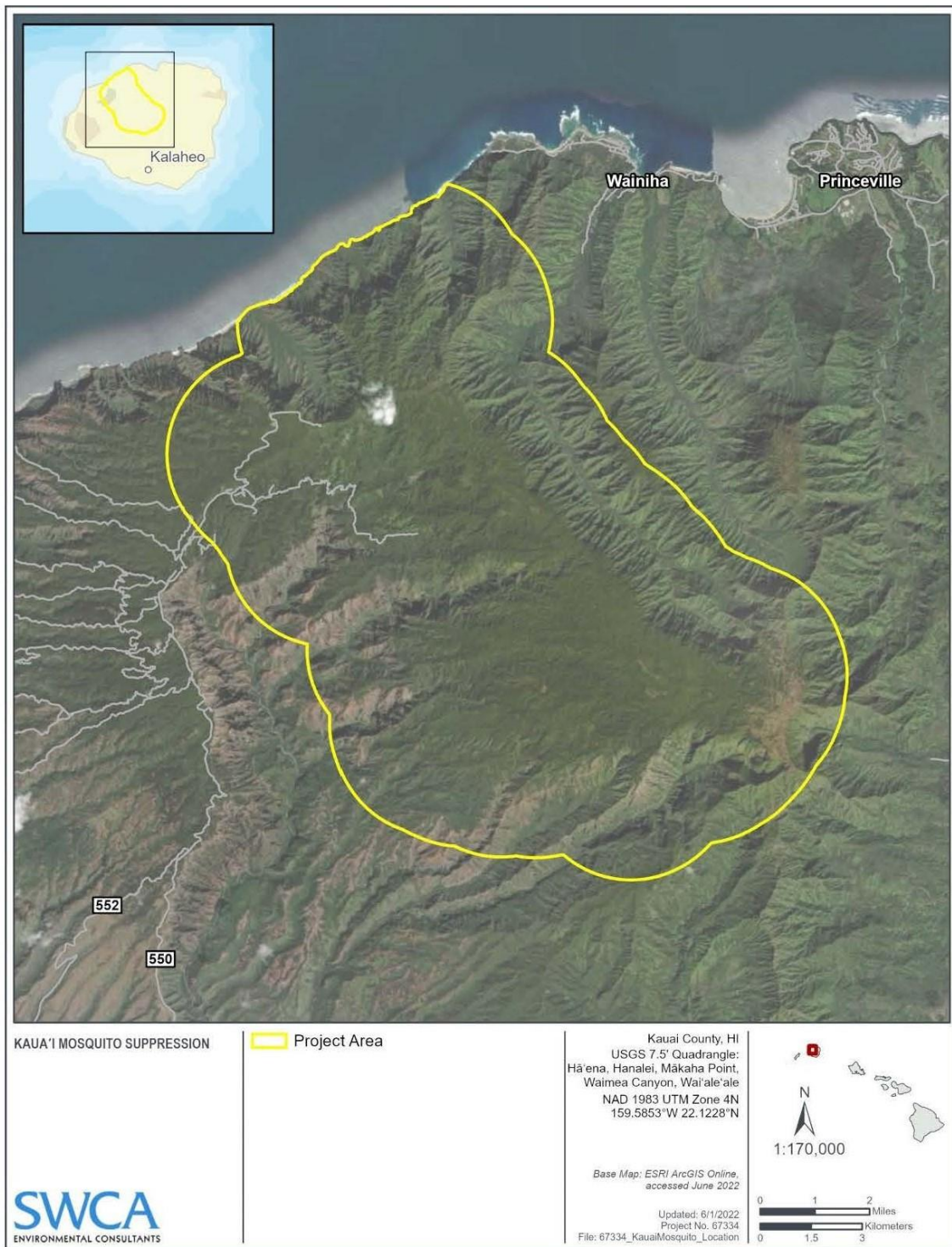


Figure 1. Boundaries of the project area.

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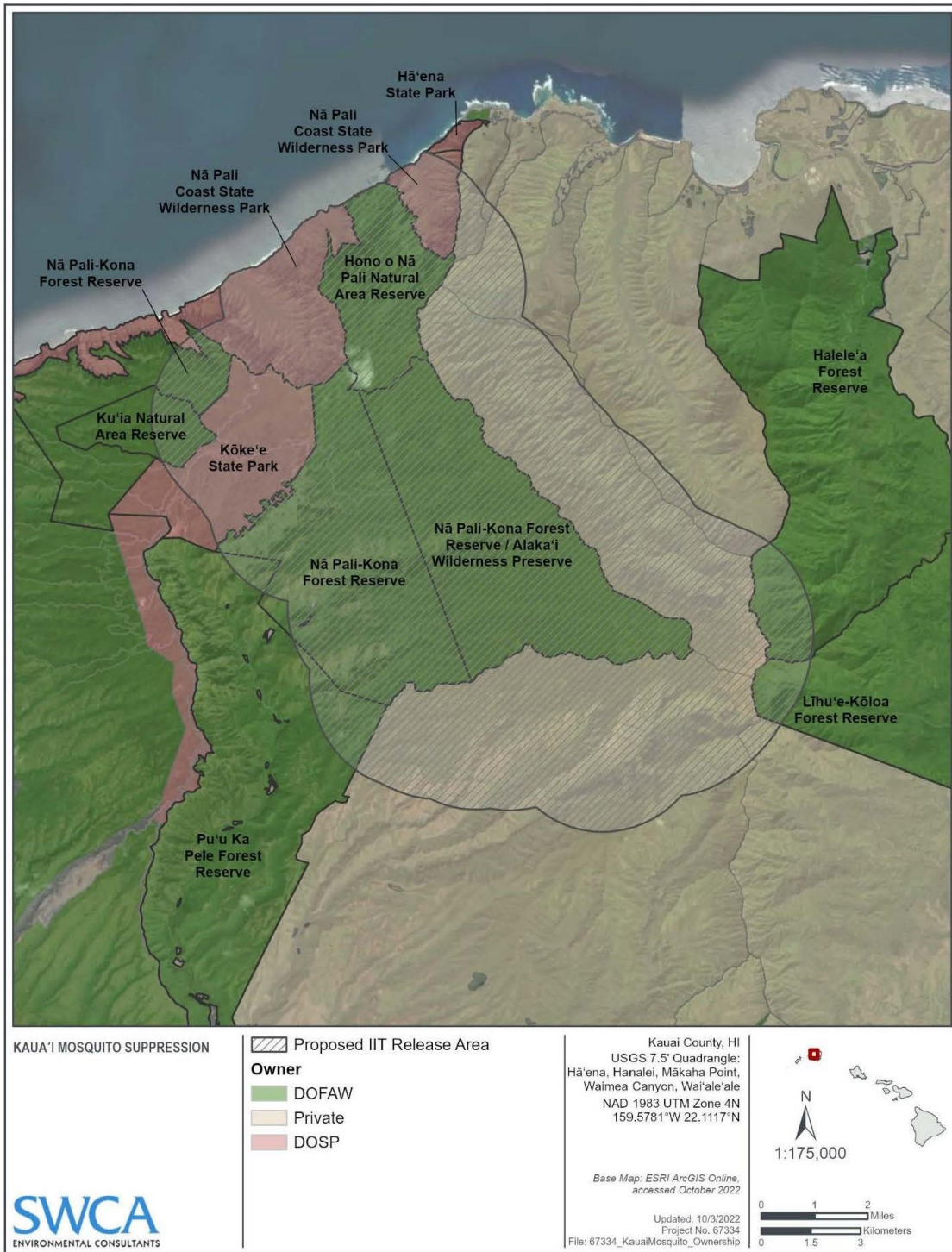


Figure 2. State Parks, Forest Reserves, Natural Area Reserves and private lands within and overlapping the project area.

Table H1. List of offices and/or people contacted with Federal and State preparatory notice of Draft Environmental Assessment.

Office or Entity Contacted	Contact Name	Title	Island
'Aha Mālama, Corp.	'Ānela Jackson	President	
Alexander & Baldwin Properties, Inc.	Sean O'Keefe		Kauai
Alexander and Baldwin	Chad Brue		
American Bird Conservancy	Steve Holmer		—
Association of Hawaiian Civic Clubs	Mr. Hailama Farden	President	
Board of Land and Natural Resources, Kauai member	Karen Ono		Kauai
Cattlemen's Association	Nicole Galase		
Center for Biological Diversity	Amy Atwood	Legal Director	—
Council for Native Hawaiian Advancement	Mr. Joseph Kūhiō Lewis	CEO	
Department of Hawaiian Homelands	Andrew Choy		Oahu
Department of Hawaiian Homelands, Kaua'i Office	Erna Kamabayashi		Kaua'i
Department of Interior, Office of Native Hawaiian Relations	Lisa C. Oshiro-Saganuma		Oahu
Department of Land and Natural Resources - CWRM			
Department of Land and Natural Resources - DAR	Brian Neilson		
Department of Land and Natural Resources - Engineering Division			
Department of Land and Natural Resources - Land Division	Russell Tsuji		
Department of Transportation	Jade Butay		Oahu
Earthjustice	David L. Henkin		Oahu
Garden Island Resource, Conservation, and Development Inc.	Gilbert P. Kea		Kauai
Grove Farm	Casey Watabu		Kauai
Hālau Ka Lei Mokihana O Leinā'ala	Leinā'ala Jardin	Kuma Hula	

Office or Entity Contacted	Contact Name	Title	Island
Halau member	Sally Jo Manea		
Hanalei Watershed Hui	Makaala Kaaumoana		Kauai
Hanalei Watershed Hui; Kauai Wildlife Coalition; Hui Ho`omalua i ka `āina	Maka`ala Ka`aumoana		
Hanapepe salt pans	Malia Nobrega-Olivera		
Hawaii Audubon Society	John Harrison		Oahu
Hawaii Cattleman`s Association	Nicole Galase		Hawaii
Hawaii Conservation Alliance	Emma Anders		Oahu
Hawaii State Government	Dee Morikawa	Representative	
Hawaii State Government	James Kunane Tokioka	Representative	
Hawaii State Government	Mayor of Kauai		
Hawaii State Government	Nadine K. Nakamura	Representative	
Hawaii State Government	Ronald D. Kouchi	Senator	
Ho`okipa Network	Puanani Rogers		
Homestead Community Development Corporation	Robin Danner		
Hui Huliau Inc.	Adrian Nakea Silva	Chairman	
Hui o Laka - Koke`e Natural History Museum	Chris Faye		
Imua Hawaii	Dreanalee Kalili	Treasurer	
"KAHEA			
The Hawaiian-Environmental Alliance"	Miwa Tamanaha		Oahu
Kamehameha Schools	Mililani Browning		
Kamehameha Schools	Namaka Whitehead		Hawaii
Kamehameha Schools - Community Relations and Communications Group, Government Relations	Piilani Hanohano	Coordinator, Government Relations	
Kanu o ka `Āina Learning `Ohana	Taffi Wise	Executive Director	
Kaua`i Aha Moku			
Kauai Albatross Network; Kauai Wildlife Coalition	Hob Osterlund		
Kauai Chamber of Commerce	Mark Perriello	Director	
Kaua`i County Council			

Office or Entity Contacted	Contact Name	Title	Island
Kaua‘i Cultural Center	Leilani Darryl		
Kauai Historic Preservation Review Commission			
Kaua‘i Historical Society	Randy Wichman	Interim President	
Kaua‘i Museum			
Kawaileo Law A Limited Liability Law Company	Na‘unanikināu Kamali‘i		
Ke Kula Ni‘ihau o Kekaha			
Kekaha Hawaiian Homestead Association	Liberta Hussey-Albao		
Makaweli Poi Mill	John A`ana		
Malama Anahola	Sherri Cummings	President	
Malama Hulei`a			
Na Koa Ikaika Ka Lahui Hawaii	Mililani Trask	Convenor	
Nā Kuleana o Kānaka ‘Ōiwi	Donna Kaliko Santos		
Na Pali Coast ‘Ohana	Sabra Kauka		
National Park Service, Pacific Island Support Office	Melia Lane-Kamahele		Oahu
National Tropical Botanical Gardens	Charles R. Wichman, Jr.		Kauai
NAVFAC Pacific	Norma Creps		Oahu
Ni`ihauan Ranch	Mary Sue Matter		
NTBG, Koke`e lessees	Chipper & Hau`oli Wichman		
Office of Conservation and Coastal Lands	Michael Cain		Oahu
Office of Hawaiian Affairs	Dan Ahuna		
Office of Hawaiian Affairs	Sylvia M. Hussey Ed.D.	CEO	
Office of Hawaiian Affairs	Kuulei Stockman	CEO	Oahu
Office of Planning, State of Hawaii	Mary Alice Evans	Director	Oahu
Office of the CEO, The Nature Conservancy	Mark Tercek		—
Office of the Chairperson, Hawaii Department of Agriculture	Phyllis Shimabukuro-Geiser		Oahu
Office of the Coordinator, Kauai Watershed Alliance, The Nature Conservancy, Kauai Program	Melissa Fisher		Kauai

Office or Entity Contacted	Contact Name	Title	Island
"Office of the Director			
US Forest Service, Institute of Pacific Islands Forestry, Pacific Southwest Research Station"	Susan Cordell		Hawaii
Office of the Director, Department of Hawaiian Homelands	William Aila, Jr.		Oahu
Office of the Director, Kauai Chamber of Commerce	Mark Perriello		Kauai
Office of the Director, Kauai County Council	Luke Evslin		Kauai
Office of the Director, National Fish and Wildlife Foundation	Amanda Bassow		—
Office of the Executive Director, Conservation Council for Hawaii	Les welsh		Oahu
Office of the Governor, State of Hawaii, Executive Chambers, State Capital	David Ige	The Honorable	Oahu
Office of the Mayor, Kauai County	Derek Kawakami	The Honorable	Kauai
Office of the President and CEO, National Audubon Society	David Yarnold		—
Office of the Program Manager, Garden Isle Resource, Conservation and Development Council			Kauai
Office of the Representative	Ed Case	Representative	Oahu
Office of the Representative	Kai Kahele	Representative	Oahu
Office of the Representative, Hawaii State Capital	Chris Todd	Representative	Oahu
Office of the Representative, Hawaii State Capital	Joy A. Sue Buenaventura	Representative	Oahu
Office of the Representative, Hawaii State Capital	Mark M. Nakashima	Representative	Oahu
Office of the Representative, Hawaii State Capital	Richard H.K. Onishi	Representative	Oahu
Office of the Senator	Brian Schatz	Senator	Oahu
Office of the Senator	Mazie Hirono	Senator	Oahu
Office of the Senator, Hawaii State Capital	Kaialii Kahele	Senator	Oahu

Office or Entity Contacted	Contact Name	Title	Island
Office of the Senator, Hawaii State Capital	Lorraine R. Inouye	Senator	Oahu
Office of the Senator, Hawaii State Capital	Russel E. Ruderman	Senator	Oahu
OHA, Community Outreach Coordinator, Kaua`i	Kaliko Santos		
Pacific Islands Refuges and Monuments Office			
US Fish and Wildlife Service			
	Ricardo Lopez		Oahu
Pacific Missile Range Facility	Jessi Hallman Behnke		
Pacific Rim Conservation	Eric VanderWerf	Dr.	Oahu
Pacific Rim Conservation	Lindsay Young	Dr.	
Robinson family			
San Diego Zoo, Conservation Program	Ron Swaisgood		—
Senior Vice President, Conservation Policy National Audubon Society	Sarah Greenberger		—
Sierra Club, Hawaii Chapter	Robert D. Harrix, Esq.		Oahu
State Historic Preservation Division			
Kakuhihewa Building	Alan Downer		Oahu
Supervising Deputy Attorney General			
Land and Transportation Division	Julie China		Oahu
The Nature Conservancy of Hawaii	Ulalia Woodside	Executive Director	Oahu
The Nature Conservancy of Hawaii, Cultural Practitioner, BLNR, etc.	Sam `Ohu Gon		
The Wildlife Society, Hawaii Chapter	Caroline Thow		Oahu
U.S. Geological Survey, Pacific Islands Ecosystem Research Center	Bob Reed	Director	Hawaii
USDA - Natural Resources Conservation Service	Jennifer Higashino		Oahu

Appendix I:

**Responses to Substantive Public Comments on
Environmental Assessment**

RESPONSES TO SUBSTANTIVE PUBLIC COMMENTS RECEIVED ON THE ENVIRONMENTAL ASSESSMENT

The total number of public comments received during the public review period for the Kaua‘i mosquito suppression Environmental Assessment (EA) was 887, of which 209 (23.6%) were considered “Substantive”. Thirty-nine (39) individual “Concerns” were identified from the substantive comments, which are listed in the “Comment Response Narrative” below with a brief summary of the concern itself; following each concern in the narrative is the detailed agency response. Each comment could include a single concern or multiple concerns. All public comments received are listed in the table (starting on page I-27) that immediately follows the comment response narratives, below. This table lists each public comment, with corresponding agency response indicated in the table column titled “Responses.” For substantive comments, the Responses column refers the reader to the corresponding Concern(s) identified by number in the Comment Response Narrative. Readers can therefore use the Responses column in the table to identify which concerns a given comment raises and where to find the relevant agency responses to these concerns in the Comment Response Narrative.

Comment Response Narrative

CONCERN 1: Commentors were concerned that the level of analysis presented in the Environmental Assessment (EA) was insufficient, and that an Environmental Impact Statement (EIS) should be prepared. Additionally, commentors were concerned about multiple EAs being completed for different locations within the state.

Response: Both the Environmental Assessment (EA) and Environmental Impact Statement (EIS) processes involve rigorous analysis of potential environmental and cultural impacts of proposed agency actions as required by federal National Environmental Protection Act (NEPA) and the Hawaii Environmental Protection Act (HEPA) and Hawai‘i Revised Statutes (HRS) Chapter 343 regulations as applicable. An agency must prepare an EA for a proposed action that is not likely to have significant effects or when the significance of the effects is unknown. The USFWS and DLNR considered potential effects of the proposed action and determined that it was not likely to have significant effects on the human environment including cultural resources. Therefore, an EA was prepared. The Finding of No Significant Impact (FONSI) affirms this and an EIS is not required.

A separate EA was prepared to analyze the potential impacts of the implementation of an Incompatible Insect Technique (IIT) program for control of the southern house mosquito on East Maui using resources made available by the National Park Service (NPS). Use of NPS funds were limited to implantation and analysis of IIT on NPS and adjacent lands. It was not until separate funding was obtained from Hawai‘i state general funds that the Chapter 343 process was initiated to analyze the potential impacts of implementation of a IIT program on Kaua‘i.

CONCERN 2: Commentors were concerned that potential impacts to public health and safety, from increased risk of mosquito abundance and disease transmission, were not sufficiently addressed.

Response: Only incompatible male mosquitoes would be released via the proposed action. Male mosquitoes do not bite humans or animals and do not transmit diseases, and therefore pose no risk to human health. Only female mosquitoes bite humans or animals. The project employs a highly technical sorting methodology originally developed to sort *Aedes aegypti* as described by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million. This proposed action would use *Culex quinquefasciatus*, a different species of mosquito, and while the methodology is very precise the estimated number of females released is expected to differ. Regardless, if a female mosquito is released, a bite from it would pose no greater risk to humans or wildlife than the wild

female mosquitoes currently present in the environment on Kaua'i.

The *Wolbachia* bacteria used to generate the incompatible male mosquitoes is already present in Hawai'i in the Asian tiger mosquito (*Aedes albopictus*). *Wolbachia* cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovici et al. 2010). Residents of Hawai'i are commonly bitten by the Asian tiger mosquito, which is distributed statewide and has remained one of the most abundant mosquitoes at lower elevations since its introduction in 1896. Residents of Hawai'i are also commonly bitten by the southern house mosquito (*Culex quinquefasciatus*), the target species in the proposed action, which was introduced to Hawai'i in 1826 and occupies both lower elevation and upper elevation habitats across the state. The southern house mosquito is also already naturally infected with *Wolbachia*. Humans in Hawai'i therefore are regularly bitten by mosquitoes carrying *Wolbachia*, including the strain that would be used in the proposed action (wAlb). No adverse effects have ever been reported in humans, nor is there a biological mechanism allowing adverse effects to occur (CDC 2022a).

As stated above, the southern house mosquito and the *Wolbachia* bacteria are already present in Hawai'i. No new organisms would therefore be introduced to Hawai'i by the proposed action. Further, there is no indication that the released mosquitoes would be any better at transmitting disease to humans or wildlife than those already present (Popovici et al. 2010). The southern house mosquito does not transmit any human diseases in Hawai'i. In contrast, the southern house mosquito is already a remarkably efficient vector of the avian malaria parasite, with an estimated 85–97% of southern house mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005). Increasing the vector competence (ability to transmit disease) of the southern house mosquito is therefore highly unlikely and ecologically insignificant when compared to the known risk of allowing these mosquitoes to proliferate on the landscape. Planning and development of IIT for forest bird conservation remains supported by state, federal, and private conservation organizations that have legal or administrative management responsibilities towards the recovery of endangered forest birds on Kaua'i.

The Incompatible Insect Technique using *Wolbachia* is an approach that was researched, developed, and first used over 50 years ago for the express purpose of protecting human public health (Laven 1967). Over the following half-century, the approach has continued to be studied, patented, and applied specifically for the benefit of improving public health outcomes for humans where mosquito-borne diseases are a threat.

CONCERN 3: Commentors were concerned that previous attempts to introduce biological control mechanisms in Hawai'i have had unforeseen and adverse impacts (e.g., mongoose introduction to control rats) in the state and that this will occur with the proposed mosquito releases.

Response: No new organisms would be introduced to Hawai'i by the proposed action. The southern house mosquito (*Culex quinquefasciatus*) and the *Wolbachia* bacteria are already present in the state. The *Wolbachia* bacteria used to generate incompatible male mosquitoes occurs in Hawai'i in the Asian tiger mosquito (*Aedes albopictus*), introduced to Hawai'i in 1896. The southern house mosquito has been widely established in Hawai'i since its introduction in 1826 and already naturally carries a strain of *Wolbachia* bacteria. (See also response to Concern 10)

Researchers and resource managers possess long-term data that aptly demonstrate that the worst-case scenario for native wildlife is currently well underway (Pratt et al. 2009; Paxton et al. 2022). The southern house mosquito continues to vector the parasite responsible for avian malaria to native honeycreepers, driving these irreplaceable biocultural resources to extinction. The proposed project aims to control populations of the southern house mosquito in forest habitat, where male and female mosquitoes are already present and causing widespread mortality to endangered forest birds. If released, incompatible male mosquitoes are expected to survive for approximately one week before

mating and then dying. If releases of incompatible male mosquitoes are halted, there will be no lasting effect on the environment.

The history of biological control in Hawai'i is complicated, with success stories largely overshadowed by misinformation. The same lack of regulations and biosecurity measures that allowed the southern house mosquito to first be introduced to Hawai'i in 1826 also enabled private plantation owners on Hawai'i Island to import the Small Indian Mongoose (*Urva auropunctata*) from Jamaica in 1883 with no official review or oversight. Many other regrettable and ill-planned species introductions were completed prior to the Kingdom of Hawai'i publishing the first "Laws of the Hawaiian Islands" in 1890, which sought to regulate pest species introductions and spread. It was not until the 1960's when the now State of Hawai'i began to comply with federal laws, including the and Endangered Species Act (1973), and established State laws (HRS 150A and HRS 343) to ensure any new species introductions of plants or animals were carefully studied and reviewed. The proposed management action is subject to each of these State and Federal laws, regulations, and requisite review.

CONCERN 4: Commentors were concerned that the introduced mosquitoes would be "genetically modified," "bioengineered," or be considered an unsafe "pesticide."

Response: The incompatible male mosquitoes are not genetically modified organisms (GMO). The U.S. Environmental Protection Agency (EPA) does not regulate this approach as a GMO or a genetically engineered product. According to the (EPA), a genetically modified organism is "a plant, animal, or microorganism that has had its genetic material (DNA) changed using technology that generally involves the specific modification of DNA, including the incorporation of specific DNA from one organism to another. Scientists often refer to this process as genetic engineering." (e.g., Gatew and Mengistu 2019).

The proposed mosquito suppression technique does not modify any or part of the genome of either mosquitoes or the *Wolbachia* bacteria. Furthermore, incompatible male mosquitoes are incapable of successfully reproducing with wild females and therefore cannot pass on their genes to successive generations. The proposed action differs from gene drive approaches because if releases are stopped, the population of mosquitoes already present in the forest within the proposed project area will gradually return to pre-release levels.

The EPA has reviewed the use of incompatible male mosquitoes with *Wolbachia* as a biopesticide. The agency defines biopesticides as "naturally occurring substances that control pests (biochemical pesticides), microorganisms that control pests (microbial pesticides), and pesticidal substances produced by plants containing added genetic material (plant-incorporated protectants) or PIPs." Many biopesticides registered by the EPA can be used in and around lands cultivated for certified organic food production if ingredients also meet U.S. Department of Agriculture standards.

The U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds (USDOI 2022) acknowledges "technology for this approach is not available for near-term implementation," and is not part of the proposed action under evaluation in this environmental assessment.

CONCERN 5: Commentors were concerned there is risk of damage to ecosystems and environment in general.

Response: No new organisms would be introduced to Hawai'i by the proposed action. The southern house mosquito (*Culex quinquefasciatus*) and the *Wolbachia* bacteria are already present in Hawai'i. The *Wolbachia* bacteria used to generate incompatible male mosquitoes occurs in Hawai'i in the Asian tiger mosquito (*Aedes albopictus*), which has been in Hawai'i since 1896. The southern house

mosquito is widely established in Hawai'i, since its introduction in 1826, and already naturally carries a strain of *Wolbachia* bacteria. There is a substantial body of data and peer-reviewed publications that demonstrate the use of incompatible insect technique is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021).

Researchers and resource managers additionally possess long-term data that demonstrate the worst-case scenario for native wildlife is currently underway (Pratt et al. 2009; Paxton et al. 2022). The southern house mosquito transmits the parasite responsible for avian malaria to native honeycreepers, driving these irreplaceable biocultural resources to extinction. The proposed project aims to control the southern house mosquito in forest habitat, where male and female mosquitoes are otherwise present and causing widespread mortality to endangered forest birds. If released, incompatible male mosquitoes are expected to survive for approximately one week. If releases of incompatible male mosquitoes are stopped, there will be no lasting effect on the environment.

CONCERN 6: Commentors were concerned that the proposed action may be inefficient, ineffective, and costly.

Response: There is no single solution to the extinction crisis endangered Hawaiian forest birds currently face. However, the release of incompatible male mosquitoes with *Wolbachia* is the most promising new approach that resource managers can implement in the near-term to control the primary threat to native forest birds in remote natural areas.

The proposed Incompatible Insect Technique (IIT) mosquito suppression project was identified as a priority for Hawai'i at local and international planning meetings in 2016 and 2017. Over the last six years, federal and state agencies and non-governmental organizations (NGOs) have participated in exhaustive research, development, and planning, and have initiated permitting and environmental compliance. The program would be part of a suite of management actions that are currently in place, or are being considered, designed to protect native forest birds from extinction. These include conservation breeding of forest birds, potential translocations of birds to Hawai'i Island, and future mosquito suppression techniques (USDOI, 2022). These tools, however, are not permanent solutions either. Should a more long-lasting technique be developed and refined to the point where it could be applied to the landscape, it could be considered in the future, with appropriate environmental compliance. It is also possible that future mosquito suppression techniques will benefit from the procedures developed for the proposed action.

Regular and consistent releases of incompatible male mosquitoes can be used to maintain population suppression of wild mosquitoes at a landscape-scale over long periods. It is common for management projects to require repeated actions to maintain the success of the project. For example, fencing to keep out problematic mammals (e.g., rats, pigs, and deer) from sensitive habitats requires regular maintenance. Similarly, controlling weeds or invasive insects usually requires repeated visits to affected sites, sometimes for many decades after an infestation is discovered (e.g., Chimera et al. 2000, Neville et al. 2019).

Conservation and resource management in Hawai'i can be costly. Programs that aim to preserve Hawai'i's watershed forests, protect near-shore beaches and reefs, stabilize and recover endangered species, control destructive invasive species, and support commercial and recreational fishing and hunting programs all require significant recurring state and federal funding. Sometimes funds are used to study and develop new management tools and approaches, while other funds are directed towards specific on-the-ground actions. The mission of the U.S. Fish and Wildlife Service (USFWS) is to work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people through Federal programs relating to migratory birds,

endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries. Likewise, the Hawai‘i Department of Land and Natural Resources (DLNR) is charged with the task of enhancing, protecting, conserving and managing Hawai‘i’s unique and limited natural, cultural and historic resources that are held in public trust for current and future generations of the people of Hawai‘i nei, and its visitors, in partnership with others from the public and private sectors.

The DLNR has not only the legal mandate, but the kuleana (privilege and responsibility) to protect biocultural resources. Hawai‘i’s unique biodiversity is deeply interlaced with Hawaiian culture. Both USFWS and DLNR stewardship aim to perpetuate the unique and continuing connections between Hawaiian culture and this sacred and evolving land. Honeycreepers such as the ‘akikiki and ‘akeke‘e are ‘aumakua (familial guardians or ancestors), and their endurance in the native forest is an embodiment of Hawaiian culture.

The Rapid ‘Ōhi‘a Death project is an example of another program that requires ongoing and extensive federal and state funding to preserve ‘ōhi‘a (*Metrosideros polymorpha*), a species that is the backbone of the native forest and a significant biocultural resource.

CONCERN 7: Commentors were concerned that the entire range of alternatives was not fully assessed, including alternatives that are “safer” and more “natural.”

Response: As is discussed in the EA, habitat protection, habitat restoration, conservation breeding, and control of predators such as small mammals are expected to continue in and around the project area. While these ongoing efforts contribute to the long-term restoration of suitable habitat throughout endangered forest bird critical habitat, these efforts alone will not prevent the extinction of forest bird species in Hawai‘i. Recent analysis of long-term survey data for seven of the eight native forest bird species on Kaua‘i found that six species had significantly declined in abundance over the past 25 years within the uppermost elevations of their available habitat on the island (Paxton et al. 2016). This decline is concurrent with increases in the prevalence of mosquitoes and avian malaria in forest bird habitat on Kaua‘i (Atkinson et al. 2014). The two rarest avian species, ‘akikiki and ‘akeke‘e, have undergone dramatic declines in recent years and are at risk of imminent extinction (Paxton et al. 2022). Best scientific information indicates that landscape-scale mosquito control as described in this EA is needed to prevent extinction of these species in the wild. Additionally, as is noted above, there is a substantial body of data and peer-reviewed publications that demonstrate the use of incompatible insect technique is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021).

Loss of suitable habitat has been extensive in the Hawaiian Islands and is an important threat to forest birds generally. However, introduced mosquitoes are also a threat because forest birds on Kaua‘i are highly susceptible to mosquito-borne diseases and are not expected to persist in areas where mosquitoes are present. Restoration of suitable habitat through reforestation of areas in which mosquitoes are present is therefore not expected to be an effective alternative strategy to prevent the extinction of those species. Restoration of suitable habitat in high elevation areas where mosquitoes are not present, or not expected to be present as global temperatures rise, is an important part of recovery efforts. Habitat restoration, however, does not constitute an effective alternative to mosquito control at this time because, 1) the acreage of potential suitable habitat at those high elevations is vanishingly small, and 2) restoration of suitable habitat in those areas requires decades of time and cannot be completed before the projected extinction timeline of the affected species.

As previously mentioned in Concern 6, the proposed action would be part of a suite of management actions designed for the preservation of native forest birds, many of which have already been implemented. The US Fish and Wildlife Service (USFWS) developed recovery plans for several taxa of endangered Hawaiian forest birds, including the remaining populations of ‘akikiki and ‘akeke‘e on

Kaua'i (USFWS 2006, USFWS 2021). These plans prioritize measures such as conservation breeding and restoration of degraded habitat through invasive species control (introduced feral ungulates, non-native plants and rats) as well as implementation of techniques to control mosquitoes at a landscape scale. Over 3,900 acres of critical habitat for 'akikiki and 'akeke'e have been fenced to exclude feral ungulates (pigs, goats and black-tailed deer) by the Kaua'i Watershed Alliance (KWA). The KWA continues to remove habitat degrading invasive plants (Himalayan ginger, Australian tree fern and strawberry guava) from these fenced areas. The Kaua'i Forest Bird Recovery Project conducts rat control using Goodnature A24 traps in core forest bird breeding habitat. From 2016 to 2018 eggs of the 'akikiki were collected to start a conservation breeding population. Over 40 'akikiki are currently in captivity at the San Diego Zoo Alliance conservation breeding facilities on Maui and Hawai'i Island. Other alternatives such as translocation of birds to other islands with high elevation habitat are being considered (Paxton et al. 2022, USDOJ 2022).

Although a range of options were considered, there are few tools available to achieve landscape level mosquito control in natural areas. While this project is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation purposes, and the first time the approach would be used in Hawai'i, there is a substantial body of data that demonstrates the Incompatible Insect Technique (IIT) approach is safe, targeted, and results in no adverse effects to humans or the environment (e.g., Laven 1967; Moreira et al. 2009; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The potential benefits of IIT in the management of human diseases and their insect vectors have led to a growing body of research on the utility of *Wolbachia* for population control in mosquito-borne diseases. Additional alternatives were considered but dismissed and are described in Appendix A of the environmental assessment.

CONCERN 8: Commentors were concerned about the potential for biopesticide drift associated with the project.

Response: For the reasons discussed in the EA and in response to comments above, disbursement of Incompatible male mosquitoes outside of the project area will have no adverse impacts on public health or the environment. This assessment is shared by the EPA. In addition, released incompatible male *Culex* mosquitoes would have no pesticidal action outside of the project area due to insufficient numbers drifting outside of the project area into areas where they would be overwhelmed by the large density of wild *Culex* mosquitoes in these lower elevations. The ratio of incompatible males to wild females would not be enough to suppress or have an effect on mosquito populations outside of the project area.

Pesticide drift is the movement of pesticide dust or droplets through the air at the time of application or soon after, to any site other than the area intended. This term has been historically associated with the use of chemical pesticides due to potential negative effects on people's health and the environment, and damage to nearby crops or infrastructure (www.epa.gov/reducing-pesticide-drift/introduction-pesticide-drift).

"Biopesticides" are derived from natural organic sources such as animals, plants, bacteria, and certain minerals. The *Wolbachia*-based incompatible male *Culex* mosquito in this EA is classified as a biopesticide by the EPA. The EPA encourages the use of biopesticides over chemical pesticides for several reasons, but mainly because they are usually inherently less toxic than conventional pesticides and generally affect only the target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides.

A Federal Insecticide Fungicide Rodenticide Act (FIFRA) Section 18 application was submitted by the Hawai'i Department of Agriculture to the EPA, in collaboration with the USFWS and DLNR, to request an emergency exemption from Section 3 pesticide registration, given the imminent extinction risks to threatened and endangered forest bird species. The EPA conducted a rigorous review to

ensure that the Incompatible Insect Technique biopesticide will not adversely affect public health or the environment. The Section 18 process results in temporary product registration and a label that identifies appropriate product use, application rates, restrictions, safety, and quality control requirements. On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB in *Culex quinquefasciatus* (DQB Strain) (Appendix C of the EA: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and U.S. EPA Letter of Authorization).

CONCERN 9: Commentors were concerned that there has been insufficient study of the proposed action, that more studies should be completed, and that the proposed action has not been considered carefully.

Response: Since 2016, Federal and State agencies and NGOs initiated development, planning and environmental compliance needed to assess the efficacy and safety of the proposed mosquito abatement program. While this program is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation there is a substantial body of data that demonstrate the approach is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atayme et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB in *Culex quinquefasciatus* (DQB Strain) (Appendix C of the EA: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and U.S. EPA Letter of Authorization). Public outreach related to the use of incompatible male mosquitoes began in 2018, and the effects of the Incompatible Insect Technique program were appropriately and extensively analyzed in this EA.

The southern house mosquito has been present in Hawai'i for nearly 200 years and already naturally carries the *Wolbachia* bacteria within its cells. This species of mosquito has invaded native forest habitat, which is the last refuge for critically endangered forest birds, and also occupies suburban and urban areas - even taking advantage of breeding indoors in air conditioner condensation/drip pans/drain pans in high rise buildings. As a result, residents of Hawai'i have been interacting with and bitten by the southern house mosquito (carrying *Wolbachia*) for generations.

The proposed mosquito suppression project using incompatible male mosquitoes was identified as a priority for Hawai'i at local and international planning meetings in 2016 and 2017. Over the following six years, Federal and State agencies and NGOs have participated in exhaustive research, development and planning to facilitate project implementation, and initiated permitting and environmental compliance. Outreach related to the use of incompatible male mosquitoes has been ongoing since 2018, and the use of this approach has been recommended by both executive and legislative branch leadership across the state.

In 2017, the Hawai'i Invasive Species Council adopted Resolution 17-2, supporting research and evaluation of landscape-scale control technologies for mosquitoes, and encouraging researchers to review and evaluate approaches that could potentially benefit both native wildlife and human health in Hawai'i. In 2019, House Resolution (HR) 297 passed the Hawai'i State House and directed the "[Department of Agriculture] to review the *Aedes aegypti* mosquito with *Wolbachia* bacteria, including *Aedes aegypti* mosquitoes originating from Hawai'i stock that could be imported for landscape scale mosquito control, and render a determination to place it on the appropriate animal import list." The resolution required the Departments of Health (DOH), Agriculture (DOA), and Land and Natural Resources (DLNR) to collaborate on a report to the Legislature with recommendations for appropriate vector control programs. In 2021, House Resolution (HR) 95 subsequently passed the Hawai'i State House urging DLNR, DOA, DOH and the University of Hawai'i to implement a

mosquito control program using *Wolbachia* to reduce mosquito population levels throughout the state. In 2022, the Hawai‘i Board of Agriculture voted to approve the administrative rule change and issuance of an import permit that would allow implementation of the proposed project. On September 7, 2022, the Kaua‘i County Council passed Resolution No. 2022-31 “Resolution Urging Federal, State, and County Elected Officials to Support the Funding and Implementation of the Use of Mosquito Birth Control to Bring Kaua‘i’s Native Forest Birds Back From Near Extinction and Towards Abundance.” On May 12, 2023, the Kaua‘i County Council passed Resolution 2023-43, “Resolution Urging Federal, State, and County Elected Officials to Support Funding and Implementation of Mosquito Birth Control Measures to Mitigate the Rapid Decline of Native Bird Species.”

The period during which these resolutions were introduced and approved, highlights the timeline over which this approach has been under public review and subject to public comment.

CONCERN 10: Commentors were concerned that the *Wolbachia* bacteria in the mosquitoes to be released is “foreign” or would be “introduced” to an environment in Hawai‘i where it currently does not occur.

Response: The proposed action will not involve introducing any new or foreign organisms to Hawai‘i (see response to Concern 3). Any releases of organisms of this kind are rightfully scrutinized, well studied, and regulated. The incompatible male mosquitoes reared in the lab would be derived from mosquitoes initially collected in Hawai‘i. These are the same species of mosquito, the southern house mosquito (*Culex quinquefasciatus*), that are present in Hawai‘i and responsible for spreading avian malaria. Similarly, the strain of *Wolbachia* in the released male mosquitoes is also present in Hawai‘i in the bodies of another mosquito common in the state, the Asian tiger mosquito (*Aedes albopictus*).

The southern house mosquitoes that exist in Hawai‘i today carry a strain of *Wolbachia* called wPip. The Asian tiger mosquito carries a different strain of *Wolbachia* called wAlb. To create the incompatible southern house mosquitoes, scientists would create a laboratory line of Hawai‘i mosquitoes with the wAlb *Wolbachia* strain. This is done through a multi-step process involving rearing mosquitoes in the lab and removing the wPip *Wolbachia* from their bodies with common antibiotics. The wAlb strain of *Wolbachia* is injected into the eggs of the *Wolbachia*-free mosquitoes. The resulting mosquitoes are southern house mosquitoes with a stable infection of wAlb *Wolbachia*, which naturally occurs in Hawaii. These are reared for several generations and carefully tested. All this work is done in controlled laboratory conditions.

The success of the suppression program is predicated on only releasing incompatible male southern house mosquitoes. As *Wolbachia* is maternally inherited, no local establishment of wAlb southern house mosquitoes is expected or is likely to occur (see response to Concern 12 for more on the issues of female contamination and local establishment). However, as no organisms (mosquito or *Wolbachia*) used in this proposed project are novel to Hawai‘i, local establishment would not constitute introduction of any foreign species.

CONCERN 11: Commentors were concerned that the proposed project would be an “experiment” that has not been implemented prior.

Response: This is neither an experiment nor a novel technique. The proposed action is an application of an established method for controlling insect populations. The Incompatible Insect Technique (IIT) has been used for decades to control mosquitoes that are a human health concern in at least 15 countries including, but not limited to, New Caledonia, Fiji, Vanuatu, French Polynesia, Australia, Indonesia, Singapore, Malaysia, Vietnam, Sri Lanka, India, China, Brazil, Columbia, and Mexico and the United States (New York, Kentucky, Florida, Texas, Puerto Rico and California). All data and

peer-reviewed studies published to date indicate that IIT is a safe and effective method to reduce mosquito populations and disease transmission. The proposed action is also not the first time IIT has been used to suppress populations of the southern house mosquito. Stand-alone field releases of incompatible southern house mosquitoes were completed in China in 2022, led by Michigan State University researcher Dr. Zhiyong Xi. The project released over five million incompatible males, and preliminary results indicated very strong suppression in the field (publication in prep; pers. comm., Z. Xi).

The only novel aspect of the proposed action is that it has not previously been employed in Hawai‘i nor has it been used for wildlife conservation. As such, protocols are being developed for its use in Kaua‘i’s native forest and other local conditions. While there is ample evidence to indicate this approach is effective for reducing mosquito populations, it remains to be seen to what extent southern house mosquito populations will be suppressed.

CONCERN 12: Commentors were concerned that female mosquitoes would be released that could ultimately breed and perpetuate or increase rather than suppress the mosquito population, possibly resulting in a “super mosquito.”

Response: Several commentors correctly identified that the release of females (i.e., “female contamination”) would negatively impact the ability of the proposed action to suppress mosquito populations. Potentially released females, however, present no more risk to humans or animals than the wild mosquitoes that currently occur on Kaua‘i, nor would releases of females increase the population of mosquitoes on Kaua‘i.

Given the importance of only releasing male mosquitoes, sorting out females is a vital part of the process. In previous Incompatible Insect (IIT) programs similar to the proposed action, sex sorting was accomplished in several ways, with varying rates of success. One of the primary methods used to separate and eliminate females uses sieves, or another similar physical separation method, taking advantage of the fact the female pupae are larger than male pupae. This method alone is estimated to remove >95% of all females, and various additional methods have been used to eliminate remaining females or render them sterile (e.g., exposure to radiation). Employing this and other available sorting methods, Crawford et al. (2020) estimated that the risk of releasing a female is 1 out of 900 million released *Aedes aegypti* mosquitoes. The proposed action would use *Culex quinquefasciatus*, a different species of mosquito, and while the methodology is very precise the estimated number of females released is expected to differ.

This highly technical process uses physical separation of pupae, followed by imaging and sorting of emerged adults via artificial intelligence (AI) programs to remove remaining females. Following this, an iterative process of vetting AI scanned images is used to further reduce the risk of females being present in any given batch of incompatible mosquitoes bound for release. Following the methods described by Crawford et al. (2020), Beebe et al. (2021) did not detect any released females (or larvae containing control *Wolbachia*) throughout the life of their project in Australia. Using a different method, Zeng et al. (2022) estimated a female contamination rate of <1% and saw no local establishment of *Wolbachia*-infected mosquitoes in their study site. The Crawford et al. (2020) sex sorting would result in a female contamination rate that is several orders of magnitude smaller than reported in Zeng et al. (2022).

The released southern house mosquitoes would be transinfected with the wAlb *Wolbachia* strain and the wild mosquitoes in Hawai‘i currently are naturally infected by the wPip *Wolbachia* strain (see response to Concern 10 for more explanation). Should a wAlb female be released, she would be compatible with the released wAlb male mosquitoes and could produce viable offspring. As such, every effort would be made to reduce or eliminate female contamination in released male mosquitoes. For local establishment of a wAlb population of southern house mosquitoes to form, females would

first need to be released and survive long enough to reproduce (mate, find a blood meal, and lay eggs). If overflooding rates of released males are correctly calculated, it is possible that a released female could find a compatible male with which to mate. Scientists have confirmed bidirectional incompatibility between the wAlb and wPip southern house mosquitoes. This means that pairings of wAlb males and wPip females are incompatible, as are pairings of wPip males and wAlb females. Should a released female mate with a wild type wPip male, no offspring would be produced. If a released female successfully produces offspring with a released male, all those offspring would be infected with the wAlb *Wolbachia* strain. These offspring would then need to mate with other wAlb southern house mosquitoes to continue the reproductive cycle, as would all successive generations. Meanwhile, any mating events with wPip wild type mosquitoes would suppress any developing wAlb population. Successful establishment of a wAlb population would thus be the product of a series of extremely unlikely events. Should local establishment be detected, halting releases of wAlb males would allow the wild type wPip mosquitoes to invade a portion of treatment area and eliminate the wAlb population. Deliberately releasing wild type wPip male mosquitoes could similarly accomplish the same objective.

Attempting to establish a population of mosquitoes with a *Wolbachia* strain other than that which is already present in an environment is an extremely challenging and resource intensive exercise. In contrast to the releases proposed in this EA, other IIT programs are specifically designed with the goal of replacing a population of mosquitoes with others infected with a different *Wolbachia* that has been shown to reduce the transmission of disease. In that type of program both males and females are released. Examining the success of those programs gives some insight into the number of females that may need to be released to successfully establish a population. For example, Hoffman et al. (2011) released between 5,000 and 11,000 females per week (assuming a 1:1 sex ratio). Even at that rate, it took multiple releases over several months to increase the *Wolbachia* frequency in the mosquito population above 50% (indicating they had replaced half the population). Hoffman et al. (2011) also continued to document suppression of their *Wolbachia* mosquitoes through ingress of females from outside the release area. The methods expected to be employed for sorting out females in the proposed action are similar to those used by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million mosquitoes released. The proposed action, however, would use *Culex quinquefasciatus*, a different species of mosquito than used by Crawford et al. (2020). While the methodology is very precise the estimated number of females released is expected to differ as a result. Regardless, based on the results on Crawford et al. (2020) very few females are expected to be released; too few to result in local establishment.

CONCERN 13: Commentors were concerned that there is a risk that the release of *Wolbachia*-infected mosquitoes could increase, rather than diminish, disease transmission within the ecosystem and to humans (e.g., malaria, dengue fever, yellow fever, Zika virus, and West Nile Virus).

Response: There is no indication that the released incompatible male mosquitoes will increase disease transmission in humans or wildlife. The general trend seen in the peer-reviewed literature is that *Wolbachia* infection leads to lower rates of disease transmission including that of dengue, chikungunya, Zika, West Nile Virus, and malaria (e.g., Moreira et al. 2009, Hussain et al. 2012, Dutra et al. 2016). The ability of *Wolbachia* to suppress disease transmission is the basis for several applications of the Incompatible Insect Technique. Prime examples are projects aimed at replacing populations of the yellow fever mosquito (*Aedes aegypti*), which is naturally *Wolbachia*-free, with those infected with *Wolbachia*, thereby reducing the spread of dengue and other diseases (e.g., Eliminate Dengue [<https://www.fhi360.org/projects/eliminate-dengue>]).

As several commentors mentioned, there are a few select studies that show the opposite pattern, i.e., increased disease transmission in *Wolbachia*-infected mosquitoes. However, there are significant differences between the proposed action and the methods employed by these studies and the study

systems involved. In all the studies highlighted by commentors, the *Wolbachia* infection involved was either natural or achieved by inoculating adult mosquitoes, resulting in transient (unstable) infections (Zelev et al. 2013, Dodson et al. 2014, Hughes et al. 2014). As Dodson et al. (2014) stated, “It should be noted that these experiments were performed with mosquitoes transiently infected in the somatic tissues with *Wolbachia*, rather than a stable maternally inherited infection. It remains to be seen whether a stable wAlbB infection will enhance WNV [West Nile Virus] in a similar way.” The released mosquitoes in the proposed action would inherit their *Wolbachia* maternally and the infection would be stable and concentrated in sex cells. It should be noted that local transmission of West Nile Virus, chikungunya, Zika, and malaria (any other form besides avian) has not been documented in Hawai‘i.

Over 200 species of *Plasmodium*, the malaria parasite, have been identified and each species is host specific, meaning it can only infect certain kinds of animals. Further, most *Plasmodium* species are spread by specific mosquito species or a closely related group of species. Hughes et al. (2014) reviewed the effects of *Wolbachia* infection on transmission of various malaria parasite species. These authors showed that while most *Wolbachia* infections led to a reduction in malaria transmission, some *Wolbachia* infections led to an increase in transmission of rat malaria (*Plasmodium berghei* and *P. yoelli*; limited to Africa), chicken malaria (*P. gallinaceum*; not present in Hawai‘i), and one case of avian malaria (*P. relictum*). As noted in the response to Concern 2, the southern house mosquito is already a highly efficient vector of the avian malaria parasite, with 85–97% of mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005) and it is improbable that susceptibility could increase beyond what is currently seen in the wild. Notably, Hughes et al. (2014) also showed that *Wolbachia* infection consistently led to a decrease in transmission of human malaria (*P. falciparum*). Regardless, neither the species of mosquito that carries human malaria, nor human malaria itself, are present in Hawai‘i and human infection is therefore not possible.

Another important difference between the studies that found increases in disease transmission in *Wolbachia*-infected mosquitoes and the proposed action is that these studies compared *Wolbachia*-uninfected and *Wolbachia*-infected mosquitoes. Zelev et al. (2013) found an increase in avian malaria infection between *Wolbachia*-uninfected southern house mosquitoes versus *Wolbachia*-infected southern house mosquitoes. In Hawai‘i, nearly 100% of southern house mosquitoes are naturally infected with *Wolbachia* (Atkinson et al. 2016) as would be the released incompatible males. A comparison with Zelev et al. (2013) is therefore inappropriate.

CONCERN 14: Commentors were concerned that transinfected *Wolbachia* will make its way into other mosquito or other insect species non-maternally, i.e., via “horizontal transfer.”

Response: *Wolbachia* (wPipV) is already present in the southern house mosquito (*Culex quinquefasciatus*) in Hawai‘i, and *Wolbachia* (wAlbA and wAlbB) strains are already found in the Asian tiger mosquito (*Aedes albopictus*) in Hawai‘i. These mosquito species have been in Hawai‘i since 1826 and 1896, respectively. It is highly improbable that incompatible male mosquitoes, which cannot reproduce, are more likely to undergo horizontal transmission of *Wolbachia* than the existing populations of mosquitoes that have been reproducing on the landscape for the last 125–200 years. Further, *Wolbachia* is common among native Hawaiian insects (Bennett et al. 2012).

Wolbachia is an endosymbiotic organism (living within the cells of another organism) that is maternally inherited or passed down from a mother to her offspring; this is also referred to as “vertical transfer”. “Horizontal transfer” in this case would be the transmission of *Wolbachia* from one organism to another, non-maternally. The mechanism for horizontal transfer in *Wolbachia* is not known, but it could only occur following a series of extremely unlikely events and would require the *Wolbachia* bacterium to live outside of their host cells for some period of time. In a laboratory setting,

keeping *Wolbachia* alive outside of host cells requires specific conditions to preserve them in a cell-free medium for even short periods (Rasgon et al 2006). These specific laboratory conditions are required in the process of creating the incompatible mosquitoes in the proposed action. However, some have asserted or implied that the ability to preserve *Wolbachia* outside of cells in a laboratory setting (Rasgon et al. 2006) represents evidence that *Wolbachia* can live extracellularly in the wild (Tolley et al. 2019). But there has yet to be any evidence of free-living *Wolbachia* in the wild and there are numerous environmental factors that would severely limit the lifespan of *Wolbachia* outside of their host cells (e.g., pH, UV radiation). The mechanism for horizontal transmission of *Wolbachia* remains unknown, but hypotheses regarding how this may have occurred in the past have little relevance to the system in the proposed action. Tolley et al. (2019) suggested that horizontal transfer in ants could have occurred through social interactions or predation, but there remains no direct evidence of this.

There is good evidence that, over millions of years, horizontal transfer of *Wolbachia* has occurred numerous times (Tolley et al. 2019, Ding et al. 2020). However, *Wolbachia* shows a high degree of host endemism (only lives within one host species or closely related species) especially the strains involved here, wPip and wAlb (Ding et al. 2020). This high rate of endemism itself is evidence of the rarity of horizontal transfer. Just as several commentors suggested, Loreto and Wallau (2016) theorized that horizontal transfer between mosquito species (or other insects) may cause some unknown impacts in an Incompatible Insect Technique program. O'Neill (2016) directly addresses the concerns of Loreto and Wallau (2016) and makes several relevant points regarding horizontal transfer including, 1) horizontal transfer is very rare in nature (e.g., Hamm et al. 2014), and 2) natural experiments indicate a low rate of horizontal transfer including in closely related sympatric (living in the same place) mosquitoes. To the second point, both the Asian tiger mosquito (*Aedes albopictus*) and the yellow fever mosquito (*Aedes aegypti*) live in the same environments in many parts of the world, including on Hawai'i Island. The Asian tiger mosquito is nearly always infected with *Wolbachia* naturally (the same strain that would be used in the proposed action), while the yellow fever mosquito is naturally uninfected by *Wolbachia*, and yet there has never been evidence of horizontal transfer of *Wolbachia* between these species. There also is no evidence that the strain of *Wolbachia* found in southern house mosquitoes has been transmitted to the Asian tiger mosquito (or any other mosquito), or vice versa, in Hawai'i (or anywhere else) despite co-occurrence for the past >130 years (Atkinson et al. 2016). Further, there is no evidence of transfer of any mosquito *Wolbachia* to other arthropods, including native Hawaiian insects. The low rate of horizontal transfer among related species, such as *A. albopictus* and *A. aegypti*, would suggest that the rate of transfer among unrelated arthropods would be even lower.

CONCERN 15: Commentors were concerned that horizontal gene transfer may occur within the transinfected mosquitoes and unknown evolutionary events may occur as a result.

Response: Commentors listed concerns regarding horizontal gene transfer between the *Wolbachia* endosymbiont and the mosquito. To clarify, this is different from the concerns of horizontal *Wolbachia* transfer involving non-heritable movement of the *Wolbachia* organism between insect species (see response to Concern 14). Horizontal gene transfer in this context would be the theoretical movement of genetic material (DNA) from *Wolbachia* into the southern house mosquito genome. Horizontal gene transfer is a natural process that has occurred innumerable times throughout evolutionary history. Scientists have found segments of DNA within numerous eukaryotic (e.g., animal) organisms that can be traced back to a prokaryotic (i.e., bacteria) organism, often in parasite-host interactions. This may in fact be an important evolutionary process that is just now being realized. However, the process of horizontal gene transfer itself is not a concern. Rather, if such a transfer includes transcriptional phenotypic traits that could be influenced by selective pressures that allow for beneficial traits to be developed. A segment of DNA does not necessarily contain all the

required information to be transcribed (read) and conferred into new traits or functions. Much of a genome in fact contains sequences of non-coding DNA, often referred to as “junk DNA.” The likelihood that such an event could somehow alter the genome of the mosquito in a meaningful way is therefore exceptionally low. Further, horizontal transfer of genes between *Wolbachia* and a mosquito is unlikely to constitute the creation of a new species of mosquito as some commentators suggested.

Some commentators singled out a study by Klassen et al. (2009) that purported to show evidence of horizontal gene transfer between *Wolbachia* (wPip) and the yellow fever mosquito (*Aedes aegypti*). These authors found several sequences of DNA within the genome of the yellow fever mosquito (which is typically *Wolbachia*-free) that had previously been identified from the *Wolbachia* genome. Klassen et al. (2009) do acknowledge, however, that while the most likely direction of transfer was from the *Wolbachia* to the mosquito, it cannot be determined for certain the transfer did not occur in the opposite direction. Most importantly, these examples of gene transfer occurred as a result of a natural evolutionary event(s), not as a result of any human-caused process, such as in the proposed action; the timescale required for these transfer events is therefore unknown. Further, given that the wPip strain of *Wolbachia* has co-evolved with the southern house mosquito for likely millions of years, it is considerably more likely that horizontal gene transfer may have naturally occurred between these species than between the transinfected wAlb and the southern house mosquito. Finally, given that only non-reproductive males are planned for release, genetic change over an evolutionary time scale is prevented.

Concerns such as horizontal gene transfer are predicated on establishment of a reproducing population of southern house mosquitoes infected with wAlb strain of *Wolbachia*. The purpose of the proposed action, however, is to suppress the population of southern house mosquitoes within the project area on Kaua‘i. Local establishment of wAlb southern house mosquitoes would work against that goal, for the reasons discussed in comment response 12 would be extremely unlikely, and extreme care would be taken to avoid that scenario. For more information, please see response to Concern 12.

CONCERN 16: Commentors were concerned that the proposed action would be “tested” on Native Hawaiians, which would constitute an environmental justice concern.

Response: With respect to environmental justice, there is no evidence that the release of incompatible male mosquitoes on Kaua‘i will have any human health impacts. Therefore, there would be no disproportionately high and adverse human health impacts to Native Hawaiians that would result in environmental justice concerns. Please refer to Section 4.8 of the EA for the full analysis of environmental justice.

As discussed in Concern 11, this is neither an experiment nor a novel technique. With respect to environmental justice, there are substantial data that demonstrate the approach is safe, targeted, and results in no adverse effects to human health or the environment ((Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The proposed action is an application of an established method for controlling insect populations. The Incompatible Insect Technique (IIT) has been used for decades in at least 15 countries and elsewhere in the United States. The IIT method is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. The southern house mosquito has been present in Hawai‘i for nearly 200 years and already naturally carries the *Wolbachia* bacteria within its cells. This species of mosquito has invaded native forest habitat, which is the last refuge for critically endangered forest birds, and also occupies suburban and urban areas. As a result, residents of Hawai‘i have been interacting with and bitten by the southern house mosquito (carrying *Wolbachia*) for generations. Therefore, there would be no disproportionately high and adverse human health impacts to Native Hawaiians that would result in

environmental justice concerns.

DLNR prepared a Cultural Impact Assessment (CIA)(See appendix B of the Final Draft EA) as part of compliance with the Hawai'i Environmental Policy Act (HEPA). Based on the research and ethnographic data within the CIA report, it was found that it would be unlikely that the proposed action would adversely impact traditional or customary practices.

The CIA also found that native birds could be considered a cultural resource as they are entwined in both Hawaiian culture and tradition across the islands. The history of the birds in Hawai'i is one of tremendous adaptive radiation due to geographic isolation resulting in numerous species of birds found nowhere else on earth (Pratt et al. 2009). The use of helicopters and drones under the proposed action could temporarily disturb native forest birds, but over the long term there would be substantial benefits by minimizing the spread of avian malaria and pox and reducing bird mortality. Any minimal impacts to ethnographic resources and traditional cultural practices would likely be temporary at any given location, though releases would likely occur over the long term. Reduction of avian malaria as proposed would conserve numerous rare birds important to Native Hawaiian culture providing a beneficial impact, outweighing the adverse impacts.

CONCERN 17: During the public comment period, commenters submitted additional literature for review.

Response: The USFWS and DLNR reviewed all literature that was submitted during the public comment period on the EA and incorporated relevant information into the EA or comment responses as necessary.

CONCERN 18: Commenters were concerned that initiating a mosquito control program would impact or disrupt pollination by mosquitoes.

Response: While it is possible that mosquitoes can serve as generalist pollinators to some flowering plants, they are not known to provide essential pollination services to any native plant species or plants of agricultural importance in Hawai'i. This is due to the fact that mosquitoes, including the southern house mosquito, have only been in Hawai'i for less than 200 years and have not evolved with these plants. Additionally, the southern house mosquito has only dispersed into higher elevation habitat in the last several decades. In contrast, Hawai'i has a remarkable diversity of native arthropod and bird pollinators that have evolved over millions of years to provide pollination services to native flowering plants in Hawai'i. This project will have no negative impacts on native arthropod pollinators. Furthermore, the project could potentially significantly benefit native forest birds and increase their numbers, which may therefore increase overall pollination services in Hawaiian forests.

CONCERN 19: Commenters expressed concern about risks to native wildlife, particularly native bats and birds.

Response: Native insects, fish, birds and bats in Hawai'i do not rely on mosquitoes as an essential component of their diets. While opportunistic predation of mosquitoes occurs, mosquitoes are just one of many native and non-native prey items consumed by native insectivores (Pinzari et al. 2019). As such, the control of southern house mosquitoes is not expected to significantly adversely impact any native wildlife as a result of changes to the existing food web. Hawai'i's native fauna evolved over millions of years as constituents in a diverse community assemblage. In contrast, mosquitoes are a comparatively recent introduction that were established on Hawai'i less than 200 years ago. There are additionally no data suggesting that consumption of transinfected mosquitoes would present a risk to native wildlife. Native taxa such as damselflies and bats have been consuming multiple mosquito species containing *Wolbachia* (including *Aedes albopictus* and *Culex quinquefasciatus*) since the

insects were first introduced, with no adverse effects. *Wolbachia* cannot live in vertebrates and thus cannot affect bats or birds (Popovici et al. 2010). See the response to Concern 14 for examination of “horizontal transfer” of *Wolbachia*.

CONCERN 20: One commentor suggested that funding for the proposed actions should instead go directly to captive rearing and releases of the affected bird species.

Response: DLNR and USFWS already receive annual federal and state funding to protect, monitor, and conduct research on endangered forest birds in the wild. Using this funding, the agencies have documented steep declines in honeycreeper species such as ‘akikiki, ‘akeke‘e, kiwikiu and ‘ākohekohe over the past 20 years. These declines correspond with mosquitoes encroaching into high elevation forest habitat where they were not previously found and an increase in the prevalence of avian malaria in birds in these areas. The data collected suggests that avian malaria (transmitted by non-native mosquitoes) is the predominant threat to honeycreepers, and the expanding range of the southern house mosquito is causing honeycreeper population declines. Landscape-scale mosquito control as described in this Environmental Assessment is the best way to provide safe habitat for these endangered honeycreeper species.

DLNR and USFWS also receive annual federal funding for conservation breeding of endangered honeycreepers at two facilities in Hawai‘i. In 2022 the agencies received funding under the Bipartisan Infrastructure Act to construct additional aviaries to house endangered honeycreepers at facilities on Maui. The agencies also received funding from the United States Fish and Wildlife Service Recovery Implementation Fund to collect ‘akikiki and kiwikiu from the wild and house them in captivity until mosquito control can be implemented on Maui and Kaua‘i. DLNR and USFWS have sufficient funding for collection from the wild and conservation breeding and diverting funding from the proposed project is therefore not necessary. In order to release birds in the future, safe habitat in which mosquito populations are suppressed is critical. The intended beneficial outcome of the proposed project is necessary to release these birds in the future and to protect other honeycreeper species that are not currently threatened with imminent extinction, but which will likely become extinct in the future if mosquito control is not implemented.

CONCERN 21: One commentor wants to see what happens on Maui (success, failure, negative impacts) before this project proceeds on Kaua‘i.

Response: While waiting for results of the Maui Incompatible Insect Technique (IIT) trials would give important insight into the resources and logistics required to implement an IIT program, there is already sufficient evidence to demonstrate the IIT method is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. There is a need to enact mosquito control in forest bird critical habitat across the state. Given the results of ample research to date, the DLNR and USFWS propose that this effective method to be employed on Kaua‘i as soon as all environmental compliance and permitting is complete, as it is likely to suppress southern house mosquito populations and will have no significant adverse effects to the environment.

CONCERN 22: One commentor wanted to know why other avian species, such as nēnē, are not being affected similarly from mosquitoes.

Response: Although avian malaria parasites can be found in any bird species, passerine birds (i.e., “perching birds” such as the Hawaiian honeycreepers) are most commonly affected by avian malaria (Valkiūnas, 2005). Hawaiian honeycreepers are unique in their high susceptibility to avian malaria; a single bite from an infected mosquito can kill a honeycreeper. Effects of avian malaria on other bird

species worldwide are generally undetectable or “sub-lethal,” meaning infection may reduce breeding success or immune response, for example, but does not result in mortality (LaPointe et al. 2012).

Hawaiian honeycreepers are a unique sub-family of birds, whereas other Hawaiian birds such as ‘alalā (Hawaiian Crow), nēnē (Hawaiian Goose), ‘io (Hawaiian Hawk), pueo (Hawaiian Owl), and ae‘o (Hawaiian Stilt) have continental relatives in the same genus. This higher degree of genetic divergence from their continental ancestors demonstrates that honeycreepers have been in Hawai‘i longer than other Hawaiian birds and likely lost their resistance to avian malaria. By contrast, other native Hawaiian birds were likely more recent arrivals and have retained their baseline resistance to avian malaria. There is evidence that some honeycreeper species such as the ‘amakihi are adapting a resistance to avian malaria (Atkinson et al. 2013). For other honeycreeper species, however, avian malaria infection is far too lethal, and they have become extinct before acquiring resistance to the disease.

State and federal biologists remain concerned about the potential for other mosquito-vectored diseases like West Nile Virus becoming established in Hawai‘i, which could have devastating consequences for many native bird species.

CONCERN 23: A commentor expressed concern that there were no biosecurity protocols for the released mosquitoes mentioned and that the pathogen screenings are unknown.

Response: The DLNR, USFWS and partners participating in this project are complying with all State and Federal requirements relating to biosecurity and the movement of invasive species. In addition, the mosquito rearing for this project is in compliance with the requirements out of the EPA, as well as Center for Disease Control (CDC) guidance. A higher level of biosafety and biosecurity standards are set for all laboratories that hold and maintain species that can vector diseases. The diet or blood supply that the mosquitoes in the lab are provided is sourced from companies that also adhere to strict Food and Drug Administration (FDA) and CDC guidance in providing pathogen-free animal blood for laboratory use. In addition to manufacturer screening, secondary panel testing occurs at the laboratory to verify that the diet is free of any diseases. Access to the lab is restricted to authorized personnel. Once packaged at the lab, the incompatible male mosquitoes are securely shipped and are not exposed to any potential pathogens. Upon arrival in the state, the shipment is inspected by a Hawai‘i Department of Agriculture official per the HDOA mosquito import permit conditions.

The incompatible male mosquitoes reared in the lab were originally collected in Hawai‘i (see response to Concern 10). These are the same species of mosquito, the southern house mosquito (*Culex quinquefasciatus*), that are present in Hawai‘i and responsible for spreading avian malaria. Similarly, the strain of *Wolbachia* in the released male mosquitoes is also present in Hawai‘i in the bodies of another mosquito common in the state, the Asian tiger mosquito (*Aedes albopictus*). Although the project would release incompatible male *Culex* mosquitoes, it would monitor for any release of females on the landscape. The methods expected to be employed for sorting out females in the proposed action are similar to those used by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million mosquitoes released. The proposed action, however, would use *Culex quinquefasciatus*, a different species of mosquito than used by Crawford et al. (2020). While the methodology is very precise the estimated number of females released is expected to differ as a result. (See response for Concern 12). These pose no risk to the humans, wildlife, or the ecosystem and females are likewise sexually incompatible with wild males. It is not expected that such a low number of females would result in local establishment. Nevertheless, monitoring would be conducted and if any lab-reared females were detected, releases of incompatible male mosquitoes could be halted in the area detected, allowing the population to revert to the wild type.

The project would be conducting pre and post release monitoring to assess changes in southern house mosquito populations and would integrate data to inform project planning and future releases.

Technical monitoring plans are being developed and as release plans are fleshed out, monitoring protocols would be put in place.

Invasive species biosecurity protocols are provided in Appendix D to help the project avoid or minimize the inadvertent transportation or spread of other invasive species that could potentially impact plants, fish, wildlife, and their habitat within the project area. These protocols and other existing biosecurity standard operating procedures and best practices would be followed by trained and experienced project personnel.

CONCERN 24: A commenter suggested that mosquito fish should be considered as a tool to control populations of southern house mosquitoes.

Response: The dispersal of mosquito fish into aquatic habitat can be an effective tool to reduce mosquito populations under certain conditions. Mosquito fish predate the larval stage of mosquitoes and have been used historically in Hawai'i as a part of an integrated pest management strategy for mosquito vector control in urban and suburban areas. To be effective, the fish must be introduced, or disperse, to available habitat where mosquitoes are breeding. In natural areas, such as those included in the proposed project area, southern house mosquitoes often breed in ephemeral larval habitat (standing water on roadsides, tree cavities, pig wallows and intermittent streams). The lack of waterway connectivity throughout core forest bird habitat would limit the mosquito fish's ability to control mosquitoes in all areas where endangered forest birds exist. Locating and distributing mosquito fish to such larval habitat is not logistically possible. Furthermore, mosquito fish are generalist predators, which means they do not target mosquitoes exclusively and are documented to have significant adverse impacts on native invertebrate fauna. In lowland waterways, mosquito fish consume native arthropods (such as the endangered *Megalagrion* species damselflies and anchialine pond shrimps *Vetericaris chaceorum* and *Procaris hawaiana*) and crustaceans causing major declines of native biota in waterways and pools where they are present. This suggested alternative has been included in Section 3.3 ("Alternatives Considered but Dismissed from Detailed Analysis") of the final draft of EA.

CONCERN 25: A commenter suggested that the DLNR and USFWS should consider the successful mosquito control approach used in Tetiaroa, Tahiti.

Response: Both the DLNR and USFWS have considered this approach. The same Incompatible Insect Technique approach using *Wolbachia* bacteria proposed in this environmental assessment, has been used in the successful suppression of an isolated mosquito population (*Aedes polynesiensis*) on the private atoll of Tetiaroa, North of Tahiti in French Polynesia. The program was initiated with the goal of reducing populations of mosquitoes that transmit diseases such as dengue fever, and chikungunya and Zika viruses to Tetiaroa residents and visitors. The release of incompatible male mosquitoes in Tetiaroa is ongoing and has resulted in 90% reductions of mosquitoes on specific islands within the atoll (<https://www.tetiaroasociety.org/programs/research/mosquito-population-control>, <https://www.tetiaroasociety.org/sites/default/files/research-docs/ILM-Tetiaroa-pilot-project-2017.pdf>)

CONCERN 26: Commentors were concerned about funding sources for the proposed action, potential conflicts of interest of agency staff and board members, and the role of special interests.

Response: All of the federal and state funds allocated to this project have traceable sources (state or federal appropriations). Potential financial aid from federal sources include, without limitation, Recovery Challenge grants, Section 6 funds, State Wildlife Grants, Bipartisan Infrastructure Law, Inflation Reduction Act fund, Stewardship grants, Migratory Bird Conservation Act grants, Recovery

Challenge grants, America the Beautiful Challenge grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications Program, and other similar funding programs. State funding comes from State general funds. The American Bird Conservancy and The Nature Conservancy are also providing funding for the project.

In regards to concerns about conflicts of interest and special interests: The mission of the U.S. Fish and Wildlife Service (USFWS) is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people through federal programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries. Likewise, the Hawai'i Department of Land and Natural Resources (DLNR) is charged with the task of enhancing, protecting, conserving and managing Hawai'i's unique and limited natural, cultural and historic resources that are held in public trust for current and future generations of the people of Hawai'i nei, and its visitors, in partnership with others from the public and private sectors. USFWS and DLNR staff and designated representatives are fulfilling their official duties and responsibilities to their respective agencies by serving on boards and committees such as the State Board of Agriculture and related subcommittees. Their role on these boards and committees, including in partnerships such as Birds Not Mosquitoes Committee, is to provide technical expertise and represent agency leadership and policy positions. DLNR and USFWS staff working on this project are not receiving remuneration beyond their current salaries. Furthermore, many of the state and federal employees involved in this project are simultaneously working on a multitude of other projects and tasks related to their respective missions.

CONCERN 27: Commentors raised a concern that informed consent is required and was not obtained from the public to undertake this Incompatible Insect Technique (IIT) project.

Response: The proposed action analyzed in this EA is neither an experiment nor a novel technique being tested on the residents of Hawai'i. In making decisions on their respective proposed actions, the DLNR and USFWS each adhered to applicable laws, including NEPA and HEPA. NEPA and HEPA each require the agencies to inform the public about a proposed action and to seek information from the public about a proposed action and alternatives thereto. Substantive information obtained through public participation and from other sources is considered by agency officials in making decisions on proposed actions. Decision-makers strive to make well informed decisions utilizing best available information. As a rule, decisionmakers are not legally required to obtain the prior consent of individuals or entities who may disagree with an agency decision, or who may otherwise be affected by an agency decision. In this matter, the public was informed about the proposed action and was afforded an opportunity to comment. Substantive information available to decision-makers was considered and a final determination was made.

CONCERN 28: A commentor was concerned that *Wolbachia* Incompatible Insect Technique (IIT) trials conducted in Florida and Texas were the cause of recent human malaria detections in those states.

Response: Mosquitoes used in *Wolbachia* based IIT field trials in Florida and Texas are from the genus *Aedes*, a genus of mosquito that are not capable of spreading human malaria. Those projects also involved only releases of male mosquitoes, which do not take blood meals and thus are not capable of spreading disease. It is therefore not possible that human malaria was spread by the *Wolbachia* based incompatible male *Aedes aegypti* mosquito programs in Florida and Texas.

Malaria is a mosquito-borne disease caused by *Plasmodium* species protozoans that can cause illness in animals. Malaria in humans is caused by five *Plasmodium* species: *Plasmodium falciparum*, *P.*

vivax, *P. malariae*, *P. ovale* and *P. knowlesi* (Sato 2021). The mosquito genus *Anopheles* is one of about forty genera of mosquitoes and is the only ones that can transmit malaria between humans (Harbach 2004, Godfray 2013). Field trials of the *Wolbachia* based incompatible insect technique programs were conducted in Florida (Mains et al 2019) and Texas (CDC 2022b). These projects released incompatible male *Aedes aegypti* mosquitoes to suppress wild *Aedes aegypti* populations. *Aedes aegypti* mosquitoes do not spread human malaria. In addition, the releases involved only male *Aedes aegypti* mosquitoes, which do not take blood meals and thus do not vector disease. Only female mosquitoes take a blood meal and are capable of spreading the disease.

Human malaria is not endemic in the United States. The Center for Disease Control (CDC) reports that an average of 2,000 malaria cases are reported in the U.S. each year. These cases are a result of travelers acquiring the disease from abroad and returning to the U.S. These imported cases can lead to disease transmission when exposed to wild mosquito populations known to transmit human malaria. Recently, the CDC has been collaborating with two U.S. state health departments with ongoing investigations of locally acquired mosquito-transmitted *Plasmodium vivax*, a human malaria. According to the CDC, there is no evidence to suggest that the cases in Florida and Texas are related (CDC 2023). Human malaria in these states is being spread by mosquitoes of the genus *Anopheles*. Florida has recorded over 10 species of *Anopheles* mosquitoes in the state, all capable of spreading human malaria (Riles 2020).

CONCERN 29: A commenter was concerned that information being provided by Dr. Lorrin Pang, a resident of Maui, is not being considered.

Response: All concerns and/or alternatives that have been proposed to DLNR and USFWS from residents relating to this environmental assessment are being seriously considered. Regarding comments by Dr. Lorrin Pang, USFWS staff has taken the additional step of meeting with Dr. Pang given his position within the community. DLNR and USFWS staff and leadership are fully cognizant of the information, literature and relevant information provided by Dr. Pang and have carefully considered the validity and legitimacy of the information provided in the formal decision-making process. Please note that Dr. Pang's participation in this process is that of a private citizen and does not reflect the position of the Hawai'i Department of Health. The Hawai'i Department of Health is a member of the Birds, Not Mosquitoes partnership, and supports the planning for use of Incompatible Insect Technique (IIT) for control of the southern house mosquito.

CONCERN 30: Commentors were concerned about the potential impacts to tourism from conducting a *Wolbachia*-based control program in Hawai'i.

Response: It is not anticipated that tourism would be impacted negatively from conducting a *Wolbachia*-based control program in Hawai'i. Incompatible male mosquitoes released in the project area will have no significant impacts on public health or the environment (see Concern 2 Response). While it is possible some individuals could avoid visiting Hawai'i due to negative impressions about mosquito management operations occurring within the state, it is not expected to be a widely adopted position. *Wolbachia*-based incompatible male mosquitoes utilized in an Incompatible Insect Technique (IIT) program for the control of mosquitoes are regarded as a safe, environmentally friendly, non-chemical, targeted approach (See Concern 2 Response). The application of a *Wolbachia*-based biopesticide is approved for use in 20 states in the U.S. and field programs have occurred in some states with similar climates and tourism appeal (California, Florida, Texas) as to Hawai'i (CDC 2017).

The project implementation area and its lower elevation buffer zones include the highest elevation areas of Kaua'i comprised of State Parks, Natural Area Reserves, Wilderness Preserves and some private lands. These areas tend to be more remote and away from most visitor experiences, especially those

from out-of-state. It is possible that the project could affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). However, there is already ongoing management occurring in these areas as well as the presence of commercial air tours. Additionally, no changes in public use or access to state-managed recreational areas are anticipated to be required for project operations. Beneficial effects to land-based recreationists could include reduced abundance of biting mosquitoes that are a nuisance for overnight users and hunters with dogs, as well as the potential for increased populations of native forest bird species to provide improved bird watching opportunities.

CONCERN 31: Commenters expressed concern that the State of Hawai'i has established a "secret" mosquito lab without public knowledge.

Response: In 2014, DLNR established an insectary facility in Kailua on O'ahu to house applied research projects and support the conservation and management of rare invertebrate species. The benefits of applied research projects are two-fold; in the process of gathering important ecological information on a rare, native species, DLNR propagates large numbers of individuals that can then be systematically released to enhance naturally occurring populations or seed new populations. The insectary is not customized to a particular taxonomic group, but instead provides an indoor laboratory environment and associated outdoor space where projects can be initiated on an array of rare species. Projects range from basic biological and ecological studies to the development of specific captive rearing, propagation and reintroduction techniques. Initial targets for conservation breeding included an endangered damselfly species, which is aquatic and predatory in the larval stage. Two mosquito species (*Aedes albopictus* and *Culex quinquefasciatus*) have been raised intermittently since 2014 as a dietary component for the damselflies.

In 2022, DLNR proposed to renovate one of the existing insectary spaces to support implementation of an Incompatible Insect Technique (IIT) mosquito control project in Hawai'i. USFWS funds (\$94,456) and State of Hawaii Capitol Improvement Project (CIP) funds (\$100,000) are allocated from the FY2022 budget for the renovation including: "Construction and equipment for installation of biocontainment enclosure with anteroom, temperature cabinets and shelving; equipment and appurtenances, and all project related costs." No state or federal funds have been spent on the renovation to date.

In the interim, DLNR staff have been working to relocate the insectary facility to a base yard in Pearl City, HI. The base yard is located on the leeward side of the island of Oahu, at an elevation of approximately 820 feet (250 meters). In advance of the move, DLNR staff conducted outreach presentations to the Aiea Neighborhood Board, Pearl City Neighborhood Board, and the Pearl City Lions Club. Presentations included specifics of plans to complete groundwork, relocate the facilities, and explained how the invertebrate labs will support DLNR objectives to stabilize and recover populations of rare and endangered species. Half of each presentation focused on DLNR's involvement in the Birds Not Mosquitoes partnership and clearly described the facility's proposed use for rearing of incompatible male mosquitoes with *Wolbachia*.

CONCERN 32: One commentor expressed concern that the use of glyphosate is causing mosquitoes to be more susceptible to malaria infection.

Response: This project does not use glyphosate. Glyphosate, also known as Roundup®, is an herbicide that can be used to treat habitat modifying invasive species in urban, suburban and natural areas. Glyphosate has also not historically been commonly used in the project area where endangered forest birds also occur. The herbicide is primarily used at lower elevations to treat grassy areas. The main herbicides used in forest bird habitat areas are Garlon/Triclopyr or Polaris/ Imazapyr. Monitoring of malaria in mosquitoes shows increased prevalence since the 1990s through 2020.

These data come from Kawaikoi Stream, Mohihi Stream, Camp 10 road, Koaie Stream; mostly areas where glyphosate is not generally applied.

CONCERN 33: One commentor expressed concern that predictive modelling is speculative and questioned whether such modeling should be used for guiding decisions.

Response: Ecology is the study of the relationships of organisms to their ecosystem and each other. Like all branches of the sciences, ecologists use data collected in the field to understand these relationships. The individual data point is not necessarily used in the Sciences to generalize about the relationships of organisms to their ecosystems, to each other, or to human interactions. Rather, it is the general trends associated with data sets that are assessed and to inform management of the organism, their ecology, and the ecosystems in which they are studied. Data that are used to inform these trends are analyzed to a degree to ensure that the efficacy of an approach or method to be employed in conservation actions is not speculative. The statistical, predictive modelling techniques used give an indication of confidence in the trend, and thus the ability to simulate them in real-world, hands-on management and for project utility. The trends and recommendations are evaluated by experts in the field, and compared to peer reviewed literature, to ensure scientific integrity, applicability, and quality.

CONCERN 34: Commenters suggest the proposed action cannot be allowed to move forward while a similar project proposed for East Maui is being litigated in court.

Response: The lawsuit relating to the implementation of an Incompatible Insect Technique program on East Maui is a separate matter and does not affect the proposed action described in this EA.

CONCERN 35: A commenter was concerned that the fluorescent marker Rhodamine B would be used on the incompatible male mosquitoes released on Kaua'i.

Response: There are no plans to use Rhodamine B to mark incompatible male mosquitoes released on Kaua'i for the purpose of this Incompatible Insect Technique project. Rhodamine B is an organic chloride salt that is commonly used to dye cloth, paper, paint and other products (<https://www.rsc.org/suppdata/ra/c4/c4ra14184a/c4ra14184a1.pdf>). It can also be used to mark insects and other animals for research and ecological studies (e.g., Papillon et al. 2002, Schellhorn et al. 2004).

CONCERN 36: A commenter was concerned that the use of antibiotics on mosquitoes in the laboratory would contribute to antibiotic resistance in humans or the environment in Hawai'i.

Response: The limited use of tetracycline in a laboratory environment poses no risk to increased antibiotic resistance in humans or the environment in Hawai'i. Tetracycline is an antibiotic that is commonly used in humans to treat bacterial infections (Nelson and Levy 2011). In the context of this project, Tetracycline will be used in the laboratory environment to remove naturally occurring *Wolbachia* bacteria from southern house mosquitoes collected from Hawai'i, prior to giving them the incompatible *Wolbachia* bacteria. Southern house mosquitoes in Hawai'i naturally carry the wPip *Wolbachia* strain. In order to be given the incompatible strain of *Wolbachia* (wAlb) necessary for an Incompatible Insect Technique program, mosquitoes originating from Hawai'i first need to be cleared of the wPip *Wolbachia*. Tetracycline will only be utilized during this specific step of the laboratory process. PCR testing will then be completed to confirm that the wPip strain is absent from the eggs of those individuals. No antibiotics will be used on subsequent generations of mosquitoes produced or maintained in the laboratory, nor will they be used directly on the mosquitoes proposed for release on Kaua'i.

CONCERN 37: A commentor requested a list of the 14 countries and 4 states in the United States in which the proposed action was noted as being used in the EA.

Response: The Incompatible Insect Technique has been used for decades to control mosquitoes that are a human health concern in over 15 countries including, but not limited to, New Caledonia, Fiji, Vanuatu, French Polynesia, Australia, Indonesia, Singapore, Malaysia, Vietnam, Sri Lanka, India, China, Brazil, Columbia, Mexico, and the United States (New York, Kentucky, Florida, Texas, Puerto Rico and California). This information is included in the final EA.

CONCERN 38: A commentor suggested looking into the immunity of other native birds and developing a vaccine that could be administered to at-risk forest birds.

Response: At present there is no vaccine available for avian malaria. DLNR and FWS will evaluate all available tools, including the use of a vaccine if one becomes available and would consider the most efficient methods for deployment. Researchers are investigating the causes of malaria resistance in 'amakihi. This project is in progress and results are not yet available. This suggested alternative has been included in Section 3.3 ("Alternatives Considered but Dismissed from Detailed Analysis") of the final draft of EA.

CONCERN 39: A commentor was concerned about field crews' ability to adequately monitor the response of mosquitoes and birds to this intervention if field crews are not allowed to move along new-to-them routes, such as pig trails.

Response: Monitoring of birds is beyond the scope of this EA. Based on mosquito dispersal and survivorship modeling completed by USFWS and USGS researchers, USFWS and DLNR are confident that accurate and efficient mosquito monitoring can be conducted across the proposed project area using existing public and management trails to evaluate the efficacy of the control program. Monitoring the response of forests bird to mosquito suppression via the Incompatible Insect Technique (IIT) mosquito control is outside the scope of the proposed action of this EA.

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Name	Entry Date	Comment	Responses
Jesse	6/23/2023 20:52	I think an extremely cautious approach should be taken here to consider if this is all being done to try and save a species whose time may already be too late or has run its course. Around 150 Species all around the world go extinct everyday and 99% of everything that has ever been around on earth has gone extinct. What's the successful track record in introducing new species to combat one thing but affecting many others. You folks already know! It's not been good. What poses more of a threat, rats, cats? Why aren't other avian species being affected similarly from mosquitos? Nene geese are thriving.	Concerns: 3, 22
Bruce Whale	6/26/2023 8:28	I think this is a very good idea. My concern is that this bacteria could spread to other insect species, the ones that are critical for pollination like bees. Bees are under severe strain worldwide and a cross contamination to them would be disastrous. The resort in Tahiti, The Brando, has eliminated all mosquitoes from the entire Tetiaroa Atoll that they inhabit. Maybe officials from Hawai'i should consult with their organization and find out what they did to achieve this.	Concerns: 14, 25
Jenny Marion	6/26/2023 13:13	Please allow science to prevail and allow the proposed IIT mosquito eradication methods to begin as soon as possible. We do not have the benefit if time in our side when it comes to saving nearly extinct species. These birds are in a precarious position already and any unforeseen natural disaster could expedite their disappearance if our islands take a direct hit and nesting and foraging sites are damaged.	Thank you for your comment
Joy and Rob Kaaz	6/26/2023 14:41	Aloha, My husband and I completely support the biological control of the growing threat of mosquitoes due to climate change that is threatening Hawai'i's native bird population. Control of mosquitos by this method is safer and more effective than spraying pesticides, has been well studied, tested and safely used in other parts of the world. In addition to causing the extinction of our native bird species, mosquitoes also pose a threat to humans by carrying and spreading such diseases as Zika virus, dengue fever, malaria and other mosquito borne diseases, many of which can be fatal to humans. Mahalo, Joy and Rob Kaaz Permanent, full time Maui residents.	Thank you for your comment
Mark Cunningham	6/26/2023 15:33	Aloha, Please allow science to prevail and allow the proposed IIT mosquito eradication methods to begin as soon as possible. We do not have the benefit if time in our side when it comes to saving nearly extinct species. These birds are in a precarious position already and any unforeseen natural disaster could expedite their disappearance if our islands take a direct hit and nesting and foraging sites are damaged. Please do not allow for non-scientific fear-mongering to sidetrack science and progress in the name of species preservation. Mark Cunningham, Pearl City, Hawaii 808mark@gmail.com	Thank you for your comment
Christopher Tipton	6/27/2023 7:53	I am in support of the this plan. We humans introduced these mosquitoes to the Hawaiian island, and we humans should do everything in our power tool remove them. Hawaii has already lost too many bird species to these mosquitoes, and we shouldn't lose any more.	Thank you for your comment
	6/27/2023 12:19	I am very much in favor of this proposal, as the endemic birds are vital to our ecosystem and culture here in Hawaii. As long as the release of these sterile male mosquitoes do no additional harm to our already decimated environment, I believe this a good idea to protect those birds that we have left for our sense of enjoyment, for purposes of culture, for pollination of our food, and to keep the web of life as intact as possible. Mahalo.	Thank you for your comment

Name	Entry Date	Comment	Responses
	6/27/2023 21:01	AloHa! Stop the MADDNESS! It is extremely dangerous project!!! Do not let the money buy your hearts and souls... Do not let Kauai be infected with this mosquito HORROR! STOP this project in the name of anything sacred in your heart! Don't let Kauai and its residents suffer PLEASE!	Concern: 26
M	6/28/2023 6:50	Why this rush on releasing untested mosquito experiments? Why Hawaii? Why are we again test subjects? Maui already started without the consent of the people that live there! I say stop! Did we ask for this mosquitoes to be brought to Hawaii? Or is someone getting paid to use Hawaii as a testing ground? Is our government really caring about us that live here? Is it really all about saving birds? Spending all that money? That money could be better used on low income housing!	Concern: 26, 27
Kyhl Austin	6/28/2023 13:02	I am writing to express my STRONG SUPPORT for this proposed mosquito suppression project. This is our best and perhaps only chance to save species like the 'akikiki from extinction.	Thank you for your comment
Warren Johnson	6/30/2023 15:16	As a Hawai'i resident, I am writing to express my strong support for the proposed suppression of invasive mosquito population project on Kaua'i. As indicated in the EA, this project would not result in the introduction of any new species to the island; would only release male mosquitoes; Wolbachia cannot be transferred between animal species,	Thank you for your comment
Kepano Carvalho	7/1/2023 17:00	Aloha hou e DLNR. I have previously offered comment and input on the approval for Wolbachia to be released on Maui to protect those Maui endemic avian species in peril. I am now doing the same for our Kaua'i manu. Without this, even more will be lost. It is probably too little too late for the 'Akikiki, which cannot be described with any other word than devastating. We Kānaka have a saying "I ola 'oe, i ola mākou nei," when you live, we all live. Without these manu, we collectively as a people lose part of our identity. We cannot afford to lose more, and approving these methods for mosquito prevention are again a step in the right direction, but a step that should have happened decades ago. Please, please approve these measures to help save our manu, it is the least we can do. Mahalo, -Kepano	Thank you for your comment
Kallie Barnes	7/1/2023 18:21	We must move forward with mosquito control, it's already too late for too many!	Thank you for your comment
Ari	7/1/2023 19:19	Let's protect native Hawaiian birds throughout forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. I agree with the project to suppress mosquitoes known to transmit diseases to native forest birds. Let's keep Hawaii native and beautiful	Thank you for your comment
Gracie Mei-Ling	7/2/2023 3:02	Fighting invasive born illness is a key part to the survival of these birds!	Thank you for your comment

Name	Entry Date	Comment	Responses
Kaleiheana Stormcrow	7/2/2023 5:46	Aloha mai kākou, I am a Kanaka Maoli wildlife biologist, ethno-ornithologist, and cultural practitioner, and I would like to testify in strong favor of IIT & the release of incompatible Wolbachia mosquitoes on Kaua'i (and across the islands). The imminent extinction of our forest birds is an emergency, and I encourage DLNR and USFWS to act quickly in hopes of saving 'Akikiki & 'Akeke'e, the former who could potentially go extinct this year. Mahalo for your time.	Thank you for your comment
	7/2/2023 6:41	Please support Hawaii's forest birds! In my short time (25) years living on Maui I saw the diversity of flora and fauna disappear one by one... please listen to conservation organizations and follow the science to help save Hawaii's special birds	Thank you for your comment
Corrina Carnes	7/2/2023 9:02	Aloha, I am writing in full support of IIT efforts on Kaua'i. Native Hawaiian honeycreepers are incredibly important to Native Hawaiian culture and the ecology of Hawai'i. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever. Wolbachia IIT is currently the only hope we have. Given the imminent risk of extinction for multiple species, we must move forward as swiftly as possible with the actions described in this EA. Mahalo for your work and for the opportunity to provide testimony. Corri Carnes Omao, Kauai	Thank you for your comment
Keith Evans	7/3/2023 10:19	Dear Hawaii DLNR-DOFAW Members, I SUPPORT the DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUAI. I think we can all agree that the situation facing Kauai's native forest birds is dire, and that we must do something, safe and effective, as soon as possible in order to save those birds that remain for future generations. The proposed Incompatible Insect Technique (IIT) has been successfully used globally for over 50 years. In each case, scientists have researched and analyzed the results and found that the method has no significant negative health or environmental impacts. An Environmental Assessment (EA) for use of the IIT method to control avian malaria on Maui was performed and approved by accredited experts and elected officials of The National Park Service and Hawaii DLNR-DOFAW. As is the case for every other known use of this technique, the draft Kaua'i EA for the IIT method has now similarly found that there will be no negative impacts to the health, environment, plants, animals, or people of Hawaii. This technique is the only hope left to save several species of the birds in the short time remaining before extinction. Given these facts, and the desperate plight of the birds, I SUPPORT the DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUAI. Please act quickly, the birds do not have much time. Mahalo nui for your consideration, Keith Evans Princeville	Thank you for your comment

Name	Entry Date	Comment	Responses
Heidi	7/3/2023 10:31	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Leah Miller	7/3/2023 11:12	I support the use of IIT to reduce the invasive mosquito population. Avian malaria and pox have been completely destroying the native Hawaiian honeycreeper population, with so few species and individuals remaining it is our duty to protect these species to the best of our ability.	Thank you for your comment
Erica Gallerani	7/3/2023 11:27	Aloha, I previously worked for the Kaua'i Forest Bird Recovery Project and I am now studying 'akikiki and 'akeke'e in graduate school at UCLA pursuing my PhD. I've spent 5 years working with these endangered species, specifically trying to identify suitable habitat for them on islands with a larger elevational range. However, I have always hoped that the Alaka'i could remain the home of these unique and imperiled birds. The IIT technique is our last hope for saving our native forest bird species and our native forests in general which are the headwaters of the most important watershed on the island. This technique has been proven to be safe, will only harm a non-native pest and is being developed responsibly with the residents of Kaua'i in mind. I have the full support of this plan and I hope it gets brought through to fruition. Thank you for your time and consideration.	Thank you for your comment
Amanda Navine	7/3/2023 11:44	Mosquito suppression has been proven to be an effective form of disease suppression in other systems and is essential for the conservation of numerous native forest bird species. Further, there is no evidence that IIT is in any way dangerous or that there is significant risk of producing off-target negative consequences. Mosquitoes are not native to Hawai'i and should be eradicated to the best of our ability.	Thank you for your comment
Daniela Casillas	7/3/2023 11:52	As a Kaua'i resident and conservation biologist by education and trade, I fully support the Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposal to use the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. The science is clear that if we do not take immediate action, our forest bird populations will dwindle and many will go extinct. The proposed technique is thoroughly researched and a safe tool to help us achieve positive conservation outcomes. Not only from an environmental perspective, but also from a cultural perspective, the people of Kaua'i and Hawai'i want to see this crisis met with combative action.	Thank you for your comment
Ashley Romero	7/3/2023 12:06	<p>Aloha,</p> <p>My name is Ashley Romero and I am submitting testimony in strong support of mosquito suppression on Kaua'i. Hawai'i's native Honeycreepers are foundational to the culture, forests, and ecosystems of Hawai'i. We have already lost a great deal of these forest bird species due to avian diseases transmitted by non-native mosquitoes. Every time we lose a bird species we lose an ecosystem service, a valuable part of our community, a beautiful native creature, a unique creation of an incredible number of years of evolution, and a piece of Hawaiian culture. Right this moment the 'akikiki is going extinct in the wild. Two native birds on Maui are predicted to also go extinct within the next few years if nothing is done immediately. These birds provide essential ecosystem services and without action or delayed action, these species have no chance of survival. The incompatible insect technique or mosquito birth control provides us with a last glimmer of hope and opportunity to save the last remaining Honeycreepers from extinction. This method has been used successfully worldwide for vector control for human diseases and gives us a powerful tool to address the main cause for the decline of our Honeycreepers. It is solely the fault of human beings for the declines and extinctions of our native birds. Introducing predators, plants, and disease to these islands has been a death sentence to our native species. If we continue to let native species go extinct, we risk the collapse of our entire ecosystem. We have the tools to make this situation better and as a professional who grew up in Hawai'i, and has worked in Hawai'i's native forests for over 6 years now, I have seen firsthand the type of dire situation we are in. Please do your part to protect Hawai'i's native bird species, its ecosystems, and its culture and support IIT and other mosquito control techniques.</p> <p>All the best, Ashley</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Michael Mack	7/3/2023 15:49	I support the use of the IIT technique to reduce mosquito populations on Kaua'i and other islands. I understand that similar methods have been used successfully for more than 10 year and that the state has worked with the federal government and with The Nature Conservancy to ensure that the method will be safe and effective here in Hawaii. I also think that harms associated with horizontal transfer are overstated, and if they eventually do occur we will find scientific solutions to overcome them. These birds are critically endangered and I believe that scientifically based methods such as these give them their best chance at survival.	Thank you for your comment
	7/3/2023 20:10	Absolutely no mosquito release anywhere on our islands.	Thank you for your comment
Shane Murphy	7/4/2023 2:44	Hello, I am writing my comment in support of the Kauai Mosquito suppression project outlined in the Environmental Assessment (EA). The timing of the Wolbachia bacterium into the mosquito population is critical as many of the species affected, including but not limited to I'iwi akeke'e and 'akikiki, are already in huge declines. As a passionate birder, it breaks my heart to see the word EXTINCTION. Not only are these birds important to the ecosystem in which they exist, but they also have a strong cultural important to the native peoples of Kauai. If nothing is done, avian malaria will continue to spread and wipe out Kauai's native bird population until they are all gone. The island of Kauai is already overgrown and overtaken by so many invasive species that we need to hold on to the natives we have. I would hate to think that future generations will be walking in Kauai's forest only to hear the calls of non-native species and look in books to see what birds used to exist on the island. Although I am not from Hawaii, I am very passionate about the protection of Hawaii's vulnerable bird population. I am fortunate enough to have been able to see a handful of the species affected first hand and would hate to never be able to see them again. I know many others feel the same way. This is a real solution that will save species and prevent extinction. We must act to prevent the loss of Kauai's native bird population and be the voices that will save them. Thank you for your time, Shane Murphy	Thank you for your comment
	7/4/2023 4:34	Another reason why I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health!	Concern: 1
Ambergrace	7/4/2023 18:20	IIT method sounds like it may be a feasible way to decrease the mosquito population without the use of chemical pesticides. One area of concern is the possible mosquito population replacement with wolbachia infected mosquitoes. This can occur when female wolbachia infected mosquitoes inadvertently get released into the population and breed. What steps will be done to mitigate and monitor this? How good are the facilities that breed the mosquitoes at sorting out male from female, as this is notoriously difficult? Are all the mosquitoes going to be irradiated to sterilize any females that may get through the sorting process? If the local mosquito population is replaced with wolbachia infected mosquitos, what hazards do that pose to bird/human population?	Thank you for your comment
Concerned Kauai Resident	7/4/2023 22:08	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Ru Carley	7/4/2023 22:16	Your campaign is FOR THE BIRDS !!!	Thank you for your comment
Sabrina jasmine	7/4/2023 23:58	Completely opposed to this. If this non sense goes thru the authorities need to take full accountability. But no, please do not go ahead with this.	Thank you for your comment

Name	Entry Date	Comment	Responses
Sabra Kauka	7/5/2023 8:35	I support the use of the Wolbachia-based Incompatible Insect Technique for the suppression of non-native southern house mosquito populations on Kaua'i.	Thank you for your comment
Mari Reeves	7/5/2023 8:45	I think it is critically important that we move forward with IIT based mosquito control on Kaua'i. We are losing the forest birds on the Alaka'i at unprecedented rates right now.	Thank you for your comment
Dallas Mitsuda-McMillan	7/5/2023 9:05	I think what they're trying to do is awesome and it's really our only way of mostly getting rid of avian malaria . I'm only 12 years old and I love native plants and birds so seeing that some of these birds may go extinct real soon is really hurtful to me. I personally would love to see the 'Akikiki and the 'Akeke'e before they go extinct so I'm hoping that this will happen to save them. Good job to DLNR and USFWS make it happen.	Thank you for your comment
	7/5/2023 9:08	Kaua'i's native forest birds are experiencing massive decline due to mosquito-borne diseases, which can and should be suppressed by use of IIT. This is a no-brainer. The released male mosquitoes will pose no threat to humans or other Hawaiian flora and fauna. This technique is the last hope.	Thank you for your comment
Phil Muller	7/5/2023 10:13	I support this!	Thank you for your comment
Marcia Stone	7/5/2023 17:21	This technique for the suppression of mosquitoes is the long-awaited, very first step in saving our native forest birds. The people of Hawai'i will be very happy when they realize mosquitoes are fewer and birds are more.	Thank you for your comment
Laura Berthold	7/5/2023 18:06	I, Laura Berthold am commenting on the Mosquito Suppression Environmental Assessment - July 2023. I am a conservation biologist on Maui and have been working with these forest birds for the last 15 years. Although I am on Maui, we are facing the same issues here. I have also worked with these birds on Kaua'i and have seen the changes over the years there in terms of mosquito presence and the lack of birds. Anecdotally, I remember being at camp without mosquitoes- now they are there. I remember when akikiki and akeke'e were not listed on the endangered species act- now they are facing extinction. I even went over to Kaua'i earlier this year as a last chance to see these birds in the wild.	Thank you for your comment
	7/6/2023 7:58	Hi! I'm writing in support of mosquito suppression via Wolbachia. I am hoping something will be done to save the remaining honeycreepers!	Thank you for your comment
Cara Thow	7/6/2023 8:41	<p>Aloha. I am writing to voice my support of the mosquito control efforts described in the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i."</p> <p>This is a vital step towards ensuring the conservation of Hawai'i's unique native wildlife, including two endemic bird species found only on Kauai and at risk of extinction in the next year to five years due to avian malaria: the 'akikiki and akeke'e. Incompatible Insect Technique is a method of mosquito control which has been used for decades all across the world and uses naturally occurring bacteria already found in Hawai'i, and does not require the application of chemical pesticides or genetic modification. It is a tested, well researched, and safe technique to control mosquitoes and prevent further extinctions due to avian malaria.</p> <p>As an ornithologist, I was given the incredible opportunity last year to observe the remaining two individual 'akikiki in Halepa'akai for days on end as they foraged and moved about the forest. It breaks my heart that these birds witnessed their species decline to the point of vanishing almost entirely, leaving behind just a father and son with no hope of continuing their lineage in the forest from which they hatched. It is essential we control Southern house mosquitoes in these forests, so that 'akikiki and other highly susceptible honeycreepers can thrive in their forests of origin.</p> <p>The loss of native birds is not just biological, but cultural as well. I dream of a mosquito free Hawai'i where native Hawaiians can enjoy the beautiful native birds their ancestors had close relationships with. Without mosquito control, we will lose these jewels of</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Cara Thow, <i>Continued</i>) the forest forever. Hawai'i has already lost all but 17 of the over 59 honeycreepers that once inhabited its verdant forests. Please support this action so we can prevent the addition of Kauai's unique forest birds to the list of species lost forever due to invasive species and disease.</p> <p>Mahalo.</p>	
Hawai'i Audubon Society	7/6/2023 9:39	<p>Aloha, The Hawai'i Audubon Society strongly supports urgent efforts by USFWS and DLNR to save the native Hawaiian honeycreepers from imminent extinction. We endorse that the use of the naturally-occurring Wolbachia bacteria as mosquito birth control is a safe way to efficiently reduce/suppress mosquito populations in Hawai'i.</p> <p>Mahalo!</p>	Thank you for your comment
Maile Adams on behalf of Rep. Luke A. Evslyn (via letter on State Capitol letterhead)	7/6/2023 11:52	<p>I'm writing in strong support of the draft Environmental Assessment for mosquito suppression on Kaua'i. I have seen firsthand the decimating decline in native forest bird populations on the island. I had the privilege of hiking the Mohihi trail in November and saw for different 'akikiki when there were about 24 known individuals in the wild. A few weeks ago, I visited Mohihi with three other Representatives and the Kaua'i Forest Bird Recovery Project. With the population down to six known individuals, we understandably saw zero 'akikiki. And while hiking out, we found a dying 'amakihiki on the trail. As we waited for the Kaua'i Forest Bird Recovery Project folks to try and save its life, we found a dead 'apapane just feet from it. The folks from the Kaua'i Forest Bird Recovery Project all shared stories of dead birds hanging from bushes as they are literally falling dead from the sky due to avian malaria. And so our high-elevation forests are almost entirely silent compared to the relative abundance I remember as a child.</p> <p>While our forest bird population on Kaua'i is rapidly dwindling, silent forests aren't our inevitable future. Mosquito control has the potential to bring our forests back to abundance. But time is critical – as every month or delay will make bringing some of these species back from the brink much harder. I believe that the Environmental Assessment was thorough and address all potential impacts, and I'm hopeful that the mosquito suppressant methods can begin as soon as possible.</p>	Thank you for your comment
Katie	7/6/2023 14:39	I am in strong support of releasing incompatible mosquitoes on Kaua'i. We need to save these incredibly special birds!	Thank you for your comment
Danya Weber	7/6/2023 15:01	I am strongly in support of this mosquito suppression technique on Kaua'i for the protection of Hawaiian honeycreepers. I am a conservationist who posts educational material online social media, and I can say that I have witnessed strong public support for mosquito suppression among my online following of over 30,000 people. This technique of mosquito suppression seems safe and we should be moving expeditiously to implement it in order to prevent further catastrophic extinctions on Kaua'i.	Thank you for your comment
	7/6/2023 16:46	I oppose the releasing of biological weapons in Hawaii. Whoever reads this I implore you to think of the danger they are considering releasing with these mosquitos and the harm could definitely befall us all. I pray you have a heart and choose wisely to not allow this to happen.	Thank you for your comment
Jessica Middleton	7/6/2023 19:11	Absolutely necessary to save native birds. Don't let the science deniers stop this very important effort.	Thank you for your comment
Mark E Sutherland	7/7/2023 4:21	The introduction of Wolbachia treated mosquitoes is critical to the survival of Hawaiian birds from the spread of avian malaria. Even if there was an environmental risk it would be better than losing the native birds of Hawaii. Since there is no risk delaying its use only kills more native birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Erin Bell	7/7/2023 9:31	As an avian biologist who has seen the devastating effects of mosquitoes on the environment in Hawai'i, I am in strong support of the Proposed Action alternative described in the Wolbachia-based Suppression of Mosquitoes on Kauai Environmental Assessment (EA). Given that this alternative does not appear to have any significant negative impacts, an Environmental Impact Statement is not needed for this project. Due to the grave consequences that the No Action alternative would have for many of our threatened and endangered native species, swift implementation of the Proposed Action is needed. This is a well described project with valid data and methods and is especially crucial on Kauai where many of the native forest birds are in dire condition. Implementation and monitoring will be important as well as a thorough communication plan with the public- ensuring that they understand the positive impacts this technique could provide, that no harm will come to them, native wildlife, or to water or cultural resources, and that cultural practitioners and hunters will still be allowed access to the affected areas. Again, I am in support of the Proposed Action and the EA as it is written. Mahalo for the opportunity to comment on this important EA.	Thank you for your comment
Wendy Kuntz	7/7/2023 14:52	This project is well designed, well-vetted and should be implemented as soon as possible.	Thank you for your comment
Sarthak Majithia	7/7/2023 17:06	I OPPOSE this	Thank you for your comment
Rosalind Young	7/7/2023 23:50	I am in favor of using the incompatible male Wolbachia in the Kōke'e and Alaka'i Wilderness areas, to mitigate the terrible toll that this species of mosquito transmitting avian diseases to our native Hawaiian birds. There are so few species left, and they are struggling for survival despite conservation efforts. Please support the implementation of programs to control and if possible, eliminate this species of mosquito on Kaua'i.	Thank you for your comment
Tiffany Watson	7/8/2023 8:18	I was born and raised on Big Island and the damage brought on to native bird populations through mosquitos has not gone unnoticed. Hopefully we can see some of these remedies being implemented there one day as well.	Thank you for your comment
Bobbie Becker	7/9/2023 8:43	To whom it may concern, I totally support the proposed method of Mosquito Suppression. To me the fact that mosquitos will only be breeding with other mosquitos makes the impacts of the Incompatible Insect Technique seem very safe.	Thank you for your comment
	7/9/2023 18:22	My name is Juliana and I'm a Kaua'i resident and filmmaker who has recently had the opportunity to partner with Kauai Forest Birds Recovery Project on a short film examining the cultural impact of species extinction. Before this project, I honestly hadn't even realized birds were considered pollinators. But through my involvement with KFBRP, and the many interviews I've conducted with experts in the fields of Hawaiian conservation and culture, I've learned so much about the necessity of Hawaii's native birds in keeping both the ecosystem and culture intact.	Thank you for your comment
Walt Anderson	7/10/2023 6:48	I have visited Kauai and was shocked at the deadly impacts of introduced mosquito populations on native songbirds. The situation will only get worse as temperatures rise. I fully support controlling the mosquitoes in this manner (not using insecticides, which are non-discriminating in their lethal and sublethal impacts). Hawaii's unique avifauna deserves every effort to protect and restore populations of the birds. Thank you.	Thank you for your comment
Kasper Andersen	7/10/2023 8:10	I think it would be wonderful to do this so that future generations might also enjoy the native birds that live nowhere else than here on Kauai.	Thank you for your comment
Melissa Barker	7/10/2023 9:06	I fully support the Kauai Mosquito Suppression program.	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/10/2023 18:51	<p>Aloha. This project is being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes while the need for further study of the risks is actively being litigated.</p> <p>NBC News has identified the fact that a similar project of mosquito release occurred two to three years ago in Texas and Florida. And both states have now reported their first malaria cases in twenty years, according to WTRF News. Could it really be a coincidence? https://www.wtrf.com/health-2/are-genetically-modified-mosquitoes-from-a-bill-gates-backed-program-causing-a-u-s-malaria-outbreak/</p> <p>There is no evidence that the release of mosquitos in Hawaii will be harmless, either. The Bill and Melinda Gates Foundation funded the company Oxitec "to rid the world of malaria". It would seem their science was faulty. https://www.gatesfoundation.org/about/committed-grants/2020/09/inv019029</p> <p>While the mosquitos being released in Hawaii are not genetically modified, they are infected with a Wolbachia virus. And the release is moving forward without proper studies.</p> <p>Wolbachia bacteria can be transmitted horizontally to parasites in our system that can then play a major role in giving people elephantitis, heartworm, and River Blindness.</p> <p>Approving these actions puts Hawaii people at risk for serious diseases. Those responsible will be held accountable.</p> <p>Please, cease and desist</p>	Concerns: 1, 2, 9, 14, 28, 34
	7/10/2023 20:09	We need to save our 'ōiwi species. There is no Hawai'i without our native species and kānaka 'ōiwi.	Thank you for your comment
Frederick Reddoch	7/10/2023 20:20	Please consider the past when considering the future. Have we not learned our lessons from "good ideas gone wrong"? It is so unfortunate what is happening to these birds, but this does not seem to be the answer. Please reread your "draft" Environmental Assessment. We have no idea the impact to this island in the future. If it goes wrong, pushing it through because "we have to do something now", will be a ridiculous statement. Please do not do this. Thank you for your time in reading this.	Thank you for your comment
Steve and Linda O'Neill	7/10/2023 23:13	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Carol Ross	7/11/2023 15:50	I live on Maui where the Mosquito Suppression has just been made known to us here in Hana. We here on Maui are now trying to make sense of this insanity as they have already released some "Wolbachia" mosquitos without our knowledge. Here there has been no EIS but we are demanding it via the court system. We the people remain hopeful.	Concern: 1
Dylan Blanchard	7/11/2023 17:00	As a conservation biologist working on Kauai for the last couple years, in addition to working in endangered bird conservation across the world, I fully support the measures to introduce IIT to the ecosystems of Kauai. These measures have become the only option available to preserve Hawaii's native birds from human-caused extinction. If IIT introduction measures do not succeed, other species will be lost forever. The opposing voices to these measures are not founded in fact and seek only to spread misinformation and false paranoia. We have not only the ability but the responsibility to proceed with IIT and save these beautiful, vital stewards of Hawaii.	Thank you for your comment
	7/11/2023 17:00	Without our birds we will lose an important species integral to watershed protection. Birds are valuable pollinators. We should be using CRISPR not this expensive method.	Concerns: 6

Name	Entry Date	Comment	Responses
Dave Hanna	7/11/2023 17:04	I believe that we are at a point with the downfall in native honeycreepers on the islands of Kauai and Maui specifically that we need to act now! The Wolbachia mosquito introduction is a proven result to suppression of mosquitoes. The honeycreepers of the Hawaiian islands are very special to the forest ecosystem, and to the native Hawaiian culture. We've lost many honeycreeper species in the past, and with the ability to use these mosquitos we would hope will lead to positive outcomes to help these birds. The Akikiki is already on extinctions doorstep, and many more honeycreepers from the islands are right behind.	Thank you for your comment
Ruby Pap	7/11/2023 17:56	We need an intervention fast to save our forest birds from extinction! This Wolbachia project is well thought out and I trust all the scientists working on it. Please approve the EA.	Thank you for your comment
Bruce Anderson	7/12/2023 2:51	Hawaii is experiencing an epidemic of avian malaria today, and it is having a devastating impact on our native forest birds. At least two bird species on Kauai, the 'Akeke'e and 'Akikiki and two on Maui, the Maui Kiwiku and Akohekohe, are expected to be extinct in as little as one to two years unless more is done to control the epidemic. All proven means must be used if we expect to be successful in saving these and other native birds from extinction.	Thank you for your comment
Jeff Koenig	7/12/2023 10:53	This sounds like a great idea. It's important to consider all avenues to prevent species from becoming extinct.	Thank you for your comment
Kekoa Plauche	7/12/2023 22:59	The proposed mosquito suppression does not introduce anything that is not already here, all mosquitos are male which don't bite. The manu are near extinction and this is the best possible chance with lowest possible chance of negative impact. This has to happen as soon as humanly possible. We lose the birds, we start to lose our native forest. Lose the native forest, lose the water.	Thank you for your comment
	7/13/2023 2:52	I am against releasing genetically modified mosquitos on Kauai or any of the Hawaiian islands.	Concern: 4
JD	7/13/2023 18:23	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Gwyn Johnson	7/14/2023 3:00	I highly believe that the mosquitoes of Kaua'i are major problems to many species of native Hawai'i birds. These birds, being heavily specialized and found no where else on Earth are true gems of the world. Yet they are declining, due to these invasive malaria-carrying insects. Let us not forget the many species we mourn across America, the Carolina parakeet, the passenger pigeon and the Kaua'i o'o, who's voice recordings inspire thousands to take action. If we do not take action immediately, we will lose these beautiful creatures. The forests of Hawai'i will have lost their voices, subjecting the archipelago to the eerie loss of birdsong. We need to take action. We need to eliminate the mosquitoes and bring back environmental balance to the islands. We have lost too many already, we cannot lose anymore. For the sake of the indigenous and tourists alike, who admire the honeycreepers unique songs and behaviors, and for the sake of the birds themselves, being subject to horrid and unnatural disease. Take action, for they do not have voices, so we must be their voice.	Thank you for your comment
Katerina Shalygin	7/14/2023 3:49	Mosquitos are terrible. Birds are good. 100% support your effort.	Thank you for your comment

Name	Entry Date	Comment	Responses
Benjamin M Torke	7/14/2023 4:54	I strongly support immediate implementation of the DLNR/USFWS proposal to use the Incompatible Insect Technique (IIT) to reduce the mosquito populations in 59,204 acres of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. I visited some more accessible parts of these areas in 1990 and saw abundant and beautiful native forest birds of several species. It is a great tragedy that the areas that I visited are now mostly devoid of native forest birds due to the climate change induced spread of invasive mosquitos carrying avian malaria and that several species are rapidly approaching extinction. This plan gives the best hope for reversing this terrible trend, preventing additional extinctions, and restoring the amazing and beautiful natural heritage of Kauai. Potential negative impacts have been carefully studied and found to be non-existent or minimal; they are greatly outweighed by the likely positive impacts on ecosystem health and the economic benefits of bird watching focussed tourism. Please implement the Kauai mosquito suppression plan now!	Thank you for your comment
Catherine Bianchi	7/14/2023 13:14	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Ellison Montgomery	7/14/2023 22:24	It is critical to release mosquito control to save our last endangered honeycreepers. I urge you to move forward with the releasing of mosquito control ASAP to save our birds from extinction. Extinction is forever. Mahalo nui loa.	Thank you for your comment
Janine Hunt	7/15/2023 16:21	<p>I strongly urge the passage of the proposed project to help support the longevity of the Akikiki. This project will not only help the survival of the Honeycreepers but also benefit our public health. As landowners in KAUA'I we would also welcome the opportunity to allow the agencies access to the land for use with this project.</p> <p>Thank you for your concern and actions.</p> <p>Aloha, Janine & Steve Hunt, Kilauea</p>	Thank you for your comment
Kimberly Estrella	7/15/2023 16:23	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Kimberly Estrella, Continued) There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
	<p>7/16/2023 4:35</p>	<p>I am a concerned resident of Kauai and care deeply about my neighbors and my stewardship of this special treasure called Kauai. Aloha Aina!</p> <p>There has been 50 years of scientific based evidence to justify this program. As long as there are attorneys, seemingly logical arguments can be made for even scientifically uninformed causes. Science is not something that is 100% and nothing will be accomplished waiting for it to be. These well intentioned people have been misled. They have the right to make their opinions heard, but not at the expense of damaging our island. Because of the extremely dire situation, any further delay is the same as doing nothing.</p> <p>Our bird species have been on Kauai far longer than any of us. Human activity has given them a death sentence. Delays like this are nothing more than a few selfish people trying to impose their uninformed wishes.</p>	<p>Thank you for your comment</p>
<p>Drs Cynthia Arenander</p>	<p>7/16/2023 11:08</p>	<p>Please please do not destroy our greater economic system on this sacred island. No one can scientifically evaluate the consequences of this. It will inevitably cause huge problems.</p>	<p>Thank you for your comment</p>
	<p>7/16/2023 11:15</p>	<p>Releasing genetically modified mosquitos is not worth the risk. Do not play God with your land, animals, and people. What happens if the mosquitos reproduce more than expected? What happens if it is discovered they cause problems? Here's a suggestion: learn how to balance a budget like any reasonable adult before doing crazy risky experiments like this which could destroy your state (and the lives of your constituents who you are sworn to serve.) usdebtclock.org</p>	<p>concerns: 4, 11, 12</p>
<p>Tanya Wendling</p>	<p>7/16/2023 12:01</p>	<p>It's not clear what the objections to this obviously very thoroughly researched plan could be, given that the only alternative seems to be no action. I think we can't afford to not try this as soon as possible given the assured terrible consequences of doing nothing. Of course, we'd all like to stand behind the maxim "don't mess with Mother Nature," but we already have so many times over we need to try to mitigate the damage using other natural interventions.</p>	<p>Thank you for your comment</p>
	<p>7/16/2023 13:42</p>	<p>I am writing to voice my strong support for the proposed mosquito suppression plan. This plan is the only way to save several native birds from certain extinction and has no apparent downsides. Having seen 'akeke'e and 'akikiki in the wild myself, I dearly hope that they are not doomed to extinction because of any misguided opposition to this plan.</p>	<p>Thank you for your comment</p>
<p>Roy L Morris</p>	<p>7/16/2023 15:27</p>	<p>Aloha. I am submitting this testimony in SUPPORT of the Draft EA: Kaua'i Mosquito Suppression. It is well documented the challenges these birds face with the rapid spread of mosquitoes into their once pristine habitats. The time is now several species have shown decline rates at 75-98% annually. These birds are not only unique to the islands they are a part of the cultural history. The work that would be undertaken by this proposal would give these species a fighting chance into the future and allow for their songs and stories to continue for future generations to enjoy. Hawai'i is the extinction capital of the world. The islands must have robust conservation management actions to protect what species are remaining to ease this trend.</p> <p>Having worked on Kaua'i with these species directly it is heartbreaking to see the declines of these charismatic birds that I and others cherish. Often just the sound of these birds calling or singing within the forest can clear a wary mind, and unfortunately much of the forest has gone silent in recent years. The value of these and other interactions with the birds is simply priceless. There is simply no more time left, we must pull together and act now to save these species from extinction. Mahalo nui, Roy L Morris</p>	<p>Thank you for your comment</p>

Name	Entry Date	Comment	Responses
	7/16/2023 16:16	I don't understand how do we know that these mosquitoes are implanted how do we know that where they come from is it just someone's say so or is somebody see somebody create them in the lab with that intention to harm the animal kingdom and the human Kingdom. Sometimes human beings get too involved in nature and just mess up the whole process. I don't want her animals to be killed because someone thinks they made a new pesticide or a new concoction that was going to change the world we are just like a little tick on her back. One of these days she's going to shake us all off when are we going to wake up and be in love with nature and stop fighting inside and outside	Thank you for your comment
J.C.	7/16/2023 17:51	As tempting as it may be for some scientists and some environmentalists...and as lucrative as it may be for others. This is not proven science, the risks are far too high, outweighing the potential "benefits". Please pause and allow/do a larger campaign for public awareness. People do not know about this. Let's see if the ones that are more educated on the topic actually want it.	Thank you for your comment
Kai	7/16/2023 18:16	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Mandy	7/16/2023 22:17	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project seems like a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Mandy, Continued) of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p> <p>There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.</p>	
Cristan Miles	7/16/2023 22:31	Do no do this. The agenda behind this appears to be evil or at best misguided. We demand a stop to this.	Thank you for your comment
Crystal	7/17/2023 2:31	<p>I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Crystal, Continued) There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
	7/17/2023 4:40	We all love and want to protect the honeycreepers. However historically releasing a non native species to combat another non native species has been disastrous for generations to come. I beg for an appropriate solution with true concern for impact to the people and bird populations that does not involve releasing another non native species in Hawaii: please stop introducing new species . Please do not introduce modified misquitos to our islands. I feel deep in my opu that this is a wrong route to take. Please .	Concerns: 3, 7, 10
Joy Piilani Trask	7/17/2023 8:00	My husband and I are opposed to the release of the Wolbachia bacteria mosquitos. As a native Hawaiian I am disgusted to see Hawaii once again being used and abused due to ignorance and money. We and our community are opposed to this release. The fact that this agency is even considering this experiment on Hawaii shows your arrogance and stupidity. Run these experiments on someone elses home not ours. If there was even the smallest chance that Department of Land and "Natural" resources could hurt our people through this process, the process should not be considered. The real question is why would you consider this experiment? You cannot be this naive. The potential consequences on our people (the people of Hawaii), are not worth this experiment. Anyone in this department who goes through with this experiment, will be held accountable. The people of Hawaii have a right to know (which individuals) are bringing lab infected insects into Hawaii.	Concerns: 2, 11, 16, 26
Adam Knox	7/17/2023 9:13	I strongly support the use of IIT mosquito suppression to protect the endemic forest birds of Kauai.	Thank you for your comment
	7/17/2023 9:50	I support IIT! Our manu po'e need this to survive for many wa.	Thank you for your comment
M	7/17/2023 10:47	I think we would have learned that bringing in other species of any kind is not wise! What are the studies on this?? All just experiments, really don't think we should take the chance! The mongoose went terribly wrong. Thank goodness they weren't introduced to Kauai. We try so hard to keep non native species out!! Why would we introduce a non native mosquito?? Man made mosquitoes at that! Until further studies are done I do NOT think it is wise to Kauai be an experiment! NO I DO NOT THINK WE SHOULD BRING EXPERIMENTAL MOSQUITOES TO KAUAI!	Concerns: 3, 9, 10, 11
	7/17/2023 12:16	I support this proven method for mosquito control in Hawaii.	Thank you for your comment
	7/17/2023 17:29	Honeycreepers are a unique group of forest birds found only in Hawai'i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years.	Thank you for your comment

Name	Entry Date	Comment	Responses
Dr. Angela Longo, big island of Hawaii	7/17/2023 17:35	<p>As a PhD research biochemist from UCB and an OMD for 50 years, founder and professor of TCM College of Hawaii for 25 years, I am strongly opposed to releasing the wolbachia-infected mosquitoes in Kauai and any where on our lands of Hawaii and the earth.</p> <p>Joining Dr. Lorrin Pang, I have studied its failure in Brazil and Indonesia and our own states of Kentucky and similarly in Florida and Texas. 6 cases of human malaria just announced in Florida, after 20 years of being malaria free.</p> <p>This experiment in Hawaii has never been done before and is unconstitutional and an international crime against the Nuremberg Trial to experiment on people without their consent. The diseases attributed to this bacteria along with the horizontal vectors it will move to are deadly like encephalitis, elephantitis, river blindness, West Nile virus, avian malaria, and Lymphoma. Why are we bringing this down on our children, elders and people. Dr. Lorrin Pang warns that it may literally speed up the extinction of these birds and of our people of Hawaii. He has Alternatives that are not deadly to human beings.</p> <p>I have been working in Thailand for 8 years. In this Clinic they had to spray every year to prevent the mosquito population on the premises of the International Resort I worked in. Right now we don't have these problems, but I guarantee that we will have severe problems and repercussions releasing these Wolbachia bacterial mosquitoes into the ecosystem by the billions for 20 years no less.</p> <p>When there are such faulty narratives and excuses I have been taught to follow the money. It has been funded by The Bill and Melinda Gates Foundation all over the world and in our country. Their mission is eugenics, to diminish our population to a faulty Narrative of human caused climate catastrophe. Climate changes are due to the precession of the Earth's axis in a different direction. I've traced another Alphabet fund to George Soros for mosquito reproduction, to be transferred to our own precious Islands. These Frankenstein mosquitoes need to stop being made and released and experimented on the people of Hawaii. We need to stop tampering with God's precious creation.</p>	Concerns: 2, 7, 11, 12, 14, 19, 26, 27, 28
Lori Kessler I	7/17/2023 19:41	Suppress mosquitos!	Thank you for your comment
Ryan Perroy	7/17/2023 20:14	<p>Aloha,</p> <p>I am writing in strong support of the Kauai Mosquito Suppression project. Mosquito suppression and eventual eradication can save our native birds from extinction and improve the quality of life for everyone in Hawaii- residents and visitors alike. Similar releases in other regions have already been done and this is a safe and effective treatment. Please, please support this program.</p>	Thank you for your comment
Roychelle Aki-Kaululaau	7/17/2023 21:16	<p>I, Roychelle Aki-Kaululaau, support Wolbachia IIT in Kauauai. I am from Waianae, Oahu.</p> <p>Me ke aloha</p>	Thank you for your comment
Tazman Shim	7/17/2023 21:19	<p>Aloha my name is Tazman Kamanakai Masami Shim and I support Walbochi IIT on Kaua'i. I am in the Hawai'i conservation community and urge you too push forward in the release of Walbachia. This is our time to take action to save our natives!</p> <p>Mahalo, Tazman Kamanakai Masami Shim</p>	Thank you for your comment
Dr. Jeri Rose	7/18/2023 3:55	There is simply not enough known about how this introduction of these specimens will effect the environment or even if they will actually function as planned.	Concern: 10
Kerri Fay	7/18/2023 6:51	There was once a time when you could easily observe native forest birds at Kōke'e State Park. Now, it's hard to find an 'apapane let alone an i'iwi or 'anianiau. They are disappearing before our eyes. Please consider a FONSI for the Kaua'i Mosquito Suppression Environmental Assessment. The forest birds have NO more time to wait before disease takes them all.	Thank you for your comment

Name	Entry Date	Comment	Responses
Kimberly De Souza	7/18/2023 8:11	I am writing in support of the Kaua'i Mosquito Suppression plan to save the Kaua'i forest birds from extinctions. This is one of our absolute last chances to save some of these birds. We must not delay any longer!	Thank you for your comment
Mark Frazer	7/18/2023 8:13	I am writing in support of the plan for Kaua'i Mosquito Suppression. We must not let misinformation being spread delay this. There isn't much time left for the Kaua'i Forest Birds.	Thank you for your comment
Paul Galewitz	7/18/2023 8:36	I understand wanting to protect native bird life. But this "solution" is so over the top misguided that it defies all logic. It also is typical of the meddling that humans have done into the workings of nature that have backfired spectacularly.	Thank you for your comment
Elyse	7/18/2023 8:40	I support Wolbachia ITT on Kaua'i to Save Hawaiian Forest Birds. This implementation is crucial to save Kaua'i's forest birds.	Thank you for your comment
Susan Burr	7/18/2023 8:51	I am in support of the project to use the incompatible insect technique to manage mosquitoes on Kauai. This critical action is necessary to protect forest birds in Hawaii. Humans have messed up our planet so much that this is the least we can do.	Thank you for your comment
Keelan Barcina	7/18/2023 9:36	Aloha. I support Wolbachia IIT on Kaua'i to save Hawaiian forest birds. Thank you for using the best available scientific information and active community engagement to accurately demonstrate the need to relieve the plight of Kaua'i's native forest birds. Mahalo, Keelan Barcina	Thank you for your comment
Emma Mariposa Gosliner	7/18/2023 10:04	Good morning, I'd like to submit my support for this project, wolbachia IIT is imperative for the future of Hawaiian forest birds on Kauai. I'm happy to see this project move forward after years of planning and hard work. Emma Gosliner, Oahu	Thank you for your comment
Alex Wang	7/18/2023 10:18	Aloha kakou, We have been watching the decline of our native manu, the Hawaiian Honeycreepers for a long time. 'Akikiki and 'Akeke'e of Kaua'i are next on the chopping block due to avian malaria and anthropogenic global warming. We finally have a tool that has a chance to make a substantial difference in conserving these unique and irreplaceable species. It is our kuleana to try. I fully support the environmental assessment of no significant impact and the application of wolbachia mosquitoes as a form of invasive mosquito control. Please hurry and stay the course, do not get harried by these naysayers and fearmongers, the manu do not have much longer without this conservation tool. Mahalo, Alex	Thank you for your comment
Nancy Hoffman	7/18/2023 10:48	I fully support the proposed alternative to use the IIT in Hawaii as outlined in the EA for Kauai Mosquito Suppression. This proposed action (Alternative 2) has a strong probability of decreasing the spread of avian disease among Hawaiian honeycreepers. Thus, aiding the recovery of our remaining endemic, endangered, Kauai forest birds. The proposed action of using the IIT, based on prior National and International introductions, will not harm humans, economics, or habitat on the Island of Kauai.	Thank you for your comment
Juliette LaFleur	7/18/2023 10:51	I am totally against this! The insanity of releasing millions of Mosquitos on any of the HI islands is a poorly thought out plan that will have devastating long term effects.	Concern: 9

Name	Entry Date	Comment	Responses
	7/18/2023 10:55	Please STOP this INSANE EXPERIMENT,,, Haven't we seen enough harm with the EXPERIMENTAL vaccine and all the injuries about it!	Concern: 11
Abram Woodward	7/18/2023 11:50	I am opposed to the release of the mosquitos. There is not enough data to back up the claims of success. This could easily turn into a situation like releasing the mongoose. That plan sounded great too until it wasn't and that situation has still not been corrected. There is also the chance that this release negatively impacts humans through an increase in a disease carrying vector and then those who supported this action would have legal impacts. This study does not address human impacts, the potential impact to tourism if the news spreads info that mosquitoes have been released in mass quantity, and no discussion of how the winds may blow the released pests to other areas outside the project area. What if the mating of these "incompatible" mosquitoes creates a "super mosquito" that causes more damage?	Concerns: 2, 3, 8, 9, 12, 13, 30
Troy Levinson	7/18/2023 12:40	I support Wolbachia IIT to save Hawaiian forest birds because without the use of this tool, Hawaiian forest birds will continue to go extinct. Hawaii has had the highest rate of forest bird extinction of any location in the world. This tragedy has been directly caused by the introduction of mosquitoes to Hawaii in the 1800s. Without steps being taken to alleviate this extinction crisis, Hawaii runs the risk of having NO native forest birds in our forests within the next century. Steps need to be taken NOW, instead of waiting longer and longer until more species disappear. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species).	Thank you for your comment
Michelle Akamine	7/18/2023 12:57	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Michelle Melendez	7/18/2023 12:58	You are putting these islands AND the birds you want to save at a huge risk of death and disease with this experiment. Dr. Pang was asked for his professional opinion from the Hawaiian Health Department, which was DO NOT DO THIS EXPERIMENT! He is being ignored.	Concerns: 2, 5, 11, 19, 29
Deborah Cockrell	7/18/2023 13:25	Releasing GMO mosquitoes is an experiment, and for the first time in 20 years we now have malaria in states where they were previously released! It is called being vaccinated without informed consent to be bitten by these franken mozis. This is a crime against humanity and nature	Concerns: 4, 27, 28
Gwen Coats	7/18/2023 14:45	I would like to express my support for the proposed action (repeatedly releasing incompatible male mosquitoes to reduce the reproductive potential of wild mosquitoes) to protect the populations of endangered Hawaiian forest birds (particularly the Akikiki since there are less than 10 left in the wild). It is critical to do everything possible to protect the native Hawaiian birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Linda Elliott, Wildlife Biol. Hāwī, HI	7/18/2023 16:33	I STRONGLY SUPPORT, the proposed use of the Wolbachia Incompatible Insect Technique to prevent the extinction of the endangered Hawaiian honeycreepers living on the islands of Kaua'i.	Thank you for your comment
Kevin Armstrong	7/18/2023 17:13	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO and strains of the Wolbachia bacteria is already present in Hawaii. Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for the use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. This technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever	Thank you for your comment
Jocelyn Dunn	7/18/2023 18:34	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Eric Kawatachi	7/18/2023 18:35	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the	Thank you for your comment

Name	Entry Date	Comment	Responses
		(Eric Kawatachi, <i>Continued</i>) voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	
Michelle dunn	7/18/2023 18:37	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Mark dunn	7/18/2023 18:37	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Wesley Piena	7/18/2023 20:17	Aloha to whom it may concern, My name is Wesley Piena, from Pukea Oahu, and I am in support of Wolbachia IIT on Kaua'i. Mahalo, Wesley Piena	Thank you for your comment
Cari Lynn Squibb	7/19/2023 3:30	I fully support the use of the IIT to reduce mosquito populations on all of the islands, but especially Kaua'i. Please act swiftly to save our remaining forest bird species!	Thank you for your comment
David Hoppe-Cruz	7/19/2023 7:54	It is sad that we have to send testimony to get action to save endangered birds and suppress mosquitos. The fact that people with no scientific background can derail projects meant to preserve Hawaiian biodiversity is infuriating. It is the same with the feral cat (toxoplasmosis) lobby that prevents landscape scale cat control. Please allow this control measure to pass, these birds may be extinct within a year, birds that have been here for millions of years, coevolved with plants that are also in danger of disappearing. What legacy are we leaving our children and what example are we showing? previous generations have kicked the can and we have the dubious title of "the endangered species capital of the world". Control the mosquitos, cats, and other invasive species by any means necessary as long as there is evidence that the benefits outweigh the risks.	Thank you for your comment

Name	Entry Date	Comment	Responses
Kimberly Welch	7/19/2023 8:47	<p>Good morning~ I am writing to express my support for the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds. IIT is the only feasible option for safely and successfully suppressing mosquito populations in Hawaii. Furthermore, IIT is not GMO. Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. If we do not use this proven technology in a timely manner, we will be witnessing imminent extinction of several species of native Hawaiian birds and the community will surely question why we chose to defer decision making to a small group of uneducated individuals whose claims are completely unfounded. Hawaii's leading experts in avian biology and conservation, from state, federal, and non-profit organizations support the use of Wolbachia IIT to save Hawaiian forest birds. As an outreach and volunteer program specialist with one of the largest conservation organizations in the state, I can testify that literally hundreds of kama'aina volunteers that join us in restoring Hawaii's native forests have repeatedly expressed support for the use of Wolbachia IIT to safely and successfully suppress mosquito populations. Please listen to our plea and move quickly to approve the use of Wolbachia Incompatible Insect Technique to save Hawaiian forest birds, before it is too late!</p> <p>Aloha, Kim Welch Outreach & Volunteer Program Specialist, Army Natural Resources Program, O'ahu, OVPRI/RCUH/U.S. Army Garrison Hawai'i email: kmwelch@hawaii.edu voice: (808) 656-7741</p>	Thank you for your comment
Charles Miller	7/19/2023 9:06	Please save our Forest Birds by implementing use of this Wolbachia Technology. I have hiked the Alakai Swamp Trail and I love seeing & hearing the Forest Birds. They are part of our heritage. The proposal doesn't harm the environment. It has succeeded in other areas. So, I'm hoping that you will approve this proposal.	Thank you for your comment
	7/19/2023 9:25	I am for the suppression of mosquitos on the island of Kauai. I believe that the suppression of the mosquitos will aid in keeping the native birds around. The native birds are so important culturally and ecologically to this island. There aren't many left so we need to protect what is still there.	Thank you for your comment
Kauilaonalani K Tengan	7/19/2023 10:21	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. As a Native Hawaiian, I feel it is especially imperative that we make this stand to protect our sacred species. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Kat Culina	7/19/2023 12:00	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1

Name	Entry Date	Comment	Responses
nawahine kahoopii	7/19/2023 12:30	<p>This letter is in OPPOSITION to the proposed mosquito release.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes, and its degree of efficacy in remote forest landscapes is unknown.” This project experiments on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, or private landowners? The DLNR has an appalling history when it comes to accountability the latest case in point is the devastation that went unaccounted for at Pohakuloa. The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p> <p>There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” We demand an Environmental Impact Statement.</p> <p>Stop the insanity, Kaho’opi’i-Nawahine Ohana</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Annette O’Toole	7/19/2023 12:32	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Rhaya Celestyne	7/19/2023 12:33	<p>I am strongly OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Rhaya Celestyne, Continued) There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>Love, Light, Laughter & Abundance 🌺 Alisen Celestyne, Kapa'a, Hawai'i</p>	
Bart Smith	7/19/2023 12:39	<p>Dear Leaders. I totally and unequivocally oppose the release of mosquitos unless there is a way to insure that there will be no repercussions ecologically. There are almost always repercussions, so don't know how you can release them in good faith unless somebody somewhere is getting paid.</p> <p>Aloha, Dr Robert Smith</p>	Thank you for your comment
THOMAS MILCAREK	7/19/2023 12:46	<p>Aloha. How many times are folks doing this kind of thing going to get it Badly Wrong before they learn? Nature, the Aina, has a balance. We humans, in our arrogance, create imbalance, then to fix it we take dangerous steps, this time a human experiment, and create MORE IMBALANCE. This one could be the WORST ever. STOP THIS NOW! Have you people lost your minds completely? Let Nature create balance as she always done. No one, NO ONE knows for sure what will happen with this release, NO ONE! If our mistakes have created an imbalance for some beautiful birds, we should pray for forgiveness and let Nature recreate balance. NOT MAKE IT WORSE WITH SOME DAM FOOL EXPERIMENT THAT WOULD NEVER HAPPEN IN NATURE. Get a grip. Let the Aina take care of the Aina!</p> <p>No one, NO ONE knows for sure what will happen with releasing BILLIONS of these Arrogant human creations into our environment, on all Islands, on into the future. NO ONE. Again, STOP THIS NOW !!!</p> <p>Use some common sense, Please !</p> <p>Mahalo, Thomas Milcarek 68-078 Au St. # 103, Waialua, Hi. 96791, 831 227 1919</p>	Concerns: 3, 11, 10
terra lucky	7/19/2023 12:53	<p>I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health</p>	Concern: 1
	7/19/2023 13:25	<p>I am very concerned that releasing billions of mosquitos will create a huge environmental disaster which we will never recover from. This has been tried in Florida and Texas and now both States are having mosquito born outbreaks of malaria.</p>	Concern: 28
Alexandria Sinker	7/19/2023 13:44	<p>This movement is something that is very important to me and I believe Kaua'i Mosquito Suppression is necessary for many reasons.</p>	Thank you for your comment
Eric Weinert	7/19/2023 14:08	<p>Please do NOT release any mosquitos in the Hawaiian Islands.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Terri Yoshinaga	7/19/2023 14:10	Why do we need to do these tests here? Ua Mau Keia O Kaaina Ika Pono! Let the life of the land be perpetuated in righteousness. I the areas where the mosquitos have been released, they have had Malaria cases. The mosquitos have been released on Maui and someone from Kailua has come down with encephalitis. What if it was caused by the release of the test mosquitos? I don't like anything I see Bill Gates name attached to, because he is pure evil.	Concerns: 2, 11, 26, 28
Terri Yoshinaga	7/19/2023 14:26	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
	7/19/2023 14:40	Do not under any circumstances allow this highly risky Kauai Mosquito Suppression program to continue. There has been no legitimate environmental impact study done; and therefore, the program should be stopped immediately.	Concern: 1,
Wes	7/19/2023 14:51	I used to be an intern for Kaua'i Forest Bird Recovery Project in 2015 and was amazed at the forests and birds that made it home. There were over 20 pairs of 'Akikiki at the time and we were doing the first egg collections. I was amazed at how carefree the 'Akikiki were and how close they came to me when they were foraging. They came even closer than some urban birds. These birds have cultural importance in Hawaiian history and to lose these birds would be to lose a living part of the culture. The metaphors that referred to the o'o as being the most dominant of the ohia flowers was portrayed by ali'i wearing yellow feathers in their garments. These metaphors lose their meaning as the species disappear. Please pass this bill so we do not lose anymore of our species and the culture.	Thank you for your comment
	7/19/2023 15:27	I'm OPPOSED to this "Wolbachcia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment and public health.	Concern: 1
Alison H	7/19/2023 15:56	<p>Dear Sirs,</p> <p>I implore you to say NO to this mosquito release. Please say NO to our beautiful islands becoming an experiment in modifying bugs to save birds. The fact that it has not been tested (we are the test) should raise the alarm! our history in Hawaii with modifying the environment have all but failed. Texas and Florida allowed similar experiments - albeit less dangerous potentially. These two states now have Malaria cases. First in over 20 years, shortly after release the modified mosquitoes. Please consider those who come after us...our children, our grandchildren, our friends. There is no amount of money we would consider enough to destroy our delicate ecosystem here on the islands.</p> <p>We the people are saying NO> please hear our plea.</p> <p>thank you, alison H. maui, hawaii</p>	Concerns: 3, 11, 26, 28
Chris	7/19/2023 16:02	In response to the above, I am opposed to this this Modified mosquito release program. We respectfully request, and demand that the state of Hawaii and it's partnership with agency birds, not mosquitoes do a complete detailed full scope environmental impact statement (eis) documenting the potential impacts to our birds ,environment and public health and safety. As a long time resident of Hawaii I am concerned for the health of my family and myself neighbors in the community in general as this experiment may go awry and cause irreversible environmental and health damage. Thank you for considering my comments and please reconsider any release of genetically modified mosquitoes.	Concerns, 1, 2, 4, 5, 11, 19

Name	Entry Date	Comment	Responses
Lexi Jordan	7/19/2023 17:24	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. Please stop trying to "fix" problems with solutions that have unknown consequences. Listen to the people, stop this from happening.	Concern: 1
Benjamin jordan	7/19/2023 17:24	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
kimo	7/19/2023 19:38	Please stop using us as guinea pigs and letting go those bioweapon mosquitos.People are already injured and died from the experimental bioweapon injection.I know if things go wrong like we all get sick from the bites you guys will deny ,lie and laugh behind our backs like the bio injection.People need to be in jail or death penalty what they did to people in hawaii by forcing the death prick.If the people who agree to let them stupid GMO mosquitos go,they should let thousands in there house to let it go.Let hundreds of thousands go in the people that agree and governors house too since he dont care.Start with that because if thats ok than it should be ok.Let atleast 1000 per day in there house then jack it up to 5000 a day.Should be fine if nothing goes wrong,I'm alright with that.	Concerns: 4, 11
Alfredo Lee	7/19/2023 19:57	Do NOT do this. Vote NO. No experimental needed here. Sent from my iPad	Concern: 11
Lois Lee	7/19/2023 20:00	Vote NO on releasing experimental mosquitoes anywhere in the state. Thank you, Lois Lee	Concern: 11
	7/19/2023 20:02	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kauai" Environmental Assessment. I demand that the State of Hawaii and its Muti-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'aina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. Who will take responsibility if something goes wrong - the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There is currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kauai". I demand an Environmental Impact Statement</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
	7/19/2023 21:11	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. For complete sample testimony click here	Concern: 1
Mary Sandell	7/19/2023 21:56	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1
	7/19/2023 22:41	<p>I am opposed to the release of these mosquitos for the reason that no actual study has been done to determine the full impact on all aspects of the island environment combined with the fact that no actual determination has been made that this method will even be effective. Further, that it may even create a greater danger to the environment and may actually have the reverse effect.</p> <p>In the past, I have taken notice that DLNR's actions run contrary to the desire of the people. Such was the case back in 1996 when I moved to the Big Island on the Hamakua coast where they allowed burning and spraying of fusilade and round up to eradicate sugar cane stumps to support the new mono crop of Eucalyptus coming in. How irresponsible is that? The health impacts were enormous and quite predictable to say the least.</p> <p>I do not consider the DLNR to have anything to do with responsible land management. That it is only in place to allow for negotiations with capitalist ventures which produce some kind of economic interest to the island. Responsibility is the least of its concerns as was demonstrated by the actions stated above.</p> <p>It takes an enormous effort from the community to counter these types of actions. Until it can demonstrate absolute responsible land management that is in line with community interests, I don't feel DLNR should even exist.</p>	Concerns: 1, 5, 6, 9, 26
	7/19/2023 23:09	<p>We come forward and strongly request that the mosquito release is immediately canceled. There's not enough information or studies to know exactly what this mosquito invasion will do to birds, humans, other animals on the islands of Hawaii.</p> <p>As a bird enthusiast and volunteer for many types of birds throughout the world, We highly recommend focusing on the birds themselves and Not introducing an invasive species to wipe out more birds. The female count of Mosquitoes being released Have not been studied either. They can be far more fertile and far more devastating than the current mosquitoes.</p> <p>How could our sensitive ecosystem handle anymore Man-made and man invented circus tricks? The current plan is not only foolish and very dangerous...but it's also an unreachable and unrealistic plan. Let's focus on the birds themselves. All of this funding should be used to capture what birds we can and multiply them in captivity then to be released in the wild, like many other places in the world that has been successful.</p> <p>Please do not allow the release of monster mosquitoes! You are making our islands into toxic paradise.</p>	Concerns: 2, 6, 9, 10, 12, 19, 20
A Human Being Who Loves Nature!	7/20/2023 1:05	I am OPPOSED to the release of these bioengineered "mosquitos". Leave Hawai'i alone. Leave the birds alone. and Leave our Earth alone!	Thank you for your comment
Vanessa baker	7/20/2023 4:06	No genetically modified mosquitos should be released ever...	Concern: 4

Name	Entry Date	Comment	Responses
Sherman Wing	7/20/2023 6:13	<p>Aloha,</p> <p>I am the 4th generation of my family living here, me on the Big Island. My great grandfather was one, of the first two people, to settle in Kalaheo, Kauai. There are now six generations of my family living in Hawaii state now. We all love our native forest birds and we need you to swiftly help protect the few remaining ones. These birds have a place in Hawaiian history and culture.</p> <p>Many endemic forest birds are listed and endangered or critically endangered. The US Endangered Species Act mandates government to save them..... so please do so. Time is running out very quickly. Extinction is forever.</p> <p>Thank you, Sherman Wing, 15-2829 Malolo St., Pahoia, Hawai'i 96778</p>	Thank you for your comment
Alyssa	7/20/2023 6:31	I AM OPPOSED to this horrible idea for a multitude of reasons. DO NOT MESS WITH HAWAII. This is DISRESPECTFUL to the people and islands and history. STOP MUTATING!!!!!! You are going to kill us and the land with your stupidity!!! STOP	Thank you for your comment
Eric VanderWerf	7/20/2023 7:42	I am writing to express my strong support for use of the Wolbachia incompatibility technique to control mosquitoes on Kauai. I have worked directly with Hawaiian forest birds for more than 30 years and I have seen first-hand the decline in many of our endemic forest bird species. This is an extinction crisis happening right now, right in front of us. Diseases carried by mosquitoes are the most serious threat to Hawaiian forest birds, and several species of Hawaiian honeycreepers will go extinct in the next few years unless mosquitoes can be controlled at a meaningful scale. The Wolbachia technique currently offers the best method of achieving mosquito control. The Wolbachia technique is safe and should be implemented as quickly as possible. I urge the State of Hawaii to not be influenced by mis-information spread by a few people who do not understand understand the technique or the urgency of the situation. Similar mosquito releases are needed on other islands.	Thank you for your comment
Jonah T.F.	7/20/2023 7:43	<p>I think it is extremely important that the Incompatible Insect Technique (IIT) be used on Kaua'i. 'Akikiki are now down to 5 known wild individuals and with the 'Akeke'e going through a free fall decline I believe this may be the only way to save them. Other honeycreeper species endemic to Kaua'i ('Anianiau and Kaua'i 'Amakihi) are also experiencing declines in population because of avian malaria and since they have more time than 'Akikiki and 'Akeke'e do, IIT could help their populations stabilize or increase before they become endangered.</p> <p>I was glad to read that once approved, IIT will be implemented as soon as possible. While 'Akikiki breed well in captivity, there is yet to be a successful breeding of 'Akeke'e in captivity, so reducing mosquito populations quickly might be the only way for 'Akeke'e to survive. We have lost so much of the biodiversity of Hawai'i due to introduced (Jonah T.F., Continued) mosquitoes, and if we don't take action we risk losing the endemic Hawaiian Honeycreepers forever. As a 13 year old, it breaks my heart that so many species still alive a few decades ago are now extinct, so I will never get to experience their beauty. We cannot let this happen to the remaining forest birds.</p> <p>IIT does not contain genetically modified organisms (GMOs), and is completely natural. It will not harm humans or the environment.</p> <p>Every creature has the right to survive and thrive. Extinction is forever, and we cannot lose 'Akikiki and 'Akeke'e. IIT must be implemented as fast as possible to ensure the survival of our precious forest birds.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Dawn Singleton	7/20/2023 7:46	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>Thank you Dawn Singleton DNM</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Frank Schenk	7/20/2023 7:47	<p>I am OPPOSED to the "Wolbachia-based Suppression of Mosquitoes on Kauai" Environmental Assessment.</p> <p>I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is an extremely dangerous EXPERIMENT on the land, birds, wildlife, and people of the Hawaiian Islands. The lab-infected biopesticide mosquitoes come with many risks, including but not limited to: 1) horizontal transmission of the introduced bacteria strain, 2) increased pathogen infection in mosquitoes, 3) irreversible evolutionary events, 4) population replacement, 5) accidental release of lab-reared females, 6) creation of lab-strain females in the wild, 7) horizontal gene transfer, 8) Biopesticide wind drift, 9) and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document all of these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is UNKNOWN." This project is an experiment on Hawaii's people, wildlife, and our 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Frank Schenk, Continued) There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." My family and I demand an Environmental Impact Statement and we will hold you and others that support this dangerous act accountable for your acoutions.</p>	
Allison Cabrera	7/20/2023 8:15	I am writing in support of the draft EA for mosquito suppression on Kauai. In just a few years, the chorus of the forest is almost non-existent. We need to do what we can to save the birds that remain. Thank you.	Thank you for your comment
	7/20/2023 8:38	I am very much in favor of the injected mosquito release. It works and will help keep people safe	Thank you for your comment
John and Mary Reilly	7/20/2023 9:01	<p>STOP any intentions to introduce mosquitos or any biological agent onto the environment. This is insanity!</p> <p>Thank you, John and Mary Reilly, Hana, HI</p>	Thank you for your comment
	7/20/2023 10:18	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
mardelle	7/20/2023 11:25	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(mardelle, Continued) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
Jeri Di Pietro	7/20/2023 11:42	<p>Aloha Kaua'i Mosquito Suppression,</p> <p>I am concerned about the open air release of the Wolbachia mosquitoes as I think that we do not have enough data to address the unexpected consequences. There is no way to recall a life form. We have seen far to many introductions of species that have negative effect on our native species. I feel that for decades, literally tons of restricted use pesticides are used with no concern for our rare, endangered bird species and their critical habitat. I believe that if Wolbachia mosquitoes are released, it will open the door for the release of gene edited mosquitos. This type of tinkering with our ecosystem is unwise and dangerous. It is truly experimental and in my opinion we should pursue other means of mosquito control such as baits or localized methods. A release of a species without the ability to control it is too risky. While we all care for our treasured birds and are bothered by mosquitoes in general, I think these releases are unsafe. Interrupting the circle of life may have a negative effect on species that feed on mosquitoes. I think that we must be very cautious before releasing any unknown into the environment. We do not yet have proof that this method with the goal of controlling Avian Bird flu is safe in the larger sense. Proceeding without regard to the pre-cautionary principle is unsafe and irresponsible.</p> <p>Thank you for allowing me to testify, Jeri Di Pietro, PO Box 338, Koloa, HI 96756, (808) 651-1332</p>	Concerns: 3, 4, 7, 9, 10, 19,
	7/20/2023 12:01	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
ELLEN LECLAIRE	7/20/2023 12:11	This project must be stopped . It is hazardous to all living creatures great and small. We must protect our beautiful islands from those who wish to destroy the balance. of nature. Please do not allow this to happen.	Thank you for your comment
Jessamin Schenk	7/20/2023 12:13	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Molokai Wahine	7/20/2023 15:35	<p>Whomever it is that would even introduce such a project into our Hawaii environment obviously has NO regard for the quality of human, animal and bird life here. I trust that enough people in our state will take a stand on this issue, to ensure a future of sound consideration based on long term research and studies, and the real effects on human and animal life, LONG BEFORE submitting to such a radical, and potentially destructive form of "prevention" in the name of "protection" against any disease..or whatever the rational may appear to be.</p> <p>To all those empowered to serve the people, on the committee that is considering passing legislation supposedly designed to " protect" our health, I urge you to take a stand for our natural immunity, and for the precious lives of WE the People of HAWAII, and the animals and birds that are an innate part of our cultural heritage. Above all please remember our State Motto, which should be a constant reminder of the Heart of our Constitution, and relationship to all life forms..which includes all of US, the Aina, and all</p>	Concerns: 2, 9, 10, 19

Name	Entry Date	Comment	Responses
		<p>(Molokai Wahine, Continued) natural life: " THE LIFE OF THE LAND IS PERPETUATED IN RIGHTEOUSNESS aka Right Use..ness!! The passing of a law that releases such an alien form of "God knows what!" into our environment is a perfect example of WRONG use..ness! Mahalo Nui Loa and Malama Pono, Sincerely, Molokai Wahine</p>	
<p>C.S. Jenkins</p>	<p>7/20/2023 16:14</p>	<p>Kaua'i Environmental Assessment</p> <p>First I want to have you look at what happened in Florida after mosquitoes were released. Now after many years they have malaria. I do not think that is a coincidence. I realize it may be but why take a chance.</p> <p>So I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Aouthern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	<p>Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34</p>
<p>Erin Marquez</p>	<p>7/20/2023 16:29</p>	<p>Manu have no time left. Our local conservation community has worked long and hard on the research regarding this project. That being said, I strongly support birds not mosquitos. This is our best attempt at salvaging what's left of the native Hawaiian bird population. If we do nothing they will be wiped out eventually. It's not a matter of if but when. How long can the Manu hold? How long can people turn a blind eye on the utter destruction of the native bird population? Please move forward with this project.</p>	<p>Thank you for your comment</p>

Name	Entry Date	Comment	Responses
Andrea Cesarek	7/20/2023 17:12	<p>Please do not do this!!!</p> <p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Bonnie Bee	7/20/2023 17:46	<p>PO Box 30848, Anahola, Kaua'i Hawai'i 96703-0848</p> <p>20 July 2023. Dear Officials of Department of Land and Natural Resources (DLNR - DOFAW) and US Fish and Wildlife. Aloha!</p> <p>We oppose "Wolbachia-based IIT - the draft Environmental Assessment (dEA). Please do not allow this proposed dEA to be Accepted. Please DO NOT allow IIT Wolbachia bacteria to be released on Kaua'i. This would be the first wide-spread conservation use of IIT Wolbachia bacteria.</p> <p>Deny the dEA of IIT Wolbachia bacteria. We do not want regulatory approval !!! We demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a federal Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This proposed project: A dangerous experiment on 'Āina, birds, wildlife, and people of Kaua'i & Hawai'i Nei.</p> <p>The lab-infected biopesticide mosquitoes come with countless risks, including horizontal transmission of the introduced wolbachia IIT bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>The U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown. This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Responsibility - Who / Agency will be held accountable if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed federal EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>A hearing is scheduled tomorrow, in First Circuit Court: 21 July 2023 on O`ahu Circuit Court (seeking a ruling to require an EIS for these mosquito releases on Maui & Kaua,'i this proposed project cannot be allowed to move forward. DEFINELY there is NEED for further study</p> <p>We do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "draft Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique (ITT) for the suppression of nonnative southern house mosquito populations on Kaua'i."</p> <p>MAHALO PLENTY ! Sincerely With ALOHA, Bonnie P Bator and `Ohana (Keana`aina, Keli`ikoa, Kai`aokamalie and Kai)</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Joanna Weber	7/20/2023 18:00	<p>Kaua'i Environmental Assessment</p> <p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Trak Trennoche	7/20/2023 19:15	<p>Messing with the Intelligence of Nature and its Natural Laws, has always turned out bad for the environment. The Side Effects always surface making greater problems. Please do not release tampered mosquitos onto Kauai, you are playing a dangerous battle with Nature. You will personally suffer.</p>	Concern: 3
Claire & Kevin Ortega	7/20/2023 19:27	<p>The release of genetically-modified mosquitos poses significance health risk. Look at what has already happened with Texas and Florida with new malaria cases because of the mosquitos they released. Please prevent the spread of any more diseases or the introduction of any more risks to the population with untested mosquitos: Genetically-modified mosquitoes are suspected of causing US malaria cases in Florida and Texas Barry O'Keefe: https://www.2ndsmartestguyintheworld.com/p/horror-show-update-are-genetically</p> <p>Dr. Lorrin Pang and Hawaii Unites' Tina Lia talk about biopesticide mosquitoes: https://rumble.com/v2nd9dc-ep.-74-maui-mosquito-agenda-continues-with-dr.-lorrin-pang-tina-lia-barry-o.html</p> <p>Thank you, Claire & Kevin Ortega, Kapaa, HI</p>	Concerns: 2, 4, 28

Name	Entry Date	Comment	Responses
Emily Brines	7/20/2023 21:45	Please push forward with the incompatible insect technique as a way to control for mosquitos. It seems there is much to gain from doing so, and relatively little risk involved. This is a last chance for these birds.	Thank you for your comment
	7/20/2023 22:03	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Lindy Lou Pounds	7/20/2023 22:07	I met an elepaio once when hiking above my farm on the Big Island. Such an awesome experience, and one I hope my children and grandchildren will get to have too. As the summers get warmer the mosquitos go higher up the mountain. I totally support this Mosquito Control Project, and it must happen soon.	Thank you for your comment
	7/21/2023 6:57	I fully support the mosquito bio control, Wolbachia. Our Manu are suffering from human mistakes, let us remedy it!	Thank you for your comment
Scott Crawford	7/21/2023 7:02	<p>Aloha,</p> <p>I am writing as an individual to express my strong support for the draft EA for IIT mosquito suppression program on Kaua'i. I am a resident of Hana, Maui, so I don't know how much weight should be given to those off-island. But we all care about the native manu and want to see them protected on all islands.</p> <p>Because this technique is also being implemented in East Maui, I have looked into this method, listened to those who are opposed to it and tried to understand their reasons for concern, and also sought answers from the proponents of the project. At this time I feel that this is a very safe method of mosquito control that has very little risk, compared to the known risk of extinction to our native</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Scott Crawford, Continued) honeycreepers and the impact that would have on the overall native rainforest ecosystem that would result, should the implementation of this project be unnecessarily delayed.</p> <p>I believe that the EA has thoroughly considered and adequately answered the questions that have been raised, and I support a finding of no significant impact through the use of this IIT for mosquito suppression.</p> <p>Mahalo</p>	
Jeremy Brown	7/21/2023 7:56	<p>I personally am very concerned about the negative implications of the mosquito release. I am also aware of the dwindling bird populations. This is a dilemma for sure.</p> <p>I am opposed to the Kauai release at this point, and would hope that decision makers would be patient and wait until Maui's release can be determined as a success or failure, and negative impacts can be evaluated carefully and with full transparency to the public.</p> <p>Thank you for hearing my testimony.</p>	Concern: 21
Jeremy Brown	7/21/2023 8:01	<p>Aloha, as a citizen of Kauai, I am currently opposed to the mosquitoes release. I would hope that restraint will be showed, and the Maui results will be studied carefully well before mosquitos are released on kauai.</p> <p>I do understand the urgency and efforts to stave off death of more native birds from AM, but I'm very concerned about the possible negative effects.</p> <p>Thank you, Jeremy</p>	Concern: 21
Jessica	7/21/2023 8:12	<p>It is very unfortunate that conspiracy theorists such as Hawaii Unites are delaying this essential effort to save our native birds. The 'akikiki is about to go extinct in the wild. The mosquito releases should have happened yesterday!!! Please please this has to happens to save our birds.</p>	Thank you for your comment
Suzanne pluskat	7/21/2023 9:15	<p>We need to do something now to save our forest birds. We know that doing nothing will cause extinction. They are going to be functionally extinct regardless. Let's do something to help the birds have a future. Release the sterile mosquitos.</p>	Thank you for your comment
Steffany Pacheco	7/21/2023 9:36	<p>I am writing in support of Kaua'i Mosquito Suppression. This project will help to protect the manu on Kaua'i whose populations are declining at an alarming rate. Please support our endangered endemic and indigenous wildlife.</p>	Thank you for your comment
Sam Wolff	7/21/2023 9:54	<p>Please allow the the release of male mosquitoes with incompatible Wolbachia in the Kōke'e and Alaka'i Wilderness areas! We must act now to save our endangered manu before they are lost forever. If you don't act, they will certainly go extinct. Only you have the power to stop that. Let this be your legacy.</p> <p>Do not let the quackery from conspiracy theorists be the demise of these beautiful species found nowhere else in the world.</p> <p>Thank you</p>	Thank you for your comment
Isis	7/21/2023 10:14	<p>Please take decisive action to curb the mosquito population and protect native birds!</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Stephanie	7/21/2023 10:23	<p>Our natural environment was created by divine design. The unique ecosystem of the Hawaiian islands can not sustain its natural beauty if the intricacies of her natural habitat continue being stripped away. Today's society is so driven by instant gratification that we are no longer taking the time to truly assess the long term damages of our decisions.</p> <p>The loss of these birds due to the mosquito population is much more than the loss of a bird. It's the loss of native plants, which shape the environment. If the environment changes, then the climate changes. If the climate changes the entire landscape of the location will change.</p> <p>We can't continue to strip our islands of their endemic life. That life is the literally the root of the beauty that is Hawai'i. It's time to take these issues seriously. Stop the short-term greed, and start paying attention to the importance of investing in sustainability.</p>	Thank you for your comment
Christiane Keyhani	7/21/2023 10:33	I support the draft Environmental Assessment for Kaua'i Mosquito Suppression! Our forest birds are heading towards extinction and this must stop now. Immediate intervention must happen now to decrease the mosquito population.	Thank you for your comment
Lake Best	7/21/2023 10:34	The release of these male mosquitoes are absolutely needed for the survival of endangered species!	Thank you for your comment
Willow Longoria	7/21/2023 10:46	<p>The Kaua'i mosquito suppression plan is not just beneficial but ESSENTIAL. The extinction of many species cannot be undone but it can be prevented for the species that remain through systemic extermination of mosquitos.</p> <p>The native birds are crucial to the survival of many already threatened native plants by pollinating and seed dispersal; many having evolved specialized beaks specifically for this purpose. The success of this project would therefore not only help to protect native birds but also native flora in turn.</p> <p>The long term benefits don't just help the birds and plants, but residents and visitors as well. No one likes mosquitos, pure and simple. They can spread other diseases to humans and animals besides just the native bird species. As humans were responsible for the introduction of mosquitos to the islands it is only right that we take responsibility for the consequences of this and take the steps to right the wrong; whether we as individuals were directly responsible or not. Save and preserve our native species.</p>	Thank you for your comment
Colleen Cole	7/21/2023 10:51	I strongly support IIT efforts on Kaua'i to protect our declining native bird populations from deadly diseases. This well researched, tried, science based approach will give managers and all stakeholders a fighting chance to keep these birds on the landscape and part of our natural world.	Thank you for your comment
Sarah Graves	7/21/2023 11:14	I am writing from Hawaii island in support of these efforts to control mosquito populations by releasing sterile mosquitos. The decimation and extinction of so many Hawaiian forest birds from Avian malaria is a great man-made tragedy, and it is so urgent that we act now to try and save the remaining ones. As avian malaria has become prevalent at higher and higher elevations, the ongoing loss of what little safe habitat remains for these birds has to urgently be reversed before we lose even more species. Please move forward as fast as possible with these releases.	Thank you for your comment
Katia Chikasuye	7/21/2023 11:22	I support the proposed project to use the Incompatible Insect Technique (IIT) to reduce mosquito populations in the Kōke'e and Alaka'i areas of Kaua'i. Widespread use of IIT is critical in reducing the spread of avian malaria to critically endangered honeycreeper species like the 'Akikiki and the 'Akeke'e. This pilot project is a huge step forward for conservation in Hawaii and will provide much needed relief to allow bird populations to recover.	Thank you for your comment

Name	Entry Date	Comment	Responses
Johnette Schenk	7/21/2023 11:54	I am OPPOSED to “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. Sincerely, Johnette Schenk	Concern: 1
Erica Ta	7/21/2023 11:57	I support Wolbachia IIT to save Hawaiian forest birds because today, only 17 species of honeycreepers remain in Hawai’i, some with fewer than 500 individuals left. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Without swift action, several species of honeycreepers will become extinct in the next ten years. Wolbachia IIT is safe for humans and the environment. Independent risk analyses indicate that the release of Wolbachia mosquitoes poses negligible risk to humans and the environment. We should try everything we can to maintain if not increase Hawaiian forest bird populations and prevent anymore manu extinctions.	Thank you for your comment
	7/21/2023 12:57	I am strongly opposed to the Incompatible Insect Technique Kauai Mosquito Suppression. In my opinion it is an experiment with unknown potential negative consequences to the land and creatures. Once set in motion any negatives can not be undone therefore best to not experience with Mother Nature.	Concerns: 11, 19
Kalei Holt	7/21/2023 14:00	I support the implementation of the IIT project not only because I think this is one of our last options for truly supporting the health of native Hawaiian forest bird species and what is tied to them (cultural knowledge and pride, ecological services, etc.), but also because it has been shown to not have negative effects in the proposed introduction area.	Thank you for your comment
	7/21/2023 14:02	We need to take care of our native birds and species. Mosquitos are an invasive species that only harm our delicate island ecosystem and an island without them is much better and authentic to Hawaii. Also better for human health, native species health, and health of the island	Thank you for your comment
Jacinto zulueta	7/21/2023 14:15	I support the incompatible insert technique. I support saving manu oiwi	Thank you for your comment
Emily	7/21/2023 14:43	Let’s maintain the splendor and joy of the island	
Kiana Walker	7/21/2023 14:54	I think it's important to prioritize the native birds of Hawaii not just for their benefit but in order to care for the islands and the people who live on them.	Thank you for your comment
Amy Cook	7/21/2023 15:09	Mosquitos are not native to the islands and have had a catastrophic impact on native bird species. I fully support the proposed control method. It has been used safely and effectively for mosquito abatement for years at sites around the world. Without this immediate action, Hawaii will lose it's few remaining species of honey creepers. Some in the next few years and the rest in the next few decades. This is an unacceptable and completely unconscionable loss. For the birds, their forests, and the Hawaiians who have always managed these lands we absolutely must move forward with the proposed abatement plan. There are no documented hazards to humans exposed to these mosquitoes, or to any native insects or animals in previous releases anywhere in the world.	Thank you for your comment

Name	Entry Date	Comment	Responses
Lillian Lewis	7/21/2023 17:32	I support moving forward with (IIT). The native birds were here long before the mosquitoes, and it is our kuleana to make sure they are here for years to come. Native Hawaiian bird species are so important to our ecosystem, and contribute to seed dispersal of our native plants. Hawaii has infamously become known as an epicenter for extinction; if we have the opportunity and the tools (like IIT), it should be our responsibility to change that narrative in support of our native species. After all, we know the benefits of having our native bird species around, but we do not know what consequences may come in a life without them. Land and species are all connected and all rely upon one another to work as a whole.	Thank you for your comment
Aprille Manzano	7/21/2023 17:41	<p>Aloha, as an avid hiker and hawaiian native plant/species enthusiast, I strongly support this IIT project. Hawaii is a special place. Our islands have beautiful species that only exist here. Not anywhere else in the world! Sadly we are the endangered species capital of the world. We need to fight and make ways to help our species survive!</p> <p>We can not afford to lose another native bird. We must save our honeycreepers! If we know there is a way to save and repopulate, why not? These native birds are full of history and give life to our ecosystem. It would be sad to have one less native species, that can no longer thrive/live in the natural environment that God specifically designed our beautiful birds to live in.</p> <p>I urge you to please move forward with this project. It will save many of our native birds, and give life to the natural resources our islands have.</p>	Thank you for your comment
Kelly Kingdon	7/21/2023 18:19	I strongly support the use of Wolbachia-based Incompatible Insect Technique to reduce the number of invasive mosquitos negatively affecting the native bird populations of Kaua'i. The time to act is now to protect birds like the 'akikiki and 'akeke'e, the plan laid out is sound and does not seem like it would negatively impact anything other than invasive mosquitos. The faster this can go through, the better.	Thank you for your comment
Nicole	7/21/2023 18:40	Please help save our native birds from extinction! This may be their only chance at survival!! Hawaii's native birds connects us to our past by being able to experience what our Hawaiian ancestors were able to experience. By going through with this project, it would show how much our state and government actually care about the animals, environment, and people. Our voices must be heard before we never hear an 'akikiki in our forests again. It is our duty to protect the animals that were here long before humans ever settled here.	Thank you for your comment
Julia Marrack	7/21/2023 19:17	<p>Hawai'i's forest birds are facing an extinction crisis and it is our kuleana to ensure that this crisis never comes to fruition. Only six of 16 native honeycreepers remain with predictions that two more will soon become extinct by 2025 and 2034 respectively.</p> <p>We need to do everything in our power to ensure that no more native birds go extinct. The Incompatible Insect Technique (IIT) needs to be instituted, so that our native birds are protected. please listen to the people working to make this happen in a responsible and thoughtful way.</p> <p>Thank you</p>	Thank you for your comment
Leon D.	7/21/2023 21:04	Protecting what's left of our native species is imperative to the continued health of Hawaii. I am in support.	Thank you for your comment
Kat Lane	7/21/2023 21:52	Please protect these incredible birds and the marvelous ecosystems of Hawaii that so many Native Hawaiians rely on! This project aims to limit harmful invasive mosquitos in a way that will have little to no impact on other non-target species; it will benefit the native ecosystems of Hawaii and protect priceless ways of life that have the potential to be lost forever; and suppress a species that is invasive and a nuisance to many people and animal life. Please support this project and thank you for your time and consideration.	Thank you for your comment
	7/21/2023 22:02	i support the protection of hawaii's native species	Thank you for your comment

Name	Entry Date	Comment	Responses
Julia Yano	7/21/2023 22:13	<p>Department of Land and Natural Resources, Division of Forestry and Wildlife, Attn: Mosquito Control Project,</p> <p>May I strongly urge you to discontinue the build out of the insectary intended to mass produce Wolbachia and genetically modified pgSIT CRISPR technology mosquitoes, aimed for release on our islands. This project may cause the extinction of endangered native birds and could affect public health.</p> <p>The Wolbachia Bacteria can transmit to wild mosquitoes and other insects, which potentially carry disease to both humans and wildlife. Claims that this poses no Human Health Risk is based on science that was discredited by the EPA. The risk outweighs the benefit.</p> <p>May wisdom and sound judgement guide this deeply crucial decision, as once it is made, it is irreversible.</p> <p>Sent With Sincerest Respect.</p>	Concerns: 2, 13, 14, 19, 31
Juhl Rayne	7/21/2023 22:39	<p>aloha,</p> <p>this is insanity... when have any invasive implants to the island EVER helped anything? NEVER!!!!!! and this is NO exception.... this is a disaster & NOT ok..I'm OPPOSED to this Wolbachia-based Suppression of Mosquitoes on Kaua'i and/or anywhere Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>mahalo,</p> <p>Juhl Rayne</p>	Concerns: 1, 3
Micah Camara	7/22/2023 0:20	<p>I support on behalf of myself and many other unheard voices, doing anything and everything possible to protect our native bird population from extinction before it is too late.. just as how it is too late for some of our species that are already lost forever. We should have been dealing with this issue long ago, but it has been brushed off and put on the back burner only until now, so time is of the utmost importance. These birds not only help save our native forests and ecosystems by pollination and seed spreading, but are also a direct representation of our culture and respect for the importance of each and every individual amongst us all.. If we let them go forever, what else are we willing to let go forever? These birds are found no where else in the world, and have survived here long before all of us have. They are our kūpuna, they are our ancestors. If we give up on them, it's like we are giving up on our own ancestors and the people that came before us. Please put this plan into action and treat it with the importance that it deserves. We have a chance to do something, before it is too late. Let's show the world we are capable of creating positive change, and lead by example.</p>	Thank you for your comment
Kana Inoue	7/22/2023 1:43	<p>Hawaiian endemic birds are so special and very uniquely beautiful. Please let me raise my voice to support protecting the birds.. I hope this can take a very quick action!! Mahalo from Japan</p>	Thank you for your comment
Yvonne Aburrow	7/22/2023 1:58	<p>It's essential to control the mosquito population using the birth control technique so that mosquitoes cannot transmit avian flu to the rapidly dwindling native Hawaiian bird population.</p> <p>Please authorize this project to give the birds a chance to survive and repopulate. The birds are needed to pollinate the plants. I'm in favour of saving them by any means necessary.</p>	Thank you for your comment
Gulsara Nuraliyeva	7/22/2023 2:04	<p>I greet you and appeal to you with a request not to build on this mountain, not to destroy it, you must think about the future of your offspring!</p>	Thank you for your comment
Nadiya	7/22/2023 2:11	<p>We can't allow to destroy the nature and sacrifice the future of our children for another building and profit. One step at a time we are destroying our planet and it will be the end of all of us.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
charles post	7/22/2023 4:27	Please take the appropriate steps to protect Hawaii's native songbirds for future generations and to preserve the ecological services they provide. Curbing mosquito populations with the Incompatible Insect Technique (IIT) is essential. The future of Hawaii's native birds are in your hands.	Thank you for your comment
Bailey Plaman	7/22/2023 4:42	I fully support the outlined plan for mosquito suppression. Protecting native bird species, and therefore native plant species, is a critical part of maintaining biodiversity on this planet.	Thank you for your comment
Jillian Rodriguez	7/22/2023 5:12	The extinction crisis among birds threatens the biodiversity and balance of the whole planet. Please choose this opportunity to protect Hawai'i's native avian pollinators with the IIT before it is too late.	Thank you for your comment
	7/22/2023 5:25	As we continue to lose species around the world, it is increasingly important to protect endemic birds of Hawaii. If we lose these birds we lose unique and critical species forever. Beauty and the effect on the ecosystem is only the start of why we should protect these birds.	Thank you for your comment
Robert Wilcox	7/22/2023 5:36	<p>To Whom it May Concern,</p> <p>I would like to express my strong support for the IIT Mosquito Control Project to hopefully ensure the long term survival of Hawai'i's native honeycreepers. With so many native species already lost to extinction, Hawai'i's remaining native birds are an integral part of ecosystem and we need to do everything in our power to save them. While I am generally not a strong proponent of introducing more non-native creatures into the environment as a conservation measure, it seems that the IIT method is based on sound science and has a decent chance of working. It seems as well that we are in last resort territory with species like the Akikiki down to single digits in the wild and this technique may be the only viable way to save them. As an avid birdwatcher and nature-lover, I've had the great luck and to be able to observe a handful of the (currently) more common native Hawaiian birds. I still hope to one day have the opportunity to catch a glimpse of highly imperiled species like the Akikiki and Puaiohi in the wild, but I'd be just as happy knowing they are still around and that we tried our best to save them while we still had a chance. Thank you for your time.</p>	Thank you for your comment
Rebecca Reuter	7/22/2023 6:03	<p>I support the proposed action to eradicate mosquitos from Kauai in the most efficient and effective manner. Mosquitos are not native to the islands and have decimated native bird populations.</p> <p>Mahalo for the time and effort all have put into this EA and I hope this moves forward expeditiously.</p>	Thank you for your comment
	7/22/2023 6:27	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Anon, 7/22/2023 6:27, <i>Continued</i>) Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement</p> <p>Stop trying to create a new disaster!!</p>	
Samuel Anderson-Moxley	7/22/2023 6:42	I am strongly in favor of releasing IIT mosquitos. This will help save our native birds. This is a moral imperative. Doing nothing is not an option.	Thank you for your comment
Adrian Garthoff	7/22/2023 6:49	Please do not send more mosquitoes in effort to depopulate the coqui. Please do not send mosquitoes in effort to impact the environment or for any purpose. These mosquitoes are very aggressive in their ability to potentially multiply to an alarming rate and harm the balance of the island, including severe harm to the honey creeper population. Please do not send mosquitoes for any reason.	Concerns: 10, 19
Opie ashley	7/22/2023 7:50	I support using the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i.	Thank you for your comment
	7/22/2023 7:53	Preserving Hawaii's native honeycreepers is an activity which DLNR should be pursuing. Too many species have already gone extinct. Please push forward with this critical effort to save these unique species for future generations.	Thank you for your comment

Name	Entry Date	Comment	Responses
Nicole Busto	7/22/2023 8:05	<p>To Whom it May Concern,</p> <p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>Regards, Nicole LeClaire Maui Nutritional Therapy Nicole LeClaire NTP, CGP 808-463-7783</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Suzie Pluskat	7/22/2023 8:11	<p>Hello,</p> <p>We need to do some thing to stop extinction. Please approve the release of wolbachia mosquitos on Kauai. The time for action is now.</p> <p>Suzanne Pluskat</p>	Thank you for your comment
	7/22/2023 8:21	<p>I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p>	Concern: 1

Name	Entry Date	Comment	Responses
resident	7/22/2023 8:24	<p>This project needs to stop. I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Rory Bolton	7/22/2023 8:24	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
SJP	7/22/2023 8:34	Enough is enough we need to take care of Mother Nature	Thank you for your comment
Devin Andaluz	7/22/2023 8:56	I support using the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i.	Thank you for your comment
Dan Corson	7/22/2023 8:59	I strongly SUPPORT the use of biocontrol for these introduced and harmful mosquitos. I would go as far as supporting the introduction of a GMO control (which this is not). Hawaii is the best place to use this system of control as its lands are far away from any land borders, that could facilitate the re-introduction of the pest by adjacent lands. If we can eradicate these pests, they would make all our lives better and decrease the ongoing use of chemical pesticides used in their eradication. Please support this project and eventually we would love it to come to the Big Island!	Thank you for your comment

Name	Entry Date	Comment	Responses
Nathan Gallagher	7/22/2023 9:10	<p>Aloha mai,</p> <p>My comment is one of unconditional support for IIT, as soon as possible. To lose a species unique to our home, like the 'akikiki and akeke'e is a devastation our we cannot allow to come to pass. There is no replacing these birds if they are gone. Far to many native species across Hawai'i have been destroyed by our short-sightedness. It is our kuleana to do everything we can for those that remain.</p> <p>Na'u me ka mahalo,</p> <p>Nathan Gallagher Kekaha, Kaua'i</p>	Thank you for your comment
Ru Carley	7/22/2023 9:32	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
arista sather	7/22/2023 9:39	<p>Aloha kakahiaka,</p> <p>After reading the EA for this project I just wanted to email say I am in support of this project and protecting the 'Akikiki from extinction using mosquito population suppression. I saw your post on instagram, couldn't find the link in the bio, so I saw this was an option.</p> <p>Mahalo, Arista Sather</p>	Thank you for your comment
	7/22/2023 9:56	No more experimental drugs on islands. No study has been done. We've only been given false information. Strongly opposed	Concern: 9
Shay Nai'a	7/22/2023 10:11	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Shay Nai's, <i>Continued</i>). Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
Karen M	7/22/2023 10:14	Save the 'i'iwi!!! Aloha <3	Thank you for your comment
Alicia Brunner	7/22/2023 10:56	Some of the most unique birds on our entire planet are in extreme peril, we've already lost so many, we need to do everything we can to save the remaining. Please consider this for our future generations, if not for ourselves as we will surely lose more species in our lifetime if we do not act.	Thank you for your comment
Emily	7/22/2023 11:11	I support this measure to protect these birds and preserve historical and cultural rights these birds have. Mahalo nō.	Thank you for your comment
	7/22/2023 11:21	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		(Anon, 7/22/2023 11:21, <i>Continued</i>). Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	
Jon Matsuoka	7/22/2023 11:22	To Whom It May Concern: I am strongly in favor of the release of mosquito to render mosquitos in Hawai'i sterile. We must save our native birds. Please don't listen to malahini with wild notions about the harm it might cause. Mahalo, Jon Matsuoka, Papakolea, O'ahu	Thank you for your comment
Adrienne Antonsen	7/22/2023 11:24	I am in full support of the use of IIT on the Hawaiian Islands to reduce mosquito populations and the transmission of avian malaria. As a conservationist working on the islands, both fighting the coconut rhinoceros beetle invasion and working to restore native dryland forests, I witness the challenges our native ecosystems face against invasive species every day. The plight of the Hawaiian honeycreepers is particularly distressing, and the rapid rate of extinctions in this one of a kind lineage requires a rapid response. IIT offers hope that aid can be rendered to these birds before it is too late. The opportunity to use an insect control technique that involves no toxic chemicals, no introduction of non-native species, and no use of genetic modification is incredibly exciting. As a trained biologist with a Masters degree in Entomology I give my full support in the release of incompatible male southern house mosquitoes and sincerely hope it will give our remaining honeycreeper populations the opportunity to rebound.	Thank you for your comment
Jay	7/22/2023 11:33	Injecting mosquitos is violating the Laws (Intelligence) of Nature. Injecting them causes them to undergo mutations that no one can predict, will they carry disease worse than MALARIA and kill more humans or even other vertebrate species? Stay on the safe side...do not altethe mosquitos. Is so called science of Agriculture negatively impacting the Honeycreepers...and weakening them vs. the mosquitos...or vice versa strengthening the mosquito...or will the injected mosquitos will mutate the mosquitos to be worse or deadly against humans or other species? Be safe leave nature up to nature. Besides is this a profit motive for the few? They put covid through gain of function and we has a pandemic and death. Mahalo, Jay	Concerns: 2, 13, 15, 19, 26,
	7/22/2023 11:54	I'm opposed to this "Wolbachia-based Suppression of Mosquitoes on Kauai Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
T. Aragaki	7/22/2023 11:55	I am writing in support of the IIT action outlined in this Draft EA, intended to control the mosquito population of Kaua'i to protect the remaining, endangered native bird species. Growing up in Hawai'i I was taught from elementary school on that the native birds of Hawai'i were severely endangered or extinct. For almost 40 years throughout my life I've been hearing this, and for many of those years I assumed things were being done to combat this. While it is clear that there are people in departments such as DOFAW and USFWS Who have dedicated their lives to this work, it's obviously not enough without the proper governmental support. If enough was being done we wouldn't have continued to see the decline and extinction of so many native birds in my lifetime. The continuing decline of our Native species, regularly puts us at the top of the list of endangered species capitals in the US and the World. This is not a title to be proud of. A track record of knowingly allowing the slow extermination of such unique species of birds, found nowhere else, is apathetic and lazy. This string of islands was theirs first, it is incumbent upon us to preserve the integrity of this land and species that evolved here without us. These birds and the plants that rely on them, not only serve to represent the	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(T. Aragaki, <i>Continued</i>) Hawaiian culture that revered them as part of their landscape and beliefs, but also as an incredible testament to the majesty of nature and the power of evolution.</p> <p>This EA shows that the benefits to the IIT action clearly. Mosquitoes are not just a threat to the birds of Hawai'i, but also the people. I truly believe that supporting this program is the safest, smartest and quickest way to address this problem that has been brewing under our noses for decades. To not support the controlling of the mosquito population and its effects on our native birds is to say that we knew the threat, we found a solution and still did nothing. This program and its impacts potentially have far reaching, positive effects for native birds on other islands and the quality and safety of life for residents of all kinds.</p>	
Lehua Matsuoka	7/22/2023 12:01	<p>To Whom It May Concern:</p> <p>My name is Lehua Matsuoka and am a Hawaiian cultural practitioner of Hula and Chant for the last forty years. I live on the Hawaiian homestead 'āina of Papakōlea, O'ahu. I deeply support the cause of Wolbachia IIT on Kaua'i to save Hawaiian forest birds from extinction. The native birds have been an important part of our culture, the ecosystem, from time immemorial and need to continue to exist not only in our chants and stories but in our forest community.</p> <p>It is our responsibility to do all we can to save our forest birds.</p> <p>Sincerely and with Aloha, Lehua Matsuoka</p>	Thank you for your comment
Ken Reyes	7/22/2023 12:10	<p>I have always loved birds and have learned a lot about the native bird population ever since I moved to Hawai'i as a teenager. It saddens me to hear of the extinction of so many native avian species and to know that this danger continues to exist for many of our endangered species, like the 'akikiki. As a current doctoral student at UH, I stand from my peers who research climate change and environment, as well as the many activists, organizers, scientists, and bird enthusiasts that desire to see the government take urgent action against the continued dwindling of our native avian populations. It is encouraging to see the USFWS and DLNR putting resources and taking action to curb one of the most hazardous threats to our birds, which are mosquitos. I hope these efforts will not only continue, but also branch out towards other actions on other islands and places that are experiencing great wildlife diversity losses, especially because all of it is caused by human activity. Mahalo for considering our comments!</p>	Thank you for your comment
Amberly Pigao	7/22/2023 12:17	<p>I support Wolbachia IIT on Kauai to save Hawaiian forests birds because I am know the impound our native bird population. Mosquitos continue to kill off our native birds which are a vital species in forest preservation. Without out our native birds, there are no native forest, without native forest there is less fresh drinking water in our aquifer overtime, therefore threats to human existence on these islands,</p> <p>Mahalo!</p> <p>Amberly Pigao, from Kapa'a, Kaua'i</p> <p>--</p> <p>Masters of Science Student, Tropical Conservation Biology and Environmental Science, University of Hawai'i at Hilo</p>	Thank you for your comment
Kenory Khuy	7/22/2023 12:37	<p>Hi,</p> <p>I support Wolbachia IIT on Kaua'i to save Hawaiian forest birds because the benefits far outweigh the perceived risks. The birds' impending extinction and other related consequences of inaction in this case will be irreversible. Please move forward this project.</p> <p>Thank you, Kenory Khuy, Honolulu, Hawai'i</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
terra luckey	7/22/2023 12:53	I Oppose to " Wolbasha- based Suppression of Mosquitos on ALL the Islands of Hawaii , PLEASE Stop this.....	Thank you for your comment
	7/22/2023 12:58	Mosquitos are BAD enough with out making them worse... as an experimental sounds crazy to me and others ... I'm sure alot of Tourist will not come to the Islands ... Not Good , Think about it...	Concerns: 11, 30
Ilana Nimz	7/22/2023 13:03	I strongly support the initiative control mosquito populations to preserve the endemic forest birds of Kauai. IIT is critical to implement now before the few remaining birds are extinct.	Thank you for your comment
Katherine Wolfenden	7/22/2023 13:06	Please protect the native birds! They need our help! Mosquitos are not native to Hawaii and this is a natural way to reduce their populations and protect the beauty of Hawaii.	Thank you for your comment
Steve Tagupa	7/22/2023 14:26	I support the use of wolbachia mosquito control on Kauai since it has been used for such purposes in other areas. Our native birds need all the help they can get. Already the Akikiki is pretty much extinct in the wild. I can only hope that captive breeding will help to reestablish them later on. That will not happen unless the mosquitoes are controlled.	Thank you for your comment
Loree	7/22/2023 15:07	I am opposed to the Mosquito suppression project to be initiated on Kaua'i. There needs to be a more in depth study(EIS performed) so the environmental impact on wildlife, plants and people can be examined further. This project was initiated in Singapore and was then halted! This is not a good sign and means there is a grave risk to releasing these variants into the Kaua'i atmosphere! I am opposed!	ConcernL: 1
	7/22/2023 15:20	Don't allow experimenting on Hawaiian islands? Kill us people and the rich will come and grab our lands. Protect our people and spend the money on low income housing. No experiments on Hawaii! Listen to Hawaiians not the rich and famous that don't mean well in the long run.	Concerns: 11
Philip Kitamura	7/22/2023 15:32	I support the proposed action for release of male mosquitoes with incompatible Wolbachia in the Kōke'e and Alaka'i Wilderness areas.	Thank you for your comment
Lauren	7/22/2023 15:33	I strongly support this initiative to control mosquito populations.	Thank you for your comment
Francesca Volger	7/22/2023 16:39	I cannot believe that anyone would even consider doing this!!!! I absolutely refuse this insanity and demand proper studies be done before anything like this is even considered. NO NO NO to this proposal.	Concern: 9

Name	Entry Date	Comment	Responses
Francesca Joybubbles	7/22/2023 16:41	<p>I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>I cannot believe this insanity is being considered.</p> <p>Yours truly, Francesca Woolger</p> <p>--</p> <p>"Trust in the Lord with all thine heart and lean not unto thine own understanding. In all thy ways acknowledge Him and He shall direct thy paths"</p> <p>~ Proverbs 3:5-6</p>	Concern: 1
Jason Preble	7/22/2023 17:01	<p>Mahalo nui loa to whoever is reading and considering these public comments. I am a local conservation biologist born-and-raised on O'ahu and I speak as someone who works to restore our native plants, birds, bats, and insects. I have had the (unfortunately) rare opportunity of meeting the beautiful endangered birds of Kaua'i that the proposed mosquito suppression project would protect. I have also had the bittersweet opportunity to observe one of our last wild 'akikiki, a species that may already be extinct in the wild before mosquito suppression actions get approved. The individual bird we saw was foraging alone, and it was heartbreaking to think that her mate, who she had built six nests with this past year and with whom she had always been seen with previously, may have just died due to mosquito-borne avian malaria...</p> <p>The first decision being considered here seems to be whether to take action to save our remaining endangered forest birds or not. I think to not act would be indefensible and foolish given that extinction not only diminishes our archipelago's natural heritage and unique identity, but also unfairly removes opportunities for our children and grandchildren to get to know these amazing birds. I have faith that even though most people have unfortunately not had the opportunity to meet our native manu because of their rarity, if asked directly, most local citizens would support taking action to save them.</p> <p>The second decision that some concerned citizens may rightly have is "what actions should we take and not take on behalf of our endangered manu?". I want to highlight that our enemies here are mosquitoes, a group of non-native insect species responsible for killing more humans worldwide and more native Hawaiian birds than any other. Paradoxically, mosquitoes are also somewhat easy to ignore (seen as "normal") and notoriously difficult to control. However, mosquitoes only arrived in the islands after European contact so before that, both Native Hawaiians and native manu had never experienced a mosquito bite (what a paradise!).</p> <p>While multiple native bird species would be directly saved from extinction by the suppression, and hopefully eventual eradication, of disease-carrying mosquitos, none of our native species would be negatively impacted. For example, I have a PhD in bat conservation and am 100% comfortable in saying that our native 'ōpe'ape'a would not be negatively impacted by lower mosquito populations or even the complete eradication of mosquitos. Our bats turn out to be quite flexible in what insects they eat and mosquitos make up a negligible part of their diet. Not to mention that our bats and other native predators were happily living here long before mosquitoes arrived.</p> <p>Many of the methods for controlling mosquitos effectively unfortunately involve science that is poorly understood by the general public. The repeated release of male mosquitos made effectively sterile using Wolbochia strains does not involve genetic modification or new species introductions. These Wolbochia strains already exist in wild mosquitos and do not affect other species. Therefore, this incompatible insect technique (IIT) would not negatively impact other local insect species, much less other wildlife, plants, or humans. If saving our native birds is not enough reason, trialling IIT locally on bird-biting mosquitos might also lead to better methods for controlling human-biting mosquitos in Hawaii, reducing the risk of mosquito-borne diseases like Dengue fever.</p> <p>Lastly, I want to touch on general opposition towards any actions seen as "messaging with nature". First of all, like it or not, we humans affect nature in a big way because of how many of us there are and our need for resources. We unfortunately cannot avoid having SOME impact on our natural environments. Our choice now is whether we wish to serve as responsible stewards or as negligent ones. As an ecologist and conservationist, I am well aware that humans have a history of ignorance and shortsightedness</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Jason Preble, Continued) concerning how we choose to manage ecosystems. It is our impacts, both purposeful and accidental that drove the majority of our native forest birds extinct already and that threatens our remaining ones. However, we HAVE learned from our mistakes and modern conservation efforts worldwide have proven that, given enough support and funding, species that we humans made endangered CAN be saved from extinction. If we do nothing, we are very likely to lose the majority of our remaining native bird species in the next 100 years, with some species like the 'akikiki very likely disappearing before the next election cycle. Even if we take other actions, it is going to be impossible to save these birds if we do not get rid of mosquitoes and get rid of them FAST.</p> <p>I hope that our policymakers and those reviewing this EA don't only consider how popular the proposed project is now, but also how popular it might seem in 10, 50, or 100 years, when it may have made the difference in whether or not our children alive then have the luxury of knowing that these unique birds still exist. The inadequacy and slowness of our actions to save our native manu thus far have been bewildering, frustrating, and shameful, but I sincerely hope we can act properly and promptly in these next few critical years. We acted too slow for the poor 'akikiki. Let us not lose even more.</p>	
	7/22/2023 17:10	<p>I am OPPOSED to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health!</p> <p>Than you!</p>	Concern: 1
Halina Ngo	7/22/2023 17:14	<p>I am OPPOSED to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and individuals’ health.</p>	Concern: 1
Kris Kokame	7/22/2023 17:31	<p>Thank you to the reviewers of these public comments. I grew up on O’ahu and have had a love of our native species and ecosystems from a young age. I currently work in renewable energy and know that our existential climate and biodiversity crises are inextricably linked. Man-made climate change is not only threatening the people of the world, but also the other animals and plants that we share our planet with. For example, we have known for decades that greenhouse gas emissions are warming up the planet, and that one of the results would be that mosquitos would be able to spread to previously mosquito-free places. Despite this knowledge, we have been heartbreakingly slow to act on behalf of our native Hawaiian manu. I sincerely hope that this EA gets approved as quickly as possible because while we think about whether to do something, our manu are dropping dead from mosquito-borne diseases.</p> <p>As this EA outlines, several Kaua’i bird species populations are in precipitous declines. The situation is even more dire than the cited research describes. ‘Akikiki in particular had a massive die off just this year and are likely to be extinct in the wild before the holiday season. My fiancé volunteered with the Kaua’i Forest Bird Recovery Project in late May. The site he visited deep in the ‘Alaka’i had had multiple breeding pairs of ‘akikiki at the beginning of the year, but by the time he got there in May, they had all disappeared. We went back to Kaua’i just last week and were lucky enough to see one of the last FIVE wild ‘akikiki known now. Our friend who works with the species told us that this adorable female had built 6 nests this past breeding season, but we did not see the mate that she built those nests with and with whom she had always been seen with previously. Our hearts sank thinking that he might have just recently died from avian malaria...</p> <p>As also outlined in the EA, the IIT method proposed poses no risks to our native species, who evolved without mosquitos, or to the people of Hawai’i. If anything, having less mosquitos is better for people too. I hope that one day, we move from mosquito supression to complete eradication.</p> <p>I believe that we are moving in the right direction towards better stewardship of our native species, but this movement is much too slow. The proposed mosquito control may save the other threatened native birds of Kaua’i, but it sadly seems too late for the ‘akikiki. Their only hope is that our captive breeding facilities rear a large enough captive flock AND mosquitos are cleared from the forest of Kaua’i. Only then, could ‘akikiki be returned to the wild and thrive. This would be a true miracle give the inadequate</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		(Kris Kokame, <i>Continued</i>) funding and infrastructure supporting our manu at the moment. I believe that we will eventually become a society that takes proper care of its natural resources, biodiversity, and global climate. However, I fear that we will move slowly towards that ultimate goal, that when we get there, we will look around and find that we have lost so much more than we needed to. Please help us move quicker towards this ultimate goal for our own sakes and for the sake of future generations.	
Kachina Aimee Woolger	7/22/2023 17:47	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1
MC	7/22/2023 19:00	<p>Since the health of Hawaii's people are involved, we demand informed consent. Since our environment is being affected, you should follow the laws, statues, and procedures of providing an Environmental Impact Assessment and statement.</p> <p>There is no emergency that requires you to drop all precautions and safeguards for the people and the aina. It is obvious that you are putting special interests and back room payoffs ahead of your duty to serve the people and health and wellbeing of the state. Did you not take an oath to protect?</p> <p>I implore you to hear the voice of the people, and do what is right in God's eyes.</p>	Concerns: 1, 2, 26, 27
Hanne	7/22/2023 19:16	Save the birds	Thank you for your comment
Nick Kowalske	7/22/2023 19:28	Mosquito suppression is the duty of the government and is essential to protecting what remains of Kaua'i's biodiversity. We cannot wait to act, we must act now before every native bird is gone	Thank you for your comment
Jessica Barajas	7/22/2023 19:35	Please help the birds	Thank you for your comment
Donna Grabow	7/22/2023 19:38	<p>Aloha,</p> <p>I oppose the draft Environmental Assessment to release of lab mosquitoes on Kauai. DLNR is receiving funding for public relations to popularize the idea that it will be safe. Also, the funding the project has ties to Soros, which raises suspicion about using the remote islands of Hawaii for experimentation. Who on the highest Federal level, is behind this plan? Does the DLNR know?</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong?</p> <p>Sincerely, Donna Grabow, Moku o Keawe</p>	Concern: 2, 4, 19, 26
Jina	7/22/2023 19:38	I am in huge support of this project, we owe it to the native species of Hawai'i to do what we can to protect them from harmful invasive species. Also these birds are just too damn cute to go extinct 🐣	Thank you for your comment

Name	Entry Date	Comment	Responses
Sarah Han	7/22/2023 20:42	I support these measures to protect our beautiful and culturally critical birds. We have already lost over half of Kauai's native bird species. 10 out of 16 of these incredible species have died out due to avian malaria, via introduced mosquitos, and by habitat destruction — both of which are caused by humans. It is our responsibility to right these wrongs, and we don't have much time left as birds like the 'i'iwi are dying every day. Please implement this innovative solution as soon as possible!	Thank you for your comment
	7/22/2023 21:00	I cannot see more tragedies like this happen without anything done before I am even an adult. All it takes to understand how important it is to protect native species is a couple science classes. I urge you to invest in the Native Hawaiian honeycreepers.	Thank you for your comment
kalena Charlene Holani	7/22/2023 21:45	Please help save the last remaining birds left in the world!!!!!!!!!!!!!! This is our chance to make a change and help to preserve such special beings.	Thank you for your comment
Desiree Hoover	7/22/2023 22:05	I am completely against altering nature like this. You will be unleashing lab-altered (Unnatural) insects out in the wild with an outcome unknown because has not been tested. Recently there was something done here on island and now the lilikoi plants are in danger. When nature is in balance, it works. You may want to look deeper in what is causing this or a better natural solution. Again, I am very against this untested lab-altered answer to a problem that does need to be addressed. Mahalo....	Concerns: 7, 9, 11,
Keoni Kailimai	7/22/2023 22:12	If there is modern technology proven safe and able to reduce the presence of an invasive, harmful, disease-carrying creature such as the mosquitoes found in Hawaii, then I'm unsure as to why it wouldn't have already been introduced! This technology is safe and effective, and we must act now to save the very few native birds we have left in Hawaii!	Thank you for your comment
Karina Champion	7/22/2023 22:37	The IIT has been effective at decreasing mosquito populations without harming beneficial insects populations or other species in many ecosystems all over the world. Especially since mosquitoes are invasive to Hawai'i using this proven technique is a responsible management protocol.	Thank you for your comment
Federico Merlin	7/22/2023 23:09	https://www.instagram.com/p/Cu9_yKervX3/?igshid=MzRIODBiNWFIZA==	Thank you for your comment
Merlin	7/22/2023 23:10	https://www.instagram.com/p/Cu9_yKervX3/?igshid=MzRIODBiNWFIZA==	Thank you for your comment
Desiree Hoover	7/23/2023 1:15	Per Stanford, you get malaria when a mosquito infected with parasites bites you and transfers the parasite to you. Malaria spreads when an infected Anopheles mosquito bites a person. This is the only type of mosquito that can spread malaria. The mosquito becomes infected by biting an infected person and drawing blood that contains the parasite. When that mosquito bites another person, that person becomes infected (1). If there is an outbreak of avian malaria, there is something off balance in Kauai's Aina as we do not have malaria here for mosquitos to transmit. To me it sounds like something is out of wack with the parasites that cause malaria. "Study of glyphosate's effects on moth, mosquito species highlights the potential for large-scale ecological impact including on malaria transmission" per Public Health. Quoting a study it found glyphosate (roundup) inhibits the production of melanin, which insects often use as part of their immune defenses against bacteria and parasites (2). "Mosquitoes exposed to glyphosate were less able to control Plasmodium infections they would have otherwise resisted, which hints that glyphosate exposure may make them better vectors for malaria," says co-first author Daniel Smith. "These results raise concerns about the increasing use of glyphosate in regions of the world where malaria is endemic." (3).	Concerns: 28, 32

Name	Entry Date	Comment	Responses
		<p>(Desiree Hoover, Continued) It's known that glyphosate impacts the honey bees gut microbiota (4). Sounds like this is another case where it is throwing off the ecosystem by altering the health of insects that keep things in balance.</p> <p>) Let's ban Round Up and all glyphosate products. In 2015 The World Health Organization reclassified glyphosate as probably carcinogenic to humans ((International Agenc, 2015) (5) . It's been linked to neurological health, Alzheimer's (6), Parkinson's, cognitive disfunction, autism, depression and other neurological disorders(7). There are many alternatives to using roundup (9)(10)(11). Ten countries (including Mexico) have banned it (8). We are just one very small island. In doing this there is a great chance of slowing and preventing these extinctions, and human disorders/diseases as well.</p> <p>Let us NOT worsen things by altering nature any more by releasing another unnatural remedy out into the wild that's untested with an unknown outcome in these vulnerable yet so precious jungles and aina.</p> <p>Mahalo and much Aloha, Desiree, Kilauea Resident</p> <p>(1) https://stanfordhealthcare.org/medical-conditions/primary-care/malaria/causes.html (2) https://publichealth.jhu.edu/2021/ingredient-in-common-weed-killer-impairs-insect-immune-systems-study-suggests (3) https://newatlas.com/biology/insect-immune-system-impaired-glyphosate-malaria-mosquito/ (4) https://pubmed.ncbi.nlm.nih.gov/32723788/ (5) IARC (International Agency for Research on Cancer) (2015). Evaluation of five organophosphate insecticides and herbicides. IARC Monographs 112, World Health Organization, International Agency for Research on Cancer. Lyon: France. Volume112.pdf. [accessed: 3/25/2020] http://www.iarc.fr/en/media-centre/iarcnews/pdf/Monograph. (6) https://news.asu.edu/20220728-new-study-shows-commonly-used-agricultural-herbicide-crosses-bloodbrain-barrier (7) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9101768/ (8) https://www.ehn.org/glyphosate-explained-2656803555/where-is-glyphosate-banned (9) https://www.gardenertofarmer.net/gardening/garden-pest-control/safe-alternatives-to-roundup/ (10) https://www.consumernotice.org/environmental/pesticides/roundup/alternatives/ (11) https://www.lawnandpetal.com/round-up-weed-killer-alternatives/</p>	
Andrew	7/23/2023 3:12	I support the efforts outlined in the EA to suppress mosquito populations to save the birds	Thank you for your comment
	7/23/2023 4:44	<p>I OPPOSE to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes must complete a detailed Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The biopesticide mosquitoes come with many risks: horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Studies have documented this.</p> <p>The U.S. Dept. of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Claims of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Anon, 7/23/2023 4:44, <i>Continued</i>) If something goes wrong it will be too late for any fix, and will the federal government, the State of Hawaii, agency partners, private landowners take responsibility? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I reject the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i" and demand an Environmental Impact Statement.</p>	
	7/23/2023 4:44	<p>I'm for this. Avian malaria is pushing our native birds to extinction and has already taken many species. The proposed male cullex mosquitoes will pose no risk to both human and bird life and will only help to aid in mosquito population suppression. They are unable to spread human malaria. They are unable to spread avian malaria as the released males don't bite birds, and they will cause female mosquito infertility. Incompatible wolbachia strains seem like a good control method.</p>	Thank you for your comment
Nathan J Murphy	7/23/2023 5:36	<p>Hello,</p> <p>Please consider this message as a vote of support for using IIT to protect native Hawaiian birds. Please protect these beautiful birds on the behalf of us citizens.</p> <p>Nathan Murphy</p> <p>8th Grade English, Team 8-4, North Shore Middle School, Student Council Sponsor, QSA Co-Sponsor, 832-386-2707, nmurphy@galenaparkisd.com</p>	Thank you for your comment
Suraj Holzwarth	7/23/2023 6:18	<p>I oppose this suppression. Introducing disease into the food chain will also affect people, plants and animals and this is simply another bio weapon to our health and well-being. I oppose this project strongly.</p> <p>Suraj Holzwarth Captain cook Hawaii</p>	Concerns: 2, 5
ROBERT DUERR	7/23/2023 6:56	<p>Please do a complete environmental study before releasing an alien pest into Hawaii forests. Best Robert Duerr. Albatross News Hilo Hawaii</p>	Concern: 1
Shiruo Stolarski-Sun	7/23/2023 7:28	<p>Dear Wildlife Services,</p> <p>We are happy to hear about the plans to release mosquitoes using the IIT technique. It's an important step towards preserving the natural Hawaiian ecosystem for ourselves and future generations.</p> <p>Sincerely, Peter and Shiruo Stolarski-Sun</p>	Thank you for your comment
Ehulani Stephany	7/23/2023 8:58	<p>Please - Stop this from happening on ALL OUR HAWAIIAN ISLANDS... There has been NO ENVIRONMENTAL TESTING ...</p> <p>I'm on Hawai'i Island... and a Hawaiian Culture Teacher in many different ways... Please DO NOT RELEASE THESE HORRIBLE MOSQUITOES!!!! WE HAVE SO MUCH TO LOSE IN OUR ENVIRONMENT</p>	Concern: 9

Name	Entry Date	Comment	Responses
Michelle	7/23/2023 9:01	<p>This is unbelievable! Your documents state that you don't know if this is going to work to save native birds and yet you want to do it for a minimum of 20 years! There are studies that show wolbachia injected mosquitoes can carry west neil virus and other diseases.</p> <p>This can no only harm humans but the birds you want to save! Plus, Dr. Pang, a tropical disease specialist that the Hawaii health department hired for his opinion, said, do not do this and you are ignoring him. Are you insane?</p> <p>Please stop this immediately and do a full EIS before you put a potentially dangers insect that can change the entire eco system forever!!!</p>	Concerns: 1, 2, 6, 13, 19, 29
	7/23/2023 9:02	<p>Without mosquito suppression, we will almost certainly lose our many of our manu within the next few years. This is the only tool we have available at the moment and it is scientifically proven to work. Please consider approving this ea and allowing the use of IIT to suppress the invasive mosquitos so that future generations can see these birds in the forests.</p> <p>Science is built on facts, not beliefs.</p>	Thank you for your comment
Jaime Cunnane	7/23/2023 9:06	<p>I support Wolbachia IIT to save Hawaiian forest birds because this is our best chance to drastically change their chances of survival. I wish we could have done this years ago already as we have lost so many native birds and continue to lose them at a rapid rate due to avian malaria. A single bite from an infected mosquito can mean death for our birds.</p> <p>Honeycreepers are a unique group of forest birds found only in Hawaii- which once had more than 50 species, but only 17 currently remain. Some of these remaining species have less than 500 individuals left. These birds are incredible and hold such importance to Hawaii and Hawaiian culture. We need to get behind this effort to save what is left of these amazing species. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. The time is now. Without swift action, several of these honeycreeper species will become extinct in the next ten years. Don't let it happen.</p>	Thank you for your comment
Sophie Mahealani	7/23/2023 9:17	<p>Hello, my name is Sophia Smith, I am a lifelong Hawaii resident, and I am writing in support of wolbachia ITT to save our native forest birds. I am a recent college graduate from University of Hawaii at Hilo in conservation biology, and I can't believe I am about to experience another extinction of our native bird species in my short lifetime. This is a science based, natural mosquito control method that is our last hope to save these birds that are so important to our ecosystems and culture. The vast majority of Hawaii residents support this and want to save our birds- please allow us a chance to save them and allow us to use Wolbachia ITT. Thank you</p>	Thank you for your comment
Chaleia Tamashiro	7/23/2023 9:25	<p>Aloha and mahalo for taking the time to read this message. I am Kanaka 'Oiwi , residing in Oahu. As a native Hawaiian, it is our kuleana to protect and preserve our 'Āina and its inhabitants . We have already lost so much ... our cultural practices, traditions, family, our land ... and the least we can do is make sure we don't lose our native bird population either . These honeycreeper birds are endemic to Hawaii . If we have the opportunity to protect them, why shouldn't we ? They need our help . It is because of western contact and the introduction of mosquitoes that our birds have been decimated. Now we are nearly down to 5 'Akikiki left in Kauai . Each native species provide something important to this island we call home . It's our kuleana to Mālama these birds .</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Marybeth Fentriss	7/23/2023 9:26	<p>Aloha, I am a Honolulu born and raised native Hawaiian bird lover who has been lucky enough to see our native birds on Oahu, Maui, and Hawaii Island.</p> <p>I support Wolbachia IIT to save Hawaiian forest birds because Honeycreepers are a unique group of forest birds found only in Hawai'i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds.</p> <p>Hawaii is at risk of losing at least four more critically endangered forest bird species to avian malaria in the next decade, and they need all the help and support we can provide. Please implement the Wolbachia ITT to save our cultural heritage. Once the birds are gone, they will never return. I don't want that to happen on my watch.</p> <p>With aloha, Marybeth Fentriss, 808-291-1166</p>	Thank you for your comment
Alyssa Piauwasdy	7/23/2023 9:41	Use IIT to reduce mosquito populations. I cannot think of a single reason not to initiate this action. Protect Hawaii's native birds and indirectly protect the native forests these birds pollinate. I believe using IIT is completely justified with the extinction crisis on hand, and quite frankly should've been done years ago.	Thank you for your comment
Mike Silbernagle	7/23/2023 9:48	<p>Comments related to: DRAFT ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA'I</p> <p>I read the detailed, thorough EA and fully support the proposal. I feel the EA covers the important aspects of the environment (threatened and endangered species, wildlife, vegetation and cultural resources, public health and safety, recreation and wilderness air quality, greenhouse gas emissions and climate change, and environmental justice) and is a vital and natural next step to saving these unique Hawai'i forest birds before it's too late and recovery becomes but a dream. I support implementation of the plan as soon as possible after all regulatory and procedural steps have been taken and approved. Many seem already initiated or approved.</p> <p>I am pleased to see the variety of treated male mosquito dispersal techniques considered. The greater the project area coverage the greater the likelihood of a more rapid decline of mosquitos in the forested areas and safer environment of Hawai'i forest birds.</p> <p>The techniques allow treated male release to areas that would otherwise be less accessible or inaccessible. Aerial treatment is a great tool. Drones are securing their place in wildlife management and this is a perfect application for this relatively new tool.</p> <p>I applaud the preparers for involving the not only the natural environment, but the cultural environment as well. The forest and these native forest birds are integrally tied to the Hawaiian culture. The rebound and recovery of these species on the brink of extinction have great environment and cultural value. Since many of these species are tied to pollination of plants important to Hawaiian culture there is another benefit in perpetuating these plants reliant on these avian species for their propagation and survival.</p> <p>I know and have worked with some of the professionals involved and interviewed and they have the qualifications, knowledge and dedication to make this a successful Action. I agree with several interviewees regarding the need for commitment to follow-up monitoring. Many times I have seen and been involved in plans where post-project monitoring is either too short or not thorough. This project is very important and post-project monitoring and reporting is critical to assessment of Proposed Action results.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Mike Silbernagle, <i>Continued</i>) I am optimistic this Action will aid in recovery of Hawai'i forest birds and a healthier natural and cultural environment. I wish this program all the success possible and look forward to monitoring updates when data are available.</p> <p>Mike Silbernagle, Wildlife Biologist, USFWS (Retired)</p>	
Robert Figarotta	7/23/2023 10:14	I believe this is the only way to save the endemic honeycreepers. Full fledged support is my opinion.	Thank you for your comment
Daniel Matthew Welch	7/23/2023 10:25	Hawaiian honeycreepers are a unique family of birds found nowhere else on the planet. More than half of the endemic birds have gone extinct. We can't let anymore species vanish, because extinction is forever. There are two species of birds here on Kauai that could be extinct anywhere within 1-5 years: We can't let that happen! Please, as a concerned citizen, I sincerely insist that the mosquito suppression program become into affect immediately. Without it, avian malaria will continue to cause our incredibly important birds to vanish to the harsh reality of extinction! Please act now! Sincerely, Daniel Welch, 5923 Kololia pl #C, Kapaa, HI 96746	Thank you for your comment
Chris Wong	7/23/2023 10:28	I am in full support of the implementation of the incompatible insect technique to reduce mosquito populations on a landscape level on the island of Kauai to reduce the transmission of mosquito borne avian diseases. Despite over 20 years of conservation efforts to address threats such as pigs and habitat loss, we are still witnessing extinctions of our native manu with the akikiki being the latest victim. We finally have a chance to address the problem of mosquitoes and it would be irresponsible to not take advantage of this opportunity for the future of our forests. Anyone who is against the implementation of IIT does not work in the field and is blind to the history of our forests.	Thank you for your comment
Lucas Behnke	7/23/2023 10:32	Fifteen years ago, 'akikiki, a small, light gray, unassuming bird of the most intact 'ōhi'a lehua forests of Kaua'i, regularly flitted above my head, calling with a high, sweet whispered tchweet. I recognized then that I was privileged to be one of the few people to have such an opportunity, so often and so intimately. It was as if I had been invited into their living room of tall mossy 'ōhi'a and quaking lapalapa to witness the daily joy and tumult of their lives. The search for food – clinging, peering, probing, creeping along the trunks and branches of the trees. The occasional dispute with the neighbors – a muted explosion of chip notes and fluttering wings. The raising of young – needy in their infancy and delightfully curious in their adolescence. What should be ordinary, mundane, and uneventful even, part of the Hawaiian forest is something that future generations may never see, and it's happened too many times already. Mosquitoes carrying and transmitting avian malaria have already forever changed the nature of the forests across the islands, and while it may already be too late for the 'akikiki, there's now a science-backed method for controlling mosquitoes that we've never had access to in the past. This could save many species that exist nowhere else on earth and are a part of the fabric and history of the islands. While this technology, and the innovative methods developed to deploy it in challenging locations, could have great benefits for human health in the future, the importance of rolling it out now to save imperiled forest birds is paramount. I am in full support of this project, and having read the EA, there are practical questions yet to be answered about how best to implement this at scale, but there are no major questions remaining about its safety or readiness for immediate use.	Thank you for your comment
	7/23/2023 10:35	I support Wolbachia IIT to save Hawaiian forest birds because it is backed by rigorous research and is the only hope we have at the moment to safeguard these species considering climate change. It would be unfortunate if these species are lost because of stupidity. Don't be stupid and get on the right side of history.	Thank you for your comment
	7/23/2023 10:35	I support Wolbachia IIT to save Hawaiian forest birds because it is backed by rigorous research and is the only hope we have at the moment to safeguard these species considering climate change. It would be unfortunate if these species are lost because of stupidity. Don't be stupid and get on the right side of history.	Thank you for your comment
Alan Robert	7/23/2023 10:38	Those birds are facing extinction, just do whatever is needed to save them. Thank you	Thank you for your comment

Name	Entry Date	Comment	Responses
Kai Morrell	7/23/2023 10:39	<p>Native Hawaiian birds are critical to the health of Hawaiian ecosystems and the cultural preservation of Hawaii. Mosquitoes are not native to this environment and have proved incredibly dangerous to native bird populations. I support this effort to save native birds! Mahalo nui to all the scientists, conservationists and representatives working to make this possible!</p> <p>Me ke aloha, Kai Morrell</p>	Thank you for your comment
Ariel Imoto	7/23/2023 10:44	<p>Dear Department of Land and Natural Resources, U.S. Fish and Wildlife Service, and other stakeholders,</p> <p>My name is Ariel Imoto, a native Hawaiian artist with a strong focus on educating people about native Hawaiian birds. Concurrently, I am pursuing my graduate studies in Plant Pathology at the University of Hawaii at Manoa. I was privileged to work closely with native birds from Kauai at the Keauhou Bird Conservation Center. One experience that left a traumatic impact on me was witnessing the death of an akikiki due to avian malaria over three agonizing days before receiving a diagnosis a week later when it was long dead. The memory of that little gray puff ball sitting under a heat lamp, hoping for its recovery, will forever stay with me. This tragic incident reinforced the critical importance of safeguarding these vulnerable creatures, as if captive birds don't stand a chance, then those flying freely in the wild face even greater peril.</p> <p>I am writing this comment in full support of the Environmental Assessment (EA) and proposed project aimed at suppressing nonnative southern house mosquitoes on Kaua'i. The comprehensive EA offers a well-founded strategy to reduce the mosquito population and protect the native Hawaiian forest birds. By adhering to environmental regulations and evaluating alternatives, the project ensures responsible and sound decision-making based on scientific evidence and cultural considerations.</p> <p>I see no legal violation as the EA complies with the National Environmental Policy Act and the Hawaii Revised Statutes. This adherence guarantees a thorough evaluation of potential impacts and outlines strategies to mitigate any adverse effects of the mosquito release, ensuring the project's compliance with all relevant Acts and regulations.</p> <p>The discussion of the no-action alternative is commendable as it provides a detailed perspective on the consequences of inaction. Additionally, the inclusion of the alternative actions (Appendix A) provided an exceptional analysis of why those alternatives were dismissed. The discussion of every alternative was fully understandable and reasonable as to why they were not an option for implementation.</p> <p>The Insect Incompatibility Technique has been extensively applied worldwide to control diseases affecting humans, making it a well-studied approach. Given the comprehensive research presented in the EA and IITs widespread use, there is no necessity to request an Environmental Impact Statement for this technique. The EA's thorough examination provides sufficient evidence to support the project's implementation without the need for further impact assessments.</p> <p>In conclusion, I fully support the project to suppress nonnative southern house mosquitoes using IIT on Kaua'i. The EA is following all rules and regulations and is backed by exemplary scientific studies. I urge all stakeholders to join in its implementation to save the native birds.</p>	Thank you for your comment
Marian Chau	7/23/2023 10:44	<p>Our 'akikiki and other forest birds (especially on Kaua'i) are suffering and on the brink of extinction, as a direct result of climate change caused by human over-consumption and over-development. It is our kuleana/responsibility to take every reasonable action to preserve endangered birds and prevent their extinction. The technique of releasing Wolbachia incompatible mosquitoes has been extensively tested and found to not harm ecosystems or human communities, and it represents our best hope for saving our native forest birds. We must act now and utilize this safe tool that is available to us to try to save our manu from extinction. Mahalo for your consideration.</p>	Thank you for your comment
Kaneao	7/23/2023 10:57	I support this action to save the birds!	Thank you for your comment

Name	Entry Date	Comment	Responses
Joseph Amory	7/23/2023 11:09	<p>I support Wolbachia IT to save Hawaiian forest birds because this is vital to prevent extinction. We do not have the luxury to wait any longer and this needs to be done asap. As a veterinarian here in Honolulu I cannot fathom why this is even being debated at this point. Let's stop wasting time and act now.</p> <p>Joseph Amory, DVM, DACVR, Honolulu, HI</p>	Thank you for your comment
Kassandra Talamantez	7/23/2023 11:12	<p>I support this EA because I refuse to see yet another native species go extinct, especially when the solution could be right in front of us. As a field technician, we put so much time and energy into our job so that we can continue to protect our native manu. The misinformation of wolbachia has lead to some people fearing a scientifically supported solution and delaying the safety of the forests. We as humans have a responsibility to fix the problems we brought to the islands, and I hope the next step forward is in support of wolbachia. For the manu!</p>	Thank you for your comment
Jodie Rosam	7/23/2023 11:16	<p>I would like to offer my support for the Draft Environmental Assessment: Kaua'i Mosquito Suppression. I have been actively involved in native ecosystem restoration on Hawai'i Island for over 20 years. I have had the opportunity to work with and witness so many incredible plant and animal species across Hawai'i. Unfortunately, I have also witnessed extinctions. I understand the depth of the loss. We are witnessing extinctions at an overwhelmingly alarming rate, and each loss is heavily echoed through human, plant, and animal communities across the pae 'āina. The rapid decline in Hawai'i's forest bird populations is more than just unfortunate, it is a tangible loss of ecosystem function and ultimately Hawaiian culture.</p> <p>Releasing incompatible male mosquitoes has the potential to reduce the mosquito population by at least 90%. IIT is not a new technology. It has been successfully implemented within the United States and 13 other countries across the globe. Without action and direct management of southern house mosquitoes, it is likely that the 'akeke'e and 'akikiki would be driven to extinction within the decade, and the 'i'iwi is likely to be extirpated on Kaua'i.</p> <p>The EA is extensive and highlights that ecosystem risks to non-target species are negligible at most. Conversely, a no-action alternative will have monumental and catastrophic negative impacts to the 'āina. I believe that if the EA were critically read and understood, much of the opposition to the incompatible male mosquito release would be overcome. While I can understand the innate concern many residents have regarding any form of a biological release, the data shows that public and environmental health impacts are not a concern. Again, a no-action alternative poses a multitude of risks. I believe that providing consistent and sound information to the public is a critical component and I truly hope that all those who choose to comment have read through the EA thoroughly.</p> <p>Mahalo for all of the hard work you all have done and continue to do for our manu.</p>	Thank you for your comment
	7/23/2023 11:27	<p>I support the proposed release of Wolbachia-altered mosquitos for the use of incompatible insect technique to help save the remaining Hawaiian forest birds from avian malaria.</p>	Thank you for your comment
Craig Foreman	7/23/2023 11:32	<p>I recently became an amateur bird photographer and I truly truly want to be able to continue photographing these amazing birds into the future. Please continue the mosquito control project so that these birds will continue to exist and fulfill their part of our forest habitats.</p> <p>Sincerely, Craig Foreman</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Katie C	7/23/2023 11:37	<p>I support this action.</p> <p>This project is essential for the conservation of Hawaiian heritage by preserving the manu. Over and over, the use of Wolbachia has proven effective and safe for the benefit of public health for humans. Reducing any human infection of dengue, west Nile, and any potential future mosquito vector based disease such as malaria should be more than enough to convince others that this action should be taken.</p> <p>Mosquitoes do not belong in Hawai'i and this action needs to be taken now.</p>	Thank you for your comment
Debbie Misajon	7/23/2023 11:40	<p>To whom it may concern,</p> <p>I'm writing in favor of IIT discovery and execution to save native birds if proven effective and not further destructive.</p> <p>Thank you.</p> <p>Debbie Misajon, Phone: 808-388-0696, Email: debbie@thecoconuttraveler.com, PO Box 327, Papaikou, HI 96781</p>	Thank you for your comment
Hailey	7/23/2023 11:43	<p>A lot of people are against this passing. Those people are uneducated on Hawaii's ecosystem and native well-being. Please do pass this. Native species in Hawai'i need to be taken care of and we can't lose any more natives. I went to school on Maui & O'ahu to learn about Hawaii's ethnobotany, geography, and ecosystems. If we don't do something now non of these birds have a chance.</p> <p>Thank you.</p>	Thank you for your comment
Melissa Simon	7/23/2023 11:43	<p>I strongly support mosquito suppression on Kauai. This science-backed technique is the only chance these birds have. Please act swiftly, we are running out of time.</p>	Thank you for your comment
Kalei Meyer	7/23/2023 11:53	<p>I support the effort to save our native birds. Please let this project pass! Our entire natural environment depends on each other and if our birds go extinct and can never be heard or seen so will other species. It is a sad thing that I will never hear or see the birds or plants that my tūtū saw, or even that my dad saw. But it breaks my heart to think my children may never see or hear their song.</p>	Thank you for your comment
	7/23/2023 11:54	<p>I support the EA</p>	Thank you for your comment
Tess Hebebrand	7/23/2023 12:45	<p>Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds.</p> <p>The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds.</p>	Thank you for your comment
Garrett Rhyne	7/23/2023 12:52	<p>I fully support the implementation of IIT on Kaua'i island to combat avian malaria. As an avian ecologist, I view the loss of Hawaiian biodiversity as an existential threat to global diversity because of the rarity and importance of the endemic honeycreepers. I hope the USFWS and DLNR approve this method to reduce invasive mosquito populations and help rescue this special and irreplaceable resource of native birds</p>	Thank you for your comment
	7/23/2023 12:53	<p>I support the decision to use IIT to decimate mosquito populations. Kaua'i native bird populations are too critical to not take action now. This method is fast, effective, and has the added benefit of not using insecticides which may hurt local insect populations.</p>	Thank you for your comment
Diego	7/23/2023 13:14	<p>I support this ea</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/23/2023 13:19	<p>In regards to the whole idea of wolbachia being used to make mosquitoes sterile, I think that we really have nothing to lose, especially when we look at our options. If this design has been tested before and does work, then I really see no problem to it. We are in a dire situation where it's practically now or never. We didn't have the kind of technology to save the Po'ouli, the Kaua'i o'o, and many that went extinct before, but now we have a chance. A chance that seems likely to work, as it has been tested and has worked, is way better than waiting to see the inevitable death of the Akikiki. Even if I haven't personally seen an Akikiki, do you think that I want to hear about the extinction of another bird, when we've lost so much. It's not just about me, as I'm quite sure I'm not the only one with the same thought. I can't even imagine how those that have seen the Akikiki are feeling right now. I really can't imagine even witnessing a species that is now gone from the Earth. At that point, we are literally watching our Earth slowly fall apart due to our own reasons. When I think about it, extinctions are inevitable, but it's just too hard to give up when you have the heart and even the chance to save a species. I also think it's unfortunate how so many people don't give a shit about what's going on in the current day, unless it starts relating to themselves. For example, I didn't really know how to feel about the comments I was reading about the topic of saving birds with the new design. I can understand if some people didn't know the full of it, but the fact that people cared about the mosquitoes being a negative effect to us, like bringing in a disease, brought me to a situation where I really didn't know how to respond. These are lab born mosquitoes, so I'm pretty sure they won't have diseases, but the fact that they choose themselves, a species with a population over 8 billion, compared to a bird species with a population 5 or less, which is completely due to that species with over 8 billion in population. Obviously, that species would be us, humans. But seriously, do you know how crazy that sounds to me? Let me put the fact that species with even a few thousand left are in danger due to less genetic variety, but look at the situation that Hawai'i is in, and has been in for years. When we look at species like the Bornean orangutan, an infamously popular but rare species, being critically endangered with a population of around 14,000. Critically endangered. The Akikiki is critically endangered too, with a population of 5 or less. Where is the extreme attention to Hawaiian birds in general that we should have had years ago? I really don't get it, but that's most likely an answer not for me. I guess it makes sense if you don't know the situation, but even some that know of the situation still go on to their daily lives. Don't get wrong, I do get it. Even with dire situations like these, we can still keep moving, but that's the part that has me on the line here. Do I really want to keep moving into a world likely of more and more extinctions? I don't know about others, but that's a really hard subject on me. I honestly wish I was born earlier so I could be able to really help with this subject. After seeing that I can go on and comment what I think about the current idea in saving the Akikiki and many birds to come, it took me a little bit of time to finally decide that I would comment. I don't know why I would consider it or not, as I know what is the best decision. Over some time, I thought that there really is no point to be scared about commenting, so I'm putting all of my thought into it. One thought that really got me was while I'm comfortably laying down on my bed in my room with A.C, trying to come up with what to say, the Akikiki is essentially fighting for it's right to exist in an environment where the average person would be scared in if they were there for too long, or if they got lost. At the end of the day, we are no longer used to a different place if we are there for too long. Everyone wants to go back to their home, a place where they don't have to worry about surviving out in the wild for their own food and such, like any other animal has to do. That's a reality that I can even confess. I'm too used to having things being handed to me almost. I'm not saying that our system of getting things is the best, as a good amount of people have to deal with poverty, but I would say a lot of people would want to live how the world is rather than having to survive on your own. Aside from that, I suppose I haven't talked about the importance as to why we should try to protect our native species. The birds, I would say, especially important to protect right now compared to the plants or even the insects. Insects will raise in population once we have more plants, so that's not too much of a problem. But anyway, the birds here are to serve as health component of the native forests. We have different kinds of birds, all to balance out the ecosystem. We have honeycreepers, which have evolved over millions of years to have their beaks fit into the flowers of the native plants, like the lobeliads. We have thrushes and flycatchers that feed on insects to balance the populations of insects such as moths. We even have or had species unique to crushing eating snails, species that eat the immature seeds of plants, etc. on the big island, the Alala had a big job of dispersing seeds of native plants, like the Ho'awa, though the species has gone extinct in the wild. It has been especially thought to bring it back into the wild due to the native Hawaiian hawk, the 'Io. While all of the birds have a vast ecological significance, they also have a large cultural significance, as a good amount of the honey creepers were harvested for feathers, but not killed. They were caught using nets, and would get stuck onto the nets due to the sap from the papala tree. The feathers were used to make cloaks and such. Aside from any more cultural information, these birds have evolved for millions of years, specifically to benefit their environment. Essentially, they're a good reason why most of our native plants are dispersed out on</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(anon, 7/23/2023 13:19, <i>Continued</i>) the islands. It also has to do with insects, but birds also have a significance for it. It's weird to think that it's still possible for a plant to exist now that was pollinated and was essentially grown from a bird species that is now extinct. But the whole idea of species spending literally millions of years to evolve to benefit the island, to benefit us, just go extinct by us. To know that we are capable of wiping out a species, and many more, is rather frightening. While frightening it is, it's unfortunately not new to us, as we've been doing that for years. We've brought species to extinction just for hunting purposes and making money. It always somehow comes back to money, something so simple but so chaotic to how we take our everyday lives. In relation to hunting, taxonomic collections of extinct species of birds here in Hawai'i are kind of sad to see, as most of those birds we really don't know much about. All we really have is what they look like due to specimens, but they were never really researched enough. Aside from that, it's sad to see a lifeless body of what used to be alive. That's why I'm really hoping that doesn't come true to the Akikiki, or the Akeke'e, just to see a lifeless body of what used to be alive. I feel like if we don't do anything to save the birds now, we just won't be able to. Especially for the Akikiki. Never did I ever think I would be alive to know that the Akikiki would be in the same position as the Po,ouli. I seriously never thought about it. I thought that the population was still around 40 or so, but apparently there's only around 5. The thought terrifies me. I guess this is what it feels like to essentially see extinction happen or live through it. It happens just like the snap of a finger, just like that. You take your eyes off of the subject for a second, and it's gone once you look back. Almost like a good dream; how you're enjoying the moment, but once you wake up, you come to the reality that it's gone. That's dream's gone. I don't want the dream of losing the Akikiki to be true. I don't think anybody that knows the situation that we're in wants it to happen, but you really do feel useless when you can't do anything about it. When you can't physically be there to help something that isn't yourself for once, you feel like you've failed even though there's nothing. You can really do about it. At least I'll feel better about myself once I submit this comment. At least I can help in some way, you know? The topic itself really isn't easy to even get yourself to talk about, if I'm going to be really honest. I've been aimlessly thinking about how I want go with what I'm saying, while having the thought of the current situation in my head. The very fact that an akikiki could be dying right now due to avian malaria as I'm creating this message is what scares the hell out of me. The fact that we've put another species in this situation, and the fact that the reality of it is unavoidable. I do tend to think what this works would look like if we never did anything, but that's obviously not reality. Even if we never existed in the first place, extinction will always take place. I've thought that maybe we're supposed to be this way, to cause another extinction crisis. This has happened with plenty of species, before we even existed, but knowing that we can save a species is the difference between if we existed or not. We made the the mistake, but we can't give hope. Any spark of hope is what carries this species on. We are legitimately the only way of saving them, so if we give up, they give up. Even if mosquitoes doesn't work, I'd say it's better that we try than to just see them die right in front of our eyes. Hell, to see the world rot in front of our eyes.</p>	
Logan	7/23/2023 13:21	We need to protect our native species, and this will be instrumental in doing so.	Thank you for your comment
Kaleiheana Stormcrow	7/23/2023 13:25	As a Kanaka 'Ōiwi artist, scientist, and cultural practitioner I support IIT to aid in the recovery of our endemic manu. Mosquitoes are not native to Hawai'i and play no vital role in our ecosystems. IIT has been used to help eradicate mosquitoes to mitigate human diseases all over the world and the EA finds no significant effect. This could be our last chance to save birds that exist nowhere else in the world, and is our responsibility as environmental stewards to do whatever is in our power to support our last remaining manu. Mahalo nui no kō 'oukou lohe 'ana mai ia'u.	Thank you for your comment
Vivian	7/23/2023 13:28	<p>loha,</p> <p>From my perspective the extinction of Hawaii native birds species can be prevented by the proven use of mosquitos by DLNR. Unfortunately there are people who just do not understand the efficacy and safety of the method proposed which will help prevent the transmission of avian malaria. Please trust the experts and start the program to save the i''wi as they cannot survive continued delays!</p> <p>Mahalo! Vivian Cohen, Kihei</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Heraldo Matthew Farrington	7/23/2023 13:46	<p>Please act NOW to implement the Wolbachia Incompatible Insect Technique on Kaua'i. Our critically endangered birds will not survive much longer in the face of a warming climate that has allowed introduced mosquitoes to penetrate the highest montane forests on Kaua'i and thereby threaten every single population of our endemic forest birds with fatal infections of avian malaria.</p> <p>The Wolbachia IIT is NOT genetic modification and it will not even eliminate all mosquitoes, but rather drastically reduce their populations in the target regions. It is a safe and effective technique that will buy our endemic bird populations a bit of precious time as we work to develop an effective vaccine.</p> <p>I spent over twenty years working all across Hawai'i Nei in support of ecological researchers from across the planet -- I understand the incredible challenges we face as we attempt to conserve our invaluable natural resources and biological diversity for ourselves and for our posterity. Mahalo for all your hard work fighting to conserve our resources and for your leadership on this issue in particular!</p>	Thank you for your comment
Natasha Barnes	7/23/2023 13:48	Save these birds! This is VERY important!	Thank you for your comment
	7/23/2023 13:53	I support the project.	Thank you for your comment
Kellen Apuna	7/23/2023 13:56	I strongly support the use of the IIT technique on the island of Kauai. Wolbachia has been studied very well for decades and could be key to the survival of our Hawaiian Honeycreepers. Please listen to the testimony of ecologists and biologists, and not the farmongering of conspiracy theorists.	Thank you for your comment
Laura	7/23/2023 13:59	I support Wolbachia IIT to save Hawaiian forest birds because I believe it is an imperative part of stopping the spread of Avian Malaria, and protecting the avian biodiversity of the Hawaiian islands. Once, more than 50 different species of honeycreepers, a truly unique group of birds, called Hawai'i home. Now just 17 of those species remain, some of which having populations of no more than 500 individuals, and they need need our immediate action to save them from joining their relatives in extinction. When just a single bite from a southern house mosquito can kill a honeycreeper, you know there is no time or room to delay in taking action.	Thank you for your comment
	7/23/2023 13:59	I support EA protect the native birds.	Thank you for your comment
CI	7/23/2023 14:13	I support Mosquito Suppression to save our native forest birds.	Thank you for your comment
Rachael Mady	7/23/2023 14:17	I fully support this assessment and plan, and hope that the Indigenous people of Hawaii are given a voice in this implementation. The time is now. We are in crisis and need to act now. Thank you for your time and effort in this endeavor!	Thank you for your comment
David Hill	7/23/2023 14:19	The Draft Environmental Assessment makes it very clear that the any potential risks are far outweighed by the potential benefits of this program.	Thank you for your comment
	7/23/2023 14:19	Save our native birds.	Thank you for your comment
Madelyn	7/23/2023 14:22	save the birds!!! don't let mankind destroy more of creation	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/23/2023 14:25	BIRDS NOT MOSQUITOS	Thank you for your comment
Aulii Mahuna	7/23/2023 14:27	I support the protection of our manu 'ōiwi	Thank you for your comment
Thea Wang	7/23/2023 14:29	I support the use of wolbachia in an effort to protect native Hawaiian birds. The mosquitoes are a recent problem for these rare birds and if nothing is done they will be driven to extinction. Time is running out there are so many hurdles to get over. It would be a disaster to not use all the tools in the toolbox. I am a biologist and i live and work to save species in California. I have visited Hawaii many times and my grandmother and great grandmother were both born in Hawaii. I haven't ever seen a Hawaiian Honeycreeper but i feel very strongly that they should be protected from extinction. For future generations including my daughter and future generations of Honeycreepers.	Thank you for your comment
Jen Sanford	7/23/2023 14:32	Hi, As a huge fan of the endemic birds of Kauai I want to voice my support for the Wolbachia Incompatible Insect Technique to save these forest birds. There are only 17 species of honeycreepers left! Without any action several species are expected to go extinct in the next decade. This is unacceptable when there is a clear way to help! Thank you for hearing me, Jen Sanford. Birder and nature-lover	Thank you for your comment
Damon tigde	7/23/2023 14:39	I am in support of releasing male mosquitoes with incompatible Wolbachia in the Kōke'e and Alaka'i Wilderness areas as a way to combat avian malaria	Thank you for your comment
Kevin Faccenda	7/23/2023 14:44	I strongly support these measures to help prevent the extinction of our endemic birds.	Thank you for your comment
Carmela Resuma	7/23/2023 14:45	Dear DLNR team, Thank you for all that you do to protect Hawai'i natural and cultural resources! I know that your work is incredibly challenging and that you must have so many issues competing for attention. I'm writing today in support of your efforts to suppress mosquito populations in Kaua'i. As someone who was born and raised in very urban areas, thanks to the education and knowledge shared by my colleagues and friends, I've come to learn the value of Hawai'i's land and animals, especially our Native Bird population. It broke my heart to learn that only 5 'akikiki are left in the wild on Kaua'i and that their recent demise is largely connected to the spread of mosquitoes and avian malaria. All living beings are incredibly interconnected. Death to one of us means death to all of us, but the reverse is true too. That a lifeline to one gives us all the opportunity to survive. In this case, you have the power to create that lifeline by taking swift action such as the Incompatible Insect Technique to suppress mosquito populations and save our native birds, such as the 'i'iwi and the 'akikiki. It is my hope that you do so, so that our future generations can continue to thrive. With gratitude, Carmela Resuma	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/23/2023 14:51	<p>It's sad to see the forests that were so beautiful and you would walk and hear native bird calls are now quiet and all you hear is buzzing or maybe one Elepaio in the distance. The 'Akikiki is at the end, the Akeke'e and Puaiohi are close, the Anianiau and Kaua'i Amakihi are getting there, the Elepaio is common now but not in the future, and I'iwi and Apapane are on other islands.</p> <p>I completely support Wolbachia and eliminating mosquitoes for the future of Kaua'i's forests. It's essential to keep these forests pristine with native species and right now this is the only thing to get rid of those f*cking mosquitoes</p>	Thank you for your comment
	7/23/2023 14:52	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Kaleolani	7/23/2023 14:55	I support this EA	Thank you for your comment
	7/23/2023 15:06	I am in full support of the actions and methods proposed for mosquito suppression to protect Kaua'i native forest birds and hope these efforts are successful. Thank you.	Thank you for your comment
Cody Lane	7/23/2023 15:08	Hello, I am in strong support of using this technique to suppress mosquito populations on Kauai. We should have done this years ago. Without this technique, we will likely lose the remaining honeycreeper species. Please vote in support of allowing this mosquito control program to proceed. Thank you.	Thank you for your comment

Name	Entry Date	Comment	Responses
E. M. R. Gross	7/23/2023 15:08	I support releasing male mosquitos that will help eradicate avian malaria by means of incompatible Wolbachia. The populations of Native island birds have been on the decline for decades, and too many populations and species are already extinct. It is our duty to protect what species we have left.	Thank you for your comment
Alan M.	7/23/2023 15:10	I very strongly support this effort to suppress the mosquito population. I am in favor of any efforts to protect the native bird population. This is the only option to save some of the most imperilled native species.	Thank you for your comment
Anya Benavides	7/23/2023 15:19	<p>Aloha. This email exists to inform you of my support for Wolbachia IIT. Without rapid action, what's left of 17 native forest bird species are headed down the pathway of continued extinction. Avian malaria is driving current extinction risks, as a single bite from a mosquito can kill an 'i'iwi and other bird species. As the temperature increases, mosquitoes are moving up in elevation and infecting birds increasingly. The Incompatible Insect Technique can lesson mosquitos, and save forest birds.</p> <p>Please contact me with any questions or concerns.</p> <p>Mahalo nui, Anya Benavides</p> <p>--</p> <p>Master of Science Student, Tropical Conservation Biology and Environmental Science , University of Hawai'i at Hilo</p> <p>I acknowledge that I live and work on Kanaka 'Ōiwi land. I acknowledge the illegal overthrow of the Hawaiian Kingdom and dedicate myself and my work to honoring this land.</p>	Thank you for your comment
Phillip Kapu	7/23/2023 15:22	I am in favor of releasing the mosquitoes. If we lose the native birds, we lose the native plants they pollinate in the mountains. If we lose the native plants in the mountain we lose our water down here. The hawaiian ecosystem is special and fragile, we need to do all we can to protect every aspect of it, not just the ones certain people know or care about.	Thank you for your comment
Joshua Lefever	7/23/2023 15:23	Please do whatever you can to suppress mosquitoes and improve the chances of survival for Kaua'i's forest birds. Human disturbances have put the birds in this dire situation, and it is our responsibility to use well informed science to prevent their extinction.	Thank you for your comment
Jessica Middleton	7/23/2023 15:24	<p>Aloha. I really hope that we can proceed with Wolbachia mosquito releases on Kaua'i and that you realize that the conspiracy theorists of Hawaii Unites claims' are all totally invalid. We need this to save our native birds! This is their last chance to avoid extinction. Please, this needs to pass.</p> <p>Respectfully, Jessica Middleton, Kamuela, HI</p>	Thank you for your comment
Beryl Blaich	7/23/2023 15:30	<p>Aloha,</p> <p>I have read the draft Environmental Assessment for Kaua'i Mosquito Suppression employing the release of male mosquitos with incompatible Wolbachia. (or most of it!) I also read the EA for the Maui project. I hope that this EA is accepted, issued a FONSI and that the next steps of this critically needed project can rapidly proceed.</p> <p>I acknowledged that this is no quick, easy or sure fix to save the most endangered Kaua'i honeycreepers. But the proposed alternatives all amount to the do nothing alternative.</p> <p>I acknowledge that there will be noise from the dispersal methods of fixed wing airplanes and helicopters and probably drones too. The forests and the people using the parks within the project area are already affected by constant airplane and helicopter operations with no purpose but to show magnificent scenery to vacationers. Meanwhile, the treasures of the forest, its voices, its propagators, the miracles of Hawai'i's unique evolution are perishing.</p> <p>Thank you. With Aloha, Beryl Blaich, Po Box 1434, Kilauea, HI 96754</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/23/2023 15:37	I am in full support of the draft Environmental Assessment for Kaua'i Mosquito Suppression to save Kaua'i forest birds from extinction.	Thank you for your comment
	7/23/2023 15:53	I have been to the forests on Kauai numerous times over the last decade. When I first visited the Alakai in 2011, Akikiki were still a regular sight. Knowing they will be gone from the wild in a matter of months is heartbreaking. We should be taking every possible measure to protect Hawaii's native birds. This is the very last chance.	Thank you for your comment
	7/23/2023 16:00	We must do everything in our ability to save Hawaii's forest birds before it's too late. The people that are opposed suck more than the mosquitoes! They should have to lie naked in a mosquito swarm and say they would rather have that than the sight and sound of our beautiful native birds overhead. Birds not mosquitoes! For our keiki and the future! I am 100% in favor of Kauai Mosquito Suppression and hopefully the rest of the state to follow. Mahalo.	Thank you for your comment
Linda and Scott Terrill	7/23/2023 16:03	The implementation of this program is critically urgent. The degree of anthropogenically caused extinction in Hawaii is tragic and we need to do everything we can to save the remaining endemic species from extinction. This program may be our last hope given the rapidly accelerating decreases in the native honeycreeper population.	Thank you for your comment
Jack Schneider	7/23/2023 16:08	It is vital that the people working to preserve native bird populations on the islands of Hawaii have access to all possible tools. In this case there is no evidence that this method of mosquito management will have any negative impacts on human health. Do not allow uniformed fear mongering control wildlife management. Protect native birds.	Thank you for your comment
Sammie Buechner	7/23/2023 16:10	It would be shameful to lose an endemic species when there are science-backed mitigation strategies available. Hawaii has lost too many endemic species already, and I don't think anyone would be able to look back with any level of pride if we lost another in 2023. Please consider this my full support of moving forward with mosquito control on Kaua'i	Thank you for your comment
Grace Sprehn	7/23/2023 16:14	I support Wolbachia IIT to save Hawaiian forest birds. It is critical we use every science backed resource we have to attempt to save these species. It would be an incredible waste to not use this technology.	Thank you for your comment
William Freedberg	7/23/2023 16:14	I support the use of Wolbachia and any other major ecological interventions to save remaining Hawaiian honeycreepers for many commonly-stated ecological reasons, but also because the extinction of the Hawaiian honeycreepers is a stain on the US' international environmental reputation and a rhetorical weakness as we preach biodiversity conservation to countries in the global tropics. We cannot keep telling Brazil and Indonesia to care for their rainforest birds when we have lost a third of our own.	Thank you for your comment
Theo	7/23/2023 16:15	Mosquito suppression is essential for the survival of at least four different native bird species. Hasn't colonialism taken enough from Hawaii? Please help stop this and save our birds <3	Thank you for your comment
Brenda Ramos V	7/23/2023 16:23	Hello, I'm writing this email in support of Wolbachia IIT to save Hawaiian birds. Over the past decades, we have observe huge declines in Hawaiian honeycreepers due to mosquitoes. Mosquitoes in Hawaii are recent and unnatural, leading to severe mass extinctions. I support the Environmental Assessment to give Hawaiian birds a chance. Best, Brenda Ramos	Thank you for your comment
Jacob Weinreich	7/23/2023 16:28	We have already lost so much in Hawaii. Don't let the 'akikiki go the way of so many other species. History will see what we do. Do right.	Thank you for your comment

Name	Entry Date	Comment	Responses
KK	7/23/2023 16:33	Please save our indigenous birds by suppressing mosquito and disease prevalence. Thank you.	Thank you for your comment
RJ Baltierra	7/23/2023 16:33	Hawaii's Honeycreepers are on the verge of extinction, with many already extinct from mostly human error and arrogance. IIT has the potential to save what is left. These birds should be protected and saved for many reasons. Not only for the importance of preserving biodiversity but also for the impact they will have on local communities and culture as a whole. Many native birds are celebrated by locals and are a part their history as well as natural history. They also help boost local economies through ecotourism, as many birders want to see them. Birding, mind you is one of if not the fastest growing outdoor hobbies in the country! So yes these birds should be saved and methods like IIT which are backed by sound science should be utilized to protect them!	Thank you for your comment
	7/23/2023 16:36	<p>Aloha,</p> <p>I am opposed to the draft Kaua'i EA for the suppression of Mosquitoes using the Incompatible Insect Technique. The EA does not contain sufficient detail for the public to evaluate and fails to provide of risk assessment for bio security of lab rearing, transport, or release of Wolbachia infected mosquitoes. There are many potential secondary impacts to include antibiotic resistance, increase pathogen infection, accidental female escape, and lab reared male mosquitoes (which can be intentionally co opted as a bio weapon by bad actors) can pass pathogens to females thru mating.</p> <p>There is insufficient proof of the actual mosquito population and rate of infection of Plasmodium relictum in proposed area. Most disturbing, is the funding behind Wolbachia research since 2002 and other connected grants thru NIH and human health includes the Bill and Melinda Gates Foundation which openly supports human depopulation and Agenda 2030 which is based on a climate emergency hoax. Furthermore, there seems to be corporate agenda leading in the direction of synthetic biology as a form of mosquito control which no one wants in Hawaii.</p> <p>I'm a very concerned citizen.</p>	Concerns: 9, 12, 13, 26, 36,
Kau'inohea Stormcrow	7/23/2023 16:47	Aloha, I am writing here now to express how important it is that we, as the community of Hawaii , do everything we can to save the remaining native bird species of our homeland. I support incompatible insect technique to save out manu population. These birds are our ohana and our kuleana and this proposed method of protection is a useful way to protect them from extinction. Mahalo nui.	Thank you for your comment
Kassandra Arias-Parbul	7/23/2023 16:50	The basis of this project seems to be a remarkable solution to limit the mosquito population. Already these wolbachia incompatatble mosquitos are used to tackle other cases such as malaria. I agree that done so correctly, it would not effect the ecosystem to a great extent.	Thank you for your comment
Leila Morrison	7/23/2023 16:51	<p>Aloha,</p> <p>As a native Hawaiian and conservationist I support this use of IIT to reduce mosquito populations as described in the proposal. This is a necessary and safe measure we must use to prevent the imminent extinction of the 'Akikiki and 'Akeke'e not to mention the other manu whose populations are also declining. It is clear that this release and use of naturally occurring wolbachia will have no negative impacts on humans. People who say otherwise need to educate themselves. We owe it to our native birds to do our very best and use the most effective tools and technology at our disposal to help them survive, which at this time includes IIT. Please do what is right and approve this proposal to prevent the extinction and continued decline of our precious manu. Once they are lost we cannot get them back. So many have been lost to us already.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Joanna Maney	7/23/2023 16:54	<p>Aloha board members,</p> <p>I am writing to express my support of the Wolbachia program to reduce mosquito populations in Hawai'i.</p> <p>I feel strongly that this program should be implemented as soon as possible because if action isn't taken immediately we risk losing our native forest birds completely. Wolbachia is a scientifically supported solution with proven results. It's not an experiment, it's been safely used with good results in other places like California, Texas, Mexico, and Australia to stop the spread of mosquito-borne diseases that sicken humans. In fact, 15 different countries, including the continental U.S. have used Wolbachia to decrease mosquito populations. It's natural, non-GMO, and safer than pesticides. There is a lot of misinformation floating around but Wolbachia doesn't hurt people, or animals that eat mosquitoes, or change the water supply in any way. Wolbachia is already in the environment—nature healthily coexists with all kinds of bacteria, we even need them in our gut to help digest food.</p> <p>Mosquitoes are not native and do not belong in Hawai'i. Additionally, no native species depend on them for food. They are, in fact, a plague on native wildlife. It is vital we fix this situation because the extinction of multiple species of birds, known only to exist here in Hawai'i, hinges on humans making the right decisions and doing the right things to correct the mistakes we ourselves have caused to this unique and fragile ecosystem we call home. Humans brought mosquitoes to Hawai'i in the 1800s and we have to be the ones to do the work to get rid of them now.</p> <p>We cannot dismiss the immediacy of this crisis. There is no recovery from extinction. Hawaiian honeycreepers are facing challenges and this is an area we can truly help have a positive impact. Do we really want to wake up one morning and hear the news that we have lost the last 'i'iwi? How will we feel if we can only describe them to our youngest family members and know they'll never see one for themselves because they are all gone? How will we feel if we know we missed a chance to save them?</p> <p>Our native birds attract tourism dollars for our economy but more importantly, they are valuable to Hawaiian culture, Hawaiian history, and Hawaiian identity. We should celebrate them because they are precious, inspiring, stunning, and they only exist here in these magnificent islands. They need our help and we will surely regret not meeting these challenges with decisive action if they disappear forever.</p> <p>One of the most beautiful things about our species is our indefatigable ability to solve complex problems and this comes into no greater light than we fix the problems we ourselves created. By reducing mosquito reproductive rates by implementing the Wolbachia bacteria plan we will see less mosquito larvae squiggling in the puddles. That's a win for birds and a solid win for us!</p> <p>Thank you sincerely for your time, Joanna Maney</p>	Thank you for your comment
Oscar Wilhelmy	7/23/2023 16:56	Save the honeycreepers! Implement the incompatible mosquito program now.	Thank you for your comment
Donna Thompson	7/23/2023 17:08	<p>Aloha,</p> <p>Please find my attached PDF testimony in opposition to the Draft Environmental Assessment for Kaua'i Mosquito Suppression. There are some very serious concerns outlined in this extensive document.</p> <p>Mahalo for your service, . Donna Thompson Kamuela, HI</p> <p>Sent with Proton Mail secure email. [TEXT COPIED FROM PDF]</p> <p>Attention: Mosquito Control Project Kaua'i Department of Land and Natural Resources U.S. Fish and Wildlife Service Aloha</p>	Concerns: 1, 2, 4, 7, 8, 9, 11, 12, 13, 14, 19, 23, 31, 33, 36

Name	Entry Date	Comment	Responses
		<p>(Donna Thompson, Continued) This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023.</p> <p>I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease.</p> <p>The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving <i>Aedes aegypti</i> males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito-borne diseases."</p> <p>https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares</p> <p>The IIT method has never been used for conservation purposes or with the species <i>Culex quinquefasciatus</i> (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.</p> <p>Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to</p> <p>Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted.</p> <p>Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gen-drive-document-for-consultation-20200129.pdf</p> <p>We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL</p>	

Name	Entry Date	Comment	Responses
		<p>(Donna Thompson, <i>Continued</i>) OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE." https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636</p> <p>Wolbachia Potential to Increase Pathogen Infection</p> <p>The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances</p> <p>"Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans." https://www.sciencedaily.com/releases/2014/07/140710141628.htm</p> <p>Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965</p> <p>Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/</p> <p>Antibiotic Resistance</p> <p>Page 12 of Kauai EA states: "To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai'i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai'i mosquitoes."</p> <p>Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning.</p> <p>The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/</p> <p>Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. "Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory's environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity."</p> <p>Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847</p> <p>"British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation." https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop-release-of-genetically-engineered-mosquitoes-in-california-florida-continues/</p> <p>There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS).</p>	

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		<p>(Donna Thompson, Continued) Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive</p> <p>“The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months.” Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/</p> <p>Horizontal Gene Transfer Between Wolbachia and the Mosquito <i>Aedes aegypti</i></p> <p>https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33</p> <p>This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov ›</p> <p>EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf</p> <p>“Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased.”</p> <p>“The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect’s nuclear genome with unknown consequences.</p> <p>Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases.”</p> <p>“The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5].”</p> <p>“It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in <i>Aedes aegypti</i> [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences.”</p> <p>“Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous.”</p> <p>Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the <i>Aedes aegypti</i> trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU</p> <p>Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, “it requires double and triple containment to make sure these don’t get out of the laboratory.” This is concerning since page 32 of EA says, “DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai’i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR</p>	

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		<p>(Donna Thompson, <i>Continued</i>) pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.”</p> <p>Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai'i. While “technology for this approach is not available for near-term implementation,” development and deployment of these tools appear to be a long-term goal at the federal level.” U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf</p> <p>Wolbachia DNA into Host DNA – “A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called <i>Drosophila ananassae</i>), and can insert parts of its genome into the genomes of members of several other host species.” https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957</p> <p>Lack of Bio-Security</p> <p>There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.</p> <p>Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html</p> <p>“We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency”. Bioterrorism on Six Legs by Dr. Manas Sarkar.</p> <p>A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en</p> <p>Page 23 of the EA states “By contrast, male’s proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden</p> <p>2009). Therefore, male mosquitoes cannot transmit disease.” This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources.</p> <p>Venereal Transmission of St. Louis Encephalitis Virus by <i>Culex quinquefasciatus</i> Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false</p> <p>There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No</p>	

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		<p>(Donna Thompson, <i>Continued</i>) documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i.</p> <p>The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor-and-two-chinese-nationals-charged-three-separate-china-related</p> <p>The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning.</p> <p>https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200-mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo</p> <p>Wolbachia Has Been Implicated in Human Disease</p> <p>Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, "There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive". https://www.cdc.gov/parasites/onchocerciasis/treatment.html</p> <p>"For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision". https://www.science.org/content/article/worms-may-not-act-alone-river-blindness</p> <p>Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/</p> <p>Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/</p> <p>The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). "</p> <p>In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext</p> <p>"Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma."</p> <p>The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed:</p> <p>"Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of</p>	

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		<p>(Donna Thompson, Continued) evidence determination in EPA’s assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?”</p> <p>The Board’s response states: “The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes.”</p> <p>Inconsistent Climate Data and Mosquito Population Trends</p> <p>The EA states, “Some climate change models suggest that the mean temperatures in Hawai’i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014).”</p> <p>Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of –0.2 to –0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c</p> <p>Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf</p> <p>Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick-moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF</p> <p>Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches-climate-change-sea-rise</p> <p>In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua’i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225</p> <p>“The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa’akai and 16 mosquitoes caught at Kawai’oi in October and November for P. relictum infection using PCR. One mosquito from Halepa’akai tested positive for infection. We dissected 33 mosquitoes caught at Kawai’oi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa’akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69).”</p> <p>Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai’i Island. “Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai’i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014).”</p> <p>Page 19 of EA states “Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species.” I could not find a reference study proving the mosquitoes are invading higher</p>	

Name	Entry Date	Comment	Responses
		<p>(Donna Thompson, Continued) elevations in the proposed release areas in Kaua'i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013.</p> <p>Verily Life Sciences and Rhodamine B</p> <p>Verily's registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito-Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estimate_movement_mating_and_population_parameters_in_preparation_for_an_incompatible_male_program</p> <p>The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai's MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms?</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522</p> <p>Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/</p> <p>In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago.</p> <p>I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program "there is no field evidence it can reduce the risk of mosquito born diseases". The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem.</p> <p>Respectfully, Donna Thompson Kamuela, HI sharkgss@protonmail.com</p>	
Stephen Tarnowski	7/23/2023 17:10	<p>Please implement this mosquito control action to give Hawaii's honey creepers a chance at continued existence. The no action alternative would be an unfathomable loss to our national avifauna and cultural and biological heritage.</p> <p>Thank you, Stephen Tarnowski</p>	Thank you for your comment
Jade Arneson	7/23/2023 17:11	<p>I support Wolbachia IIT to save Hawaiian forest birds by suppressing mosquitos and the threat they pose to the continued existence of several species of endemic birds. Without action, several species of honeycreepers, which are only found in Hawaii, will face extinction. Never again will Hawaii have their songs.</p>	Thank you for your comment
Penny Concerned Citizen	7/23/2023 17:17	<p>Please consider my testimony AGAINST any release of mosquitoes on any of the Hawaiian islands.</p> <p>It is a very concerning development that mosquitoes have already been released in eastern Maui. More thorough research, testing and environmental studies are definitely required. Please do not think that we can interfere in a complex environment like Hawaii's ecosystem without triggering undesirable and unexpected consequences. This is a living disease vector for animals and humans that has spread misery throughout the world. What a precious natural environment to be experimenting on. I can't even believe we would even remotely consider this.</p>	Concerns: 2, 9, 10, 11, 19
Braden Collard	7/23/2023 17:19	<p>Just pass the damn thing. I don't have time to read it but we need to save these species.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Danny Tipton	7/23/2023 17:20	Hello, I support Wolbachia IIT to save Hawaiian forest birds. Whatever can be done to save the last few remaining precious native honeycreepers on the Hawaiian Islands, in my opinion, should be done after humans have done so much to eviscerate this group. The least we can do is try to help protect them from avian malaria and other mosquito-borne diseases. Please, value these birds. Danny Tipton	Thank you for your comment
Lisa Ferentinos	7/23/2023 17:20	The environmental impact of doing nothing is unacceptable. This project should receive a finding of no significant impact and expedited. Humans depend on a complex web of life. Weakening one link weakens the web. Mahalo the birds. Mahalo, Lisa Ferentinos	Thank you for your comment
	7/23/2023 17:20	I support Wolbachia IIT to save Hawaiian forest birds because without an immediate plan to save the birds, they will go extinct. Avian malaria is the biggest threat to the survival of the native forest birds and mosquito control is the most pragmatic solution in all senses to combat this threat. Mosquito species infected with a different strain of wolbachia have been released elsewhere around the world to combat threats brought upon mosquito borne diseases. IIT is a proven concept and the use of Wolbachia strategies is the most ideal to swiftly take action. Studies have shown the failure of horizontal transfer of differing wolbachia strains from mosquitoes already infected to non-infected mosquitoes. There is no external threat to releasing these mosquitoes and only positive outcomes can be expected, backed up by scientific research. The time is now, before the remaining birds fall to avian malaria and our native forests will no longer be home to native forest birds.	Thank you for your comment
JoAnna Maney	7/23/2023 17:21	Aloha, my name is Joanna Maney. I am a Honolulu resident, an artist, a small business owner, and a volunteer for the Hawai'i Wildlife Center. My artwork is featured on this year's Hawai'i Conservation Stamp and I am writing in support of the Wolbachia program. In the past several years, I have witnessed interest in native birds surge among the community as evidenced by social media, art, and volunteerism. Social media groups focusing exclusively on Hawaiian birds have a combined following of over 55,000 people across multiple platforms. These individuals dream of seeing native birds flourishing in Hawaiian forests and now we have the opportunity to make that happen. The decline of Hawaiian birds is directly tied to human activity, including the introduction of mosquitoes and the rapid advancing of climate change that allows these pests to climb higher into the last havens of island birds. This is a chance to clean up our mistakes. The science is sound and the evidence of success can be seen in the US and globally. We can be confident in moving forward. The concerns of the opposition have been thoroughly addressed by the science community, however we continue to hear the same fearful speculations repeated. In response, I would like to remind the board that the introduction of mongoose was not, in fact, the result of a studied biocontrol but rather the whim of a farmer.—not the same thing at all. I'd also like to remind the board that nothing new is being created in the Wolbachia technique because this bacteria already exists in the environment around us. There is no gene altering taking place. There is no chance of creating a new type of mosquito. These are the same mosquitoes that have spread all over the world and we would be using the same method to mitigate their numbers as other countries. There will always be members of the community whose fear of doing something new is greater than their fear of doing nothing at all, but if we as a species embraced that kind of fear we would never have progressed to the places we are now. The fear manufactured around something already successfully in use in the US is a waste of our energy, resources, and time. It's likely, regardless of the decision today, that Wolbachia will eventually be used here to limit the mosquito-borne diseases that sicken humans. But having this effective control method already in place could prevent suffering, loss of life, and the economical impact of a public health crisis. I beg the board to not delay this program. A time consuming EIS (Environmental Impact Statement) will seal the fate of multiple species. Let's not make that mistake. Safety and effectiveness have already been established. Meanwhile extinction is looming for species that mean a great deal to Hawaiian history, Hawaiian culture, and Hawaiian identity. We need immediate action. Postponing	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(JoAnna Maney, <i>Continued</i>) this program for further redundant studies would be like asking a qualified EMT to go take a refresher course in CPR when there is a cardiac patient laying right in front of them.</p> <p>We know what works. A wealth of proof is before us in the form of real-world successes. Now is the time to make the decision to move forward.</p> <p>Mahalo for your time, Joanna Maney</p>	
Dayoldpoi	7/23/2023 17:32	I support this EA	Thank you for your comment
Molly	7/23/2023 17:40	I support the use of IIT to protect biodiversity and save native birds! Too many of Hawaii's native species have gone extinct already, let's save the ones we still have.	Thank you for your comment
Kyle Pias	7/23/2023 17:46	I wholeheartedly support the safe and scientifically supported IIT project described in the EA. I am a conservation worker on the island of Kauai and have worked at conserving native species of birds here for the last 10 years. My first two years on island were spent working with the Kauai Forest Bird Recovery Project. I worked closely with all species of Kauai's native forest birds, but in particular focused on the 'akikiki, 'akeke'e, and puaiohi. I helped to design and implement the egg collection techniques that were used to establish captive populations of 'akikiki. I have spent and continue to spend much of my time in the high elevation forests of Kauai and over the past 10 years have seen the mosquitoes spread and heard the birds go quiet. We must act now to attempt to save the birds that are left. This technique is the best available, poses no risk to people or the environment, and can be relatively easily implemented. Please approve this project to conserve our native birds.	Thank you for your comment
	7/23/2023 17:46	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
RH	7/23/2023 17:53	I support the use of IIT to protect and preserve our native manu.	Thank you for your comment
Brittni Brooks	7/23/2023 17:55	<p>Hi! I'm writing in support of mosquito suppression. Please do everything possibly to eliminate avian malaria and help the remaining honeycreepers survive.</p> <p>Thank you, Brittni</p>	Thank you for your comment
Forest Jarvis	7/23/2023 18:08	When the birds are gone, they're gone forever. We've lost too many Hawaiian birds already to simply dither while even more of them slip away. The methods are science-based and this is our only chance.	Thank you for your comment

Name	Entry Date	Comment	Responses
Semyon Bilmes	7/23/2023 18:12	<p style="text-align: right;">23 July 2023</p> <p>Attention: Mosquito Control Project Kaua'i Department of Land and Natural Resources U.S. Fish and Wildlife Service</p> <p>In his testimony I am standing in opposition to the draft of Kaua'i Environmental Assessment (EA). We need to stop this right where it is, we can't be taking lightly this extermination technology. At the very least, we need to hit the pause button, and go through due diligence long term research on ALL possible side effects of releasing billions of infected mosquitoes to the Hawaiian Island.</p> <p>Arthropods make up about 75% of all animals on Earth and even bigger percentage in Hawaii, and have a major role in maintaining ecosystems as pollinators present complex and poorly understood ecological relationships, and alterations in reproductive parameters of non-target species can generate ecological disturbances. The Cartagena Protocol - a United Nations safety regulation for transfer, handling, and use of genetically modified organisms is not applicable to Wolbachia-infected mosquitoes because the bacteria are considered non-transgenic. Therefore, the release of insects hosting Wolbachia was not subject to these regulations.</p> <p>But even in case of genetically modified mosquitoes, transfer of which in one Brazilian town was supposed to reduce the number of mosquitoes did not work as planned, laboratory produced mosquitoes are continually breeding in Brazil, despite biotech firm's assurances to the contrary. The claim was that genes from the release strain would not get into the general population because offspring would die. That obviously was not what happened. Mutated insects have been found in the natural population of mosquitoes, which was never supposed to happen.</p> <p>There is a strong probability that Wolbachia strains being transferred to other insects and the potential environmental and economic impacts of this host. Wolbachia strains are capable of transferring horizontally among distantly related arthropods in a short evolutionary time. Moreover, some parasites are able to carry Wolbachia strains to other species. Although mosquitoes deliberately infected with Wolbachia could reduce the need for insecticide use, the consequences of Wolbachia host shift to native species are for now, unpredictable. One of many possible unplanned outcomes is that through horizontal transmission, arthropods may develop resistance to pesticides.</p> <p>As far as I am aware, no country has regulations specifically pertaining to Wolbachia-infected insect release or mitigation strategies to deal with unexpected results. The release of insects hosting Wolbachia strains should be more carefully considered, and further studies of the potential impact of these bacteria on biodiversity should be undertaken.</p> <p>The public has a right to meaningful participation in the decision-making process for this project.</p> <p>Any action by the BLNR to deny Hawaii Unites' petition for a contested case hearing would be an infringement on the public's right to due process and open government.</p> <p>Semyon Bilmes, 3365 Kuaua Pl. Kihei, 96753</p>	Concerns: 9, 14, 18
Christiana Hetzel	7/23/2023 18:16	Aloha, We're writing to voice our support for the birds. Please do the right thing & prevent their extinction. Jason & Christiana Hetzel	Thank you for your comment
sheila indamascus	7/23/2023 18:24	I support efforts to eliminate mosquitoes which carry disease to birds.	Thank you for your comment
Jack Bechtel	7/23/2023 18:40	It is my strong belief that IIT is a safe and critical tool that must unambiguously be used to control mosquito populations on Kaua'i and other Hawaiian islands to stop the spread of avian malaria and protect the deeply engendered birds that were here long before mosquitoes were brought to HI by colonization. Every available tool at our disposal should be used to protect Kaua'i endemic species. A lack of action and failure to deploy IIT in Kaua'i constitutes condemnation of irreplaceable native species to extinction to appease uneducated individuals without a strong grasp of the science and safety of the well studied biological tools that are	Thank you for your comment

Name	Entry Date	Comment	Responses
		available. I deeply support the native species of Kaua'i and hope the use of infertile mosquito technologies will help prevent the extinction of Akikiki and other vulnerable birds that call the island home.	
	7/23/2023 18:40	I support this EA.	Thank you for your comment
	7/23/2023 18:44	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Becky	7/23/2023 18:49	<p>Aloha,</p> <p>I am saddened to hear that multiple bird species will go extinct within the next five years due to mosquitos. I support the birds and hope things can be done to save these beautiful birds.</p> <p>Mahalo,</p> <p>Becky</p>	Thank you for your comment
Brendan C	7/23/2023 18:54	I support the IIT to provide better habitat conditions and survivability of native and threatened/endangered wildlife. Specifically birds threatened by disease carried by mosquitoes. Human disturbance has exacerbated these impacts and I humbly ask the government via its natural resource agencies to take action to protect native species and enhance habitat conditions and chances of survival.	Thank you for your comment

Name	Entry Date	Comment	Responses
Justin Hite	7/23/2023 18:58	<p>Aloha. I am writing in support of using Wolbachia IIT to save the Hawaiian honeycreepers on Kaua'i. Most of Kaua'i's honeycreepers will go extinct if we do not do this.</p> <p>And not only must we do this, but we must succeed. If this technique does not work, the birds will go extinct.</p> <p>For the past nine years I have worked to try and save the 'akikiki. I began in 2015, finding their little mossy nests high in the 'ōhi'a. I helped coordinate the crews that collected these eggs and flew them out of the field to be hatched and raised and eventually bred. We now have a small flock of about 50 birds in breeding facilities. Soon this is all that will remain.</p> <p>During this time I mapped and tracked the wild birds. I witnessed their decline in the valleys of Halepa'akai and Halehaha. The number of 'akikiki breeding pairs in those two valleys dwindled from 35 in 2015 to zero in 2022. I couldn't bring myself to go back to these valleys in 2023. I can't bear the idea of walking those forested ridges valleys and having them be entirely empty of 'akikiki. I knew so many of these birds individually, more than 100 of them. I followed different breeding pairs, knowing how many young each of them fledged every year. I then tracked those fledglings in following years, noting who paired with who, how many young they had, if they failed or succeeded at breeding. I celebrated their successes, I mourned the disappearances of beloved adults.</p> <p>This past field season I led the efforts to bring the very last 'akikiki in out of the wild. It broke my heart to do this. I wanted to believe that it was the wrong decision, that we still had time, that we should just leave these last individuals out there and hope that they would survive long enough for IIT to save them. But during the field season, as we tried our hardest to catch birds, we witnessed them disappearing faster than we could catch them.</p> <p>We observed 16 breeding pairs in March of this year, but by June there were only five individuals left. In that time we had only caught two. They simply died before we could catch them. Every nest that we did not collect eggs from also failed. In many cases the adults simply vanished while incubating or brooding their young, never to be seen again, abandoning their eggs and chicks to the rain.</p> <p>For nine years I had a front row seat to extinction in the wild. It will haunt me for the rest of my life. I will blame myself for not raising the alarm louder, for not raising it sooner, for not forcing everyone to take this more seriously before now. I doubt there will be any 'akikiki left the wild at the end of this year. Already we believe the male from the last breeding pair – one of the five remaining – has disappeared. The exact same thing is coming for the 'anianiau, 'akeke'e, Kaua'i 'amakihi, 'i'iwi and 'apapane.</p> <p>Not only can IIT save these birds, it can radically change the ecological landscape within which they live. Without mosquitoes and avian malaria, the dramatic declines in their populations may not only lessen, but their populations may begin to grow again. All of the habitat is still beautiful and perfect and intact. Rarely in conservation do we have the opportunity to do something remarkably positive for the environment. Most conservation actions can only hope to slow declines, not dramatically reverse them. That is what we have a chance to do here. If we do not act now the honeycreepers of Kaua'i will quietly vanish, never to return.</p> <p>My first daughter, Fiona Wren Lilly, was born four days ago. She will never see 'akikiki quietly work their way up and down the mossy 'ōhi'a in the Alaka'i. If we do not act now to limit mosquitoes with IIT, she will also not have the opportunity to see 'anianiau sipping nectar from green 'ōhelo blossoms or watch the scarlet feathers of an 'i'iwi flash past her through the dark forest. I hope we do act, and that she can enjoy these wild birds as all the generations before us have.</p>	Thank you for your comment
Kazz	7/23/2023 18:59	<p>Aloha,</p> <p>I am writing this email to urge you to support efforts to stop the extinction of our native birds by stopping the spread of mosquito-borne disease. One bite from a mosquito is sufficient to sicken and kill many of our already threatened native species of birds. For some it may already be too late. Without immediate action multiple species will go extinct within the next five years.</p> <p>Please allow this program to proceed. If you don't, Hawai'i will be a quieter, sadder and more silent place.</p> <p>Mahalo for your mālama and kuleana. Joy Kaaz</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
John Morey	7/23/2023 19:09	We, the people of Maui, should not be treated as lab rats. Already there have been problems reported in other states and other countries regarding the release of "biopesticide" mosquitos and genetically altered mosquitos. This type of experimentation is dangerous to humans in the absence of further testing. Everyone involved in this activity should be held accountable.	Concerns: 2, 4, 9, 11
Adam Wayson	7/23/2023 19:16	Hawai'i needs to act now so in order to stop and hopefully reverse the mass extinction of Hawaiian animals, especially our manu. Many Hawaiian born children have never seen a native honey creeper and at the current rate, they never will. Please allow for all action toward suppressing threats to our native animals. Please advocate for our animals and actively seek to eliminate controllable threats.	Thank you for your comment
Alicia	7/23/2023 19:16	Please do not release mosquitoes on the people and aina! What a nightmare I can't believe this is even a thing! Is this the legacy you wish to leave? How much money is who getting?	Concern: 26
Maureen Oberacker	7/23/2023 19:19	<p>I AM OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Keliikanoe Mahi	7/23/2023 19:23	<p>Aloha kākou,</p> <p>I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration.</p> <p>Mahalo, A. Keli'ikanoe Mahi I'm gonna.</p>	Thank you for your comment
Ryan Chang	7/23/2023 19:23	<p>To whom it may concern,</p> <p>My name is Ryan Chang and I am in strong support of saving our native endemic birds with the use of IIT (Incompatible Insect Technique) to help suppress mosquitoes and mosquito borne diseases such as avian malaria. I grew up on O'ahu and frequently visited Kaua'i. One of my fondest memories of birds on Kaua'i is during the summer of 2015. It was one the first time hiking into the Alaka'i swamp. I remember hiking and stopping at a vantage point with a bunch of photographers lined up. They were photographing an 'i'iwi, one of our native honey creepers. This was the last time I've seen or heard that bird on Kaua'i.</p> <p>I recently traveled deep into the Alaka'i, botanizing and birding off the the Mōhihi-Wai'alae trail where some of the birds like the 'akikiki and the 'akeke'e inhabit. Sadly I did not see or hear one native bird. These birds are going extinct within my lifetime and it is incredibly hard to witness this happen.</p> <p>Please approve the EA and FONSI to prevent this birds from going extinct!</p> <p>Sincerely, Ryan Chang</p>	Thank you for your comment
Gerard Mahi	7/23/2023 19:27	<p>Aloha kākou,</p> <p>I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration.</p> <p>Mahalo, Gerard Mahi</p>	Thank you for your comment
Alicia 'Ilikea Kam	7/23/2023 19:31	<p>Aloha kākou,</p> <p>I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration.</p> <p>Mahalo, Alicia M. 'Ilikea Kam</p>	Thank you for your comment
	7/23/2023 19:32	Please protect Hawaii wildlife from mosquito borne diseases. Please use mosquito controls to keep endangered bird species alive.	Thank you for your comment
Katia	7/23/2023 19:34	We absolutely need to do this to save our birds. They are Hawaii. Writing in support of mosquito suppression to save our birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Jean Campbell	7/23/2023 19:40	<p>Our native birds are disappearing in large part due to mosquito borne diseases. Where I live in Volcano, there were no mosquitoes until about 2007. The forest around my home was full of Oma'o, our native thrush. The Oma'o have now disappeared from the area. The last time I saw or heard one was at least 7-8 years ago. Very sad. Thankfully Oma'o are still present in other areas.</p> <p>We have a chance to prevent the actual extinction of Kauai's native forest birds if we act quickly. Please approve the release of mosquitoes for this purpose. Extinction is forever. We have already lost too many species. Please don't contribute to more of this loss. Thank you.</p> <p>Aloha, Jean Campbell, Volcano, Hawaii</p>	Thank you for your comment
	7/23/2023 19:41	I strongly support the USFWS and DLNR's use of IIT to reduce the non native mosquito population. We must take immediate action to protect native species from becoming extinct. We have a crucial window in which to take advantage of the science available to us to prevent the loss of these birds. This is a safe and concrete action we can take to make real environmental change now. Please listen to the science and not to the conspiracy theories surrounding this initiative.	Thank you for your comment
	7/23/2023 19:42	I support the use of IIT in order to suppress mosquitoes to save our native forest birds.	Thank you for your comment
Kathleen Grady	7/23/2023 19:43	I support Wolbachia IIT to save Hawaiian forest birds because as a wildlife biologist, I know that honeycreepers are a unique and imperiled group of forest birds found nowhere else. Without swift action, even more of them will fall to extinction, and soon. Avian malaria is a threat to these special birds. The invasive mosquitoes that have arrived in Hawaii could actually be suppressed by the incompatible insect technique and maybe we can help save the native forest birds.	Thank you for your comment
	7/23/2023 19:53	It is absolutely imperative this project starts as soon as possible. There is no other tool we have to readily prevent the extinction of some of Kauai's native birds. These species deserve a place on this plant in the Hawaiian forests and we owe it to them to rescue them from extinction. Furthermore, the use of wolbachia is tried and true as it has been used in other cases successfully.	Thank you for your comment
	7/23/2023 19:58	I support the use of IIT to suppress mosquitoes on Kauai and protect our native forest birds.	Thank you for your comment
	7/23/2023 19:58	<p>Aloha,</p> <p>With the recent news of only 5 'akikiki being left in the wild, it is more imperative now than ever that we truly prioritize our native birds. Hawai'i is already the bird extinction capitol of the world. We are seeing history repeat itself and extinction right in front of our eyes. I support this project to help protect and hopefully save our native birds. Though this is only one aspect of the uphill journey to save our native and endangered birds, it is a crucial part to help deal with one of their biggest threats. As the climate warms, the spread of mosquitos will continue into more of our native habitat. It is crucial that we do all we can, while still thinking of all impacts to the environment, to protect our native birds especially from avian malaria.</p> <p>Mahalo nui</p>	Thank you for your comment
Owen Sinkus	7/23/2023 20:01	<p>I am writing to voice my support for Kauai Mosquito Suppression through IIT. So many of these majestic and unique species of birds are dwindling and disappearing so fast due to human introduction of non-native mosquitoes, so we must take action to slow and stop the damage we have done and try to save as many of these birds as we can. This is not a natural cycle, this is a human introduced plague. If we don't do anything, our apathy will lead to their demise. Please keep the birds' lives in the forefronts of your minds when thinking about this.</p> <p>Thank you.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/23/2023 20:04	I support this wholeheartedly. I am a resident of Oahu but work with wildlife and dearly value the native birds. I hope that DLNR will move forward with this and protect our native species. Mahalo	Thank you for your comment
Kiandra Mitchell	7/23/2023 20:13	The endemic birds of Hawaii are not only beloved, but an important part of the ecosystem. They bring in visitors to keep the Hawaiian economy robust, while fulfilling the important role of seed dispensers. They are living textbooks on how evolution works. It is imperative to save them, and IIT is one major weapon in mitigating their declines from avian malaria. Please support the use of IIT so we may have a chance of saving some of these species from extinction.	Thank you for your comment
Brad Shine	7/23/2023 20:16	I support Wolbachia IIT to save Hawaiian forest birds because if we do not do action we will see more native and endemic bird populations go extinct. Without swift action, several species of honeycreepers will become extinct in the next ten years. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Mosquitos never belonged in Hawaii but birds like the 'Akikiki do. Let's use the tools we have available like IIT and curb invasive mosquitoes in Hawai'i where they never belonged!	Thank you for your comment
	7/23/2023 20:19	Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawai'i's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Keep what makes Hawaii!	Thank you for your comment
Jamie Ahuna	7/23/2023 20:20	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. Mahalo, Jamie Perry	Thank you for your comment
Susan Oakland	7/23/2023 20:21	>> I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. >> >> Mahalo, Susan & Gary Oakland	Thank you for your comment
Kyoko Johnson	7/23/2023 20:23	I support this EA and the use of mosquitos/wolbachia to help save native forest birds!	Thank you for your comment
Dona Ahuna	7/23/2023 20:25	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. Mahalo, Dona Ahuna -- Family, Everything, Always	Thank you for your comment

Name	Entry Date	Comment	Responses
Halia Ahuna	7/23/2023 20:26	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. Mahalo, Halia Ahuna	Thank you for your comment
Iokewe Ahuna	7/23/2023 20:27	>> Aloha kākou,>> >> I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. >> Mahalo, Iokewe Ahuna	Thank you for your comment
Ku'ulei Wong	7/23/2023 20:37	Aloha mai, I was born and raised on Kaua'i and I've had the unfortunate opportunity to hear our forests that used to be full of life fall silent. As a kanaka, our birds connect us to our culture, to our ali'i, to a time before western perspectives. They were highly revered and for good reason. They are the balance of the forest; the birds have evolved with the forest here and due to adaptive radiation, they create PERFECT HARMONY. They are the reason for healthy forests, healthy aquifers, and then some. We need to do everything we can to protect them as they are found nowhere else on Earth. How can we let a rare gem be lost forever? I wholeheartedly support the IIT movement; our birds need our help, we are the reason for their demise. Please for our 'āina, for our kūpuna, for Kaua'i.	Thank you for your comment
	7/23/2023 20:37	I support mosquito control on Kaua'i. Wolbachia is a near-ubiquitous insect symbiont and poses an effective natural control for mosquito populations (which are non-native to Hawai'i). Mosquitoes spread avian malaria (which is also non-native to Hawai'i), which is a major cause of declines in native Hawaiian birds, including the critically endangered honeycreeper.	Thank you for your comment
Scott Blackwell	7/23/2023 20:39	I am in favor of mosquito control on Kaua'i and other islands to conserve and help to prevent the extinction of native Hawaiian birds. There is no time, native birds will become extinct and this a proven method that can give them a slim chance of survival. Please support mosquito control and save our native birds from extinction!	Thank you for your comment
A. G.	7/23/2023 20:41	Yes, I'm for using the Incompatible Insect Technique to protect Kaua'i's native forest birds! It's to everyone's benefit.	Thank you for your comment
S. I.	7/23/2023 20:44	Yes! I'm in favor of using the Incompatible Insect Technique to protect Kaua'i's native forest birds! It's important that we save what little is left of Hawai'i and to do so, we need to consider all options and use all available tools.	Thank you for your comment
	7/23/2023 20:47	Please help save these beautiful and important birds!!	Thank you for your comment
Tiare Gutierrez	7/23/2023 20:48	In other parts of the country and world, Incompatible Insect Technique has been tested and proven safe and effective when used for the benefit of humans. In which case, there's no reason we should prevent it from being used for the survival and recovery of Kaua'i's native forest birds, crucial not only to our diverse ecosystem, but unique culture. To steward such wonders of creation is our God-given duty, one which we've not properly exercised in our imperfect state and for which we will be held accountable. It's our responsibility to pull these birds back from the brink of extinction to which we've pushed them and provide such species as the 'akikiki, 'akeke'e, 'apapane, 'anianiau, i'iwi, and 'amakihi with an environment in which they're able to not just survive, but thrive.	Thank you for your comment

Name	Entry Date	Comment	Responses
Emmylou Kidder	7/23/2023 20:54	As a bird biologist on Kaua'i, I would like to share my full support for this EA to suppress mosquitos on our island using the Incompatible Insect Technique. It is my professional opinion that this plan poses no risk to the public and is necessary to prevent the extinction of our remaining forest bird species. Opposers of this EA are fueled by misinformation, conspiracy, and fear-mongering while supporters are backed by rigorous peer-reviewed scientific research. The loss of our Kaua'i manu would be a cultural and ecological tragedy. It is our kuleana to protect the aina by moving forward with this EA. Mosquito suppression using the Incompatible Insect Technique has been successfully applied in various other states and countries with no adverse effects. This EA is our best chance to change the tide of the bird extinction crisis in Hawaii and we have no tangible excuse not to move forward with this plan. Please listen to the recommendations of conservation professionals and move forward to safeguard our manu. Mahalo.	Thank you for your comment
Jason Ley	7/23/2023 20:54	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers.	Thank you for your comment
Yoshio Akaha	7/23/2023 20:56	Please enact policy to rid our islands of threats to native birds that our vital to perpetuating a healthy ecosystem.	Thank you for your comment
M. G.	7/23/2023 20:58	<p>Aloha!</p> <p>In other parts of the country and world, Incompatible Insect Technique (which uses naturally occurring bacteria, Wolbachia, from male mosquitoes that don't bite) has been tested and proven safe and effective when used for the benefit of humans. In which case, there's no reason we should prevent it from being used for the survival and recovery of Kaua'i's native forest birds, crucial not only to our diverse ecosystem, but unique culture.</p> <p>To steward such wonders of creation is our God-given duty, one which we've not properly exercised in our imperfect state and for which we'll be held accountable. It's our responsibility to pull these birds back from the brink of extinction to which we've pushed them and provide such species as the 'akikiki, 'akeke'e, 'apapane, 'anianiau, i'iwi, and 'amakihi with an environment in which they're able to not just survive, but thrive.</p> <p>Mahalo for realizing the importance of this matter and allowing the public to comment.</p>	Thank you for your comment
Shyla M	7/23/2023 21:01	<p>No to Kauai gmo mosquitoes. Why introduce one more animals that isn't supposed to be introduced? DLNR is known for introducing the invasive fish species, egrets, toads, and now one mosquito that wasn't even proven to save birds? No thank you.</p> <p>Shyla Moon and Isaac Moon, Kauai resident, 808-652-0913</p>	Concerns: 3, 4, 10
Chris Frohlich	7/23/2023 21:02	Mosquito suppression is incredibly important at this juncture in Hawaiian history. Our native birds are on the brink of extinction due to mosquito-transmitted disease. We must support the draft environmental assessment for Kaua'i mosquito suppression before it's too late for Kaua'i's 'akikiki and the 'akeke'e.	Thank you for your comment
	7/23/2023 21:02	I oppose releasing these experimental mosquitos	Concern: 11
Alissa Nelson	7/23/2023 21:03	I support the use of mosquito suppression to save native birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Adrian Burke	7/23/2023 21:05	Please go forward with use of incompatible insect technique on Kaua'i (and elsewhere in Hawai'i) to save our native forest birds from extinction. This is absolutely the only shot we have of saving several species that without a doubt will go extinct very soon in the wild without this intervention. These birds are worth saving! We must not let Kaua'i's remote forests become quiet. Please do not give in to objections from the misinformed. This technique (IIT) has already been deployed for human health reasons in several places and has not caused any problems. There are virtually no risks to this action, but the payoff would be huge if Akeke'e, Anianiau, Kaua'i Amakihi, and Kaua'i Elepaio, and I'iwi can be saved on Kaua'i! These birds are important to the health of our forests and to the Hawaiian culture, and they are precious gems that make this island truly special. We have already lost far too many Hawaiian birds forever. Let's do something now that we finally can!	Thank you for your comment
Kara Winter	7/23/2023 21:05	I support the suppression of mosquitos. Save the birds!	Thank you for your comment
Dena Nakahashi	7/23/2023 21:09	"I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers"	Thank you for your comment
sally chew	7/23/2023 21:09	This is so critical! With current trend of native bird populations, action should be taken sooner while there is a fighting chance. With avian malaria being one of the main reasons for dwindling numbers, addressing the mosquito population would be the most effective way to help our native birds.	Thank you for your comment
Charles Hamnett	7/23/2023 21:10	"I am in favor of mosquito control on Kaua'i as a conservation action. I dont like mosquitos. I like native birds"	Thank you for your comment
Jim Denny	7/23/2023 21:11	<p>To Whom It May Concern,</p> <p>My Name is Jim Denny. I am 76 years old and a 55 year resident of Kekaha, Kaua'i. For 30 years I worked as a medical technologist at Kaua'i Vererans Memorial Hospital in the nearby town of Waimea, but my passion has always been to photograph the native forest birds of these Hawaiian islands. In the 1970s when I first began to hike the upland trails of Kaua'i, birds were everywhere. The Pihea Trail, a Hawaiian name which means cacophony, was certainly that. The calls of our native honeycreepers and native `Elepaio flycatcher, were nearly overwhelming. You didn't have to search for them. At any stop along the trail, dozens of noisy `Apapane were in the canopy above, feeding on the lehua blossoms. `Amakihi and `Anianiau were plentiful and busy in the understory below, feeding on the flowers of `ohelo, `ai`akamanu, kukaimoa, and naupaka kuahiwi. The squeaky-gate call of `I'iwi permeated the forest. When the lobelias were in bloom , particularly koli`i, there would be 5 or 6 of them at a time, all day long, chasing the `Amakihi away from it. It was a sight to behold. The now critically endangered `Akeke'e was not as easily seen as the aforementioned birds. It's habit of foraging through the ohia leaf clusters in the canopy made it hard to spot, but there were places where I could always easily find families of 4 or 5 birds calling back and forth to each other as they fed. The Alaka'i Swamp Trail crossing at Kawaiko'i Stream was a given for this species. They could even be seen at the Puu O Kila lookout. The `Akikiki was the least numerous of these honeycreepers but pairs of them could still be seen along Pihea. On many occasions while hiking further into the swamp along the Mohihi Trail, I would see flocks of 8 to 10 of these small birds coming up out of the valley below to forage up and down the branches and trunks of trees along the ridge. It was a habit they repeated every morning and late afternoon. Mohihi was a special place. I remember hiking along this trail with Tom Telfer, the Kaua'i District Land and Natural Resources Manager at the time. He pointed out places where only decade before he had seen the now extinct `O'u feeding along the ridge on the fruiting Tetraplasandra. Tom was one of the last to ever see the also extinct Kaua'i Nukupu`u along this trail on the flowers of the tall Cyanea leptostegia. I wondered at the time what happened to these wonderful birds and if the rest might also be in danger, but never thought that their demise would come about in my lifetime. Unfortunately, this is a once-upon-a-time story from an old man. You can only imagine my sadness when I visit these places today and find nothing, just the lonely call of a distant `Apapane. Sometimes when I travel between islands on Hawaiian Air and see the names or our native birds on the fuselage, I think how many people aboard this plane have ever see them. I feel blessed that I have.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Jim Denny, Continued) I can also attest to the fact that there are a gazillion Culex mosquitoes on Kaua`i. I love to photograph the stars and occasionally go a few miles above Kekaha, away from light pollution, to setup my camera for the night. Around dusk, I begin to hear a low hum down in the valley below. In half an hour the hum has become a loud din as they rise up to attack. Personally, I can't understand the reluctance of those to are against this effort. Perhaps too many zombie movies have made the misinformed think that there is a danger in manipulating these insects. I'm not a scientist and cannot speak to the safety of the current proposal to rid our island of Culex mosquitoes, but I have read the Environmental Assessment and am confident that the research into this method is sound and has been exhaustive. I trust those who have said so. If I had my way, I would use the Gene Drive approach and get rid of them entirely.</p> <p>In February of 2021, I wrote about my concerns to the Garden Island Newspaper and to our local legislators. I have included that document below:</p> <p>Silent Mountain</p> <p>I am writing to voice my concern over the dramatic decline in native forest birds on Kaua`i. Fifty years ago when I first began to go into the forest to see and to photograph them, these birds were everywhere. Their voices filled the forest. Many older residents and generations before me have experienced this wonderful abundance. Now, all that is heard is the occasional call of an alien bird, the sound of the wind in the trees, and that of water dripping off the leaves. This is not just happening on the fringes of the mountain but in the remote interior as well. Personally, having seen these beautiful birds throughout the expanse of the Alaka`i, I am deeply saddened at this loss.</p> <p>We face not just the extinction of our precious native species but a loss of a part our culture as well. In the not so distant past the colorful feathers of these forest birds were highly valued. Leis, helmets, and capes were made from them to adorn the ali`i. The Hawaiian songs we love to listen to today are full of references to them.</p> <p>The effect on our island economy is significant. Hawaiian honeycreepers are famous the world over for their adaptations. Nearly every week I get inquiries from potential visitors asking where they can go on Kaua`i to see our native birds. Lately, I have to tell them "don't come". If birds are the reason for your trip, go to the Big Island or Maui – the high islands where they can still be seen.</p> <p>In 1962 Rachel Carson wrote a book entitled Silent Spring. The book brought public attention to the detrimental effect the unregulated use of DDT and other pesticides was having on birds. In the book she predicted that its continued use would one day bring about a spring when there would be no birds to sing.</p> <p>The issue here is not the use of chemicals but the rapid spread of mosquito-borne diseases – avian malaria and viral pox. I fear that if we do not rid this island of the Culex mosquito we will be left with a silent mountain. The technology to do this exists. The sooner we make use of it, the better.</p> <p>The argument that ridding our island of mosquitoes may upset a delicate ecological balance does not apply. On the contrary, mosquitoes didn't arrive here until ships from foreign lands brought the larvae in their water barrels</p> <p>Of the 13 species of birds that were here when the Europeans arrived, 5 are already gone. The more we delay, the more birds we are going to lose and the native plants that depend on them for pollination. I urge you to introduce legislation to allow the use of this technology.</p> <p>A recent visitor into our forest remarked to me that it should be an easy decision "after all everybody loves birds and hates mosquitoes".</p> <p>Respectfully Submitted, Jim Denny</p>	

Name	Entry Date	Comment	Responses
Liz Nutt	7/23/2023 21:11	The use of the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kaua'i's Kōke'e and Alaka'i areas is a commendable effort to protect native forest birds and their habitats. By focusing on critical higher-elevation forest areas spanning 59,204 acres, this targeted approach shows promise in suppressing disease-transmitting mosquitoes without harming other species. Implementing IIT requires careful monitoring and community involvement to ensure its effectiveness and minimize any unintended ecological impacts. Overall, this initiative represents a significant step toward preserving Kaua'i's delicate ecosystem for future generations.	Thank you for your comment
Conrad Hamnett	7/23/2023 21:12	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers. I also don't like mosquitos because I get bitten a lot.	Thank you for your comment
	7/23/2023 21:12	Dear god, PLEASE listen to the science here. Implementing the mosquito control program brings a very low chance of negative environmental impacts, and not implementing it come with a near 100% chance that multiple Hawaiian birds go extinct in the next decade.	Thank you for your comment
Jonathan Shepherd	7/23/2023 21:17	I support the use of Wolbachia based IIT to suppress and control mosquito populations on Kauai. Without urgent intervention ALL of Kauai's native forest birds WILL go extinct within our lifetimes. All of our current conservation effort will have been for nothing. This is a proven technique that has successfully controlled mosquito populations in other locations. We cannot sit idley by and watch as more of our native species go extinct when we have the means by which to prevent it.	Thank you for your comment
Robert M Hamnett	7/23/2023 21:18	I am writing in support of mosquito control on Kaua'i in order to help prevent extinction of endemic Hawaiian birds. These birds are running out of time and options and it is desperate. Considering the impact that the mosquito population has on the spread of avian malaria, the only practical approach is to address this problem closer to the root cause. Wolbachia has proven to be safe for humans and animals, and has been used to reduce mosquito populations during outbreaks of zika and dengue fever. Without utilizing this proven technique the state of Hawai'i is essentially complicit in the extinction of endemic Hawaiian birds.	Thank you for your comment
	7/23/2023 21:18	I am a concerned resident of Kauai working for ecotourism. I support this EA to protect Kauai forest birds through mosquito suppression using the incompatible insect technique.	Thank you for your comment
	7/23/2023 21:18	<p>I support the protection of native birds as they are an integral part of our ecosystem. The control of mosquitoes not only benefits the 'akikiki, but ALL of our native avian fauna. These species have existed in our islands for thousands of years, but in a matter of decades have been decimated; due in large part from human created problems. Is it not our duty then, to utilize the knowledge and power we have to protect them from Extinction?</p> <p>As someone who deals with preventing the extinction of native species everyday, it hurts to see these amazing creatures helpless in the face of an uncertain future. We know the cause, and we have a solution to the problem. Will our keiki only know of these birds from photos and videos? What will we tell them when they learn that the birds could have been saved but we did nothing?</p>	Thank you for your comment
Mark	7/23/2023 21:19	Yes, I support mosquito suppression to protect the native birds.	Thank you for your comment
Sierra Smith	7/23/2023 21:19	I support mosquito suppression on island for the sake of the native birds, native plants, and the future of the water supply.	Thank you for your comment
Melissa Smith	7/23/2023 21:21	Yes, I support mosquito suppression to protect our native birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Sharae Wong	7/23/2023 21:21	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Mahalo for your time and consideration. Mahalo, Sharae Wong	Thank you for your comment
Jadyn Smith	7/23/2023 21:22	Yes, I support mosquito suppression to protect our native birds.	Thank you for your comment
Nada M	7/23/2023 21:24	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done right now to save these birds from disappearing forever.	Thank you for your comment
Alec Zarenkiewicz	7/23/2023 21:26	I support mosquito suppression for the sake of native birds, plants, the watershed, and the overall cultural significance of the species affected by the diseases mosquitoes carry.	Thank you for your comment
Maggie Kua	7/23/2023 21:26	I support the implementation of IIT on Kaua'i and across the pae 'āina. At this critical time it is imperative that we do everything possible to save our native birds. This is our kuleana as stewards of this land. Please move quickly to protect these fragile birds and their habitat. Mahalo	Thank you for your comment
Megan Pearl	7/23/2023 21:26	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Megan Pearl, Continued) There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
	7/23/2023 21:31	I demand a full environmental impact study before you release any of Bill Gates mosquitoes on Kauai or any island!	Concern: 1, 26
Joanna Wheeler	7/23/2023 21:36	<p>Dear Sirs;</p> <p>I write in strong opposition to the release of mosquitoes that are linked to malaria and zika. You are not offering an demonstrable method to eliminate the mosquitoes we currently have and in fact are reking the appearance of illnesses like Malaira. Florida saw it's first case of malaria after the release of lab mosquitoes in their state.</p> <p>Other concerns is that information is coming out about the development of moa</p> <p>Joanna Wheeler, RS-59507</p> <p>Realtor, Green Designee, RENE- Real Estate Negotiation Expert eXp Realty, (808)651-1756, joannawheeler.com</p>	Concerns: 2, 6, 28
MJ	7/23/2023 21:39	I visited Kaua'i not too long along and after visiting with local researchers and the native population it has put in perspective how detrimental this issue is and can become. With the introduction of invasive species into an already delicate ecosystem it has the potential to collapse the intricate foundation the island is built upon, not only is this worrisome for the local population but it has already resulted in crucial loss of valuable life within natures system. It has never been more important to raise awareness and take action not only for the well-being of the land lived upon but as respect to the island itself.	Thank you for your comment
Dylan Blanchard	7/23/2023 21:45	As a conservation biologist working on Kauai for the last couple years, in addition to working in endangered bird conservation across the world, I fully support the measures to introduce IIT to the ecosystems of Kauai. These measures have become the only option available to preserve Hawaii's native birds from human-caused extinction. If IIT introduction measures do not succeed, other species will be lost forever. The opposing voices to these measures are not founded in fact and seek only to spread misinformation and false paranoia. We have not only the ability but the responsibility to proceed with IIT and save these beautiful, vital stewards of Hawaii.	Thank you for your comment

Name	Entry Date	Comment	Responses
Breanne Fong	7/23/2023 21:47	I support Wolbachia IIT to save Hawaiian forest birds because they are a significant biocultural resource. Not only are the health of these birds indicative of a healthy forest ecosystem, they also provide great cultural significance to Native Hawaiians as these birds are part of mo‘olelo (stories, history) as well as are forms of ‘aumakua (ancestors, guardian spirits). Sadly, invasive mosquitoes transmit avian malaria, killing native forest birds and putting them closer to extinction. Only 17 species remain today, with some comprising of fewer than 500 individuals. Thus, it is urgent that we take action and tools like the Incompatible Insect Technique can suppress the invasive mosquito populations and give hope to these endangered native bird populations that have both ecological and cultural importance to Hawai‘i. Thank you for your time and consideration.	Thank you for your comment
Meredith Miller	7/23/2023 21:50	The forest birds in Hawaii are facing an extinction crisis. They are being decimated by Avian Malaria that is being transmitted by non-native mosquitoes. I support the use of the Incompatible Insect Technique (Wolbachia), to reduce the mosquito populations in Kauai. Please allow these techniques to be implemented by DLNR and USFWS to save the ‘akikiki. Thank you for your consideration. Meredith Miller	Thank you for your comment
Kanakanā Climbers	7/23/2023 21:53	Aloha kākou, This statement is on behalf of Kānaka Climbers, a Hawai‘i-grown non-profit organization. We are commenting in strong SUPPORT of using the Wolbachia Incompatible Insect Technique detailed in this draft Environmental Assessment to prevent the extinctions of Kaua‘i forest bird species, and agree with the Finding Of No Significant Impact (FONSI) We are a Kānaka ‘Ōiwi (Native Hawaiian) and ally led non-profit that aims to cultivate a more responsible and ethical outdoor recreational community in Hawai‘i. We hope to provide knowledge and guidance that will help people form meaningful connections with ‘āina (land) and in turn become better stewards. We actively engage in conversations with Kānaka ‘Ōiwi, Native Hawaiian Organizations and locals within different recreational areas to assist in voicing and supporting area-specific concerns, which often involve the protection and preservation of sacred spaces. Our organization recognizes that our island home is unfortunately known as the endangered species capital of the world. Of more than 50 species of honeycreepers that used to live here, all but 17 have gone extinct. The Kānaka ‘Ōiwi relationship to manu (birds) runs from the beginning of time. They play critical roles in our mele ko‘ihōnua (cosmogonies), mo‘olelo and ka‘ao (stories and legends), including the Kumulipo, the Epic of Hi‘iakaikapoliopole, and the legend of Keaomelemele. We value these manu as gods, ancestors, guardians, and keepers of mana or great spiritual power. There is a reason why their feathers were chosen to adorn the ahu‘ula, mahi‘ole, pā‘ū and kāhili of our ali‘i. As Kānaka ‘Ōiwi, we continue to live in unique times just as our kūpuna did. In an era of reclamation where we are revitalizing practices such as ‘Ōlelo Hawai‘i, wayfinding, and traditional food systems, we believe the restoration and protection of manu is a vital part of cultural preservation and modern-day ahupua‘a management. It is clear that the actions detailed in the draft EA to suppress avian malaria are needed to make room for a future where manu nāhele thrive in the physical and spiritual landscapes of Hawai‘i once again. Mahalo for this opportunity to comment. Me ke aloha ‘āina, Kānaka Climbers	Thank you for your comment

Name	Entry Date	Comment	Responses
Carol D. Yokoyama	7/23/2023 21:56	<p>Aloha,</p> <p>I strongly oppose the "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes, should complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, wildlife, ecosystem, environment and public health.</p> <p>This planned project is a dangerous experiment. The lab-infected biopesticide mosquitoes come with many risks. Additionally, there are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. There are plenty of unknowns. What about human health risks? Sound science is required.</p> <p>Have safer alternatives been considered? Have conflicts of interest been addressed? How long has all of this been researched and studied? Has all the research been provided? How long will the project last? Where did the funding for all of this come from?</p> <p>There is currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." An Environmental Impact Statement needs to be done.</p>	Concerns: 1, 2, 7, 9, 11, 23, 26, 34
Charlene Higa	7/23/2023 21:56	<p>Another travesty to our people to endanger us from something not proven to be safe or effective. Another example is GMO, which has glyphosates, and proven to be harmful, yet we continue to have this in our food. Brazil saw no positive effects whatsoever from these mosquitoes, and Florida has a rise of malaria cases because of these mosquitoes. Our leaders are not taking responsibility for their actions.</p> <p>See if it works and is safe, before you unleash this to our environment. This might take years to know what the effects or consequences are. Why are you taking this risk? Who is behind this? What is their track record?</p> <p>Charlene Higa</p>	Concerns: 2, 4, 5, 28, 32
kara bernarda	7/23/2023 22:00	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Riley Nakasone	7/23/2023 22:01	<p>I support the finding of no significant impact in the draft environmental assessment regarding the suppression of mosquitoes using the incompatible Wolbachia technique.</p> <p>Hawaiian forest birds represent an integral part of Hawai'i's biological and cultural history. Due to increasing temperatures, these birds no longer have a safe heaven from invasive mosquitoes which spread lethal diseases such as avian malaria. We are now at a critical point in the conservation of two species in particular, the 'akikiki and 'akeke'e. Both are predicted to go extinct within the next five years without intervention. Extinct is forever, and it is happening right before you. The incompatible Wolbachia technique is the most promising lifeline available to save our beloved Hawaiian forest birds.</p>	Thank you for your comment
	7/23/2023 22:02	Please do not insert a mosquito into the environment. Inserting non- native species always have consequences that often aren't discovered until after the fact.	

Name	Entry Date	Comment	Responses
	7/23/2023 22:04	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
	7/23/2023 22:07	I am in full support of mosquito suppression methods on Kaua'i. As of now, male mosquito sterilization is the only way we can preserve the remaining endemic forest birds on the Hawaiian islands. These birds are crucial keystone species to the Hawaiian ecosystems, wonderfully diverse and delicate ecosystems that are not only important to keeping the islands beautiful and alive but also to the people of the Hawaiian islands. In order to keep Hawaii as self sufficient and sustainable as possible, we need healthy forests; without the birds, the native plants like the 'Ohi'a will lose one of their most important pollinators, and without these native plants the waterways become unclean, landslides become more frequent, shade becomes fewer and carbon dioxide levels become greater, increasing island temperatures, all this causing a butterfly effect of even more issues in the future. There are countless oli, mele and hula about the native forest birds dating back centuries, as these birds are rooted deeply in Hawaiian culture. It is no wonder the birds were important to Hawaiian ancestors, as they should be now and in the far future. To many hawaiian people, the forest birds are guardian spirits or 'aumakua, sometimes even believed to be passed on family members or ancestors of long family chains. In other words, the native forest birds of Hawaii are 'Ohana. Rarely in the world do we see endangered animal species that carry this much ecological and cultural importance, and if there was ever a time to save species from extinction, that time is right now. We need to act as quickly as possible to suppress invasive mosquito populations, because while we work quickly now, the mosquitoes work even quicker at spreading avian malaria which is killing our birds in jarring numbers, not to mention it is an agonizing disease for these poor animals to endure. The 'akikiki, 'akeke'e, puaohi, Kaua'i amakihi, 'anianiau, 'iwi, 'apapane and Kaua'i elepaio need our help; with man-made problems comes man-made solutions, and after centuries of mosquitoes on the islands, we finally have a safe and effective solution to controlling their populations, proven by previous successful operations in other parts of the world. Please, do your research on these studies, look into what is actually happening in these processes and note that wolbachia already exists in abundance in nature in Hawaii naturally, and that there are no possible negative ramifications for this kind of ecological procedure. We owe it to the 'Aina and to our future generations to do what we can to keep these species safe from extinction, please consider these words coming from a previous Hawaiian forest bird conservationist. Mahalo for reading	Thank you for your comment
Keely Hassett	7/23/2023 22:08	<p>I support the Wolbachia IIT to save Hawaiian forest birds because it is all we have to combat the detrimental effects of the invasive mosquito and avian malaria WE humans brought to these special islands. My ancestors sailed here thousands of years ago and stepped into a manu oasis. I often wonder what Hawaii was like in all its beauty before humans converted so much of the land to agriculture and housing. Today, I can hike up to the highest peaks and find a parcel of that true Hawaii: native forest still intact, native birds here and there, and the gentle breeze and cool fog rolling through. It's taken a career in conservation to find that place, to reconnect to my Hawaiian ancestry, and feel it's real-life presence. I don't have kupuna that can tell me about the iwi, or stories of the apapane because they've never experienced the upland forests. My parents don't have stories of when the birds lived close by because that time was lost in my lineage. Because of the efforts of the state and other organizations to save species on the brink of extinction, we still have the nene, Laysan duck, and monk seal to name a few. Today, I have stories about the curious elepaio of Kauai that follow me along my hikes, the sound of the flutter of the apapane through the canopy, and the sway of the olapalapa in the wind to share with my children. This project will dictate whether those experiences die with our generation forever, or are shared with the future generations.</p> <p>This project is pivotal in our history of what Hawaii is now and what it can be tomorrow. Optimism in the face of tragedy looks like a future where where the IIT suppresses 90% of the mosquito population, forest bird numbers flourish, where kids grow up hearing the flutter of the apapane and can look in the eye of the elepaio. The future can be a place where we almost lost the akikiki but then they made a comeback and can be seen hopping around the canopy for grubs and their call can be heard in group chats:)Failure is the lack of trying, the lack of care, and the lack of risk for a greater purpose than ourselves. I support this IIT project and I truly hope the work put in pays off and we can change history. Thank you!!!</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
David Rodriguez	7/23/2023 22:15	Please suppress mosquitos to save our native species	Thank you for your comment
Ben Newton	7/23/2023 22:23	I like me some native endemic birbs, and I hates mosquitos	Thank you for your comment
Zach Rogers	7/23/2023 22:25	Aloha! As a resident born and raised in the islands i understand There has always been issues with misqitotos but there has been little to no talk about prevention prior to the GM misqitotos being offered as a solution here. I believe there are not only other solutions at hand that are less invasive but ones far less dangerous to the human populations. There needs to be more studies before they are released as not enough is known. Some studies in florida showed that these misqitotos may actually INCREASE the avian malaria as well as viruses that can harm humans. Our islands are particularly precious and delicate and they need protecting, let's find other ways that do not potentially put us or the birds in harms way.	Concerns: 4, 7, 9, 28
	7/23/2023 22:26	<p>In reviewing this thorough 305-page environmental assessment, it is clear to me that wolbachia IIT is a safe and effective technique to control Culex mosquito populations in the Alakai to save our native forest birds from extinction. Although I wish we had this technology 5, 10 or 20 years ago so that we may have avoided the collapse of many forest bird populations and saved the 'akikiki, I recognize that the wolbachia IIT has gone through rigorous scientific study during this time, and may not have been ready for use on a landscape scale with Culex mosquitoes particularly until recently.</p> <p>Comment:</p> <p>As a scientist I recognize that our ability to continue using IIT to control Culex populations will depend on being able to show data that IIT is causing Culex populations to decline. I believe that Culex abundance will begin to decline within several months, but my only worry is that we will not have the ability to accurately show this decline in the data given the wording in the draft environmental assessment. My only comment therefore pertains to the repeated wording in the document along the lines of “only existing trails will be used for pedestrian releases and mosquito monitoring efforts; no new trails will be created”. I have done an extensive amount of conservation work in the Alakai and have a solid understanding of the existing trail system used by conservation workers and hunters alike. Only placing mosquito monitoring equipment on these existing trails will mean we will not get data on huge areas of the Alakai. In addition, many of the trails follow ridge tops as they are the path of least resistance, but there is data to suggest that mosquitoes are much more abundant in streams that on windy ridges. I worry that we will be biasing our monitoring data based on a few sparse trails for the sake of a few native plants. I am not suggesting that trees be cut or sawed to make new trails, but many conservation organizations working in the Alakai are able to carefully walk off-trail through the forest to carry out scientific research or monitor invasive species (and have been trained to identify native flora and fauna as to have as little impact as possible on the forest). Hunters are permitted to follow pigs and deer throughout the Alakai. How different is this work to monitor Culex mosquitoes than that of a hunter or a conservation worker seeking to control invasive mammals? In addition, the proposed mosquito monitoring efforts for IIT have a very light impact as each mosquito trap only needs to be set for one night per week, versus previous monitoring efforts where each trap is set for 4+ consecutive nights (meaning 8 visits to the trap over a week). Therefore, I think that placing some traps “off trail” will allow researchers to get a better understanding of the whole treatment area, instead of only placing traps on few ridge tops with existing trails. Perhaps mitigation restoration efforts could be carried out to offset the impacts of the additional human traffic. Or perhaps the final EA document can better define what the authors perceive as a “trail”, or set a limitation to the number of traps that can be placed off-trail.</p> <p>Final thoughts and observations:</p> <p>Our forests have suffered devastating changes since I started working in the Alakai in 2017. In only 7 years I have seen our 'akikiki population crash from over 400 individuals to FIVE (or 0?) today. I was working at what once was our core field site – HPK, as we considered it as the stronghold for our native honeycreepers including all 3 endangered species. It was the highest in elevation of our 3 main sites, so when we discovered Culex mosquitoes in our traps in 2019 we were astonished as we thought Culex were still moving up the mountain, but in fact we found that they had already invaded the highest elevations. In 2020, mosquito</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(anon., 7/23/2023 22:26, <i>Continued</i>) captures began to skyrocket and we saw the delayed effects of this unexpected “mosquito storm”, as we were only able to find less than half of the breeding pairs of ‘akikiki as the previous year. By 2021 there were only a handful of individuals left at HPK, and last ‘akikiki was a bird I remember banding in 2018- “Carrot”. He was captured and taken from that site into captivity to save him from the same fate as the rest of his family succumbed to, and it breaks my heart to imagine my favorite place in the world without ‘akikiki. I’iwi have also all but disappeared from this site in the last 7 years; I have fond memories of seeing 10 or more there per day, and they have not been seen there at all this year.</p> <p>Our pristine native forest is already becoming eerily silent in areas that were previously abundant with ‘akikiki, i’iwi, ‘akeke’e, anianiau, amakihi, apapane, elepaio, puaiohi. The ‘akeke is harder to study as they are more cryptic and fly much greater distances, but we are estimating their population to be less than 600 individuals. I am VERY worried about the anianiau as well. This species is not even listed as threatened and from what I can gather from our 5 year forest bird surveys that occurred this year, the population has drastically declined. I fear they could go extinct before they are able to be listed as threatened or endangered, as quickly as we may lose the ‘akeke’e. We do not need or want an EIS, the time is NOW to act, to control mosquito populations and save our forest birds, before it is too late.</p>	
Emma Stierhoff	7/23/2023 22:29	I fully support the Wolbachia-based mosquito suppression on Kaua'i proposed by DLNR. I believe this Environmental Assessment shows negligible negative environmental impact, and mosquito suppression will have a significant positive impact by helping native bird populations bounce back. Avian malaria has decimated native bird populations, with many of our unique birds already facing extinction as a result of this deadly disease. Those that remain are severely threatened. The best way to help native birds is to reduce the devastating spread of avian malaria, and the Wolbachia-based incompatible insect technique is a non-intrusive and effective way to do just that. We must act now, otherwise many of our native honeycreepers could risk extinction within the next decade. Kaua'i does not have mosquito free high-altitude refugia that the birds can escape to. They have nowhere to go, so we must take these steps to reduce the mosquito population and give our manu a fighting chance. Therefore, I urge you to pass DLNR's EA for mosquito suppression on Kaua'i. Mahalo nui.	Thank you for your comment
Amy Parsons	7/23/2023 22:30	<p>Aloha. I am writing in strong support of the suppression of mosquitoes on Kaua'i (and all of Hawai'i).</p> <p>Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds and we must do anything possible to stop it. There seems to be no evidence that mosquitoes carrying wolbachia will have any negative impact on the environment, and it's our best chance to save our birds. That this method has dramatically reduced the spread of dengue is enough for me to wholly support this plan . Please move forward with efforts to reduce the spread of avian malaria and the mosquito population.</p>	Thank you for your comment
Nicole Nakata	7/23/2023 22:37	I support the EA. The proposed action to release Wolbachia incompatible mosquitoes in the project area on Kaua'i benefits not only native Hawaiian birds and the environment, but also humans. Mosquitoes have no place in our ecosystem and will continue to cause the extinction of native bird species if nothing is done. Mosquitoes will only continue to increase their negative impact on our islands with climate change, and humans are not exempt from this because mosquitoes can and do spread deadly human diseases as well.	Thank you for your comment

Name	Entry Date	Comment	Responses
Brian Kennard	7/23/2023 22:38	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
	7/23/2023 22:44	I support mosquito suppression	Thank you for your comment
Courtney Matson	7/23/2023 22:55	I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement. We have countless examples of how introduced species, although apparently introduced to assist, actually caused eventual harm. This is a dangerous game and we cannot reverse it once it has been done. I feel that Hawaii's fragile ecosystem be untampered with and let the aina restore herself.	Concern: 1, 3
C.s.Jenkins	7/23/2023 23:22	Totally against releasing these mosquitoes. Look ar what happened in Florida - they now have malaria cases & there were none before there release for 20 years. Don't you have family & children who may be harmed from this experiment?	Concern: 28
Kelsey Ke'alohilani Rogers	7/23/2023 23:22	Our ecosystems rely on the health of our birds. Our native plants require them, as do our native peoples. Native birds are a vital piece of our culture. Mosquito suppressant needs to be a priority in order to save what species we have left.	Thank you for your comment

Name	Entry Date	Comment	Responses
Alison	7/23/2023 23:26	<p>Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left.</p> <p>Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds.</p> <p>The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Hawaii is at risk of losing at least four more critically endangered forest bird species to avian malaria in the next decade, and they need all the help and support we can provide.</p>	Thank you for your comment
Henry Krol	7/23/2023 23:26	<p>I support Wolbachia IT to save Hawaiian forest birds because like all animals in our world, they are the building blocks of an ecosystem. Many species of honeycreepers are already extinct and we have a chance to prevent that. The Wolbachia IT can help by reducing the mosquito population, which can in turn reduce the spread of avian malaria. The Wolbachia IT is a promising approach because it is a natural and sustainable solution to controlling mosquito populations. Unlike traditional insecticides, which can have negative impacts on the environment and non-target species, the Wolbachia IT targets only mosquitos and does not harm other organisms. Furthermore, the Wolbachia IT has been successfully used in other areas to control mosquito populations and reduce the spread of mosquito-borne diseases. By supporting the Wolbachia IT, we can help protect Hawaiian forest birds and preserve the unique biodiversity of Hawaii.</p>	Thank you for your comment
Sam	7/23/2023 23:26	<p>I support the proposal for IIT mosquito suppression to save 'Akikiki and other endangered species on Kaua'i. The science is clear and this initiative is our best hope to save the forest birds. We are running out of time to save these endangered species, and this safe IIT mosquito control technique offers a solution to give the birds a chance at survival.</p>	Thank you for your comment
Lorraine Waianuhe	7/23/2023 23:44	<p>Aloha kākou,</p> <p>My name is Lorraine Waianuhe and I am commenting on the draft EA as a Hawai'i resident in strong SUPPORT of using Wolbachia Incompatible Insect Technique (IIT) to suppress mosquitoes and the spread of avian malaria on Kaua'i to prevent future Hawaiian honeycreeper extinctions.</p> <p>In 2019, I had the privilege of working on the USGS Avian Malaria Genome Research Project. As part of a small crew, I helped to safely collect blood samples from forest birds to be tested for avian malaria. Our work took us to Kaua'i where we watched 'Akeke'e and 'Akikiki forage in the moss-laden 'ōhi'a trees right next to our camp, surrounded by the songs of our Hawaiian forest birds. It was an unforgettable experience that grew my love for our manu and my desire to prevent their extinction.</p> <p>Just a few days ago, I heard the devastating news that there are only 5 'akikiki known in the wild. I wept for our forests, the 'Akikiki, and all of the current and future generations that may never see a 'Akikiki. According to reports by the team at Kaua'i Forest Birds, the forests are falling silent and dead honeycreepers are seen along the trails in the Alaka'i. Over the past 4 years since I visited, Culex quinquefasciatus mosquitoes carrying avian malaria have invaded the most pristine forests of Kaua'i and killed our manu.</p> <p>Currently, I am a graduate student at University of Hawai'i at Mānoa studying mosquitoes. With the reading I have done related to native Hawaiian forest birds, mosquitoes and avian malaria, I believe mosquito population suppression using Wolbachia IIT is the only viable option we have right now to prevent extinctions of our forest birds. As described in the EA, Wolbachia IIT has been used successfully around the world to suppress mosquito species (including Culex quinquefasciatus) and the diseases they carry. Wolbachia IIT does not involve genetic modification. Wolbachia spp. bacteria live in close symbiosis with their invertebrate hosts and cannot infect humans, pets, birds, or other wildlife.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Lorraine Waianuheha, Continued) One of the most popular phrases in comments submitted by those against the EA for Maui was “This project is an experiment on our island home. There are serious risks, and the outcome is admittedly unknown.” This comment not only rings with anti-science sentiment (using the word “experiment” to stoke fear), but it is also vague and not supported by decades of research. While it is true that no one can with absolute certainty that Wolbachia IIT will save our birds, we have plenty of evidence to show that failure to control the spread of avian malaria will lead to the extinction of many more honeycreeper species.</p> <p>The Kaua'i draft EA is thorough and has gone to lengths to discuss and address possible foreseen negative impacts of Wolbachia IIT deployment. These include impacts to other threatened and endangered species, noise pollution from drones and helicopters, as well as potential impacts of the noise and deployment activities on subsistence hunters and cultural practitioners. These potential impacts are detailed because they must be carefully considered and understood. Ultimately, these negative impacts can be mitigated while the certain loss of more honeycreeper species under the No Action Alternative cannot be. Extinction is forever.</p> <p>As a Native Hawaiian person, I believe our manu are kin. They are manifestations of our gods, our 'aumakua and our kupuna (ancestors). They play critical roles in our ecosystems, pollinating the pillars of our forests such as 'ōhi'a and koa trees, spreading the seeds of native plants and preying on invertebrates. Losing these species to extinction is the irreversible loss of connections to our 'āina and Hawaiian culture forever. We cannot allow anti-science rhetoric, fear mongering, and conspiracy theorists to kill our beloved manu 'ōiwi.</p> <p>In conclusion, I am in strong SUPPORT of the Wolbachia IIT project described in the draft Kaua'i EA, as well as the Finding of No Significant Impact (FONSI). Our manu are quickly running out of time and Wolbachia IIT is the best chance we have at saving them.</p> <p>Me ka ha'aha'a, Lorraine Waianuheha</p>	
	7/23/2023 23:44	As a Native Hawaiian we must protect our native birds and with that we must get rid of the mosquito problem within our islands!	Thank you for your comment
Baylee hunt	7/23/2023 23:52	Protect native species, always!!	Thank you for your comment
Benjamin Vizzachero	7/23/2023 23:56	I support the mosquito suppression project. Please do whatever it takes to save Kauai's native birds. We have every indication that these techniques are safe and effective. Hawaii's endemic species are part of what makes these islands so special. Their imperilment is the result of human action and it is our duty to mitigate our impacts. Once they go extinct they are gone forever. Thank you.	Thank you for your comment
Andrea Lecocq	7/24/2023 0:00	<p>To: DLNR</p> <p>My name is Andrea Lecocq. I have been a resident of Hawaii since 1974, and lived on Kauai since 1982. I think it is a horrible idea to let loose up to 775,000,000 mosquitoes per week for at least 20 years. If anything goes wrong you can decimate Kauai's bird populations. There has been no assessments to human health risks, already there were four cases of malaria in Florida and one case in Texas. Wolbachia bacteria can transmit to wild mosquitoes vectors of disease. You are creating a Frankenstein and the citizens of east Maui did not like you dumping your experiment on them. Does the DLNR really want to be the cause of killing birds and humans in the future. Do not proceed. Andrea Lecocq.</p>	Concerns: 2, 13, 14, 19, 28,
Karen Chan	7/24/2023 0:04	Please implement the mosquito control as soon as possible. Humans have driven these birds to pretty much extinction and we need to do what we can to help. This technique is safe and mosquitoes are invasive i.e. if every mosquito was eliminated from the islands, no harm would be done. I am kama'āina and am in full support of Incompatible Insect Technique.	Thank you for your comment

Name	Entry Date	Comment	Responses
Patti Lai	7/24/2023 0:04	The Kauai 'Akikiki and Akeke'e are in dire need of help in the form of releasing the Wolbachia-incompatible males southern house mosquitos. It's a proven method to stop the spread of invasive mosquitos, which carry avian disease. These two indigenous birds will be extinct soon without this method - which will be release-controlled and monitored. Science backs up its success, and has proven that it's not a threat to humans or animals (eg. fish, birds, pets). It would be a giant step in the right direction if we could help these native birds, and other indigenous Manu (Kaua'i 'Amakihi, 'I'iwi, 'Apapane and 'Anianiau)! Mahalo, Patti	Thank you for your comment
Tori Kobayashi	7/24/2023 0:05	<p>There are approximately 8,759 species found only in the Hawaiian archipelago. With our vast isolation and climactic variation, this makes the islands an ecological hotspot to host an array of diverse flora and fauna that is found nowhere else in the world. Such a high degree of endemism comes with the assumption that populations of these species are rather low. This also means that ecosystems can be somewhat fragile; especially if they are threatened by rising invasive species. Every part of an ecosystem must work symbiotically in order to be considered healthy. Everything is connected. If one species is affected, unfortunately the others will be soon to follow. We see this happening with our native honeycreepers. With the decline in native plants that serve as their food source, this creates a huge disadvantage for native birds, snails, etc. Less pollination equals less plants, which leads to less food and homes for surrounding native species. Along with declining food sources, native birds are also being affected by rising mosquito populations. There are no native mosquito species found in Hawai'i, concluding that they are all categorized as invasive which gives us all the more reason to find effective ways to control such populations.</p> <p>What role do we play in all of this and how does this affect us? Humans have the capability to destroy nature for future generations in order to gain incomes in the short term. A loss of biodiversity can mean having a harder time growing and gathering food, decreasing air quality, pollution, erosion, increase the likelihood of extreme weather, and it can also make us sicker. This may sound a bit extreme, but if we continue the way we have been and don't hold ourselves accountable, it may become our reality. Without our native birds to pollinate our native plants, the islands can be subjected to erosion, our natural aquifers can be effected making it difficult to grow food and to gather water. If money is the only thing that will make people pay attention, look at this as an investment.. An investment that will determine the trajectory of our lives and the lives of future generations.</p> <p>As long as it will not harm surrounding species, including humans (which from my understanding, it won't) I am in support of this project.</p>	Thank you for your comment
Kimeona Kane	7/24/2023 0:14	Aloha nui, Mahalo foe the opportunity to engage in this critical point of Hawai'i and the mo'olelo that will be carried forward. It is absolutely imperative that all available resources as well as ones needing to be identified and developed be utilized in collaboration to ensure the protection of our native birds. These birds are a critical element of the very culture of which is Hawai'i. I support the protection of native birds at all cost including the implentation of processes intended to eradicate mosquitoes. Mahalo nunui for your consideration and prioritizing the protection of native birds, culture and Hawai'i.	Thank you for your comment
Rachel Murray-Watson	7/24/2023 0:17	<p>This is an urgent and much needed action, and in my belief, the only real solution to this problem. I am a mathematical disease modeller with degrees from Imperial College London (where I first researched the use of gene drives, a similar innovation), the University of Cambridge, and the London School of Hygiene and Tropical Medicine. I am currently working at Yale.</p> <p>The research so far, including the trial runs in Australia and parts of central America, has shown how safe and effective this technique is. There may be voices of dissent from those who do not believe in "interference", but we have already interfered in an unintended, uncontrolled, and dangerous way many times over. The deliberate use of this technique offers us a rare chance to mitigate those harms.</p>	Thank you for your comment
ashley	7/24/2023 0:34	i support mosquito suppression!! save our birds	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/24/2023 0:45	Protecting native wildlife is critical to the health of ecosystems and if the native bird species go extinct it could have disastrous effects on every other area of the island. I must ask that you do all you can to protect these birds for the sake of the entire island ecosystem as well as to preserve a unique creature to be seen and appreciated by future generations	Thank you for your comment
Tina Lia	7/24/2023 0:57	<p>[PDF ATTACHED IN ADDITION TO THIS TEXT - 2023_0508_Hawaii_Unites_and_Lia_v_BLNR_and_DLNR] July 24, 2023</p> <p>Attn: Mosquito Control Project Department of Land and Natural Resources Division of Forestry and Wildlife 1151 Punchbowl Street, Room 325 Honolulu, HI 96813</p> <p>RE: Comment in Opposition to Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI)</p> <p>Hawaii Unites is a nonprofit organization dedicated to the conservation and protection of our environment and natural resources. We are opposed to "Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI)." We demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua'i project area and the 64,666-acre East Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Female mosquitoes that bite, breed, and spread disease will be released. EPA guidelines allow for one female to be accidentally released with every 250,000 males.</p> <p>Southern house mosquitoes transmit diseases to humans, birds, and other animals, including avian malaria, avian pox, heartworm, elephantiasis, West Nile virus, Western equine encephalitis, and St. Louis encephalitis; and they're a potential vector of Zika virus. Wolbachia is a complicated and potentially dangerous bacteria. Strains of Wolbachia in parasitic worms play a role in elephantiasis, heartworm, and river blindness. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Our organization filed a FOIA request with the EPA for the Data Evaluation Record (DER) for these biopesticide mosquitoes, including a confidential attachment. That DER document containing a full review of the manufacturing process, including testing for relevant pathogens, has been withheld from the public and was not included in the FOIA document received from the EPA. This is unacceptable. There should be complete transparency with the details of this bacteria-infected disease vector product that is planned for mass release on our island home.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. The University of Hawaii and USGS disclosed in their April, 2022 Technical Report HCSU-103 that the Department of Land and Natural Resources (DLNR) has been funded to build out an insectary where they intend to mass produce lab-altered mosquitoes for release on the islands. This mosquito production at the DLNR</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 31, 34

Name	Entry Date	Comment	Responses
		<p>(Tina Lia, Continued) insectary is planned to continue "into perpetuity" (forever). The draft environmental assessment proposing agency's own board has final approval on a project that benefits the proposing agency:</p> <p>"The state has been funded to develop a small-scale insectary that will be equipped with a containment biobubble to maintain tool efficacy and meet both federal and state permitting requirements regarding an Arthropod Safety Level 2 (ASL-2) facility."</p> <p>We have an active case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. We are in the process of a hearing for a Temporary Restraining Order and Preliminary Injunction to stop the release of bacteria-infected mosquitoes on East Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>We do not accept the Anticipated Finding of No Significant Impact (AFNSI) for the "Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI)." We demand an Environmental Impact Statement.</p> <p>Details about the risks of these lab-infected mosquitoes are documented in our case in environmental court filed May 8, 2023 (attached): Hawaii Unites and Tina Lia v. Board of Land and Natural Resources, State of Hawai'i, and Department of Land and Natural Resources, State of Hawai'i.</p> <p>Aloha, Tina Lia Founder and President Hawaii Unites HawaiiUnites.org (808) 298-6335 tinalia@live.com</p> <p>REFERENCES:</p> <p>U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds (12/15/22) https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventing%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf</p> <p>"Hawaiian Forest Bird Conservation Strategies for Minimizing the Risk of Extinction: Biological and Biocultural Considerations" – Eben H. Paxton, Megan Laut, Stanton Enomoto, Michelle Bogardus (USGS, UH Hilo, April 2022) (Appendix VI. Wolbachia IIT Implementation Outline, pages 80-85) https://dspace.lib.hawaii.edu/server/api/core/bitstreams/8b60e14e-0935-4b61-8339-4107fce3ce91/content</p> <p>Hawaii Unites and Tina Lia v. Board of Land and Natural Resources, State of Hawai'i, and Department of Land and Natural Resources, State of Hawai'i (5/8/23) https://hawaiiunites.org/wp-content/uploads/2023/05/2023_0508_Hawaii_Unites_and_Lia_v_BLNR_and_DLNR.pdf</p>	
Jacob Hunter Craft	7/24/2023 1:02	I strongly support the release of lab-reared incompatible male mosquitoes on the island of Kaua'i. I have had the enormous privilege of working with Hawai'i's native birds over the last two and a half years, including the 'akikiki on Kaua'i. These birds are important for their ecological services to the 'āina, for their place in Hawaiian culture, and for their natural beauty. Protecting them from the effects of avian malaria and other human-caused problems should be a high priority. Wolbachia IIT represents a very promising, safe way to do this. We should not be afraid of using this technique. It has been carefully vetted by the scientific community and is the best available option for saving the incredible manu of Hawai'i.	Thank you for your comment

Name	Entry Date	Comment	Responses
Brennan Kaaihue	7/24/2023 1:11	Humans need birds to survive. The islands would not be what they are without our special birds. Human behaviors have caused our birds to be imperiled, which means our ecosystems and our people too are imperiled. Humans must act meaningfully to try and reverse this course of mass extinction in the extinction capital of the world. As a land steward and conservation worker, I fully support the plan to release Wolbachia affected mosquitoes in an attempt to control the mosquito populations that are devastating our birds, our lifeline. We must do whatever we thoughtfully can to save our birds.	Thank you for your comment
Alex Kuzmin	7/24/2023 1:18	This is our responsibility to protect native forest birds from extinction. They are dying right now as you reading my message. Moho braccatus could have been with us if someone would have made appreciate decisions 50 years ago.	Thank you for your comment
Debra Vitola	7/24/2023 1:28	<p>I'm opposed to this Wolbachia based Suppression of mosquitoes on Kaua'i" Environmental Assessment. I demand that the state of Hawaii and its multi-agency partnership, birds not mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds,environment and public health.</p> <p>The planned project is a dangerous experiment on the land, birds and people of these islands. The lab infected biopesticide mosquitoes, come with many risks,including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events,population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild,horizontal gene transfer, biopesticide wind drift,and mosquitoes becoming more capable of transmitting avian malaria and west nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the US Department of Interior Strategy "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife and aina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release,and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmits diseases to humans,birds and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes,and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong- the federal government, the State of Hawaii, agency partners,private landowners? The scope, risks and experimental nature of this plan require a EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further studies for the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Findings of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based incompatible Insect technique for the suppression of non-native southern house mosquito populations on Kaua'i." I demand an Environmental Impact Study.</p> <p>Mahalo nui loa.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Ann Johnson	7/24/2023 1:30	<p>Aloha mai kākou,</p> <p>I SUPPORT, Wolbachia IIT to SAVE our native Hawaiian forest birds.</p> <p>Hawai'i is my home. Growing up here, my heart is heavy to think that our precious native birds could be lost forever, and that my children and future grandchildren may not be able to hear them and enjoy watching them in our native forests. Mahalo nui for the opportunity to comment on this important issue. I speak on behalf of the birds who have no voice, no voice to ask for help. Please find it in your hearts to make a difference, and to help save them. Their lives are in your hands, and they are running out of time.</p> <p>Finding ways to help save species from extinction is incredibly challenging. With those challenges come many personal and political issues, difficulties that may even cause division. Today, I am asking you to put all of that aside. Consider all the facts, pros and cons. As a scientist/researcher, I believe this is one of the safest options available to help save our precious birds that are such an important part of our home and Hawaiian culture.</p> <p>I understand people may be hesitant about things they are unfamiliar with. Wolbachia is a non-GMO and already exists in many arthropods in Hawai'i. Looking at previous studies, its use in other places around the world for disease mitigation, and the fact that chances are, many, though unaware, may have already been exposed to Wolbachia through other arthropods in Hawai'i. I feel this may be the best way to help the birds. To my knowledge, this is the safest method available we have to help.</p> <p>Have you ever been bitten by a mosquito in Hawai'i? If you've spent any time in Hawai'i at all (let alone lived here), you've most likely been bitten many, many more than just once. Now, can you imagine if all it took was 1 single mosquito bite to be deadly? All it takes is 1 single bite by an infected mosquito to kill one of our precious endangered native forest birds.</p> <p>Time is of the essence as every wasted moment moves them closer to extinction. If nothing is done to help them, we are choosing to let them be lost forever.</p> <p>We, however, still have a small window of opportunity. That small bit of time to save many species is still here within our grasp. Now is the time to take action!</p> <p>I submitted this very close to the deadline. Similarly, our native birds are approaching a very real DEADline. A literal one. Without our help, they will be lost forever. Can you imagine a quiet native forest without their voices? It would not be the same forest, it would be empty, void, and heartbreaking. Along with the loss of our precious native species, we'd lose all the important 'services' they bring to our native forests, we'd lose another part of our Hawaiian culture... It brings tears to my eyes just thinking about it. Many times in our Hawai'i nei, negative impacts to our ecosystem may happen (such as introduction of invasives, loss of culture, decline/extinction of Hawaiian species) and due to various reasons, we wait until things are too late... Too far gone. It's then that many are saddened and we realize that we should have taken action sooner. The sooner we take action, the more of a chance we have to make a literal life changing difference! With every moment that passes that we do nothing, they are moving closer to that DEADline.</p> <p>I urge you to please take this final opportunity to save our native birds from extinction. They have no voice to cry for help. Please be their voice & change the course of what could be their inevitable history. We are their last and only hope.</p> <p>Please SUPPORT the mosquito control efforts of Wolbachia IIT on Kaua'i, and on every island in our Hawaiian Islands. Please take a stand for our native species and make a difference for them, for our aina, for our culture, and for our future.</p> <p>Mahalo for your time and consideration. Ann Tanimoto-Johnson</p>	Thank you for your comment
Marc kramer	7/24/2023 1:50	<p>We need to take swift and radical action to save the Hawaiian honeycreepers. The release of Wohlbachia infected male mosquitoes is the best and scientifically backed option to save the Akikiki and the akeke and the other native Hawaiian birds that are disappearing forever from the planet. We must be rapid in the approval because there is no time or we will lose our Hawaiian native birds forever.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Joanna Wheeler	7/24/2023 1:52	<p>Dear sirs:</p> <p>I strongly oppose the release of experimental mosquitoes in our island of Kaua and the rest of Hawaii. There was a public meeting but the answers to the questions did not make sense / I asked specifically if this exact method has been used successfully anywhere in the World. The answer I was given was yes.I have learned that this is not true.The risks are too high for something that puts us at risk. States like Florida have seen the appearance of malaria after experimental mosquitoes were released there.</p> <p>Lab manipulated ticks have caused havoc in the lives of millions of people. The last thing we need is to endanger the lives of people in Kauai with an experiment with insects that could cause damage to humans and even the birds we are being told would be protected by these mosquitoes. There is not enough transparency about exactly who is behind the mosquitoes provision. Names like the Gate foundation are connected and Bill Gates has been very vocal about the need decrease the World population so that doesn't inspire a lot of trust.</p> <p>It is now known the lab manipulated ticks are the cause of Lyme disease. that has harmed so many creating havoc on their healths.. https://www.newsweek.com/pentagon-weaponized-ticks-lyme-disease-investigation-1449737</p> <p>There are reports of mosquitoes as bio weapons.and of experiments on unsuspecting subjects in the past https://www.usatoday.com/story/news/nation/2021/02/04/big-buzz-mosquito-experiment-savannah-black-distrust-covid-vaccine/4391880001/</p> <p>I am also attaching a testimony a fully agree with in opposition of this ill conceived lab manipulated mosquito experiment.</p> <p>Sincerely, Joanna Wheeler. Kapaa, Hi</p> <p>Attention: Mosquito Control Project Kaua'i 22 July 2023 Department of Land and Natural Resources U.S. Fish and Wildlife Service</p> <p>Aloha,</p> <p>This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023.</p> <p>I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease.</p> <p>The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases."</p> <p>https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares</p> <p>The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued) admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.</p> <p>Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to</p> <p>Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted.</p> <p>Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gen-drive-document-for-consultation-20200129.pdf</p> <p>We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE."</p> <p>https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636</p> <p>Wolbachia Potential to Increase Pathogen Infection</p> <p>The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances.</p> <p>"Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans."</p> <p>https://www.sciencedaily.com/releases/2014/07/140710141628.htm</p> <p>Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965</p> <p>Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued)</p> <p>Antibiotic Resistance</p> <p>Page 12 of Kauai EA states: “To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai‘i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai‘i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai‘i mosquitoes.”</p> <p>Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning.</p> <p>The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/</p> <p>Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. “Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory’s environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity.”</p> <p>Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847</p> <p>“British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation.” https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop-release-of-genetically-engineered-mosquitoes-in-california-florida-continues/</p> <p>There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS).</p> <p>Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive</p> <p>“The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months.” Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/</p> <p>Horizontal Gene Transfer Between Wolbachia and the Mosquito <i>Aedes aegypti</i></p> <p>https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33</p> <p>This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov ›</p> <p>EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf</p> <p>“Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased.”</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued) “The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect’s nuclear genome with unknown consequences.</p> <p>Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases.”</p> <p>“The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5].”</p> <p>“It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in <i>Aedes aegypti</i> [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences.”</p> <p>“Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous.”</p> <p>Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the <i>Aedes aegypti</i> trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU</p> <p>Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, “it requires double and triple containment to make sure these don’t get out of the laboratory.” This is concerning since page 32 of EA says, “DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai’i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.”</p> <p>Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai’i. While “technology for this approach is not available for near-term implementation,” development and deployment of these tools appear to be a long-term goal at the federal level.” U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf</p> <p>Wolbachia DNA into Host DNA – “A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called <i>Drosophila ananassae</i>), and can insert parts of its genome into the genomes of members of several other host species.” https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957</p> <p>Lack of Bio-Security</p> <p>There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape,</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued) wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.</p> <p>Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html</p> <p>"We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar.</p> <p>A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en</p> <p>Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources.</p> <p>Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false</p> <p>There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i.</p> <p>The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related</p> <p>The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning.</p> <p>https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo</p> <p>Wolbachia Has Been Implicated in Human Disease</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued) Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, “There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive”. https://www.cdc.gov/parasites/onchocerciasis/treatment.html</p> <p>“For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision”. https://www.science.org/content/article/worms-may-not-act-alone-river-blindness</p> <p>Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/</p> <p>Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/</p> <p>The Kauai EA’s assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says “Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). “</p> <p>In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin’s lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext</p> <p>“Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin’s lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin’s lymphoma.”</p> <p>The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed:</p> <p>“Is the research described in the published article ‘Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes’ scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA’s assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?”</p> <p>The Board’s response states: “The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes.”</p> <p>Inconsistent Climate Data and Mosquito Population Trends</p> <p>The EA states, “Some climate change models suggest that the mean temperatures in Hawai’i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014).”</p> <p>Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of –0.2</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, <i>Continued</i>) to $-0.8^{\circ}\text{C}/\text{decade}$ at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c</p> <p>Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow.</p> <p>https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf</p> <p>Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick-moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF</p> <p>Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches-climate-change-sea-rise</p> <p>In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225</p> <p>“The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa’akai and 16 mosquitoes caught at Kawai’oi in October and November for P. relictum infection using PCR. One mosquito from Halepa’akai tested positive for infection. We dissected 33 mosquitoes caught at Kawai’oi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa’akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69).”</p> <p>Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai’i Island. “Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai’i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014).”</p> <p>Page 19 of EA states “Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species.” I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua’i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013.</p> <p>Verily Life Sciences and Rhodamine B</p> <p>Verily’s registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito-Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estimate_movement_mating_and_population_parameters_in_preparation_for_an_incompatible_male_program</p> <p>The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai’s MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms?</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522</p> <p>Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/</p>	

Name	Entry Date	Comment	Responses
		<p>(Joanna Wheeler, Continued) In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago.</p> <p>I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program “there is no field evidence it can reduce the risk of mosquito born diseases”. The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem.</p> <p>Respectfully, Donna Thompson Kamuela, HI sharkgss@protonmail.com</p>	
Nico	7/24/2023 2:30	<p>Save the akikiki!</p> <p>Kauai is the where my passion for birds started. It saddens me to see the birds that got me into this wonderful passion actively going extinct. This is the last chance to save them.</p>	Thank you for your comment
James R Muller	7/24/2023 2:30	Please do what you can to save Hawaii's unique birds!	Thank you for your comment
Taylor Soto	7/24/2023 2:44	<p>Rainbows are circles, but humans believe them to be arches because of our perception from the ground. If we don't preserve species that are capable of looking at life in ways we can't, we will be forced to look at life in ways we shouldn't. Our evolution is dependent upon the survival of those greater than ourselves. And to think a small bird isn't greater, is to insist that a rainbow will never be a circle, or that humans may one day fly. Invest in the projects and your teams, but remember money is paper to a bird. and one day we'll learn that it's just paper to us too. Our evolution is dependent upon the survival of those greater than ourselves.</p>	
Elizabeth Abraham	7/24/2023 3:04	<p>The forest birds of Hawaii are so unique to this Earth, and can't be found anywhere else. It's our responsibility to protect them against invasive, non-natural species like the mosquito. There are only 4-5 akikiki left in the wild. They and other species will go extinct without intervention such as the use of Wolbachia. I whole heartedly support the Wolbachia incompatible insect technique to save these species before they disappear from this world.</p>	Thank you for your comment
	7/24/2023 3:06	I am in full support of mosquito suppression. Native populations are at stake, and have faced extinction. Please do your part to protect the remaining forest birds.	Thank you for your comment
Zealon	7/24/2023 3:07	I believe that these birds should be protected at all costs.	Thank you for your comment
Lauren	7/24/2023 3:09	I support this proposal! Please save the birds!	Thank you for your comment
Michael Smith	7/24/2023 3:16	I am in favor of the IIT program on Kaua'i	Thank you for your comment
	7/24/2023 3:19	I support mosquito suppression in order to protect the birds of Hawaii!!!	Thank you for your comment

Name	Entry Date	Comment	Responses
Jyen-ai Jones	7/24/2023 3:25	I support mosquito suppression!	Thank you for your comment
Gabby Means	7/24/2023 3:30	Save the birds!!!	Thank you for your comment
Emily Bird	7/24/2023 3:35	I support saving these birds, and stopping the spread of avian malaria!	Thank you for your comment
Jan Ford	7/24/2023 3:42	I support mosquito suppression efforts on Kauai island.	Thank you for your comment
Gary Oakland	7/24/2023 3:50	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. Mahalo, Gary Oakland	Thank you for your comment
Diana Thow	7/24/2023 3:53	I wholeheartedly support this effort, which is based on science-backed evidence and run by a team of skilled professionals. It is essential to give these incredible native Hawaiian birds a fighting chance against avian malaria, and time is quickly running out for the 'akikiki!	Thank you for your comment
Lilli	7/24/2023 4:03	I support the use of IIT for mosquito suppression on Kauai. This is a necessary step in Hawaiian forest bird conservation. We have lost too many native species already and action must be taken now. The mosquito project poses no threat to humans of Āina, I am in support to using it to help save the birds.	Thank you for your comment
Kelley Strohm-Voss, Ph.D.	7/24/2023 4:06	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds. These methods are backed by science to give native bird species a chance against avian malaria, a disease that will eradicate them if no action is taken. Opposition to this conservation action is based on deeply, dangerously false information and should not carry weight in conservation decisions. Thank you for protecting native birds with mosquito control!	Thank you for your comment
	7/24/2023 4:20	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers. This is an incredibly important conservation action item that I fully support.	Thank you for your comment
Sarah Joy	7/24/2023 4:22	Please do this as soon as possible.	Thank you for your comment
Teresa Pegan	7/24/2023 4:25	I strongly support the mosquito control efforts to save Kaua'i's native forest birds. I can't think of a worthier cause for the sake of the natural and cultural heritage of Hawai'i. I had the privilege of visiting Alaka'i Wilderness in March of this year (2023), when there were still multiple pairs of 'Akikiki trying to raise their young in these beautiful Kaua'i forests. It was a joy to see them living their lives there, but also sad to know that they and the other birds in the forest were in such danger. Since that time, over the course of only a few months, it has been heartbreaking to hear that nearly every 'Akikiki has disappeared, their nests dying and the adults vanishing as they die of mosquito-borne disease. I can't believe that these birds, which were here in March, are now basically extinct by August of the same year. I also know that the other birds of the Alaka'i Wilderness are in danger of the same fate, especially the 'Akeke'e and the beautiful and iconic 'Tiwi. So many of Hawai'i's native birds are extinct already, taking with them the opportunity for others to witness and enjoy these beautiful species, which are so special to Hawai'i and to the world. For the sake of the faint hope of re-introducing 'Akikiki, and for the sake of the 'Akeke'e and 'Tiwi and all of the other birds in danger, please support and go through with this safe, well-reasoned, and well-designed plan to eradicate mosquitos from Kaua'i.	Thank you for your comment

Name	Entry Date	Comment	Responses
Lance Tanino	7/24/2023 4:29	I support Wolbachia IIT to save Hawaiian forest birds because it can help suppress mosquito populations and help save the remaining native birds in the Hawaiian Islands.	Thank you for your comment
Kapuahinano	7/24/2023 4:39	PLEASE SAVE OUR NATIVE BIRDS!!!	Thank you for your comment
Jared Jones	7/24/2023 4:50	I support mosquito suppression	Thank you for your comment
	7/24/2023 4:53	It is vital to prevent the extinction of honeycreeper birds. Many of these birds have already gone extinct and we should not lose more species than we already have. By using the incompatible mosquitos, we may be able to save honeycreepers from extinction. Using mosquitoes is an important action that needs to be taken NOW.	Thank you for your comment
	7/24/2023 4:54	Please use the incompatible mosquito release to save the honeycreepers.	Thank you for your comment
David M	7/24/2023 4:56	I support this EA. These birds are so vital to the ecosystem. We can learn so much from studying them and keeping them around. Please support these birds so our future generations can learn about them and understand their uniqueness.	Thank you for your comment
	7/24/2023 4:57	Preserving native bird species is extremely important and efforts to do so should be prioritized by environmental initiatives. IIT is an approach that can help reduce the population of non-native mosquitoes and subsequently protect native species of birds. This approach has been proven to be successful previously. I would like to voice my support for the project.	Thank you for your comment
	7/24/2023 4:59	Please input mosquito control to save these birds!	Thank you for your comment
Ryan Oyama	7/24/2023 4:59	I strongly support the effort to suppress mosquito populations. All mosquito species are introduced to Hawai'i and threaten not only human health but the health of our native ecosystems. The approach being taken here, which has been successfully implemented in several other places globally, offers the first real hope to stop and maybe even reverse the decline of our native forest birds and with them our native forests. This is crucial for the perpetuation of our watersheds. The EA addresses all concerns and this project should move forward with the urgency that the situation requires.	Thank you for your comment
Abigail Kreuser	7/24/2023 5:14	The suppression of mosquitos on Kaua'i is urgent. Without mosquito suppression all native honeycreepers will be lost to avian malaria in a very short time, as climate change increases suitable habitat for the non-native southern house mosquitos that spread the disease. I worked as an intern with Kaua'i Forest Birds from 2018-2019, and returned to work with the project as a technician in the spring of 2021. I only missed one breeding season (spring of 2020), and the decline of individual 'akikiki, i'iwi, and akeke'e was unbelievable. Now with only 5 'akikiki remaining, I fear the other species of honey creepers on Kaua'i will face the same fate. Mosquito suppression is critical to preventing extinction and will also benefit the honey creeper species that are also facing decline but not yet endangered. I support the Environmental Assessment's findings and believe the risks have been appropriately considered. Potential impacts of the operations on the native ecosystem have been noted in the assessment and I believe they are outweighed by the benefit of preventing extinction of the honeycreeper species.	Thank you for your comment

Name	Entry Date	Comment	Responses
Jodie Johns	7/24/2023 5:15	<p>I oppose the experimental release of waboquia mosquitoes. For reasons too numerous to mention; this is a health hazard that is unnecessary to the people of HAWAII & KAUI.</p> <p>Please do not rely on subjective science. This is a danger. Period. And it must be stopped.</p> <p>Jodie Johns, Assoc Pastor, The Church @ Koloa, HI</p> <p>Mahalo Ke Akua</p>	Concern: 2, 11
Yasha	7/24/2023 5:31	Imagine a future where your children have no birds. wouldnt you do anything to prevent that?	Thank you for your comment
Barbara Heindl	7/24/2023 5:32	<p>Please accept this email as my support for the Kauai Mosquito Suppression draft Environmental assessment.</p> <p>The effects of avian malaria, spread by non-native mosquitos, on Hawaii's native wildlife, are well documented. While this method has not been used in Hawaii, it has successfully reduced mosquito populations elsewhere (Texas, California, Mexico, Singapore, Australia). This draft EA is extensive and discusses the proposal well and clearly illustrates the options and their risks, including what happens if we do nothing... the loss of some of the most rare species on earth. Other conservation management techniques to bolster native bird populations are a waste of time and money without large-scale mosquito control efforts to reduce avian malaria on the landscape.</p> <p>The approval of this draft EA is critical in the next steps to protecting Kauai's native birds, and birds across the Hawaiian chain. I had the privilege of working with endangered forest birds on Kaua'i from 2010-2014. When it was not uncommon to see and hear species like Akikiki and Akeke'e in the Alaka'i. When I started working for KFBRP in 2010 both species had just been listed but it felt like there was still time. Now, in less than a decade since I left that position, Akikiki and Akeke'e are at critically low numbers at no fault to the dedicated individuals who continue to try to save them with limited options, funding and support. Forests that less than 20 years ago were noted by biologists as being vibrant with the songs and calls of native birds are now growing silent. It is heartbreaking to come to terms with the undeniable fact that we are willingly witness species go extinct, especially species I worked so closely with, while there are proven methods that could save them. Now is our only opportunity to keep them from blinking out of existence.</p> <p>Please approve and support the draft EA for mosquito suppression on Kauai and pave the way forward for mosquito suppression on other Hawaiian Islands. Please do not let our last few remaining native forest birds go the way of the O'O and Po'ouli.</p>	Thank you for your comment
Henry	7/24/2023 5:40	Please please please listen to these experts. It's so sad and maddening to see species just disappear in front of our eyes when there is a feasible solution. I'm an avid 15 year old birder and would like to see these incredible birds one day, please consider the solutions so that everybody can enjoy them in the future. We've brought back species from the brink of extinction before, let's do it again.	Thank you for your comment
Concern for Aina	7/24/2023 5:46	Introducing species? When will you learn? This has never gone well for Hawai'i! Stop the madness! Stop experimenting on Hawaiian People and Islands! You are suppose to represent what the people want and We don't want this!	Concerns: 3, 10, 16
Faith Blalock	7/24/2023 5:51	I am in support of the birds not mosquitos project. It is an effective and safe way to protect our Native birds. It is also a necessary effort, if this project is not allowed then you are ensuring the extinction of our Native manu. Treat these birds with respect, like 'ohana, and save their lives.	Thank you for your comment
Madison	7/24/2023 5:51	I support the proposed mosquito control methods to save Hawai'i's native forest birds	Thank you for your comment

Name	Entry Date	Comment	Responses
John Ewen	7/24/2023 5:55	Hawaii's avifauna has been decimated from what it was prior to European arrival. A delicate balance was upset and one major driver of that was the introduction of mosquitoes. Mosquitoes have acted as highly efficient vectors for avian malaria parasites and avipoxvirus. Hawaiian honeycreepers are particularly vulnerable and many species have been lost and most others continue to decline. This is a heart breaking situation and, until recently, there has been very little management opportunities to stop it occurring. Sadly, the impacts on Hawaii's remaining native birds is only accelerating under global climate change with warmer temperatures allowing mosquitoes to invade ever higher altitudes – the last remaining refugia for many of Hawaii's birds. The avifauna on Kaua'i is no exception. Only this year has an emergency operation got fully underway to rescue the 'akikiki from the brink of extinction. Its extinction in the wild predicted in the near future and may already have effectively occurred. Its not the only species crashing because of the mosquito advance. In the face of all of this, there are dedicated people and organizations fighting to save these Hawaiian species. It takes immense strength and resolve to continue fighting against extinction when the odds are so heavily stacked against you. I want to express my immense gratitude to everyone involved in work to recover Hawaii's unique and precious native avifauna.	Thank you for your comment
Edward Schaefer	7/24/2023 5:56	Please do the mosquito release on other islands that you are already doing on Maui. Thank you, Edward Schaefer 76-6360 Kupuna St., Kailua-Kona	Thank you for your comment
Michaela Baumgartner	7/24/2023 6:10	This is a bioweapon and experimental drug project without any safety studies! I completely oppose this project! No to lab-infected mosquito release! No to genetically modified technology that has not been studied long enough for safety! Michaela Baumgartner, Captain Cook, Hawaii	Concerns: 4, 9
Michaela Baumgartner	7/24/2023 6:14	Here is my comment: "This is a bioweapon and experimental drug without long-term safety studies! I completely oppose the planned lab-infected mosquito release in Hawaii! No to technology without long-term safety trials!" - Michaela Baumgartner, Captain Cook, Hawaii	Concerns: 9, 11
	7/24/2023 6:18	Do it	Thank you for your comment
Stephan J Schoech	7/24/2023 6:29	I support the birds!	Thank you for your comment
Nathaniel Watkins	7/24/2023 6:32	The plan is essential for the survival of the native honeycreepers of Kauai and the other Hawaiian islands as a whole. This plan is absolutely necessary, with so much of Hawaii's native flora and fauna being restricted to a mere fraction of what it was is all the more reason to make sure this plan goes into action. I'm sure it's difficult for folks who haven't visited the Alaka'i to understand the impact besides reading stats, but watching Kauai Elepaio so sick they can't even fly off the ground right by your feet because of this sickness is heartbreaking. Even in the only safe place for them in the forest they're still not safe.	Thank you for your comment
Natalie	7/24/2023 6:32	I am in full support of the scienced based IIT as a means of mosquito suppression and endemic bird conservation in Kauai	Thank you for your comment
	7/24/2023 6:46	I strongly support instituting this mitigation technique to prevent further decline in Hawaiian native biodiversity. The methods have had success elsewhere and the stakes to save endemic Kauai species are very high. I believe it is critical to implement the best available science as soon as feasible to ensure the survival of Kauai's native forest birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Caroline Poli	7/24/2023 6:48	<p>Hello,</p> <p>I am a wildlife expert with a research program that focuses on the effects of introduced species on birds. I understand in detail the challenges of conserving wildlife in a complex and populated world. I enthusiastically support Wolbachia IIT to save Hawaiian forest birds because Hawaiian birds are infinitely precious, incredibly unique, and highly threatened by disease and climate change. In particular, avian malaria was introduced to Hawaii and native honeycreepers are highly susceptible. Human-caused climate change has exacerbated the problem because it allows disease-carrying mosquitoes to occupy habitat at higher elevations than normal, putting more birds at risk of mortality or morbidity from a disease they never should have experienced. Bird population declines in the islands have been steep and extinction is imminent unless countermeasures are taken. This would be tragic and wrong. I believe that it is our duty to be good stewards of nature, and to counteract harm that is the direct result of human action. We should do everything we can to help these birds thrive. Mosquito control and eradication is a necessary and important step towards that goal.</p> <p>Thank you, Dr Caroline Poli, Avian Ecologist, University of Florida</p>	Thank you for your comment
Kurt Ongman	7/24/2023 6:49	<p>To whom it may concern,</p> <p>I SUPPORT Board approval of the Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA) on Kauai!</p> <p>I write today in sheer desperation. Much of my life has been dedicated to the conservation of rare and enigmatic wildlife. PLEASE give Hawaii's enigmatic avifauna the opportunity to heal from mosquitos and mosquito borne illnesses alien to Hawaii.</p> <p>Mahalo, Kurt Ongman</p>	Thank you for your comment
Lizzy Baxter	7/24/2023 6:53	<p>Aloha, I am a resident on Kauai and I fully support the Wolbachia/IIT mosquito suppression techniques. The science confirms that this will actually help benefit the native forest birds. Despite the political climate in our country, and those with loud opinions who don't have the education, we need to stay true to what will actually benefit our aina. Negativity will not. Facts and preservation of our unique biodiversity are what will hold true for generations to come. The future will be disappointed if we strip them of possibility now. Please support the mosquito suppression so we can save our unique wildlife.</p>	Thank you for your comment
Rachel Kingsley	7/24/2023 7:00	<p>I am writing in support of the IIT efforts to suppress mosquito populations on Kaua'i. The Hawaiian honeycreepers are the ancestors of Hawai'i. Their voices were some of the first this place has known and today they are being silenced. The sound of mosquitoes is instead replacing them. The diseases these invasive pests carry are harming the birds and the ecosystems they call home. We, humans, are the sole cause of this issue and we have the responsibility to take action and try to do right in these places and for these species. Please support this effort and give the birds a chance to survive for future generations.</p>	Thank you for your comment
Bettina	7/24/2023 7:01	<p>I support this project and urge authorities to provide the necessary means for endangered species to be protected and consider cancelling anything that would have the opposite effect.</p>	Thank you for your comment
jeanette imler	7/24/2023 7:09	<p>I support for Incompatible Insect Technique (IIT) to reduce mosquito populations on Kauai. Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 50 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. I appreciate your support as well in implementing IIT.</p> <p>Mahalo, Jeanette Imler</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Malia Staab	7/24/2023 7:11	Protecting native species and ecosystems is the responsibility of everyone who calls Hawai'i home. We must learn from the place we occupy, listen to the stories, meet the residents, and do what we can to preserve the unique biodiversity that has suffered as a result of human impact and oversight. I support the wolbachia suppression of mosquitos to protect endangered forest birds. We hope to give a fighting chance to the species that still provide and ensure future generations are not only learning about Hawaiian honeycreepers in text books. It is something profound and special to find yourself in native forest in Hawai'i surrounded by manu and kahuli, sharing the voices that have echoed through the mountains for hundreds of years. This is our chance to add our human voices and advocate for those that came before us.	Thank you for your comment
Rona Holub	7/24/2023 7:15	Please stop the spread of mosquito born disease that decimates bird population. Thank you Rona L Holub, Kakaako	Thank you for your comment
Kerry Parsons	7/24/2023 7:19	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I DEMAND that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This is in court, and should not be able to be released without an impact study!!!! If you approve this to go through and these mosquitoes to be released, you will personally be responsible for the damage. Think about that you will be morally responsible and it will haunt you!!! We look forward to connecting with you! 📧 Kerry Parsons, Elevate Wellness Kauai, 808-755-8030	Concern: 1, 34
	7/24/2023 7:26	There is no choice but to act now. With only 5 remaining individuals, the 'akikiki are on their last legs. For too long have the ecologically inconsiderate actions of invasive people brought destruction to unique wildlife. In a place so special with an indigenous culture uniquely tied to it's native birds, it is of utmost importance to reverse the damage caused. For the entire birding and environmental community, and for the people and nature of Hawai'i, please do this in order to save the birds and set an example and beacon of hope for conservation worldwide. We implore you to take action immediately.	Thank you for your comment
Olivia Wang	7/24/2023 7:29	I am writing to express my full support for this plan. Native forest birds hold so much ecological and cultural value, and avian malaria is one of the greatest threats to their survival. Many are already extinct in the wild, and cannot persist without our help. I am in full support of the use of IIT, which has been proved to be safe and effective for mosquito control in other regions, as a tool to help conserve our native wildlife.	Thank you for your comment
Vanessa	7/24/2023 7:36	PROTECT OUR NATIVE FOREST BIRDS!!	Thank you for your comment
	7/24/2023 7:36	I support mosquito suppression because mosquitoes are an invasive species that are threatening the existence of our native birds. We need our native Hawaiian birds to thrive in order to keep the entire native Hawaiian ecosystem around them thriving. But this is not possible if they are being wiped out by the invasive mosquito. I believe that action must be brought quickly to save our damaged, native ecosystem.	Thank you for your comment
	7/24/2023 7:45	Please save the birds!!!	Thank you for your comment

Name	Entry Date	Comment	Responses
Christian Reynolds	7/24/2023 7:49	Aloha, I am writing this email today in show of my support of the mosquito control methods on the island of Kaua'i. For the sake of preserving the island's unique biodiversity, mosquitoes must be eradicated. The IIT method has been proven effective elsewhere on the globe, and without its implementation on Kaua'i we will certainly see the loss of many of the island's endemic forest birds. I wouldn't want to have to see another go extinct in my lifetime. Here's to hoping for a better future for our manu! Mahalo.	Thank you for your comment
Elizabeth Conlon	7/24/2023 7:49	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
Matthew Leibowitz	7/24/2023 7:52	The native Hawaiian wildlife must be protected at all costs.	Thank you for your comment
Sarah	7/24/2023 7:53	I completely support the Incompatible Insect Technique to suppress the population of mosquitos on Kaua'i. After working in the Alaka'i and Koke'e area for three years to protect seabird populations, I gained a deep appreciate for the cultural and economic value of both the seabirds and native forest birds. Losing our forest birds results in a less biodiverse and more unstable ecosystem, and each species lost tilts the forest further toward collapse. The IIT is a major step in the right direction toward preserving our forests for future generations.	Thank you for your comment
Roberta McBride	7/24/2023 7:58	I am in firm opposition to the release of Wolbachia-infected mosquitoes on ANY Hawaiian island. I am a 35-year resident of Kauai. My husband has even longer residence. Through the decades lived here, we have experienced the after-effects of many other "experimental" releases of non-indigenous plants and animals. Consider the genocidal effect of the Mongoose upon native Hawaiian birds. Consider the tree-choking Golden Pothos vine as it takes over acres of trees. Consider the white Egrets as they compete voraciously with Nene Goose for food. Look at the Guinea Grass takeover along our roads and highways on Kauai, blocking views and access to pull over on roadsides for safety purposes. The bulky, clumping grass blocks waterways, contributing to later flooding. Millions of dollars are spent trying to keep up with mowing that grass. Unintended, unseen consequences are inherent to all these examples. What dire consequences will ensue from lab-infected mosquitoes upon our fauna, flora, and people? This proposed course of action must be stopped. Roberta McBride, PO Box 2114, Kapaa, HI 96746	Concerns: 2, 3, 5, 9, 10

Name	Entry Date	Comment	Responses
Emily Senegal-Thyroff	7/24/2023 7:59	<p>Aloha kākou,</p> <p>I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem.</p> <p>Mahalo for your time and consideration!</p> <p>Mahalo, Emily Senegal-Thyroff, emthyroff@gmail.com</p>	Thank you for your comment
Nancy Norton	7/24/2023 8:04	<p>We need to save these birds from extinction and to do that we need all the tools necessary including lands scape control of mosquitoes using naturally occurring wolbachia.</p>	Thank you for your comment
Caitlin Kawaiaea	7/24/2023 8:09	<p>Aloha,</p> <p>I hope this email finds you in good spirits. I am in support of the use of wolbachia mosquitoes. Our native Manu are disappearing at alarming rates. Although they play a significant role in Hawaiian culture their ecological roles are of equal importance.</p> <p>I have personally collected wolbachia data on Maui in Kipahulu valley and the numbers we saw were alarming. One pool contained hundreds if not thousands of larvae, all disease carrying vectors. Without our native birds the ecosystem will have a cascade effect and our native ecosystems will cease to exist. Please give our Manu a fighting chance.</p> <p>Me ke aloha, Kili Kawaiaea</p>	Thank you for your comment
Kelly	7/24/2023 8:09	<p>I am writing in support of using the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kōke'e and Alaka'i swamp on Kaua'i. This method is the best way to save Kauai's forest birds, who are an essential part of the island ecosystem and Kauai's culture of place. I am praying that the DLNR and USFWS' proposal to use IIT is accepted.</p>	Thank you for your comment
Uma Nagendra	7/24/2023 8:09	<p>I support the use of IIT to suppress mosquito populations on Kaua'i and protect critically endangered birds. It is our responsibility to take care of the native birds who are on the precipice of extinction. The situation is incredibly dire with only 5 Akikiki remaining. Every moment that we delay using these safe and effective tools puts us at risk for losing species forever. This technology has already been used safely and effectively in other areas for protecting human populations. This is an action that we can do to give hope to native forests now and in the future.</p>	Thank you for your comment
Alicia	7/24/2023 8:12	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Alicia, <i>Continued</i>) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
Laurie and Joe Gentle	7/24/2023 8:12	<p>NO TO MOSQUITO SPRAYING!!! Hawaii is one of the worlds treasures, especially Kauait. Please, please do not allow this massive chemical invasion.</p> <p>THANK YOU!!!</p>	Thank you for your comment
Susan ANDERSON	7/24/2023 8:13	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Stephanie Mladinich	7/24/2023 8:17	<p>Dear Department of Land and Natural Resources, Division of Forestry and Wildlife,</p> <p>I SUPPORT the approval of the Kaua'i NPS Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA). Native birds of Hawai'i have been experiencing extinctions and population declines driven by avian malaria for nearly the past 200 years, that have only accelerated over the past 20 years. With Hawai'i standing as the bird extinction capital of the world, this is evidenced by the reduction of what were originally more than 50 honeycreeper species endemic to the Hawaiian Islands to just 17 that remain, and more than half are listed as Endangered or Threatened species.</p> <p>Wolbachia IIT has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. Successful IIT projects have resulted in mosquito population declines of 90 percent or more. Beyond supporting conservation, Wolbachia IIT can also lead to positive public health impacts, with the reduction of mosquito populations that can vector human disease.</p> <p>The EA that has been conducted thoroughly analyzed all potential impacts of the implementation of Wolbachia IIT for Kaua'i, with thoughtfulness towards safeguarding the health and well-being of both the forest birds and people of Kaua'i. It is made clear, through research supported by decades of peer-reviewed science, that there are no significant negative environmental or cultural impacts that will result. I believe this report provides ample evidence that is sufficient to warrant moving forward with the Wolbachia IIT for the island of Kaua'i. Compliance has been demonstrated with NEPA and HEPA.</p> <p>Wolbachia IIT is currently the only hope we have to avert further extinctions of these culturally and ecologically significant species. We cannot afford any delays. I urge you to please APPROVE the Kaua'i NPS Wolbachia IIT EA and issue a FNSI to save Kaua'i forest birds.</p> <p>Mahalo for the opportunity to provide testimony, Stephanie Mladinich</p>	Thank you for your comment
Alicia Wills	7/24/2023 8:17	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Friends of Hakalau Forest	7/24/2023 8:21	<p>Aloha members of the Dept. of Land and Natural Resources board,</p> <p>The Friends of Hakalau Forest would like to support mosquito control and the draft Environmental Assessment for Kaua'i Mosquito Suppression.</p> <p>The Friends of Hakalau Forest NWR is a 501C3 non-profit organization dedicated to the conservation and protection of native birds and plants at the Hakalau Forest National Wildlife Refuge and surrounding lands. We represent almost 400 members, including many biologists as well as community members who know and love our native birds.</p> <p>We watch with alarm as disease-bearing mosquitoes begin to reach higher elevations and threaten the endangered birds at Hakalau. We sympathize with our colleagues on Kaua'i who have seen all of their native forests invaded by mosquitoes and their native birds die out. The Incompatible Insect Technique is an environmentally-friendly method to control mosquitoes and our best shot at saving our native birds. We look forward to its successful implementation on Kaua'i and hope that it will also be deployed at Hakalau in the future.</p> <p>Sincerely, J. B. Friday, PhD President, Friends of Hakalau Forest NWR</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Sandra	7/24/2023 8:21	Why on Earth would anyone want to introduce mosquitoes into the environment they do not do anything positive and many people react physically to the bites. Please stop this nonsense!!	Thank you for your comment
Robert Lee, Hawaii County	7/24/2023 8:26	My wife and I are OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full-scope Environmental Impact Statement (EIS) documenting the impacts on our native birds, environment, and public health. This release is non-reversible so more thorough studies need to be conducted to prevent unintended consequences.	Concern: 1
Deborah Sevy	7/24/2023 8:27	<p>I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p> <p>There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Courtney Dwyer	7/24/2023 8:28	Please help protect the native bird species by suppressing the mosquito population.	Thank you for your comment
	7/24/2023 8:28	I support the Draft EA statement for Kaua’i mosquito suppression. The IIT method is a the best chance we have to save these native honey creepers from the brink of extinction. Used in other countries, including the United States to successfully to suppress mosquitos for human health reasons, we owe it to these bird species the same kind of help. Please vote to support this draft EA. Maholo for your time.	Thank you for your comment

Name	Entry Date	Comment	Responses
J. B. Friday	7/24/2023 8:29	<p>Dear Land Board,</p> <p>I am writing to support mosquito control on Kaua'i through the Incompatible Insect Technique. I recall working up in Koke'e in the 1990s when we would see 'i'iwi almost every day. Now I hear that sightings are rare and the rare birds are on the brink of extinction. The Incompatible Insect Technique has been deployed in other places with success and it's our last shot at saving some of our native birds. Please support mosquito control and support our native birds.</p> <p>Mahalo, JB Friday, PhD, 1416 Kilikina St, Hilo, Hawaii 96720</p> <p>Life is like riding a bicycle - in order to keep your balance, you must keep moving. - Albert Einstein</p>	Thank you for your comment
Julia	7/24/2023 8:32	<p>I am completely against this mosquito experiment you are pushing the islands into. This needs much more research especially since this is the same people placed the mosquitos into Florida, who immediately after now have the first cases in 20 years of mosquito born virus.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? Will you be the responsible one? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>"We the people "</p>	Concerns: 9, 28
Jaime McEwen	7/24/2023 8:34	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>Jaime McEwen</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Jaime McEwen, Continued) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
	7/24/2023 8:35	I support the use of Wolbachia for mosquito control in Kaua'i	Thank you for your comment
Helen raine	7/24/2023 8:36	I fully support the use of this benign and proven technology to save our endangered Hawaiian birds from extinction. Wolbachia has been used successfully around the world to control mosquitoes for health reasons... a small minority of vocal opponents should not block what the majority of the population supports, namely action to save birds which will otherwise be lost forever	Thank you for your comment
	7/24/2023 8:37	I strongly support the draft EA to suppress mosquito populations on Kaua'i. This method is a proven tool that is the last chance to save some of the native forest birds from extinction due to avian malaria.	Thank you for your comment
	7/24/2023 8:44	In this day and age where invasive species are running rampant and climate change is exacerbating disease, we need to support efforts to protect native flora and fauna and contain the spread of diseases such as avian malaria. Please choose to support mosquito suppression and protect native birds!	Thank you for your comment
	7/24/2023 8:45	We need this mosquito control to work and we need it now. I was lucky enough to see some of the remaining akikiki and the wild. Seeing how vulnerable they (and many other species) are to the (sadly) growing mosquito population is horrible. This work should have been done a long time ago and now is our chance (maybe last chance) to help them. I fully support this project and hope the rest of the public do to.	Thank you for your comment
Gabrielle Solomon	7/24/2023 8:46	As a former volunteer with PIERC USGS, I appreciate the importance of Hawaii's native bird species. Further, as a master's student studying ornithology in Dr. Robert Curry's lab, I recognize that birds serve as bio-indicators of the environment. Therefore, it is devastating to see the negative effects that mosquitoes are having on bird populations in HI. We are hopeful that this approach will be effective in reducing the mosquito population, ultimately saving the Hawaiian Honeycreepers. Thank you for your time and consideration!	Thank you for your comment
Jordan Lerma	7/24/2023 8:47	<p>I am writing to express my profound support for the Kaua'i Mosquito Suppression Project, a critical initiative aimed at protecting Hawai'i's invaluable forest bird species.</p> <p>The plight of our native Hawaiian honeycreepers is deeply concerning. With a significant number of these species already extinct and many others threatened, the urgency of this situation cannot be overstated. The principal threats—avian malaria and avian pox—spread by the nonnative southern house mosquito, require innovative and effective solutions.</p> <p>This is why the proposed use of the Incompatible Insect Technique (IIT) in Kaua'i's Kōke'e and Alaka'i Wilderness areas is a cause for optimism. Having seen the successful implementation of IIT in other parts of the world, it's heartening to see this environmentally friendly solution being considered for our precious island.</p> <p>What I appreciate most about IIT is its respect for nature's balance—it uses the naturally-occurring bacterium Wolbachia and doesn't involve genetic modification. This aligns perfectly with our shared commitment to preserving Hawai'i's unique biodiversity.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Jordan Lerma, Continued) The comprehensive approach to the project, including extensive pre- and post-release monitoring, speaks volumes about the careful planning and foresight invested in this initiative. I am hopeful that this project will bring about a significant positive change in the fight against avian diseases affecting our forest birds.</p> <p>Please accept my deepest gratitude for your commitment to this cause. I fully support this project and look forward to witnessing its positive impact on the preservation of Kaua'i's forest birds.</p>	
Siobhan Brier	7/24/2023 8:55	Please save these beautiful animals	Thank you for your comment
Cristina Rothwell	7/24/2023 8:55	<p>TO DLNR HAWAII,</p> <p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>This is a dangerous move that will impact the PEOPLE of Hawaii for years to come.</p> <p>Sincerely, Cristina Rothwell</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Tom Stanton	7/24/2023 8:58	<p>To the Hawaii Department of Land and Natural Resources,</p> <p>I am adamantly opposed to introducing laboratory infected biopesticide mosquitoes into Kauai's human population. There are no long term studies to determine if there could be negative consequences to the human population from horizontal transmission or possible unanticipated evolutionary events. Any harmful effects potentially generated from the introduction of these modified mosquitoes on Kauai could not only hurt the human and animal population of Kauai but also could leave the County of Kauai and State of Hawaii open to massive litigation. I am opposed to the current environmental assessment and the introduction of these mosquitoes until a long term complete, full scope, Environmental Impact Study can be done.</p> <p>Mahalo for your consideration, Tom Stanton, 4436 Emmalani Dr, Princeville, HI 96722</p>	Concerns: 1, 2, 9, 14, 15, 19
Tim Healy	7/24/2023 8:58	The dire reality facing native Hawaiian forest birds cannot be overstated. Action must be taken swiftly to prevent further losses of these uniquely wonderful species. Please move forward with mosquito suppression efforts as promptly and efficiently as possible to save our birds.	Thank you for your comment
Zoli Wall	7/24/2023 9:02	I support mosquito suppression on Kaua'i! Saving native birds is so important, but also mosquitoes suck let's eradicate them! They aren't native here and they are only harmful to the local ecosystem. This method of mosquito suppression is safe and won't cause any harm, this is a no brainer!	Thank you for your comment
Racheal Fernandez	7/24/2023 9:03	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Thomas Ford-Hutchinson	7/24/2023 9:03	<p>As a research scientist and an avid bird watcher, I am writing to express my wholehearted support for the proposed Environmental Assessment for Kaua'i Mosquito Suppression, particularly the implementation of the Incompatible Insect Technique (IIT) to protect the endangered Hawaiian forest bird species from avian malaria transmitted by non-native mosquitoes.</p> <p>The decline in populations of native forest birds on Kaua'i over the last two decades is a distressing reality that demands immediate and effective action. Avian malaria, primarily spread by non-native southern house mosquitoes, poses a grave threat to the survival of these beautiful and unique bird species. The extinction of 10 out of Kaua'i's 16 native honeycreepers is a heartbreaking reminder of the urgent need for conservation efforts to protect the remaining species.</p> <p>The proposed approach utilizing IIT is a groundbreaking and promising solution to mitigate the impact of avian malaria on native bird populations. IIT has demonstrated its safety and effectiveness in various locations worldwide, including successful trials in California, Kentucky, and French Polynesia. The potential benefits of IIT in the fight against mosquito-borne diseases are well-documented, and I firmly believe that it can be a game-changer for the conservation of Kaua'i's endangered avian species.</p> <p>The use of lab-raised male mosquitoes carrying Wolbachia to suppress the wild mosquito population by at least 90% is a precisely targeted and eco-friendly method. I am heartened to learn that Wolbachia is already present in mosquitoes in Hawai'i, and the strain used for this project naturally occurs in the Asian tiger mosquito. The fact that no new organisms will be introduced to the island through this project allays any concerns regarding the introduction of foreign species.</p> <p>IIT does not involve genetic engineering and does not result in genetically modified organisms (GMOs). As a research scientist, I appreciate the importance of employing safe and scientifically proven methods for conservation efforts, and IIT aligns perfectly with these principles. The extensive body of data supporting the safety and effectiveness of IIT reinforces my confidence in the project's potential to protect native bird species on Kaua'i.</p> <p>Furthermore, the success of this project could have broader implications beyond Kaua'i, offering hope for the conservation of other endangered bird populations in Hawai'i and elsewhere facing similar threats from mosquito-borne diseases.</p> <p>Preserving Hawaii's unique and diverse avifauna is not just an ecological imperative but also a cultural responsibility. Native Hawaiian forest birds have played a vital role in the island's cultural heritage, and their continued decline would represent an irreplaceable loss. It is our moral obligation to do everything in our power to prevent their extinction.</p> <p>In conclusion, I wholeheartedly endorse the proposed Kaua'i Mosquito Suppression Environmental Assessment and urge the authorities to move forward with the implementation of IIT as part of a comprehensive strategy to protect the native bird species of Kaua'i. As a research scientist and avid bird watcher, I firmly believe that this project holds great promise and represents a vital step towards securing the future of Kaua'i's endangered forest birds.</p> <p>Thank you for your dedication to the conservation of Hawaii's unique biodiversity, and I trust that the decision-makers will prioritize the long-term survival of these iconic bird species through this important initiative.</p>	Thank you for your comment
Adam Cunningham	7/24/2023 9:04	This mosquito suppression plan is the only shot of saving Akekee, Akohekohe, and Kiwikiu. If this plan is rejected it will be catastrophic for these treasured birds who have called Kauai home for thousands of years.	Thank you for your comment
	7/24/2023 9:06	protect the birds	Thank you for your comment
Kristen Wacker	7/24/2023 9:09	As an ornithologist and evolutionary biologist, I strongly support the Kaua'i Mosquito Suppression initiative. The non-native mosquitos on the Hawaiian islands are an extreme threat to biodiversity, and the scientifically-supported and safe proposal to release Wolbachia-infected mosquitos into the wild is the single best opportunity that Hawaii has to preserve their incredible unique avian communities.	Thank you for your comment

Name	Entry Date	Comment	Responses
Rory Pascarelli	7/24/2023 9:09	Oppose to Wolbachia-based Suppression of Mosquitoes on Kauai. There are unknown long term environmental effects as well as potential disease that could come out of this harmful act.	Concerns: 2, 5
Lila Kono Kim Fried	7/24/2023 9:12	As a biologist who has worked in natural resource management and avian conservation in Hawai'i, I approve of the Kaua'i Mosquito Suppression Plan. The environmental assessment is sound and the plan should be enacted as soon as possible. Honeycreepers are a unique group of forest birds found only in Hawai'i, with only 17 out of 50 species remaining. We are on track to lose several more in the next few years, and the 'Akikiki this year if swift action is not taken. Avian malaria, a disease transmitted by invasive mosquitoes, is rapidly decimating the archipelago's native birds, and it will only continue to expand upslope into the last refugia for Hawai'i's honeycreepers without the Incompatible Insect Technique. We know that this technique is proven to be safe and effective, and the time to put it in action in Hawai'i is long past due. Please do not let ignorance and misinformation derail this plan -- We are in the eleventh hour for the 'Akikiki and we will lose it forever without swift and immediate mosquito control on Kaua'i.	Thank you for your comment
Susie Jenkins	7/24/2023 9:15	Aloha, I am totally against the release of these on native mosquitos. Really what are you thinking? This is an experiment that could have disastrous impact. Please stop this. C.S.Jenkins	Concern: 11
	7/24/2023 9:16	I support the need to better the forest mosquito problem and get more resources.	Thank you for your comment
Lily B	7/24/2023 9:18	Save the birds from avian malaria!	Thank you for your comment
Harley Winfrey	7/24/2023 9:20	Please support mosquito suppression to protect the critically endangered Akikiki, Akeke'e, and other native Hawaiian birds.	Thank you for your comment
Karen Clarke	7/24/2023 9:21	I support ITT to save the birds. Wildlife is precious and must be protected from deforestation and other global attacks.	Thank you for your comment
Ben Fitt	7/24/2023 9:29	Control of invasive mosquitos to save endemic birds is our duty. We created the mess, we have an obligation to do our best to mitigate the effects before it's too late. I support the efforts to release sterile male mosquitos. to curb population levels.	Thank you for your comment
	7/24/2023 9:30	While human intervention in the local ecosystem is what got Kaua'i and its native birds into their current situation, this seems to be a crucial last-stitch effort to save Akeke'e from extinction and I'iwi from extirpation. This plan will undoubtedly face public backlash, but please do not succumb to public pressure. This may be the only hope of saving these birds.	Thank you for your comment
Syd Zoll	7/24/2023 9:34	I support IIT wolbachia mosquito control. Malama the manu!	Thank you for your comment
Andrew Marden	7/24/2023 9:41	This needs to be passed and is absolutely crucial for the survival of some Hawai'ian honeycreeper species. Without this going through, the 'Akikiki, 'Akeke'e, Kauai population of I'iwi, and probably 'Anianiau will go extinct. Now is a critical time for these species with single digits of 'Akikiki left in the wild, and time is of the essence where this needs to be passed.	Thank you for your comment

Name	Entry Date	Comment	Responses
Kirkland Mawae	7/24/2023 9:44	<p>Aloha</p> <p>My name is Kirkland Keoni Mawae and I am in support of the mosquito suppression efforts through the DLNR and USFWS. As a native Hawaiian and conservation worker, there is not our culture without our environment. Our gods, our people, our spirit lives with the birds, the plants, the fish. For us to lose such a vital part of our environment is to lose a vital piece of our culture. Not only will the mosquito suppression be saving the birds, it is another step forward in protecting us as a people.</p> <p>Thank you, kirkland Keoni Mawae</p>	Thank you for your comment
	7/24/2023 9:45	<p>To: DLNR, I Oppose the "Wolbachia-based Suppression of Mosquitoes on Kaua'i"</p> <p>As I look down and see a mosquito about to bite my hand I am reminded of 1992. In 1992, I was sitting in a coffee shop in Petaluma, California, reading a San Francisco paper. In the back of the paper there was a small 2 inch announcement. It stated something like this: "The United States, under Herbert Walker Bush, declares that if any indigenous group falls at or below 2% pure, the United States reserves the right to declare that group null and void and any benefits afforded to the group will be withdrawn." This is what is happening with the mosquito release. The release of Bill Gate's, death jab mosquitoes, is being planned to remove people from Hawaiian lands by death and disease, the birds don't own the land. The citizens of Hawaii will not stand by and let you release billions of infected mosquitoes in an attempt to kill us.</p> <p>You want us to believe that you did genital exams on the mosquitoes but we know that's not true.</p> <p>You want us to believe the mosquito agreed to only mate with infected partners!</p> <p>You want us to believe that death jab mosquitos promised to never bite a human!</p> <p>You obviously do not know the true nature of mosquitoes!</p> <p>Mosquitoes do not follow your orders. They will mate and they will spread disease to uninfected birds and diseases that will infect people. We cannot allow you to bring untested foreign mosquitoes into our land. It is against the law in Hawaii to bring invasive species in especially infected ones. Have you change the law without telling us? I have seen no proof that you have done the required environmental studies. In my opinion you are attempting murder on the citizens of Hawaii and you will be prosecuted. Stop this nonsense and go home with your mosquitoes! You are not welcome.</p>	Concerns: 2, 12, 13, 16, 19
Karl Edinger	7/24/2023 9:47	Protect the birds! What are we doing here. With climate change already here we can't cause any more damage, especially explicitly, than will l ready happen naturally. STOP PILLAGING HAWAII	Thank you for your comment
Anna	7/24/2023 9:48	I trust the conservation experts of Hawai'i to take all measures necessary to save the remaining native bird species in our islands. I am in support of the methods they choose and am hopeful for a positive outcome. These birds are precious to our work in conservation and beyond valuable in Hawaiian culture.	Thank you for your comment
Lisa Viviano	7/24/2023 9:50	Suppressing mosquito populations is our only hope to protect the native forest birds of Kaua'i from extinction.	Thank you for your comment
Lauren C	7/24/2023 9:53	I support the evaluation assessment. It is critical that we eradicate invasive mosquitoes in order to preserve the native and endemic species that are integrated in the native and endemic ecology of Hawaii. It is our kuleana to step up as stewards of not only our home, but this shared space that has been called home by many species before us.	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/24/2023 9:53	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Alex Harper	7/24/2023 9:56	It is clear that thoughtful and informed management needs to be made to give these species a chance.	Thank you for your comment
Claire Ann Domingo	7/24/2023 9:57	I support this EA	Thank you for your comment
Eric R. Gulson	7/24/2023 9:57	I strongly support Alternative 2, the proposed release of lab-raised mosquitoes carrying the Wolbachia wAlbB strain. Based on the Environmental Assessment, the proposed action has been extensively researched and very carefully planned. It is a rare example in conservation in which a feasible method that has no detriments to humans or other life forms can be put in place at a large scale to save several endangered species of birds. I personally am a graduate student in biology who studies birds and witnessed the astonishingly rapid decline of native birds in the Hawaiian highlands earlier this year (the adult birds at a nest I found died just days afterwards). I urge decision makers to approve the proposed action to help save these endangered bird species.	Thank you for your comment

Name	Entry Date	Comment	Responses
aukuna	7/24/2023 9:58	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are additional alternatives that were not discussed in the Environmental Assessment. Further, combining any of the dismissed alternatives – such as habitat source reduction, translocation of birds, and treatment of infected birds – does not appear to have been considered.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 20, 23, 27, 28, 34, 38
Art Wang	7/24/2023 10:00	I support using Wolbachia to suppress mosquitoes and try to save native birds. We can't afford to lose any more bird species and they are in dire straits unless we take drastic action to save them. Kauai's species are among the most threatened in the world. We owe it to future generations to do everything possible to protect them.	Thank you for your comment
	7/24/2023 10:01	I support the environmental assessment. It's a no brainer.	Thank you for your comment
Madi Miyamura	7/24/2023 10:02	I am in full support of IIT and the methods mentioned in the draft EA for Kauai Mosquito Suppression. With several degrees in the environmental science field, I can attest that this technology has a substantial body of trustworthy, science-based and evidence driven studies to back-up its claims of mosquito suppression. IIT is a not a new technology, it does not involve GMOs, and will not have an adverse impact to humans. Proponents of this project not only include well-respected global conservation organizations like The Nature Conservancy and National Park Service, but also human-health related associations like the Hawaii Department of Health and Department of Agriculture. Implementing this is our best shot at suppressing mosquito populations to minimize the already detrimental effects mosquitos have posed on the Native Hawaiian bird populations and Hawaiian ecosystems. There is no more time to contemplate - Native Hawaiian birds are on the brink of extinction as we speak.	Thank you for your comment

Name	Entry Date	Comment	Responses
Derek Risch	7/24/2023 10:07	I am writing in full support of the draft Environmental Assessment for Kaua'i Mosquito Suppression and the strategies mentioned within to mitigate the impacts of mosquitoes on native forest birds. As a professional in the conservation field for 6 years, I have witnessed the precipitous declines and extinctions of endemic species within my short time working to protect them. Further, having listened and learned from those who have dedicated their lives and careers to protecting and preserving our native forest birds for both cultural and conservation benefit I understand the dire situation we are now presented with. IIT has been rigorously tested and successfully implemented and stands as one of our best options to combat the overwhelming threat of both avian malaria and avian pox.	Thank you for your comment
Jason C	7/24/2023 10:09	Yes definitely support using wolbakia to save forest birds.	Thank you for your comment
Paula Blum	7/24/2023 10:09	We already have Dengue, Chikungunya & Zika carrying mosquitoes. We do not need any other mosquitos to make the humans & animals sick. If this goes through and we get a new deadly virus from this its on YOU! Hope you have a plan for that!	Concerns: 2, 19
Lucian Davis	7/24/2023 10:10	I support the IIT plan for mosquito control. We need to continue taking action to save Hawaiian Honeycreepers and this plan is safe and science based.	Thank you for your comment
Amelie Mason	7/24/2023 10:12	To whom it may concern: I support Wolbachia to save the forest birds. Thank you, Amelie Mason	Thank you for your comment
GRAHAM TALABER	7/24/2023 10:19	I have spent 50 of the past 100 days living in critical forest bird habitat. Over that period of time there has been a DRAMATIC change in the presence/habit of native forest birds on the Alaka'i plateau. The need for intervention to prevent the spread of mosquitoes/avian malaria is imminent. I support the use of Wolbachia to save Hawaiian forest birds. Please do not let conspiracy theorists and false information derail good conservation work. The people that are behind this project work tirelessly around the clock (and I wouldn't hesitate to say would give their lives) to save Hawai'i forest bird species from anthropogenic extinction. This technique has been used successfully ALL OVER THE WORLD to mitigate the spread of mosquito-borne illnesses that infect people. LETS DO THE RIGHT THING AND DO EVERYTHING WE CAN TO SAVE THESE INCREDIBLE SPECIES. THIS IS OUR ONLY SHOT.	Thank you for your comment
David A DeCleene	7/24/2023 10:21	I oppose the release of mosquitoes. Testing has been insufficient. The stakes are too high for a Rush-To-Release (RTR) based upon a mindset that the crisis is so far along, so devastating, that there isn't time for the normal precautionary assessments and community input. British scientist Helen Wallace has studied GM mosquito release over a 10 year period in various parts of the world. She states: "Releases of genetically modified mosquitoes and other insects into the environment more than 10 years ago have basically been a failure. "Oxitec has been doing experimental releases of millions of GM mosquitoes, releasing large numbers of female GM mosquitoes inadvertently, which can bind to transmitted disease. Risks include not properly accounting for the fact that there are multiple species that transmit diseases, so if you only attack one you can create worse problems. They released large numbers of genetically modified mosquitoes to mate with the mosquitoes and then the offspring of those meetings was a postive darling at the larval stage and the idea was to suppress the numbers of the wild mosquito. They've claimed great success in suppressing wild mosquito populations, but in fact recent information from the Cayman Islands has shown all those claims have been misleading, and it's diverted resources away from better ways of tackling tropical diseases. "The intention was to release only male mosquitoes because they don't bite, but in practice with Oxitec's technology the sorting process was actually very poor and large numbers of GM female mosquitoes were released, which can bite and transmit disease.	Concerns: 4, 15, 26

Name	Entry Date	Comment	Responses
		<p>(David A DeCleene, Continued) "There are also concerns about the survival of future generations of GM mosquitoes that are supposed to die off, but in fact that's also not perfect. There are multiple species which transmit these diseases, so if you successfully suppress one species, other species can move in and actually potentially become more difficult to eradicate. Proper risk assessments were never really done and certainly risk assessments that met European standards which was the legal requirement for the export of these GM or scooters were never published and consulted on. In addition, we don't even really know whether reducing the population is actually going to reduce the transmission of disease so there were many uncertainties which were kind of brushed under the carpet."</p> <p>A small group of individuals seem certain that Oxitec's GM mosquito release is the best option. Before moving forward, it is imperative that due time is taken in compiling reports and studies, and bringing this information not only to Kauai and Maui, but across the entire state, given the potential for mobility of mosquitoes to spread in various ways.</p> <p>It would be an unconscionable dereliction of duty to push a proposal that later proved harmful to our precious Hawaii Ne. This generation carries a heavy responsibility to those who have dwelt here in the past, as well as to our keiki and our keiki's keiki. Let us exercise caution!</p>	
Kate Righter	7/24/2023 10:21	Aloha, I fully support the draft EA for mosquito suppression on Kauai. Mahalo, Kate Righter, Kailua, Oahu, Hawaii	Thank you for your comment
Patricia Barrett	7/24/2023 10:23	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Rami PositiveSpace	7/24/2023 10:24	<p>Aloha- I'm opposed to the planned biopesticide mosquito releases on Kauai. This project is an experiment on our island home. There are countless risks and this experiment cannot be controlled.</p> <p>The experimental lab mosquitoes will be infected with a different strain of Wolbachia bacteria, which could cause them to become more capable of spreading diseases like avian malaria and West Nile virus (bird and human). While state agencies and wildlife officials are hoping this novel strategy will prevent extinction of native birds, it may cause their extinction, and it could impact human health.</p> <p>Why would a loving state whose government cares about its people do this? There will be natural consequences to all the islands if this release happens. No one will be excluded from diseases after being bit by a mosquito and traveling with what tourists have received on our islands.</p> <p>I'm attaching testimony that I support.</p> <p>Rami Donahoe, M.S. Author Proverbs 3:5 Mindset -- Rami Donahoe, M.S. Author Proverbs 3:5 Mindset [TEXT COPIED FROM PDF]</p> <p>Attention: Mosquito Control Project Kaua'i Department of Land and Natural Resources U.S. Fish and Wildlife Service</p> <p>Aloha,</p> <p>This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023.</p> <p>I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease.</p> <p>The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases."</p> <p>https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares</p> <p>The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents</p>	Concerns: 2, 9, 13, 19

Name	Entry Date	Comment	Responses
		<p>(Rami PositiveSpace, Continued) admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.</p> <p>Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to</p> <p>Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted.</p> <p>Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gen-drive-document-for-consultation-20200129.pdf</p> <p>We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE."</p> <p>https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636</p> <p>Wolbachia Potential to Increase Pathogen Infection</p> <p>The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances.</p> <p>"Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans."</p> <p>https://www.sciencedaily.com/releases/2014/07/140710141628.htm</p> <p>Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965</p> <p>Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/</p>	

Name	Entry Date	Comment	Responses
		<p>(Rami PositiveSpace, Continued)</p> <p>Antibiotic Resistance</p> <p>Page 12 of Kauai EA states: “To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai‘i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai‘i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai‘i mosquitoes.”</p> <p>Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning.</p> <p>The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/</p> <p>Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. “Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory’s environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity.”</p> <p>Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847</p> <p>“British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation.” https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop-release-of-genetically-engineered-mosquitoes-in-california-florida-continues/</p> <p>There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS).</p> <p>Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive</p> <p>“The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months.” Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/</p> <p>Horizontal Gene Transfer Between Wolbachia and the Mosquito <i>Aedes aegypti</i></p> <p>https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33</p> <p>This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov ›</p> <p>EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf</p> <p>“Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased.”</p>	

Name	Entry Date	Comment	Responses
		<p>(Rami PositiveSpace, Continued) “The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect’s nuclear genome with unknown consequences.</p> <p>Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases.”</p> <p>“The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5].”</p> <p>“It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in <i>Aedes aegypti</i> [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences.”</p> <p>“Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous.”</p> <p>Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the <i>Aedes aegypti</i> trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU</p> <p>Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, “it requires double and triple containment to make sure these don’t get out of the laboratory.” This is concerning since page 32 of EA says, “DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai’i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.”</p> <p>Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai’i. While “technology for this approach is not available for near-term implementation,” development and deployment of these tools appear to be a long-term goal at the federal level.” U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventing%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf</p> <p>Wolbachia DNA into Host DNA – “A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called <i>Drosophila ananassae</i>), and can insert parts of its genome into the genomes of members of several other host species.” https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957</p> <p>Lack of Bio-Security</p> <p>There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape,</p>	

Name	Entry Date	Comment	Responses
		<p>(Rami PositiveSpace, Continued) wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.</p> <p>Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html</p> <p>"We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar.</p> <p>A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en</p> <p>Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources.</p> <p>Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false</p> <p>There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i.</p> <p>The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related</p> <p>The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning.</p> <p>https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo</p> <p>Wolbachia Has Been Implicated in Human Disease</p>	

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		<p>(Rami PositiveSpace, Continued) Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, “There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive”. https://www.cdc.gov/parasites/onchocerciasis/treatment.html</p> <p>“For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision”. https://www.science.org/content/article/worms-may-not-act-alone-river-blindness</p> <p>Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/</p> <p>Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/</p> <p>The Kauai EA’s assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says “Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). “</p> <p>In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin’s lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext</p> <p>“Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin’s lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin’s lymphoma.”</p> <p>The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed:</p> <p>“Is the research described in the published article ‘Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes’ scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA’s assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?”</p> <p>The Board’s response states: “The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes.”</p> <p>Inconsistent Climate Data and Mosquito Population Trends</p> <p>The EA states, “Some climate change models suggest that the mean temperatures in Hawai’i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014).”</p> <p>Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of –0.2</p>	

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		<p>(Rami PositiveSpace, <i>Continued</i>) to $-0.8^{\circ}\text{C}/\text{decade}$ at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c</p> <p>Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow.</p> <p>https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf</p> <p>Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick-moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF</p> <p>Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches-climate-change-sea-rise</p> <p>In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225</p> <p>“The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa’akai and 16 mosquitoes caught at Kawai’oi in October and November for P. relictum infection using PCR. One mosquito from Halepa’akai tested positive for infection. We dissected 33 mosquitoes caught at Kawai’oi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa’akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69).”</p> <p>Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai’i Island. “Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai’i Island where monthly temperatures average $70-75^{\circ}\text{F}$, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average $55-60^{\circ}\text{F}$ (Samuel et al. 2011, Atkinson et al. 2014).”</p> <p>Page 19 of EA states “Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species.” I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua’i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013.</p> <p>Verily Life Sciences and Rhodamine B</p> <p>Verily’s registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito-Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estimate_movement_mating_and_population_parameters_in_preparation_for_an_incompatible_male_program</p> <p>The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai’s MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms?</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522</p> <p>Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/</p>	

Name	Entry Date	Comment	Responses
		<p>(Rami PositiveSpace, Continued) In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago.</p> <p>I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program “there is no field evidence it can reduce the risk of mosquito born diseases”. The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem.</p> <p>Respectfully,</p> <p>Donna Thompson Kamuela, HI sharkgss@protonmail.com</p>	
Jessica Winchester	7/24/2023 10:25	<p>I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.</p>	Thank you for your comment
Christine Nakashima	7/24/2023 10:27	Please do not release lab mosquitoes onto our islands. No more harm to the people of Hawaii.	Thank you for your comment
Krista Graves	7/24/2023 10:27	<p>I'm OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
		<p>(Krista Graves, Continued) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
Keane Sammon	7/24/2023 10:29	I am absolutely in favor of the Kaua'i Mosquito Suppression project. We have plenty of data to support that this poses no issue to humans and by not acting we are allowing these birds to go extinct, all for no reason. I support being able to help the birds making sure we can keep the natural diversity that the island of Kaua'i exhibits.	Thank you for your comment
Kinsley McEachern	7/24/2023 10:31	I greatly support Wolbachia IIT, the incompatible insect technique to save native Hawaiian birds because these birds are culturally, biologically, and environmentally essential to the Hawaiian landscape. Honeycreepers deserve to live for their own inherent reasons to live and thrive on the islands which have been their sacred place of birth, evolution, and home for millions of years! Moreover these birds provide essential ecological benefits to other species and the island ecosystem as a whole. These amazing species face so many threats from habitat loss, to resource depletion, to climate change, and their last remaining refuge in high elevation forested area is now at risk from Avian Malaria from mosquitos spreading there. We have the power to reduce this threat, so we must act now and expedite this process to help the populations of these species who are on the brink. If we delay employing this technique any longer we will lose more species than we already have to extinction. Please help save the four most critically endangered forest bird species before they go extinct from Avian Malaria over the next years to decade. Please help all the precious remaining Hawaiian Honeycreepers and other native birds. Please implement the Wolbachia Incompatible insect technique as soon as possible!	Thank you for your comment
Veton Saliu	7/24/2023 10:36	Let's not miss this opportunity to protect the few remaining endemic species from extinction. It is critical that we act fast.	Thank you for your comment
Mark Dettling	7/24/2023 10:37	I support the proposed action in the draft Environmental Assessment for Kaua'i Mosquito Suppression. Our native birds desperately need our help to survive and addressing avian malaria is the only way. Please take action to help our Hawaiian birds.	Thank you for your comment
Wendy Larson	7/24/2023 10:40	I strongly support swift action to save Hawaii's unique and beautiful honeycreepers and other forest birds by using the IIT to reduce mosquito populations. Follow the science and do the right thing before it's too late!	Thank you for your comment
	7/24/2023 10:43	I am in full support of the Incompatible Insect Technique!!!	Thank you for your comment
Audrey	7/24/2023 10:44	Kaua'i has an amazingly diverse ecosystem that has faced years of difficult changes with Western tourism, invasive imports, and climate change. This is an opportunity to take action on behalf of the birds of this unique island. Any chance we have to help species of plants, animals, and indigenous peoples of this island should be taken very seriously.	Thank you for your comment

Name	Entry Date	Comment	Responses
Eric B	7/24/2023 10:47	<p>I oppose the Kaua'i Environmental Assessment. It is an incomplete study that cannot be properly evaluated. I support the research and documentation in the testimony attached PDF. Do not play "Russian Roulette" with the Hawaiian people. Everyone is on alert due to the suspicious high speed pace at which they are trying to ram this program through for approval without the proper studies. I demand a full scope environmental impact statement.</p> <p>Eric Bjerke</p> <p>Attention: Mosquito Control Project Kaua'i 22 July 2023 Department of Land and Natural Resources U.S. Fish and Wildlife Service</p> <p>Aloha,</p> <p>This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023.</p> <p>I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease.</p> <p>The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases."</p> <p>https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares</p> <p>The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.</p> <p>Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to</p> <p>Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted.</p> <p>Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall</p>	Concerns: 1, 9, 11, 26

Name	Entry Date	Comment	Responses
		<p>(Eric B. <i>Continued</i>) et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gene-drive-document-for-consultation-20200129.pdf</p> <p>We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE."</p> <p>https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636</p> <p>Wolbachia Potential to Increase Pathogen Infection</p> <p>The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances.</p> <p>"Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans."</p> <p>https://www.sciencedaily.com/releases/2014/07/140710141628.htm</p> <p>Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito <i>Culex tarsalis</i> https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965</p> <p>Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/</p> <p>Antibiotic Resistance</p> <p>Page 12 of Kauai EA states: "To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai'i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai'i mosquitoes."</p> <p>Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning.</p> <p>The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/</p> <p>Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. "Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory's environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity."</p>	

Name	Entry Date	Comment	Responses
		<p>(Eric B. <i>Continued</i>) Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847</p> <p>“British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation.” https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop-release-of-genetically-engineered-mosquitoes-in-california-florida-continues/</p> <p>There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS).</p> <p>Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive</p> <p>“The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months.” Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/</p> <p>Horizontal Gene Transfer Between Wolbachia and the Mosquito <i>Aedes aegypti</i></p> <p>https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33</p> <p>This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov ›</p> <p>EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf</p> <p>“Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased.”</p> <p>“The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect’s nuclear genome with unknown consequences.</p> <p>Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases.”</p> <p>“The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5].”</p> <p>“It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in <i>Aedes aegypti</i> [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences.”</p> <p>“Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes,</p>	

Name	Entry Date	Comment	Responses
		<p>(Eric B. Continued) have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous.”</p> <p>Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the Aedes aegypti trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU</p> <p>Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, “it requires double and triple containment to make sure these don’t get out of the laboratory.” This is concerning since page 32 of EA says, “DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai’i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.”</p> <p>Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai’i. While “technology for this approach is not available for near-term implementation,” development and deployment of these tools appear to be a long-term goal at the federal level.” U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf</p> <p>Wolbachia DNA into Host DNA – “A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called Drosophila ananassae), and can insert parts of its genome into the genomes of members of several other host species.” https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957</p> <p>Lack of Bio-Security</p> <p>There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.</p> <p>Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan’s biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html</p> <p>“We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency”.</p> <p>Bioterrorism on Six Legs by Dr. Manas Sarkar.</p>	

Name	Entry Date	Comment	Responses
		<p>(Eric B. Continued) A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en</p> <p>Page 23 of the EA states “By contrast, male’s proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease.” This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources.</p> <p>Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false</p> <p>There is no mention in the Kaua’I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai’i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai’i.</p> <p>The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related</p> <p>The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning.</p> <p>https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo</p> <p>Wolbachia Has Been Implicated in Human Disease</p> <p>Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, “There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive”. https://www.cdc.gov/parasites/onchocerciasis/treatment.html</p> <p>“For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision”. https://www.science.org/content/article/worms-may-not-act-alone-river- blindness</p> <p>Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/</p> <p>Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/</p>	

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		<p>(Eric B. Continued) The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010)."</p> <p>In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext</p> <p>"Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma."</p> <p>The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed:</p> <p>"Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA's assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?"</p> <p>The Board's response states: "The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes."</p> <p>Inconsistent Climate Data and Mosquito Population Trends</p> <p>The EA states, "Some climate change models suggest that the mean temperatures in Hawai'i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014)."</p> <p>Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of –0.2 to –0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c</p> <p>Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf</p> <p>Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick-moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF</p> <p>Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches-climate-change-sea-rise</p>	

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		<p>(Eric B. Continued) In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225</p> <p>“The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa’akai and 16 mosquitoes caught at Kawaikoi in October and November for P. relictum infection using PCR. One mosquito from Halepa’akai tested positive for infection. We dissected 33 mosquitoes caught at Kawaikoi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa’akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69).”</p> <p>Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai’i Island. “Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai’i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014).”</p> <p>Page 19 of EA states “Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species.” I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua’i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013.</p> <p>Verily Life Sciences and Rhodamine B</p> <p>Verily’s registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito-Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estimate_movement_mating_and_population_parameters_in_preparation_for_an_incompatible_male_program</p> <p>The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai’s MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms?</p> <p>https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522</p> <p>Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/</p> <p>In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago.</p> <p>I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program “there is no field evidence it can reduce the risk of mosquito born diseases”. The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem.</p> <p>Respectfully,</p> <p>Donna Thompson Kamuela, HI sharkgss@protonmail.com</p>	

Name	Entry Date	Comment	Responses
Clay Dugo	7/24/2023 10:47	Mosquitoes are wreaking havoc on Hawaii's endemic bird populations and we must act soon!	Thank you for your comment
	7/24/2023 10:48	It is critical that we take measures to eradicate invasive mosquito species that are leading to the swift demise of Hawaii's endemic bird populations	Thank you for your comment
	7/24/2023 10:48	Birds are a critical part of any ecosystem so preserving bird species is critical. Suppressing species of mosquitos that are decimating endangered endemic birds is important even if the technique might appear to be novel and therefore scary. I support mosquito suppression for this purpose.	Thank you for your comment
	7/24/2023 10:49	I completely support the mosquito suppression project on Kauai to save native bird populations. With so few birds left on Kauai it's vital to get aggressive and use this technology to try and save what bird populations are left. What approach should have happened years ago cannot wait any longer. Our native birds are important to our culture, our ecosystems, and our identity as Hawaiian people and as a state.	Thank you for your comment
	7/24/2023 10:53	Please STOP this insane idea!!! there needs to be a LONG study....No invasives have ever done any good for the islands...	Concerns: 3, 9
Adam Cunningham	7/24/2023 10:54	This mosquito suppression plan is the only shot of saving Akekee, Akohekohe, and Kiwikiu. If this plan is rejected it will be catastrophic for these treasured birds who have called Kauai home for thousands of years.	Thank you for your comment
Abby Kimmitt	7/24/2023 10:55	I am evolutionary biologist and ornithologist PhD and I am in support of the proposed actions for mosquito suppression for the protection of Hawaiian native songbirds.	Thank you for your comment
Elizabeth L	7/24/2023 10:55	I support the use of IIT to control Culex mosquitos and save Hawaiian birds.	Thank you for your comment
Michael Bohling	7/24/2023 11:04	<p>Aloha,</p> <p>I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.</p> <p>--</p> <p>Michael Bohling, Natural Resources Manager michaelbohling321@gmail.com (808)439-3765</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Bailey	7/24/2023 11:05	Control of Mosquitoes in Hawaii is important for our native birds. I am in support of the release of Wolbachia mosquitoes. This technique has proven effective in other countries to combat mosquito borne diseases for humans and the fear people have has no basis in fact. Especially since the Culex mosquito prefers avian blood. This is important and needs to be done soon. Otherwise we are going to lose our native birds.	Thank you for your comment
	7/24/2023 11:13	I very much support this plan. Please we need to do what we can to save these endangered birds.	Thank you for your comment
	7/24/2023 11:15	NO, AS IN A'OLE!! TRANSLATION: NO!@!	Thank you for your comment
Braxton Igne	7/24/2023 11:17	Based on this assessment, the benefits of implementing ITT in the Alakai so outweigh any potential downsides that it's not even a question for me. Please implement ITT in the Alakai asap and save our native birds!	Thank you for your comment
	7/24/2023 11:22	I support the preservation of our native birds and wildlife.	Thank you for your comment
Tanya Aynessazian	7/24/2023 11:23	<p>Aloha,</p> <p>My name is Tanya Yamanaka Aynessazian and I am OPPOSED to the “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health and have the EPA complete a risk assessment.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including transmission of the introduced bacteria strain, increased infection in mosquitoes, irreversible evolutionary events, accidental release of lab-reared females, creation of lab-strain females in the wild, gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.</p> <p>There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an EIS and an EPA risk assessment. Further study of the risks is of utmost importance, when the natural, ecological balance of all life is at stake.</p> <p>Tanya Yamanaka Aynessazian, Pahoa, Hawaii Island, (808) 747-4410</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Lanessa McClellan	7/24/2023 11:26	<p>Aloha</p> <p>I live in Hilo hawaii and I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health</p> <p>Thank you, Lanessa McClellan, 808-960-8060 2443 Kinoole st, Hilo, HI 96720</p>	Concern: 1
Oliver	7/24/2023 11:27	<p>Hi,</p> <p>I fully support the release of incompatible Wolbachia mosquitos into the highlands of Kaua'i. This measure is absolutely critical to the survival of endangered native honeycreepers, which not only represent an important component within Hawaiian ecosystems, but also a priceless and irreplaceable part of the archipelago's natural and cultural history. Without this intervention, these birds—especially the 'akikiki—are condemned to death. The release of incompatible male mosquitos offers the ONLY way to save these birds, which represent some of the few surviving members of Hawaii's marvelous native avifauna, hold distinct cultural values for Hawaiian people, and represent a major ecotourism draw for the islands. I urge DNL and USFWS to go forward with the release.</p>	Thank you for your comment
Dr. Kevin J. Burns	7/24/2023 11:33	<p>I fully support the implementation of IIT to reduce mosquito populations to help Hawai'i's native birds recover. As a professional ornithologist (PhD in Biology) and everyday person interested in nature, I am alarmed at the speed of which the unique birds of Hawaii are disappearing. In 1994, I visited Kauai and easily found 6 species of native songbirds on the Pihea Ridge trail (Kauai Elepaio, Kauai Amakihi, Apapane, Iiwi, Akekee, and Anianiau). I visited again earlier this month (July 2023) and only found a few Apapane and Kauai Elepaio, and even those were hard to find. I had heard Kauai's birds were struggling, but had no idea things had declined so rapidly. This plan represents the last best hope.</p>	Thank you for your comment
David DeCleene	7/24/2023 11:37	<p>I oppose the release of mosquitoes. Testing has been insufficient. The stakes are too high for a Rush-To-Release (RTR) based upon a mindset that the crisis is so far along, so devastating, that there isn't time for the normal precautionary assessments and community input.</p> <p>British scientist Helen Wallace has studied GM mosquito release over a 10 year period in various parts of the world. She states: "Releases of genetically modified mosquitoes and other insects into the environment more than 10 years ago have basically been a failure. Oxitec has been doing experimental releases of millions of GM mosquitoes, releasing large numbers of female GM mosquitoes inadvertently, which can bind to transmitted disease. Risks include not properly accounting for the fact that there are multiple species that transmit diseases, so if you only attack one you can create worse problems. They released large numbers of genetically modified mosquitoes to mate with the mosquitoes and then the offspring of those meetings was a positive darling at the larval stage and the idea was to suppress the numbers of the wild mosquito. They've claimed great success in suppressing wild mosquito populations, but in fact recent information from the Cayman Islands has shown all those claims have been misleading, and it's diverted resources away from better ways of tackling tropical diseases. The intention was to release only male mosquitoes because they don't bite, but in practice with Oxitec's technology the sorting process was actually very poor and large numbers of GM female mosquitoes were released, which can bite and transmit disease."</p> <p>"There are also concerns about the survival of future generations of GM mosquitoes that are supposed to die off, but in fact that's also not perfect. There are multiple species which transmit these diseases, so if you successfully suppress one species, other species can move in and actually potentially become more difficult to eradicate. Proper risk assessments were never really done and certainly risk assessments that met European standards which was the legal requirement for the export of these GM or scooters were never published and consulted on. In addition, we don't even really know whether reducing the population is actually going to reduce the transmission of disease so there were many uncertainties which were kind of brushed under the carpet."</p>	Concerns: 4, 9, 12

Name	Entry Date	Comment	Responses
		<p>(David DeCleene, Continued) A small group of individuals seem certain that Oxitec's GM mosquito release is the best option. Before moving forward, it is imperative that due time is taken in compiling reports and studies, and bringing this information not only to Kauai and Maui, but across the entire state, given the potential for mobility of mosquitoes to spread in various ways.</p> <p>It would be an unconscionable dereliction of duty to push a proposal that later proved harmful to our precious Hawaii Ne. This generation carries a heavy responsibility to those who have dwelt here in the past, as well as to our keiki and our keiki's keiki. Let us exercise caution!</p>	
Ariana Dittmer	7/24/2023 11:37	I support this	Thank you for your comment
Concerned Resident of Kauai	7/24/2023 11:39	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
	7/24/2023 11:40	I STRONGLY SUPPORT AND AGREE	Thank you for your comment

Name	Entry Date	Comment	Responses
Lee Miller	7/24/2023 11:41	<p>I support the use of the Wolbachia Mosquitoes to reduce the mosquito populations in Kauai.</p> <p>The forest birds in Hawaii are facing extinction. They are being decimated by Avian Malaria that is being transmitted by non native mosquitoes. The 'akikiki will most likely be extinct by 2025. Please allow these techniques to be implemented by DLNR and USFWS to save the 'akikiki.</p> <p>Thanks for your consideration. Lee Miller</p>	Thank you for your comment
Susan F. DeCleene	7/24/2023 11:45	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Bobby Brittingham	7/24/2023 11:46	<p>I am a huge advocate for the mosquito suppression actions being taken in order to desperately try to protect and ultimately revive our declining native forest birds. Personally I believe this action is too late for the 'Akikiki, as their numbers in the wild are already in single digits. Therefore I think this action could set a good precedent for other native forest birds in peril such as the 'akeke'e, by being more proactive on measures like this in the future instead of being reactive and enacting these measures before the wild populations of these birds dwindle too low for desperate chance of recovery. This methodology has been well studied, and has had very effective changes in other scenarios. To have a fighting chance for saving these fading Kaua'i birds, this mosquito suppression is a requirement at this stage and hopefully these positive results in other scenarios can translate here as well. The ones who tend to oppose mosquito suppression the loudest have commonly been those far removed from the situation (those who do not live in Kaua'i but speak with the blind authority as if they do; those who have not researched mosquito repression from reputable sources; those tying in political agendas wrongfully into mosquito suppression; etc.) and these straw-man arguments should not stand in the way of protecting endemic species that carry cultural pieces of history with them.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		(Bobby Brittingham, Continued) This action should have been taken years ago, but enacting this change would set a good precedent and hopefully prevent future certain extinctions or at least allow the individuals who spent countless hours and all their energy to keep these species alive a fighting chance at keeping valuable wildlife and cultural history alive.	
Nora Stone	7/24/2023 11:58	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Lisa Crampton	7/24/2023 11:59	I fully endorse the use of Incompatible Insect Technology to control invasive mosquitos to benefit our native forest birds and ultimately human health and well-being. The Environmental Assessment has adequately addressed negative impacts in the area, which will be negligible, especially considering the huge potential payoffs for avian, ecosystem, and human health. My one specific comment is that I do not believe it will be possible to adequately monitor the response of mosquitoes and birds to this intervention if field crews are not allowed to move along new-to-them routes, such as pig trails. Natural resource field crews already routinely go "off trail" to maintain predator and ungulate control grids, and mosquito monitoring crews need the flexibility to do the same. This is not the same thing as "cutting" trails but rather these crews take advantage of existing natural openings and animal trails to do this important work. I hope this kind of movement will not be precluded by the EA.	Concern: 39
	7/24/2023 12:03	Considering the damage already done on the native bird population, some type of action needs to be done and I am in support in the protection and conservation against this crisis	Thank you for your comment
	7/24/2023 12:05	Birding Hawai'i was one of the most transformative experiences of my life, and these birds are worth protecting. Utilizing IIT in efforts to attempt to save these birds is the best least we can do. IIT is safe to the birds and to the public, and we are on borrowed time to act to save these magnificent creatures.	Thank you for your comment
Ed McClellan	7/24/2023 12:06	My name is Edward McClellan and I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1

Name	Entry Date	Comment	Responses
Elizabeth Freeman	7/24/2023 12:09	<p>Mongoose. Mongoose. Mongoose. Axis Deer. Cane Toad. Pigs.</p> <p>"The Mongoose was introduced to Hawaii in the Late 19th Century in an attempt to control the large rat population in the sugar cane fields. However, since then the mongoose population has grown to large numbers without controlling the rat population and has greatly diminished the population of native ground nesting birds, snails and palms.</p> <p>Hawaii is the most isolated major land mass in the world and that isolation has led to very high rates of endemism. Uniquely adapted endemic species are often sensitive to competition from invasive species and Hawaii has had numerous extinctions (List of extinct animals of the Hawaiian Islands). While not the only cause, introduction of invasive species can be a major cause of population decline and extinction.</p> <p>There are several routes for introduction of non-native species. Some species were accidentally introduced to Hawaii like the rat, fire ants, coqui frog, mosquitos, and asiatic rhinoceros beetle.[1] Some are species brought in for cultivation that spread to wild areas like miconia, pigs, and goats. Some species were intentionally introduced for sport like axis deer and some for pest control like mongoose or cane toad."</p> <p>These are examples of past idiocies. This is a Bad Idea. A Stupid Idea. A Horrible Idea.</p> <p>"I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement."</p> <p>Elizabeth Freeman</p>	<p>Concerns: 1, 3, 7, 8, 10, 11, 12, 13, 14, 15, 23, 27, 28, 34</p>

Name	Entry Date	Comment	Responses
Claire Jones	7/24/2023 12:18	I fully support the use of the incompatible insect technique in Hawai'i. This method is well tested and has been effectively used in other places to drastically reduce the mosquito populations. Hawai'i has a huge array of incredible endemic birds that enrich the ecosystem and bring beauty to our lives. Humans brought allowed invasive mosquitos into Hawai'i, causing thousands of birds to die from mosquito-carrier diseases. These birds are found nowhere else in the world, so if they are allowed to die off in Hawai'i they will be gone forever. It is our responsibility to protect the remaining bird populations. We need to solve the mosquito problem and save Hawai'i's beautiful and unique endemic birds!	Thank you for your comment
Roger and Share Christie	7/24/2023 12:18	<p>Aloha. My wife and I remain strongly OPPOSED to the DLNR plan as it stands. We demand a critical, independent environmental review BEFORE any further action is taken.</p> <p>Like the COVID-19 "vaccines" are in reality bioweapons of mass destruction containing well-hidden dangers made with ingredients designed to install a "SMART", digital and invisible prison making humans walking antennas for 5G and other invisible technologies, the proposed mosquito release seems like it's part of an extinction agenda for humans and animals.</p> <p>We're OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i."</p> <p>We demand an independant Environmental Impact Statement.</p> <p>Thank you. Roger and Share Christie</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Vashti Daise	7/24/2023 12:22	I support Wolbachia IIT to save Hawaiian forest birds because protecting the native bird species is the right thing to do. Native birds already face many other challenges, some of which we have little control over, and without protective action more species will become extinct. The spread of avian malaria can and should be reduced for everyone's sake. There may not be a perfect course of action, but protecting native bird species is the best course. Mahalo, Vashti Daise	Thank you for your comment
Katie	7/24/2023 12:23	IN SUPPORT OF KAUA'I MOSQUITO SUPPRESSION	Thank you for your comment
Karim Hanna	7/24/2023 12:23	please suppress the mosquitos. Mosquito control will help out birds. mosquitos are the number the threat to our forest birds.	Thank you for your comment
M. Ella Powell	7/24/2023 12:25	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I expect the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes to complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health before proceeding with this project. If you continue with this without an Environmental Assessment, be prepared to spend some time in jail! What you are doing is illegal and may be considered "Crimes Against Humanity", punishable by death.	Concern: 1
David E Chernack	7/24/2023 12:26	Please do all you can to reduce mosquito populations and save the remaining Hawaiian Honeycreepers!	Thank you for your comment
Rosemary Bearden	7/24/2023 12:30	As a life-long Hawai'i resident, I completely support the use the Incompatible Insect Technique (IIT) to reduce mosquito populations on Kaua'i. We must do all we can to protect these ecologically and culturally important birds from disappearing permanently. Extinction is forever and far too many of our unique Hawaiian flora and fauna have already gone extinct. Anything that can help save our remaining beautiful and unique species here in Hawai'i from extinction must be utilized. Please do the right thing and protect our manu. Aloha, Rosemary Bearden	Thank you for your comment
Jeremy Cohen	7/24/2023 12:35	Release the incompatible insects	Thank you for your comment

Name	Entry Date	Comment	Responses
Adele Henkel	7/24/2023 12:42	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I insist that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is an EXPERIMENT on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). (LOOK AT THE OUTBREAK OF MALARIA IN OTHER STATES WHERE THESE MOSQUITOES HAVE BEEN RELEASED.) Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I insist on an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Chapin Czarnecki	7/24/2023 12:42	I am strongly in support of using the incompatible release technique outlined in this draft for suppressing mosquito populations in Kaua'i. As an ornithologist and conservation biologist, I believe it is absolutely critical that mosquito control is implemented, and I believe this highly effective technique could save multiple species from extinction.	Thank you for your comment
	7/24/2023 12:45	I believe that using the Incompatible Insect Technique would be a good way to reduce the invasive mosquito population. As someone who works with birds and has to use anti-avian malaria medication, I think it would be great to reduce the risk of the infection even occurring. This method would be a good non-invasive way to control the mosquitoes. I'm in support of creating methods to prevent the extinction of the native Hawaiian honey creepers. Too many of the species have already gone extinct and we need to do all we can to save the species that are still alive.	Thank you for your comment

Name	Entry Date	Comment	Responses
Jackie Milligan	7/24/2023 12:46	<p>This email is to send my support for the Wolbachia-incompatible insect technique to be released in Kaua'i to help decrease the threat of extinction for the last remaining native forest manu. Extinction is forever and this effort may as well be or last stand to keep these manu from this terrible fate.</p> <p>Mahalo nui loa,</p> <p>Jackie Milligan Native Species Illustrator on Hawai'i Island & Conservation kumu</p>	Thank you for your comment
Concerned resident of Kaua'i	7/24/2023 12:47	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Adam	7/24/2023 12:47	<p>Why would this be considered safe?</p> <p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p>	Concern: 1

Name	Entry Date	Comment	Responses
Deborah McCarty	7/24/2023 12:48	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
	7/24/2023 12:48	PLEASE protect our Kaua'i manu 'ōiwi from avian malaria by the suppression of mosquito populations. Release male mosquitos with a naturally occurring bacterial strain that is different than the females in the wild, which prevents viability of offspring, ASAP! MAHALO PIHA	Thank you for your comment
Joe Duke Del Beato	7/24/2023 12:50	Aloha, I work deeply in conservation on Maui I'm in full support of the wolbachia release. This is the LAST CHANCE for these birds in there natural habitat. People who are against it have never done anything to help the species of Hawaii, and now stand directly in front of there only chance at survival. So sad that this is even a discussion.	Thank you for your comment
Kellyna Campbell	7/24/2023 12:54	<p>To Whom This May Concern,</p> <p>It is unconstitutional for you to proceed with this project, without an EIS. Many concerned inhabitants of this aina would like to comprehend the repercussions of the release of these Wolbachia lab infected mosquitoes. We want an EIS done before the release!! It can't be undone once you release them.</p> <p>Thank you for your attention to this matter. Aloha, Kellyna</p>	Concern: 1
Lichen	7/24/2023 13:01	Please support native birds!	Thank you for your comment

Name	Entry Date	Comment	Responses
Gabriella Berman	7/24/2023 13:05	I support wolbachia mosquito control! Please save our native birds.	Thank you for your comment
Tanya Dreizin	7/24/2023 13:06	<p>Aloha,</p> <p>I am submitting testimony in support of the implementation of the Incompatible Insect Technique on Kaua'i to protect native species. As so many of Hawai'i's native birds have gone extinct already, and with climate change continuing to threaten birds around the world (Audubon Society, 2019; Sekerciog'lu et al., 2012) Hawai'i needs to be on the forefront of innovative responses to protecting species. According to the Draft EA, IIT has been successfully implemented in 14 countries worldwide, and if utilized on Kaua'i could protect endangered and threatened Hawaiian honeycreeper species from extinction. As there are little to no other viable options, please consider using the IIT as a tool to suppress the mosquito population and protect Hawai'i's precious forest birds from extinction.</p> <p>Mahalo!</p>	Thank you for your comment
Eric S	7/24/2023 13:06	<p>We need to have many plans implemented simultaneously to protect our native birds. Have we looked into helping the remaining birds to have their own immunity against avian malaria? One such way would be to use the mosquitos that are already biting them to give them the immunity. By inoculating the feral pigs in the area with pig feeders to spread the vaccine amongst the same mosquitos that are biting the pigs. This in turn could help to spread the protective benefits to the native birds. There are encapsulated vaccines that can be eaten by pigs in development. It's used for a different disease for feral and domestic pigs but in theory could be used to spread immunity to other species that the mosquitos are biting. Another way would be to use octenol lures to attract the mosquitos in the desired area to a solution that has the vaccine for avian malaria to be spread to the birds via the inoculated mosquitos.</p>	Concern: 38
Denny CONRAD	7/24/2023 13:10	<p>I support efforts to mitigate the mosquitos that affect the native bird population. Please be aggressive in controlling feral cats, as well. Please insure that we are doing all we can so future generations can enjoy the unique sounds and beauty of these feathered creatures. This is their home, we are all guests passing through.</p> <p>Nikko Tiaht-Conrad 808-345-0678</p>	Thank you for your comment
Kassandra Conner	7/24/2023 13:10	<p>Aloha,</p> <p>I am writing in support of the use of the Incompatible Insect Technique to reduce mosquito populations on Kaua'i and the environmental assessment that will be done in order to do so. We have a small time-frame left to reduce the number of avian malaria deaths of our native forest bird species before multiple species become extinct and even more become critically endangered. We know our native forest birds have very little resistance to avian malaria so as mosquito populations continue to thrive, in turn our native bird populations dwindle.</p> <p>I believe the steps that DOFAW and USFWS are proposing are our best chance for our native forest birds survival.</p> <p>Mahalo nui loa.</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Sherilyn Wells	7/24/2023 13:12	<p>See Attached Document for correct display of all images. Testimony of Sherilyn Wells votetrees@protonmail.com 360-441-7098 7/24/23</p> <p>U.S. Department of the Interior Strategy: “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.”</p> <p>I OPPOSE an “anticipated FONSI” (Finding Of No Significant Impact) for Environmental Assessment of “Wolbachia-based Suppression of Mosquitoes on Kaua’i” FULL EIS IS ESSENTIAL and statutorily appropriate. – Please prove that DLNR will no longer be (as it was for Maui) an acronym for Department of Let’s Not Review.</p> <p>“Scientific studies document serious concerns/risks with lab-infected biopesticide mosquitoes, including: “For arthropods[1], the presence of endosymbiotic bacteria, such as Wolbachia (Rickettsiales: Rickettsiaceae), may complicate management plans and exacerbate the challenges faced by conservation managers. Wolbachia poses a substantial and underappreciated threat to the conservation of arthropods because infection may induce a number of phenotypic effects, most of which are considered deleterious to the host population[2] “ , horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming MORE capable of transmitting human/bird diseases, such as avian malaria and West Nile virus.”</p> <p>The Hawai’i Environmental Protection Act (HRS 344) and the Environmental Impact Statements (HRS 343) both fall under Title 19 – PUBLIC HEALTH. And yet, the coverage of human health impacts in this EA is dramatically deficient, which may be related to the lack of consultant experience in this area. https://law.justia.com/codes/hawaii/2022/title-19/https://www.capitol.hawaii.gov/hrsall/ChaptersByVolume.aspx?id=6</p> <p>1. Fundamental scientific error at the outset: WOLBACHIA – "You've never heard of it because it ONLY INFECTS BUGS.." emphasis added. New tool for combating mosquito-borne disease: insect parasite genes, 2/27/17, Vanderbilt, https://www.sciencedaily.com/releases/2017/02/170227120400.htm</p> <p>HOWEVER – “Herein, we describe detection of Wolbachia genes from the blood of a patient subsequently diagnosed with non-Hodgkin's lymphoma (NHL). “The findings suggest the potential for Wolbachia bacteria to infect humans. “Additionally, under experimental conditions, some Wolbachia spp. can infect mammalian cells, even human cells in vitro [[10]]. “Horizontal transmission in insects and among helminths[3] occurs via cell–cell invasion, predation and cannibalism [11, 12], among other possibilities, establishing the potential for horizontal transfer to animals and humans as well. “ Detection of Wolbachia genes in a patient with non-Hodgkins lymphoma, 10/28/14, Clinical Microbiology and Infection https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext</p> <p>“The recent isolation of Wolbachia pipientis in the continuous cell line Aa23... allowed us to perform extensive characterization of the isolate. Bacterial growth could be obtained ... in a human embryonic lung fibroblast monolayer at 28 and 37 degrees C, confirming that its host cell range is broader than was initially thought. https://pubmed.ncbi.nlm.nih.gov/14662922/</p> <p>NOT ONLY HAVE WOLBACHIA GENES ENTERED “NEW – human - TERRITORY,” AN UNEXPECTED DISCOVERY, BUT THE MOSQUITO HOST IS ALSO “ADAPTABLE, FAST EVOLVING.” One conclusion is that mosquitoes are highly</p>	Concerns: 1, 2, 4, 6, 8, 9, 12, 13, 14, 15, 23, 26, 28, 36

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, Continued) genetically variable, adaptable, fast evolving, and have versatile vectorial competence. Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs.</p> <p>https://pubmed.ncbi.nlm.nih.gov/30529448/</p> <p>2. Elephant in the Corner: General Population Altered Immune System Status since 2021 - A Small Sample of the Ever-Growing Body of Death/Injury Data.</p> <p>Assertions of “no human health risks” are based on unsound science that has been discredited by the EPA - references cited in both Donna Thompson’s and Tina Lia’s testimony. In deference to HEPA’s mandate for comprehensive analyses, one cannot look at a single isolated factor (Wolbachia genes now found in humans), but must include as many potentially connected, relevant knowns as possible (the better to predict what “MAY” have a significant impact).</p> <p>Still to be determined: Did immune system dysfunction play any role in facilitating the entry of Wolbachia genes into the cancer patient’s blood?</p> <p>OR</p> <p>Is a more basic human/bacterium “microevolution” underway, potentially facilitated by decades of governmental bioweapon research with mosquitoes and other insects (a topic discussed later in this testimony – also see Pfizer footnote[4])?</p> <p>IF being immuno-compromised is a factor in the new Human/Wolbachia connection, what IS also known is that a large percentage of humanity has recently been injected with an experimental medical product (“gene therapy”) whose unevenly distributed contents/effects (https://howbad.info/), as we are learning months/years later, can be to significantly impair the immune response. Thus, this is expanding the population of immune-compromised individuals (the category of person in whom Wolbachia genes were detected). Looking at landscape-level[5] issues (background human health foundational/interactional issues, against which the contact with Wolbachia and disease organisms will be mediated): Since 2021, within a large percentage of the general population, there has been a dramatic rise in negative post-injection impacts (sharp rise in disabilities and all cause mortality following injections of the experimental gene therapies known as the Covid-19 injection(s)). The following link is a compendium of ever-increasing scientific/medical analyses by 3000+ medical/scientific experts re the Pfizer experimental data, whose release was court-ordered (versus the 75 years Pfizer had hoped to keep it hidden): https://dailyclout.io/category/pfizer-reports/</p> <p>While the COVID-19 shots are referred to as “vaccines,” they do not meet the classical definition of a vaccine. Health authorities actually had to change the definition to accommodate the COVID-19 shots and shut down the argument that, as experimental gene therapies, they may be riskier than traditional vaccines. Meanwhile, based on the FDA’s definition of “gene therapy” they’re clearly gene therapies, and both Moderna and BioNTech acknowledge this. https://childrenshealthdefense.org/defender/covid-vaccines-gene-therapy-cola/</p> <p>Our findings reveal a potential molecular mechanism by which the spike protein might impede adaptive immunity and underscore the potential side effects of full-length spike-based vaccines. SARS-CoV-2 spike protein significantly inhibits DNA damage repair, which is required for effective V(D)J recombination in adaptive immunity. https://pubmed.ncbi.nlm.nih.gov/34696485/</p> <p>For example – one graph revealing that dramatic rise in negative post-injection effects: Edward Dowd (a MAUI resident, by the way, ergo one who could easily be reached for EIS input) has written CAUSE UNKNOWN to document this phenomenon. Black Swan Event - Ed Dowd: ‘They Can’t Run From This Data’ https://rumble.com/v2zz64c-ed-dowd-they-cant-run-from-this-data.html</p> <p>‘Cause Unknown’: Former BlackRock Manager Details ‘Epidemic of Sudden Deaths’ in New Book https://childrenshealthdefense.org/defender/cause-unknown-book-edward-dowd-sudden-deaths-cola/</p> <p>Comparing gene therapy injections to traditional vaccines – note last column (rate of adverse events per 100,000 doses):</p> <p>“According to European Medicines Agency recommendations, frequent COVID-19 booster shots could adversely affect the immune</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, <i>Continued</i>) response... The decrease in immunity can be caused by several factors such as N1-methylpseudouridine, the spike protein, lipid nanoparticles, antibody-dependent enhancement, and the original antigenic stimulus. In conclusion, COVID-19 vaccination is a major risk factor for infections in critically ill patients.” https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9167431/</p> <p>Research shows the SARS-CoV-2 spike protein obliterates 90% of the DNA repair mechanism in lymphocytes, white blood cells that help your body fight infection and chronic disease, including cancer. https://childrenshealthdefense.org/defender/covid-boosters-increase-cancer-young-adults-cola/</p> <p>Two specific microRNAs have been found in people who got the COVID-19 vaccine. These microRNAs interfere with a key part of your immune system, which can make you more prone to infection and chronic disease. https://childrenshealthdefense.org/defender/covid-vaccines-immune-system-neurological-disease-cola/</p> <p>3. ENHANCE DISEASE, NOT SUPPRESS? RAPID EVOLUTION? POSSIBLE INTERACTION WITH PERVASIVE PROTEINS/NANOPARTICLES? MOBILOME (Mobile Genetic Elements)? Still under study...</p> <p>“Wolbachia-infected mosquitoes are currently being released into nature to control human disease. However, a worrying trend is emerging whereby Wolbachia infections enhance rather than suppress pathogens in insect vectors.”</p> <p>“These data will allow us to estimate how likely Wolbachia-based control strategies are to fail or make things worse, for identifying potential points where Wolbachia-based control is likely to break down in the field, and for planning risk mitigation strategies in the case of unforeseen harmful outcomes.”</p> <p>“...a sobering reminder that the pathogen inhibitory effects resulting from Wolbachia infection in some insects cannot and should not be generalized across vector-pathogen systems.” https://grantome.com/grant/NIH/R01-AI116636-02</p> <p>Not only have Wolbachia genes been discovered in humans, BUT ITS MOSQUITO HOST IS ALSO “ADAPTABLE, FAST EVOLVING,” which does NOT assure us of “a stable situation whose outcomes can be predicted for decades into the future” (the current trajectory/plan for the release).</p> <p>“One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence.</p> <p>“Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs.” https://pubmed.ncbi.nlm.nih.gov/30529448/</p> <p>This mosquito has been shown to Create ANOTHER Species of Mosquito through horizontal gene transfer. https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33</p> <p>Changes in Wolbachia or their host genomes in the same species have now been documented (Hornett et al., 2006; Weeks et al., 2007) and suggest that evolutionary shifts in Wolbachia–host interactions (and their host effects) can be rapid. Wolbachia can therefore mediate rapid evolutionary shifts in host reproductive patterns and fitness effects. https://www.nature.com/articles/hdy200950</p> <p>Wolbachia is consistently described as “manipulating the host’s reproductive system” – “We've known for decades that one of the secrets to Wolbachia's success is that it interferes with host reproduction in order to spread itself through females.. https://www.sciencedaily.com/releases/2017/02/170227120400.htm</p> <p>The secret to the over-achieving bacterium's success is its ability to hijack its hosts' reproduction. https://www.infectioncontroltoday.com/view/new-tool-combating-mosquito-borne-disease-insect-parasite-genes</p> <p>“The reproductive manipulation of hosts by Wolbachia include 1) feminization of infected males (turning genetic males into females), 2) Induced parthenogenesis (reproduction without males), 3) killing of infected males and 4) Cytoplasmic Incompatibility</p>	

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		<p>(Sherilyn Wells, Continued) (CI), the modification of sperm from infected males resulting in embryonic defects and death when sperm fertilize eggs not similarly infected.” https://www.sas.rochester.edu/bio/labs/WerrenLab/WerrenLab-WolbachiaBiology.html</p> <p>MOBILOME – Mobile Genetic Elements – “The widespread intracellular bacterium Wolbachia .. is now more than ever triggering a surge of interest due to recent discoveries broadly related to its mobile genetic elements (its mobilome[6]). Remarkably, Wolbachia is capable of manipulating the reproduction of its host, thereby favoring its own—almost exclusively maternal—spreading.”</p> <p>Results from these studies indicate that Wolbachia are much more widely distributed in host tissues than previously appreciated. Furthermore, the distribution of Wolbachia in somatic tissues varied between different Wolbachia/host associations.</p> <p>Some associations showed Wolbachia disseminated throughout most tissues while others appeared to be much more restricted, being predominantly limited to the reproductive tissues. https://www.researchgate.net/publication/13100943_Wolbachia_infections_are_distributed_throughout_insect_somatic_and_germ_line_tissues</p> <p>The significance of Wolbachia infections in insect non-reproductive tissues has recently reemerged with the description of a Wolbachia strain that forms heavy infections in nervous and muscle tissues of Drosophila and drastically reduces the life-span of adult flies (Min and Benzer, 1997). ... These examples indicate that early assessments of Wolbachia tissue distribution in insects may have underestimated the extent and significance of somatic infections. https://www.sciencedirect.com/science/article/pii/S0965174898001192?via%3Dihub</p> <p>Recently, it has become apparent that Wolbachia infections influence the fitness of their hosts in diverse ways, by altering patterns of reproduction, resistance to microbial infections and the provision of nutrients (Hedges et al., 2008; Teixeira et al., 2008; Ghedin et al., 2008). How might a bacterium that manipulates host reproduction, with a special affinity for the female, has “mobile genetic elements,” and is hostile to males, interact with toxic components of a gene therapy injection - spike protein and lipid nanoparticles - which also accumulate in human reproductive tissues (especially the ovaries, according to a Japanese biodistribution study)?</p> <p>Consider what court-ordered document production revealed about Pfizer’s product[7] https://dailyclout.io/miscarriages-in-covid-19-vaccinated-mothers-as-reported-in-vaers/ https://childrenshealthdefense.org/defender/mrna-technology-covid-vaccine-lipid-nanoparticles-accumulate-ovaries/</p> <p>For one effect of the “gene therapy” on male reproductive tissues, compare these Testicular Tissue Slides, pre & post injection... https://dailyclout.io/report-58-part-2-autopsies-reveal-medical-atrocities-of-genetic-therapies-being-used-against-a-respiratory-virus/</p> <p>“Small” segue worth mentioning: SUDDEN ADULT DEATH SYNDROME is a term that did not exist prior to the rollout of the Covid-19 injections, prior to the circulation of its ingredients inside the human body.</p> <p>And - as presented by Federal Investigator Donna Thompson: The bacterium the mosquitoes are injected with has been shown to ENHANCE West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Research has shown Wolbachia can ENHANCE malaria parasite infection in two genera of mosquitoes. [19-21]. https://downloads.regulations.gov/EPA-HQ-OPP-2015-0374-0018/attachment_1.pdf</p> <p>A 2020 study in BMC describes the Potential for Wolbachia bacteria to SPREAD not only vertically through breeding, but horizontally through parasitism or proximity to infected individuals. “Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore” (Huicong Ding, Huiqing Yeo, Nalini Puniamoorthy)</p> <p>4. Social/health issue: Is unchecked immigration introducing new disease threats (some historically enhanced by Wolbachia)?</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, Continued) The current policy of open borders and the disbursing of tens of thousands of unvetted immigrants throughout the U.S. (including Hawai'i) may well introduce/spread diseases that have hitherto not been seen nationally/locally, which means that studies like the one below might become increasingly relevant to Hawai'i's/U.S.'s populations as well.</p> <p>"Filarial nematodes[8] cause some of the most debilitating diseases in tropical medicine. Recent studies, however, have implicated the parasites' endosymbiotic Wolbachia bacteria, rather than the nematode, as the cause of inflammatory-mediated filarial disease. https://www.researchgate.net/publication/10661175_Wolbachia_in_the_Inflammatory_Pathogenesis_of_Human_Filariasis</p> <p>"Wolbachia have proven to be the Achilles' heel of nastier parasites too. Before Klion and her team showed that doxycycline can be used to treat the annoying worm infections, other doctors learned that it is an effective way to eliminate their nasty cousins, the parasites that cause elephantiasis and river blindness" (kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive). https://www.wired.com/2009/10/wormtreatment/</p> <p>https://onchocercaparasite.wordpress.com/2017/12/01/treatment-and-control/</p> <p>5. Cause for CAUTION: the project's research bedfellows and their history.</p> <p>We are reassured by certain experts that this Wolbachia/mosquito experiment is harmless. However, many of these researchers and organizations are funded by the Bill and Melinda Gates Foundation and Wellcome Trust.</p> <p>Gates Foundation involvement with Wolbachia, alteration of mosquitoes, etc.: https://www.gatesfoundation.org/about/committed-grants/2020/09/INV019029 https://www.worldmosquitoprogram.org/en/about-us/our-story</p> <p>Wellcome Trust partnered with Gates multiple times, including for "exploring synergies between human and animal infections."</p> <p>https://www.gatesfoundation.org/about/committed-grants/2014/05/opp1109338</p> <p>http://www.eliminatedengue.com/progress/index/view/news/1088</p> <p>Is it possible that a Wolbachia-research organization being generously supported by Gates/Wellcome will tend to find that harmful or unintended consequences are NOT taking place re the object of research (knowing the focus of the study is intended as a future cash cow for the funders)? Gates recently commissioned a study into how much people will pay to use Wolbachia.</p> <p>Arlington, VA—January 31, 2022—Management Sciences for Health (MSH) today announced that it has been awarded a contract to examine what countries are willing to pay to use the Wolbachia pathogen.. The study, funded by the Bill & Melinda Gates Foundation, will analyze the willingness of public and private payers to use the naturally occurring bacteria to control outbreaks of the mosquito-borne diseases</p> <p>https://msh.org/story/management-sciences-for-health-tapped-to-study-costs-to-control-mosquito-borne-disease-outbreaks-in-latin-america-and-asia/</p> <p>Former editors of medical/scientific journals have described a proliferation of junk/compromised science in recent decades[9] due to industry influence (greed, profits over people, etc.). AND, unfortunately, there is a recent, very public example in the case of the virologists who suddenly altered their testimony on SARS-CoV-2 origins and then received large grants from Fauci.. An article in the BMJ (British Medical Journal) calls out Gates and Wellcome for covering their ultimate agendas (and financial interests) with the cloak of charity and public-spirited research, failing to reveal large conflicts of interest.</p> <p>"Mohga Kamal-Yanni, a policy adviser to UNAIDS and other organisations who recently co-wrote a paper citing problems with the Gates Foundation's influence in the pandemic, says that Wellcome's investments raise critical questions around transparency and accountability.5</p> <p>"Yet charities such as Gates and Wellcome—and even drug companies—have generally been praised in the news media during the pandemic for their efforts to solve the public health crisis, with relatively little attention paid to their financial interests and with few checks and balances put on their work. https://www.bmj.com/content/372/bmj.n556</p>	

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		<p>(Sherilyn Wells, Continued) Gates' windfall profits from hawking the Covid-19 injections as something the entire world MUST do, followed by his subsequent incredibly timely sale of his vaccine stocks as the bad side-effects/fraud news started to emerge, are a window into his historical behavior when involved in any particular product.</p> <p>https://childrenshealthdefense.org/defender/bill-gates-pfizer-covid-vaccine-profits/ https://childrenshealthdefense.org/defender/bill-gates-profits-biontech-effectiveness-covid-vaccines/ https://www.gatesphilanthropypartners.org/perspectives/2022-world-mosquito-program https://www.biznews.com/health/2023/01/30/bill-gates-mrna</p> <p>His extensive investments in media assist him in keeping the message about his "work" on target. It's so handy to have your own team of "fact checkers" "correcting" what others report about you.</p> <p>https://www.cjr.org/criticism/gates-foundation-journalism-funding.php</p> <p>A tiny bit of historical/moral/ethical background on the Wellcome Trust (formerly Burroughs Wellcome), uncovered by Tom Fitton of Judicial Watch – human experimentation/murder in a concentration camp:</p> <p>"The omitted evidence by Oxford of Rhodes' 1895 Privy Council appointment directly implicates ... in the 2nd Boer War concentration camp atrocities where over 60,000 whites and blacks (incl. over 14,000 mostly white children of French, German and Dutch descent) were murdered in the camps. The omission also implicates the Crown, Privy Council, Henry de Worms (a Rothschild cousin) and the Rothschilds banking fortune in the human vaccine experimentation carried out by Burroughs Wellcome (Wellcome Trust today) in those 2nd Boer War concentration camps..” In 2018, the same Wellcome organization which conducted vaccine experiments in the 2nd Boer War concentration camps researched vaccine confidence (how to encourage uptake of vaccines) just in time for 2021's Covid-19 gene therapy injections, which created dozens of new billionaires[10].</p> <p>And note how the mantra of "Trust The Science" was subsequently utilized by Official Narrative talking-heads ... "...120,000 respondents in 126 countries to assess how societal-level trust in science is related to vaccine confidence. In countries with a high aggregate level of TRUST IN SCIENCE, people are more likely to be confident about vaccination.." (emphasis added)</p> <p>https://pubmed.ncbi.nlm.nih.gov/34002053/</p> <p>The documents suggest that the US's secretive Defense Advanced Research Projects Agency (DARPA) has become the world's largest funder of "gene drive" research.. https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies</p> <p>Gates is also studying how to aggressively push genes into a different biome. What could go wrong when an avowed population-reduction "philanthropist" is/has been associated with (a) Wolbachia and (b) Covid-19 injections and (c) the alarming "gene drive" technology? https://www.forbes.com/sites/matthewherper/2016/06/10/bill-gates-says-gene-drives-to-eradicate-some-mosquito-species-could-be-ready-for-in-two-years/</p> <p>As Federal Investigator/Subject Matter Specialist Donna Thompson notes in her testimony, the presence of Bill Gates in the Wolbachia research picture is cause for concern. Refer to Donna Thompson's testimony on page 2 through page 4 of her 3/24/23 comments to the BLNR.</p> <p>Bill Gates has been funding Wolbachia research for 20 years, but is apparently playing both sides of the aisle – funding both pro- and con-Wolbachia research, given that Wolbachia is known to be essential to the survival of certain disease organisms that infect humans. (https://www.mdpi.com/2414-6366/4/3/108 - Calibr, a division of Scripps Research has partnered with and the Bill & Melinda Gates Medical Research Institute (Gates MRI)). Federal Investigator Donna Thompson has now submitted, in her current comments, Wolbachia/mosquito information related to antibiotics and the potential for developing antibiotic-resistant-strains of</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, Continued) organisms, with the obvious potential human/animal health effects. Here is another Gates-funded project in which antibiotics are used for manipulating mosquito gender ratios (with a similar risk of increasing antibiotic-resistant organisms?)..</p> <p>Bill Gates-Funded Biotech Firm Claims GMO Mosquito Project a ‘Success,’ But Critics Cite Lack of Proof</p> <p>“Oxitec’s pilot project in the Florida Keys involves releasing up to 1 billion OX5034 mosquitoes....</p> <p>“Oxitec said the mosquitoes have a “self-limiting” gene that makes the females dependent on the antibiotic tetracycline. Without the drug, they will die.</p> <p>“.. critics said the experiment so far hasn’t stemmed the spread of mosquito-borne illness.”</p> <p>https://childrenshealthdefense.org/defender/bill-gates-biotech-gmo-mosquito/</p> <p>6. Future Warfare Slide Presentation in 2001 - “Welcome to 2025.” Exploring the research into Mosquitoes/Bacteria as a BIOWEAPON. There are no documented biosecurity protocols for these mosquitoes, and plans for pathogen screenings are unknown. “THE EFFECTS OF BIOLOGICAL WEAPONS HAVE LARGELY DISAPPEARED FROM PUBLIC AWARENESS.”</p> <p>See below..</p> <p>Drone delivery is discussed in the EA as the primary method of delivery – “The primary tool proposed for release of mosquitoes on the landscape is drones..”</p> <p>PATENT 8,967,029 B1. https://patents.google.com/patent/US8967029B1/en</p> <p>Toxic Mosquito Aerial Release System</p> <p>Filed November 14, 2014, Received March 3, 2015</p> <p>Background Art –</p> <p>"Governments have sought after weapons that can be used to deliver chemicals, viral and bacteriological substances for lethal and non-lethal administration to assembled masses of people."</p> <p>Abstract -</p> <p>A device for the aerial release of mosquitoes includes an unmanned aerial vehicle operable by remote control. It carries a container holding a central processing unit and a mosquito breeding bin, which is a self-contained volume housing mosquitoes and a mosquito food having a toxin suitable to be transmitted by mosquito bite after the mosquito consumes the mosquito food. A release tube is connected to the mosquito breeding bin and sized to release mosquitoes from the mosquito breeding bin. A valve is connected to the release tube and is operable by remote control so that when opened, the mosquitoes have an open pathway out of the container through the release tube. The documents suggest that the US’s secretive Defense Advanced Research Projects Agency (DARPA) has become the world’s largest funder of “gene drive” research.. https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies</p> <p>Genetically engineer SKIN BACTERIA to resist mosquito bites? What could possibly go wrong? Could “protection from” also be turned into its opposite – “vulnerability/susceptibility to”?</p> <p>https://www.chemistryworld.com/news/darpa-wants-to-genetically-engineer-soldiers-skin-bacteria-to-protect-them-from-mosquitoes/3010506.article</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, Continued) https://news.fiu.edu/2020/team-awarded-15m-by-darpa-to-develop-skin-microbiome-based-mosquito-repellent</p> <p>The authors argue that the insects used to deliver the viral agents might be perceived as “means of delivery” in terms of the (Biological Weapons) Convention. "Because of the broad ban of the Biological Weapons Convention, any biological research of concern must be plausibly justified as serving peaceful purposes. The Insect Allies Program could be seen to violate the Biological Weapons Convention, if the motivations presented by DARPA are not plausible. This is particularly true considering that this kind of technology could easily be used for biological warfare," explains Silja Vöneky, a law professor from Freiburg University.</p> <p>https://www.sciencedaily.com/releases/2018/10/181009102511.htm</p> <p>BACTERIAL “SYRINGES” have now been CUSTOMIZED to ferry drugs into specific types of human cells. “Unclear whether human side-effects will occur”... Researchers have harnessed tiny biological “syringes” bacteria use to carry and inject cargo into cells to ferry drugs into specific types of human and mouse cells, they report this week in Nature. The new strategy improves on current drug delivery such as nanoparticles, which cannot be customized to cells or organs, the team says. “Still, the technology is” (allegedly) “far from being a feasible strategy in humans, STAT reports, because the bacterial syringes did not work for all drugs, and it’s unclear whether the approach will cause side effects in humans.” https://www.science.org/content/article/biological-syringes-could-change-how-drugs-are-delivered</p> <p>Renee Wegrzyn, PhD, a program manager at the Defense Advanced Research Projects Agency (DARPA), discusses her work on gene editing to combat infectious diseases or counter future enemies that may employ genetically modified insects as weapons with Defense & Aerospace Report Editor Vago Muradian at the DARPA-D60 Symposium in September 2018 to commemorate the agency's 60th anniversary. https://www.youtube.com/watch?v=IlounGf1zK8</p> <p>The use of “CO-OPTED INSECTS” as part of a new human warfare strategy - this concept was part of a Future Strategic Issues, Future Warfare presentation by NASA scientist Dennis M. Bushnell, at the NASA Langley facility (Langley being CIA, of course) on August 14, 2001.</p> <p>Bushnell Slide Show:</p> <p>https://zerogeoeengineering.com/wp-content/uploads/2018/07/dtic.mil-ndia-2001testing-bushnell-3.pdf https://archive.org/details/FutureStrategicIssuesFutureWarfareCirca2025</p> <p>7. CONFLICTS OF INTEREST HAVE BEEN IGNORED.</p> <p>The basis for bias within the BLNR and within the Agriculture Advisory Committee on Plants and Animals is spelled out in prior testimony of Hawai'i Unites/Tina Lina, Donna Thompson, which catalogues a history of Advisory Committee (and BLNR) members' employment, of historical and current association and allegiances (including, but not limited to, Committee Members being affiliated with agencies who are a part of Birds Not Mosquitoes, which has the firmly stated intention that they WILL USE Wolbachia mosquitoes/biopesticides. Here are the conflicted/biased Committee members whose agency affiliations (e.g., members of Birds Not Mosquitoes, BNM) makes their approval(s) and recommendations suspect: deficient in terms of guaranteeing an impartial review of evidence, of ensuring that foregone conclusions have no place in the deliberations.</p> <p>(1) Dr. Marcia Haws, (2) Cynthia King, (3) Gracelda Simmons, (4) Joshua Fisher, (5) Dr. Samuel Ohu Gon III.</p> <p>Predetermined outcome? (BNM language reveals a bias before hearings/studies were completed)</p> <p>Birds Not Mosquitoes was using the term “WILL USE naturally-occurring bacteria” on its opening webpage, long before the first Environmental Assessment (Maui) was released. When the intention – WILL USE - of the Advisory Committee Members' affiliate agencies is so openly stated, how willing and open-minded are those advisory committee members to finding, on the basis of ALL the evidence, that there is a pronounced need for far more extensive analysis, that caution is appropriate and that an intention might</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, Continued) need to be revised? This has led to downplaying serious issues, avoiding other issues entirely, etc. all in an effort to expedite their WILL USE goal.</p> <p>https://www.birdsnotmosquitoes.org/</p> <p>Errata on the BNM website: BNM (ergo the agencies that fall under its umbrella) have also failed to update the information on their website, in that there is NO mention of the fact that Wolbachia genes have now been detected in an immuno-compromised human, a fact which, if revealed, might alter the general public's perception of this project. The two BLNR board members with open conflicts of interest are Dawn N.S. Chang and Vernon Char. BLNR guidance requires members to abstain from participation as well as voting, when "any interest, direct or indirect" exists (see below), but Chang and Char declined to recuse themselves.</p> <p>https://dlnr.hawaii.gov/boards-commissions/blnr-board/</p> <p>BLNR FOLLOWED EXAMPLE OF BIASED ADVISORY COMMITTEE (Agriculture Advisory Committee on Plants and Animals). Granting any deference to the precedent set by an action of a compromised Advisory Committee[11] compounds the error of partiality and bias that is explicitly supposed to be absent from administrative processes. The mandate, the longstanding judicial precedent</p>	
Joe Conti	7/24/2023 13:12	<p>I think this is very dangerous experimenting with this type of situation. It's gone bad in the past, there's a chance it could go bad now. I'm very opposed to this Frankenstein approach. There have been issues with malaria outbreaks in Texas, and also problems in Florida with mosquito tampering/genetic code. Please don't do this to Hawaii.</p>	Concerns: 3, 4, 11, 28
Nathan Goldberg, The Finch Network	7/24/2023 13:13	<p>To whom it may concern,</p> <p>Attached, please find a letter of written testimony from the Finch Research Network which we ask please be distributed to the Department of Land and Natural Resources - Department of Fish and Wildlife for the upcoming meeting covering the Environmental Assessment on Kauai for use of Mosquito suppression techniques.</p> <p>Thank you, Nathan Goldberg and Matt Young Finch Research Network</p> <p>[TEXT COPIED FROM PDF LETTER ATTACHMENT] July 24th, 2023</p> <p>To the Department of Land and Natural Resources – Division of Forestry and Wildlife,</p> <p>The Finch Research Network, a 501(c)(3) nonprofit dedicated to the study and conservation of finches and their habitats globally, would like to take this time to highlight the severity and importance of the draft Environmental Assessment for Kaua'i Mosquito Suppression you'll be reviewing today regarding Hawai'i's forest bird extinction crisis. We are writing to you today in SUPPORT of this Environmental Assessment and use of Wolbachia to aid in the suppression of mosquitos to assist in the conservation of these species.</p> <p>The Hawaiian honeycreepers are a very diversified group of finches, and as such, have garnered the attention of our organization and members (many of whom are based on the mainland). We are astonished at the rapid pace these species are headed towards extinction, and are working with partners in Hawai'i to ensure these extinctions do not take place. We would like to emphasize the value in the two tools that are being presented on today - both the use of mosquito control through Incompatible Insect Technique, and through captive care of two of the most endangered honeycreepers (the 'akikiki and kiwikiu). These are the only tools left in the so-called tool-box, and if we don't employ them, we are guaranteed to lose these birds forever.</p> <p>Extinctions of Hawaiian birds and birdlife have proceeded at an incredibly rapid pace since contact with Europeans first took place in 1778, and now only 17 of the 50+ species of honeycreepers that used to exist on the island are holding on today. We hope you</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Nathan Goldberg, <i>Continued</i>) will not take this matter lightly, and do all you can to help save these birds that are 'ohana, kūpuna, and 'aumākua to Native Hawaiians. These birds are only found here and nowhere else in the world. We must do what we can to save them before it is too late.</p> <p>Thank you for your work, Matt Young and Nathan Goldberg Finch Research Network https://finchnetwork.org</p>	
<p>Goettelmann, Margaret</p>	<p>7/24/2023 13:17</p>	<p>What are you waiting for....our Native Forest Birds to become extinct. I hear that there's a lot of misinformation flying around out there but the Wolbachia Program is Scientifically supported & has, already, been effectively & safely, implemented in TX & CA. As you debate this the clock is ticking. Pls vote in favor, today</p> <p>Kind Regards, Margaret Goettelmann</p> <p>MARGARET S. GOETTELMMANN (R) REALTOR® RB-17517 Coldwell Banker Realty 970 N. Kalaheo Ave. Suite C-215Kailua, Hawaii 96734 C: 808.255.7999 F: 808.262.2861 margaretg@cbpacific.com margaretg.cbintouch.com</p>	<p>Thank you for your comment</p>
<p>Kristina Ammon</p>	<p>7/24/2023 13:18</p>	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p>	<p>Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34</p>

Name	Entry Date	Comment	Responses
		<p>(Kristina Ammon, Continued) I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.</p> <p>Kristina Ammon, (808) 895-8775</p>	
Brady Stewart	7/24/2023 13:22	<p>Aloha,</p> <p>I am writing to urge the continued procedure of carrying out a full environmental impact statement on the Wolbachia mosquito release plan in opposition to those who would award a FONSI determination. I think that the draft environmental assessment issued by the DLNR/ US Fish and Wildlife/ SWCA Consulting was a very thorough broad assessment, but it is lacking some details in terms of implementation, modeling assumptions, and an overly optimistic sense of confidence in the inevitable success of the plan. I would appreciate your consideration of a few of my concerns.</p> <p>My primary concern is that I felt the EA downplayed the potential for female Wolbachia infections due to the authors' inherent bias toward the success of their plan. In the case of a minutely small rate of Wolbachia-infected female mosquitoes, those infected females will have the ultimate evolutionary advantage over their now infertile competitors. This will completely negate the intended outcome of the project, dooming it to failure and proving it to be a waste of valuable resources. This could happen one of two ways.</p> <p>1. Insufficient lab safety controls could lead to infected female escapes. In the first appendix under the heading "Unintended release of female mosquitoes", the EA cites Crawford et al 2020 that the risk of releasing a female will be 1 out of 900 million. Nowhere in the body of the report did I notice any intended release rates but I know you intend to implement a potentially perpetual release cycle to ensure the success of the plan. How many hundreds of millions of mosquitoes will be released over time at what cost? What lab will you be depending on to purchase female-free brood? If you plan on setting up biopesticide labs in Hawaii, I presume you will be doing a much more comprehensive EIS.</p> <p>2. Horizontal transfer of the Wolbachia from male to female mosquitoes could occur during mating. This subject is addressed in the EA draft appendix immediately following the female release risk. Even if there were only an infinitesimally small risk of infecting females to pass on the infection to the next generation of offspring, how many infected female generations would be needed before they just replace the uninfected population?</p> <p>It is an inevitability that over some period of time you will have replaced the uninfected population in your release zone with an infected one while your plan is to induce sterility. The understated implication of the whole concept of Wolbachia induced cytoplasmic incompatibility, if we imagine one step beyond the current implementation to the probable outcome, is that you are creating selection pressure to advantage the group you want to suppress. The EA mentions that this plan is not new and so initial results exist from some of the countries where it has been tried showing mosquito population reduction of 90%. Do you think those remaining 10% could consist of some infected females and eventually a more fit population of mosquitoes will return to something approaching their prior carrying capacity still able to spread malaria but with a new hitchhiker Wolbachia on board?</p> <p>That brings me to my next concern. This seems to be, by necessity, just another neverending government program that we all end up paying for regardless of its performance. The EA was extremely vague regarding the foreseeable future development of the project. Will you release mosquitoes on a regular basis from now until the fall of the empire? If your project fails due to a growing population of infected compatible mates to carry on the avian malaria crisis will you admit defeat or will you pivot to some other poorly thought out homerun swing? Once you set up your base operation here for mosquito release, will the public be allowed access to audit your operation? If the program fails, how much money will the government have diverted from more productive ends?</p> <p>The final concern that I wanted to share is this. I believe many of the underlying assumptions are either lacking sufficient data or based on predictive modeling which is irrelevant speculation. First, why do we believe that anyone can tell us what the weather is going to do in a year or a decade? Suppose the climate ended up five degrees cooler on average in 2033. Would the mosquito population retreat to the lowlands or evolve and continue to sicken and kill birds with malaria? Perhaps the birds would also start to nest at lower elevation sites. Who knows? These types of natural climactic shifts and occasional upheavals have occurred throughout</p>	Concerns: 1, 6, 9, 11, 12, 14, 26, 27, 33

Name	Entry Date	Comment	Responses
		<p>(Brady Stewart, Continued) time forcing all species to adapt or perish. Perhaps the small percentage of Akeke'e and Akikiki that remain are the individuals with immune resistance to the malaria and they can confer that immunity to their progeny. Suppose you are successful in eliminating the southern house mosquito in the whole NW region of the island and then one typhoon comes and blows the load of lowland mosquitos beyond their natural range up-hill into the forest. You see how many factors this proposal just doesn't address?y</p> <p>I'm all for protecting our precious manu and the amazing botanical wonders that they proliferate. I have just seen repeatedly how new technologies get thrust onto the public and the ecosystem with very little notice or request for consent from those it could affect. Open air introductions of a slew of toxic chemicals now poison our water and air. GMO seeds have made our commodity foods practically inedible. If I could snap my fingers and make the mosquitoes go away maybe I would, but I would be forced to weigh the risk/reward of unintended consequences that are beyond my current comprehension. Your plan still has too many holes to float. I highly recommend you carry out a full Environmental Impact Assessment.</p> <p>Respectfully, Brady Stewart, Kaua'i resident</p>	
Megan	7/24/2023 13:26	I support mosquito suppression efforts in Kaua'i to save our native forest birds from extinction.	Thank you for your comment
Catherine Bianchi	7/24/2023 13:30	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Name	Entry Date	Comment	Responses
Kristen Dahl, PhD	7/24/2023 13:33	<p>I wholeheartedly SUPPORT the Kaua'i Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA). It is alarming, the rate at which we are losing native Hawaiian forest birds. We have already lost so many. Do not let our last surviving endemic forest birds disappear from Hawai'i, and the world, forever.</p> <p>Avian malaria spread by invasive mosquitoes (<i>Culex quinquefasciatus</i>) cannot be allowed to extirpate our precious endangered native forest birds across the archipelago. Specifically, extant Kaua'i honeycreepers have experienced drastic (>90%) population declines exacerbated by climate warming which result in the spread of mosquitoes into high elevation forest reserves that were previously too cold for mosquitoes and avian malaria. Currently, there are hardly any forest refuges left that are safe from mosquitoes carrying this devastating disease. No doubt, many things have caused our endemic birds to decline in number over recent decades (& human history here), but malaria will cause extinction of these diverse fauna if nothing is done (and indeed, if climate change does not continue on its current trajectory). 'Akikiki are at risk of extinction by 2025, and 'akeke'e could go extinct as soon as 2034. They cannot afford any unnecessary delays to successful mosquito and avian malaria suppression. Extinction is forever. You will not get a do-over.</p> <p>No matter how pristine Hawai'i's native forests are, they are not safe for forest birds if they have mosquitoes spreading avian malaria. The transinfection of mosquitos with the maternally-inherited, endosymbiotic bacteria Wolbachia is an extremely promising biocontrol approach. Unlike traditional pesticides, Wolbachia IIT is a safe and species-specific form of landscape-scale mosquito control.</p> <p>Wolbachia IIT has been used successfully in other parts of the world to suppress mosquitoes (and the diseases they carry) with no negative impacts to people or the environment. Elsewhere in the United States, this mosquito control technique has been approved and used for several other mosquito species (<i>Aedes albopictus</i> in California and Kentucky; <i>Ae. aegypti</i> in California, Texas, and Florida, with amendments to add Puerto Rico and the U.S. Virgin Islands; and <i>Ae. polynesiensis</i> in American Samoa).</p> <p>The fundamental purpose of an EA is to determine if a project will cause significant negative effects that would require the preparation of an Environmental Impact Statement (EIS). The Wolbachia IIT EA for Kaua'i (and East Maui) is supported by decades of peer-reviewed science. It concluded that no significant negative environmental or cultural impacts will occur.</p> <p>To quote Dr. Chris Farmer of American Bird Conservancy, "We are racing time, and successful application of this management tool will prevent the extinction of multiple species of invaluable and irreplaceable honeycreepers. They are integral components of our forests, indicating overall ecosystem health and serving as pollinators, seed dispersers, and predators. Their beauty, behaviors, and spiritual connotations are woven into mele, hula, and 'ōlelo no'ēau, and iconic Hawaiian materials created through featherwork. These birds are found nowhere else in the world, and we have a kuleana to protect them."</p> <p>I, along with countless other citizens and experts, SUPPORT the Kaua'i Wolbachia IIT EA to save our forest birds.</p> <p>Mahalo for your consideration and the opportunity to provide comment, Kristen Dahl, Ph.D.</p>	Thank you for your comment
Andrea T	7/24/2023 13:43	Please protect the native species and suppress the mosquito invasion. Thank you. Mahalo	Thank you for your comment
Ano Hanamana	7/24/2023 13:49	I do not support releasing any injected mosquitoes, period.	Thank you for your comment
Kestrel	7/24/2023 13:54	Aloha, my name is Kestrel Swift and I am a student currently earning a B.S in Environmental Science in Hawai'i. I support the use of the Incompatible Insect Technique to reduce misquoto populations with every ounce of my being. This is our best shot at saving the akiki and other endangered Hawaiian honeycreepers from extinction. Right now we have the chance to prevent these culturally and biologically important bird from being lost forever. Please, I am begging you, make it so.	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/24/2023 14:02	I fully support the use of the IIT for controlling the populations of avian-malaria-carrying mosquitoes. As a resident of Hawai'i Island who, for the time being, lives off-island, the diversity and maintenance of the native birds of the islands is very important to me and I believe that we should use all of the tools at our disposal to ensure the continued survival of our birds. The IIT technique is safe and has been shown to work in other systems. There are no new species introductions to the islands using this technique. I fully support the use of IIT and I look forward to a brighter and more bird-filled future!	Thank you for your comment
Tammy	7/24/2023 14:06	Please protect the birds and allow for IIT to reduce the mosquito populations threatening their existence!	Thank you for your comment
Jill LaBram	7/24/2023 14:13	Aloha, I am writing in support of the native Hawaiian birds on Kauai. I am in support of the Incompatible Insect Technique. We can't afford to lose any more native Hawaiian birds. Mahalo, Jill LaBram	Thank you for your comment
Shelley Ballam	7/24/2023 14:22	support our endemic birds, please pursue the control of mosquitoes on Kaua'i to stop the spread of mosquito-borne disease.	Thank you for your comment
Pua Heimuli	7/24/2023 14:22	I support the Wolbachia IIT as a tool to help save our native forest birds because it's supported by science and has the ability to suppress mosquito populations which are known to carry avian malaria. We have lost many of our native forest birds to this disease and without actions like this, our critically endangered birds on Kaua'i like the 'Akikiki and 'Akeke'e will become extinct in the next few years. Please approve this assessment and the tools necessary to save our native forest birds! Mahalo nui!	Thank you for your comment
Sara Oliveira	7/24/2023 14:28	I fully support the use of this proven technique to support the native birds of Hawaii and their protection. They are also living "residents" of the state and the invasive mosquito populations are driving them to extinction. We need to protect the birds that are left and this approach has showed no ill effect on people; in other countries it's actually used to help keep people safe too!	Thank you for your comment
Miyamura	7/24/2023 14:29	I strongly support the Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposal of using the Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. This effort would suppress mosquitoes known to transmit diseases to native forest birds in critical higher-elevation native forest habitat. Please vote to protect the native Hawaiian honeycreepers and other native birds from the mosquitoes known to transmit disease and threaten extinction. Please act NOW to protect our precious native birds! Support the DLNR and USFWS recommendation to use IIT to reduce the mosquitoes population that threatens our native birds' survival. Mahalo!	Thank you for your comment
Jill Ekar	7/24/2023 14:29	Mosquitoes are not only bothersome to us humans, they are spreading lethal diseases to our birds and are an invasive species to Hawaii. While mosquitos run rampant, we have a priceless ecological resource in our Hawaiian ecosystem that we have failed to protect for decades. I support IIT, incompatible insect technique, to save Hawaiian birds.	Thank you for your comment

Name	Entry Date	Comment	Responses
Sherilyn Wells	7/24/2023 14:30	<p>Please require FULL EIS. A finding of FONSI is ridiculously inappropriate, scientifically inaccurate, and simply lazy, as it fails to include obviously relevant concerns. I have emailed further testimony to mosquitocontrol@hawaii.gov. Scientific studies document serious concerns/risks with lab-infected biopesticide mosquitoes, including:</p> <ul style="list-style-type: none"> o “For arthropods , the presence of endosymbiotic bacteria, such as Wolbachia (Rickettsiales: Rickettsiaceae), may complicate management plans and exacerbate the challenges faced by conservation managers. Wolbachia poses a substantial and underappreciated threat to the conservation of arthropods because infection may induce a number of phenotypic effects, most of which are considered deleterious to the host population “ o horizontal transmission of the introduced bacteria strain, o increased pathogen infection in mosquitoes, o irreversible evolutionary events, o population replacement, o accidental release of lab-reared females, o creation of lab-strain females in the wild, o horizontal gene transfer, o biopesticide wind drift, and o mosquitoes becoming MORE capable of transmitting human/bird diseases, such as avian malaria and West Nile virus.” <p>Fundamental scientific error at the outset: WOLBACHIA – “You've never heard of it because it ONLY INFECTS BUGS..” emphasis added. New tool for combating mosquito-borne disease: insect parasite genes, 2/27/17, Vanderbilt, https://www.sciencedaily.com/releases/2017/02/170227120400.htm</p> <p>HOWEVER –</p> <p>“Herein, we describe detection of Wolbachia genes from the blood of a patient subsequently diagnosed with non-Hodgkin's lymphoma (NHL). “The findings suggest the potential for Wolbachia bacteria to infect humans. “Additionally, under experimental conditions, some Wolbachia spp. can infect mammalian cells, even human cells in vitro [[10]]. “Horizontal transmission in insects and among helminths occurs via cell–cell invasion, predation and cannibalism [11, 12], among other possibilities, establishing the potential for horizontal transfer to animals and humans as well.” Detection of Wolbachia genes in a patient with non-Hodgkins lymphoma, 10/28/14, Clinical Microbiology and Infection https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext “The recent isolation of Wolbachia pipientis in the continuous cell line Aa23... allowed us to perform extensive characterization of the isolate. Bacterial growth could be obtained ... in a human embryonic lung fibroblast monolayer at 28 and 37 degrees C, confirming that its host cell range is broader than was initially thought. https://pubmed.ncbi.nlm.nih.gov/14662922/</p> <p>NOT ONLY HAVE WOLBACHIA GENES ENTERED “NEW – human - TERRITORY,” AN UNEXPECTED DISCOVERY, BUT THE MOSQUITO HOST IS ALSO “ADAPTABLE, FAST EVOLVING.” One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs. https://pubmed.ncbi.nlm.nih.gov/30529448/ “Wolbachia-infected mosquitoes are currently being released into nature to control human disease. However, a worrying trend is emerging whereby Wolbachia infections enhance rather than suppress pathogens in insect vectors.” “These data will allow us to estimate how likely Wolbachia-based control strategies are to fail or make things worse, for identifying potential points where Wolbachia-based control is likely to break down in the field, and for planning risk mitigation strategies in the case of unforeseen harmful outcomes.” “...a sobering reminder that the pathogen inhibitory effects resulting from Wolbachia infection in some insects cannot and should not be generalized across vector-pathogen systems.” https://grantome.com/grant/NIH/R01-AI116636-02 Not only have Wolbachia genes been discovered in humans, BUT ITS MOSQUITO HOST IS ALSO “ADAPTABLE, FAST</p>	

Name	Entry Date	Comment	Responses
		<p>(Sherilyn Wells, <i>Continued</i>) EVOLVING,” which does NOT assure us of “a stable situation whose outcomes can be predicted for decades into the future” (the current trajectory/plan for the release). “One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. “Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs.” https://pubmed.ncbi.nlm.nih.gov/30529448/ This mosquito has been shown to Create ANOTHER Species of Mosquito through horizontal gene transfer. https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 Changes in Wolbachia or their host genomes in the same species have now been documented (Hornett et al., 2006; Weeks et al., 2007) and suggest that evolutionary shifts in Wolbachia–host interactions (and their host effects) can be rapid. Wolbachia can therefore mediate rapid evolutionary shifts in host reproductive patterns and fitness effects. https://www.nature.com/articles/hdy200950 MOBILOME – Mobile Genetic Elements – “The widespread intracellular bacterium Wolbachia .. is now more than ever triggering a surge of interest due to recent discoveries broadly related to its mobile genetic elements (its mobilome). Results from these studies indicate that Wolbachia are much more widely distributed in host tissues than previously appreciated. Furthermore, the distribution of Wolbachia in somatic tissues varied between different Wolbachia/host associations. Some associations showed Wolbachia disseminated throughout most tissues while others appeared to be much more restricted, being predominantly limited to the reproductive tissues. https://www.researchgate.net/publication/13100943_Wolbachia_infections_are_distributed_throughout_insect_somatic_and_germ_line_tissues The significance of Wolbachia infections in insect non-reproductive tissues has recently reemerged with the description of a Wolbachia strain that forms heavy infections in nervous and muscle tissues of Drosophila and drastically reduces the life-span of adult flies (Min and Benzer, 1997). ... These examples indicate that early assessments of Wolbachia tissue distribution in insects may have underestimated the extent and significance of somatic infections. https://www.sciencedirect.com/science/article/pii/S0965174898001192?via%3Dihub Recently, it has become apparent that Wolbachia infections influence the fitness of their hosts in diverse ways, by altering patterns of reproduction, resistance to microbial infections and the provision of nutrients (Hedges et al., 2008; Teixeira et al., 2008; Ghedin et al., 2008). How might a bacterium that manipulates host reproduction, with a special affinity for the female, has “mobile genetic elements,” and is hostile to males, interact with toxic components of a gene therapy injection - spike protein and lipid nanoparticles - which also accumulate in human reproductive tissues (especially the ovaries, according to a Japanese biodistribution study)? The bacterium the mosquitoes are injected with has been shown to ENHANCE West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Research has shown Wolbachia can ENHANCE malaria parasite infection in two genera of mosquitoes. [19-21]. https://downloads.regulations.gov/EPA-HQ-OPP-2015-0374-0018/attachment_1.pdf A 2020 study in BMC describes the Potential for Wolbachia bacteria to SPREAD not only vertically through breeding, but horizontally through parasitism or proximity to infected individuals. “Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore” (Huicong Ding, Huiqing Yeo, Nalini Puniamoorthy “Filarial nematodes cause some of the most debilitating diseases in tropical medicine. Recent studies, however, have implicated the parasites' endosymbiotic Wolbachia bacteria, rather than the nematode, as the cause of inflammatory-mediated filarial disease. https://www.researchgate.net/publication/10661175_Wolbachia_in_the_Inflammatory_Pathogenesis_of_Human_Filariasis “Wolbachia have proven to be the Achilles' heel of nastier parasites too. Before Klion and her team showed that doxycycline can be used to treat the annoying worm infections, other doctors learned that it is an effective way to eliminate their nasty cousins, the parasites that cause elephantiasis and river blindness” (kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive). https://www.wired.com/2009/10/wormtreatment/ https://onchocercaparasite.wordpress.com/2017/12/01/treatment-and-control/ Issues with Gates involvement in Wolbachia research: Is it possible that a Wolbachia-research organization being generously supported by Gates/Wellcome will tend to find that harmful or unintended consequences are NOT taking place re the object of</p>	

Name	Entry Date	Comment	Responses
		<p>research (knowing the focus of the study is intended as a future cash cow for the funders)? Gates recently commissioned a study into how much people will pay to use Wolbachia. The study, funded by the Bill & Melinda Gates Foundation, will analyze the willingness of public and private payers to use the naturally occurring bacteria to control outbreaks of the mosquito-borne diseases https://msh.org/story/management-sciences-for-health-tapped-to-study-costs-to-control-mosquito-borne-disease-outbreaks-in-latin-america-and-asia/</p> <p>An article in the BMJ (British Medical Journal) calls out Gates and Wellcome for covering their ultimate agendas (and financial interests) with the cloak of charity and public-spirited research, failing to reveal large conflicts of interest. https://www.bmj.com/content/372/bmj.n556</p> <p>Population reduction enthusiast Gates is also studying how to aggressively push genes into a different biome. Wolbachia, Covid-19 gene therapy injections, and now gene drive technology. Hmm</p>	
	7/24/2023 14:45	I support wolbachia IIT	Thank you for your comment
	7/24/2023 14:49	I support wolbachia IIT for the protection of native birds on Kaua'i.	Thank you for your comment
Simon Sharp	7/24/2023 14:50	<p>I am in favor of using the Incompatible Insect Technique to achieve landscape level mosquito control on Kaua'i to save the rapidly declining native forest birds from avian malaria!</p> <p>Simon Sharp, Duke University, Nicholas School of Environment</p>	Thank you for your comment
	7/24/2023 14:51	<p>Aloha kākou.</p> <p>I work with native species in Hawai'i. While I have been an ally to native birds since beginning my work here, it was not until recently I truly understood the importance of protecting native forest birds.</p> <p>As a conservationist, I already understood the dangers of eliminating native species from an ecosystem. It was not until hearing the mo'olelo of citizens from around the islands, I began to grasp the cultural and spiritual impact the extinction of these birds could cause. I have had the honor of speaking with many kūpuna who remember when the forest birds were many. I have heard them speak of the slow reduction of native birdsong and seen tears pour from their eyes as they spoke about the last times some of those songs were heard. I got to witness those who mālama Kaua'i come together to plead for the defense of their native forest birds in a beautiful mele, in which they resurrected the names of birds long past and recited the names of birds whose futures rely on this effort.</p> <p>I recently visited the Bishop museum. Native forest bird feathers adorn their halls, but most of the birds featured in these ornate displays are endangered, or already extinct. These birds should not be reduced to displays in a museum. Future generations should not be introduced to their ancestors through glass walls. They should be learning about the birds from their kūpuna. They should be able to visit wahi pana and see 'akikiki and 'i'iwi flying through the trees. They should be able to hear their songs in the forest and not through a speaker system. Those who remember when native birds were plenty and have raised their voices for their well-being should have more opportunities to interact with them in this lifetime. We must protect these birds for the past, present and future generations.</p> <p>Forest birds are not just an important part of native Hawaiian ecosystems, but also of native Hawaiian culture and soul. If we want to strive for true aloha, we must move forward with mosquito suppression.</p>	Thank you for your comment
Bryan Graybill	7/24/2023 14:54	It's up to us to be good stewards of our environment and conserve as best we can remaining endangered species. It is absolutely necessary to implement mosquito control and prevent the outbreak of avian malaria.	Thank you for your comment

Name	Entry Date	Comment	Responses
caroline zepecki	7/24/2023 14:55	Please go forth with the IIT release if possible for the sake of the people and animals of Kauai. Hesitance to support this action is likely due to misunderstanding of the ecosystem fragility and impacts of the intervention	Thank you for your comment
Christine Chiu	7/24/2023 14:56	I support mosquito suppression. It is critical for the survival of the endemic birds in Hawaii.	Thank you for your comment
ALICE TOBIN	7/24/2023 14:57	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and the residents' health.	Concern: 1
Kachina Aimee Woolger	7/24/2023 15:00	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Child of The Creator	7/24/2023 15:09	<p>Any and all who choose to participate in releasing bio weapons aka lab modified mosquitoes is committing sin and violating a plethora of international laws treaties and God's Law. Carefully consider stopping the insanity you are about to unfold. Like the mongoose, frogs and other invasive species intentionally introduced to these islands, the damage can not be undone.</p> <p>If you truly believe mosquitoes are the thing to do. Watch bill gates mosquito Ted talk!</p> <p>Then have a mind to thing for yourself.</p>	Concerns: 3, 10

Name	Entry Date	Comment	Responses
Alex Urbina,	7/24/2023 15:09	It is critical to protect native species. Without them, it can have cascading negative effects on the entire ecosystem. IIT method has gone through rigorous testing to ensure it does not negatively impact humans or other wildlife. Please approve this effort to save native bird species in Hawai'i. Alex Urbina, Master of Environmental Management '24	Thank you for your comment
Gabriel Campos	7/24/2023 15:11	I am absolutely in favor of Mosquito Suppression on Kaua'i, a chance to save some of Earth's most endangered animals. Gabriel Campos: Nicholas School of Environment, Duke Conservation Society President	Thank you for your comment
	7/24/2023 15:12	I am in support to use IIT in order to further bird conservation efforts in Hawaii. Biodiversity and preventing extinction is extremely important in this day and age, especially in the times of climate change. Please consider the use of this technique to save native birds.	Thank you for your comment
Jacob Freedman	7/24/2023 15:15	Hello, I am a student at Duke University's Nicholas School of the Environment. Mosquito control is critical to saving these species of native Hawaiian birds. Please help us protect these birds!	Thank you for your comment
Lee Trent	7/24/2023 15:17	I strongly OPPOSE to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
Seth Anderson	7/24/2023 15:19	I support the Kaua'i mosquito suppression project, I think the IIT is a useful tool to combat the mosquito populations and save our native birds.	Thank you for your comment
Jay Baker	7/24/2023 15:40	To Whom It May Concern: Aloha kākou... This letter is written in support of the actions proposed in the Draft Environmental Assessment: Kaua'i Mosquito Suppression : The Incompatible Insect Technique (IIT) that uses Wolbachia, a naturally-occurring bacteria to help suppress mosquito populations on Kaua'i. I'm astonished and emotionally affected to learn that many species of Kaua'i forest birds are endangered and close to extinction due to avian malaria. I'm in support of the IIT. In my opinion, this is an opportunity that must be attempted before these birds are lost forever. I am a resident of Anahola ahupua'a on the mokupini of Kaua'i. These opinions are my personal opinions and do not reflect any opinions of my employer. Please feel free to contact me with any questions. Sincerely, Harry J Baker hjba@pm.me	Thank you for your comment
Bart Smith	7/24/2023 15:42	Oppose!!!	Thank you for your comment
Alayna Wiley	7/24/2023 15:42	I'm a resident of Hawai'i Island and I strongly support this mosquito suppression initiative to help protect native birds.	Thank you for your comment
	7/24/2023 15:44	Don't mess with nature. Do not release lab injected mosquitoes into the environment, no one knows the impact it could have on humans and other animals.	Concerns: 2, 19

Name	Entry Date	Comment	Responses
Chris Farmer, American Bird Conservancy	7/24/2023 15:50	<p>[TEXT COPIED FROM PDF ATTACHMENT] 24 July 2023</p> <p>Dear Hawai'i Department of Land and Natural Resources and US Fish and Wildlife Service,</p> <p>American Bird Conservancy (ABC) strongly supports the proposed action to use Wolbachia bacteria and the Incompatible Insect Technique (IIT) to suppress southern house mosquitoes on Kaua'i. American Bird Conservancy's mission is to protect wild birds and their habitats. We have been active in Hawai'i for over 15 years, working to protect and restore bird populations across the state, nearly all of which are on the US Endangered Species list. We work on endangered birds across the western hemisphere and the situation in Hawai'i presents the most significant bird extinction threat we have encountered. If action is not taken quickly to suppress invasive Culex mosquitoes, several species will go extinct statewide in the next few years and a total of 12 species are likely to follow in the coming decade or two. These extinctions are imminent on Kaua'i this is a true emergency.</p> <p>ABC has been a leader in the Birds, Not Mosquitoes partnership, actively engaging community leaders, elected officials, and other stakeholders; there is both broad support and strong demand that we find and implement a solution quickly to prevent the loss of these biologically and culturally important species. The extensive testing and safe implementation of this technique for human health provides a foundation and invaluable opportunity to implement a similar solution for a conservation purpose. Wolbachia-based IIT mosquito control programs for human health have been approved for Ae. albopictus in California and Kentucky, Ae. aegypti in California, Texas, and Florida, with amendments to add Puerto Rico and the U.S. Virgin Islands, and Ae. polynesiensis in American Samoa.</p> <p>This Environmental Assessment is incredibly in-depth and detailed, while still being flexible enough to allow for the best possible treatment approaches. This is a strength because it will allow the implementation partners to suppress mosquitoes at the landscape-scale needed, and also allow adaptive treatment responses depending on the initial results. Appendix A is also a very thorough treatment of other possible alternatives, and why they were not considered further. The section on "Other Potential Environmental Impacts" (pg. A6-A9) is very helpful and addresses many of the common concerns with the Wolbachia-IIT approach, especially regarding accidental release of females and horizontal transfer of Wolbachia and why these are incredibly unlikely and improbable events. It is so important for the public to understand these questions about how the process works, that we encourage DLNR and USFWS to reorganize this material and incorporate it into the main body of the EA.</p> <p>The No-Action alternative's cost will be extinctions of multiple bird species, weakening of ecosystems and resilience, and possible declines in other native species that depend on the birds. The extinction of 'akeke'e and 'akikiki, and extirpation of 'i'iwi, are described in Section 4.1.2 (pg. 33), but the timeline of "the next decade" is too cautious. There are only five 'akikiki left in the wild, so their continued survival is highly unlikely, much less persisting to the next decade. 'Akeke'e and 'i'iwi are also declining faster than projected, so are running out of time. There are some 'akikiki in a captive propagation program, but 'akeke'e are not as suitable and their best hope for survival is to remain in the wild protected from mosquitoes and avian disease. Although they are not formally listed by the federal or state government, both 'anianiau and Kaua'i 'amakihi are rapidly declining (Paxton et al. 2016, 2020). These species are now difficult to find in the forests on the Alaka'i Plateau, and could go extinct before there is even sufficient time to list them. Conversely, that this management action could "prevent the global extinction of these species and allow their populations to expand within suitable habitat on Kaua'i" needs to be amplified throughout the EA. The IIT management action will protect all six honeycreepers on Kaua'i, and hopefully allow their populations to increase and recover.</p> <p>The results of the No Action alternative need to be more explicit throughout the EA. Many of the discussions of the No-Action alternative do not sufficiently consider and explicitly state that no action will lead to multiple species extinctions (up to four species of birds), with another two extirpations ('i'iwi and 'apapane); rather they say things would remain the same or similar to existing conditions. The urgent need and clear stakes should be clearly stated throughout the EA. Something that needs to be incorporated into the evaluation is that the current rate of climate change has exceeded most previous predictions and models. This means that mosquitoes and the malaria parasite have been able to successfully move into the Alaka'i Plateau quicker than expected. This has allowed the mosquitoes to breed and transmit malaria for longer periods and at higher densities than previously expected. This combination of factors suggest that the timeline to deploy mosquito control is rapidly shortening. We have run out of time for</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
		<p>(Chris Farmer, <i>Continued</i>) 'akikiki, and have even less time than projected to save 'akeke'e, 'anianiau, and Kaua'i 'amakihi, and protect the other birds. we suggest this factor should be included in the overall consideration of deploying Wolbachia IIT.</p> <p>There are a handful of areas where the EA could be more clear or there is some confusion between different sections:</p> <ul style="list-style-type: none"> · On the top of pg. 13, the EA correctly states “no organisms (mosquito or Wolbachia) used in this proposed project are novel to Hawai'i”, however on pg. A1 (Table A1) it incorrectly talks about the “risk of novel strains of Wolbachia being transmitted...” (underlining added). The table should be changed to correctly describe that the Wolbachia strain is already present in Hawai'i. · The main body of the EA briefly discusses how the technique works and the importance of only releasing males (pg. 12), but it is not until A6-A7 that it discusses what happens if a female is released. The ecology of what happens is critical to people understanding the process, so suggest the material in Appendix A be incorporated into the main body. The description of bidirectional incompatibility is also too brief (pg. A7). This is a complicated and important topic, so the explanation should be expanded. Also the management response to detecting Culex quinquefasciatus with wAlbB in the wild should be expanded. · The sorting techniques used by Crawford et al. (2020; pg. A7) resulted in the risk of releasing a female Aedes aegypti mosquito of 1 out of 900 million released, which could be explicitly stated. The methods for sorting Culex quinquefasciatus are highly precise, thus using a more recent sorting estimate for Culex would better help evaluate the risk. · In discussing Horizontal Transfer of Wolbachia (pg. A8), wAlbA is included. While it is indeed present in the wild Aedes albopictus of Hawai'i, it will not be in the Culex released. Including it in the discussion here is slightly confusing, and maybe even misleading, as it suggests that it might be in the male Culex mosquitoes released. <p>We are racing time, and successful application of this IIT tool will prevent the extinction of multiple species of invaluable and irreplaceable honeycreepers on Kaua'i. American Bird Conservancy applauds the efforts of the Department of Land and Natural Resources and US Fish and Wildlife Service to save these birds and protect our ecosystems, and strongly urges approval of this Environmental Assessment so that land managers can move forward with these actions to save the honeycreepers on Kaua'i.</p> <p>Mahalo nui loa, Chris Farmer and Lukanicole Zavas cfarmer@abcbirds.org lzavas@abcbirds.org Hawai'i Program Director and Outreach Manager 808-987-1779, 808-330-3240</p>	
C cartee	7/24/2023 15:51	I support the IIT for control of mosquito borne infections. Thank you.	Thank you for your comment

Name	Entry Date	Comment	Responses
Beckhood	7/24/2023 15:52	<p>Dear Chair, Vice Chair, and members of the committee,</p> <p>My name is Rebecca Geelhood, I live in Makiki, Oahu, and I am testifying today in support of Board approval of the Kauai Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA), and Board authorization of the Chairperson to issue a finding of no significant impact (FONSI).</p> <p>As a very concerned citizen and former resident of Kauai county, I urge you to consider saving these few remaining native forest birds that we have left in the Alaka'i. I have personally worked with three of the species that are currently most threatened with extinction in the next few years, the 'Akikiki, the 'Akeke'e and Puaiohi. I hand reared many of the birds while working for the Hawai'i Endangered Bird Program, and in collaboration with the Kauai Forest Bird Recovery Project. While the breeding centers on Maui and Big Island have seen some successes, they have also had to deal with great losses including the Kiwikiu release in 2019, where all of the birds, except for one, succumbed to avian malaria.</p> <p>Wolbachia is a safe and species specific form of landscape-scale mosquito control. It has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever.</p> <p>Thank you for this opportunity to testify. Rebecca Geelhood, 96822</p>	Thank you for your comment
LL Howell	7/24/2023 15:54	<p>Please please please save our wonderful, beautiful, rare birds from being attacked by the avian mosquitos!</p> <p>Do Everything you can! Mahalo, Lani Howell, Big Island</p>	Thank you for your comment
Rebecca Geelhood	7/24/2023 15:54	<p>Dear Chair, Vice Chair, and members of the committee,</p> <p>My name is Rebecca Geelhood, I live in Makiki, Oahu, and I am testifying today in support of Board approval of the Kauai Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA), and Board authorization of the Chairperson to issue a finding of no significant impact (FONSI).</p> <p>As a very concerned citizen and former resident of Kauai county, I urge you to consider saving these few remaining native forest birds that we have left in the Alaka'i. I have personally worked with three of the species that are currently most threatened with extinction in the next few years, the 'Akikiki, the 'Akeke'e and Puaiohi. I hand reared many of the birds while working for the Hawai'i Endangered Bird Program, and in collaboration with the Kauai Forest Bird Recovery Project. While the breeding centers on Maui and Big Island have seen some successes, they have also had to deal with great losses including the Kiwikiu release in 2019, where all of the birds, except for one, succumbed to avian malaria.</p> <p>Wolbachia is a safe and species specific form of landscape-scale mosquito control. It has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever.</p> <p>Thank you for this opportunity to testify. Rebecca Geelhood, 96822</p>	Thank you for your comment
Michael Denker	7/24/2023 15:56	I demand that the DLNR and relevant gov. agencies require a detailed and transparent environmental impact assessment before implementing mosquito control project proposed on Kauia..	Concerns: 1
Alex Manuel	7/24/2023 16:02	I support the native birds!!! Mahalo, Alexander Manuel	Thank you for your comment

Name	Entry Date	Comment	Responses
Becky Hart	7/24/2023 16:03	Please please vote to save the birds. I work in native forest restoration and it is incredible to be able to contribute to saving the habitat of the native birds on Hawai'i. I only hope that this effort can help the birds of Kaua'i. This is something good we can do as humans to help salvage the ecosystems we have deteriorated. Also, it will not only help the birds, but it will also help humans. There never used to be mosquitos in Hawai'i, and we can help return it back to that state. Mahalo.	Thank you for your comment
Alexander Lin-Moore	7/24/2023 16:13	I am strongly in favor of using IIT in the effort to save endangered forest birds on Kaua'i and in the rest of the Hawaiian islands. This is a technique that I have imagined as a possible conservation strategy since gene drive anti-mosquito technologies were first tested, and I am very optimistic that it may alleviate the incredible disease stress on some the country's most critically endangered animals. Testing & monitoring releases for viability and safety is of course a priority, and I am optimistic that these quality controls will be performed to the best ability to ensure both public safety and wildlife preservation. Again, I am very strongly in favor of the use of this technique to conserve Hawaiian birds, and am very optimistic about its efficacy.	Thank you for your comment
Erin	7/24/2023 16:17	Please release the incompatible mosquitoes to give the endangered birds a chance to survive.	Thank you for your comment
Brenda	7/24/2023 16:22	I am in full support of Incompatible Insect Technique to reduce mosquito populations. We are quite literally watching extinction happen before our eyes and this is the best and most promising path forward.	Thank you for your comment
Veronique Leferink	7/24/2023 16:23	<p>This is still in test face. Itisu acceptable to release these mosquitos. It will kill birds since also females will be released. It's impossible to avoid that. This might kill more birds and will bread disease under birds and humans!!!</p> <p>This is unacceptable. This has to stop no matter what. This has to be asked to the people first. No hidden agendas or information. Transparency is required!</p> <p>This is absolutely a very dangerous experiment. Unless the goal is to make money in the long run, kill more birds and cause disease for birds and people and then offer vaccines with side effects causing more trouble then doing any good.</p> <p>Sincerely, Veronique Leferink</p>	Concerns: 2, 9, 11, 12, 19
Kealii Thoene	7/24/2023 16:24	I fully support the IIT technique in attempt to reduce mosquito populations. This action is us critical for us as kānaka 'ōiwi. E ola mau na manu!	Thank you for your comment
	7/24/2023 16:24	The protection of species and the native ecosystem of Hawaii must be a concern of ours as Americans and as humans. The existence of authentic native land is so rare in our nation and must be protected.	Thank you for your comment
Jory Teltser	7/24/2023 16:26	Please, the birds on Hawaii desperately need your attention, and enameling feral cats are among the worst thing that can be done. Please, help these critically endangered birds!!!!!!	Thank you for your comment
Sarah Ruiz	7/24/2023 16:30	I am writing to express my support for using the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kaua'i. So many of Hawai'i's native birds are on the brink of extinction due to avian malaria, so we must act now to save them. Releasing Wolbachia-incompatible male southern house mosquitoes in Kaua'i will have a minimal negative impact on the environment, unlike the mosquito elimination options of insecticides (which can harm birds) or lethal traps (which are not practical across a large landscape). Humans introduced the mosquitos that are killing native honeycreepers, so I hope humans will do the right thing and give these native birds a chance at survival by using IIT to reduce mosquitos and avian malaria.	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/24/2023 16:33	I strongly support the use of the Incompatible Insect Technique (IIT) to reduce mosquito populations on Kaua'i.	Thank you for your comment
Ryan Fuller	7/24/2023 16:36	In a slowly dying flora and fauna, mainly brought in by human activity, it is our responsibility to nurture and conserve every species we can.	Thank you for your comment
	7/24/2023 16:44	To sit still and not take action to save Hawaiian birds is borderline criminal. Time is perhaps more important in Hawaiian conservation than it is in the conservation of nearly any other habitat in any other country. Native animals are disappearing at an absolutely alarming rate and to sit back and not use every possible weapon against extinction we have would be shameful. The passivity would actively contribute towards the extinction of hawaiian birds. This is of course not the only action we have to take to prevent the further extinction of Hawaiian animals. An emphasis on the recovery of many habitats on the Hawaiian Islands, especially over the interest of land developers, is necessary to a complete conservation plan as well as action taken against ROD (although it is my relatively uninformed perception that action is being taken against ROD already) and action taken to fight against climate change. The path of conservation in the Hawaiian Islands is long and arduous, but this is a relatively simple and important step	Thank you for your comment
	7/24/2023 16:50	I am writing in support of the proposed efforts to suppress mosquitos on Kaua'i. This is a critical effort to help prevent the extinction of native Hawaiian honeycreepers using methods that have demonstrated potential.	Thank you for your comment
Rafael Antonio Ruiz	7/24/2023 16:50	I agree with the use of IIT to help the native bird population. Thank you for providing the thorough documentation above. I believe this approach shall have a minimal negative impact on the environment and prevent avian malaria. These birds are national treasures that cannot be revived if they become extinct. Future generations deserve to see them in the wild, not taxidermied or on a computer screen.	Thank you for your comment
Daniel O'Brien	7/24/2023 16:52	I support the Kaua'i mosquito suppression program using Incompatible Insect Technique, because it's now or never to stop the extinction of the akikiki. We've lost so many of Hawai'i's incredible and unique species, especially honeycreepers, and Hawai'i and the world are poorer for it. In the face of climate change and a rapidly warming planet the situation is only going to get worse and more dire for other honeycreepers regardless of what happens with the akikiki.	Thank you for your comment
	7/24/2023 16:54	Mosquitos are being used as human disease vectors all over the world. Importing new species to our Aina is a horrible idea. Please do not make things worse with this ill-conceived project.	Concerns: 2, 10

Name	Entry Date	Comment	Responses
CJ	7/24/2023 16:56	<p>Here in Hawaii, the jewel in the crown of the USA, might we soon be fighting off swarms of Frankenstein mosquitoes mass-produced in a DLNR lab that is already in existence in the state, worrying about getting seriously ill from insect bites?</p> <p>We've heard recent news reports about cases of human malaria in Texas and Florida, the first time the potentially fatal mosquito-borne disease has been locally acquired in the United States in 20 years. Is this because in the last few years, Texas and Florida have both released Oxitec GMO mosquitoes as well as lab-infected Wolbachia mosquitoes similar to the ones being released now in Maui and planned for release in Kauai? With the State of Hawaii's multi-agency partnership "Birds, Not Mosquitoes" pushing for the use of these infected mosquitoes throughout the island chain, we have every reason for alarm. In fact, "Birds, Not Mosquitoes" is an ironic title for the project as it is likely to increase rather than reduce the numbers of mosquitoes on the islands and even worse, hasten the extinction of the endangered Hawaiian birds it is claiming to save.</p> <p>I am a former BBC journalist and part-time resident of Hawaii who is OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>Tropical disease expert Dr. Lorrin Pang (speaking as a private citizen) has shared his concerns about this Wolbachia mosquito project: "...with new life forms coming to the islands, there is too much potential for unexpected, dangerous, irreversible 'evolutionary' events. Proponents may be right that this intervention will save the native birds in the short-term, but long-term consequences to other island ecologies and to these same native birds may ultimately be detrimental ... The damage may be impossible to recall or repair, like the effect we've seen with so many other invasive species in Hawaii."</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Although officially claiming that only non-biting male lab-produced mosquitoes will be released, the agencies' own documents admit that females who bite and spread disease will be released – it's impossible to avoid that. EPA guidelines allow for over 3,000 females weekly to be let loose in East Maui alone, with most likely the same figures for Kauai. Just one female can produce 160,000 more females in her eight-week lifespan.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and it has not been disclosed what, if any pathogen screenings will be done. Project documents do not describe any metrics for ascertaining the success of the program, and the plan is for mosquito releases to go on in perpetuity. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Proponents have officially claimed The Wolbachia mosquito project is being done solely to save Hawaiian birds. However, when you dig deeply into various related documents, it is clear that the bird program in effect a Trojan Horse, hiding a much wider scope of additional aspects to the plan. The public has been misled to believe that these mosquitoes are only being used to address avian malaria in remote forest landscapes. The truth is that, according to project documents, approvals are already in place for ground release "to control mosquitoes of public health concern." The Department of Health is running their own program targeting human health with these mosquitoes. No information about the details of their plan has been disclosed to the public.</p>	Concerns: 2, 4, 12, 19, 28, 31

Name	Entry Date	Comment	Responses
		<p>(CJ, Continued) The environmental nonprofit Hawaii Unites recently discovered that the State of Hawai'i's Department of Land and Natural Resources (DLNR) already has a secret mosquito lab here on the islands. They've been funded by unknown sources to build out the insectary where they intend to mass produce 400,000 lab-infected mosquitoes every month for release throughout Hawai'i. Not only are they planning to produce billions of dangerous Wolbachia-infected mosquitoes, but they have lied to the public about their intent to release genetically modified (GMO) mosquitoes. The DLNR will actually be producing GMO mosquitoes here in their Hawai'i lab using pgSIT (precision guided sterile insect technique) CRISPR technology, once research and development are complete. Documents unearthed by Hawaii Unites, describe gene drives, synthetic biology control tools, and even CRISPR genetic modification of forest birds in the bigger picture plan. Let me repeat that - instead of preserving existing Hawaiian birds, there are plans to replace them with genetically modified versions.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	
	7/24/2023 16:59	Save native birds!!! Kill the mosquitos!! I support wolbachia IIT.	Thank you for your comment
Kiani Wong	7/24/2023 16:59	I wholeheartedly support the use of the Incompatible Insect Technique to suppress the populations of mosquitoes that are more likely to carry diseases that harm our native birds. What is a Hawaiian forest without Hawaiian birds? Thee cost of inaction to our land and culture is too high.	Thank you for your comment
Andrew Gibbons	7/24/2023 17:03	<p>To whom it may concern,</p> <p>I am strongly in support of mosquito control on the island of Kauai, and all of Hawai'i for that matter. Our native birds must be protected and the science is clear that Wolbaccia is a safe and effective management practice for preventing total extinction.</p> <p>Thanks, Andrew</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
<p>Anthony Ching, The Nature Conservancy</p>	<p>7/24/2023 17:06</p>	<p>[TEXT FROM PDF LETTER INCLUDED AS EMAIL ATTACHEMNT] July 24, 2023 Hawai'i State Department of Land and Natural Resources Division of Forestry and Wildlife Attn: Mosquito Control Project 1151 Punchbowl Street, Room 325 Honolulu, HI 96813</p> <p>RE: The Nature Conservancy Comments on the Draft Environmental Assessment for Use of Wolbachia-based Incompatible Insect Technique for the Suppression of Nonnative Southern House Mosquito Populations on Kaua'i.</p> <p>Aloha, Mahalo for the opportunity to comment on this document. We appreciate the high level of detail and thoughtfulness that went into the development of this Draft Environmental Assessment (DEA). The Nature Conservancy (TNC) supports this DEA. The need to protect Kaua'i's forest birds is urgent. The 'akikiki (<i>Oreomystis bairdi</i>) is in a dire situation, potentially down to single digit-number population in the wild. Last breeding season, it was predicted the 'akikiki would have 2-5 years left before reaching this critical point; however, an especially bad mosquito season followed and biologists observed dead forest birds "falling from the skies and littering the trails."</p> <p>Native forest birds, like the 'akikiki, are dying from avian malaria and avian pox spread by the invasive Southern House Mosquito (<i>Culex quinquefasciatus</i>). This is the only mosquito species in Hawai'i which transmits these deadly diseases, carrying them from bird to bird through infected bites. Only female mosquitoes bite, males do not, which is part of what makes the management strategy proposed in the DEA, the Incompatible Insect Technique (IIT), feasible. The other key element is that only mosquitoes with the same strain of Wolbachia can produce viable eggs, meaning that male mosquitoes with an incompatible strain of Wolbachia can be released to breed with wild females to decrease the population without adding any additional biters into the system.</p> <p>The IIT approach to mosquito suppression is a promising method, which does not involve any insecticides, chemicals or toxins, which can be used across a large and remote landscape. This technique was developed to control mosquitoes which spread diseases negatively impacting humans, meaning it has met the highest standards of scrutiny and passed all approvals. Our native forest birds are not just beautiful, charismatic, and vital members of the ecosystem, the manu nahele are family members to the Hawaiian people and they deserve the same level of care and support that we provide to our ailing kupuna.</p> <p>The time for urgent care is now and TNC supports the implementation of this promising tool, hopefully in time to protect the last remaining 'akikiki and offer a chance for future generations to recover. There are eight species of native forest birds on Kaua'i that stand to benefit from this work. Please approve this Draft Environmental Assessment and protect our native birds from this threat.</p>	<p>Thank you for your comment</p>
	<p>7/24/2023 17:08</p>	<p>This is important and should be done to help these unique birds!</p>	<p>Thank you for your comment</p>
<p>Ben Meredyk</p>	<p>7/24/2023 17:12</p>	<p>This strategy is our only, final hope to save akikiki and akeke'e from certain extinction. We have an environmental, ecological, ethical, and moral obligation to implement IIT on Kaua'i as aggressively and as soon as possible. This needs to happen now, and it needs to work. I cannot adequately express the urgency of this situation.</p>	<p>Thank you for your comment</p>
	<p>7/24/2023 17:13</p>	<p>This is our last chance to save akikiki and akeke'e from certain extinction. You need to do it.</p>	<p>Thank you for your comment</p>

Name	Entry Date	Comment	Responses
<p>Matthew (Matt) Toenies</p>	<p>7/24/2023 17:14</p>	<p>Aloha, I am submitting comments on the Draft Environmental Assessment for use of the Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i. The Draft Environmental Assessment demonstrates a high degree of scientific rigor and thoroughness in regard to the proposed action.</p> <p>Honeycreepers are a unique group of forest birds found only in Hawai'i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without immediate action, several species of Honeycreepers will become extinct in the next ten years, and at least one is projected to go extinct potentially this year or next. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. Furthermore, as the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawai'i's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds.</p> <p>Our native Honeycreepers are foundational to the culture, forests, and ecosystems of Hawai'i. We have already lost dozens of forest bird species due to avian diseases transmitted by non-native mosquitoes, among them iconic species like the Kaua'i 'ō'ō, featured in mahiole and 'ahu 'ula, and the spectacular Kaua'i 'akialoa, a pollinator of 'ōhi'a lehua and insect eater. We are grieving the loss of their song, the loss of their beauty and the loss of their presence.</p> <p>As pollinators, seed dispersers, and insect eaters, our native birds are essential for our forests and without action or delayed action, these species have no chance of survival. The incompatible insect technique or mosquito birth control provides us with a glimmer of hope and opportunity to save the last remaining Honeycreepers from extinction. This method has been used successfully worldwide for vector control for human diseases and gives us a powerful tool to address the main cause for the decline of our Honeycreepers: avian malaria transmitted by the Southern House Mosquito. Neither the disease nor the vector is native to the Hawaiian islands and the mosquitoes have invaded the highest elevation of our island, decimating our Honeycreeper populations every day. Our forest birds evolved in a mosquito-free Hawai'i and a single bite of an infected mosquito can be enough to kill an 'i'iwi.</p> <p>The question to consider for our forests and for our ecosystem: How many more native forest bird species can we afford to lose, before the environmental impact will lead to the collapse of our native Hawaiian forests and watersheds?</p> <p>Mahalo for reading my comments, Matt Toenies (he/him) ><(((°></p> <p>"Now we face the question whether a still higher 'standard of living' is worth its cost in things natural, wild and free." -- Aldo Leopold, 1949</p>	<p>Thank you for your comment</p>
<p>Niki van den Hurk</p>	<p>7/24/2023 17:15</p>	<p>I am NOT in favor of the release of these mosquitos on Kauai or anywhere else in Hawaii! We have too many invasive species that were introduced in the name of fixing something else or that accidentally were introduced that failed horribly! Buffo frogs, Mongoose, coqui frogs etc. Please stop! We need to do studies to determine the long-term effects of introducing these mosquitos into our eco system! What are the effects to humans and what are the effects to other species! Please STOP and do research and quit haphazardly doing things that can destroy or harm our animals and beautiful Aina. You have no idea what this could do to all of us!!!!</p>	<p>Concerns: 2, 3, 5, 9, 19</p>
<p>Lisa Kerman</p>	<p>7/24/2023 17:18</p>	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. The possible risks and outcomes from this experiment are unknown, and once these mosquitoes are released into the wild, it will be impossible to undo any damage caused by them. Both for the health of the environment and our public health, we cannot afford to take this chance. Therefore, I am demanding that the State of Hawaii complete a full Environmental Impact Statement to determine whether or not to go forward with this project.</p>	<p>Concerns: 1, 2, 5</p>

Name	Entry Date	Comment	Responses
Faith Chase	7/24/2023 17:22	<p>I am in strong objection to this premature BioPesticide Wolbachia Mosquito experīemt. Please follow basic established laws and conduct an Environmental Impact Statement before commencing on this most outrageous proposal.</p> <p>There are many unexplored forest management practices that wi help the survival of our native birds. This Wolbachia infected mosquito will cause harm to insects, animals and humans.</p> <p>Stop the madness. Sincerely, Faith Chase</p>	Concerns: 1, 2, 7, 19
Robbin Hill: World Council for Health	7/24/2023 17:27	<p>Aloha. Aloha, Aloha, I am Co-Founder of SEOM,a known whistleblower, as well as a speaker on biological warfare and weaponized weather systems and other tactical agents meant to undermine freedoms and sovereignty of native beings.</p> <p>I testified at last hearing, and introduced verified documentation how the "birds not bugs" is a PR stunt. Militaries around the globe have denounced the "bio engineered mosquitos" as a WMD. Even in the papers from 2001 (A NASA-Langely-Darpa) document, as well as subsequent patents obtained in 2015, show the stated warfare reasons for the technology of Biowarfare through a mosquito infection release system.</p> <p>In addition, as I sit on the WCH, we are exceptionally concerned about the subsequent lawyers meetings and the choice of the DLNR and others to ignore the very serious legitimate facts brought before.In doing this, you have put; including but not limited to, the land, the people and the animals at great and foreseeable risk.</p> <p>We know altruistic groups, caring people, passionate people in service ...all too often are unwitting puppets for another nefarious agenda. The benefit of the doubt should always be given. Now you have been made aware. The choice of bioweapons makers to slip this into a necessary bill is purposeful and insulting for all who care for the culture and the aina.</p> <p>You have only now. The world is watching Hawaii. Will you do the right thing and say "no more?"</p> <p>Please wake up. This is a war for the food supply and the islands. The third (in the actual release documents) release point is to infect humans. That is not a typo.</p> <p>Out of sheer care for you, the keiki and this sacred aina, are some of us trying and fighting so hard to help you see.</p> <p>Robbin Leigh Hill</p>	Concerns: 2, 19
Haley	7/24/2023 17:30	I support this project and trust my friend(s) working on this project to do good work and protect the birds!	Thank you for your comment
Shay Maney	7/24/2023 18:02	<p>To whom it concerns,</p> <p>I'm a Hawaii resident, and I support the Incompatible Insect Technique to reduce mosquito populations on Kauai. The safety of our forest birds is paramount.</p>	Thank you for your comment
Emma Brentjens	7/24/2023 18:03	I am writing to express my support for the Incompatible Insect Technique (IIT) to control mosquito populations on Kaua'i and protect rapidly declining forest bird species from avian malaria. One species in particular, the Akeke'e, is on the brink of extinction and desperately needs support to ensure its survival.	Thank you for your comment

Name	Entry Date	Comment	Responses
	7/24/2023 18:04	I'm opposed to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i". I demand that the State of Hawaii and its multi-agency partnership Birds Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This is very concerning. More information, more research and more public discussion and more transparency is needed.	Concerns: 1, 9
Charlet Hotchkiss	7/24/2023 18:08	I think any effort to suppress the mosquito populations on Kaua'i is a good idea. My first trip into the Alakai Wilderness six years ago I saw many native endemic bird species. Today those sighting are rare. It is with a heavy heart that I know these efforts while valiant and still worthwhile will be too late to save several species. I support	Thank you for your comment
BBT	7/24/2023 18:10	I fully support the use of IIT as a tool to protect the remaining forest birds of Hawai'i. Utilizing scientifically developed methods to address the challenges facing these birds represents the only available chance we have for their survival. The extinctions we are witnessing are not natural; they are the result of human-caused disruptions to their ecology, both pre and postcolonial. We bear responsibility for this problem and should, at the very least, attempt to fix it. Regrettably, it seems too late for the 'Akikiki. This species is functionally extinct in the wild, which is truly heartbreaking for anyone who has had a personal connection with these birds. The same can certainly be said for those once who knew the Nukupu'u, 'Akialoa, or 'O'o. To possess a potential solution and yet deny it to these birds out of fear would be selfish. Preserving all of the biodiversity left on this planet is worth the effort, but I cannot imagine a more valuable slice of evolutionary beauty to hold onto than the Hawaiian honeycreepers and their allies. Let us confront our responsibility and make dedicated efforts to protect these magnificent birds and their habitats. Their preservation is crucial, and in doing so, we demonstrate our commitment to the ecological balance of our shared world.	Thank you for your comment
Sara Edwards	7/24/2023 18:11	Leave our islands ALONE! Do NOT introduced these pests!	Thank you for your comment
Shelby Green	7/24/2023 18:15	I support this project.	Thank you for your comment
	7/24/2023 18:26	to risk losing even one more native species of bird because of the hesitation of others - hesitation that science has deemed unwarranted - would be a true tragedy. i fully support the project and all efforts to control avian malaria.	Thank you for your comment
Stephanie Lachel	7/24/2023 18:28	I support the Mosquito Reduction Plan on Kaua'i. Enough native birds have already been lost!! Please implement this plan asap!! Thank you, Yvonne Stephanie Lachel	Thank you for your comment
	7/24/2023 18:29	I support wolbachia IIT because i believe that our precious native forest birds are in need of this critical help to give them the best fighting chance to combat avian malaria. Humans introduced this problem and this disease. I believe it is our duty to do what we can to at least give them the bare minimum chance to survive. wolbachia Is the best option we have and time is running out to save these species.	Thank you for your comment
Efua Peterson	7/24/2023 18:31	I support the project to use incompatible males to suppress disease carrying mosquitos on Kaua'i for the purpose of protecting native bird populations.	Thank you for your comment

Name	Entry Date	Comment	Responses
Brian	7/24/2023 18:34	I support IIT, and believe the science demonstrates it is a valid method for mosquito control in Kauai.	Thank you for your comment
Ben Costello	7/24/2023 18:48	The Hawaiian Honeycreepers are a vitally important part of Hawaiian cultural heritage, and they continue to inspire people despite the extinction of the majority of them. Enough is enough. We have the means to safely attempt mosquito population control at the landscape level and such a brief (and perhaps already too short, sadly) window of opportunity left in which to use it to hopefully save the 'akikiki and other forest birds endemic to Hawai'i and Kaua'i in particular. These amazing birds are perishing through no fault of their own. They are perishing through the fault (even if unintentional), of humans, and we have the responsibility to care for and prevent the deaths of our avian brothers and sisters when we can. In the Incompatible Insect Technique, we have a proven safe tool that represents the last hope for many of these birds, and we owe it to them to use it. And if the moral imperative to care for our endemic Honeycreepers weren't incentive enough, we should remember that these birds hold a special place in the hearts and traditions and history of the people of Hawai'i, and are a source of positive, productive tourism (and money from the tourist industry) from those who are drawn to their astonishing beauty and biological diversity. The draft proposal clearly outlines why the Incompatible Insect Technique is the only real option at this time, as well as why it is safe for the wildlife and the people of Kaua'i. I dream of a day when the forests of Kaua'i will once again ring with the sounds of the remaining Honeycreepers and other endemic birds--a future only possible by implementing the proposed plan for suppressing the population of mosquitoes that can carry and transmit avian malaria.	Thank you for your comment
Rebecca Gehres	7/24/2023 18:50	NO NO NO to Frankenstein mosquitoes in Hawaii. It is diabolical! It is also in the face to the a'ina and God Almighty.	Thank you for your comment
Andree Lecocq	7/24/2023 19:00	I am a resident of Hawaii since 1974. I am against he release of these mosquitoes. I do not think the Hawaiian islands should be blanketed with these mosquitoes for the next 20 years or longer. I believe it is a dangerous experiment, as we know there will be females in every release. My name is Andree Lecocq 6734A Kahuna Rd , Kapaa. Hi 96746	Concerns: 11, 12
Andrew Roth	7/24/2023 19:02	To whom it may concern: As a person raised on Kauai, who has witnessed tremendous changes in the environment since the 80s as decades pass, I urge you to support the use of Wolbachia to curtail the spread of avian malaria. We need to work to preserve biodiversity. The many past extinctions of Hawaii forest birds are a shame on us. Please do what you can to shift the trajectory of loss that we face. Ruby R., Kilauea, Kauai	Thank you for your comment
Kupono Matsuoka	7/24/2023 19:06	Aloha, My name is Kupono Matsuoka, I am born and raised from Papakolea Homestead on the island of Oahu. I have spent the last 15 years of my professional career working directly with Endangered Species. As the Team Field Supervisor for the Natural Resource Crew I have seen first hand the depletion of our native species. I am in full support of the Wolbachia IIT in Kauai. Mahalo, Kupono Matsuoka	Thank you for your comment

Name	Entry Date	Comment	Responses
Jeffrey Schuster	7/24/2023 19:07	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p> <p>Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 2, 4, 7, 11, 23, 26
	7/24/2023 19:09	I support the IIT TECHNIQUE. Mahalo	Thank you for your comment
Chloe Roth	7/24/2023 19:13	<p>To whom it may concern:</p> <p>Raised on Kauai, I have witnessed tremendous and largely negative changes in the environment since the 80s. I urge you to support the use of Wolbachia to curtail the spread of avian malaria. We need to work to preserve biodiversity. The many past extinctions of Hawaii forest birds is on our hands. Please do what you can to shift the trajectory of loss that we face.</p> <p>Thank you, Chloe R Kilauea, Kauai</p>	Thank you for your comment
Liz Wright	7/24/2023 19:31	I appose this experiment with mosquitoes. It is not necessary and the dangers are not known	Concerns: 9, 11
Jenna Lidua	7/24/2023 19:32	I support this project to protect our native birds!	Thank you for your comment
Peter Thoene	7/24/2023 19:40	I support mosquito control.	Thank you for your comment
Michael Cabral	7/24/2023 19:46	I am against any release of mosquitoes, male or female. Haven't we learned common sense from previous releases from human interaction? Release mongoose to rid a problem, they become a bigger nuisance, harder to get rid of. I have zero confidence in the powers that be to solve this problem, but confident they will make conditions worse. Let nature take its natural course.	Concern: 3
Sylvia Partridge	7/24/2023 19:51	<p>Aloha,</p> <p>I strongly support the mosquito release planned to save our native forest birds. Have read about the process involved and am very happy that there is an EIS. It certainly seems that there is a good chance of increasing our native bird population by reducing or eliminating the disease carrying mosquito population. Thanks for giving our native forest birds a chance to live and to thrive.</p> <p>Sylvia Partridge, 3800 Kamehameha Rd., # 22 Princeville HI 96722. sylpartridge@yahoo.com</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Katherine Valier	7/24/2023 20:09	When I was volunteering in the Alakai many years ago, an akikiki perched on a branch a foot above my head and watched me. It was always a delight to see family groups else where in the forest. I have since watched the akikiki and iiwi disappearing from the forest. I think the mosquito suppression plan is well thought out and our only real hope for saving these gems of evolution. I fully support this plan.	Thank you for your comment
S. B.	7/24/2023 20:13	<p>"SAVE THE HUMANS", is how this mosquito release experiment is being sold in other parts of the world. In Hawaii the humans are fine so it is sold as, "SAVE THE BIRDS." I think you need to more carefully consider how error prone and/or misleading the corporate "science" we have relied on is proving to be. (I.e. DDT, Dioxin, RoundUp, to name just a few examples.)</p> <p>NEW DISEASES FOR HAWAII? Oddly enough, outbreaks of malaria were relatively unknown in Texas and Florida for the past 20 years UNTIL a similar mosquito release program happened there. (FACT CHECK: Any implied connection between the Florida malaria cases, and the biotech firm Oxetic funded by Bill Gates' foundation, has been debunked relying heavily on unsworn statements obtained from representatives of Oxetic and the Bill and Melinda Gates Foundation. https://apnews.com/article/fact-check-bill-gates-oxitec-mosquitoes-malaria-cases-106569617546)</p> <p>So you don't want to complete a proper Environmental Impact Statement? Ok then, sure lets try ONE island, IF the people of that island agree to it and just see how it goes.</p> <p>BUT NO, YOU (our trusted stewards of the Aina) want to to expose ALL islands in the same manner without opportunity for a long term environmental assessment? That almost sounds like the plot for a new Bond movie! I jest.</p> <p>However...</p> <p>Mosquitoes are known to carry a host of pestilence lethal to humans. And of course there are other "uses" for mosquitoes a Bond villain might find intriguing. But mosquitoes being known carriers of pestilence alone should be enough for Hawaii NOT to gamble on experimental and risk prone selective breeding science. Right?</p> <p>If you insist on proceeding as things stand, your actions may be determined to be unlawful and/or immoral thus proper accountability to the people dictates that two more things must be placed in the public record.</p> <ol style="list-style-type: none"> 1. A complete list of the names of all people and organizations who profit financially from this experiment now and in the future, including from the sale of solutions to problems that may arise as a result of this experiment. We want to know all who are being paid at all times. 2. A complete list of the names of individuals and organizations here in Hawaii and elsewhere whom the people of Hawaii can hold socially, civilly and criminally liable for subjecting the people of Hawaii unknowingly and/or unwillingly to an experiment with potentially lethal consequences. <p>STOP NOW.</p> <p>If you are sincerely working in Hawaii's best interest ALONE, then work in good faith to gain the consent of the people. Do the right thing which is, at a minimum, the Environmental Assessment BEFORE you subject Hawaii to that from which you admit there being no failsafe and no return.</p> <p>Are you listening? Malama aina. Malama ohana. Malama pono. S.B.</p>	Concerns: 1, 2, 9, 11, 26, 28
Ray	7/24/2023 20:14	<p>Heven't we damaged nature enough already? Your rational for more mosquitoes is disgusting. Lets bring in more mongoose to control the rats! Stop with mosquito experiments in Hawaii</p> <p>Ray Songtree, Hanalei, 808-483-4520</p>	Concerns: 3, 9

Name	Entry Date	Comment	Responses
Glauco Puig-Santana	7/24/2023 20:20	I support the IIT efforts and see it as the last option we have to save these birds. Good luck	Thank you for your comment
Keoni Smith	7/24/2023 20:21	This project is not wanted by our community and is playing god with the delicate ecosystem of the high lands. The report is very thin on the downstream effects of such a release. Please stop this plan right now.	Thank you for your comment
Johann P Lall	7/24/2023 20:27	m testifying in strong support of the effort to use wolbachia gut bacteria to control the mosquito population and save endangered native birds. We spent 2 years talking about "following the science" regarding COVID-19 and here is an opportunity to follow the science to protect biodiversity on our planet. The impact of not moving forward is extinction for several species, and extinction is irreversible. Mahalo! Johann Peter Lall, Kama'ole, Kihei, Hawai'i	Thank you for your comment
Russell Kallstrom	7/24/2023 20:29	As a private citizen, I support birds, not mosquitos. I'm not a resident of Kaua'i, but here on Molokai, I don't think there's been a confirmed sighting of 'i'iwi in the last 10 years. And that's supposed to be a common native bird! I hate to see Kaua'i get to where our island is because their protection was delayed- a few million dollars and many dead birds later to arrive at "coulda, woulda, shoulda." We know enough to take the next steps, and that is for decisive action for our native birds. If we lose them, how long will it be before we lose the forest that supplies our drinking water?	Thank you for your comment
Kimberly Wood	7/24/2023 20:47	Please help save our almost extinct birds!!	Thank you for your comment
Susan Ching	7/24/2023 21:01	In full support of mosquito control for protection from of native bird species from diseases spread by these invasive insects. Encourage those making decisions to listen to those who are directly involved in the work and the substantial evidence for safe and effective methods to produce sterile mosquitoes to reduce their populations around native bird populations. Mahalo for the chance to comment in support of native bird species!	Thank you for your comment
Harshana	7/24/2023 21:02	I support suppression of mosquitos	Thank you for your comment
David Spier	7/24/2023 21:06	I am in full support of the proposal to control mosquitos on Kauai. During my 23 years on Kauai I have witnessed the decline in native bird populations. It is alarming and I believe we need to take measures to try to save more native bird species from extinction.	Thank you for your comment
Adriane Truluck	7/24/2023 21:26	Please allow mosquito control to go forward to save the critically endangered birds. This method has been tested and proven effective; it's our last best chance to avoid extinction of our precious irreplaceable manu. My ohana completely supports this initiative.	Thank you for your comment
Zak Timan	7/24/2023 21:40	I'm a kauai resident and trail hiking guide. I just heard about this campaign. Please please please do everything in your power to save the native forest birds! They are so important to me and to this land. It's madness not to be doing all we can. Thank you so much. Zak Timan -- ZAK TIMAN 520.240.9377 ZAKTIMAN.COM	Thank you for your comment
Kiana Dulan	7/24/2023 21:42	Mosquitos suck. Native birds fly and should continue to fly in perpetuity. Implement the IIT to reduce the mosquito population.	Thank you for your comment

Name	Entry Date	Comment	Responses
<p>Rebecca Chrystal</p>	<p>7/24/2023 21:43</p>	<p>Kia ora, I am writing to you from Aotearoa New Zealand in support of landscape level mosquito control in order to protect rare and endangered species of birds in Hawaii.</p> <p>Something that our respective island environments have in common is their isolated position from other land masses that has allowed for the evolution of unique species to evolve and flourish. The honeycreeper family of Hawaii is one of these iconic kinds of birds, like the kiwi is ours.</p> <p>What is concerning is that after colonisation by humans, these birds and other species have been allowed to become endangered and in some cases go extinct. Extinction is still not off the cards for many of these species, and one of the most pressing threats to species such as honey creepers is avian malaria carried by the invasive southern house mosquito.</p> <p>I work at Zealandia Te Māra a Tāne, a predator proofed fence ecosanctuary that was the first of its kind in the world. The task when it was originally conceived was seemingly impossible, costly and unpopular to some locals, but after completing the fence and working to support our endangered native species inside the birdlife boomed, and this wasn't just in our area, but across the entire of Wellington city. It has contributed to improved well being, connection with nature, and even a rise in house prices! I suggest that you are in a not so unsimilar situation, where the survival of species is on the line and drastic and perhaps unpopular methods are being discussed around the table.</p> <p>I would have you consider electing not to take action in using the Incompatible Insect Technique the irreversible loss of native species and biodiversity will continue, effecting the wider environment, the cultural knowledge and traditions of kanaka maoli in relation to these species, and eco-tourism (a growing sector). Ultimately what you will be deciding is the legacy passed down to the next generations of Hawaii. Will you allow your grandchildren the opportunity to see an 'i'iwi in the wild? Or in a glass museum case? And which outcome would you want to tell them you had a part in?</p> <p>Ngā mihi, Rebecca Chrystal</p>	<p>Thank you for your comment</p>
<p>Alana Ross</p>	<p>7/24/2023 21:53</p>	<p>To Whom It May Concern:</p> <p>I agree with we need more studies and am gravely concerned. I'm strongly OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "WolbachiaIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua'i project area and the 64,666-acre Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.</p>	<p>Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34</p>

Name	Entry Date	Comment	Responses
		<p>(Alana Ross, <i>Continued</i>) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p> <p>Sincerely, Alana Ross, Hana, Maui</p>	
Kimberly Hughes	7/24/2023 21:54	<p>I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.</p> <p>Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua'i project area and the 64,666-acre Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.</p> <p>There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.</p> <p>There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.</p> <p>I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.</p>	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
Diana Miller	7/24/2023 21:58	<p>I fully support the efforts to control mosquitos in order to save our birds. The birds will disappear if action is not taken. Many birds are already gone. How can we NOT do this????</p> <p>thank you, Diana B Miller, Lt Col, USAF retired PO Box 1295, Kurtistown, Hi 96760. 808-345-0696</p>	Thank you for your comment

Name	Entry Date	Comment	Responses
Valerie Lasciak	7/24/2023 22:01	i opposed releasing infected mosquitoes without careful study to assure the safety of the release. Theory and tested realty are very different. i object to an untested mosquito release!! i demand responsibility to assure civilian safety!!	Concern: 9
Kimberly Shoback	7/24/2023 22:06	I fully support the mosquito suppression program. It is the only chance the native forest birds have left. Let's continue the fight to keep the fragments of Kauai's unique ecosystem intact, one species at a time.	Thank you for your comment
Bret Nainoa Mossman	7/24/2023 22:15	I am writing in strong support of wolbachia IIT to control mosquitoes on Kaua'i. This EA is thorough, and outlines why this important management strategy is the safest, most effective, and most likely to succeed in protecting native birds.	Thank you for your comment
Marcus Alejandro Collado	7/24/2023 22:19	<p>I fully support the use of IIT to eradicate non-native mosquitoes on Kauai. Our native birds are in extreme danger, and it is our responsibility as a people to help them. The IIT is a safe and well researched method of reducing mosquito populations and poses no threat to wildlife, the ecosystem, or to humans. In fact, eradicating mosquitoes on Kauai will help to restore balance to the local ecosystem because mosquitoes are not from here. The plants and animals here evolved a complex interconnected system without mosquitoes and the diseases that are carried by them. After adapting and evolving here for millions of years without the threat of mosquito borne diseases, our birds were wholly unprepared for a sudden introduction of mosquitoes brought here by recent European colonizers. Before colonization, the forests were alive with the songs of millions of honeycreepers. Now the forests are eerily quiet. Avian malaria can kill a Hawaiian honeycreeper after just one bite from an infected mosquito. Many plants who relied on the birds for pollination and seed dispersal now go unvisited, and create no more young. In this way our forests will diminish and along with them the unique spirit of the land. If you look around you might notice that the only birds you see are the ones imported from the world's busiest cities: pigeons, mynas, house sparrows, white-eyes. These birds evolved with mosquitoes and avian malaria and can survive the infection.</p> <p>I have seen the akikiki and the akeke'e. I have followed them and found their nests. I have watched them hunt for insects and raise their young. I have held them in my hands and smelled their scent. Have you ever smelled the scent of a honeycreeper? I've heard their songs echo through the mists of the Alaka'i. Now when I walk the miles back in to Halehaha and Halepa'akai, I can't find them. The places where I knew a family of akikiki lived are empty, and the other birds are becoming rare too. There is a pattern here and we need to do something before we lose everything.</p> <p>Please take action. Please listen to the ecologists and ornithologists and passionate scientists who want to save the birds. By helping the birds we help our selves. If we stop to listen to the conspiracy theorists, the people proud of their ignorance and fear, the birds will wink out of existence and it will be too late.</p> <p>Look around, do you want to live in a Hawaii filled with mosquitoes and pigeons and invasive weeds? Or a Hawaii filled with Hawaiian birds and Hawaiian forest plants? What kind of world do you want your children to grow up in? What will you say when your grandchildren ask what people did when the birds started going extinct?</p>	Thank you for your comment
	7/24/2023 22:30	Save the native endemic birds with the Kauai Mosquito Suppression program.	Thank you for your comment
Steve and Linda O'Neill	7/24/2023 22:50	Dept. of Land and Natural Resources I am writing with my very strong opposition to any release of lab generated , experimental mosquitoes on Kauai or any other island. This is not good science. It has not been studied for an environmental impact and should not be allowed. Please stop this insanity ! Regards, Steve and Linda O'Neill	Concerns: 1, 9, 11
Takamori, Kellie	7/24/2023 23:07	Not sure if I'm too late on this but please save our Native Hawaiian birds on brink of extinction from the mosquitoes on Kaua'i.	Thank you for your comment

Name	Entry Date	Comment	Responses
Jan Bernard	7/24/2023 23:14	<p>To whom it may concern;</p> <p>I am thoroughly convinced, after seeing Bryn's Research, that IIT, incompatible insect technique, is a viable program for the preservation of Kauai's forest bird population.</p> <p>With the decimation of so many of our native forest species, and the perilous proximity of 17 species of honey creeper alone, to extinction, and their present rapid acceleration to their demise, this appears to be the single viable method to arrest their complete decimation. This is a timely idea with a very short time frame for implementation. Now we must act or suffer.</p> <p>Incompatible insect releases have been utilized, with success across the globe. This IIT protocol has little to no downside, as mosquitos, being newly introduced to Hawaii have no longstanding biological niche that needs protecting, and the honeycreeper has little to no immunity to these deadly diseases such as Avian Malaria an Avian Pox, carried by the female mosquitos.</p> <p>Please do not delay in allowing this mosquito release to move forward. Our forest birds are at stake.</p> <p>Sincerely, Janet Bernard, 5014 Emmalani Drive, Princeville, HI 96722</p>	Thank you for your comment
	7/24/2023 23:38	<p>Allowing the use of the IIT approach for invasive mosquito population control is likely one of the last opportunities available to save a number of vital native honeycreeper species from extinction, including the 'akikiki and the 'akeke'e. This approach has been used successfully a number of times to control outbreaks of mosquito born diseases in humans, and can be an essential tool in conservation biology. It's successful use in Hawai'i and in Kaua'i gives the native bird populations a chance to recover from avian malaria as well as opening up opportunities to control potential future outbreaks of deadly human diseases in Hawaii as well.</p>	Thank you for your comment
Chris Hirose	7/24/2023 23:53	<p>Please read reconsider the Wolbachia mosquito release.</p> <p>1. Mosquitoes and Gates Foundation Florida and Texas had the first cases of mosquito borne malaria in the US in 20 years. This was after lab altered mosquito releases in both Florida and Texas. Gates foundation funded GMO mosquitoes for Florida and Texas. Gates foundation has a world wolbachia mosquito program. wolbachia mosquitoes were released in Florida.</p> <p>2: Polio and Gates Foundation The US was declared polio free. Vaccine derived polio appeared in the US. The vaccine derived polio is from the live virus oral polio vaccine used in 3rd world countries. The live virus oral vaccine has been discontinued in the US and replaced with the injected vaccine. The injected vaccine does not spread a live virus. The Gates foundation funded the oral live virus vaccination programs being cheaper than the injected vaccine in India and Africa. The end result is many children paralyzed in India and Africa and a resurgence of vaccine derived polio.</p> <p>Lakh is an Indian word for 100,000, 4.9 lakh = 490,000. https://www.thehindu.com/news/cities/Delhi/vaccine-induced-paralysis-calls-for-action-says-study/article24740588.ece https://journal-neo.org/2020/09/28/gates-vaccine-spreads-polio-across-africa/ https://www.npr.org/sections/goatsandsoda/2017/06/28/534403083/mutant-strains-of-polio-vaccine-now-cause-more-paralysis-than-wild-polio</p> <p>A picture of an oral polio vaccine used on the Gates Foundation website. https://www.gatesfoundation.org/our-work/programs/global-development/polio</p> <p>3. Covid vaccines and the Gates Foundation The Gates Foundation is the main proponent and investor in the Covid vaccines. This is like how Gates monopolized computer software, Gates is monopolized global health.</p>	Concerns: 4, 26, 28

Name	Entry Date	Comment	Responses
		<p>(Chris Hirose, <i>Continued</i>) https://www.corbetteport.com/gates/</p> <p>More people died from Covid in 2021 than in 2020 in the US. The vaccines started in late December of 2020 and the 1st recorded case in the US was late January of 2020.</p> <p>https://www.statesman.com/story/news/politics/politifact/2022/01/16/fact-check-did-more-people-die-covid-19-2021-than-2020/8858993002/</p> <p>In 17 other countries there was a marked increase of covid after the vaccine. In initially low COVID death countries, the change was dramatic. https://childrenshealthdefense.org/defender/covid-vaccine-deaths-cause-unknown/. This because after a while the vaccine produced antibodies actually help the virus. This is called Antibody Dependent Enhancement. This was a known risk and the reason why a vaccine for other corona viruses were not developed. https://pubmed.ncbi.nlm.nih.gov/33113270/</p> <p>In the FDA Emergency Use Authorization: "...vaccine-associated enhanced respiratory disease as an important potential risk." https://www.fda.gov/media/144416/download</p> <p>If you look at figure 2 of this study, the more doses taken, the more incidence of COVID. https://academic.oup.com/ofid/article-pdf/10/6/ofad209/50502965/ofad209.pdf</p> <p>The mRNA and viral vector technologies are gene therapies untested in vaccines. The viral vector technology was only used once before in the Ebola vaccine. Since Ebola is so deadly the vaccine wasn't trial tested.</p> <p>The gene therapy in vaccines added to the danger. Pfizer has the least near term deaths per vaccination, then Moderna, then J&J. We have the most information on the Pfizer vaccine. The Pfizer vaccine trials: In the Pfizer 16 and older trial more people died and got sick with the vaccine overall. But less people got sick and died with COVID. Reducing overall sickness and death overall should be end goal, not just reducing COVID sickness and death. In the 12-15 year old trial, 12 year old girl Maddie de Garay loss the use of her legs, is wheel chair bound and has to eat through a feeding tube. She was only one of a 1,005 vaccinated. She was hospitalized within 24 hours of receiving the vaccine. Pfizer's report said as her symptoms were just abdominal pain.</p> <p>https://rumble.com/vqx3kb-the-pfizer-inoculations-do-more-harm-than-good.html https://www.canadiancovidcarealliance.org/wp-content/uploads/2021/12/The-COVID-19-Inoculations-More-Harm-Than-Good-REV-Dec-16-2021.pdf</p> <p>The FDA approved the dangerous vaccines because they are corrupted by big pharma. The FDA gets 75% of its drug related funding from big pharma. The former FDA top commissioner Stephan Hahn is now working for Moderna's venture capital investor. The previous FDA Scott Gottlieb commissioner is now on Pfizer's board. Former FDA deputy director Curtis Wright IV helped Purdue Pharma market the opioids as less addictive. Wright then went to work for Purdue Pharma about a year after he left the FDA.</p> <p>https://www.forbes.com/sites/johnlamattina/2018/06/28/the-biopharmaceutical-industry-provides-75-of-the-fdas-drug-review-budget-is-this-a-problem/?sh=1f6faf1a49ec</p> <p>Rasmussen Poll: More Than 1-in-4 Think Someone They Know Died From COVID-19 Vaccines.</p> <p>https://www.rasmussenreports.com/public_content/politics/public_surveys/crosstabs_2_vaccine_deaths_december_28_30_2022</p> <p>The US COVID vaccine rollout was in December 2020. Edward Dowd, "From February 2021 to March 2022, millennials (born 1981-96) experienced the equivalent of a Vietnam war, with more than 60,000 excess deaths. The Vietnam war took 12 years to kill the same number of healthy young people we've just seen die in 12 months." "The vaccination rate, particularly among working people, rose extremely fast in a short amount of time. I would soon confirm that being employed in 2021 was actually detrimental to your health."</p> <p>Dowd, Ed. "Cause Unknown": The Epidemic of Sudden Deaths in 2021 & 2022</p>	

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		<p>(Chris Hirose, Continued) https://www.amazon.com/Cause-Epidemic-Sudden-Childrens-Defense/dp/1510776397/ref=sr_1_1?crd=3GSKCVMWGOVB&keywords=Dowd%2C+Ed.+%22Cause+Unknown%22%3A+The+Epidemic+of+Sudden+Deaths+in+2021+%26+2022&qid=1674533131&s=books&prefix=dowd%2C+ed.+cause+unknown+the+epidemic+of+sudden+deaths+in+2021+%26+2022+%2Cstripbooks%2C778&sr=1-1</p> <p>4. The Gates Foundation squashed ivermectin as an early Covid treatment world wide. Early treatment of any disease is a pillar of healthcare. It doesn't make sense to let Covid get worse until your lips turn blue from lack of oxygen and then go to the hospital. Repurposing existing drugs to treat Covid could have saved millions of lives. There are many studies showing ivermectin effective in treating Covid. https://c19ivm.org/</p> <p>If an early treatment to Covid was officially recognized, the vaccines couldn't get an Emergency Use Authorizations because their be a viable alternative. The big pharma would not get billions in profits. That's why corrupted media and public health officials disparaged ivermectin costing millions of lives. Also the Gates Foundation wouldn't get over 20 to 1 return on their vaccine related investments.</p> <p>How the Gates Foundation squashed ivermectin worldwide at the World Health Organization through Andrew Hill's study. https://www.bitcute.com/video/aDVPtTTgE2O2/</p>	
Koa Grabar	7/24/2023 23:59	<p>Save our endemic species! The use of IIT is probably one of the best and last reasonable options we have to save our forest birds without spending a huge amount of money. Please support the use of this!</p> <p>Koa Grabar</p>	Thank you for your comment
Wendy Winkler	7/25/2023 6:30	Do not allow this ! We have a beautiful island that should not be used to test poison	Thank you for your comment
Carly Ko	7/25/2023 6:58	<p>*I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.* For complete sample testimony click here I have seen male mosquitoes released in Italy near perugia and they currently have an over-population of these mosquitoes. Some basic questions would be: how do mosquitoes serve the bat species, who are the main pollinators of fruit trees? Or rather if there were more bats, could that be a better idea for a natural life cycle to happen? A larger perspective needs to be had, based on the failures with other introduced species "eg. mongoose" and rather than a mono vision "kill this to save that" looking at the effects on the entire eco system and if a more "nature made" solution is possible.</p>	Concerns: 1, 3, 7, 12, 18, 19
Roslyn Cummings	7/25/2023 9:50	<p>In response to the kahea of The Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) propose using the Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. This project is intended to suppress mosquitoes known to transmit diseases to native forest birds in critical higher-elevation native forest habitat.</p> <p>I command this agency along with all affiliated agencies including corporate entities and individuals involved to provide water data, maps dating back to 1810, all metes and bounds, trails, roadways, springs, waterways, and projects that have taken place in the past 150 years within and surrounding the subject property</p> <p>Their interest in said proposal: In order for any kanaka person, members of the public to partake in any input one must be clear and have the ability to ascertain what is happening. Also, please provide all data, field studies of the previous or ongoing usage of information concerning IIT. Names of those who are a driving force behind this project and those who in a long term interest will be held responsible for the upkeep, funding, and maintenance of such project</p>	Concerns: 9, 11, 26

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		<p>(Roslyn Cummings, <i>Continued</i>) Provide the public access to all records: I humbly command that the Department of Land and Natural Resources under the Direction of the Board of Land and Natural Resources provide an accurate chain of title for the purpose of protecting private property as such maps to prove the true metes and bounds and title held by individuals who claimed stewardship within and surrounding the project areas. There is no trust between the people and the government due to years of mismanagement with our lands as stated November 23 1993 United States Public Law 103-150.</p> <p>The "Apology Resolution". Passed by Congress and signed by President William J. Clinton, November 23, 1993. A joint resolution to acknowledge the 100th anniversary of the January 17, 1893 overthrow of the Kingdom of Hawaii, and to offer an apology to Native Hawaiians on behalf of the United States for the overthrow of the Kingdom of Hawaii. Again, verbiage.</p> <p>If you understand the difference between Kanaka Maoli vs Native Hawaiian you'll understand why this bill works in the way it does. Whereas, the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum. Whereas, the health and well-being of the Native Hawaiian people is intrinsically tied to their deep feelings and attachment to the land; Whereas, the long-range economic and social changes in Hawaii over the nineteenth and early twentieth centuries have been devastating to the population and to the health and well-being of the Hawaiian people; Whereas, the Native Hawaiian people are determined to preserve, develop and transmit to future generations their ancestral territory, and their cultural identity in accordance with their own spiritual and traditional beliefs, customs, practices, language, and social institutions; Whereas, on January 14, 1893... the United States Minister assigned to the sovereign and independent Kingdom of Hawaii conspired with a small group of non-Hawaiian residents of the Kingdom of Hawaii, including citizens of the United States, to overthrow the indigenous and lawful Government of Hawaii; Kingdom Law 1846, Kanaka Maoli Haawina 5, Pauku 1&3</p> <p>Compiled Laws 1846 Hawaiian quasi-public institution is a direct violation of the laws of occupation, whereby the United States was and continues to be obligated to administer the laws of the occupied State—the Hawaiian Kingdom. This requirement comes under Article 43 of the 1907 Hague Convention, IV, and Article 64 of the 1949 Geneva Convention, IV.</p> <p>To further this statement of no trust with government: I am not anti-government, anti-military, or anti-American. I never imagined there were any real “domestic enemies.” The following is a partial example of the activities of those “domestic enemies.” In 1997, the Pittsburgh Post Gazette exposed the “Tuskegee Experiment.” It was conducted for forty years, from 1932 to 1972. According to the Associated Press, “The government withheld treatment from 399 black men with syphilis so they could study how it spreads and kills.” That’s not an “experiment;” that’s genocide, it is wrong and violates everything the country stands for. 6,000. Americans were sickened, deformed or killed as a result of The UNITED STATES Government’s “Tuskegee experiment” to study how syphilis kills. President Clinton didn’t bother to acknowledge their suffering.</p> <p>In 1977 during the Senatorial Select Committee on Intelligence hearings (reported in “Project MK-Ultra; the CIA’s Program of Research in Behavior Modification”), the CIA revealed that over forty universities and institutions were involved in extensive testing and experimentation using covert drugs on unwitting citizens at all social levels. In 1977, the University of Maryland newspaper reported that during the 1950s and 1960s, forty-four colleges, fifteen research foundations, twelve hospitals, and three prisons knowingly participated in MK Ultra experiments, but people that were experimented upon were never informed or asked to consent to be “guinea pigs.” Project MK Ultra was one of the biggest military experiments (there were one hundred forty-nine sub-projects) and lasted for years. It included human drug and biological testing by the Department of Defense (DOD) under the direction of the CIA over entire American communities. The Bureau of Narcotics and even the IRS participated in MK Ultra. When you see these government documents, they are more frightening than the rumors because our government actually admits to participating in these experiments.</p> <p>In 1950, the UNITED STATES government released bacteria – “serratia marcesens” – that cause pneumonia and urinary tract infections into the San Francisco Bay. The bacteria were “aerosolized” by the surf and blown inland to study how effective an offensive biological weapon would be against the people of San Francisco. According to the report, it blew fifty miles inland. People died as a result of that experiment. Incidentally, the amount of “serratia marcesens” still remaining in San Francisco is three times the national average. It follows that we can legitimately ask how much of the syphilis that we have in the South today is a direct</p>	

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		<p>(Roslyn Cummings, <i>Continued</i>) result of conducting the Tuskegee experiment for forty years when they could have stopped it? How much of today's other diseases are a result of government "experiments"? Is it possible, as some have published, that AIDS is a product of one of these government experiments?</p> <p>At the U.S. Army Biological Weapons Research facility at Fort Dietrich, Maryland, "weaponized" mosquitoes were developed. They actually grew viruses inside mosquitoes, placed the mosquitoes in balloons, released the balloons from aircraft over American communities and infected people. They had to infect people to tell how far the disease went and how far it would spread. How many of today's diseases are direct results of those experiments? Tuskegee was not a one-time anecdote; it's just the tip of an iceberg that indicates they're still doing experiments on the American people.</p> <p>Another experiment was done in 1966 at Kessler Air Force Base. In 1966, 12,000 recruits at Kessler received the "micro plasma vaccine." Obviously another experiment. "MK Ultra" considered various means of controlling human behavior; it was literally a mind control project. "MK Action" was funded with CIA money through the Geschichter Foundation at Georgetown University. In the 1977 congressional hearing, Dr. Geschichter testified that during the Vietnamese War, the CIA didn't know if various Vietnamese nationals were double agents. Therefore, the CIA included a material in the anti-cholera vaccine given to pro-American Vietnamese, which made them glow when they were exposed to an ultraviolet light and helped identify those who rejoined the Viet Cong. This may be a clever wartime strategy, but it illustrates that as early as the 1960s, our government used vaccinations for purposes other than the prevention of disease</p> <p>The 1977 Senate Hearing report (Biological Testing Involving Human Subjects by the Department of Defense) actually says that unwitting American people were involved in open air testing. For example, it says, "The Army was using live organisms which we know can infect human beings." The Food and Drug Administration allowed it; entire cities were involved in the testing of these biological agents.</p> <p>The government even placed biological warfare agents in the New York City subway to see how many people would be infected. They did the same thing in Pennsylvania's Kittatinny and Tuscarora turnpike tunnels. You would drive through and receive aerosolized bacteriological agents. Pennsylvania's Kittatinny and Tuscarora turnpike tunnels. You would drive through and receive aerosolized bacteriological agents.</p> <p>"MK Naomi" – a biological project from the 1950s through 1969 which exposed six entire towns (including Ft. McClellan, Alabama; San Francisco, California; Ft. Wayne, Indiana; Minneapolis, Minnesota; and St. Louis, Missouri) to biological warfare agents dropped out of aircraft to see how many people would become ill. They say MK Naomi ended in 1969. Why should I believe them?</p> <p>On page 160 of the 1977 "Human Drug Testing by the CIA" Senate report (S. 1893), they discussed "EA3167" – a compound they could rub up against you and it would absorb into your skin and kill you. They tested it in Pennsylvania and Kentucky prisons. It was applied to the skin through some type of adhesive tape. They also did this on military and civilian people without telling them what they were exposed to or getting their informed consent. As if anyone would volunteer!</p> <p>The primary excuse for nearly going to war again with Iraq in February, 1998, was the suspicion that Iraq had been conducting biological experiments on its own prisoners. If those experiments are evil for Iraq, how then can they be legal, moral or ethical, in the United States of America? Have you clones of hydrocarbon base gone completely insane? In 1997 Congressional hearings, the Army admitted conducting these experiments but argued, "We just didn't tell you about it because nobody was hurt and there was no problem." No problem? There is a serious problem with this outrageous conduct. Title 50, Chapter 32, Section 1520, permits the government to experiment on us with biological and chemical agents. Thanks to a treacherous Treasonous Congress, it is now legal for the DOD or their contractors to experiment with biological and chemical agents on the American people. The only proviso Congress imposes on them is that at least two unspecified local officials be notified within the subject community, and they could be the garbage collector or the water meter reader. Once that major communication event occurs, the test can begin within 30 days. But we are not told; our children aren't told. No problem?</p>	

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		<p>(Roslyn Cummings, Continued) Through government oversight and regulations it is done now with our food with Pesticides, herbicides, RBST, GMO's, Fluorides, Estrogen sterilization agent coatings on the inside of nearly every can used to can common everyday foods, then we wonder why men need viagra just to get an erection and why we have a much higher percentage of unmanly men, and manly women. Harm is done with Pharmaceutical Drugs, Vaccines, and Heavy Metals. All these things change our very Gnomes. Our DNA. Today we are poisoned by spraying of our air, food, water, doctor's dealing legal death drugs, all at the blessing of government. Desplicable! Shame on you.</p> <p>This is but a few of the many reasons, (all would fill many volumes) that I, a God fearing Living Soul must sever my relationship with the UNITED STATES (Corporation) government, to ease the heavy burden on my soul these foul deeds have laden it with. The water has gotten far too hot for me and is evaporating under the boil.</p> <p>“And after these things I saw another angel come down from heaven, having great power; and the earth was lightened with his glory. And he cried mightily with a strong voice, saying, ‘Babylon the great is fallen, is fallen, and is become the habitation of devils, and the hold of every foul spirit, and a cage of every unclean and hateful bird. For all nations have drunk of the wine of the wrath of her fornication, and the kings of the earth have committed fornication with her, and the merchants of the earth are waxed rich through the abundance of her delicacies.’ And I heard another voice from heaven, saying, ‘Come out of her, my people, that ye be not partakers of her sins, and that ye receive not her plagues. For her sins have reached unto heaven, and God hath remembered her iniquities.’” – Revelation 18: 1-5 . As one of God's people, I must now also leave Babylon the Great and not partake of her sins any longer lest I receive her plagues, for her sins have reached unto Heaven, and God will remember her iniquities. May God have mercy on the United States!</p> <p>Unlawful Conversion Unlawful conversion of our identities and our assets has been the entire aim of the Territorial United States/Municipal United States Tag Team. We've had the British Enemy pretending to be our friend on one side, and the out-of-control Vatican Thugs on the other, conspiring together against us and against virtually everyone else's lawful government, too, because the same evils have been visited on a many other countries including most of Europe, Australia, New Zealand, Japan, India, Canada, Mexico.... and the list goes on.</p> <p>Unlawful conversion of our Trade Names redefining them as Foreign Situs Trusts. Unlawful conversion of our American state national standing to that of mere corporate US "citizens". Unlawful conversion of our land patents to titles and leases held under color of law. Unlawful conversion of our private property to public assets. Unlawful conversion of our government on the land to a government on the sea. Unlawful conversion of the copyrights and trademarks we are owed. Unlawful conversion of our private bank accounts to public "personal" accounts. Unlawful conversion of our States to "State of States" and "STATE OF STATES". Unlawful conversion of our public courts to private corporate tribunals. Unlawful conversion of private civilian assets to public trust assets. Unlawful conversion of American Common Law to English Common Law. Unlawful conversion of public records to private registrations. Unlawful conversion of our right to elect to mere voting privileges.</p> <p>Hawaiian Kingdom Law: Must abide by the laws of the land the first, and foundational Hawaii Revised Statute. HRS §1-1 Common law of the State; exceptions. Contains the door to Hawaiian Kingdom Law: ‘...except as...fixed by Hawaiian judicial precedent, or established by Hawaiian usage...’ HRS §1-1 Common law of the State; exceptions. Traces its legislative intent directly to the law to Queen Liliuokalani wanted to protect ‘the autonomy and absolute independence of this Kingdom’, in 1892. The Supreme court in Hawaii indicated on June 22, 1977.that “Hawaiian usage" must predate November 25, 1892.’ (58 H. 106, 566 P.2d 725.)</p> <p>Prior to November 25, 1892, the laws of the Hawaiian Islands included, but not limited to: The Complied Laws of the Hawaiian Kingdom (1884), The Penal Codes of the Hawaiian Kingdom (1869), The Civil Codes of the Hawaiian Kingdom (1859), The Statute Laws of the Hawaiian Kingdom (1841) s9</p> <p>All of the English version of these lac by/ can be found at www.llmc.com, click on “open access”, then search “Hawaiian Kingdom”, there get you will find virtually all of the laws mentioned above, including but not limited to legislative records, Supreme Court decisions “fixed by Hawaiian judicial precedent, or established by Hawaiian usage”.</p>	

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		<p>(Roslyn Cummings, <i>Continued</i>) Some of the more important laws that are “established by Hawaiian National usage”, included but are not limited to:</p> <p>‘The laws are obligatory upon all persons, whether subjects of this kingdom, or citizens or subjects of any foreign State, while within the limits of this kingdom, except so far as exception is made by the laws of nations in respect to Ambassadors or others. The property of all such persons, while such property is within the territorial jurisdiction of this kingdom, is also subject to the laws. The Civil Codes of the Hawaiian Islands (1859), Chapter II OF THE EFFECTS OF LAWS, SECTION 6.</p> <p>‘An alien, whether his native country be at war or at peace with this kingdom, owes allegiance to this kingdom during his residence therein, and during such residence, is capable of committing treason against this kingdom. [Penal Codes of the Hawaiian Islands (1869), Article VI. Treason, Section 3.</p> <p>‘All laws now in force in this Kingdom, shall continue and remain in full effect, until altered or repealed by the Legislature; such parts only excepted as are repugnant to this Constitution. All laws heretofore enacted or that may hereafter be enacted, which are contrary to this Constitution, shall be null and void.’ ARTICLE 79. Constitution of the Hawaiian Kingdom. 1887.</p> <p>By; Roslyn:Nicole:Manawaiakea; Malama mare Cummings , sui juris. in care of 2569 Pu’u Road, Kalaheo Ahupua’a, Hawaii Nei, Zip exempt</p> <p>To: Joe Biden As: The PRESIDENT OF THE UNITED STATES, 1600 Pennsylvania Ave. Washington, District of Columbia</p> <p>To: Antony Blinken As: The SECRETARY OF STATE OF THE UNITED STATES,2201 C Street NW. Washington, District of Columbia 20520</p> <p>To: Merrick Garland As: The ATTORNEY GENERAL OF THE UNITED STATES U.S. Department of Justice 950 Pennsylvania Avenue, NW, Washington, District of Columbia 20530-0001</p> <p>To: Anne E. Lopez As: The ATTORNEY GENERAL of STATE OF HAWAII, 425 Queen St., Honolulu, HI 96813</p> <p>Notice to Agent[s] is Notice to Principle[s], and Notice to Principle[s] is Notice to Agent[s]</p> <p>Declaration of Roslyn: Nicole: Manawaiakea; Malama mare Cummings makuahine of Jaidalyn Cummings, Ryder Kekoa Cummings, Madison Cummings, Hunter Cummings, Maddox Cummings, Noah Cummings, and Luke Cummings</p> <p>Kupuna of my mo’opuna Ike manawa</p> <p>When in the Course of human Events, it becomes necessary for one People to dissolve the Political Bands which have connected them with another, and to assume, among the Powers of the Earth, the separate and equal Station to which the Laws of Nature and of Nature's God entitle them, a decent Respect to the Opinions of Mankind requires that they should declare the causes which impel them to the Separation.</p> <p>We hold these Truths to be self-evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness--That to secure these Rights, Governments are instituted among Men, deriving their just Powers from the Consent of the Governed, that whenever any Form of Government becomes destructive of these Ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its Foundation on such Principles and organizing its Powers in such Form, as to them shall seem most likely to effect their Safety and Happiness, Prudence, indeed, will dictate that Governments long established should not be changed for light and transient Causes; and accordingly, all Experience hath shown, that Mankind are more disposed to suffer, while Evils are sufferable, than to right themselves by abolishing the Forms to which they are accustomed. But when a long Train of Abuses and Usurpations, pursuing invariably the same Object, evinces a Design to reduce them under absolute Despotism, it is their Right, it is their Duty, to throw off such Government, and to provide new Guards for their future Security. Such has been the patient sufferance of these Colonies; and such is now the Necessity which constrains them to alter their former Systems of Government. The History of the present (UNITED</p>	

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		<p>[Roslyn Cummings, <i>Continued</i>] STATES Corp) is a History of repeated Injuries and Usurpations, all having in direct Object the Establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid World.</p> <p>So here shall I, Stand...</p> <p>This shall serve as notice to certify that I; A Living Soul, so called by my Father and Mother since born, Roslyn Nicole Manawaiakea; of the genealogy of Malama; Kumulipo, was born 24th of November, in the year 1983, in the Sovereign Hawaiian State. Noho Ao Hawaii, I presently live upon the land of Hawaii:Kamehameha established Unified Monarchical Government for the Hawaiian Islands, the United States of America, secured the assurance of U.S. President Tyler on December 19, 1842 of its recognition of Hawaiian independence, and then proceeded to meet Sir George Simpson in Europe and secure formal recognition by Great Britain and France. On March 17, 1843, King Louis-Phillipe of France recognizes Hawaiian independence at the urging of King Leopold of Belgium, and on April 1, 1843, Lord Aberdeen on behalf of Her Britannic Majesty Queen Victoria, assured the Hawaiian delegation that "Her Majesty's Government was willing and had determined to recognize the independence of the Sandwich Islands under their present sovereign."</p> <p>On November 28, 1843, at the Court of London, the British and French Governments entered into a formal agreement of the recognition of Hawaiian independence.</p> <p>"Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and His Majesty the King of the French, taking into consideration the existence in the Sandwich Islands (Hawaiian Islands) of a government capable of providing for the regularity of its relations with foreign nations, have thought it right to engage, reciprocally, to consider the Sandwich Islands as an Independent State, and never to take possession, neither directly or under the title of Protectorate, or under any other form, of any part of the territory of which they are composed.</p> <p>The undersigned, Her Majesty's Principal Secretary of State of Foreign Affairs, and the Ambassador Extraordinary of His Majesty the King of the French, at the Court of London, being furnished with the necessary powers, hereby declare, in consequence, that their said Majesties take reciprocally that engagement. In witness whereof the undersigned have signed the present declaration, and have affixed thereto the seal of their arms. Done in duplicate at London, the 28th day of November, in the year of our Lord, 1843.</p> <p>I am not a Resident, Employee or Citizen of the UNITED STATES Government (Corporation), whose situs is Washington, the District of Columbia. My relationship to that Federal entity as far as jurisdiction is that of a non-resident alien to the Corporate United States Government. Also known as an American State National, or Bloodline American.</p> <p>Lawehala</p> <p>USC 28 Section 91 defines the Judicial District of "Hawaii", can anyone show me where the Hawaiian Islands are included within that district? Because I asked the Hawaii Secretary of State, The US Secretary of State, Both Attorney Generals and NONE can answer the question. YOU CANT BUILD A HOUSE WHERE ONE ALREADY STANDS.</p> <p>"Hawaii constitutes one judicial district which includes the Midway Islands, Wake Island, Johnston Island, Sand Island, Kingman Reef, Palmyra Island, Baker Island, Howland Island, Jarvis Island, Canton Island, and Enderbury Island: Provided, That the inclusion of Canton and Enderbury Islands in such judicial district shall in no way be construed to be prejudicial to the claims of the United Kingdom to said Islands in accordance with the agreement of April 6, 1939, between the Governments of the United States and of the United Kingdom to set up a regime for their use in common.</p> <p>I am a free and natural kanaka, kanaka maoli, kanaka oiwi, kane, described by the Lord God 'I'O as a Living Soul, living under God's law and God's grace alone. I have assumed among the Powers of the Earth, granted by the Lord God Almighty, the Separate and Equal Station to which the Laws of Nature and Nature's God entitle me. Giving me dominion over all things. Therefore, in order to secure the Blessing of Liberty to my posterity and myself, to re-acquire my Birthright as a member of the Sovereign Body of "We the People," I hereby Asseverate, Repudiate and Revoke my Citizenship, if any ever existed, with the Legal fiction known as</p>	

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		<p>(Roslyn Cummings, Continued) the “UNITED STATES” Government (Corporation), USA Inc, and any and all subsidiary corporations both known (STATE, COUNTY, CITY,) and unknown under its control.</p> <p>Maxim of Law: No man can renounce the country in which he was born, nor abjure the obligation of his allegiance. Co. Litt. 129. Sed vide Allegiance; Expatriation; Naturalization. (The Nation State Republic is the country state in which you were born and it cannot be renounced, by anybody or anyone). I further rescind any and all feudal contracts with that Federal government, its agencies and with the State of Hawaii and its agencies, the County of Kauai and its agencies. I rescind the Social Security number, fraudulently issued upon me by the government before the age of 18, as such I was legally incompetent to enter into a legal contract with the government. The government by obfuscation of facts and misinformation led me to believe at that time that I was required to secure a Social Security Account number in order to gain employment, which is simply not true. The government agent who obligated me to the Social Security System knew or should have known that there existed serious liabilities to anyone who accepted a Social Security Number. That Agent had a fiduciary responsibility to inform me of the true nature of the Social Security Trust Account and the obligations and liabilities that the Trust involved. By the government’s silence on the matter, the government established, by fraud, a Constructive Trust Agreement with me which must be vitiated. Since receiving that Account, I have through my religious instruction come to the belief that the Social Security number may be what is referred to in the Holy Bible, Book of Revelation 13:16-18 and 14:9-10, as the mark of the beast or at the least its precursor. For me to participate in that program and continue to use that number may place my eternal soul in jeopardy. This I will not and cannot do.</p> <p>The money which has been paid into that Socialist Security system within my lifetime, including the monies paid by my employers’ demand, is hereby made demand for full reimbursement to me. I also now understand that my SS number or CUSIP was used, via fraud while under the extreme duress of child birth, using my mother as an informant to give me up to STATE without full and honest disclosure was bonded and insured since my birth. And at present those funds are being used by multiple Corporations including multiple Life insurance policies. I demand that those bonds and policies be redeemed for real monies and if any debts are proved against me those debts withheld as payment in full that I may be made whole and the balance paid to me in real money. US Postal Money Orders, gold or silver shall suffice.</p> <p>I do not wish, nor am I permitted by God, to make myself a ward of the State, as would be the case if I accepted the Social Security benefits. I demand the same treatment that was given to the people of the Philippines who were participants in the Social Security Trust and who choose Citizenship of the Philippines over that of the United States. As the Social Security program is not a feudal contract, in that Congress gave no property rights to a Social Security Trust Account, I demand the contract be voided and all monies returned, as would be the case for any fraudulent contract or Constructive Trust Agreement. The United States Government Corporation should not enrich its self from the Fruits of a Poisonous Tree.</p> <p>I emphatically deny that I have ever filed for bankruptcy protection with any degree of complete understanding and honest disclosure. Nor have I ever given my Power of Attorney to anyone or to the State of Hawaii or any of the union states or territories of the UNITED STATES (Corporation) government for the purpose of instituting a bankruptcy action in my name with any degree whatsoever of complete understanding, full and honest disclosure or without great duress. Nor granting that my Labor and or my Property of whatever kind, or wherever situated, be held as collateral in any bankruptcy proceeding of the State or Federal governments. Nor any scheme, using my labor and property as collateral, to support or fund a fiat money scheme of the Federal Reserve Bank, Inc. and/ or the State of Hawaii, and/or Federal UNITED STATES Government.</p> <p>Since time immemorial, My family first arrived these shores kahakai, and now many, many generations of family will suffer the anxiety of their spirit as a result of my having chosen to recognize the malignant and treasonous misconduct of this government against “we the people” and speak out against it.</p> <p>With this I shall speak oiaio in protection of Ko Hawaii Pae Āina Malama, Palekana Na Manu May the truth be revealed in revelation Without Prejudice - Without Recourse</p>	

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		(Roslyn Cummings, <i>Continued</i>) Autographed by Roslyn Nicole Manawaiakea Malama mare Cummings; a woman, a Living Soul on the very day of the 39th year of my Live Birth.	
Jeremy Schrader	7/25/2023 13:46	<p>Aloha,</p> <p>I am emailing to express my support for the implementation of an infertile insect technique to control the non-native mosquito populations of the Hawaiian islands. I personally believe this to be one of our last, best chances to arrest the precipitous decline of Hawaii's native avifauna--an incredible resource of not only singular biological interest, but also of profound cultural and historical value. These birds comprise a vital part of the very fabric of the 'aina dating back millenia, and are a source of joy and wonder to all who walk it even today.</p> <p>These bird species represent a truly unique instance of adaptive radiation, but not one of them has evolved to contend with these invasive pests that threaten their very survival as species. As stewards of the land, I feel it is our duty as a society to do everything we can to reverse the damage done by our introductions of damaging species. This method presents an opportunity to fulfil the duty espoused by the state for years--to protect our land, its creatures, and to safeguard the health and beauty of our ecosystems for the generations that follow.</p> <p>These bird species are currently at risk from a number of threats, including loss of habitat, climate change, and the encroachment of invasive species. Therefore time is of the essence--we must act now to protect these important members of our community, as we would jump into action for any of our own. Though these problems are both insidious and challenging to solve, thanks to years of research and thousands of dedicated, conservation-minded scientists, policymakers and citizens, we are poised to affect real change. Previous research has laid the groundwork for successfully removing these unwelcome insects, and Hawaii can here champion the use of cutting-edge methods while employing hundreds of its very own people.</p> <p>Please, make the right choice for Hawaii's incredible birds, its unique ecosystems, and its proud and responsible citizens. Support Wolbachia infertile insect technique!</p> <p>Thank you for your consideration, Jeremy -- Jeremy Schrader (he/him), M.S. Tropical Conservation Biology and Environmental Science, University of Hawaii at Hilo</p>	Thank you for your comment
Mimi Forsyth	7/26/2023 7:37	The birds must be protected. Eradicate the destructive mosquitos!	Thank you for your comment
	7/24/2023 9:47	Hello, I am a student of mechanical and biological engineering, and I firmly support the Wolbachia mosquito program, please save Hawaii's native birds. The bacteria is already present, this just helps lessen the load.	Thank you for your comment
	7/24/2023 14:41	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concerns: 1

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Mary Lu Kelley	7/24/2023 23:24	<p>Aloha.</p> <p>The native forest birds are dying and close to extinction because they are being infected by mosquito-borne diseases such as avian malaria and avian pox. The numbers of wild forest birds are plummeting.</p> <p>In this MOSQUITO RELEASE PROGRAM, only male mosquitoes that are incapable of producing viable offspring with our disease carrying females are released. This will greatly reduce the size of future mosquito generation and it is only then that the native wild birds will have a chance to live and to thrive.</p> <p>THIS PROGRAM MAY BE OUR ONLY HOPE TO KEEP WILD BIRDS ALIVE IN OUR FORESTS. WE MUST SAVE OUR NATIVE FOREST BIRDS FROM EXTINCTION! Please support this MOSQUITO RELEASE PROGRAM!</p> <p>Thank you, Mary Lu Kelley, Kapa'a, Kauai</p>	Thank you for your comment
Jenny Neuman		<p>I'm OPPOSED to this Wolbachia-based suppression of mosquitoes on Kaua'i environmental assessment. I demand that the State of Hawaii and its multiagency partnership Birds, not mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.</p> <p>This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitos come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns.</p> <p>I demand an Environmental Impact Statement.</p> <p>Sincerely, Diane Neuman</p>	Concerns: 1, 8, 11, 12, 13, 14, 15, 28
KianaRose Dulan		<p>And native birds should fly for as long as they can. Implement the IIT to reduce mosquito populations. E ola mau i nā Manu 'ōiwi.</p> <p>Kiana Dulan -- KianaRose Dulan, kdulan@hawaii.edu, (808)397-3215 (Cell)</p>	Thank you for your comment
Nativa Law		<p>Aloha,</p> <p>I was born and raised on Kaua'i and have concern for the native birds of my ancestors. My tutu and her neighbors used to have small ponds with mosquito fish which helped to minimize local mosquito populations in the area. The ponds did not require filtration as they had plants to filter the water naturally, the fish would repopulate on their own and never grew more than 2 inches so upkeep was minimal.</p> <p>Wanted to submit this as a potential solution for the issue here and save our manu.</p> <p>If we're able to get government or local funding, let's offer residents in wet areas of Kaua'i installation of these small ponds with mosquito fish and plants.</p> <p>Happy to discuss the idea further and develop budget/logistical plans to support the initiatives.</p> <p>Mahalo, Nativa</p>	Concern: 24