FILE COPY

JAN 23 2019

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DEC 21 2018

MEMORANDUM:

TO: Scott Glenn, Director
Office of Environmental Quality Control

FROM: Suzanne D. Case, Chairperson
Board of Land and Natural Resources

SUBJECT: Final Environmental Assessment and Issuance of a Finding of No Significant Impact
Pouhala Marsh Restoration Project, Phase I, Waipahu, Oahu

With this letter, the State of Hawaii, Department of Land and Natural Resources, hereby transmits the Final Environmental Assessment and Finding of No Significant Impact (FEA-FONSI) for the Pouhala Marsh Restoration Project situated on Tax Map Keys (TMK) 9-3-01:2, 9-3-01:4, 9-3-01:6, 9-3-01:12 (portions), in the Ewa District on the island of Oahu, for publication in the next available edition of *The Environmental Notice*.

The Division of Forestry and Wildlife has included copies of comments and responses that it received during the 30-day public comment period on the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI).

Enclosed is a completed Office of Environmental Quality Control Publication Form, one hardcopy of the FEA-FONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the Publication Form in Microsoft Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Jason Misaki, Wildlife Manager, at (808) 973-9786.

Sincerely,

SUZANNE D. CASE
Chairperson

RECEIVED
'18 DEC 28 P2:26
OFC. OF ENVIRONMENTAL
QUALITY CONTROL

Enclosures: OEQC Publication Form
One hardcopy of the FEA
CD with electronic copy of the FEA

19-213

AGENCY
PUBLICATION FORM

Project Name:	Pouhala Marsh Restoration Project, Phase I
Project Short Name:	Pouhala Marsh Restoration Project
HRS §343-5 Trigger(s):	Use of state lands and state funds; Use of conservation district lands
Island(s):	O'ahu
Judicial District(s):	Ewa District
TMK(s):	9-3-01:2, 9-3-01:4, 9-3-01:6, 9-3-01:12 (portions)
Permit(s)/Approval(s):	ESA, Section 7 Consultation; Section 106 Consultation; Section 404, Department of the Army Permit; CWA, Section 401; Chapter 6E, HRS, Historic Preservation Review; Conservation District Use Application; Coastal Zone Management Act Consistency Determination; NPDES Permit; Special Management Area Permit; Community Noise Permit; Construction Permits
Proposing/Determining Agency:	Department of Land and Natural Resources, Division of Forestry and Wildlife
Contact Name, Email, Telephone, Address	Jason Misaki, Wildlife Manager, jason.c.misaki@hawaii.gov, (808) 973-9786 DLNR-Division of Forestry and Wildlife, Oahu Branch 2135 Makiki Heights Dr., Honolulu, HI 96822
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Bow Engineering & Development, Inc.
Contact Name, Email, Telephone, Address	William F. Bow, M.S., WBow@bowengineering.com, 808-941-8853 x117 1953 S. Beretania Street, PH-A Honolulu, HI 96826

Status (select one)	**Submittal Requirements**
____ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
__X__ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.

____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary

Pouhala Marsh is a 70-acre coastal marsh located in Waipahu on the southwestern region of the Island of O'ahu. The U.S. Fish and Wildlife Service identified Pouhala Marsh as a protected, core wetland area with permanent habitat that supports a substantial number of waterbirds. The marsh is owned by the State of Hawai'i and the City and County of Honolulu. The State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife manages the area as a wildlife sanctuary through a land lease agreement with the City. Over the past several decades, the marsh has been degraded through siltation, waste disposal, water pollution, and alien plant invasions. The State DLNR, DOFAW proposes the creation of a wetland pond within a ±8.8-acre area in Pouhala Marsh. Wetland restoration would provide a naturally functioning ecosystem with suitable habitat for four endangered Hawaiian waterbirds, including the Hawaiian Moorhen, Hawaiian Stilt, Hawaiian Duck, and Hawaiian Coot. Restoration of the site would allow for environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.

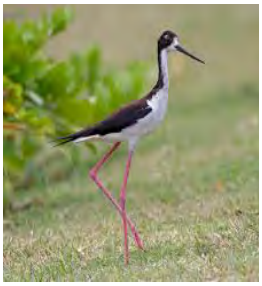
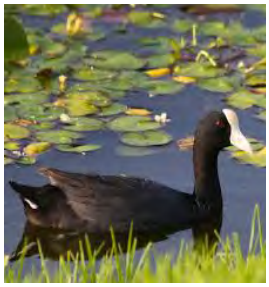
FINAL
ENVIRONMENTAL ASSESSMENT

POUHALA MARSH RESTORATION PROJECT
PHASE I

Waipahu, Island of O‘ahu

State of Hawai‘i
Department Land and Natural Resources
Division of Forestry and Wildlife, O‘ahu Branch

November 2018


Pouhala Marsh Restoration Project
Phase I

Waipahu, Island of Oʻahu

Final Environmental Assessment

This environmental document has been prepared pursuant to
Hawaiʻi Revised Statutes, Chapter 343
and Hawaiʻi Administrative Rules, Title 11, Chapter 200

Prepared for:

State of Hawaiʻi
Department of Land and Natural Resources
Division of Forestry and Wildlife
2135 Makiki Heights Dr.
Honolulu, Hawaiʻi 96822

Prepared by:
Bow Engineering & Development, Inc.
Environmental Planning Partners, Inc.

November 2018

This page intentionally
left blank.

PROJECT SUMMARY

Project Name:	Pouhala Marsh Restoration, Phase I
Location:	Pouhala Marsh, West Loch of Pearl Harbor Waipahu, Island of Oʻahu TMK 9-3-01:2, 9-3-01:4, 9-3-01:6, 9-3-01:12 (portions)
Proposing/Approving Agency:	State of Hawaiʻi, Department of Land and Natural Resources Division of Forestry and Wildlife, Oʻahu Branch 2135 Makiki Heights Dr. Honolulu, Hawaiʻi 96822 Contact: Jason Misaki, Wildlife Manager (808) 973-9786
Proposed Project:	The proposed project includes the creation of a tidal wetland pond within a ±8.8-acre area at the Pouhala Marsh State Wildlife Sanctuary.
HRS Ch. 343 Trigger:	Use of state lands and state funds; use of conservation district lands
State Land Use Designation:	Conservation District
Existing Zoning:	Preservation District, Restricted (P-1)
Special Management Area:	Within City & County of Honolulu SMA
Determination:	Finding of No Significant Impact (FONSI)

SUMMARY OF MITIGATION MEASURES AND PROJECT COMMITMENTS TO MINIMIZE POTENTIAL IMPACTS OF THE PROJECT

The following measures have been incorporated into the project description:

Controlled Access and Environmental Education

- Access to the site will be controlled, particularly during the breeding season to avoid and minimize disturbance to nesting Hawaiian stilts.
- All public access will be limited to individuals accompanied by a DOFAW escort or preapproved for special access by DOFAW.
- All environmental education programs will emphasize the importance of people not feeding wildlife and disposing of trash in proper receptacles.

Signage, enforcement, and fencing will be the primary methods to control site access. A DOFAW community liaison will continuously work with the community to keep them informed. The outreach efforts will be focused on why access needs to be limited during nesting season. In addition, DOFAW plans to have staff on site regularly to ensure compliance.

Site-Specific Best Management Practices

The proposed project would include site-specific Best Management Practices (BMPs) to be implemented during project construction and during removal of stockpiled material to minimize erosion and potential impacts to water quality. The BMPs would include but would not be limited to the USFWS recommended standard BMPs regarding sedimentation and erosion in aquatic environments:

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.
2. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.
3. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non- native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP - see http://www.haccp- nrm.org/Wizard/default.asp) can help to prevent attraction and introduction of non-native species.
4. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (e.g., with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.
5. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.
6. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non- invasive vegetation matting, hydro-seeding, etc.

These BMPs will be refined in accordance with City and County of Honolulu regulatory requirements as part of the permitting process.

Geology, Topography, and Soils
An erosion control plan will be submitted prior to grading and trenching activities and will specify BMPs in accordance with the City and County of Honolulu's Best Management Practices Manual for Construction Sites, as amended (City and County of Honolulu 2011). The BMPs would include site-specific measures as outlined above and in Section 2.2 of this EA.
Hydrology and Water Quality
Prior to the initiation of grading, the project applicant will prepare and implement a stormwater pollution prevention plan and BMPs designed to reduce potential impacts to water quality during construction of the project. The BMPs would include site-specific measures as outlined above and in Section 2.2 of this EA. These BMPs will be developed in accordance with the City and County of Honolulu regulatory requirements as part of the permitting process.
Biological Resources
To minimize impacts to the endangered Hawaiian hoary bat, the USFWS recommended measure is included as mitigation: • Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).

To avoid and minimize potential project impacts to Hawaiian waterbirds, the USFWS recommended measures are included as mitigation:

- In areas where waterbirds 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.
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within three days of project initiation and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - 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.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

To avoid and minimize impacts to the Hawaiian goose, the USFWS recommended measures are included as mitigation:

- Do not approach, feed, or otherwise disturb Hawaiian geese.
- If Hawaiian geese are observed loafing or foraging within the project area during the Hawaiian goose breeding season (September through April), have a biologist familiar with the nesting behavior of the Hawaiian goose 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 three 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 work, or a previously undiscovered nest is found within said radius after work begins.
- In areas where Hawaiian geese 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.

During construction, site-specific BMPs developed as part of the permitting process would minimize erosion and sedimentation and potential adverse effects to aquatic biota in the vicinity of the project site.

While it does not appear that the previous fill site contains wetlands, a wetland delineation will need to be completed for jurisdictional determination purposes, and to ensure that no existing wetland would be converted with implementation of the proposed project. Following the wetland delineation, the USACE would be able to determine if the project qualifies for coverage under the NWP #27, or if it will be processed as a Standard Permit.

During the DA Permit process, the USACE will consult with NMFS regarding potential adverse effects to EFH as a result of project activities. The conditions as set forth in the permit will be required to be implemented, and would minimize potential adverse impacts to wetlands or EFH. Additional measures have been incorporated into the project in order to minimize project impacts to NOAA trust resources, including project specific BMPs to control erosion and runoff during construction.

Historical, Archaeological, and Cultural Resources
The following mitigation measure will be required to minimize impacts to unidentified cultural resources: • A qualified archaeological monitor will be present during all ground-altering activities in order to document any historic artifacts that may be encountered during the proposed undertaking. • In the event that historic resources, including human skeletal remains, are identified during the construction activities, all work will cease in the immediate vicinity of the find, the find will be protected from additional disturbance, and the SHPD, O'ahu Section, will be contacted immediately.
Air Quality and Climate
• All construction work will be in conformance with the air pollution control standards contained in HAR Title 11, Chapter 59, "Ambient Air Quality Standards," and Chapter 60, "Air Pollution Control," which would minimize air quality emissions.
Noise
• Construction will be confined to 7 a.m. to 6 p.m., Monday through Friday, and 9 a.m. to 6 p.m. on Saturday. No construction activities exceeding maximum allowable noise levels will occur on Sundays and holidays without prior notice. Construction activities will comply with HAR Chapter 11-46, "Community Noise Control."
Secondary Impacts

Implementation of these measures and compliance with regulatory requirements would minimize environmental impacts resulting from the proposed project. Permits and approvals required for implementation of the proposed project are listed in Section 2.3 of this EA.

TABLE OF CONTENTS

FIGURES

APPENDICES

1 INTRODUCTION

This Final Environmental Assessment (EA) has been processed as a Finding of No Significant Impact (FONSI) by the State of Hawai'i, Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). As a result, the preparation of an Environmental Impact Statement is not required.

1.1 PROJECT PURPOSE AND NEED

Pouhala Marsh is a 70-acre coastal marsh located in Waipahu on the southwestern region of the Island of O'ahu. The U.S. Fish and Wildlife Service (USFWS) identified Pouhala Marsh as a protected, core wetland area with permanent habitat that supports a substantial number of waterbirds in its 2011 update to the *Recovery Plan for Hawaiian Waterbirds*. The marsh is owned by the State of Hawai'i (State) and the City and County of Honolulu (City). The State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife manages the area as a wildlife sanctuary through a land lease agreement with the City. Over the past several decades, the marsh has been degraded through siltation, waste disposal, water pollution, and alien plant invasions. According to DOFAW studies, only a 24-acre portion of the marsh is used by waterbirds.

The State DLNR, DOFAW proposes the creation of a wetland pond within a ±8.8-acre area in Pouhala Marsh (see Figure 1 for project location map). The State DOFAW has identified the following objectives of the Pouhala Marsh Wetland Restoration Project:

- Creating ±8.8 acres of wetland at the Pouhala Marsh State Wildlife Sanctuary. Wetland creation is necessary to improve and enhance nesting habitat for four identified endangered species of Hawaiian waterbirds.
- Ensuring that the created wetland maintains wetland functions and ecological values.

Wetland restoration would provide a naturally functioning ecosystem with suitable habitat for four endangered Hawaiian waterbirds, including the Hawaiian Moorhen, Hawaiian Stilt, Hawaiian Duck, and Hawaiian Coot. Restoration of the site would allow for environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.

Pouhala Marsh Restoration

SOURCE: Department of Land and Natural Resources, Division of Forestry and Wildlife, 2018; Google Earth 2017; Planning Partners 2017

Figure 1
Project Location Map

1.2 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

The evaluation of projects to determine their effects on the environment is required by the Hawai'i Revised Statutes (HRS) Chapter 343. An Environmental Assessment is a "written evaluation to determine whether an action may have a significant effect" (HRS Section 343-2). The agency with primary responsibility over the project (the proposing agency) is required to prepare an EA and make a final environmental determination according to the presence of significant impacts or the lack thereof. As stated in HRS Section 343-1:

> An environmental review process will 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. …The process of reviewing environmental effects is desirable because environmental consciousness is enhanced, cooperation and coordination are encouraged, and public participation during the review process benefits all parties involved and society as a whole.

As described above, the basic purpose of an EA is to provide information to the public and decision makers on proposed actions. The EA must also disclose: potential significant adverse environmental impacts, the expected primary and secondary consequences, and the cumulative as well as the short- and long-term effects of the action.

1.3 FEDERAL AND STATE AUTHORITY

The proposed action would use state funding and would be subject to state environmental laws and regulations. Environmental review procedures required by the State of Hawai'i include compliance with HRS Chapter 343 "Environmental Impact Statements", and Hawaii Administrative Rules (HAR) Title 11, Chapter 200, Department of Health, "Environmental Impact Statement Rules".

The project site is located within the State's land use district's Conservation District, which is under the jurisdiction of the State Board of Land and Natural Resources (BLNR). Permitted uses are defined under HAR Title 13, Chapter 5, and require compliance with the State's environmental review process.

The project area is also located within the City's Special Management Area (SMA), as regulated under Revised Ordinances of Honolulu (ROH) Chapter 25. Compliance with the State's environmental review process is required.

The proposed restoration improvements may also involve the use of federal funds, which would make the project subject to environmental requirements prescribed under the National Environmental Policy Act (NEPA). However, because these funds have not yet been secured, nor is it known which federal agency might fund a portion of the proposed improvements, a NEPA analysis will not be completed at this time. Should federal funding become available, portions of this EA may be used for NEPA compliance. The proposed improvements could be determined "Categorically Excluded" under the NEPA compliance regulations. The following section highlights NEPA regulatory compliance requirements.

Federal Regulatory Overview

The following is a summary of the Federal laws and consultations that may be relevant to implementing the restoration project.

National Environmental Policy Act
The proposed action may be subject to compliance with the National Environmental Policy Act of 1969, 42 United States Code (USC) §4321, as implemented by the Council on Environmental Quality regulations, 40 Code of Federal Regulations (CFR) Parts 1500-1508 (40 CFR §1500 *et seq.*).

National Historic Preservation Act
The National Historic Preservation Act (NHPA) of 1966, as amended (16 USC §470) recognizes the Nation's historic heritage and establishes a national policy for the preservation of historic properties as well as the National Register of Historic Places. Section 106 of the NHPA requires Federal agencies to take into account the effects of Federal undertakings on historic properties. The Section 106 process, as defined in 36 CFR §800, provides for the identification and evaluation of historic properties, for determining the effects of undertakings on such properties, and for developing ways to resolve adverse affects through the process of consultation.

Coastal Zone Management Act
The purpose of the Coastal Zone Management Act (CZMA) of 1972, as amended (16 USC §1451 *et seq.*) is to encourage States to manage and conserve coastal areas as a unique, irreplaceable resource. Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. HRS Chapter 205A implements this program for the State, and the City's Special Management Area (SMA) regulations under ROH Chapter 25 specifies the procedures for reviewing a project's consistency with coastal zone management objectives and policies for the island of Oahu.

Endangered Species Act
The Endangered Species Act (ESA) (16 USC §1531 *et seq.*) establishes a process for identifying and listing species. It requires all Federal agencies to carry out programs for the conservation of federally listed endangered and threatened plants and animals, and prohibits actions by Federal agencies that may adversely affect listed species or adversely modify designated critical habitat without formal consultation with the U.S. Fish and Wildlife Service or the National Oceanographic and Atmospheric Administration (NOAA). Section 7 of this Act specifies the consultation program conducted with these Federal agencies.

Clean Water Act
The Clean Water Act (CWA) of 1972 is the primary Federal law that protects the nation's waters, including lakes, rivers and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters.

Section 401 of the CWA requires a Water Quality Certification (WQC) be obtained from the State (or territory) for actions that require a Federal permit to conduct an activity, construction or operation that may result in a discharge into waters of the United States. The State of Hawai'i Department of Health, Clean Water Branch (DOH-CWB) implements this program issuing WQC permits for activities affecting jurisdictional waters.

Section 402 of the CWA establishes a National Pollution Discharge Elimination System (NPDES) general permit process for point and non-point source discharges such as storm water discharges associated with construction activities. Such a permit would be required if construction activities disturb a land area of one acre or more and discharge storm water from the construction site to waters of the U.S. The DOH-CWB implements this NPDES for the State.

Section 404 of the CWA requires a permit for the discharge of dredged or fill material into a wetland, navigable water, or jurisdictional waters of the United States. The U.S. Army Corps of Engineers (USACE) issues a permit under these regulations.

Executive Order 11988 Floodplain Management
Executive Order 11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains. It also requires agencies to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The Environmental Protection Agency (EPA) has policies and procedures for implementing this Order, and each federal agency is responsible for implementing these procedures.

Executive Order 11990 Protection Of Wetlands
Executive Order 11990 was issued to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. This Order requires Federal agencies, in their planning actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The EPA has policies and procedures for implementing this Order, and each federal agency is responsible for implementing these procedures.

Executive Order 12898 Environmental Justice
Executive Order 12898 (Environmental Justice) issued in 1994 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. Federal agencies need to identify and address disproportionately high and adverse environmental effects from an action on minority and low-income populations.

Fish and Wildlife Coordination Act
The Fish and Wildlife Coordination Act was enacted to protect fish and wildlife when Federal actions result in the control or modification of a natural stream or body of water. The Federal agency needs to take into consideration the effect that water-related projects would have on fish and wildlife resources, take action to prevent loss or damage to these resources, and provide for the development and improvement of these resources. This regulation is administered by the FWS and the National Marine Fisheries Service, as appropriate.

Land and Water Conservation Fund, Section 6(f)
The Land and Water Conservation Fund (LWCF) program was enacted in 1965, and it provides federal assistance to the states by the Department of the Interior, National Park Service (NPS) to enhance public outdoor recreation. These funds are made available to acquire, develop, and renovate public land to enhance outdoor recreation. Section 6(f)(3) of the LWCF Act of 1965 requires that any property acquired or developed with LWCF assistance shall be retained and used for public

outdoor recreation in perpetuity. The State DLNR, Division of State Parks (DSP) administers this regulation in the State of Hawai'i in coordination with the NPS.

American Disabilities Act
The Americans with Disabilities Act (ADA), signed into law in 1990 and later amended with changes in 2009, is a wide-ranging civil rights law intended to make American Society more accessible to people with disabilities, and prohibits discrimination based on disability under certain circumstances. The ADA is divided into five titles that cover: 1) employment; 2) public services; 3) public accommodations; 4) telecommunications; and 5) miscellaneous items. The State DOFAW would need to comply with these regulations by having new project improvements (e.g. pathways) meet the 2010 ADA standards for accessible design.

1.4 STEPS IN THE ENVIRONMENTAL REVIEW PROCESS

Early Consultation and Data Gathering

HAR Section 11-200-9 requires that an agency must consult with agencies and individuals that might have jurisdiction or expertise with respect to the proposed action. Early consultation is considered an important part of the environmental review process – the ultimate goal is the gathering of information, data, and public concerns. A preliminary description of the project was circulated to agencies and individuals in December 2017, and phone consultations were conducted with permitting agencies as necessary. For a detailed description of the early consultation component of this project, see Chapter 6, *Individuals, Community Groups, and Agencies Consulted,* of this EA.

Circulation of the Draft Environmental Assessment

Following completion of the Draft EA, the environmental document will be submitted to the State Office of Environmental Quality Control (OEQC). Notification of the availability of the Draft EA was published in the September 8, 2018 *The Environmental Notice* by OEQC, in addition to the Honolulu Star Advertiser and public library. During the 30-day public comment period ending October 8, 2018, agencies, organizations, and individuals were provided the opportunity to comment on the proposed project. For the proposed project, DLNR submitted a notice of determination with the Draft EA to the OEQC with an Anticipated Finding of No Significant Impact (AFONSI) (HAR Section 11-200-11.1).

Final Environmental Assessment and Finding of No Significant Impact

After the 30-day review period, the DLNR will consider all comments and incorporate necessary changes into a Final EA. The purposes of the Final EA are to document agency and public consultation on the project and respond to the comments received during the comment period on the Draft EA. The Final EA also considers new issues and changes to the project since publication of the Draft EA, and establishes that there are no significant impacts, and that a FONSI is appropriate so that the project can proceed. The publication of the notice of availability of the Final EA-FONSI in *The Environmental Notice* initiates a 30-day judicial challenge period under HRS Section 343-7(b).

2 PROJECT DESCRIPTION

2.1 ENVIRONMENTAL SETTING

Project Location

Pouhala Marsh is a 70-acre coastal marsh located in Waipahu on the southwestern region of the Island of O'ahu. The marsh is located in Pearl Harbor Estuary's West Loch (see Figure 1). The project site includes a ±8.8-acre portion of Pouhala Marsh that includes portions of Tax Map Key: 9-3-01:2, 9-3-01:4, 9-3-01:6, and 9-3-01:12 (see Figures 2 and 3). As classified by HAR Section 13-126, Pouhala Marsh, including the portion of the project site located on TMK 9-3-01:4, is listed as a "CLOSED" wildlife sanctuary, and entry by the public is prohibited (HAR Section 13-126-4) (see Figure 2). The project site is bounded by Kapakahi Stream on the east. Waikele Stream is located farther west of the project site. The habitat areas at Pouhala Marsh have been characterized into three sections: the project site, the Main Pond, and the Waikele Pond (see Figure 2). The Main Pond and Waikele Pond are made up of one large pond divided by a natural mudflat barrier.

Project Background

Pouhala Marsh is the largest remaining wetland habitat area in the Pearl Harbor complex. Historically, the marsh was composed of multiple fishponds used by the royal court and in the late nineteenth century was reverted to the government during the Great Mahele. Subsequently, the area was subdivided and converted into rice paddies. The decline of rice production in the early twentieth century resulted in many of the remaining fishponds filled in by incinerator ash, trash, and mangroves. Pouhala Marsh was considered for a potential landfill site due to the marshes location across from the City Waste Convenience Station. When the area was being prepared as a landfill, an 8-acre area was modified with the addition of fill material (DOFAW 2017). This disturbed area currently remains dry under most conditions and therefore is the target for restoring waterbird habitat ponds.

Exhibit 2.1 – View of the project fill site from northwest corner of the site.

Pouhala Marsh Restoration

SOURCE: Department of Land and Natural Resources, Division of Forestry and Wildlife, 2018
Google Earth 2017; Planning Partners 2017

Figure 2
Project Site

Pouhala Marsh Restoration

SOURCE: Honolulu Land Information System, 2018

Figure 3
Tax Map Key

Previous Environmental Review
An Environmental Assessment was prepared in 1998 for the *Pouhala Marsh Environmental and Enhancement Plan* (Ducks Unlimited 1998). The project helped to restore 70 acres of degraded and non-functioning tidal wetland habitats by removing 50,000 cubic meters (66,000 cubic yards) of fill, and clearing trash and debris that had been dumped into the wetland. A Special Management Area permit was obtained for the project. The project was completed in 2007.

A copy of this Environmental Assessment can be accessed from the OEQC website:
http://oeqc2.doh.hawaii.gov/_layouts/15/start.aspx#/EA_EIS_Library/Forms/AllItems.aspx

Restoration and Community Participation
The DOFAW has completed restoration efforts in the Pouhala Marsh State Wildlife Sanctuary with the assistance of National Coastal Wetlands Conservations Grants. With the participation of community groups, the following restoration tasks were completed:

1. The marsh was cleared of all dumped garbage and man-made materials. Crews regularly removed materials that were dumped after the clean-up. 10 cars and over 100 tons of bulky items and trash were removed the wetland from 2007 to 2018.
2. A boundary fence was installed in 2007 on the north end of the marsh, between Kapakahi and Waikele Streams. Fencing the west and south boundaries was deemed not feasible due to heavy mangrove growth and salt water, and the east portion was not fenced, as DOFAW was not able to reach an agreement with the City and County to build the fence.
3. From 2007-2017, the marsh area was grubbed and vegetation was removed on an annual basis to create and maintain waterbird habitat, including: mangrove, California grass, and pickle weed habitats.

Pouhala Marsh State Wildlife Sanctuary has benefitted from the participation of local community members since the DOFAW began restoration efforts. A number of community organizations and schools have put in numerous hours working in the sanctuary as well as learning about the natural and cultural history of Pouhala Marsh and its surrounding areas. Efforts by DOFAW and volunteer groups to restore the original wetlands include invasive plant removal, refuse removal, native plantings, in addition to installation of fencing to prevent predation, trespassing, and illegal dumping. Volunteer restoration work has been coordinated by groups such as the Hawai‘i Nature Center and the UH Mānoa Graduate Student Organization.

The proximity of the wildlife sanctuary to schools and the public allows for numerous learning opportunities. Various educators and instructors, including science and social studies teachers, instructors from local community colleges and universities, and special education teachers, have used the sanctuary in order to practice scientific methods and conduct projects that focus on the wetland environment. According to DOFAW, on a typical day, 40 – 60 students might rotate through three activities, such as water quality testing, bird observation and/or plant identification, and removal of invasive plants. From January 2016 to February 2018, the service groups included 453 volunteers and 4,476 volunteer hours, and the service learning included 35 trips, with 1,056 students and educators.

Existing Site Conditions

An approximate 8-acre area within the project site has been disturbed by the importation of fill material when the site was being prepared for use as a landfill. There are no remaining dumped garbage or man-made materials on the project site or perimeter.

The project site includes scattered *kiawe* trees and patches of grasses. Most of the exposed soil remains dry for long durations during the year. During the rain seasons, parcels near the southwest corner of the site may contain some water but will soon dry if not kept continuously saturated. During the July 2017 site visit, most of the project site was dry. Some lower areas were muddy, but only one low point contained ponded water. During a February 2018 site visit following 24 hours of active rain and flood watches for the area, the project site was saturated, with a few modest puddles in the lower depressions. Very few waterbirds and shorebirds use this area. Golden Plovers are most commonly sighted with occasional sightings of stilts loafing within the area.

Exhibit 2.1 – View of Kapakahi Stream looking southwest from the bridge.

North and west of the project site there are mangroves and established ponds, including the Main Pond and Waikele Pond (see Figure 2). There is a berm/dike between the project site and Kapakahi Stream, with a bridge crossing over the stream.

Surrounding Land Uses

The project site is bounded by an existing functioning wildlife bird habitat to the north; mangroves, marsh areas, and Waikele Stream to the west; and Kapakahi Stream to the east. Existing developed land uses in the area consist of single- and multi-family residential uses to the north, public facilities to the east, military lands to the south, and the Pacific Ocean to the east. Public facilities to the east include the Police Academy on Waipahu Depot Street.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed project under development includes the creation of a wetland pond within the ±8.8-acre area (see Figure 2). The proposed wetland pond system design is based on the construction of a single pond that would blend seamlessly with the existing wetland.

To accommodate the habitat preferences of the different endangered Hawaiian waterbirds, the water depths would vary within the pond. The gently sloped area of the pond would create habitat in shallow waters (1 inch to 6 inches of water) for the Hawaiian Moorhen and Hawaiian Stilt. The deep

section would create habitat for the Hawaiian Duck and Hawaiian Coot, with the water depth ranging from 6 inches to 1 foot. An unpaved access pathway with adequate width for light-duty maintenance vehicles would surround the pond. No work would occur within the adjacent Kapakahi Stream.

Based on the Final Engineering Study Report (Oceanit December 2009) completed for the project, concept plans have been developed for the proposed project. The concept plans provide approximately 226,000 square feet of gently sloped wetland area with a 12-foot wide access road at the perimeter. Approximately 32,000 cubic yards of excavated soil would be stockpiled onsite temporarily to the west and adjacent to the created wetland. The stockpiled area side slope could vary in steepness from 20 to 50 percent slope, and the top elevations of the embankment could vary from 11 to 12.8 feet as plans develop (see Figures 4 and 5 for grading concept plan options 1 and 2).

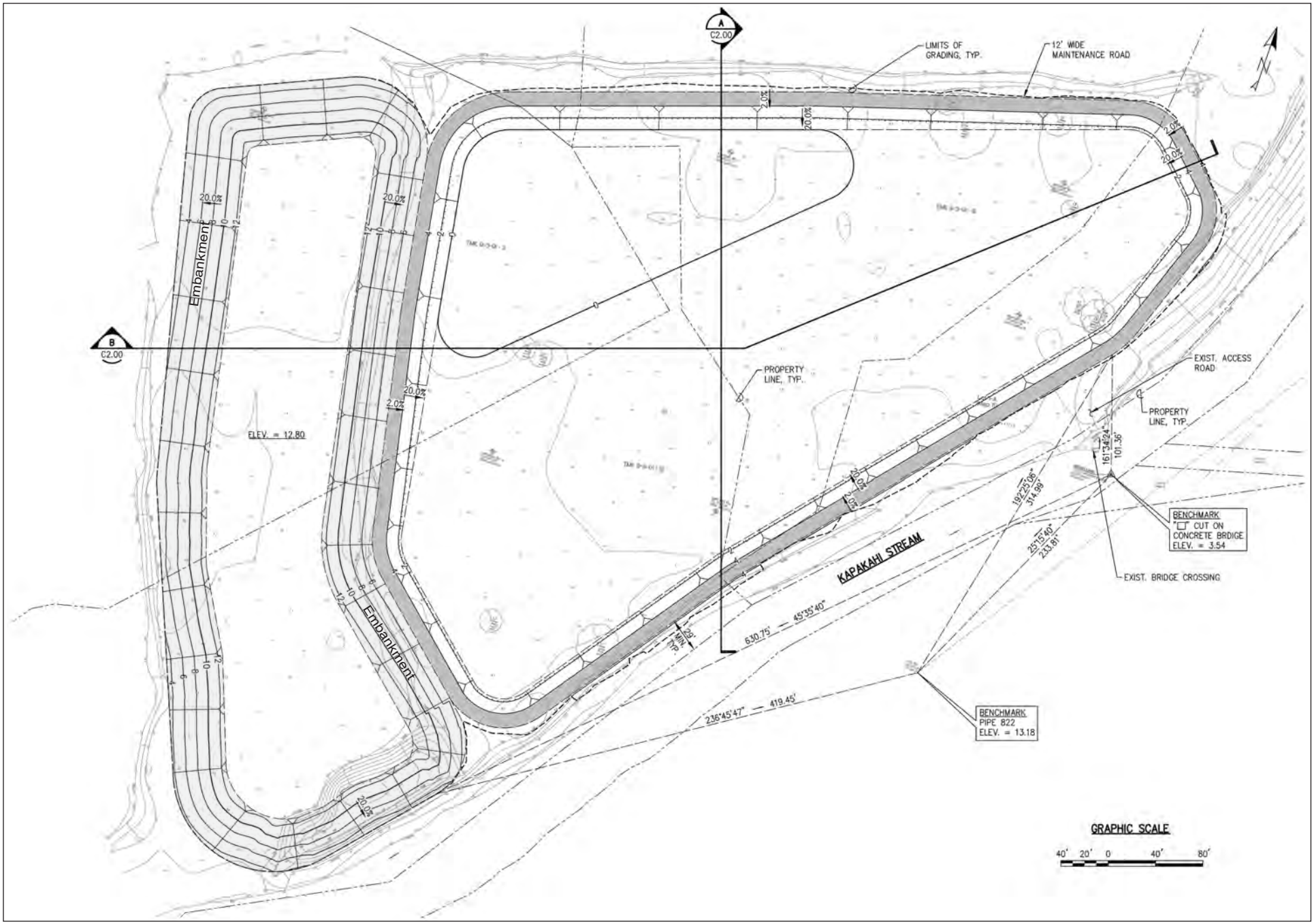
The concept plan is considered the first phase of the marsh rehabilitation. Currently there is very little useful area for bird habitats, and the first phase would increase the habitat area within the Pouhala Marsh significantly. Over time, all of the excavated material would be removed to make the entire ±8.8-acre site a functioning wetland (see Figure 6 for the concept plan with the stockpile removed completely). As future funds are allocated, the stockpiled material would be hauled out in phases until the entire site is a wetland, including the area used for stockpiled material.

Until the stockpile of soil can be removed, it would be grassed and would serve as a lookout or area where groups of volunteers could stage their maintenance efforts. As the stockpile is removed, best management practices would be used to prevent runoff until more grass is grown or until the entire stockpile is removed. Future phases to expand the wetland would occur as funds become available. The excavated soil would be loaded onto trucks and hauled away to PVT Landfill in Nānākuli, approximately 14 miles away from Pouhala Marsh.

Wetland Management

Tidal fluctuations and rain events are the major influences that help circulate the existing wetland pond water to stabilize to proper water chemistry for wildlife. Background research determined that excavating to the elevation of 0.9 feet MSL would have an 85 percent probability of retaining standing water in the project site and sustaining a wetland environment for waterbirds (Oceanit 2009). Due to the high probability of standing water at an excavated elevation of 0.9 feet MSL, this elevation was initially used as the water surface elevation for the wetland construction, and excavation below this elevation was then used to achieve the preferred depths for the endangered Hawaiian waterbird habitats. Water levels in the proposed wetland pond have been planned to mimic the naturally occurring wetland pond onsite. The proposed project would use the existing hydrology as a means to manage the wetland, and to ensure the wetland function and wetland value at the constructed wetland pond.

Fish growth in the wetland ponds presents a management issue in Pouhala Marsh. Since DOFAW cannot drain water from the pond, there is no way to control the population. However, since it is expected that most of the input would be from rainwater, fish larvae ingress would be minimal. The primary management goal would be to prevent ingress. However, if there are fish that get in to the pond, the pond bottom's varying topography should create enough habitat for nesting chicks and fish. If fish occurs in large concentrations, DOFAW would either use approved pesticides or manually remove them.

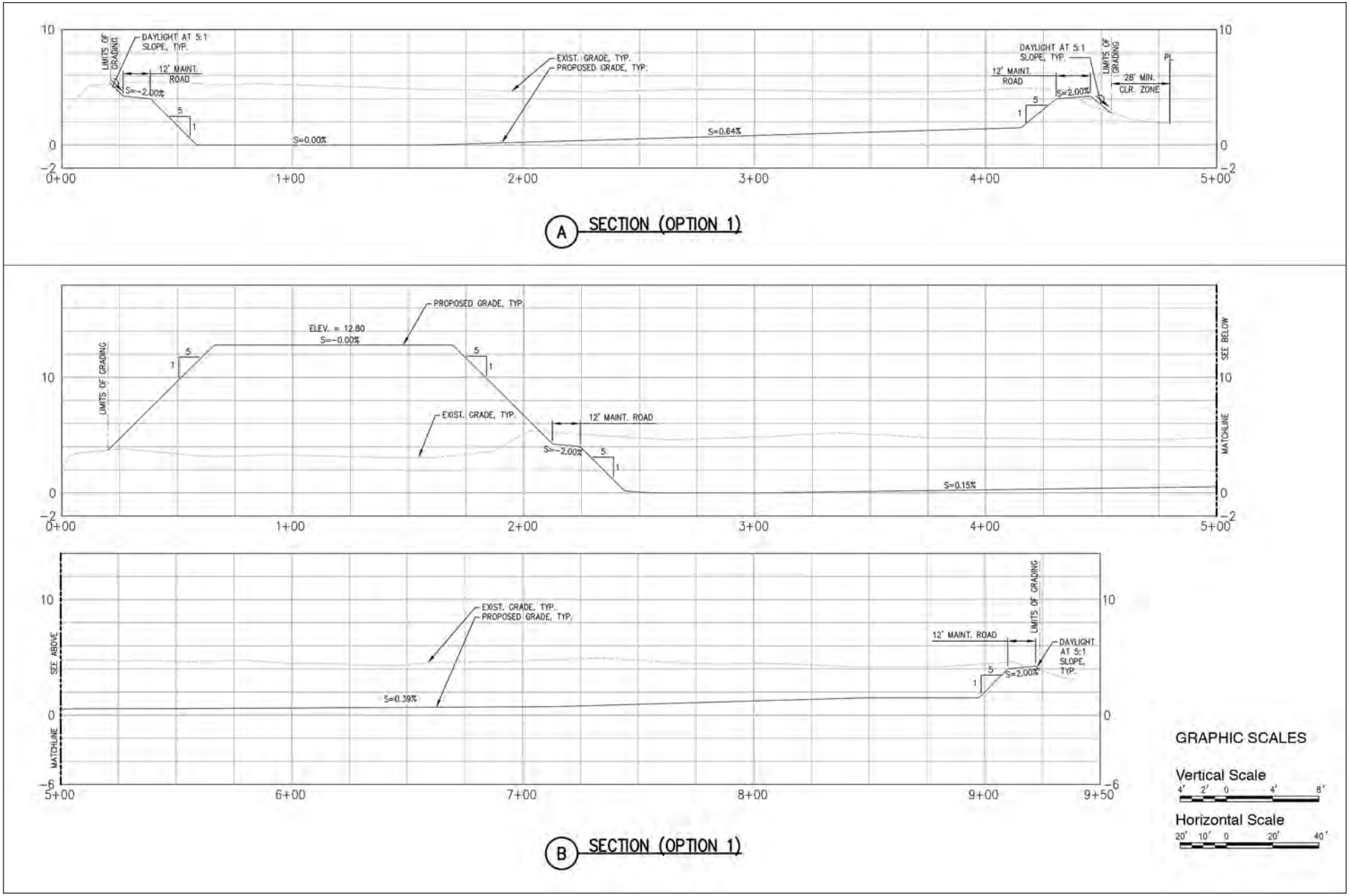


Pouhala Marsh Restoration

SOURCE: Bow Engineering 2017

Figure 4a

Grading Concept Plan: Option 1

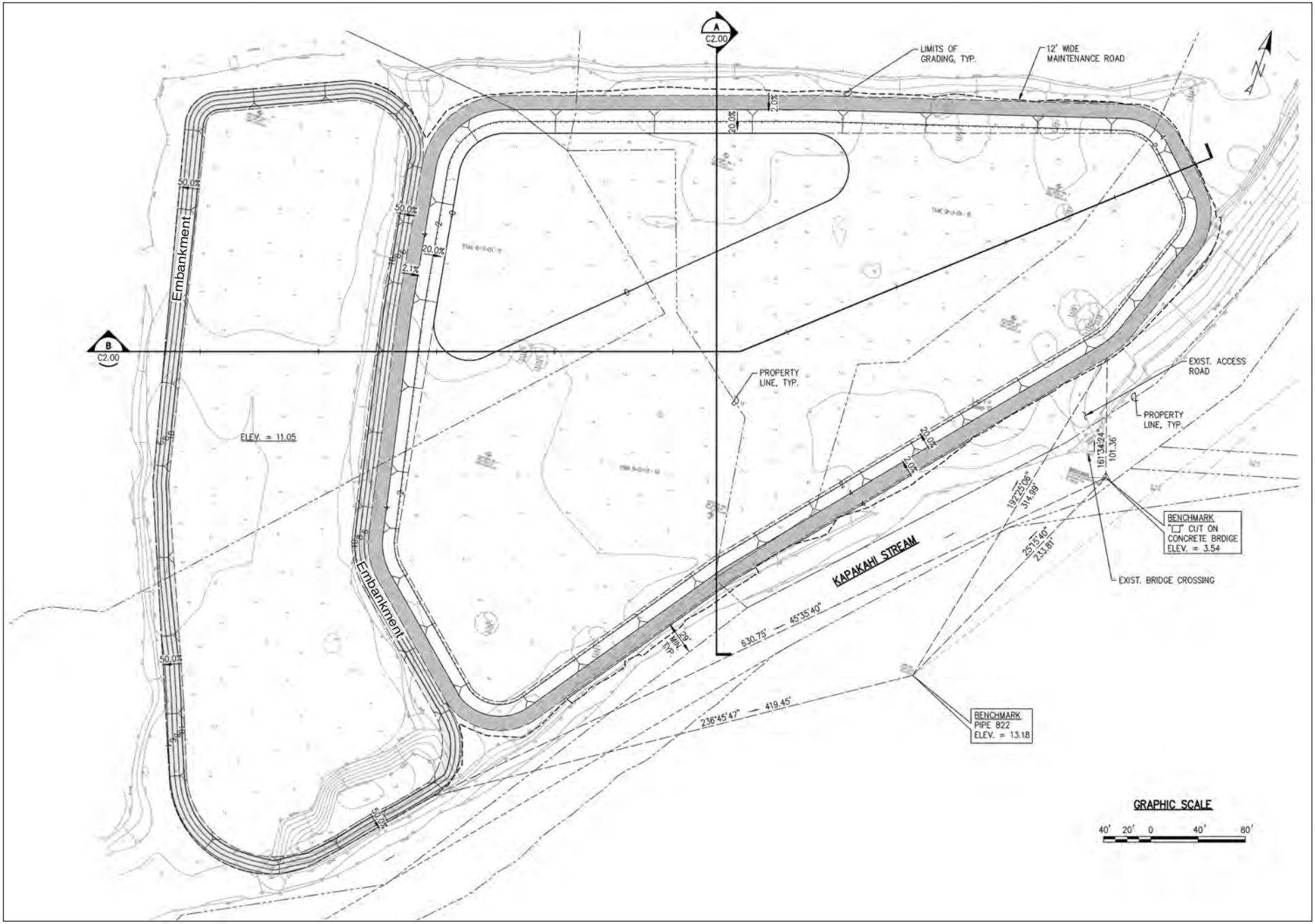


Pouhala Marsh Restoration

SOURCE: Bow Engineering 2017

Figure 4b

Grading Concept Plan: Sections (Option 1)

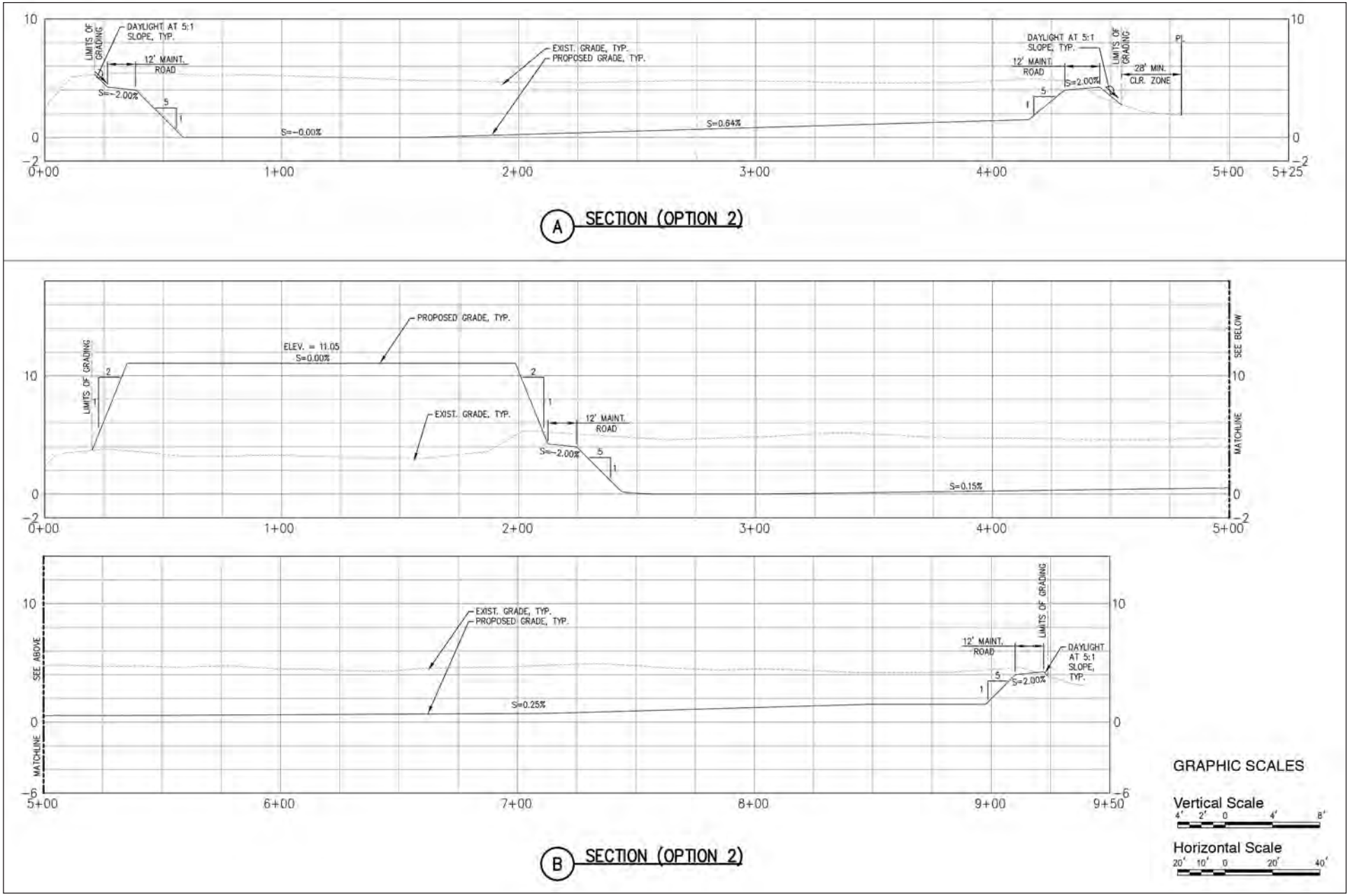


Pouhala Marsh Restoration

SOURCE: Bow Engineering 2017

Figure 5a

Grading Concept Plan: Option 2

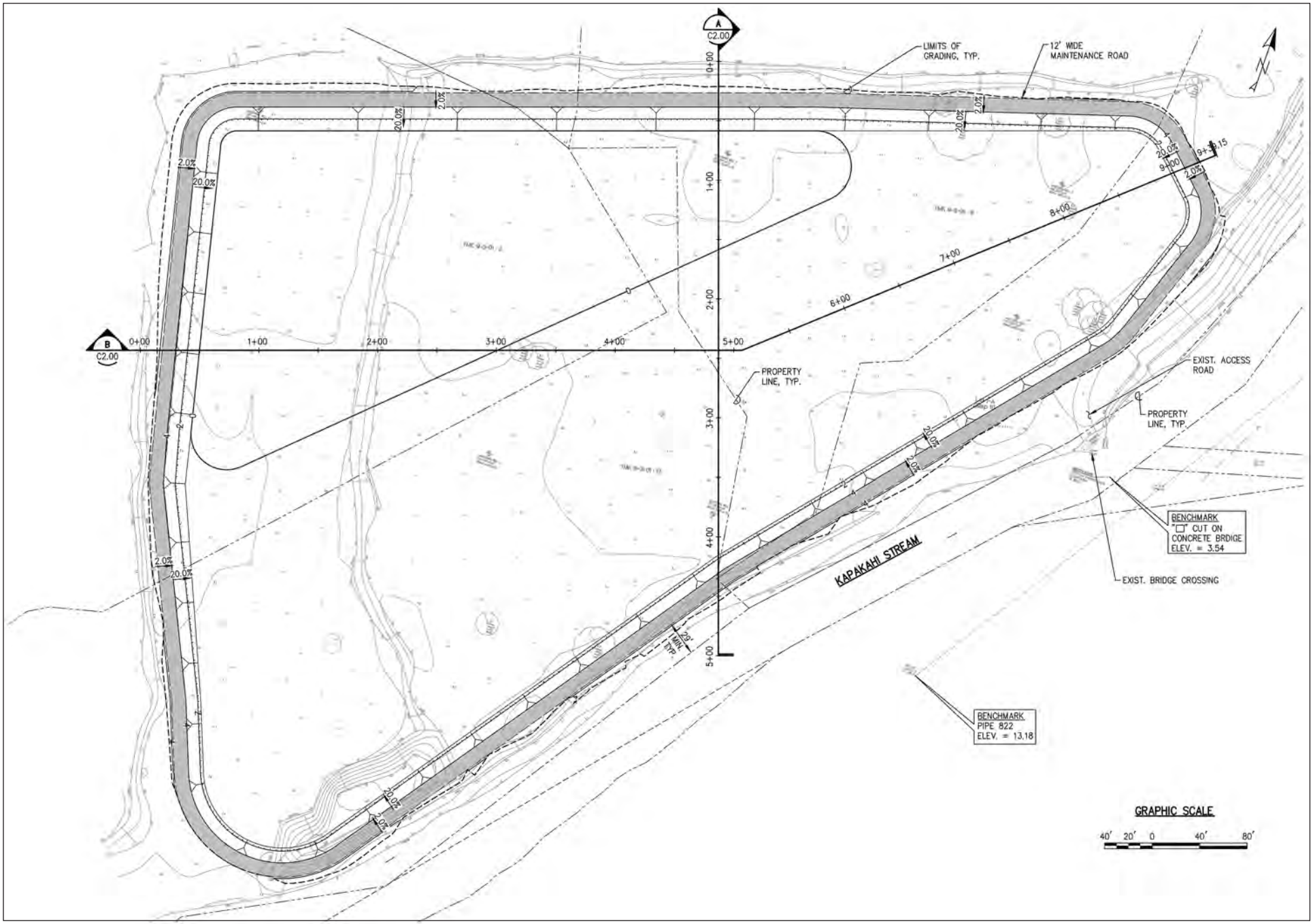


Pouhala Marsh Restoration

SOURCE: Bow Engineering 2017

Figure 5b

Grading Concept Plan: Sections (Option 2)

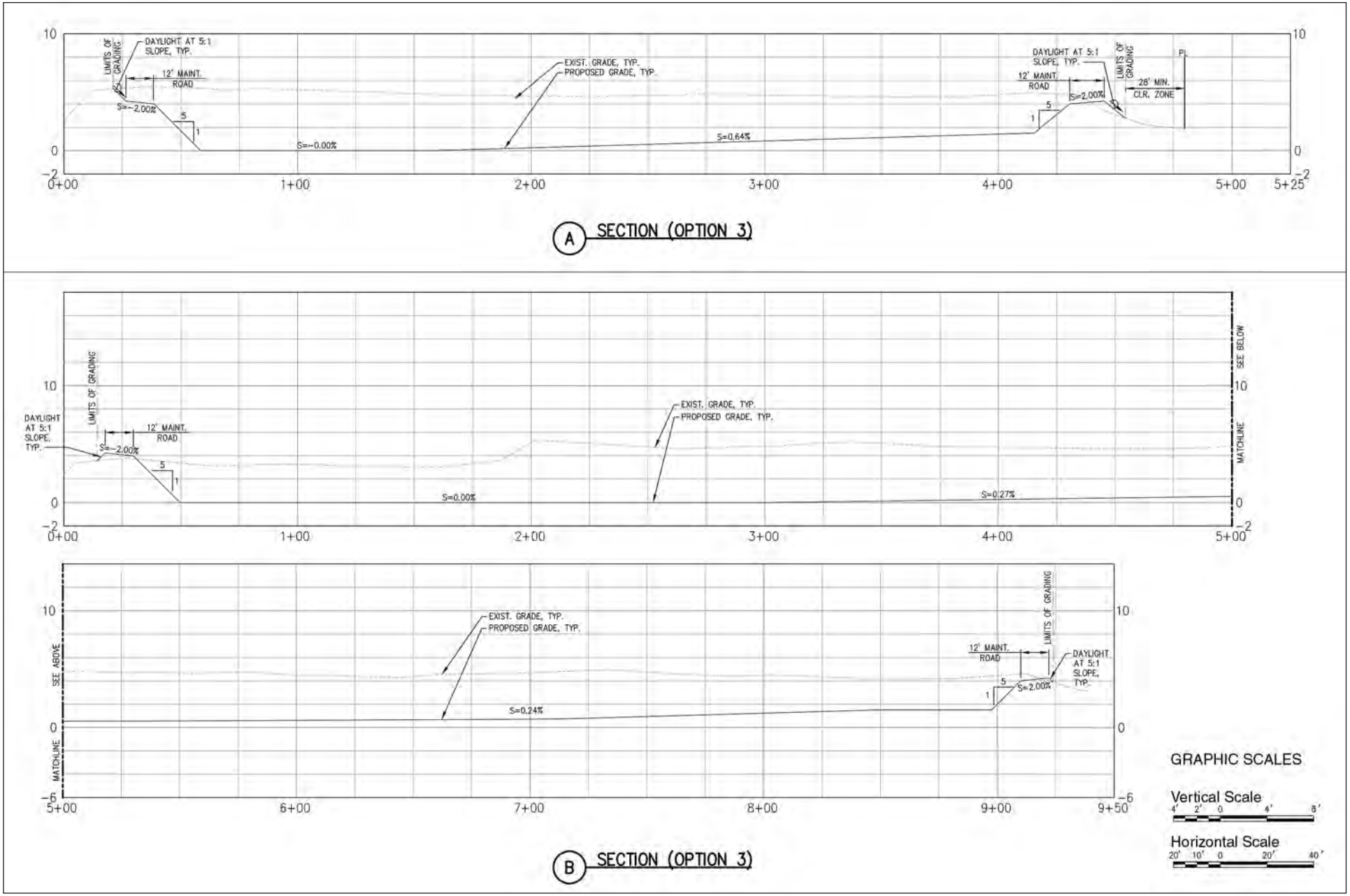


Pouhala Marsh Restoration

SOURCE: Bow Engineering 2018

Figure 6a

Grading Concept Plan: Option 3, Stockpile Removed



SOURCE: Bow Engineering 2018

Pouhala Marsh Restoration

Figure 6b

Grading Concept Plan: Sections (Option 3)

Habitat Restoration and Predator Control
As described above, DOFAW staff and community volunteers have worked to restore wetland health and promote waterbird-nesting habitat, including invasive plant removal, refuse removal, native plantings, and predator control. The main focus has been to re-vegetate the banks along Kapakahi Stream to enhance the Moorhen and Coot nesting habitats. Mangrove, saltbush, and California grass continue to be targeted for eradication, and predator control is conducted year-round to ensure habitats are protected. These efforts will continue in Pouhala Marsh as part of the restoration efforts.

Controlled Access and Environmental Education
During early consultation, the USFWS expressed concern with providing access to the marsh during the Hawaiian stilt breeding season. The following measures have been incorporated into the project description:

- Access to the site will be controlled, particularly during the breeding season to avoid and minimize disturbance to nesting Hawaiian stilts.
- All public access will be limited to individuals accompanied by a DOFAW escort or preapproved for special access by DOFAW.
- All environmental education programs will emphasize the importance of people not feeding wildlife and disposing of trash in proper receptacles.

Signage, enforcement, and fencing will be the primary methods to control site access. A DOFAW community liaison will continuously work with the community to keep them informed. The outreach efforts will be focused on why access needs to be limited during nesting season. In addition, DOFAW plans to have staff on site regularly to ensure compliance.

Site-Specific Best Management Practices
Due to the proximity of existing wetlands and Kapakahi Stream, the project could present increased potential for water quality impacts during construction or as stockpiled materials are incrementally removed. The proposed project would include site-specific Best Management Practices (BMPs) to be implemented during project construction and during removal of stockpiled material to minimize erosion and potential impacts to water quality. The BMPs would include but would not be limited to the USFWS recommended standard BMPs[1] regarding sedimentation and erosion in aquatic environments:

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.
2. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

[1] Since no activities are proposed in the adjacent Kapakahi Stream or nearby marine environment, several BMPs from the USFWS standard recommendations were not included.

3. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP - see http://www.haccp- nrm.org/Wizard/default.asp) can help to prevent attraction and introduction of non-native species.
4. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (e.g., with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.
5. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.
6. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non- invasive vegetation matting, hydro-seeding, etc.

These BMPs will be refined in accordance with City and County of Honolulu regulatory requirements as part of the permitting process.

Project Construction and Cost

The construction of the proposed project would require the following tasks: equipment mobilization and demobilization, excavation of soil, slope grading, loading of soil into trucks, and hauling soil for stockpiling or disposal.

The project would be phased based on funding availability. The first phase would include the excavation and pond creation of up to 5.74 acres of the site and the stockpiling of the excavated material temporarily on the remainder of the ±8.8-acre site. DOWFAW anticipates the stockpiled soil would remain for approximately for approximately 2 - 3 years. As funds become available, portions of the stockpile would be removed and disposed of off site, thereby increasing the area of wetland. Funding or equipment availability and resources from within DLNR could decrease the time of stockpiling; if machinery becomes available, then DOFAW can cut away slowly at the stockpile using in-house resources and staffing.

The estimated construction costs for completion of the wetland restoration project, including pond construction and soil hauling, is $5 million. The hauling and disposal of the soil would generate the majority of the construction cost.

2.3 PERMITS AND APPROVALS REQUIRED OR POTENTIALLY REQUIRED

Government permits required or potentially required to implement the proposed action are listed below:

Federal Permits

- Endangered Species Act, Section 7 Consultation - U.S. Fish and Wildlife Service
- National Historic Preservation Act, Section 106 Consultation – State Historic Preservation Division
- Clean Water Act, Section 404, Department of the Army (DA) Permit - U.S. Army Corps of Engineers
- Clean Water Act, Section 401 – Implemented by the State of Hawai'i, Department of Health, Clean Water Branch

State of Hawai'i

- HRS Chapter 343, Preparation and approval of an Environmental Assessment – The DLNR, Division of Forestry and Wildlife is the accepting agency for the proposed action and has the authority to determine if the EA is adequate and whether a FONSI is appropriate
- HRS Chapter 6E, Historic Preservation Review – DLNR, Historic Preservation Division
- Conservation District Use Application (CDUA) – DLNR, Office of Conservation and Coastal Lands (OCCL)
- Coastal Zone Management Act Consistency Determination - Department of Business, Economic Development and Tourism, Office of Planning
- National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Stormwater Activities - Department of Health
- Special Management Area Permit (SMA) – City and County of Honolulu, Department of Planning and Permitting
- Community Noise Permit – Department of Health
- Construction Permits – Grading and Stockpiling permits from the Department of Planning and Permitting.

Since there would be no construction within the Kapakahi streambed or banks of the stream channel, a Stream Channel Alteration Permit would not be required.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT, ANTICIPATED EFFECTS, AND PROPOSED MITIGATION MEASURES

The intent of this chapter is to describe the existing physical and social environment that is affected by the proposed action. As defined in HAR Section 11-200, Environmental Impact Statement Rules, potential project impacts or effects may include primary and secondary impacts, in addition to cumulative impacts:

- A "primary impact" or "direct impact" means impacts that are caused by the action and occur at the same time and place.
- A "secondary impact" or "indirect impact" means impacts that are caused by the action but occur later in time, but are still reasonably foreseeable. Indirect effects 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.
- A "cumulative impact" means the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (HAR Section 11-200-2).

Potential impacts that may result from implementation of the proposed action and mitigation measures to minimize the adverse impacts are described below.

3.1 GEOLOGY, TOPOGRAPHY, AND SOILS

Geology

The Island of Oʻahu is of volcanic origin. Pouhala Marsh is located on recent sediments deposited on the southern flank of the Koʻolau Volcano (see Figure 7). The Koʻolau lavas are divided into the Koʻolau Basalt and the Honolulu Volcanics. The Pouhala Marsh area consists of Koʻolau Basalt, with Holocene and Pleistocene[2] sedimentary caprock deposits directly underlying the project area. (Oceanit 2009)

The rocks of the Koʻolau Basalt can be divided into three groups: lava flows (aʻa and pahoehoe), pyroclastic[3] deposits, and dikes. The lava flows of the Koʻolau basalt are usually thin bedded with an average thickness of about ten feet. These beds are composed of aʻa and pahoehoe flows and pyroclastic deposits. Aʻa contains a solid central core between two gravely clinker[4] layers. Pahoehoe flows are usually characterized by a smooth ropy texture. Pyroclastic deposits originate from explosive volcanism. They are composed of easily crumbled sand-like ash and hardened tuff[5] deposits. Dikes are thin near vertical sheets of rock that intruded or squeezed into existing lava flows or pyroclastic deposits. (Oceanit 2009)

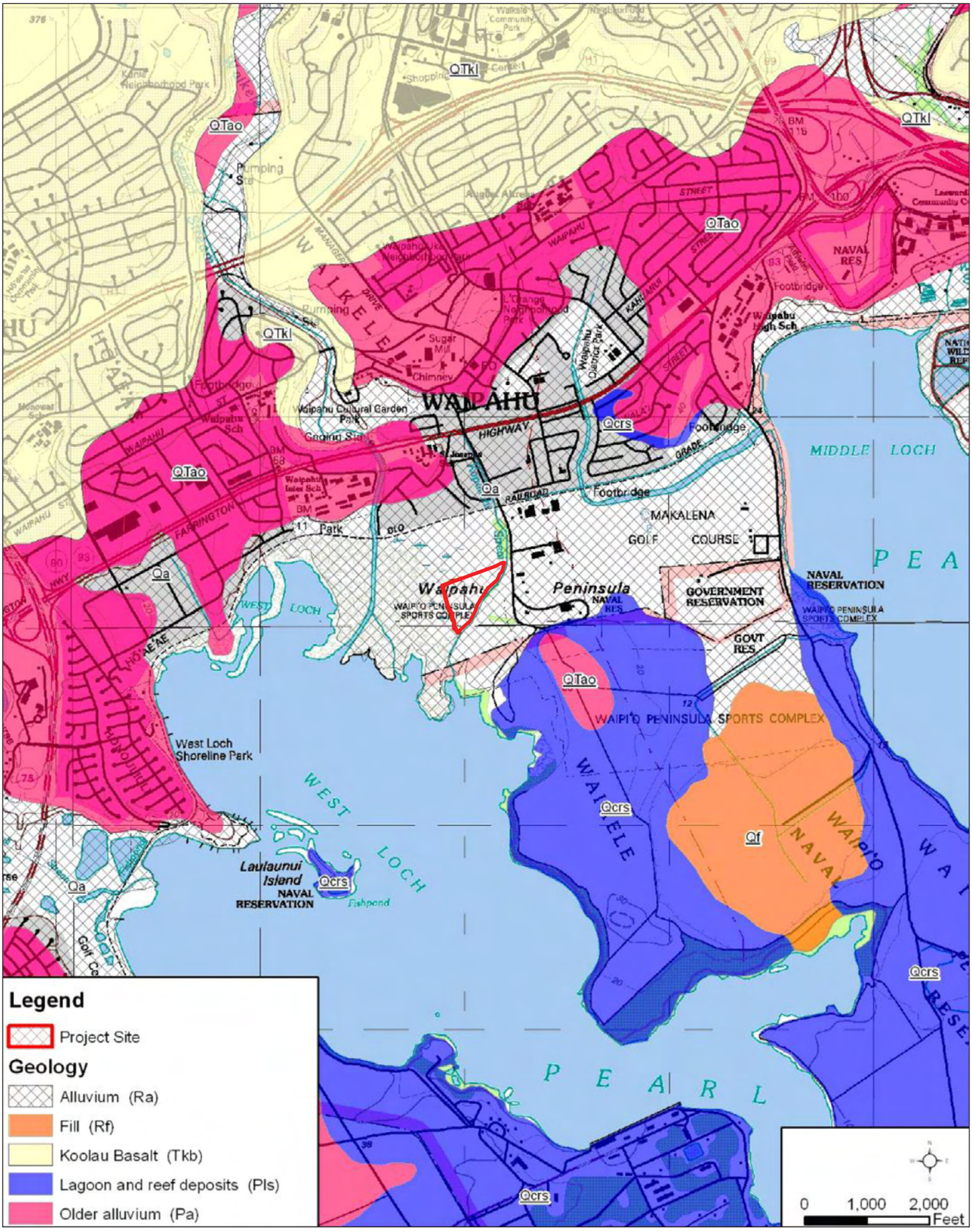
---

2 The Holocene is the current geological epoch, which began after the Pleistocene, approximately 11,700 years ago.

3 Pyroclastic deposits are the products of volcanic explosions.

4 Clinkers are the loose fragments that make up the surface of flows that are formed as pasty lava is pulled apart by shearing.

5 Tuff is an igneous rock (solidified molten rock material) that forms from the products of an explosive volcanic eruption.



Pouhala Marsh Restoration

SOURCE: Oceanit 2009

Figure 7

Geology Map of Pouhala Marsh

The caprock is composed of a wedge of a diverse variety of terrestrial and marine sediments. It forms a coastal plain about 5,000 feet wide between basalt outcrops in the Waipahu and Pearl Harbor coast. The caprock is slightly over 100 feet thick in the Pouhala Marsh area. The caprock in the project area has been covered with artificial fill. The surface deposits in the project area are predominantly mud, soil, and pebbles deposited by Waikele Stream. The artificial fill in the area is composed of saprolitic red soil (Oceanit 2009).

Soils

The Natural Resources Conservation Service (NRCS) classifies the soils in Pouhala as mixed fill land (see Figure 8). Waipahu Silty Clay and Tropaquepts soils are also found adjacent to the project site (NRCS 2018). Waipahu Silty Clay weathered directly from the existing volcanic rock and is common near the ocean in southern Oʻahu. Tropaquepts are soils formed in wetlands. They were formed in conditions of periodic flooding (Oceanit 2009).

Soil Hazards

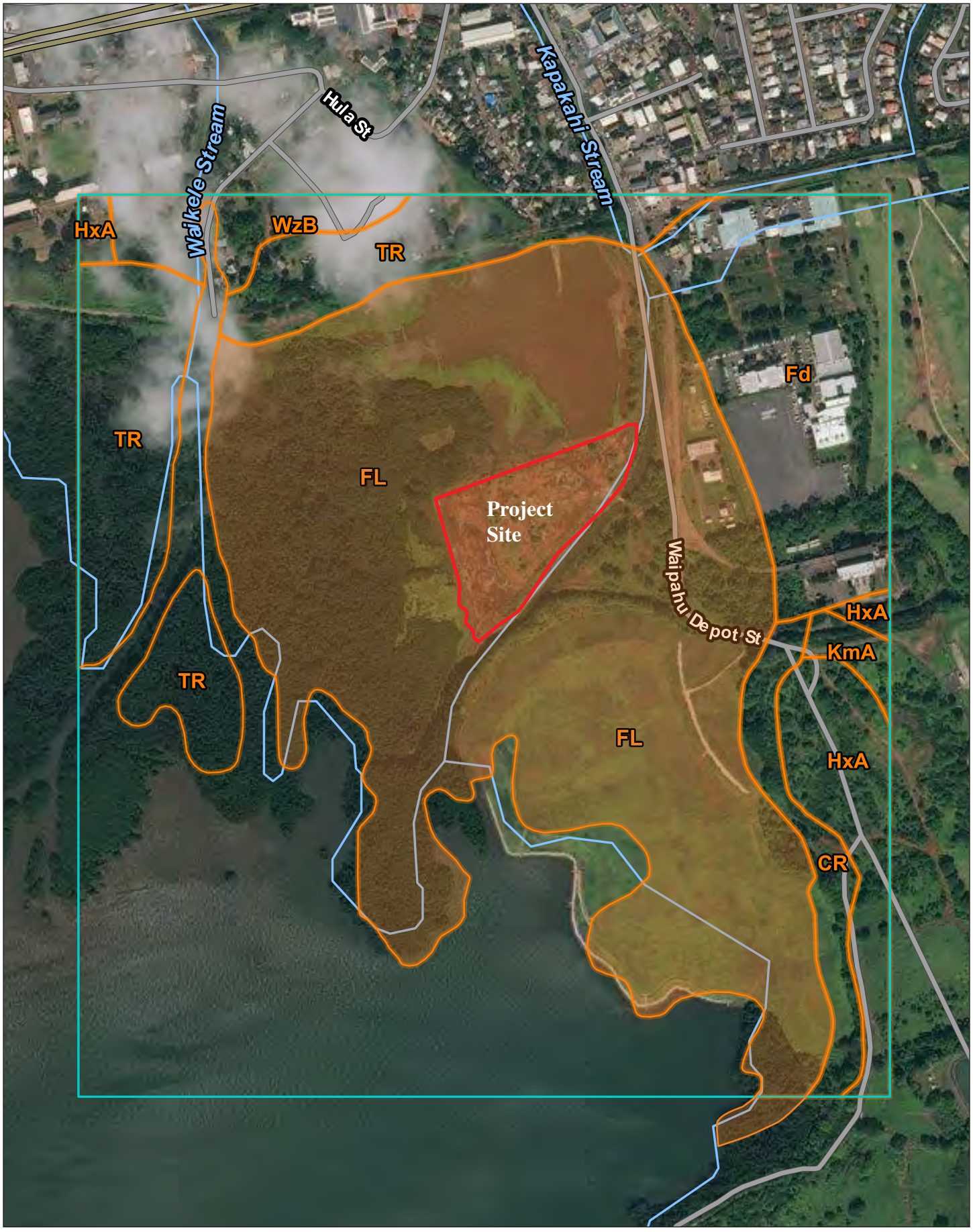
Based on soil sampling completed for the 1998 EA, it was determined that the landfill soils at the site represent a well-homogenized fill material that do not appear to present an environmental risk, and do not require special handling, treatment, or disposal. The survey determined that the material littering the project site appears to be limited to the surface and is a product of random illegal dumping. Since that time, the site has been cleared of surface materials in previous cleanup efforts. No further illegal dumping has occurred at the project site (DLNR 2018).

Topography

Elevations on the project site range from 3-4 feet Mean Sea Level (MSL). The area of proposed wetland restoration is relatively flat. Kapakahi Stream borders the southern boundary of the site, with a dike separating the stream from the project site.

Agricultural Soils

Based on soil suitability and extent, the State of Hawaiʻi, Department of Agriculture has established the Agricultural Lands of Importance to the State of Hawaiʻi (ALISH) system to identify areas of prime farmland. The ALISH system classifies three types of land suitable for agriculture: Prime Lands, Unique Lands, and Other Lands. The project site is not located on designated agricultural lands of importance (Hawaiʻi OP 2018).



Pouhala Marsh Restoration

SOURCE: Oceanit 2009; NRCS 2018

Figure 8
Soils Map

IMPACTS AND MITIGATION MEASURES

The project involves the excavation and temporary stockpiling of previously filled material onsite, in addition to hauling soil for disposal when funding becomes available. There would be a short-term increase in soil erosion during construction since soil excavation and slope grading associated with construction of the proposed project would result in the exposure of bare soil to potential erosion. An erosion control plan will be submitted prior to grading and trenching activities and will specify BMPs in accordance with the City and County of Honolulu's Best Management Practices Manual for Construction Sites, as amended (City and County of Honolulu 2011). The BMPs would include site-specific measures as outlined in Section 2.2 of this EA. BMPs and soil stabilization measures would also be required for removal of stockpiled materials and hauling soil for disposal, to be completed in phases. All excavation and grading operations would be conducted in compliance with dust and erosion control requirements included in the grading and trenching permits issued by the City and County of Honolulu, and the proposed project would not result in a significant impact due to soil erosion or off-site sediment transport. For a discussion of drainage on the project site, see Section 3.2, *Hydrology and Water Quality*.

Ongoing erosion and sedimentation from the project site could present impacts to the sections of wetland closest to the project site (Ducks Unlimited 1998). The removal of the soil and stockpiling of the materials would include slope stabilization measures that would mitigate transport to the adjacent wetland areas. Since it was determined no contaminants of concern are present in the project site soils, no impacts from mobilization of hazardous soil contaminants during construction would occur.

No long-term or cumulative adverse effects to geology, topography, or soils are anticipated with implementation of the proposed action.

3.2 HYDROLOGY AND WATER QUALITY

Hydrology

Along the coastal area of southern O'ahu, the flow of groundwater toward the ocean is impeded by the caprock confining unit. Groundwater discharge from this area occurs as diffuse leakage through the caprock and as spring flow over the top and through openings or breaks in the caprock. Groundwater flows into Pearl Harbor along a nearly continuous zone of springs (USGS 1997). Groundwater recharge occurs mostly from infiltration of rainfall and irrigation water in the Pearl Harbor area.

The soil test borings data from February 18 to March 17, 2009 found that the groundwater elevations ranged between 0.799 and 1.599 feet MSL on the project site, with an average groundwater level of 1.12 feet MSL (Oceanit 2009).

Surface Waters

The State DLNR, Division of Aquatic Resources (DAR) has established watershed areas for the island. The project site and the Kapakahi Stream are within the Waipio Naval Reservoir / Kapakahi watersheds (DAR 2008; DOH CWB 2006). The area of the watershed is approximately 2,400 acres, and is located just to the east of the much larger Waikele watershed. The watershed of the Pouhala Marsh is almost completely developed. The Kapakahi stream is channelized, primarily for flood

control, but is not continuously lined with concrete. The mouth of the stream enters West Loch through the same forest of mangrove as Waikele Stream.

Water levels at Pouhala Marsh are affected by direct rainfall and tidal and stream waters. The two major water inputs for Pouhala Marsh are from the Koʻolau and Waiʻanane Ranges (Ducks Unlimited, 1997). Water inputs that come directly to Pouhala Marsh are the Waikele Stream, West Loch, and rainfall. Waikele Stream and tidal fluctuations directly contribute to water levels within the marsh. Surface water from Kapakahi Stream does not influence the groundwater or surface water in the marsh due to a dike separating the stream and the marsh (DOFAW 2017; Oceanit 2009). Total rainfall at the marsh during the field investigation period was minimal, and rainfall was not considered a significant water source in the marsh. However, evaporation was substantial and was considered a significant water sink (Oceanit 2009).

Drainage

The project site and upstream urban development is on relatively flat terrain. Currently, approximately seven acres of the project site is a slightly raised area consisting of fill material. Runoff entering the marsh area generally flows from north to south (Bow Engineering 2018) (see Figure 9). Because of the raised fill on the project site, little to no ponding occurs and the project site remains dry under most conditions.

Wetlands

A review of the USFWS National Wetland Inventory Map was completed to identify the presence of wetlands within the vicinity of the project. While there is Estuarine and Marine Wetland identified for other areas of Pouhala Marsh, no potentially jurisdictional wetlands or wetlands of the United States were identified on the project site (see Figure 10) (USFWS 2018).

State Water Quality Standards

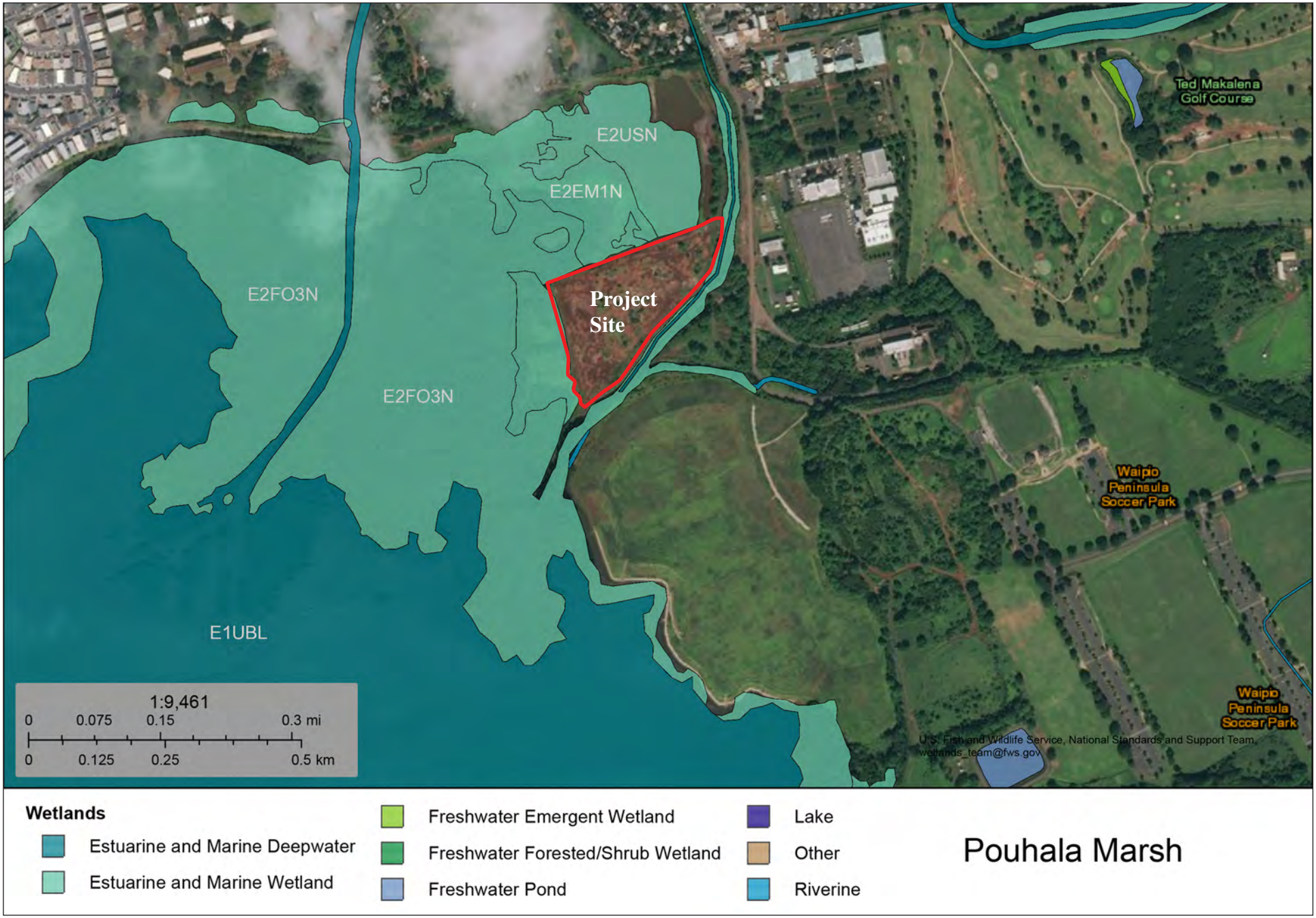
Wetlands located within the Pouhala Marsh Wildlife Sanctuary are State waters as listed in Appendix A of HAR Chapter 11-54. Waters in the West Loch of Pear Harbor are classified by the DOH as "Inland waters, Class 1" subject to Class 1 water protection (DOH 2014)[6]. The objective for Class 1 Inland waters is that the waters remain in their natural state as nearly as possible with the absolute minimum of pollution from any human-cause source. To the extent possible, the wilderness character of these areas shall be protected. Activities resulting in a demonstrable increase in levels of point or nonpoint source contamination are prohibited (DOH 2014). The area can be further classified as Class 1.a. or 1.b., Inland Waters based upon the designation of Pouhala Marsh as a regulated wildlife sanctuary and its State land use designation as "protective subzone" under the Conservation District.

[6] State DOH letter also confirms this status in a comment letter submitted in response to early consultation dated January 26, 2018. See Appendix A.

Pouhala Marsh Restoration

SOURCE: Bow Engineering & Development, Inc. 2018

Figure 9
Project Site Drainage



Pouhala Marsh Restoration

SOURCE: USFWS 2018

Figure 10

National Wetlands Inventory Map

Water Quality

The Clean Water Act (CWA), Section 303(d), requires states to submit a list of waters that do not attain or maintain applicable water quality numeric criteria, in addition to a priority ranking of impaired waters for Total Maximum Daily Loads (TMDL) development based on the severity of pollution and the uses of the waters. After the identification of water quality-limited waters is completed, states develop TMDLs at a level necessary to achieve the applicable state water quality standards. The State's water quality report lists the Pearl Harbor estuary for levels of total nitrogen, total phosphorus, and other pollutants that have exceeded water quality standards, and is categorized as a "high" priority for initiating TMDL development for the next cycle of monitoring and assessment. Pearl Harbor has been identified and posted as area where fish and shellfish should not be consumed. Both the Kapakahi and Waikele streams are listed as impaired water bodies under the Clean Water Act's 303(d) listing (DOH CWB 2016). Both streams have been identified as a high priority for initiating TMDL development in order to improve water quality, with the TMDLs in progress for Kapakahi Stream. Waikele Stream is listed for total nitrogen, nitrates, and turbidity during the wet season. Kapakahi Stream is listed for total nitrogen, nitrates, and total phosphorus during the wet season, in addition to trash during the wet and dry season, and a visual listing from 2001-2004 for turbidity during the dry season (DOH CWB 2016). The sources of nutrients feeding Kapakahi Stream are likely to include sewer and cesspool seepage, fertilizers from surrounding farms, animal wastes, and household and commercial products that drain into the ground (DOH CWB 2006).

IMPACTS AND MITIGATION MEASURES

The proposed project would have minimal effect on the underlying aquifer because improvements would consist of the creation of a wetland pond and stockpile embankment, in addition to truck hauling of soil for disposal. To accommodate the habitat preferences of the different endangered Hawaiian waterbirds, the excavation depth would vary in the pond from 0 to 2 feet MSL in order to create shallow waters of 1 to 6 inches of water. The aquifer below the project site would not be used as a drinking water source. Therefore, the project would not have long-term impacts adversely affecting the underlying aquifer system or potable water resources.

Construction activities disturbing one or more acres are regulated under the National Discharge Elimination System (NPDES) stormwater program and are required by the State to obtain a NPDES permit. Prior to the initiation of grading, the project applicant will prepare and implement a stormwater pollution prevention plan and BMPs designed to reduce potential impacts to water quality during construction of the project. The BMPs will identify the most effective erosion, sedimentation, and turbidity control measures to reduce the amount of soil and sediment accumulation in the coastal waters as a result of construction activities. The mitigation measures may include, but not be limited to, the onsite use of the "*Site-Specific Best Management Practices*" listed in Section 2.2 of this EA regarding sedimentation and erosion in aquatic environments.

The BMPs will be developed in accordance with the City and County of Honolulu regulatory requirements as part of the permitting process, including the prevailing soil erosion and stormwater quality standards ("Rules Relating to Water Quality"). With implementation of BMPs, the construction of the project would not result in a violation of water quality standards. For a discussion of impacts due to soil erosion and off-site sediment transport, see Section 3.1, *Geology, Topography, and Soils*. For a discussion of impacts due to flooding, see Section 3.3, *Natural Hazards*.

Following establishment of the proposed pond, stormwater runoff upstream of the project site would either enter the proposed wetland pond or would be diverted to the west of the proposed stockpile embankment. If a storm event causes runoff and baseflow from tidal and stream waters to exceed the proposed wetland pond capacity, overflow would enter Kapakahi Stream and discharge to the waters of West Loch, Pearl Harbor. Runoff and baseflow diverted by the proposed stockpile embankment would flow to the west into the mangroves and eventually discharge to the waters of West Loch, Pearl Harbor (see Figure 9). The proposed pond would not result in an increase in stormwater since there would be no increase in impervious surfaces. Comparing existing drainage and proposed drainage impacts, the proposed pond would create an area for waters to settle instead of allowing existing sheetflow over the current fill. The proposed wetland pond and stockpile embankment would not create additional stormwater or impede stormwater flows that would adversely affect adjacent City facilities and developed properties located east of Kapakahi Stream. Therefore, there would be no impact on flooding of the areas upstream which currently occurs in a storm. Further, the marsh and new wetland pond would act as a buffer for pollutant sources and sediments in stormwater as it exits into West Loch (DOH CWB 2006). The proposed pond improvements would not be expected to cause an increase in sediment discharge from the project site to nearby surface waters.

The proposed wetland pond improvements should have a beneficial impact on water quality by providing a new wetland pond that would act as a filter for pollutants and sediments in stormwater from upland urbanized areas. As discussed above, there would be no increase in discharge of stormwater to Kapakahi Stream or Pearl Harbor over existing conditions.

Wetland restoration improvements planned under this project would have a positive beneficial impact on the larger Pouhala Marsh wetland by increasing overall wetland pond area. Increased open water areas and seasonal mud flats created would provide better habitat for endangered waterbirds to breed and forage within Pouhala Marsh. For a discussion of permitting pertaining to wetlands, see Section 3.4, *Biological Resources*.

Site-specific BMPs will be implemented during construction to prevent any wastewater, sediment, soil, and debris resulting from the proposed construction from adversely impacting the coastal ecosystem and State Waters in accordance with HAR Chapter 11-54. Compliance with BMPs for construction would minimize impacts to water quality. No long-term or cumulative adverse effects to hydrology or water quality are anticipated with implementation of the proposed action.

3.3 NATURAL HAZARDS

Natural hazards in Hawai‘i include earthquakes, volcanoes, tsunamis, and flooding from hurricanes and tropical storms. Climate change and the related sea level rise will also impact the Hawaiian Islands.

Earthquake and Volcanic Hazards

Most of the earthquakes in Hawai‘i are directly related to volcanic activity and are caused by magma moving beneath the earth’s surface. Numerous small earthquakes are reported each year, mostly on Hawai‘i Island. According to FEMA earthquake hazard maps, the project area is located within Seismic Design Category D, which means it could experience strong shaking with sustained damage to poorly designed or built structures (FEMA 2017). The project area is not located adjacent to any active volcanoes.

Tsunami and Flood Hazards

The Federal Emergency Management Agency (FEMA) maps the project site as predominantly Zone XS[7] with peripheral areas in floodway areas designated as Zone AE (see Figure 11). Flood Zone AE as defined for the project area applies to lands within the 100-year flood zone with a Base Flood Elevation of 2 feet (FEMA 2011). The floodway area designation (Zone AEF) denotes that the area is in the channel of a stream in addition to adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can occur without substantial increases in flood heights (HNFIP 2018). The 8.8-acre project site is outside of the tsunami inundation zone, though there are other areas of Pouhala Marsh that are low-lying and are within the tsunami evacuation zone.

The project site and upstream urban development is on relatively flat terrain with broad floodway areas draining to Pearl Harbor. While flooding does occur in these low-lying areas and interior valleys of Central O'ahu, they are usually not the flash flooding episodes commonly found on the windward side of the island. Flooding has been prevalent in the Central O'ahu lowlands. The flooding problem has increased as flood plain and wetland areas have been developed. Floods can cause considerable damage to agricultural lands, public property, homes, and human and animal life (Honolulu Board of Water Supply 2007). Runoff entering the marsh area generally flows from north to south (Bow Engineering 2018). Pouhala Marsh serves as natural flood basin slowing down surface runoff and reducing discharges to Pearl Harbor.

Hazardous Materials

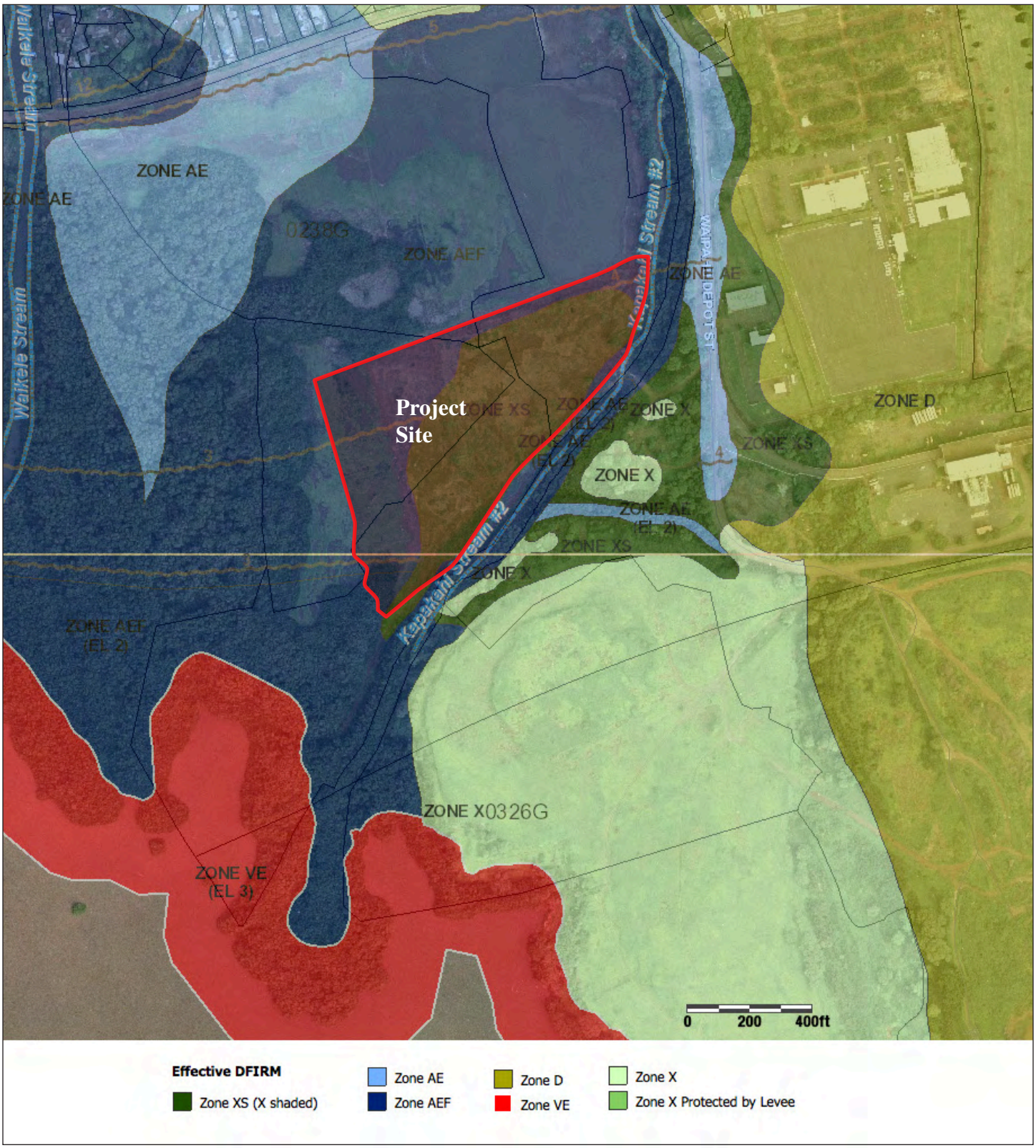
As discussed above in Section 3.1, *Geology, Topography, and Soils: Soil Hazards*, the landfill soils at the site represent a well-homogenized fill material that does not appear to present an environmental risk, and does not require special handling, treatment, or disposal.

Climate Change and Sea Level Rise

Global Warming is a public health and environmental concern around the world. As global concentrations of atmospheric greenhouse gases increase, global temperatures increase, weather extremes increase, and air pollution concentrations increase. Global warming and climate change has been observed to contribute to poor air quality, rising sea levels, melting glaciers, stronger storms, more intense and longer droughts, more frequent heat waves, increases in the number of wildfires and their intensity, and other threats to human health (IPCC 2013). The six warmest years in the 138-year record of global temperatures all have occurred since 2010, with 2016 ranking as the warmest year on record (NOAA 2018).

The influences of climate change on global and local ecosystems are varied and often detrimental. In Hawai'i, the rate of warming air temperature has quadrupled in the last 40 years to over 0.3°F (0.17°C) per decade. Higher temperatures are projected to result in native plant and animal stress, an increase in heat-related illnesses and vector-borne diseases such as dengue fever, and a higher concentration of invasive species. Additional impacts are projected to include a decrease in trade winds and overall disruption of rainfall patterns; warmer oceans and higher ocean acidity, which could lead to coral bleaching; and a rise in sea levels. Projected sea-level rise will undoubtedly increase erosion and flooding statewide and expose coastal communities to greater hazards (University of Hawai'i 2014).

[7] Zone XS includes areas of 0.2 percent annual chance of flood (also known as the "500-year floodplain"; areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1 percent annual chance of flood). Properties in Shaded Zone X are considered to be at moderate risk of flooding under the National Flood Insurance Program, and flood insurance is not required.



Pouhala Marsh Restoration

SOURCE: Hawai'i National Flood Insurance Program (HNFIP) 2018

Figure 11
Flood Hazard Map

IMPACTS AND MITIGATION MEASURES

Establishment of the wetland pond would not result in increased flooding or hazards from flooding in surrounding areas. Storm runoff upstream of the project site would either enter the proposed wetland pond or would be diverted to the west of the proposed stockpile embankment. If a storm event causes runoff and baseflow from tidal and stream waters to exceed the proposed wetland pond capacity, overflow would overtop the pond and exit the site in the same manner as other wetland ponds naturally occurring onsite. Some waters may enter Kapakahi Stream and ultimately discharge to the waters of West Loch, Pearl Harbor. Runoff and baseflow diverted by the proposed stockpile embankment would flow to the west into the mangroves and eventually discharge to the waters of West Loch, Pearl Harbor (see Figure 9). Based on existing drainage and proposed drainage impacts, the proposed wetland pond and stockpile embankment would not result in increased flooding that could adversely affect the adjacent City facilities and developed properties located east of Kapakahi Stream (Bow Engineering 2018). For a discussion of stormwater erosion and sedimentation, see Section 3.2, *Hydrology and Water Quality*.

Greenhouse gas emissions would be generated from the proposed wetland restoration project during construction and operation. Temporary greenhouse gas emissions would occur during construction activities and during removal of stockpile materials, predominantly from vehicle and equipment exhaust. No regular operational greenhouse gas emissions are anticipated – limited emissions could occur from maintenance/work vehicles accessing the site. Greenhouse gas emissions would not be expected to be significant, and the project would not be expected to make a substantial contribution to the cumulatively significant impact of global warming and climate change.

According to a recent report by the Hawai‘i Climate Change Mitigation and Adaptation Commission (2017), potential sea level rise could result in low-lying coastal areas around the island to become chronically flooded within the mid- to latter-half of this century. Based on modeling predictions, areas of the Pouhala Marsh would be permanently flooded with 3.2 feet of sea level rise, particularly along Kapakahi Stream. New and expanded wetland areas would form, potentially improving wildlife habitat (Hawai‘i Climate Change 2017). The report encourages the preservation and restoration of natural landscape features, such as streams, floodplains, and wetlands based on their inherent capacity to minimize the impacts of climate change. Therefore, the proposed wetland restoration project would have a beneficial effect on climate change (Hawai‘i Climate Change 2017).

To minimize potential damage to the wetland restoration improvements during flooding, the pond and drainage improvements would be designed and constructed in conformance with applicable design standards. No significant long-term or cumulative adverse environmental effects would result from natural hazards, and no mitigation would be necessary.

3.4 BIOLOGICAL RESOURCES

A Biological Survey was completed for Pouhala Marsh in December 2017 (DOFAW 2017). The survey included information on habitat restoration, predator control, and existing habitat in the marsh, including the project site. Waterbird surveys were conducted to determine existing population and preferred habitat, and management recommendations were included (see Appendix B).

The project site consists of an 8.8-acre area that has been previously disturbed by the importation of fill material. The project site currently remains dry under most conditions. Kapakahi Stream borders the site to the east, and Waikele Stream is located to the west of the site. The surrounding area consists of established wetlands and mangroves within the Pouhala Marsh Wildlife Sanctuary. The marsh provides existing waterbird habitat. The marsh is adjacent to a small residential area that has resulted in illegal dumping and the introduction of cat and dog predators to nesting sites. Over the past several decades, the marsh has been degraded through siltation, waste disposal, water pollution, and alien plant invasions. According to DOFAW studies, only 24 acres of the marsh within the Main Pond and Waikele Pond areas are used by waterbirds.

Existing Habitat

The habitat at Pouhala Marsh has been characterized into three sections: the Main Pond, the project site (Landfill), and the Waikele Pond. The Main Pond and Waikele Pond are made up of one large pond divided by a natural mudflat barrier and encompassed by pickleweed. Although mangroves have been known to provide some benefits, including shoreline stabilization, Hawaiian habitats can be smothered by the vegetation, impacting the habitat used by native waterbirds and migratory shorebirds (DOH CWB 2006). The project site is distinguished from the Ponds in that it is has a mean elevation of 1.0-foot, is dry year around, except during exceptional rain events, has kiawe scattered throughout, and pickleweed and saltbrush bordering with the adjacent Kapakahi stream. During significant rain events, the project site does not flood, but becomes muddy and is not utilized by any waterbird species aside from shorebirds. The Kapakahi stream borders the marsh and is frequented by the bird species surveyed (DOFAW 2017; see Appendix B).

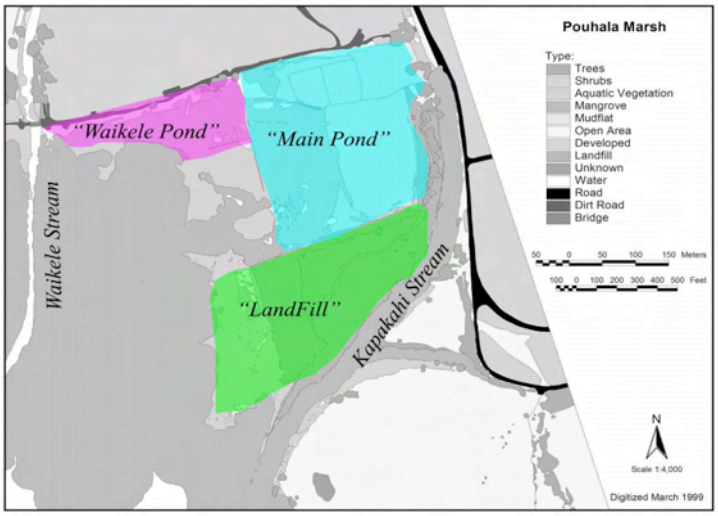


Exhibit 3.1: Three survey areas at Pouhala Marsh: Waikele Pond, the project site (Landfill), and Main Pond (see Appendix B).

The hydrology of the marsh is characterized by influences from sea level, tidal fluctuations, and ground and surface water of the Kapakahi and Waikele streams (Oceanit 2009). Together these factors create "micro" habitats within the larger three areas of the marsh and are utilized differently by the waterbirds. A mudflat is described as an area without vegetation that may be inundated during a high tide or rain event, but at the survey time is not covered with water. Mudflat with vegetation is the same as a mudflat but is vegetated. Habitats described as 0-3 inches, 3-6 inches, or 6 inches> of water, are those that are mostly always inundated but the depth at which they are varies on the above hydrological factors (DOFAW 2017; see Appendix B).

Waterbird Surveys and Nesting

Surveys were conducted following DOFAW protocol and were repeated the same for every survey. The Main Pond is continuously the most used area of Pouhala Marsh by waterbirds (see Appendix B Figure 2). The Main Pond is the most popular because it provides the largest amount of necessary habitat for foraging, loafing, and nesting. It may also provide a degree of refuge from predators due

to the large area of water within the marsh. Stilts are the most common species observed. They also prefer to use habitat that has 0-3 inches of water present and have rarely been observed in dry portions of the marsh. Gallinules and Coots are also observed in the Main Pond but at much lower numbers (see Appendix B Figure 4) and infrequently.

The project site has been described to have loafing stilts scattered around the parcel, with an occasional heavy rain event that creates a pond in the southwest portion of the area. Nesting attempts have been made in the project site by stilts, but few have been successful. Exposure to predators and the elements continuously cause nesting attempts to fail without having the proper habitat established for the stilts. Other water-bird species do not make any attempts to nest in this area due to the dry-nature of the land and lack of wetland vegetation.

Based on nesting information, the current suitable habitat for waterbirds is in the Main Pond area. Although nesting efforts are at a minimal status overall in Pouhala, the habitat that the Main Pond provides encourages varying numbers of stilts, gallinules, and coots to congregate within this area. If these birds are commonly sighted within this area, food resources, vegetation, water-levels, and preventative predation efforts are all supporting the water-birds' survival. The Main Pond contains various water depths and patchy vegetation, allowing for partitioned areas for each bird species. The research and survey data suggest that current populations are affected by confined habitat use within the Main Pond.

Protected Habitat and Species

No federally-listed endangered or threatened plant species were noted during the assessment. The project site has been highly modified. No fisheries are present within the project site, since the project site is dry.

As stated above, Pouhala Marsh provides important habitat for four endangered species of native Hawaiian waterbirds. It has been identified by the USFWS as a protected, core wetland area with permanent habitat that supports a substantial number of waterbirds in its 2011 update to the Recovery Plan for Hawaiian Waterbirds. Four species of endangered Hawaiian waterbirds found in Pouhala Marsh include the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), Hawaiian moorhen (*Gallinule chloropus sandvicensis*), and Hawaiian duck (*Anas wyviliana*).

During the early consultation process, the USFWS provided the following comments based on data compiled by the Hawaii Biodiversity and Mapping Program as it pertains to listed species and designated critical habitat in accordance with Section 7 of the Endangered Species Act (ESA) (see comment letter in Appendix A):

> There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate that the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat *(Lasiurus cinereus semotus);* the endangered Hawaiian stilt, endangered Hawaiian coot, endangered Hawaiian gallinule (moorhen), and endangered Hawaiian duck (hereafter collectively referred to as Hawaiian waterbirds), and the endangered Hawaiian goose *(Branta sandvicensis).* Also, the Pacific golden-plover *(Pluvialis fulva),* ruddy turnstone *(Arenaria interpres),* sanderling *(Calidris alba),* and wandering tattler *(Tringa incana),* shorebird species protected under the MBTA, are known to occur within the proposed project area.

IMPACTS AND MITIGATION MEASURES

In their pre-assessment consultation comment letter, the USFWS provided the following information and recommended mitigation measures to minimize impacts to these federally listed species (see letter in Appendix A):

Hawaiian hoary bat
The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when the adults forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away.

To minimize impacts to the endangered Hawaiian hoary bat, the USFWS recommended measure is included as mitigation:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).

Hawaiian waterbirds
Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water occurs. Hawaiian waterbirds are known to occur at the Pouhala Marsh, which has been designated as a core wetland (USFWS 2011) that is protected and has been managed by DOFAW to recover Hawaiian waterbirds.

Hawaiian stilt nesting occurs from mid-February through August. Hawaiian coot nesting occurs primarily from March through September, although some nesting occurs in all months of the year. Hawaiian gallinules nest year-round, but mostly from March through August. For the Hawaiian duck, nesting can occur year round. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards. If a nest is present, potential impacts include parents being flushed from the nest for extended periods of time causing the nest to fail *(e.g.,* exposed to predation) or eggs or chicks being crushed by humans or equipment.

To avoid and minimize potential project impacts to Hawaiian waterbirds, the USFWS recommended measures are included as mitigation:

- In areas where waterbirds 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.

- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within three days of project initiation and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - 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.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

Hawaiian goose

Hawaiian geese have been documented at various sites on Oahu and have been seen regularly traversing between Mililani at the Agricultural Park and at a local golf course and to the North Shore of Oahu at James Campbell National Wildlife Refuge and Turtle Bay Resort. They have been observed at the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. They are observed in a variety of habitats, but prefer open areas, such as natural grasslands and shrublands, pastures, wetlands, golf courses, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize impacts to the Hawaiian goose, the USFWS recommended measures are included as mitigation:

- Do not approach, feed, or otherwise disturb Hawaiian geese.
- If Hawaiian geese are observed loafing or foraging within the project area during the Hawaiian goose breeding season (September through April), have a biologist familiar with the nesting behavior of the Hawaiian goose 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 three 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 work, or a previously undiscovered nest is found within said radius after work begins.
- In areas where Hawaiian geese 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.

The project is expected to have an overall positive beneficial impact on bird species, particularly the four species of endangered Hawaiian waterbirds found in Pouhala Marsh. Construction of the proposed pond would not result in displacement during implementation, since the project site is not is not the preferred habitat of the Hawaiian waterbirds. Establishment of the proposed wetland pond would create additional habitat for the waterbirds. Creating a new pond in the project site provides wildlife managers an opportunity to create preferred habitats. Having deeper-water perimeters would create a "moat" like buffer that can prevent predators from entering the sensitive interior pond and provide foraging habitat for Coots. Creating exposed elevated mudflats and

planting native water plants along the perimeters and interior areas of the pond would allow a full utilization of the habitat. This would avoid the problem that the Main Pond faces in having the only nesting habitat on the perimeters. Having a new pond to mold from the beginning would also ensure that native plant life can be planted and thrive while ensuring invasive plants like mangrove and pickle weed are not introduced.

During construction, site-specific BMPs developed as part of the permitting process would minimize erosion and sedimentation and potential adverse effects to aquatic biota in the vicinity of the project site. No adverse long-term effects to aquatic biota would occur, and no mitigation would be necessary.

As stated in the early consultation letter (see Appendix A), the USFWS is in support of the proposed Pouhala Marsh Restoration project and the work DOFAW has done to manage Pouhala Marsh for Hawaiian waterbird recovery.

It appears that a Department of the Army (DA) permit would be required for the proposed Pouhala Marsh Restoration project before any work can be initiated. Based on early consultation with the USACE (see Appendix A), the proposed project would likely qualify for a Nationwide Permit (NWP) #27, Aquatic Habitat Restoration, Establishment, and Enhancement Activities. The NWP #27 states: "To be authorized by this NWP, the aquatic habitat restoration, enhancement, or establishment activity must be planned, designed, and implemented so that it results in aquatic habitat that resembles an ecological reference. An ecological reference may be based on the characteristics of an intact aquatic habitat or riparian area of the same type that exists in the region." The proposed project was designed with the existing wetland pond at Pouhala Marsh as an ecological reference. The NWP #27 "does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments." While it does not appear that the previous fill site contains wetlands, a wetland delineation will need to be completed for jurisdictional determination purposes, and to ensure that no existing wetland would be converted with implementation of the proposed project. Following the wetland delineation, the USACE would be able to determine if the project qualifies for coverage under the NWP #27, or if it will be processed as a Standard Permit.

For the DA Permit, the National Marine Fisheries Service (NMFS) anticipates that the USACE will consult with NMFS Pacific Islands Regional Office (PIRO) on the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, section 305(b)) as described by 50 CFR 600.920, and Section 7 of the Endangered Species Act. The Magnuson-Stevens Act defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802(10)). Adverse effects to EFH may result from actions occurring within EFH or "upstream" from EFH; and may include site-specific or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions (50 C.F.R. § 600.810(a)).

As set forth in the NMFS response to early consultation (see Appendix A):

> The marine water column from the surface to a depth of 1,000 meters (m) from shoreline to the outer boundary of the EEZ (200 miles), and the seafloor from the shoreline out to a depth of 700 m around each of the Hawaiian Islands, have been designated as EFH. As such, all waters and submerged lands (i.e., the water column and bottom) of Pearl Harbor

are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. The MUS and life stages found in these waters include: eggs, larvae, juveniles, and adults of Coral Reef Ecosystem MUS; eggs, larvae, juveniles, and adults of Bottomfish MUS; eggs, larvae, juveniles, and adults of Crustacean MUS; and juveniles and adults of Pelagic MUS.

During the DA Permit process, the USACE will consult with NMFS regarding potential adverse effects to EFH as a result of project activities. The conditions as set forth in the permit will be required to be implemented, and would minimize potential adverse impacts to wetlands or EFH. Additional measures have been incorporated into the project in order to minimize project impacts to NOAA trust resources, including project specific BMPs to control erosion and runoff during construction.

3.5 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

An archaeological Reconnaissance was completed for the Pouhala Marsh by Bishop Museum for the previous Environmental Assessment (Ducks Unlimited, Inc. 1998). In order to assess the potential for encountering archaeological remains, the archaeological survey included the following:

- Relevant historical documents were reviewed (including maps, land surveys, grand and land court records, and written descriptions) to determine the types of activities that took place in the area to predict the types of archaeological remains that could be encountered. These sources were consulted to help determine the possible archaeological significance of the area.
- Previous archaeological work around the West Loch of Pearl Harbor was reviewed to determine the types of sites and cultural materials that were recorded in the vicinity of the project area.
- A pedestrian survey of the project area above water was completed and subsurface testing was conducted to assess the potential for cultural materials.
- If archaeological materials were encountered, their significance was assessed, based on the Hawai'i State Historic Preservations regulations in place at the time (Ducks Unlimited, Inc. 1998).

The following sections are summarized from the previous EA for the Pouhala Marsh (Ducks Unlimited, Inc. 1998).

Historical Background

The project site is located in the Waikele *ahupua'a* in the Ewa District of O'ahu. Historically, from the A.D. 900s or so to the 1800s, the project area included fishponds, shallow shore fisheries, and the edges of taro lands of Waikele. In the mid-seventeenth century, Waikele was an important center for Native Hawaiian chiefs. Two *heiau*, or Hawaiian temples, were located in Waikele, about a kilometer *mauka* (toward the mountains) of the project area. The lower area of Waikele is noted for its springs. (Ducks Unlimited, Inc. 1998)

The two main historic features of the project area were Kaʻaukuʻu and Pouhala fishponds (*loko*), which extended into the Sea of Kaihuopalaai, or the West Loch of Pearl Harbor. According to the report:

> Loko Kaʻaukuʻu was once 41 acres in extent, and Pouhala was 22 acres. A smaller fishpond, Mokuola, was 23 acres at one point, and Loko Maʻaha was 48 acres. Many of the ponds were subsequently subdivided and converted to rice paddies in the late nineteenth to early twentieth centuries. After the end of rice production in the early twentieth century, most of the remaining fishponds were filled in by trash, incinerator ash, and mangroves. The lack of documentation of these fishpond walls presents difficulties in predicting their exact location at the project area. (Ducks Unlimited, Inc. 1998)

Although most of the fishponds have been filled in the twentieth century, the walls of the fishponds were not necessarily destroyed in the process of filling. It is well documented that many of the Hawaiian fishponds were simply filled in with the walls intact. However, based on historical evidence, these appear to have changed their boundaries over the course of the historic period, and most are no longer readily discernible on the ground. (Ducks Unlimited, Inc. 1998)

Previous Archaeological Research

While the project site has not been subject to specific archaeological investigations, there have been numerous projects in the Pearl Harbor area, including West Loch Estates, the Golf Course, and Shoreline Park along the western shore of the west loch. Many of these research projects encountered fishponds and other types of archaeological deposits, including a wide variety of pre- and post-contact archaeological deposits in and around the Pearl Harbor region. (Ducks Unlimited, Inc. 1998)

IMPACTS AND MITIGATION MEASURES

The findings of the archaeological reconnaissance did not recover significant intact deposits related to the past land use of the area. However, surface and subsurface deposits findings in the archaeological reconnaissance suggest the possibility of archaeological deposits, including mid- to late-nineteenth-century debris related to habitation documented along the eastern and northeastern parts of the Pouhala Marsh project area. In addition, the site assessment determined the marsh was historically used as a series of fishponds. These findings indicate that archaeological remains of the fishponds (walls and associated sediments) could be present at the project site.

With the close proximity of historic settlement sites to the proposed project area and historic use as fishponds, due to the lack of subsurface testing or data recovery under fill at the project site, there is potential for previously unidentified subsurface historic and or cultural deposits to be present in the proposed project area. While it is possible that archaeological materials are deeply buried by alluvium and modern fill activities and may not be encountered by land clearance associated with the proposed wetland habitat reconstruction, the following mitigation measure will be required to minimize impacts to unidentified cultural resources:

- A qualified archaeological monitor will be present during all ground-altering activities in order to document any historic artifacts that may be encountered during the proposed undertaking.

- In the event that historic resources, including human skeletal remains, are identified during the construction activities, all work will cease in the immediate vicinity of the find, the find will be protected from additional disturbance, and the SHPD, O'ahu Section, will be contacted immediately.

With implementation of these conditions, no adverse effect to cultural, historic, or archaeological resources would occur. It is emphasized that sensitivity to cultural concerns be employed when dealing with burial issues. Based on historical research and the relatively small scope of the proposed marsh restoration, it is reasonable to conclude that, pursuant to Act 50, the exercise of Native Hawaiian rights, or any ethnic group, related to gathering, access, or other customary activities within the project area would not be affected, and there would be no direct adverse effect upon cultural practices or beliefs.

3.6 AIR QUALITY AND CLIMATE

Hawai'i receives most of its precipitation during the winter months (October to April). Flooding is more likely during this wet period, and stream flows decrease during drier conditions from May to September. Along the Ko'olau Mountains, trade winds come from the northeast for most of the year and bring moisture from the ocean, and overcast skies and showers are frequent. Average temperatures vary from 73.2° Fahrenheit (F) in January to 81.9°F in August at Honolulu Airport (National Weather Service 2018). Mean annual rainfall in the project area is about 24 inches (Giambelluca et. al. 2013). Although tradewind rainfall contributes a proportion of average rainfall, storm events are the most important climatic factor for the project area.

The Department of Health, Clean Air Branch (CAB), monitors the ambient air in the State of Hawai'i for various gaseous and particulate air pollutants. The U. S. Environmental Protection Agency (EPA) has set national ambient air quality standards (NAAQS) for six criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and particulate matter (PM_{10} and $PM_{2.5}$). Hawai'i has established state ambient air standards for all of these pollutants (except for $PM_{2.5}$) in addition to hydrogen sulfide, a product of volcanic emissions (CAB 2016). The primary purpose of the statewide monitoring network is to measure ambient air concentrations of these pollutants and ensure that these air quality standards are met.

In 2015, there were four air monitoring stations on the island of O'ahu. One of the monitoring stations is located in Pearl City, in the general vicinity of the project site. According to the State of Hawai'i Department of Health Annual Summary 2015 Air Quality Data, criteria and pollutant levels in the State remained below all federal and state ambient air quality standards (excluding exceedances due to volcanic activity) (CAB 2016).

IMPACTS AND MITIGATION MEASURES

Construction of the proposed project could result in temporary air quality effects, including exhaust emissions from construction vehicles and dust generated by short-term construction related activities. Components of construction emissions include employee trips, exhaust emissions from construction equipment, and fugitive dust emissions. Excavation and grading within the project area could generate airborne dust particulates.

Dust control measures such as watering and sprinkling will be implemented as needed to minimize wind-blown dust. To minimize construction-related exhaust emissions, project contractors will

ensure that all internal combustion engines are maintained in proper working order. All construction work will be in conformance with the air pollution control standards contained in HAR Title 11, Chapter 59, "Ambient Air Quality Standards," and Chapter 60, "Air Pollution Control," which would minimize air quality emissions.

Once completed, the proposed wetland creation would not result in any air emissions, and there would be no long-term adverse air quality impacts associated with the proposed action. Other than passing vehicles on nearby roadways, there are no air contaminant sources in the immediate project area.

3.7 NOISE

The project site is located in Pearl Harbor Estuary's West Loch, with marshland to the west and the Police Academy to the east in the immediate surrounding area. Surrounding noise levels in the vicinity of the project site are considered relatively low. Existing noise sources include the sound of flowing stream water, occasional vehicular traffic on Waipahu Depot Street, and activities at the Police Academy.

IMPACTS AND MITIGATION MEASURES

Noise impacts from a project can be categorized as those resulting from construction and those from operational activities. Construction noise would have a short-term effect; operational noise would continue throughout the lifetime of the project. Implementation of the proposed wetland improvements could temporarily increase noise levels during construction. Noise from construction activities is regulated under Title 11, Chapter 46 (Community Noise Control) of the State DOH's Administrative Rules (State of Hawai'i, 1996). The zoning district classification and maximum permissible sound levels are outlined in HAR Section 11-46-4. The project falls under the Class A zoning district category that applies to properties zoned for preservation and conservation types of land uses. The maximum permissible noise level for this site under Class A is 55 dBA at the property line during daytime and 45 dBA during nighttime. Typical ranges of construction equipment noise vary between 70 and 95 dBA. Therefore, earthmoving activities could temporarily increase noise levels during construction above maximum allowable limits that would impact nearby existing public uses.

A Community Noise Permit for construction activities may be required by the Department of Health. Prior to construction, consultation with the state Department of Health will occur to determine permitting requirements. Should the permit be required, allowable construction conditions will be specified. Construction will be confined to 7 a.m. to 6 p.m., Monday through Friday, and 9 a.m. to 6 p.m. on Saturday. No construction activities exceeding maximum allowable noise levels will occur on Sundays and holidays without prior notice. Construction activities will comply with HAR Chapter 11-46, "Community Noise Control."

There would be no long-term increase in noise during project operations since the project includes establishment of a wetland pond at Pouhala Marsh. Further, the project would not generate additional traffic and associated noise.

3.8 VISUAL RESOURCES

The project area includes wetland marsh, including vegetated areas of pickleweed and mangrove. The project site consists of exposed soil that is predominantly cleared of vegetation. From the project site, there are views of the Kapakahi Stream and wetlands in the short range, and the Waianae Mountain range in the distance.

IMPACTS AND MITIGATION MEASURES

During construction, workers, materials, and equipment would be visible from the Police Academy to the east and motorists on Waipahu Depot Street. Visual impacts during construction would be temporary and intermittent. The proposed temporary stockpiling of material adjacent to the created wetland would create an embankment that could vary from 11 to 12.8 feet. Existing elevations on the project site range from 3-4 feet MSL. The increase of approximately 7 to 9 feet of raised embankment could create more expansive views Waianae Mountain range at this location. While the embankment could be used by educational groups or volunteers to stage maintenance efforts, following completion of the wetland creation and removal of the stockpiled material, the embankment would no longer be available for use.

Since the proposed project consists of wetland restoration within the Pouhala Marsh area, the proposed project would not significantly change the scenic and visual character of the surrounding area. However, restoration improvements should have a beneficial impact by improving this marsh as a scenic resource. Creating additional wetland in a currently dry area would enhance the overall visual unity of the marsh.

3.9 SOCIAL AND ECONOMIC CHARACTERISTICS

In 2013, the population in Honolulu County included an estimated 964,678 persons, with a total of 309,803 households, a median family income of $85,440, and an unemployment rate of 3.7 percent. In the West Loch Census Tract (Tract 87.03), there are an estimated 7,056 persons, a total of 1,665 households, a median family income of $54,398, and an unemployment rate of 9.8 percent (DBEDT 2013).

IMPACTS AND MITIGATION MEASURES

The proposed project is not anticipated to have significant, adverse impacts on the social and economic characteristics of the area. The proposed improvements would enhance the Pouhala Marsh and provide additional wetland habitat for Hawaiian waterbirds. The proposed restoration activities would not generate any new permanent full-time jobs. Therefore, the primary economic effects would be associated with short-term construction jobs that would generate a small minor positive economic impact.

Improvements planned under the proposed wetland restoration would not impact the number of housing units in the surrounding area and surrounding community of Waipahu because no housing units are included under this project.

The proposed restoration improvements would enhance Pouhala Marsh's value as a wildlife sanctuary and increase wetland habitat for Hawaiian waterbirds.

3.10 UTILITIES AND PUBLIC SERVICES

The project site is located within the Pouhala Marsh Sanctuary and is not served by any utility services. The project site is not served by public water or wastewater services, or connected to stormwater facilities. There is no electrical, telecommunications, or solid waste service provided to the project site since it is a wildlife area.

Several public facilities are located within the project vicinity. Waipahu Intermediate School is located approximately 0.5 miles to the northwest, and Waipahu High School is located approximately one-mile to the northeast of the project site. The Waipahu Public Library is located approximately 0.6 miles northeast of the project site. There are several public and non-profit health facilities located in west O'ahu, including the Waipahu Family Health Center, located approximately 0.5 miles to the north of the project site, and the Queen's Medical Center – West O'ahu located approximately 1.25 miles to the west of the project site.

The Honolulu Fire Department provides fire protection and first responder emergency medical services. There are 44 fire stations on the island, with Fire Station 12 Waipahu located approximately one mile from the project site. The Honolulu Police Department also provides service to the area. The Honolulu Police Training Academy is located directly east of the project site.

IMPACTS AND MITIGATION MEASURES

The proposed project includes the restoration of a wetland pond within the Pouhala Marsh. No feature of the project would result in the need for new or altered services for fire or police protection, schools, libraries, parks, or health services. Because no new residences would be constructed on site, and no new employees would be drawn from the local labor pool, no increase in population would result from the proposed project. Therefore, no increases in the demands for public services such as schools, libraries, parks, health services, police, or fire protection would be expected, and no additional public facilities would need to be constructed. Further, activities at the proposed marsh restoration project site would not affect the provision of utilities and public services to adjacent land uses. Restoration improvements planned are expected to have no negative long-term impact on utilities and public services.

For information regarding storm drainage, see Section IX, *Hydrology and Water Quality*.

3.11 TRAFFIC AND TRANSPORTATION

Vehicle access to the project area is via Waipahu Depot Street. Currently, restoration workers park off of Waipahu Depot Street and access the site via foot. Farrington Highway (State Route 93) and Interstate Highway 1 (H-1/Queen Liliuokalani Freeway) provide regional access to the Waipahu area. Farrington Highway is a two-lane principal arterial that connects Central and West O'ahu. Farrington Highway connects to Kamehameha Highway near the Pearl Highlands Shopping Center. The PVT Landfill, where the excavated soil would be hauled in later phases of the project, is approximately 14 miles west of Pouhala Marsh in Nānākuli.

IMPACTS AND MITIGATION MEASURES

Construction of the proposed project could result in short-term increases in traffic. During construction of the proposed pond and again during soil hauling for disposal, there would be work vehicles using area roadways. However, this short-term increase in roadway use would not adversely impact traffic flow or levels of service for Waipahu area roadways. As set forth in Appendix A, the Department of Transportation (DOT) stated that the proposed project does not appear to impact DOT facilities.

There would be no direct increase in operational traffic due to implementation of the proposed project, and no long-term adverse affects to transportation and traffic would occur.

For a discussion of project consistency with alternative transportation plans, including pedestrian and bicycle connections to Pouhala Marsh, see Section 3.12, *Conformance with State and Local Plans, Policies, and Land Use Controls*.

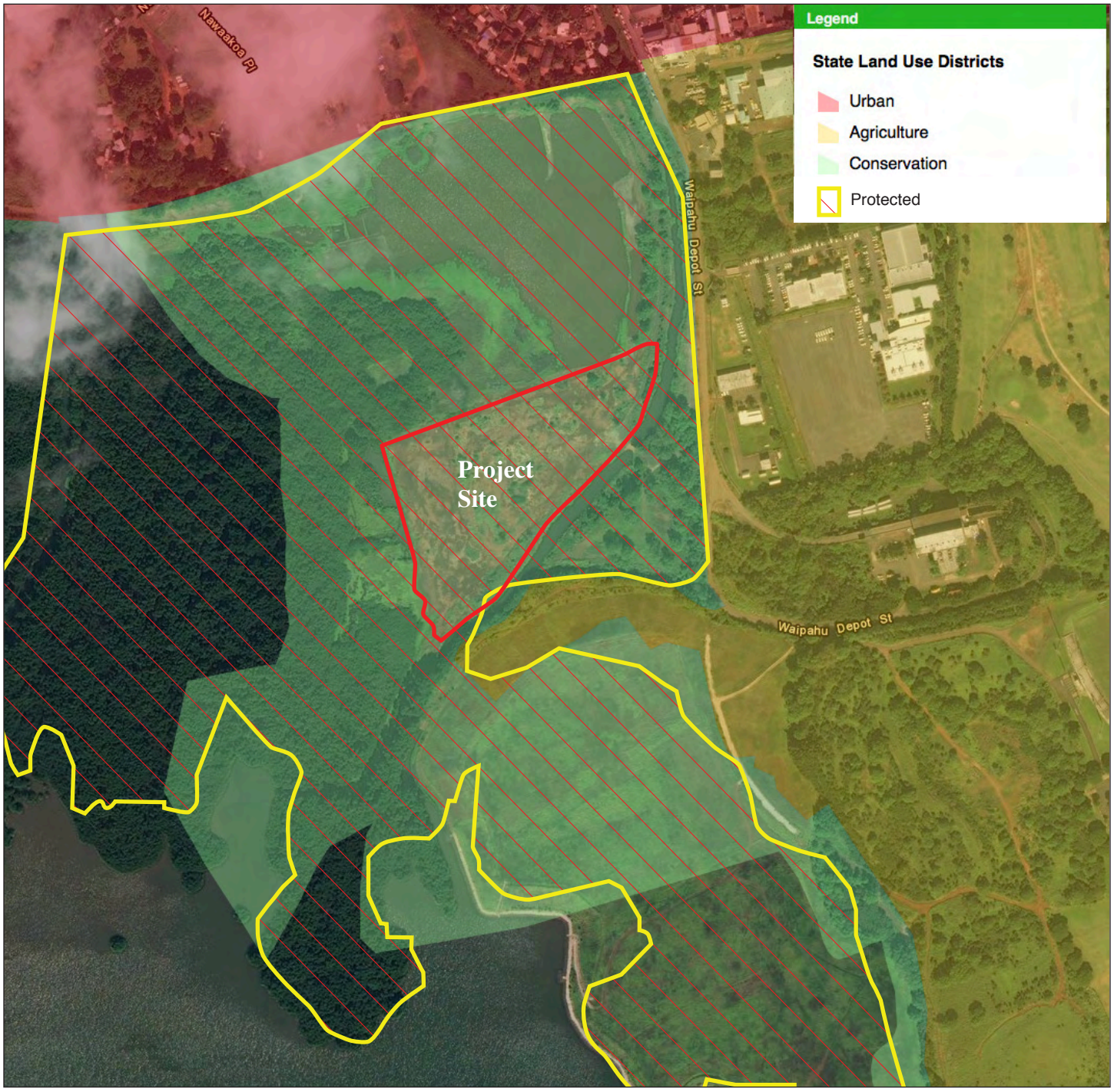
3.12 CONFORMANCE WITH STATE AND LOCAL PLANS, POLICIES, AND LAND USE CONTROLS

State and County policy, and land use and community plans and controls are established to address the long-term physical, social, economic, and environmental needs in Hawai'i. Pertinent land use controls for the Pouhala Marsh Restoration project are described below.

State of Hawai'i

State of Hawai'i, Land Use Commission – State Land Use Districts
HRS Chapter 205 establishes four major land use districts in which all lands in the State are placed. These districts include: urban, rural, agricultural, and conservation. The Conservation District has five subzones: Protective, Limited, Resource, General, and Special. Excluding the Special subzone, the four subzones are arranged in a hierarchy of environmental sensitivity, ranging from the most environmentally sensitive (Protective) to the least sensitive (General). These subzones define a set of identified land uses that may be allowed by discretionary permit as regulated by HAR Chapter 13-5 "Conservation District" and HRS Chapter 183C. The project site is located within the "Conservation" (C) District with a subzone designation of "Protective" (see Figure 12). The objective of the protective subzone is to protect valuable resources, such as wildlife sanctuaries, marine or plant life, or significant historic or archaeological sites.

Construction of the proposed wetland pond would require a Conservation District Use Permit. However, as set forth in HAR Section 13-5-22(b), the proposed project basic data collection and environmental education programs are permitted in the protective subzone without a permit since they are temporary and would result in negligible ground disturbances.



Pouhala Marsh Restoration

SOURCE: Department of Land and Natural Resources, 2012; Department of Planning & Permitting, HoLIS 2018

Figure 12
State Land Use District Map

Hawaii State Planning Act, HRS Chapter 226

The Hawaii State Planning Act (HRS Chapter 226) is a broad policy document that forms a basis for all activities, programs, and decisions made by local and state agencies. The Act sets forth the Hawaii State Plan, which is a long-range comprehensive plan that identifies the goals, objectives, policies, and priorities for the state, and provides a basis for determining priorities and allocating limited resources. The objectives and policies focus on general topic areas, including population, economy, physical environment, facility systems, and socio-cultural advancement. The proposed marsh restoration project is compatible with applicable objectives and policies, and priority guidelines listed in HRS Chapter 226, as discussed below.

Hawaii State Planning Act, HRS Chapter 226 – Part I. Overall Theme, Goals, Objectives, and Policies		
Objective or Policy	**Consistency**	**Discussion**
§226-4: State goals. In order to ensure, for present and future generations, those elements of choice and mobility that ensure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve: (1) A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations. (2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people. (3) Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.	Yes	DOFAW's mission is to enhance, protect, conserve, and manage Hawaii's unique natural resources.
§226-6(19). Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.	Yes	The proposed Pouhala Marsh Restoration project would protect and enhance the scenic resources of the marsh.
§226-11(a). Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives: (1) Prudent use of Hawaii's land-based, shoreline, and marine resources. (2) Effective protection of Hawaii's unique and fragile environmental resources. §226-11(b). To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to: (1) Exercise an overall conservation ethic in the use of Hawaii's natural resources. (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems. (3) Take into account the physical attributes of areas when planning and designing activities and facilities. (4) Manage natural resources and environs to encourage	Yes	The proposed Pouhala Marsh Restoration project would create wetland habitat for four species of Hawaiian waterbirds. Restoration of the site would allow for compatible environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.

Hawaii State Planning Act, HRS Chapter 226 – Part I. Overall Theme, Goals, Objectives, and Policies		
Objective or Policy	**Consistency**	**Discussion**
their beneficial and multiple use without generating costly or irreparable environmental damage. (6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii. (8) Pursue compatible relationships among activities, facilities, and natural resources. (9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.		
§226-12(a). Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources. (b). To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to: (1) Promote the preservation and restoration of significant natural and historic resources. (2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities. (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	Yes	The proposed Pouhala Marsh Restoration project would protect and enhance the scenic resources of the marsh. The proposed project would be required to implement mitigation measures, including archaeological monitoring, in order to minimize potential effects during construction activities on potential subsurface artifacts that may be present.
§226-13(a). Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives: (1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources. (2) Greater public awareness and appreciation of Hawaii's environmental resources. (b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to: (1) Foster educational activities that promote a better understanding of Hawaii's limited environmental resources. (2) Promote the proper management of Hawaii's land and water resources. (3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.	Yes	As set forth in Section 5, *Findings and Determinations*, of this EA, no adverse effects to air quality or water quality would occur with implementation of the proposed wetland restoration project. Environmental education programs would continue at Pouhala Marsh. The proposed wetland restoration project would provide additional habitat for study, which would support increased public awareness and appreciation of Pouhala Marsh as an important natural resource. In addition, the project includes BMPs to be implemented during project construction and during removal of stockpiled material to minimize erosion and potential impacts to water quality.

Hawaii State Planning Act, HRS Chapter 226 – Part I. Overall Theme, Goals, Objectives, and Policies		
Objective or Policy	**Consistency**	**Discussion**
§226-21(a). Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations. (b) To achieve the education objective, it shall be the policy of this State to: (1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	Yes	Restoration of the site would allow for compatible environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.
§226-23(a). Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations. (b) To achieve the leisure objective, it shall be the policy of this State to: (4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.	Yes	See response above.

HRS Chapter 226 Part I includes additional objectives and policies for: population (§226-5); the economy (§226-6); agriculture (§226-7); the visitor industry economy (§226-8); the federal expenditures economy (§226-9); potential growth and innovative activities (§226-10); the information industry economy (§226-10.5); facility systems (§226-14); solid and liquid waste facility systems (§226-15); water supply facility systems (§226-16); transportation systems (§226-17); energy facility systems (§226-18); telecommunication systems (§226-18.5); housing (§226-19); health (§226-20); social services (§226-22); individual rights and personal well-being (§226-24); socio-cultural advancement (§226-25); public safety (§226-26); and government (§226-27). The proposed Pouhala Marsh Restoration project objectives include the creation of wetland to improve and enhance foraging and breeding habitat for four identified endangered species of Hawaiian waterbirds, and ensuring that the created wetland maintains wetland functions and ecological values. The above cited sections of HRS Chapter 226 do not conflict with the project objectives, are are not directly applicable to the proposed project.

The Hawaii State Planning Act also includes Part II, Planning Coordination and Implementation. The purpose of Part II is to "establish a statewide planning system to coordinate and guide all major state and county activities" (HRS §226-51). Part II therefore sets forth guidelines for a larger level of implementation and planning than the proposed Pouhala Marsh Restoration project. The Functional Plans developed as a result of Part II of the Hawaii State Planning Act set forth the policies, statewide guidelines, and priorities within a specific field of activity, when such activity or program is proposed, administered, or funded by any agency of the state. The following Functional Plan objectives were determined applicable to the marsh restoration project. Additional Functional Plan objectives not included in the table below were determined not applicable to this project, and the proposed marsh restoration project would not conflict with their stated purpose or objective.

Hawaii State Planning Act, HRS Chapter 226 – Part II. Functional Plans		
Objective or Policy	**Consistency**	**Discussion**
Conservation Lands Functional Plan		
Objective IIA: Establishment of plans for natural resources and land management. Objective IIB: Protection of fragile or rare natural resources. Objective IIC: Enhancement of natural resources.	Yes	DOFAW's mission is to enhance, protect, conserve, and manage Hawaii's unique natural resources. The proposed Pouhala Marsh Restoration project would protect and enhance the scenic resources of the marsh and create wetland habitat for four species of Hawaiian waterbirds.
Education Functional Plan		
Objective C (3): Research Programs and [Communication] Activities. Support research programs and activities that enhance the education programs of the State.	Yes	Restoration of the site would allow for compatible environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.
Recreation Functional Plan		
Objective VI.C: Assure the protection of the most valuable wetlands in the state.	Yes	The Pouhala Marsh is identified as a protected, core wetland area. The proposed Pouhala Marsh Restoration project would protect and enhance the wetland resources of the marsh.
Water Resources Development Functional Plan		
Objective G: Provide for the protection and enhancement of Hawai'i's freshwater and estuarine environment.	Yes	See response above. Further, the project includes BMPs to be implemented during project construction and during removal of stockpiled material to minimize erosion and potential impacts to water quality.

The purpose of Part III, Priority Guidelines, is to "establish overall priority guidelines to address areas of statewide concern" (HRS §226-101). The following guidelines were determined applicable to the marsh restoration project. Additional guidelines not included in the table below were determined not applicable to this project, and the proposed marsh restoration project would not conflict with their stated purpose or objective.

Hawaii State Planning Act, HRS Chapter 226 – Part III. Priority Guidelines		
Objective or Policy	**Consistency**	**Discussion**
§226-104. Population growth and land resources priority guidelines. (b) Priority guidelines for regional growth distribution and land resource utilization: (10) Identify critical environmental areas in Hawaii to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.	Yes	The USFWS identifies Pouhala Marsh as a protected, core wetland area with permanent habitat that supports a substantial number of waterbirds. The proposed Pouhala Marsh Restoration project would protect and enhance the waterbird habitat of the marsh.

Hawaii State Planning Act, HRS Chapter 226 – Part III. Priority Guidelines		
Objective or Policy	**Consistency**	**Discussion**
§226-108. Sustainability. Priority guidelines and principles to promote sustainability shall include: (1) Encouraging balanced economic, social, community, and environmental priorities;	Yes	The proposed project would protect environmental resources while also allowing for the continuation of environmental education programs and opportunities.
§226-109. Climate change adaptation priority guidelines. Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall: (5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change.	Yes	As set forth in Section 3.3 of this EA, areas of the Pouhala Marsh could be permanently flooded with sea level rise resulting from climate change, particularly along Kapakahi Stream. New and expanded wetland areas would form, potentially improving wildlife habitat. With the preservation of natural landscape features, the proposed project would have a beneficial effect on climate change.

Coastal Zone Management Program

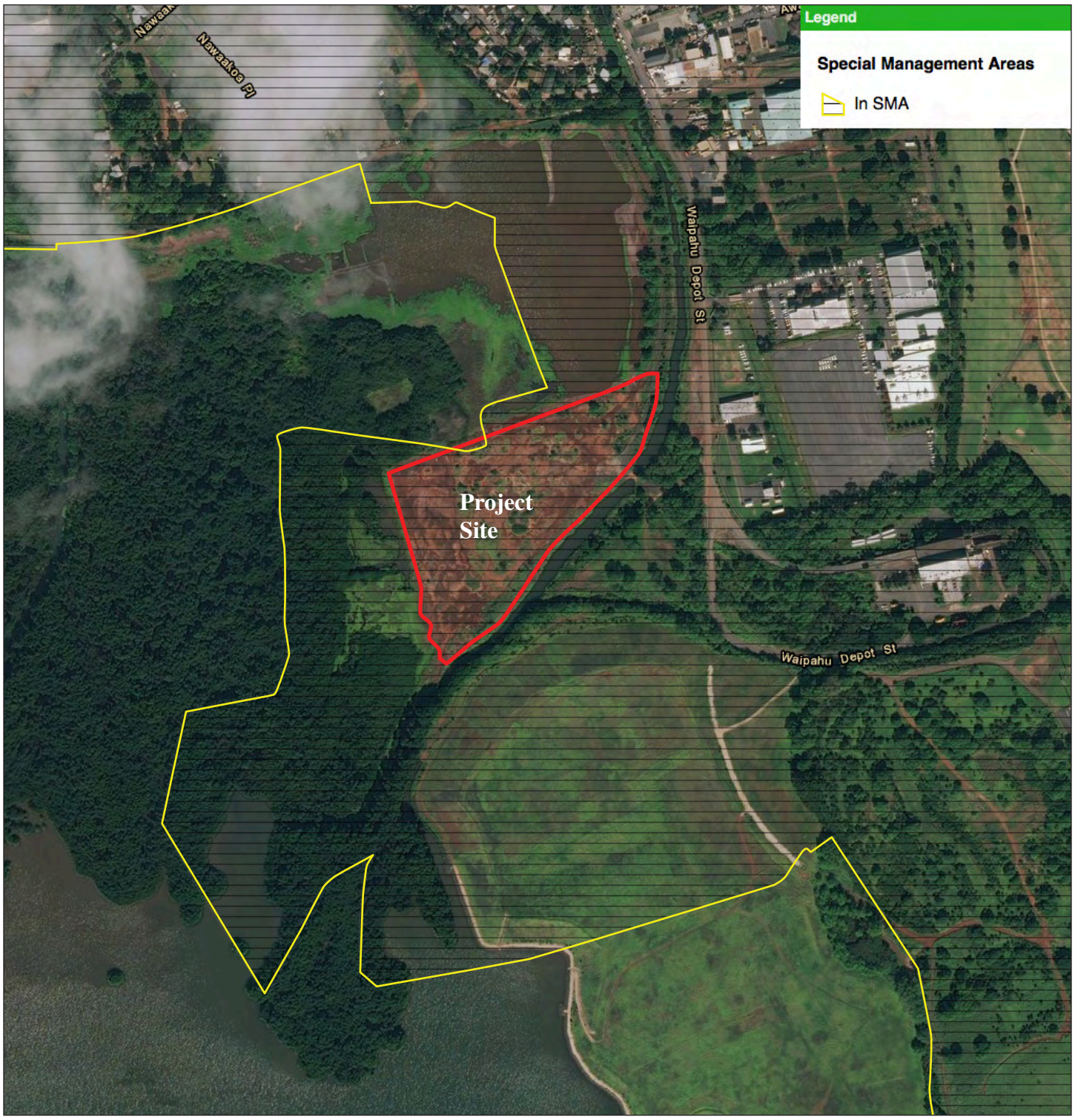
In October 1972, Congress passed the Coastal Zone Management Act for the purpose of establishing a national program for the management, beneficial use, protection, and development of land and water resources of the coastal areas of the United States. The Hawai'i Coastal Zone Management (CZM) Program (HRS Chapter 205A) was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. The objectives and policies of the CZM Program are to provide recreational resources; protect historic, scenic, and coastal ecosystem resources; provide economic uses; reduce coastal hazards; and manage development in the coastal zone.

Consultation with the State of Hawai'i Office of Planning will occur during the permitting process with the U.S. Army Corps of Engineers for CZM federal consistency review.

Special Management Area Designation

The CZM Program outlines controls and policies within an area along the shoreline called the Special Management Area (SMA). The objectives of the SMA are "the maintenance, restoration, and enhancement of the overall quality of the coastal zone environment, including, but not limited to, its amenities and aesthetic values, and to provide adequate public access to publicly owned or used beaches, recreation areas and national reserves." The purpose of the SMA Permit is to regulate any use, activity or operation that qualifies as a "development" and is administered at the County level – the permit is a management tool to ensure activities within the SMA are carried out in compliance with the CZM objectives and policies, and SMA guidelines.

The project site is located within the SMA boundary (see Figure 13). Consultation with the City and County of Honolulu, Department of Planning and Permitting was initiated at the time of early consultation and EA preparation. It was determined that an SMA Major permit would be necessary, based on the project valuation and preliminary understanding of the project scope (Department of Planning and Permitting 2018).



Pouhala Marsh Restoration

SOURCE: Department of Planning & Permitting, HoLIS 2018

Figure 13
Special Management Area Map

The following discussion evaluates the consistency of the proposed Pouhala Marsh Restoration project with the applicable objectives and policies of HRS Chapter 205A. The policies of Chapter HRS 205A, the consistency of the proposed wetland improvements with those policies, and the reasoning for the conclusion are set forth in the table below.

Policy compliance is often a matter of interpretation. The City Council is the ultimate arbiter of public policy for the project, and their judgment regarding the project and a specific policy may be different from that set forth in this report. Therefore, the following policy evaluation should be viewed as preliminary, with the ultimate decision to be made by the appropriate appointed and elected officials.

Coastal Zone Management Program, HRS Chapter 205A		
Objective or Policy	**Consistency**	**Discussion**
(1) Recreational resources; (A) Provide coastal recreational opportunities accessible to the public.	N/A	As described in Section 3.10 above, there are no recreational resources associated with the proposed wetland restoration project.
(2) Historic resources; (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture. Policy: (A) Identify and analyze significant archaeological resources; (B) Maximize information retention through preservation of remains and artifacts or salvage operations; and (C) Support state goals for protection, restoration, interpretation, and display of historic resources.	Yes	Due to the close proximity of historic settlement sites to the proposed project area and lack of subsurface testing or data recovery, historic sites and/or site remnants may be present in the subsurface. Mitigation measures to protect historic resources have been included in Section 3.6 above.
(3) Scenic and open space resources; (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources. Policy: (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline. (C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.	Yes	The construction of the proposed wetland would improve the overall visual character of the project site and would be consistent with the existing wetland uses of the area.

Coastal Zone Management Program, HRS Chapter 205A		
Objective or Policy	**Consistency**	**Discussion**
(4) Coastal ecosystems; (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems. Policy: (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources; (E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.	Yes	The objective for the proposed project is to restore habitat for native Hawaiian waterbirds within the 8.8-acre project site that has been previously used as a fill site at Pouhala Marsh. The proposed action is required to obtain a NPDES permit to reduce potential impacts to water quality during construction of the project. Adverse effects to water quality from stormwater flows would be minimized by site-specific BMPs (see Section 3.2 above).
(5) Economic uses; (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.	N/A	The proposed project does not include public or private facilities that are important to the State's economy.
(6) Coastal hazards; (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.	Yes	The proposed project would be constructed to minimize the potential for erosion and pollution, and would not be subject to damage from storm waves, flooding, or tsunami. See Section 3.3 above.
(7) Managing development; (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.	Yes	Early consultation with agencies, organizations, and individuals was conducted during preparation of the Draft EA for the proposed project. Additional public review will occur during the public comment period for the EA, and during the public hearing before the City and County of Honolulu Planning Commission during the SMA permit process.
(8) Public participation; (A) Stimulate public awareness, education, and participation in coastal management. Policy: (A) Promote public involvement in coastal zone management processes.	Yes	See above.
(9) Beach protection; (A) Protect beaches for public use and recreation.	N/A	The proposed project would not have a direct impact on public beaches or the shoreline; the project area would continue to be protected as a marsh sanctuary with project implementation.

Coastal Zone Management Program, HRS Chapter 205A		
Objective or Policy	**Consistency**	**Discussion**
(10) Marine resources; (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability. Policy: (A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial.	Yes	As evaluated in this EA, adverse environmental impacts from implementation of the proposed action would be minimized through project design and mitigation measures contained in this document.

City and County Land Use Plans and Policies

City and County of Honolulu General Plan

The City and County of Honolulu General Plan (1992 edition, amended in 2002) sets forth the long-range objectives and policies for the general welfare and, together with the regional development plans, provides a direction and framework to guide the programs and activities of the City and County of Honolulu. A Proposed Revised O'ahu General Plan was issued in December 2017, and went to Planning Commission hearing on March 21, 2018. Planning Commission recommendations will be forwarded to City Council for further decision-making. The Proposed Revised Plan includes continued focus on critical issues such as regional population, economic health, and affordable housing, while also addressing concerns such as climate change and sea level rise and sustainability.

The following discussion evaluates the consistency of the proposed project with applicable objectives and policies of the current General Plan.

City and County of Honolulu General Plan		
Goal or Policy	**Consistency**	**Discussion**
O'ahu General Plan, Objectives and Polices		
Natural Environment		
Objective A To protect and preserve the natural environment. Policy 2: Seek the restoration of environmentally damaged areas and natural resources. Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu. Policy 10: Increase public awareness and appreciation of Oahu's land, air, and water resources.	Yes	The objective for the proposed project is to restore habitat for native Hawaiian waterbirds within the 8.8-acre project site that has been previously used as a fill site at Pouhala Marsh. Wetland restoration would provide a naturally functioning ecosystem with suitable habitat for four endangered Hawaiian waterbirds. Environmental education programs would continue at Pouhala Marsh. The proposed wetland restoration project would provide additional habitat for study, which would support increased public awareness and appreciation of Pouhala Marsh as an important natural resource.
Objective B To preserve and enhance natural landmarks and scenic views of Oahu for the benefit of both residents and visitors. Policy 1: Protect the Island's well-known resources: its mountains and craters; forests and watershed areas;	Yes	The project's wetland restoration improvements would support a naturally functioning ecosystem and provide additional wildlife habitat at Pouhala Marsh. Restoration improvements would provide for educational opportunities

City and County of Honolulu General Plan		
Goal or Policy	**Consistency**	**Discussion**
marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands. Policy 4: Provide opportunities for recreational and educational use and physical contact with Oahu's natural environment.		within the wildlife sanctuary.
Culture and Recreation		
Objective B To protect Oahu's cultural, historic, architectural, and archaeological resources. Policy 1: Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks. Policy 2: Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.	Yes	The proposed project would be required to implement mitigation measures, including archaeological monitoring, in order to minimize potential effects during construction activities on potential subsurface artifacts that may be present.
Economic Activity		
Objective F To increase the amount of Federal spending on Oahu. Policy 1: Take full advantage of Federal programs and grants which will contribute to the economic and social well-being of Oahu's residents.	Yes	Previous restoration work and restoration project planning has been funded by both federal grants and state funds. Additional federal funds may also be used for construction, though funding sources are unknown at this time.

City and County of Honolulu Land Use Ordinance

The land use ordinance of the City and County of Honolulu, or zoning ordinance, regulates land use on O'ahu to encourage "orderly development in accordance with adopted land use policies," such as the O'ahu General Plan (ROH Section 21-1.20). The proposed project site is located in an area with a Preservation District, Restricted zoning designation (P-1). The purpose of the preservation district is to preserve and manage major open space and recreation lands and lands of scenic and other natural resource value. All lands within a state designated conservation district are within the restricted preservation district (P-1) (ROH Section 21-3.40). All uses, structures, and development in this district are governed by state agencies. No feature of the proposed wetland restoration project would conflict with existing zoning.

Central O'ahu Sustainable Communities Plan

The City and County of Honolulu Department of Planning and Permitting develops long-range plans for O'ahu's eight planning areas, under the overall guidance of the O'ahu General Plan. The long-range plan for Central O'ahu, the Central O'ahu Sustainable Communities Plan (CO SCP) was adopted by the City Council in late 2002.

The 2016 Central O'ahu Sustainable Communities Plan (CO SCP) Proposed Revised Plan is currently under consideration by the City Council. The revised plan has not been adopted as of the date of this environmental analysis (April 2018).

The CO SCP identifies the protection of natural and scenic resources as a primary goal, as sets forth conservation of natural resources as a priority within the CO SCP:

> Central O'ahu's natural resources, including endangered species habitats, ravines, potable water supply, and Pearl Harbor waters, will be conserved by:
>
> - Protecting valuable habitats for endangered waterbirds located on the shoreline of Pearl Harbor at Pouhala Marsh.

The CO SCP also states that "nearshore wetlands and mangroves should be maintained and enhanced, where necessary, as wildlife habitats". The CO SCP identifies the Pouhala Marsh as a natural resource area of wetland/waterbird habitat that contains rare/endangered native species (City of Honolulu 2002). As stated by the Department of Planning and Permitting, the proposed project conforms to the CO SCP because the wetland restoration provides valuable habitat for endangered Hawaiian waterbirds (see Appendix A).

Waipahu Town Plan

The *Waipahu Town Plan* (December 1995) recognizes Pouhala Marsh as an open space resource for the Waipahu area. The plan identifies Pouhala Marsh as a proposed wildlife sanctuary; the marsh has since been designated a wildlife sanctuary by the DLNR. A historic railroad right-of-way traverses the *mauka* boundary of Pouhala Marsh.

The *Waipahu Town Action Plan* (September 2017) was developed to help prepare Waipahu Town for rail transit service. The plan identifies developing Pouhala Marsh educational signage as a near-term strategy for future transit development. The signage is envisioned as a way to improve awareness of local natural resources and native species in the area.

DOFAW maintains existing signage at the marsh, including a sign at the bridge crossing and signage north of the main wetland pond area. The Waipahu Town Action Plan identifies signage to be located along the Pearl Harbor Historic Trail near the intersection with Waipahu Depot Street. While the proposed project focus is on the first phase of habitat restoration at the previous landfill site, DOFAW will consider signage at this location in the future.

Waipahu Neighborhood Transit-Oriented Development (TOD) Plan

The *Waipahu Neighborhood Transit-Oriented Development (TOD) Plan* (April 2014) emphasizes the creation of a network of green spaces and linkages through the station areas. Pouhala Marsh is identified as an important amenity that should be accessible to residents. The TOD plan encourages the restoration of Kapakahi Stream with a stream walk along Waipahu Depot Road to Pouhala Marsh and the Pearl Harbor Historic Trail. These identified improvements would occur outside of the Pouhala Marsh State Wildlife Sanctuary. The TOD Plan places the restoration of Kapakahi Stream and stream walk to Pouhala Marsh in Phase 2 of the plan, with implementation likely to occur within five to ten years of the opening of the transit system. Agencies identified to implement these improvements include the City and County of Honolulu, Hawaii Nature Center, Oahu Resource Conservation and Development Council, and the State of Hawaii (City and County of Honolulu 2014).

There are currently no sidewalks leading to the marsh. The marsh itself has restricted access and is not open to the public at large. No existing pedestrian or roadway access from Waipahu Town to the Pouhala Marsh State Wildlife Sanctuary would be affected by the proposed wetland restoration project. The proposed project objectives include the creation of wetland to improve and enhance foraging and breeding habitat for four identified endangered species of Hawaiian waterbirds, and ensuring that the created wetland maintains wetland functions and ecological values. As detailed in Section 2.2, *Description of the Proposed Action*, the proposed wetland restoration project would be phased based on funding availability. Roadway and sidewalk improvements identified in the TOD Plan to facilitate pedestrian and bicycle connections from the Pearl Harbor Historic Trail and Waipahu Town to the Pouhala Marsh State Wildlife Sanctuary could be implemented in future phases as identified in the TOD Plan and in coordination with DOFAW, though they are outside the scope and budget of the proposed wetland restoration project.

4 ALTERNATIVES TO THE PROPOSED ACTION

This chapter considers alternatives to the proposed action, including the No Action Alternative. Based on the hydrology results and the design criteria of a maximum excavation elevation of 0.9 feet MSL, three wetland pond system alternatives, including the proposed project alternative, were considered in the engineering report (Oceanit 2009). However, two of these alternatives were eliminated from consideration due to complexity and cost.

4.1 PROPOSED ALTERNATIVES

No Action Alternative

The No Action Alternative identifies the expected environmental impacts in the future if existing conditions were left as is with no action taken by the approving agency. Under the No Action Alternative, establishment of the proposed wetland pond would not occur. As a result, the present conditions within the project area would predominantly continue into the future with continued crowding of endangered Hawaiian waterbirds in the existing limited wetland habitat. This alternative would not meet any of the identified project objectives.

Alternative 1: Proposed Project

Under this alternative, the restoration improvements described in Section 2.2 would be implemented as the Proposed Project. The negative factors about this alternative include: there is no way to drain water in the pond; the water does not circulate well; and the design is at a moderate cost. This alternative was selected because the wetland pond system design would blend seamlessly with the existing wetland ponds and because of the simplicity of a single pond system.

Alternatives Eliminated From Consideration

Alternatives that were initially considered and eliminated from further consideration are presented in this section. These alternatives were eliminated based on their effectiveness in addressing project needs and meeting project objectives, conflicts with the physical environment, or feasibility and practicability of implementation. Alternatives for the wetland restoration were considered by DOFAW staff and engineers during the initial planning and evaluation of site conditions.

Alternative 2: Two Pond System

The second alternative would be to build two ponds: a shallow pond and a deep pond. The surface area of the shallow pond would be approximately 5.3 acres, and the surface area of the deep pond would be about 1.9 acres. The water level in the shallow pond would range from dry to 6 inches deep, and the water level in the deep pond would range from 6 inches to 1 foot. The two-pond system would provide separate habitats for the Hawaiian Moorhen and Hawaiian Stilt from the Hawaiian Duck and Hawaiian Coot. The large pond is similar to the plan of Alternative 1, while the shallow pond can be drained into deep pond with a concrete sump. The side slopes of the banks on the northwest and west of both ponds would be constructed at a ratio of 5H:1V[8] (a slope of 11 degrees, similar to a steep ocean beach). The bank slopes on the other side would be graded at a gentle slope. The beach of the shallow pond would have a minimum slope of 0.8 percent, and the beach of the deep pond would have a minimum slope of 1.4 percent, similar to a very gently sloping

[8] H = the horizontal distance and V = the vertical distance.

beach. The gently sloped area would accommodate individual waterfowl habitat preferences for different water levels. An unpaved access pathway with adequate width for light-duty maintenance vehicles would surround the ponds. The negative aspects of this plan include: the ponds are more complex than plans in Alternative 1; there is no easy way of draining the deep pond; fish growth in the deep pound can be hard to control due to tidal influence; and the design for this plan is most expensive. This alternative was eliminated due to the complexity of the pond system and overall cost.

Alternative 3: Two Pond System with Modified Size and Orientation

The third alternative would be a shallow pond and a deep pond similar to those in the second alternative except for size and orientation of the ponds. The shallow and deep ponds of Alternative 3 would be smaller than their counterparts in Alternative 2. The surface area of the shallow pond would be about 3.8 acres, and the surface area of the deep pond would be about 1.2 acres. The deep pond would be located north of the shallow pond in Alternative 3 as opposed to being located west of the shallow pond in Alternative 2. The purpose of Alternative 3 is to provide a two-pond system on a smaller scale, which should be cheaper to construct than Alternative 2. The two-pond system in Alternative 3 would retain the same habitat characteristics as the two-pond system in Alternative 2, such as isolation of the Hawaiian Moorhen and Hawaiian Stilt habitat from the Hawaiian Duck and Hawaiian Coot habitat. The side slopes of the banks on the northwest and west of the shallow pond and on the west, north, and south of the deep pond would be constructed at a ratio of 5H:1V (a slope of 11 degrees, similar to a steep ocean beach). The bank slopes of the other sides would be graded at a gentle slope. The beach of the shallow pond would have a minimum slope of 1 percent, and the beach of the deep pond would have a minimum slope of 2.1 percent, similar to a very gently sloping beach. The gently sloped area would accommodate individual waterfowl habitat preferences for different water levels. An unpaved access pathway with adequate width for light-duty maintenance vehicles would surround the ponds. Negative factors of this plan include: the ponds are more complex that Alternative 1; there is no simple way of draining the deep pond; and fish growth in the deep pond can be hard to control due to tidal influences. This alternative was eliminated due to the complexity of the pond system.

5 FINDINGS AND DETERMINATION

As set forth in HAR Section 11-200-12, in considering the significance of potential environmental effects, an agency must "consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action." The proposed action is not expected to have a significant effect on the environment. A Finding of No Significant Impact has been determined for the Pouhala Marsh Restoration, Phase I project. The findings supporting this determination are discussed below.

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The project site at Pouhala Marsh is characteristic of disturbed coastal wetlands in Hawai'i, with little vegetation on the site due to previous fill activities. The marsh was historically used as a series of fishponds, and archaeological remains of the fishponds (walls and associated sediments) could be present at the project site. An archaeological monitor will be present during construction to document any historic artifacts that may be encountered during the proposed undertaking. While there is the potential for discovery of historic or cultural remains during construction, environmental impacts would be minimized with implementation of mitigation measures and BMPs contained in this document.

(2) Curtails the range of beneficial uses of the environment.

The proposed improvements would not curtail the range of beneficial uses at the project site. The project would increase the range of beneficial uses of the environment by establishing additional wetland habitat for use by endangered Hawaiian waterbirds and migratory shorebirds.

(3) Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in HRS Chapter 344, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed project is consistent with the environmental goals, policies, and guidelines established in HRS Chapter 344. The following guidelines (HRS Section 344-4) from the State Environmental Policy apply to the proposed project:

(2) Land, water, mineral, visual, air, and other natural resources.

(E) Establish and maintain natural area preserves, wildlife preserves, forest reserves, marine preserves, and unique ecological preserves;
(G) Promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling so that all our wastes become utilized.

(3) Flora and fauna.

(A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard;
(B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.

(4) Parks, recreation, and open space.

(A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses;

(9) Education and culture.

(B) Encourage both formal and informal environmental education to all age groups.

The project objectives are to create ±8.8 acres of wetland at the Pouhala Marsh State Wildlife Sanctuary; and to ensure that the created wetland maintains wetland functions and ecological values. Wetland restoration would provide a naturally functioning ecosystem with suitable habitat for four endangered Hawaiian waterbirds, including the Hawaiian Moorhen, Hawaiian Stilt, Hawaiian Duck, and Hawaiian Coot. Restoration of the site would allow for environmental education programs and opportunities, such as vegetation identification, avian surveys, and water quality studies.

(4) Substantially affects the economic or social welfare of the community or state.

The proposed action would have a short-term positive effect on the economic welfare of the island resulting from hiring construction workers. This project is not expected to significantly affect traditional native Hawaiian cultural practices or other traditional cultural practices occurring in the surrounding area. Mitigation requiring archaeological monitoring during construction would minimize any impacts on potential subsurface sites. The proposed action would not have a substantial long-term effect on the economic and social welfare of the community or the state. The proposed project is in accordance with land use plans and regulations as set forth in Section 3.12, *Conformance with State and County plans, Policies, and Land Use Controls.*

(5) Substantially affects public health.

The project would not substantially affect public health as discussed in various sections of this document. Construction activities may temporarily increase fugitive dust and noise levels in the project vicinity. Short-term construction-related effects would be minimized by complying with pertinent State or City regulations and conditions of permits required. Further, these impacts would cease upon completion of construction. No long-term negative impact on public health is anticipated with implementation of the proposed action.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed action would not generate population or create secondary demands and impacts on public facilities and services. Once completed, the project site may provide for educational viewing of wildlife resources.

(7) Involves a substantial degradation of environmental quality.

There would be no long-term, adverse environmental impacts associated with the proposed action. Construction activities may temporarily increase dust and noise in the project vicinity. However, these impacts would cease upon completion of construction. The proposed project will also include site-specific BMPs to minimize erosion and sedimentation effects to

water quality. Additional mitigation measures included in Chapter 3 would minimize potential construction-related impacts. The proposed wetland restoration would have a beneficial effect on the environmental quality of Pouhala Marsh.

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

The proposed Pouhala Marsh Restoration, Phase I, is limited to establishment of a wetland pond with stockpiled soils. Until the stockpile of soil can be removed, it would be grassed and would serve as a lookout or area where groups of volunteers could stage their maintenance efforts. Over time, all of the excavated material would be removed to make the entire ±8.8-acre site a functioning wetland. As future funds are allocated, the stockpiled material would be hauled out in phases until the entire site is a wetland, including the area used for stockpiled material. In a regional context, the project would not have cumulatively significant impacts.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat.

The proposed project would establish additional habitat for Hawaiian waterbirds. With implementation of mitigation and BMPs described in Section 3.4 of this document, no substantial adverse effects would occur to rare, threatened, or endangered species, or their habitats.

(10) Detrimentally affects air or water quality or ambient noise levels.

Construction activities would have a short-term effect on air quality, water quality, and ambient noise levels. Mitigation included in Chapter 3 would minimize these potential impacts. Construction activities would also be subject to applicable State and City regulations and permit conditions. No additional long-term impacts would occur.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

No structures would be constructed within the flood plain, and wetland restoration activities would not occur within a tsunami evacuation zone, within the shoreline, or geologically hazardous area. Portions of the project site are located within a flood plain, though wetland restoration activities would support the flood protection function of Pouhala Marsh.

(12) Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

The proposed establishment of a wetland pond would improve the visual character of Pouhala Marsh by increasing wetland habitat and removing a previous fill site. The proposed improvements would not obstruct views from any recognized view corridor or scenic roadway.

(13) Requires substantial energy consumption.

There would be energy consumption associated with construction of the proposed project. The amount of energy that would be consumed with project implementation is not considered substantial.

6 INDIVIDUALS, COMMUNITY GROUPS, AND AGENCIES CONSULTED

6.1 EARLY CONSULTATION

Early consultation was conducted from December 2017 to April 2018, prior to preparation of the Draft EA for the proposed project. This is part of the scoping process for the Draft EA, and is intended to identify environmental issues and concerns to be addressed in the Draft EA. The following agencies, organizations, and individuals were sent a preliminary project description for comments or questions. Those that provided written comments (either by hard copy or electronically) are highlighted in italics. Copies of the written comments are included in Appendix A.

FEDERAL AGENCIES

U.S. Fish and Wildlife Service
Department of Army Corps of Engineers
Department of the Navy
Environmental Protection Agency
U.S. National Oceanic Atmospheric Administration, National Marine Fisheries Service

STATE AGENCIES

Department of Health, Environmental Health Administration
Department of Transportation
Department of Business, Economic Development and Tourism (DBEDT) – Office of Planning
University of Hawai'i Environmental Center
University of Hawai'i Water Resources Research Center
Office of Hawaiian Affairs
Department of Hawaiian Home Lands
Department of Land and Natural Resources
Department of Land and Natural Resources - Historic Preservation Division

CITY AND COUNTY OF HONOLULU

Department of Design and Construction
Department of Environmental Services
Department of Planning and Permitting
Department of Parks and Recreation

ELECTED OFFICIALS

State Senator Mike Gabbard
State Representative Henry Aquino

COMMUNITY

Neighborhood Board No. 22, Waipahu

6.2 COMMENTS AND RESPONSES ON THE DRAFT ENVIRONMENTAL ASSESSMENT

Notification of the availability of the Draft EA was published in the September 8, 2018 *The Environmental Notice* by OEQC. During the 30-day public comment period ending on October 8, 2018, agencies, organizations, and individuals were provided the opportunity to comment on the proposed project. Copies of the Draft EA were distributed to the following parties for review and comment, or notification of its availability was provided. Those that provided written comments (either by hard copy or electronically) are highlighted in italics. The comment letters and responses are included in Appendix C of this document.

FEDERAL AGENCIES

U.S. Fish and Wildlife Service
Department of Army Corps of Engineers
Department of the Navy
Environmental Protection Agency
U.S. National Oceanic Atmospheric Administration, National Marine Fisheries Service

STATE AGENCIES

Department of Health, Environmental Health Administration
Department of Business, Economic Development and Tourism (DBEDT) – Office of Planning
University of Hawai'i Environmental Center
University of Hawai'i Water Resources Research Center
Office of Hawaiian Affairs
Office of Planning
Department of Land and Natural Resources
Department of Land and Natural Resources - Historic Preservation Division

CITY AND COUNTY OF HONOLULU

Department of Design and Construction
Department of Environmental Services
Department of Planning and Permitting
Department of Parks and Recreation

ELECTED OFFICIALS

State Senator Mike Gabbard
State Representative Henry Aquino

COMMUNITY

Neighborhood Board No. 22, Waipahu

6.3 ENVIRONMENTAL ASSESSMENT PREPARATION

This Draft Environmental Assessment (EA) was prepared for DLNR by Environmental Planning Partners, Inc. and Bow Engineering & Development, Inc. The following consultants were involved in the preparation of this document:

William F. Bow, Executive Project Manager / Chemist, Bow Engineering & Development, Inc.

Robert D. Klousner, President, Principal in Charge, Environmental Planning Partners, Inc.

Raadha M. B. Jacobstein, Professional Planner, Environmental Planning Partners, Inc.

Dale Nutley, Graphic Artist, Environmental Planning Partners, Inc.

7 REFERENCES

BWS. See Honolulu Board of Water Supply.

CAB. See Hawai'i, State of, Department of Health, Clean Air Branch.

City and County of Honolulu, Department of Planning and Permitting 2018. Communications with Alex Beatty, Planner regarding SMA requirements. April 9, 2018.

City and County of Honolulu, 2011. City and County of Honolulu Storm Water Best Management Practice Manual. Construction. Final, November 2011. City and County of Honolulu Department of Environmental Services.

City and County of Honolulu, 2002. Central Oahu Sustainable Communities Plan. City and County of Honolulu Department of Planning and Permitting. December 2002.

DAR. See Hawai'i, State of, Division of Aquatic Resources.

DBEDT. See Hawai'i, State of, Department of Business, Economic Development & Tourism.

DLNR. See Department of Land and Natural Resources, Division of State Parks.

DOH. See Hawai'i, State of, Department of Health.

DOH CWB. See Hawai'i, State of, Department of Health, Clean Water Branch.

Federal Emergency Management Agency, 2017. Earthquake Hazard Maps. Last updated 11/02/2017. Accessed on March 13, 2018 at <https://www.fema.gov/earthquake/earthquake-hazard-maps>

Federal Emergency Management Agency, 2004. Flood Insurance Rate Map, City and County of Honolulu. Map Number 15003C0238G. Map Revised 1/19/2011.

FEMA. See Federal Emergency Management Agency.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013. Online Rainfall Atlas of Hawai'i. *Bull. Amer. Meteor. Soc.* 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1. Accessed on March 15, 2018 at < http://rainfall.geography.hawaii.edu/interactivemap.html >

Hawai'i Climate Change Mitigation and Adaptation Commission. 2017. Hawai'i Sea Level Rise Vulnerability and Adaptation Report. Prepared by Tetra Tech, Inc. and the State of Hawai'i Department of Land and Natural Resources, Office of Conservation and Coastal Lands, under the State of Hawai'i Department of Land and Natural Resources Contract No: 64064.

Hawai'i National Flood Insurance Program (HNFIP), 2018. Flood Hazard Assessment Tool. Accessed on March 13, 2018 at <http://gis.hawaiinfip.org/FHAT/>

Hawai'i, State of, Department of Business, Economic Development & Tourism, 2013. American Community Survey 2013 5-Year Estimates Data Profiles By Hawai'i Geographic Area. Accessed on March 13, 2018 at <http://census.hawaii.gov/acs/american-community-survey-2013/acs-2013-geographic-5yr/>

Hawai'i, State of, Department of Health, Clean Air Branch (CAB), 2016. State of Hawai'i Annual Summary 2015 Air Quality Data. December 2016. Accessed on March 15, 2018 at <http://health.hawaii.gov/cab/>

Hawai'i, State of, Department of Health, 2014. Water Quality Standards Map of the Island of O'ahu. June 2014. Accessed on March 19, 2018 at <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards/>

Hawai'i, State of, Department of Health, Clean Water Branch, 2016. 2016 State of Hawai'i Water Quality Monitoring and Assessment Report. December 15, 2017. Accessed on March 13, 2018 at < http://health.hawaii.gov/cwb/clean-water-branch-home-page/integrated-report-and-total-maximum-daily-loads/ >

Hawai'i, State of, Department of Health, Clean Water Branch, 2006. Watershed Based Plan for Kapakahi Stream. October 2006. Accessed on March 19, 2018 at < http://oahurcd.org/kapakahi-stream-watershed-plan/ >

Hawai'i, State of, Department of Planning, 2013. Stormwater Impact Assessments: Connecting primary, secondary and cumulative impacts to Hawaii's Environmental Review process. May 2013. Accessed on March 7, 2018 at: < http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf >

Hawai'i, State of, Department of Planning, Department of Land and Natural Resources, 2012. State of Hawai'i Conservation Subzone – Island of O'ahu. November 2012. Accessed on April 6, 2017 at: < https://dlnr.hawaii.gov/occl/subzone-maps/>

Hawai'i, State of, Division of Aquatic Resources, 2008. Atlas of Hawaiian Watershed & Their Aquatic Resources. Waipio Naval Reservoir, O'ahu. DAR Watershed Code: 34018, dated 4/7/2008. Accessed on March 19, 2018 at <http://www.hawaiiwatershedatlas.com/>

Hawai'i, State of, Division of Forestry and Wildlife, 1998. Environmental and Enhancement Plan for Pouhala Marsh, Oahu, Hawaii. Ducks Unlimited, Inc. July 1998.

Hawai'i, State of, Office of Planning (OP), 2018. Agricultural Lands of Importance to the State of Hawaii (ALISH). Map accessed on March 14, 2018 at: <http://planning.hawaii.gov/gis/various-maps/ >

HNFIP. See Hawai'i National Flood Insurance Program.

Honolulu Board of Water Supply, 2007. Central O'ahu Watershed Study. Final Report. May 2007. Prepared by Oceanit, Townscape, Inc., and Eugene Dashiell. Accessed on March 13, 2018 at < http://www.boardofwatersupply.com/water-resources/watershed-studies >

Honolulu, City and County, 2017. Waipahu Town Action Plan. April 2017. Accessed on March 15, 2018 at: < http://www.honolulu.gov/tod/neighborhood-tod-plans/dpp-tod-waipahu.html>

Honolulu, City and County, 2014. Waipahu Neighborhood TOD Plan. April 2014. Accessed on March 15, 2018 at: < http://www.honolulu.gov/tod/neighborhood-tod-plans/dpp-tod-waipahu.html>

Honolulu, City and County, 2011. City and County of Honolulu Storm Water Best Management Practice Manual: Construction. November 2011. Accessed on March 15, 2018 at < https://www.honolulu.gov/dfmswq/calendar/875-site-dfm-swq-cat/21038-rules-relating-to-storm-drainage-standards.html >

Intergovernmental Panel on Climate Change (IPCC), 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp. Accessed on March 6, 2018 at < http://www.ipcc.ch/report/ar5/wg1/>

National Oceanic and Atmospheric Administration, National Centers for Environmental Information (NOAA), 2018. State of the Climate, Global Analysis – Annual 2017. Accessed on April 16, 2018 at: <https://www.ncdc.noaa.gov/sotc/global/201713>

National Weather Service. 2018. Climate data at URL http://www.prh.noaa.gov/hnl/.

NOAA. See National Oceanic and Atmospheric Administration.

NPS. See National Park Service.

NRCS. See U.S. Department of Agriculture, Natural Resources Conservation Service.

U.S. Department of Agriculture, Natural Resources Conservation Service, 2014. Custom Soil Resource Report for Island of Oʻahu, Hawaiʻi. Accessed on March 5, 2018 at <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

U.S. Fish and Wildlife Service 2011. *Recovery Plan for Hawaiian Waterbirds*, *Second Revision*. Original plan approved 1978, First revision approved 1985. Second revision approved October 28, 2011. Accessed on February 5, 2018 at: < https://www.fws.gov/pacificislands/CH_Rules/Hawaiian%20Waterbirds%20RP%202nd%20Revision.pdf>

U.S. Geological Survey, 1997. Summary of Oahu, Hawaii, Regional Aquifer-System Analysis. By William D. Nichols, Patricia J. Shade, and Charles D. Hunt, Jr. U.S. Geological Survey Professional Paper 1412-A. March 11, 1997.

University of Hawaiʻi at Manoa, Sea Grant College Program, 2014. Climate Change Impacts in Hawaiʻi - A summary of climate change and its impacts to Hawaiʻi's ecosystems and communities. June 2014.

APPENDIX A

EARLY CONSULTATION AND CORRESPONDENCE

APPENDIX A

Agencies, organizations, and individuals included on the Office of Environmental Quality Control recommended distribution list for an Environmental Assessment were sent a preliminary project description for comments or questions in December 2017. The following correspondences include responses to early consultation requests from the following agencies. The content of this consultation has been incorporated into the analysis contained in this Draft EA.

FEDERAL AGENCIES

U.S. Fish and Wildlife Service

Department of Army Corps of Engineers

U.S. National Oceanic Atmospheric Administration, National Marine Fisheries Service

STATE AGENCIES

Department of Health, Environmental Health Administration

Department of Transportation

Department of Business, Economic Development and Tourism (DBEDT) – Office of Planning

CITY AND COUNTY OF HONOLULU

Department of Design and Construction

Department of Parks and Recreation

Department of Planning and Permitting

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:
01EPIF00-2018-TA-0121

JAN 2 6 2018

Mr. William Bow
Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Subject: Technical Assistance for Pouhala Marsh Restoration, Phase I, Waipahu, Oahu

Dear Mr. Bow:

The U.S. Fish and Wildlife Service (Service) received your letter on December 28, 2017, requesting information or data in regards to the proposed Pouhala Marsh Restoration, Phase I project. The project is located within a ±9 acre portion of Pouhala Marsh State Wildlife Sanctuary (Pouhala Marsh) in Waipahu, Oahu [TMK: (1) 9-3-001:002, 012, & 006 (por)]. We understand Bow Engineering & Development, Inc. will be preparing the Draft Environmental Assessment (EA) for the project in accordance with Chapter 343, Hawaii Revised Statutes on behalf of Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW).

The proposed project involves creating a wetland pond within a ±9 acre area for endangered Hawaiian waterbirds. The gently sloped area of the pond will create shallow (one to six inches water depth) water habitat for the Hawaiian stilt (*Himantopus mexicanus knudseni*) and Hawaiian gallinule (*Gallinula galeata sandvicensis*). The deep (six inches to one foot water depth) water section would create habitat for the Hawaiian duck (*Anas wyvilliana*) and Hawaiian coot (*Fulica alai*). Approximately 32,000 cubic yards of soil will be excavated from with project area to create the wetland pond and stockpiled onsite to the west and adjacent to the created wetland. The side slope of the stockpile could vary in steepness from 20 to 50 percent slope, and the top elevations of the embankment could vary from 11 to 12.8 feet. The excavated material will remain onsite, grassed, and used as a lookout. In the future, once funds have been acquired, the excavated material will be removed and hauled to a private landfill in Nanakuli. Restoration of the site will provide environmental education programs such as; vegetation identification, avian surveys, and water quality studies. A 12 foot wide unpaved access pathway will be constructed surrounding the pond for light-duty maintenance vehicles.

This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 401], as amended (NEPA); the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended

(ESA); the Migratory Bird Treaty Act of 1918 [16 U.S.C. 703-712] (MBTA); and other authorities mandating Service concern for environmental values. Based on these authorities, we offer the following comments for your consideration.

We have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program as it pertains to listed species and designated critical habitat in accordance with section 7 of the ESA. There is no federally designated critical habitat within the immediate vicinity of the proposed project. Our data indicate that the following federally listed species may occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); the endangered Hawaiian stilt, endangered Hawaiian coot, endangered Hawaiian gallinule, and endangered Hawaiian duck (hereafter collectively referred to as Hawaiian waterbirds), and the endangered Hawaiian goose (*Branta sandvicensis*) . Also, the Pacific golden-plover (*Pluvialis fulva*), ruddy turnstone (*Arenaria interpres*), sanderling (*Calidris alba*), and wandering tattler (*Tringa incana*), shorebird species protected under the MBTA, are known to occur within the proposed project area.

Hawaiian hoary bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away.

To minimize impacts to the endangered Hawaiian hoary bat we recommend you consider incorporating the following measure into your project description:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).

Hawaiian waterbirds

Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water occurs. Hawaiian waterbirds are known to occur at the Pouhala Marsh, which has been designated as a core wetland (Service 2011) that is protected and has been managed by DOFAW to recover Hawaiian waterbirds.

Hawaiian stilt nesting occurs from mid-February through August. Hawaiian coot nesting occurs primarily from March through September, although some nesting occurs in all months of the year. Hawaiian gallinules nest year-round, but mostly from March through August. For the Hawaiian duck, nesting can occur year round. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards. If a nest is present, potential impacts include parents being flushed from the nest for extended periods of time causing the nest to fail (*e.g.*, exposed to predation) or eggs or chicks being crushed by humans or equipment.

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you consider incorporating the following applicable measures into your project description:

- In areas where waterbirds 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.
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within three days of project initiation and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - 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.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

The Service is in support of the proposed Pouhala Marsh Restoration project and the work DOFAW has done to manage Pouhala Marsh for Hawaiian waterbird recovery. However, we are concerned with providing access to the marsh during the Hawaiian stilt breeding season and that the proposed environmental education program emphasize the importance of people not feeding wildlife and disposing of trash in proper receptacles. We recommend access be controlled during the breeding season to avoid and minimize disturbance to nesting Hawaiian stilts. In addition, we recommend the Draft EA include information regarding the environmental education topics that will be emphasized at Pouhala Marsh including, but not limited to not feeding the wildlife and why it is important, and disposing of trash in proper receptacles.

Hawaiian goose

Hawaiian geese have been documented at various sites on Oahu and have been seen regularly traversing between Mililani at the Agricultural Park and at a local golf course and to the North Shore of Oahu at James Campbell National Wildlife Refuge and Turtle Bay Resort. They have been observed at the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. They are observed in a variety of habitats, but prefer open areas, such as natural grasslands and shrublands, pastures, wetlands, golf courses, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

We recommend you consider incorporating the following applicable measures into your project description to avoid and minimize impacts to the Hawaiian goose:

- Do not approach, feed, or otherwise disturb Hawaiian geese.

- If Hawaiian geese are observed loafing or foraging within the project area during the Hawaiian goose breeding season (September through April), have a biologist familiar with the nesting behavior of the Hawaiian goose 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 three 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 work, or a previously undiscovered nest is found within said radius after work begins.
- In areas where Hawaiian geese 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.

Additional Comments

The project involves the excavation and temporary stockpiling of previously filled material onsite. The Service is concerned with the potential presence of contaminants within the fill material at the site and the mobilization of any contaminants that may be present during the excavation. We recommend that contaminant surveys be conducted if they haven't already been done and results included in the Draft EA. In addition, we recommend the Draft EA evaluate project impacts to resources, and identify measures to avoid and minimize such impacts.

Because the proposed project will involve work within the aquatic environment, we are attaching the Service's recommended Best Management Practices (BMPs) regarding sedimentation and erosion in aquatic environments. We encourage you to incorporate the relevant practices into your project design.

If it is determined that the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may further assist you with ESA compliance.

We appreciate your efforts to conserve listed species and we look forward to reviewing the Draft EA for the proposed project. If you have questions regarding these comments, please contact Leila Nagatani, Fish and Wildlife Biologist (phone: 808-792-9400, email: leila_nagatani@fws.gov). When referring to this project, please include this reference number: 01EPIF00-2018-TA-0121.

Sincerely,

Aaron Nadig
Island Team Manager
Oahu, Kauai, North Western Hawaiian Islands, and American Samoa

Enclosure: Service BMPs for erosion and sediment control
cc: Jason Misaki, DOFAW

Literature Cited

U. S. Fish and Wildlife Service. 2011. Recovery Plan for Hawaiian Waterbirds, Second Revision. U.S. Fish and Wildlife Service, Portland, Oregon.

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see *http://www.haccp-nrm.org/Wizard/default.asp*) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

From: Frager, Rebecca M CIV USARMY CEPOH (US) [mailto:Rebecca.M.Frager@usace.army.mil]
Sent: Wednesday, January 31, 2018 4:30 PM
To: William Bow <WBow@bowengineering.com>
Subject: POH-2018-00036 (Phase 1 Pouhala Marsh Restoration, Waipahu, Oahu, HI)

Aloha Mr. Bow,

I have been reviewing your proposed project as listed in the subject line above. It looks as if this project may qualify for a Nationwide Permit (NWP) #27, Aquatic Habitat Restoration, Enhancement, and Establishment Activities. However, I have a couple of questions for you before I can make that determination.

1) NWP 27 states: "To be authorized by this NWP, the aquatic habitat restoration, enhancement, or establishment activity must be planned, designed, and implemented so that it results in aquatic habitat that resembles an ecological reference. An ecological reference may be based on the characteristics of an intact aquatic habitat or riparian area of the same type that exists in the region. An ecological reference may be based on a conceptual model developed from regional ecological knowledge of the target aquatic habitat type or riparian area." Was an ecological reference, as described, used in planning this site?

2) By stockpiling the excavated soil, will you be converting any existing wetland area into an upland? Or is the marsh an upland at this location? NWP 27 "does not does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments."

If these two criteria are met, than your proposed project will likely qualify for NWP 27 from our office. If not, than it will likely need to be processed as a Standard Permit.

Thank you for contacting our office regarding your proposed project. I look forward to hearing from you soon.

Sincerely,
Becca Frager
Biologist
U.S. Army Corps of Engineers
Honolulu District Regulatory Office
Building 230
Fort Shafter, HI 96858-5440
808-835-4307

From: Shannon Lyday Ruseborn - NOAA Affiliate [mailto:shannon.ruseborn@noaa.gov]
Sent: Thursday, January 25, 2018 2:39 PM
To: William Bow <WBow@bowengineering.com>; jason.c.misaki@hawaii.gov; Gerry Davis - NOAA Federal <gerry.davis@noaa.gov>; Malia Chow - NOAA Federal <malia.chow@noaa.gov>
Subject: Pouhala Marsh Restoration

Project Name: Pouhala Marsh Restoration
Applicant: State of Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife
Agent: Bow Engineering and Development, Inc., Attn: William Bow
Re: NMFS Technical Assistance
Date: January 25, 2018
NMFS EFH Consultation Point of Contact: Shannon Ruseborn

NOAA's National Marine Fisheries Service (NMFS) was contacted to provide pre-consultation technical assistance for the proposed Pouhala Marsh Restoration on the island of Oahu. It is anticipated that the State of Hawaii Division of Forestry and Wildlife (applicant) and Bow Engineering and Development, Inc. (agent) will apply for a Department of the Army (DA) permit from the U.S. Army Corps of Engineers (USACE) in order to carry out the proposed project. As such, NMFS anticipates that the USACE will consult with NMFS Pacific Islands Regional Office (PIRO) on the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, section 305(b)) as described by 50 CFR 600.920, and Section 7 of the Endangered Species Act.

PIRO's Habitat Conservation Division provides the following comments, concerns, and suggestions on how to more effectively avoid and minimize project impacts to NOAA trust resources. This technical assistance will facilitate the subsequent DA permitting process and streamline the consultation between NMFS and USACE on the essential fish habitat (EFH) provisions of the Magnuson-Stevens Act. This letter does not provide any comments pursuant to the Endangered Species Act, which can be obtained directly from NMFS' Protected Resources Division.

Project Description
The applicant proposes to create a tidal wetland pond within an approximately 9-acre area within the Pouhala Marsh State Wildlife Sanctuary. Pouhala Marsh is a 70-acre tidal wetland located in Waipahu on the island of Oahu in Pearl Harbor Estuary's West Loch and is bounded by Kapakahi Stream on the east.

The objectives of the project are to create wetland to improve and enhance nesting habitat for four species of Hawaiian waterbirds and to restore wetland function and ecological value. Currently the project site is degraded and has been disturbed by the importation of fill material when the site was being prepared for use as a landfill. The proposed action is to create a 226,000 square foot sloped wetland area with water depths ranging from 1-inch to 1-foot deep with a 12-foot wide unpaved access pathway around the pond. The proposal is for the first phase of the project, which includes creating a 5.74 acre pond and stockpiling the approximately 32,000 cubic yards of excavated material temporarily on the remainder of the site area. The stockpile of soil would be grassed and serve as a lookout or staging area. Future phases of the project would expand the pond and haul out the stockpiled soil offsite to the PVT landfill in Nanakuli.

Magnuson-Stevens Act
The Magnuson-Steven Act defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802(10)). Adverse effects to EFH may result from actions occurring within EFH or "upstream" from EFH; and may include site-specific or habitat-wide

impacts including individual, cumulative, or synergistic consequences of actions (50 C.F.R. § 600.810(a)).

The marine water column from the surface to a depth of 1,000 meters (m) from shoreline to the outer boundary of the EEZ (200 miles), and the seafloor from the shoreline out to a depth of 700 m around each of the Hawaiian Islands, have been designated as EFH. As such, all waters and submerged lands (i.e., the water column and bottom) of Pearl Harbor are designated as EFH and support various life stages for the management unit species (MUS) identified under the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. The MUS and life stages found in these waters include: eggs, larvae, juveniles, and adults of Coral Reef Ecosystem MUS; eggs, larvae, juveniles, and adults of Bottomfish MUS; eggs, larvae, juveniles, and adults of Crustacean MUS; and juveniles and adults of Pelagic MUS.

The minimum requirements to initiate an EFH consultation includes the following basic information (i.e., standard of evidence) as described at 50 CFR 600.920 (e)(3).
1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the MUS.
3) The federal agency conclusions regarding the effects of the action on EFH.
4) Proposed mitigation (avoidance, minimization and offset) measures if applicable.

Early coordination can be provided throughout the lead Federal agency's planning process, and typically leads to the identification of the types of information needed and the appropriate confidence level (i.e., accuracy) of supporting data (i.e., the standard of evidence) for PIRO HCD to: (1) conduct an initial review of the proposed action, (2) determine completeness of the materials, and (3) determine the appropriate scale of the EFH effects analysis.

NMFS Comments

NMFS is unable to estimate all potential adverse effects to EFH as a result of project activities until more explicit project implementation information is made available. However, the following approaches can be incorporated and many project impacts to NOAA trust resources would be avoided and/or minimized.

- Specify erosion control measures in construction plans to prevent turbid run off from the project area.

- Recommended best management practices/mechanisms for reducing sedimentation and turbidity include: silt fences, silt curtains, geotextile rock bag protection, dewatering using the Caisson system, use of coffer dams.

- The applicant should perform as much of the construction activities as is practical during low tide periods in order to minimize run-off and sedimentation.

- Incorporate low impact development stormwater practices (e.g. native landscaping, bioretention and infiltration techniques, and green buffers) to the extent practical to retain stormflows and pollutants on-site.

- Use native and/or non-invasive plants for stabilization of exposed soil and to avoid siltation run-off from entering the water during storms and to help filtrate water.

- Use geotextile fabric that is compatible with soil underneath to help with particle retention while allowing hydraulic infiltration and exfiltration.

- Project design should replicate natural stream channel and flow conditions to the greatest extent practicable.

- Use "soft" approaches in lieu of impervious "hard" stabilization and modifications whenever possible to allow for water infiltration.

- Design and install new structures in a manner not to interfere with aquatic organism passage and that complies with all applicable regulations.
- Avoid the modification of riparian habitat.

Conclusion

The preferred method for submitting requests for consultations with NMFS PIRO is via the email addressEFHESAconsult@noaa.gov. However, the point of contact for essential fish habitat consultations under the Magnuson-Stevens Act is Gerry Davis, Assistant Regional Administrator for the Habitat Conservation Division, gerry.davis@noaa.gov. The point of contact for Section 7 of the Endangered Species Act is Anne Garrett, Assistant Regional Administrator for the Protected Resources Division, ann.garrett@noaa.gov.

NMFS is committed to providing continued cooperation and subject matter technical expertise that result in beneficial outcomes for NOAA trust resources and sufficiently comply with relevant mandates, while achieving the project goals effectively and expeditiously. Please contact Shannon Ruseborn at 808-725-5017 and/or Shannon.ruseborn@noaa.gov with any comments, questions, or to request further technical assistance.

Shannon Lyday Ruseborn
EFH/Habitat Blueprint Assistant Coordinator
Contractor - Lynker Technologies
Habitat Conservation Division
NOAA Fisheries, Pacific Island Regional Office
Inouye Regional Center
1845 Wasp Blvd.
Honolulu, HI 96818
shannon.ruseborn@noaa.gov
808-725-5017

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

01044CEC.18

January 26, 2018

Mr. William Bow
Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, HI 96826

Dear Mr. Bow:

SUBJECT: Comments on Proposed Pouhala Marsh Restoration, Phase I Scoping and Early Consultation, Island of Oahu, Hawaii TMKs: (1) 9-3-001:002; (1) 9-3-001:012; (1) 9-3-001:006 (portions)

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges on December 27, 2017 receipt of a letter from Mr. Jason Misaki, Wildlife Manager of the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW), Oahu Branch, to the Director of the Department of Health soliciting comments on specific issues to be included in the environmental analysis and permitting requirements to ensure that the Environmental Assessment is thorough and adequate, and that it meets the needs of the public and responsible/reviewing agencies. The DOH-CWB has reviewed the document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. DLNR-DOFAW may be responsible for fulfilling additional requirements related to our program. We recommend that they also read our standard comments on our website at:
http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

A. General Comments

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. The DLNR-DOFAW may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

   Based on information contained in the Preliminary Project Description, a National Pollutant Discharge Elimination System (NPDES) may be required. For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, DLNR-DOFAW must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. DLNR-DOFAW will be asked to do a one-time registration to obtain DLNR-DOFAW's login and password. After DLNR-DOFAW register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If DLNR-DOFAW's project involves work in, over, or under waters of the United States, it is highly recommended that they contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations (CFR), Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. Please note that all discharges related to the project construction and/or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards (WQS). Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

   d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

   e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

B. Comments on Preliminary Project Description

1. Please provide the "closed Pouhala Wildlife Sanctuary" legal boundary in Figure 2.

Wetlands located within the "Pouhala Marsh Wildlife Sanctuary" are State waters as listed in Appendix A of HAR, Chapter 11-54 and classified by the DOH as "Inland waters, Class 1" subject to "Class 1" water protection.

Tax Map Key (TMK) number of the wildlife sanctuary located within the Pouhala Marsh as specified in "Exhibit 1. List of CLOSED wildlife sanctuaries" of HAR, Chapter 13-126 is identified as (1) 9-3-001:004.

The "Preliminary Project Description (PPD)" states that the DLNR-DOFAW manages the "Pouhala Marsh" as "a wildlife sanctuary through a land lease agreement with the City." The proposed restoration project is located in TMKs: (1) 9-3-001:002; (1) 9-3-001:012; and (1) 9-3-001:006 (portions).

Clarification is needed to determine whether the proposed project site is located within the wildlife sanctuary legal boundary and to allow the DOH-CWB to determine the classification of the State water located within the project site.

2. Please provide updated wetland delineation in Figure 2.

   The PPD also stated that "Pouhala Marsh is a 70-acre tidal wetland." A wetlands delineation is needed to justify this statement. "The proposed project under development includes the creation of a single wetland pond within the ±9-acre area." "An approximate 8-acre area within the project site has been disturbed by the importation of fill material when the site was being prepared for use as a landfill. This disturbed area currently remains dry under most conditions and is the project area identified for wetland restoration."

   Wetland delineation at Kouhala Marsh is needed to identify the State water boundary at the project site and for permitting jurisdictional determination purpose.

3. Please provide information on how to maintain water depth at the proposed "Wetland Pond".

   Water depth in the proposed wetland pond would vary to "create habitat in shallow waters (1 inch to 6 inches of water) for the Hawaiian Moorhen and Hawaiian Stilt. The deep section would create habitat for the Hawaiian Duck and Hawaiian Coot, with the water depth ranging from 6 inches to 1 foot." One of the objectives of the proposed project is "[E]nsuring that created wetland maintains wetland functions and ecological values." The draft environmental assessment (DEA) needs to discuss the project site hydrology, verify wetland pond water sources and quality and determine how would the designed water depth be maintained to ensure the wetland function and wetland value at the constructed

"wetland pond." The discussion should provide justification for the adequacy of the "grading conceptual plan" or provide base information for wetland pond design modification or for wetland pond operation consideration.

4. Clarification is needed on the size of the proposed Phase 1 wetland pond construction

   The PPD indicated that the concept plan development, based on the Oceanit December 2009 Final Engineering Study Report, provides approximately 226,000 square feet of gently sloped wetland area with a 12-foot wide access road at the perimeter. The 226, 000 square feet converted to acreage is approximately **5.19** acres. However, the PPD further stated that "[T]he first phase would include the excavation and pond creation of up to **5.74** acres of the site and the stockpiling of the excavated material temporarily on the remainder of the ±9-acre site."

5. Please clarify/discuss whether working in Kapakahi Stream is part of the proposed action

   As discussed in the proposed action, the proposed project under development includes the creation of a "single wetland pond" system within the ±9-acre area that would blend seamlessly with the existing wetland.

   However, the project objective also indicated that "[R]estoration of the site and adjacent Kapakahi Stream would allow for environmental education programs, such as vegetation identification, avian surveys, and water quality studies."

6. Provide discussion on whether the operation of the proposed wetland pond would result in discharge wetland water to Kapakahi Stream and affect stream and Pearl Harbor Estuary water quality

   The PPD indicated that, in the past, the marsh may have been flushed with freshwater during high flows of the Waikele stream into the Kapakahi stream.

   Is pumping excess flood or storm water accumulated in the proposed wetland pond to Kapakahi Stream part of the system operations procedure?

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

EC

c: Mr. Jason Misaki, DLNR, DOFAW [via e-mail jason.c.misaki@hawaii.gov only]

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
INTERIM DIRECTOR

Deputy Directors
ROY CATALANI
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
DIR 1635
STP 8.2299

JAN 31 2018

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

January 29, 2018

Mr. William Bow
Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Dear Mr. Bow:

Subject: Pouhala Marsh Restoration, Phase I
Scoping and Early Consultation for Environmental Assessment
Waipahu, Oahu, Hawaii
TMK: (1) 9-3-001:002, 006 and 012 (Por.)

The State of Hawaii, Department of Land and Natural Resources proposes to create a wetland pond within a ±9-acre area at the Pouhala Marsh State Wildlife Sanctuary. Based on the information provided, the State Department of Transportation (DOT) has no comment as the proposed project does not appear to impact DOT facilities at this time.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

JADE T. BUTAY
Interim Director of Transportation

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS 201801171425RI

January 17, 2018

MEMORANDUM

TO: Jason Misaki, Wildlife Manager
Division of Forestry and Wildlife, Oahu Branch
Department of Land and Natural Resources

FROM: Leo R. Asuncion, Director

SUBJECT: Pouhala Marsh Restoration, Phase I, Scoping and Early Consultation, Waipahu, Oahu; TMK: (1) 9-3-001: 002, 012 and 006 (portions)

Thank you for the opportunity to provide early consultation on the proposed Pouhala Marsh Restoration Project at Waipahu, Oahu, transmitted via memorandum received December 27, 2017.

According to your consultation request, the Department of Land and Natural Resources proposes to create a wetland pond with an approximately 9 acre area at the Pouhala Marsh State Wildlife Sanctuary. The project site is located within the Pearl Harbor complex, and is bounded by Kapakahi Stream on the east.

The design of the proposed wetland pond system is based on the construction of a single pond that would blend seamlessly with the existing wetland. The proposed wetland restoration would require equipment mobilization and demobilization, excavation of soil, slope grading, loading of soil into trucks, and hauling soil for disposal. The estimated construction cost is from $4.5 to 5.0 million.

For use of state lands and funds, and use of conservation district lands from the proposed project, an Environmental Assessment (EA) is required pursuant to Hawaii Revised Statutes (HRS) Chapter 343.

The Office of Planning (OP) has reviewed your EA consultation request, and has the following comments to offer.

1. The Hawaii State Planning Act, HRS Chapter 226, provides goals, objectives, policies, and priority guidelines for growth, development, and the allocation of resources throughout the state in areas of state interest.

The subject EA should include an analysis on the Hawaii State Plan Act that addresses whether the proposed development conforms with state and county plans, policies and controls. The analysis should include a discussion on the compatibility of the proposed development with the objectives and policies, and priority guidelines listed in HRS Chapter 226.

2. Hawaii Coastal Zone Management (CZM) law, HRS Chapter 205A, requires all state and county agencies to enforce the CZM objectives and policies. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343.

   The subject EA should include an assessment as to how the proposed development conforms to CZM objectives and supporting policies set forth in HRS § 205A-2, as amended. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection and marine resources.

3. The EA should assess potential impacts of the proposed wetland restoration activities on the Pouhala Marsh, adjacent Kapakahi Stream and water quality, and discuss site-specific mitigation measures to prevent any wastewater, sediment, soil and debris resulting from the proposed construction, including excavation, slope grading and onsite stockpile, from adversely impacting the coastal ecosystem and the State waters as specified in Hawaii Administrative Rules Chapter 11-54.

   OP's Stormwater Impact Assessments, a document for Hawaii's environmental review process, could help the project to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. Mitigation measures listed in this document can be applied to water runoff strategies to protect coastal ecosystems.

   The document is available at
   http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf

4. The proposed wetland restoration project is located within the Special Management Area (SMA) delineated by the City and County of Honolulu. The EA should discuss

the compliance with the SMA use requirements by consulting with the Department of Planning and Permitting, City and County of Honolulu.

5. The EA should provide a list of all required permits and approvals for the proposed wetland restoration project. If an U.S. Army Corps of Engineers Permit is required for the project, please consult with our office for CZM federal consistency review.

If you have any questions regarding this comment letter, please contact Shichao Li of our CZM Program at (808) 587-2841.

c: Mr. William Bow, Bow Engineering and Development, Inc.
Mr. Luis P. Salaveria, Director
Department of Business, Economic Development and Tourism

JAN 2018

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

January 11, 2018

Bow Engineering & Development, Inc.
ATTN: William Bow
1953 South Beretania Street, PH-A
Honolulu, HI 96826

Mr. Bow,

Subject: Pouhala Marsh Restoration, Phase I
Scoping and Early Consultation

Thank you for the opportunity to review and comment. The Department of Design and Construction, Facilities Division has some comments.

The proposed project should have a study done to evaluate the impact it will have on the drainage for this area. For example, what will be the impact of the berm and how long will it remain in place? Historically, this area has experienced major flooding in large rain events. There are major City facilities nearby and any increase in the flooding would be of major concern and would need to be mitigated.

Should you have any further questions regarding these comments, please call Clifford Lau at 768-8431.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(713734)

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

JAN 2 5 2018

January 23, 2018

Mr. William Bow
Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Dear Mr. Bow:

SUBJECT: Environmental Assessment
Pouhala Marsh Restoration, Phase 1
Scoping and Early Consultation

The State of Hawaii, Department of Land and Natural Resources has requested we transmit our comments on the proposed Pouhala Marsh Restoration project to your office.

The Department of Parks and Recreation (DPR) agrees with the U.S. Fish and Wildlife Service identification that the Pouhala Marsh is a wetland of critical concern for protection and habitat enhancement. DPR supports the proposed restoration improvements to improve and enhance nesting habitat for Hawaiian waterbirds and ensuring that created wetlands maintain wetland functions and ecological values.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

(for) Michele K. Nekota
Director

MKN:jr
(713763)

cc: Jason Misaki, Department of Land and Natural Resources
Glenn Kajiwara, Department of Parks and Recreation

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

2018/ELOG-23 (at)

April 19, 2018

Mr. Jason Misaki
Wildlife Manager
Department of Land and Natural Resources
Division of Forestry and Wildlife, Oahu Branch
State of Hawaii
2135 Makiki Heights Drive
Honolulu, Hawaii 96813

Dear Mr. Misaki:

Subject: Request for Pre-Environmental Assessment Comments on Pouhala Marsh Restoration, Phase I (Project)

We received your letter on January 2, 2018, requesting a pre-assessment consultation prior to preparation for an Environmental Assessment (EA) for the proposed creation of a tidal wetland pond within a portion of the Pouhala Marsh State Wildlife Sanctuary (Sanctuary).

We offer the following comments and recommendations regarding the relevant environmental issues and concerns that should be addressed in the EA:

Land Use Regulations and Permits

- The project site is located in the State Land Use Conservation District.
- The project site is located in the City P-1 Restricted Preservation District. According to the Land Use Ordinance, Revised Ordinances of Honolulu (ROH) Chapter 21, all uses, structures, and development standards in the P-1 District are governed by the appropriate state agencies.
- The project site is partially within the flood plain and must comply with the applicable provisions of ROH Chapter 21A (Flood Hazard Areas).
- The project site is outside of the shoreline setback area. As such, ROH Chapter 23 does not apply.

- As noted, the project site involves development within the Special Management Area (SMA) and is subject to ROH Chapter 25. The project's valuation is over $500,000 and, therefore, requires a SMA Use Permit (major).
- The project will require grading and stockpiling permits.
- In addition to the listed federal and state permits and approvals required, the EA should also include a list of all required city permits and approvals.
- The project must comply with the prevailing soil erosion and storm water quality standards ("Rules Relating to Water Quality"). The project's compliance with the Rules Relating to Water Quality will be verified at the time that the grading/stockpiling plans are submitted to the Department of Planning and Permitting for review.

Other Considerations

- The proposed project conforms to the Central Oahu Sustainable Communities Plan (www.honoluludpp.org) because the restoration provides valuable habitat for endangered Hawaiian waterbirds. It also incorporates the wetland and wildlife habitat area as a potential passive recreational resource, located on the shoreline of Pearl Harbor at the Sanctuary.
- The Waipahu Town Action Plan (www.honolulu.gov/tod) identified the community's interest in highlighting the Sanctuary through educational signage for residents and visitors alike. The signage is envisioned as a way to improve awareness of local natural resources and native species in the area. The signage should be located along the Pearl Harbor Historic Trail (PHHT) near the intersection with Waipahu Depot Street. It would be a great community benefit if the proposed project could include and implement the above recommendation. The EA should acknowledge and assess this request by the community.
- The EA should discuss what range of sidewalk and roadway improvements are needed and will be provided to facilitate pedestrian and bicycle connections from the PHHT and Waipahu Town to the Sanctuary Restoration Area.

  The Waipahu Neighborhood Transit-Oriented Development (TOD) Plan (www.honolulu.gov/tod) emphasizes the creation of a network of green spaces and linkages through the station areas. Pouhala Marsh is called out as an important amenity that should be accessible to residents. As recommended in the TOD Plan, please consider incorporating a stream walk along Kapakahi Stream within the Sanctuary and marsh. Coordination with the State Department of Transportation on their

Leeward Bikeway project, which begins at Waipahu Depot Street, could improve public access as part of both projects.

- The EA should include an archeological investigation for the presence of traditional and historic land uses and assess whether this constitutes a historic and cultural site.
- The proposed "temporary" stockpiling of material adjacent to the created wetland will create an embankment that could vary from 11 to 12.8 feet. Please indicate the expected time-span of "temporary." The proposed projects states that the temporary embankment will also serve as a lookout for groups wishing to engage in environmental education, such as vegetation identification, avian surveys, and water quality studies. This embankment could be high enough to create panoramic views of the Koolau and Waianae Ranges as well as other significant views around the harbor. While this interim use will clearly be beneficial to manage expectations, please analyze and assess the impact that the eventual removal of the embankment will have on the community and groups who engage in passive recreation and educational programs in this area.
- Since stockpiled material is planned to be removed only as funds become available, describe the interim measures or Best Management Practices that will be in place to prevent short- and long-term erosion and sedimentation.
- Due to the site previously being prepared as a landfill, soil tests should be conducted, or official documents provided, to record and verify it is clean and free of contaminants and other hazardous substances before removal, stockpiling, and eventual disposal off-site.
- Discuss the extent of how converting the site to a fully functioning wetland could influence surrounding drainage and/or serve as flood control for the neighborhood.
- The EA should address the possible impact of sea level rise in relationship to the sanctuary as a wetland. The Final EA should reflect recent findings published in the Hawaii Sea Level Rise Vulnerability and Adaptation Report (December 2017) by the State Climate Change and Mitigation Commission. In particular, the Final EA should expand on the long-term effects of sea level rise on this project or any sea level adaptation or mitigation measures the wetland could provide.

Thank you for the opportunity to provide input on the content of the EA. Should you have any questions, please contact Andrew Tang of our staff, at 768-8123 or andrew.tang@honolulu.gov.

Very truly yours

Kathy K. Sokugawa
Acting Director

cc: William Bow
Bow Engineering & Development, Inc.

APPENDIX B
POUHALA MARSH BIOLOGICAL SURVEYS AND HABITAT ASSESSMENT

Division of Forestry and Wildlife

Oahu Branch

2135 Makiki Heights Drive • Honolulu • HI • 96822

(808) 973-9788

Pouhala Marsh Biological Surveys and Habitat Assessment

12/12/2017

Prepared by:

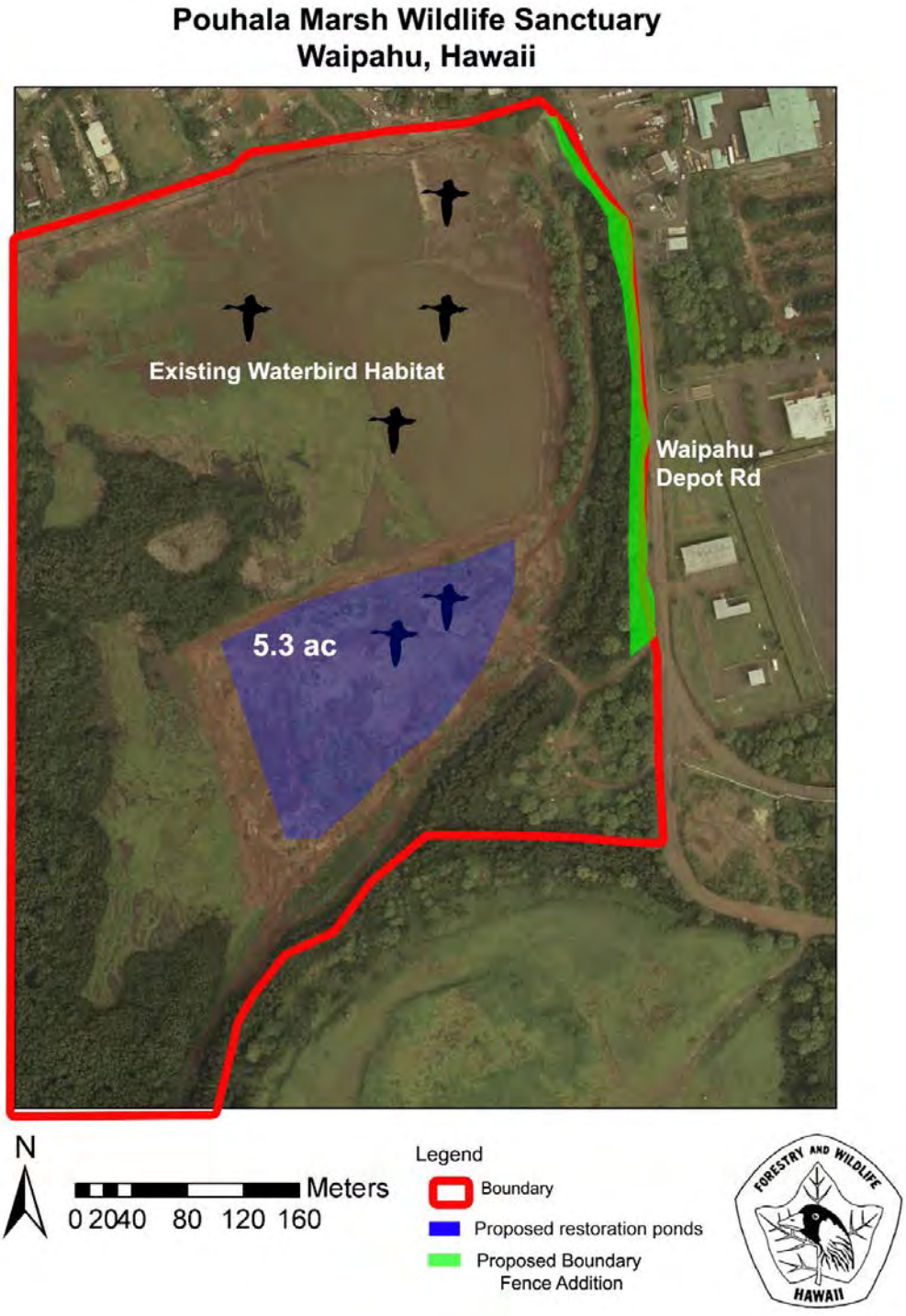
Eryn N. Opie, Wildlife Biologist, Division of Forestry and Wildlife, Oahu Branch

Nicholas J. Vargas, Wildlife Biologist, Division of Forestry and Wildlife, Oahu Branch

Table of Contents

Appendices:

1.0 Map of Project Site



Map 1: Designating the existing waterbird habitat and the location of the proposed area of restoration ponds (highlighted in purple). Waikele and Main Pond are both located in the area stating "Existing Waterbird Habitat" and Kapakahi Stream is located on the part of the map that is green.

2.0 Background of Pouhala Marsh

Pouhala Marsh is a 70-acre tidal wetland comprised of a remnant fishpond and coastal wetland. It is located in Waipahu on the southwestern coastline on the island of Oahu, Hawaii (Map 2). It is the largest remaining wetland habitat in the Pearl Harbor complex. Historically, the marsh was composed of multiple fishponds used by the royal court and in the late nineteenth century was reverted to the government during the Great Mahele. Subsequently, the area was subdivided and converted into rice paddies. The decline of rice production in the early twentieth century resulted in many of the remaining fishponds filled in by incinerator ash, trash and mangroves. Pouhala Marsh was considered for a potential landfill site due to the marshes location across from the City Waste Convenience Station. When the area was being prepared as a landfill, an 8-acre area was modified with the addition of fill material. This disturbed area currently remains dry under most conditions and therefore is the target for restoring waterbird habitat ponds. Expansion of this area would not only provide new habitat for waterbirds, but may restore nesting behaviors within the marsh (Map 1).

Map 2: Pouhala Marsh in relation to the island of Oahu. Boundary lines are depicted in the figure.

The State and the City and County of Honolulu own Pouhala marsh while the Department of Land and Natural Resources-Division of Forestry and Wildlife (DLNR-DOFAW) manages the area as a wildlife sanctuary through a land lease agreement with the City. The state parcel consists of 24 acres and the City parcel contains 86.5 acres. The marsh is adjacent to a small residential area that has resulted in illegal dumping and increases cat and dog predators to nesting sites. Over the past several decades, the marsh has been degraded through siltation, waste disposal, water pollution, and alien plant invasions. Only 24 acres remain available and used by waterbirds.

The US Fish and Wildlife Service has identified Pouhala marsh as a wetland of critical concern in its *Recovery Plan for Hawaiian Waterbirds* (USFWS 1985). The marsh provides critical habitat for at least 10% of the worlds remaining population of the federally endangered Hawaiian Stilt (Ae'o) (Ducks Unlimited). Stilts have been observed breeding at the marsh, but have not been successful at rearing young due to predation by mongoose, rats, and feral cats and dogs. Other native species observed using the marsh are the Black-crowned Night-Heron (Auku'u), Hawaiian Gallinule ('Alae Ula), Hawaiian Coot ('Alae ke' ke'o) and the Hawaiian Duck (Koloa). Migratory shorebirds observed using the marsh include the Bristle-thighed Curlew, Sanderling, Wandering Tattler, Pacific Golden Plover and Ruddy Turnstones.

Development, water pollution, and invasive plants, such as mangrove and pickleweed, have degraded Pouhala Marsh. Restoration efforts include invasive plant removal, refuse removal, native out-plantings, fencing to prevent predation, trespassing, and illegal dumping. Continued wetland restoration

would provide a naturally functioning ecosystem with suitable habitat for four endangered Hawaiian waterbirds. Restoration of the site and adjacent Kapakahi Stream would allow for environmental education programs, such as vegetation identification, avian surveys, and water quality studies.

Pouhala Marsh invasive plant removal focuses on chemical and manual removal of mangrove, saltbush and California grass. Heavy equipment has cleared and opened the banks along Kapakahi Stream and in the "Landfill" area. Removal and re-vegetation with native plants removes predator cover and restores the areas natural state. Mudflats surrounded by Pickleweed comprise the interior of the marsh. Herbicide is used to keep the pickleweed from encroaching on the mudflats, a naturally occurring Stilt habitat.

Rainfall in the winter months create ponds in the mudflats, while tidal influences create fluctuations in water levels ideal for stilts. Though there is more than adequate habitat for Coots and Gallinules, large numbers are still not seen. We hypothesize that the increased removal of bulrush (Southwest Corner of Main Pond) and opening up of the ponds (Waikele) more coots and gallinules will arrive.

3.0 Habitat Restoration

Pouhala Marsh followed the restoration template that garnered success for Hamakua Marsh, utilizing the natural hydrology and topography to enhance the habitat already present. Mangrove was removed from the banks of Kapakahi Stream to open up the waterway and eliminate ambush points and staging areas for predators. Much of the mudflats in the interior was present and already provided adequate habitat for stilts, so predator control was integral in the nesting success of the waterbirds. Tidal influences create the fluctuation in water levels ideal for stilt habitat; rainfall supplements the ponds in the winter months, creating greater range in available habitat for nesting, and a larger surface to forage for insects dislodged by water. This source of water creates year-round foraging for adult and hatch year chicks. Although there is adequate habitat for larger numbers of coots and moorhens that are already present, the populations continue to stay the same.

October 2011: View of the Kapakahi Stream adjacent to the Landfill where mangrove was removed and replaced with native wetland species.

DOFAW staff and community volunteers have all worked along the Kapakahi Stream to remove mangrove as well as other invasive species detrimental to the wetland health. Along with invasive plant removal, the community participated in native-plantings to restore wetland health and promote waterbird nesting habitat. The main focus is to re-vegetate the banks along Kapakahi Stream to enhance the Moorhen and Coot nesting habitats. Mangrove, saltbush, and California grass continue to be targeted for eradication, and predator control is conducted year-round to ensure habitats are protected.

DOFAW staff and community volunteers also preform land management at the Main Pond. Some of the main objectives include the removal of the pickle weed and bulrush and replace them with native aquatic plants such as Ahuawa (*Cyperus owahuensis*). By re-establishing a native seed bank within the

Main Ponds my result in more open space from the pickle weed being removed for waterbirds to establish their nesting territories and utilize more appropriate native vegetation for the construction of their nests.

4.0 Predator Control

In 2007, DOFAW began conducting predator control in Pouhala marsh after numerous feral dogs were observed throughout the marsh as well as dog tracks near and around stilt territories. The trapping resulted in the removal of two mongooses, one cat, and two dogs. The control program had initial success, but as catch effort increased and catch success decreased, the program was deemed insufficient with the limited staff. In 2008 the United States Department of Agriculture, Wildlife Services (USDA-WS) was contracted by the DLNR DOFAW to conduct predator control in DOFAW wildlife sanctuaries.

In 2008 a total of 188 animals were trapped; 173 mongooses, 11 cats and four dogs. Six Stilt territories were established, with only one successfully hatching four chicks. Only one of the four chicks were able to fledge. The territories established and lost chicks were likely killed or harassed by feral dogs in the marsh. This was the first year of full time predator control actions, which were increased to address the threat of dogs in the marsh. Following the '08 season, improvements were made to the perimeter fences and in frequency of presence to monitor dog ingress.

Increased predator control in 2008-09 led to a total of 22 chicks reaching fledgling stage in 2009. Although there were still signs of dogs present, pressure and removal efforts reduced the frequency of feral dog presence. In 2009, increased predator control effort led to the removal of 561 total animals; 16 cats, 1 dog and 524 mongooses and 20 mice/rats. In 2010, predator control was continued and 384 animals were removed: 30 cats, 2 dogs, 9 rats and 343 mongooses.

Predator Control continues to be a vital asset to the rehabilitation of Pouhala Marsh. The USDA-WS continues its efforts to trap and dispatch invasive predators currently in 2017. Totals that have been currently calculated include 122 total animals, 117 total mongoose, and 5 total cats. There were no sited territories, no nests, and no chicks sited within the year. One Juvenile Stilt was sighted in Waikele Pond which can be attributed to successful predation control. All other stilt data shows adults populations within Waikele pond and the Main Pond slowly decreasing as the year progresses. Coot data reveals that adults were solely sighted this year in the Main Pond and Kapakahi Stream; no nesting efforted were noted. Gallinule data reveled that populations only consisted of adults within the Main Pond and Kapakahi Stream. Gallinules residing to the Kapakahi Stream were the only population gradually increasing in adult numbers but both areas did not show any nesting activity. Since predation control is occurring during the year and with positive results, decreasing adult populations and nesting activity can mostly be attributed towards the suitability of the habitat.

5.0 Habitat Description

The habitat at Pouhala Marsh has been characterized into three sections; the Main Pond, the Landfill, and the Waikele Pond. The Main Pond and Waikele Pond are made up of one large pond divided by a natural mudflat barrier and encompassed by pickleweed. The Landfill is unique from the Ponds in that it is has a mean elevation of 1.0 ft, is dry year around, except during exceptional rain events, has kiawe scattered throughout and pickleweed and saltbrush bordering with the adjacent Kapakahi stream. During significant rain events, the Landfill doesn't flood, but becomes muddy and is not utilized by any waterbird species aside from shorebirds. The Kapakahi stream borders the marsh and is frequented by the species being surveyed. The stream is exempt from the survey, however observations of species present are noted.

The hydrology of the marsh is characterized by influences from sea level, tidal fluctuations, and ground and surface water of the Kapakahi and Waikele streams (Oceanit 2009). Together these factors create "micro" habitats within the larger three areas of the marsh and are utilized differently by the

waterbirds (Figure 1). A mudflat is described as an area without vegetation that may be inundated during a high tide or rain event, but at the survey time is not covered with water. Mudflat with vegetation is the same as a mudflat but is vegetated. Habitats described as 0-3", 3-6", or 6"> of water, are those that are mostly always inundated but the depth at which they are varies on the above hydrological factors.

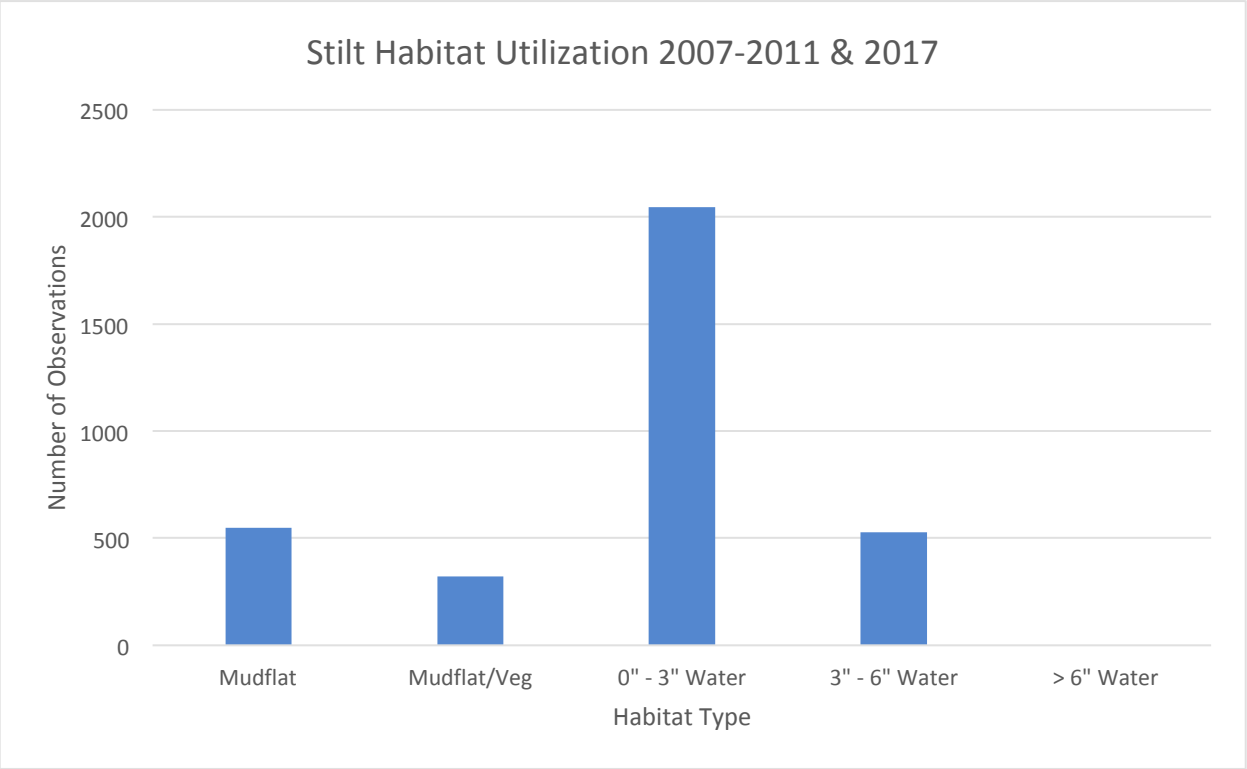


Figure 1: Graph shows the number of observations of stilts within the whole marsh broken down by specific habitat type. Data reflects that stilts prefer to be in shallow water to loaf and forage.

MAIN POND/LANDFILL/WAIKELE POND

Photo 1. View facing the Southwest portion of the Main Pond. The pond is composed of various depths ranging from mudflats to 6" of water. Immediately surrounding the water is *Batis maritima* or pickleweed. Though this is a non-native invasive species, it provides the preferred nesting habitat for stilts and can be maintained. Other native species can be introduced to complement the pickleweed and/or eventually replace it.

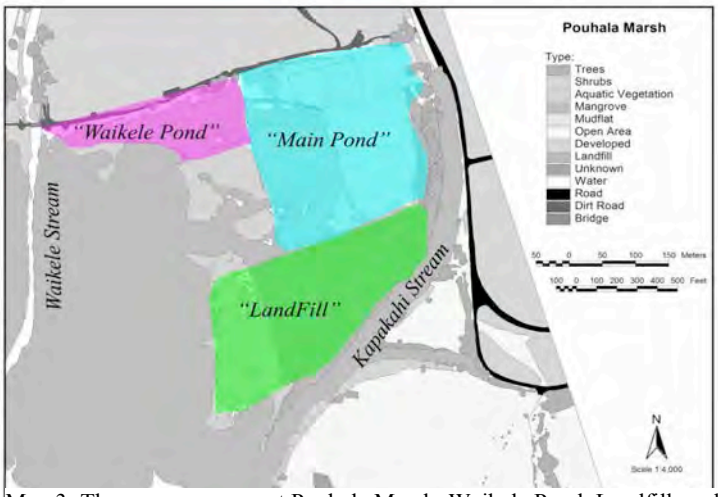
Photos 2-3: Examples of water level heights 0–3”, 3–6 within the Main Pond that the birds prefer to loaf and forage in.

Photo 4: A Westward view of Waikele Pond in Pouhala Marsh. The pond is adjacent to the Main pond and shares similar characteristics. Although not as deep as the main pond, Waikele pond does retain water and has a buffer vegetation (*Batis maritima*) along its perimeters. Even having such similar habitat to that of the Main Pond, its proximity to neighboring houses, human activity, and predation result in it not being as successful. Even if these factors were not present, the habitat would be overwhelmed with congested populations due to the small amount of area it provides.

Photo 5: View of the Landfill area of Pouhala Marsh. This is the site for the construction of new waterbird habitat and the creation of new ponds. The composition of the Landfill shows scattered Kiawe Trees and patches of grasses. Most of the exposed soil will stay dry for long durations during the year. During the rain seasons parcels near the Southwest corner will contain some water but will soon dry if not kept continuously saturated. Very few waterbirds and shorebirds will utilize this area, however the present vegetation is not a wetland habitat and will not encourage waterbird activity. Most of the time Golden Plovers are sighted with occasional sightings of stilts loafing within the area.

6.0 Waterbird Surveys and Habitat Use

Waterbird surveys are conducted to monitor nesting success, habitat utilization, and predator control success to determine future management and restoration goals. The more commonly noted water-bird species found in Pouhala include the Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Gallinule (*Gallinula chloropus sandvicensis*), Hawaiian Coot (*Fulica alai*), and the Hawaiian Duck (*Anas wyvilliana*); some other wetland and shorebird species are occasionally found as well. All species mentioned above are endemic Hawaiian water-birds that utilize the wetland at varying degrees for nesting, feeding, and loafing. Pouhala Marsh has been divided up into three survey sections that are labeled as followed: Landfill, Main Pond, and Waikele Pond. Any particular survey section is subjected to predation, flooding, and habitat loss.



Map 3: Three survey areas at Pouhala Marsh: Waikele Pond, Landfill, and Main Pond. The Landfill is the focal point of this project.

Survey Methods

Surveys are conducted following DOFAW protocol and have been repeated the same for every survey. Observers walk along the perimeters banks, roadways near Kapakahi stream, and interior parcels of the following: Landfill area, Waikele Pond, the Main Pond, and Kapakahi Stream. Each individual survey area will have 20 minutes devoted to monitoring any activity and listing bird sightings. Surveyors have free range on vantage points and movement throughout the survey so long as a single area is surveyed at a time. Surveyors have binoculars and survey sheets to effectively distinguish and record bird activity. On each visit, the number of waterbirds and shorebirds in each of the 3 survey areas were counted, native or non-native. Gallinule, Coot and Stilt numbers, habitat usage, nesting activity, banding information, predator control success, and overall wetland condition were the focus in each of the surveys. Individuals were counted and mapped. Habitat usage was identified as: mudflat, mudflat/vegetated, 0”-3” water, 3”-6” water and >6” water. Pairings, establishment of territory, and nesting activity was observed and recorded on maps. Survival rates of chicks and brood sized were also recorded.

Survey Results

Since survey data has been collected, the Main Pond is continuously the most used area of Pouhala Marsh by waterbirds (Figure 2). The Main Pond is the most popular because it provides the largest amount of necessary habitat for foraging, loafing, and nesting. It may also provide a degree of refuge from predators due to the large area of water within the marsh. Stilts are the most common species observed with numbers upwards of 700 observations in a year (Figure 3). They also prefer to utilize habitat that has 0-3” of water present and have rarely been observed in dry portions of the marsh.

Gallinules and Coots are also observed in the Main Pond but at much lower numbers (Figure 4) and infrequently.

Gallinule and Coot populations continue to be limited to the Kapakahi stream area. These are the only areas that have water depths suitable for breeding throughout the nesting season. Coots have been observed foraging and loafing in the southern portions of Kapakahi Stream, but no nesting activity has been recorded. Outplanting of native sedges, shrubs and reduction of alien weeds were done to enhance habitat, and encourage more coots to utilize the area. With continual habitat restoration that includes the entire Landfill area, a least 10 more acres of habitat will become available for the 4 waterbird species present, as well other temporary migratory species.

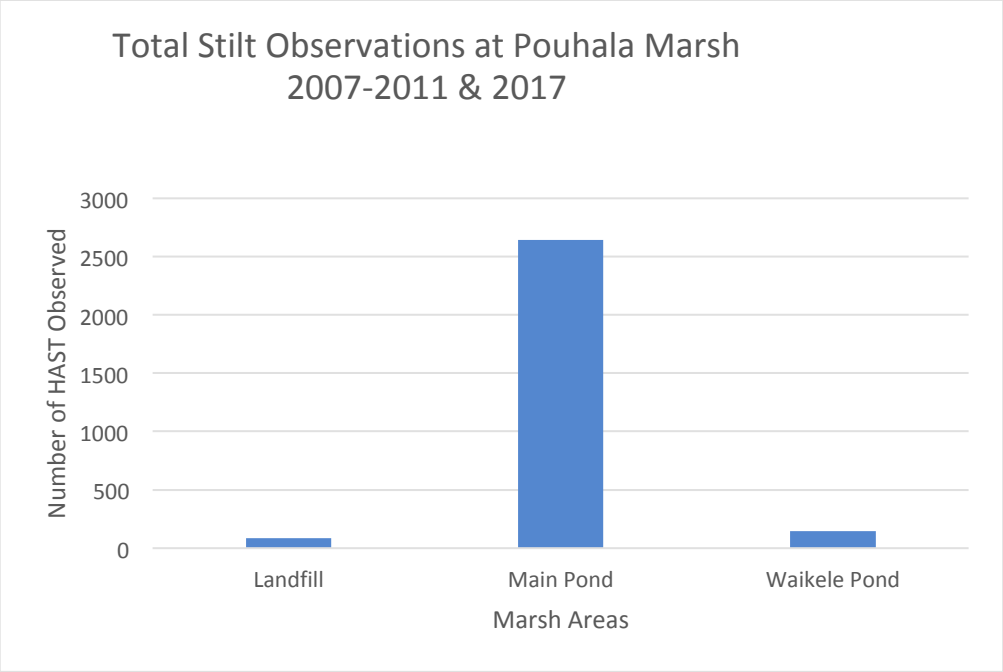


Figure 1: This graph shows the total number of observations of stilts at Pouhala Marsh and is broken down by area within the marsh.

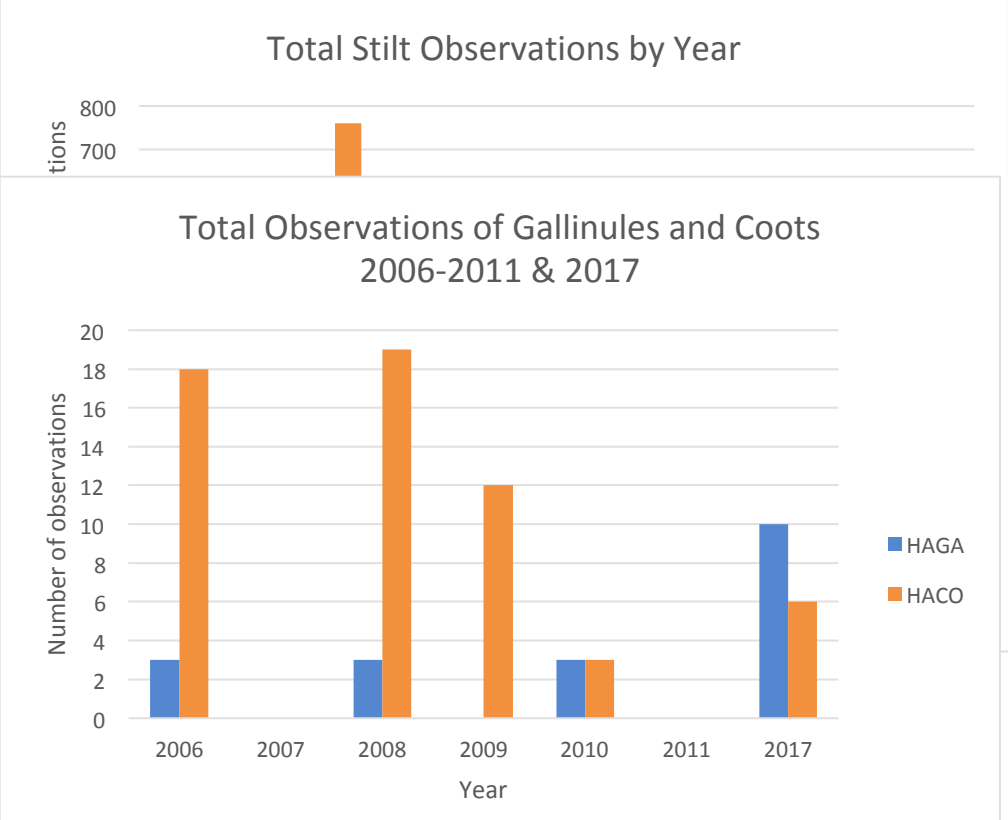


Figure 3: This graph shows the total number of HAST observations by year and within the Landfill, Main Pond, and Waikele Pond separately.

Figure 4: HAGA and HACO observations by year. No data found for 2007 and 2011.

7.0 Waterbird Nesting Information

Overall nesting efforts occur in exposed mudflats and vegetative portions of the interior and perimeters of the Main Pond. The main pond provides a larger area for various nesting territories, foraging areas, and protection from predation. The surveys that are conducted in this area tend to have a higher frequency of stilts that loaf in the deeper sections of the pond. Waikele Pond has also been surveyed to have some stilts in more water-saturated areas, however due to its close proximity to neighboring houses no nesting behaviors have been noted in this zone. The Landfill area has been described to have loafing stilts scattered around the parcel, with an occasional heavy rain event that will create a pond in the southwest portion of the area. Nesting attempts have been made in the Landfill area by stilts, but few have been successful. Exposure to predators and the elements would continuously cause nesting attempts to fail without having the proper habitat established for the stilts. Other water-bird species do not make any attempts to nest in this area due to the dry-nature of the land.

The following data tables and charts will exemplify how nesting conditions were when Pouhala Marsh was first acquired till present day management procedures (2006 – 2017). Some data years were not compiled due to insufficient reporting, however the data represented still allows for insight on preferred nesting areas and patterns on fledgling numbers over the years.

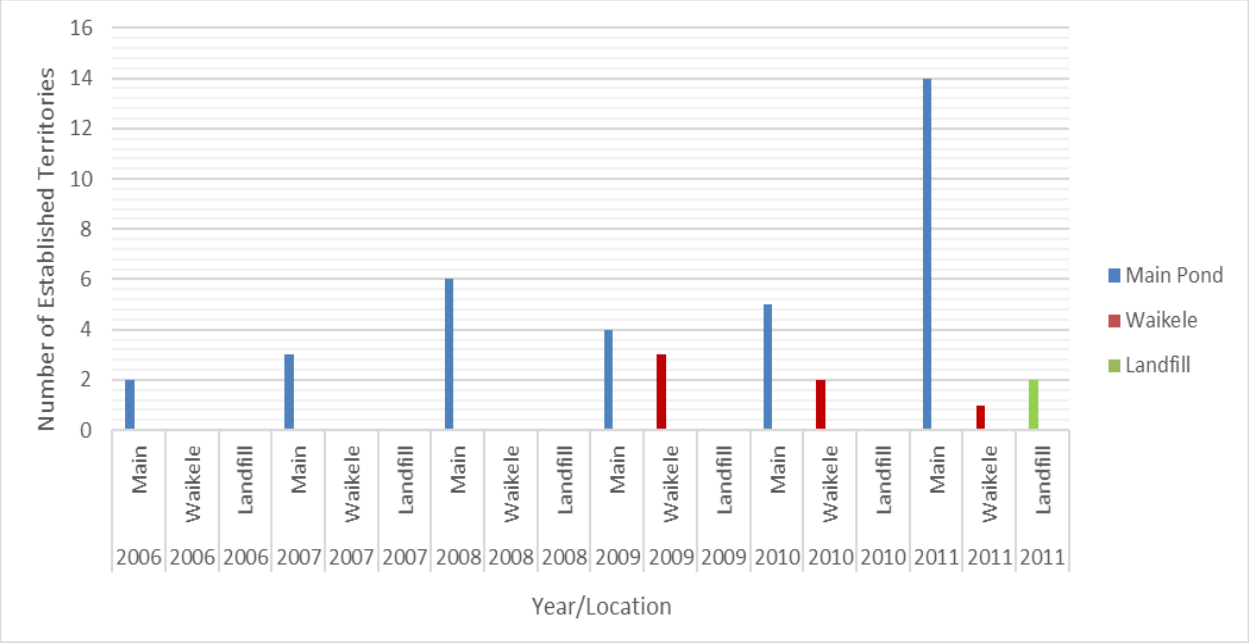


Figure 6: Stilt numbers of established territories within Pouhala Marsh. Data depicted represents surveys completed from 2006 – 2011 within the three survey nesting areas in the marsh. Data shows a continuous increase in the amount of established territories

for Hawaiian Stilts as years progress to 2011. Waikele and Landfill site both show data in the latter years which may be a direct result of predator control and weather but is still shadowed by territories within Main Ponds.

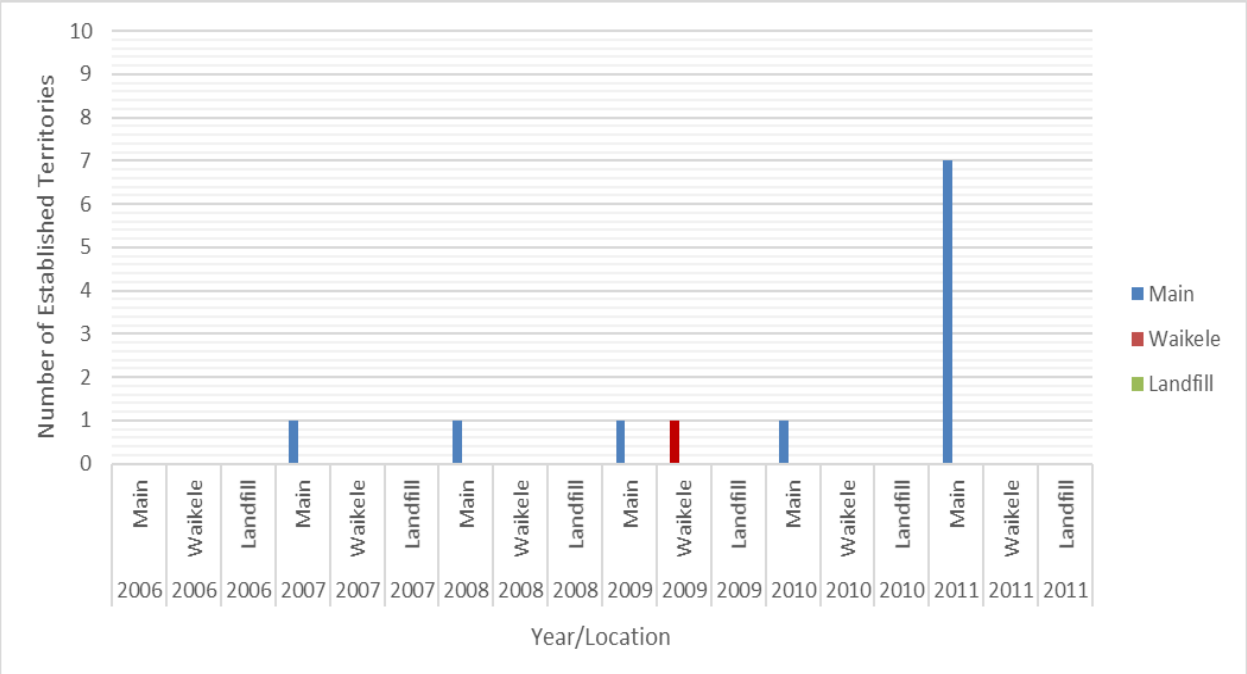


Figure 7: Coot numbers of established territories within Pouhala Marsh. Data depicted represents surveys completed from 2006 – 2011 within the three survey nesting areas in the marsh. Coot territories were mostly established within the Main Pond. No data was represented by the Coots within the landfill area since these birds require an aquatic habitat. Coot numbers dramatically increase in 2011 which may be a result of executed predator control or habitat factors of the time.

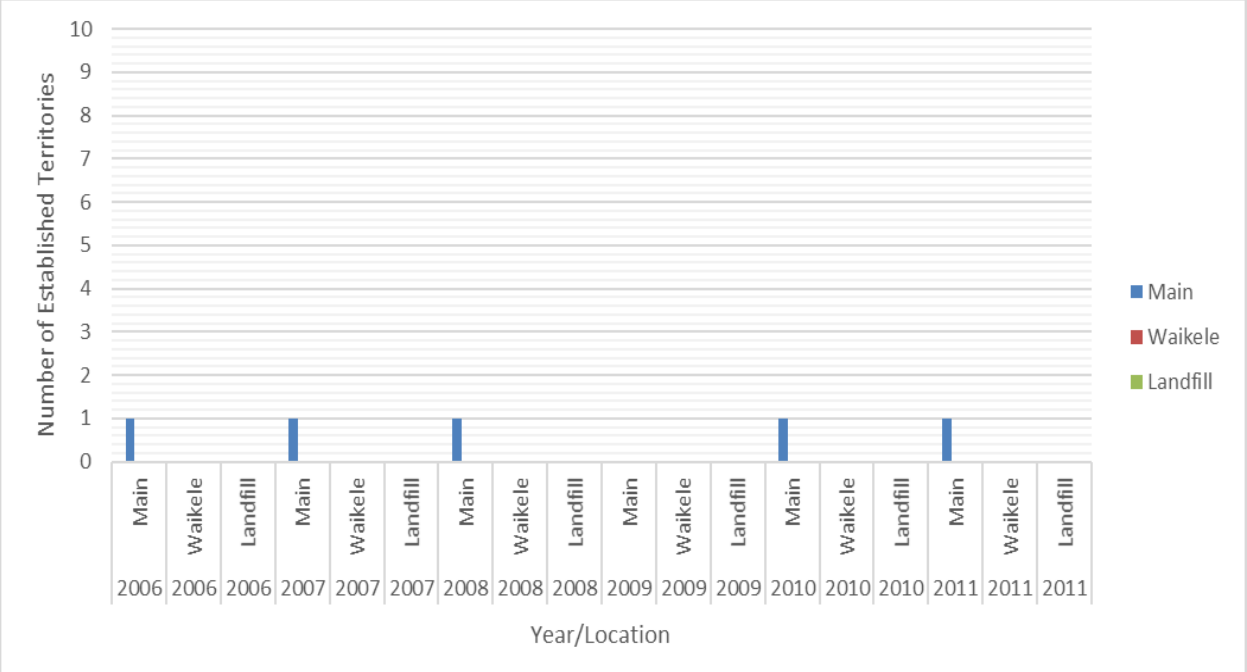


Figure 8: Gallinule numbers of established territories within Pouhala Marsh. Data depicted represents surveys completed from 2006 – 2011 within the three survey nesting areas in the marsh. The Gallinules had a consisted number of one territory throughout the years in the Main Ponds. This may be a result of the Main pond having suitable mudflat/vegetation habitat the

species prefers. Due to the high frequency of other bird species having preference to the area, congestions would dwindle the Gallinule territories.

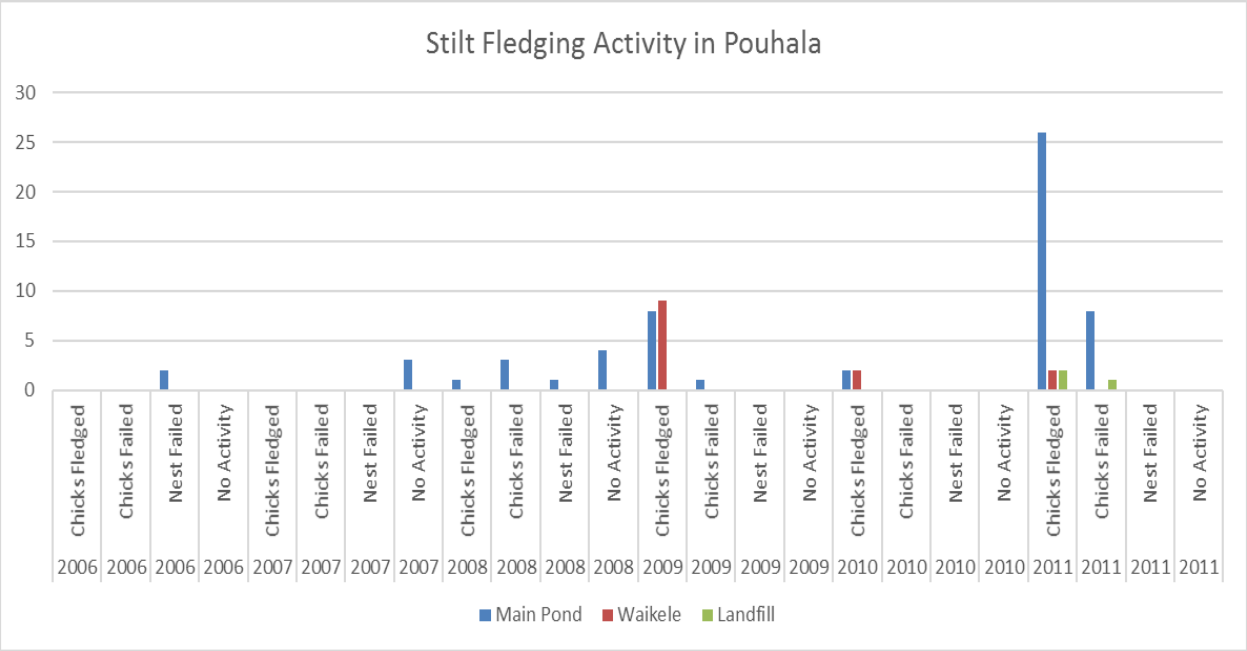


Figure 9: Stilt fledgling activity at Pouhala Marsh completed during the survey years of 2006 – 2011. Graph shows Stilt chick fledge success, chick failure, nest failure, or no activity for the survey year. Fledging activity increases dramatically in 2011 having a higher success rate in the Main Pond rather than the Lanfill area. Fledglings are present in the Landfill in 2011 but the chicks failed later on.

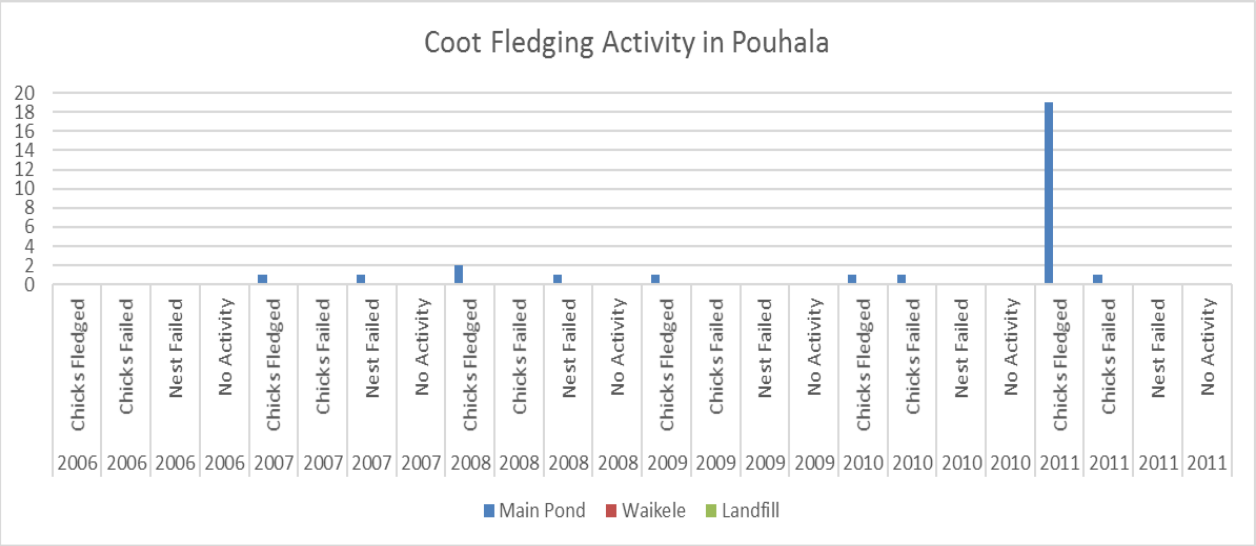


Figure 10: Coot fledgling activity at Pouhala Marsh completed during the survey years of 2006 – 2011. Graph shows Coot chick fledge success, chick failure, nest failure, or no activity for the survey year. Fledging activity increases dramatically in 2011 having a higher success rate in the Main Pond rather than the Lanfill area. No data is represented in the landfill or Waikele Pond for Coot data in the survey years.

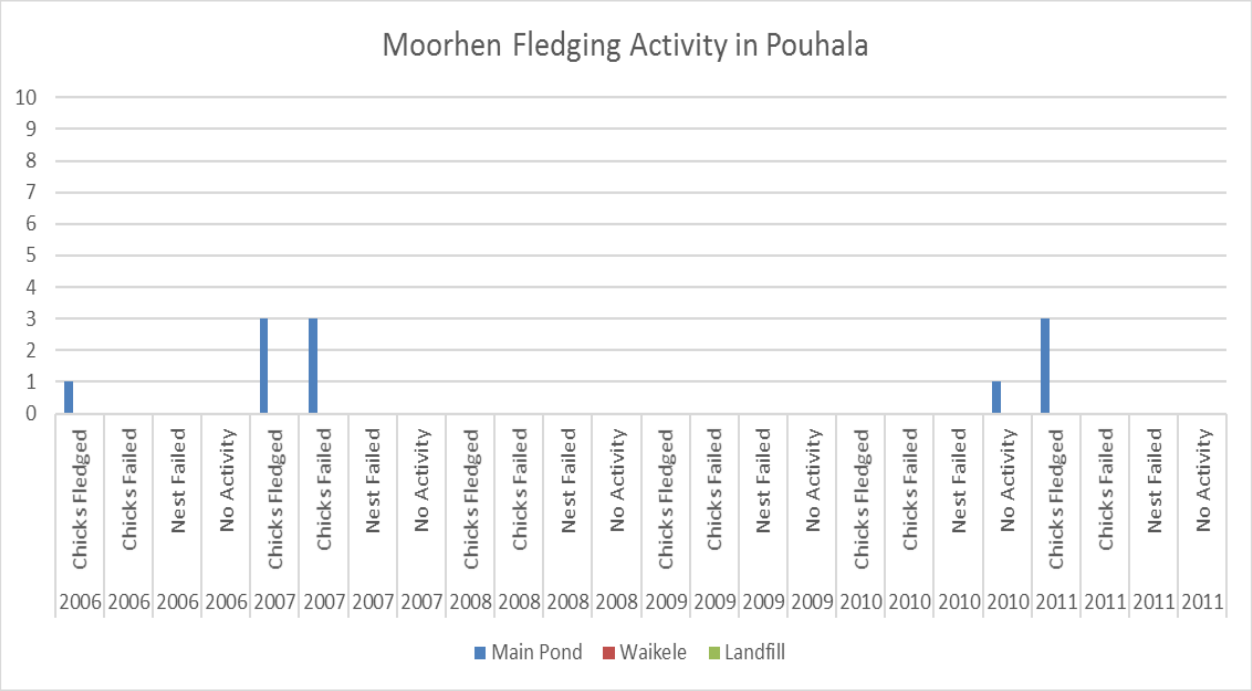


Figure 11: Gallinule fledgling activity at Pouhala Marsh completed during the survey years of 2006 – 2011. Graph shows Gallinule chick fledge success, chick failure, nest failure, or no activity for the survey year. Fledging activity over all is little to no success for this species. However, the activity and attempts to have a successful nest is only occurring in the Main Ponds. No data is represented in the landfill or Waikele Pond for Gallinule data in the survey years.

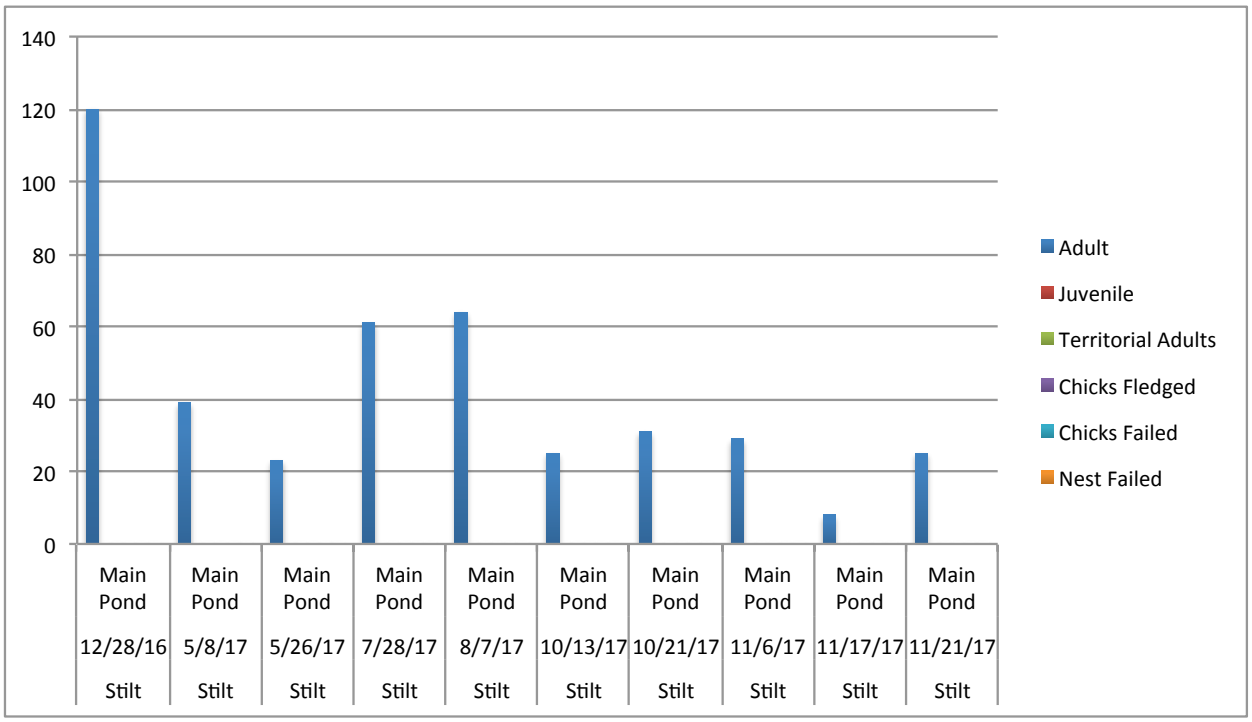


Figure 12: Stilt survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Main Pond). During this survey year only adult Stilts are present and recorded. No territorial activity was noted which results in not having any nesting data present. The number of adults decreases as the year progresses from the summer months, but numbers are still higher than Waikele and Landfill sites.

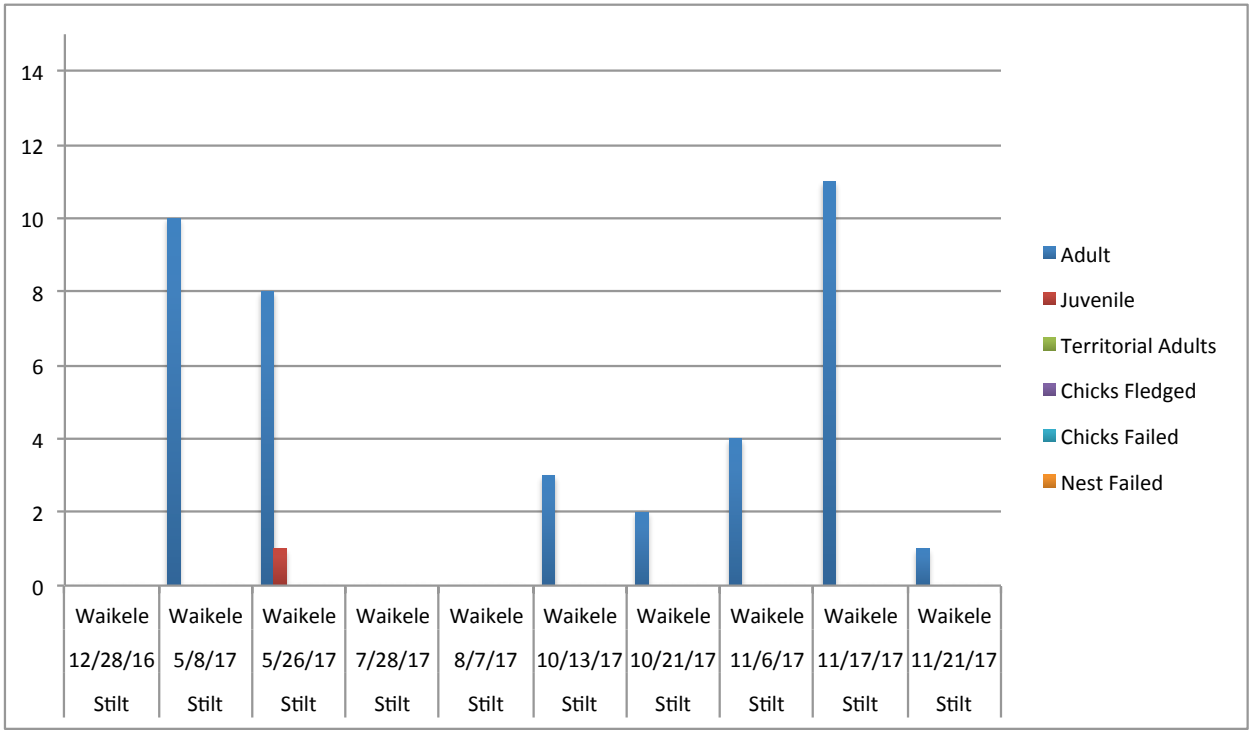


Figure 13: Stilt survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Waikele Pond). The survey site has mostly adults present with only one sighting of a Juvenile in the month of May. All latter data shows an increase in adults present in the habitat but are not surpassing Main Pond data.

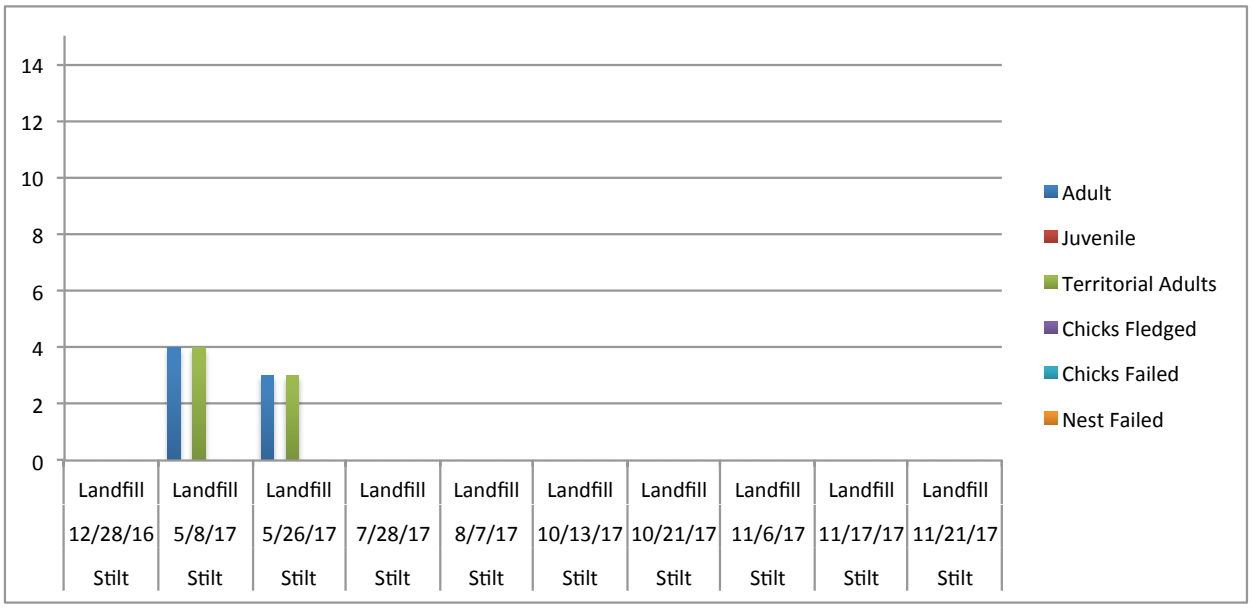


Figure 14: Stilt survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Landfill). This survey site contained territorial adults from two separate occasions ultimately showing that Stilts were attempting to nest but no further activity was detected. Most likely the nest failed or chick(s) failed due to weather or predation. The Stilt pair probably tried to nest here due to the Main Pond being unsuitable habitat for the time i.e. low water levels or dried mudflats. Their attempt just proves that the landfill cannot sustain a nesting habitat and management would need to take place.

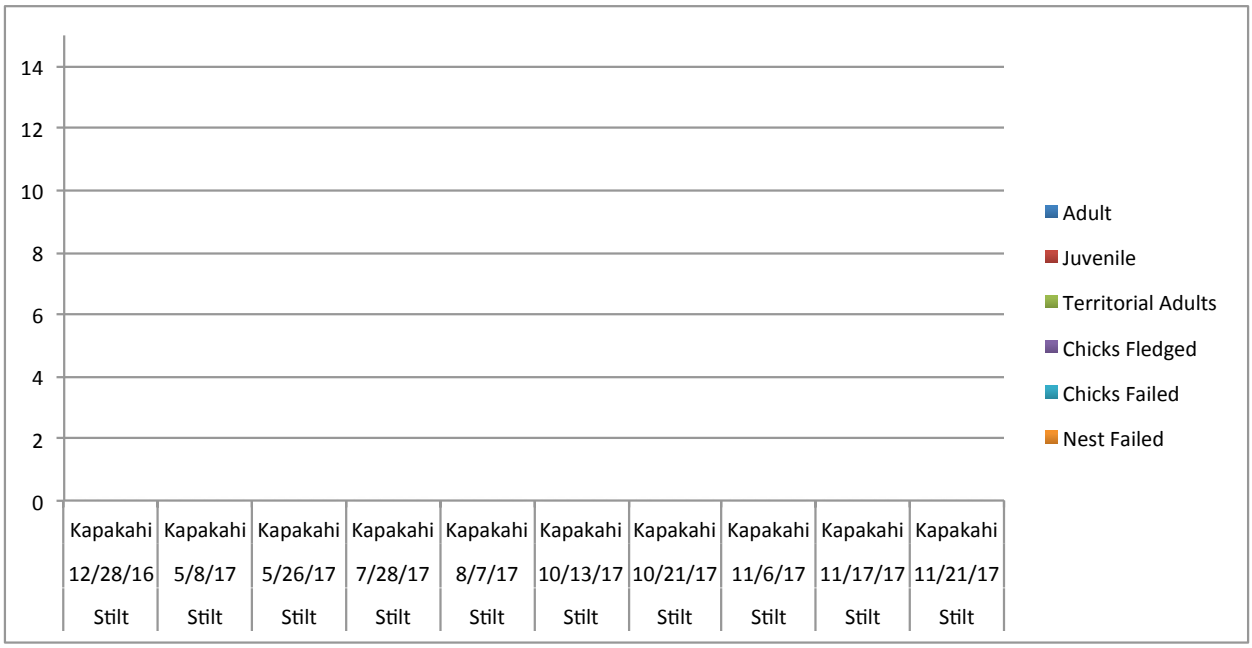


Figure 15: Stilt survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Kapakahi Stream). No Stilt activity was observed at Kapakahi Stream as a result unsuitable water levels for this species of bird. Water levels in this area may be too deep for them.

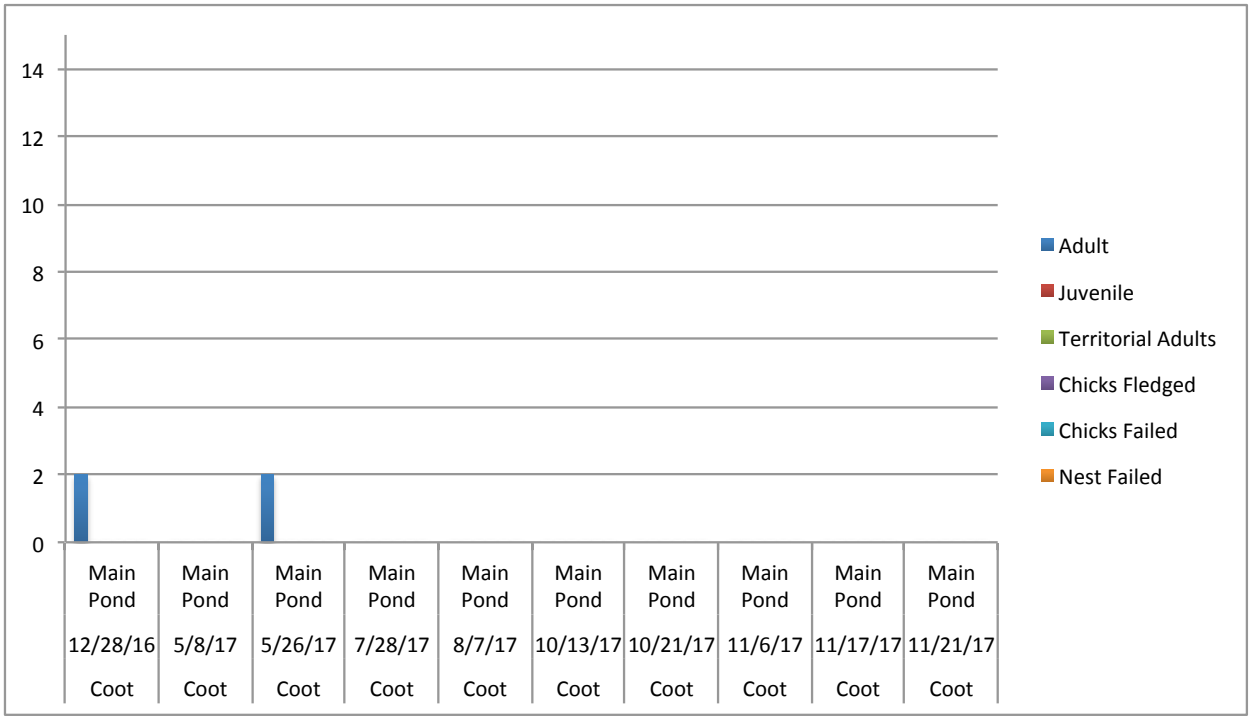


Figure 16: Coot survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Main Pond). Coot adults were only spotted during the start of the summer and no other activity was noted in the latter months. The Main Pond has the water environment the coots need to thrive but it is quite possible the pond is not deep enough for them to inhabit.

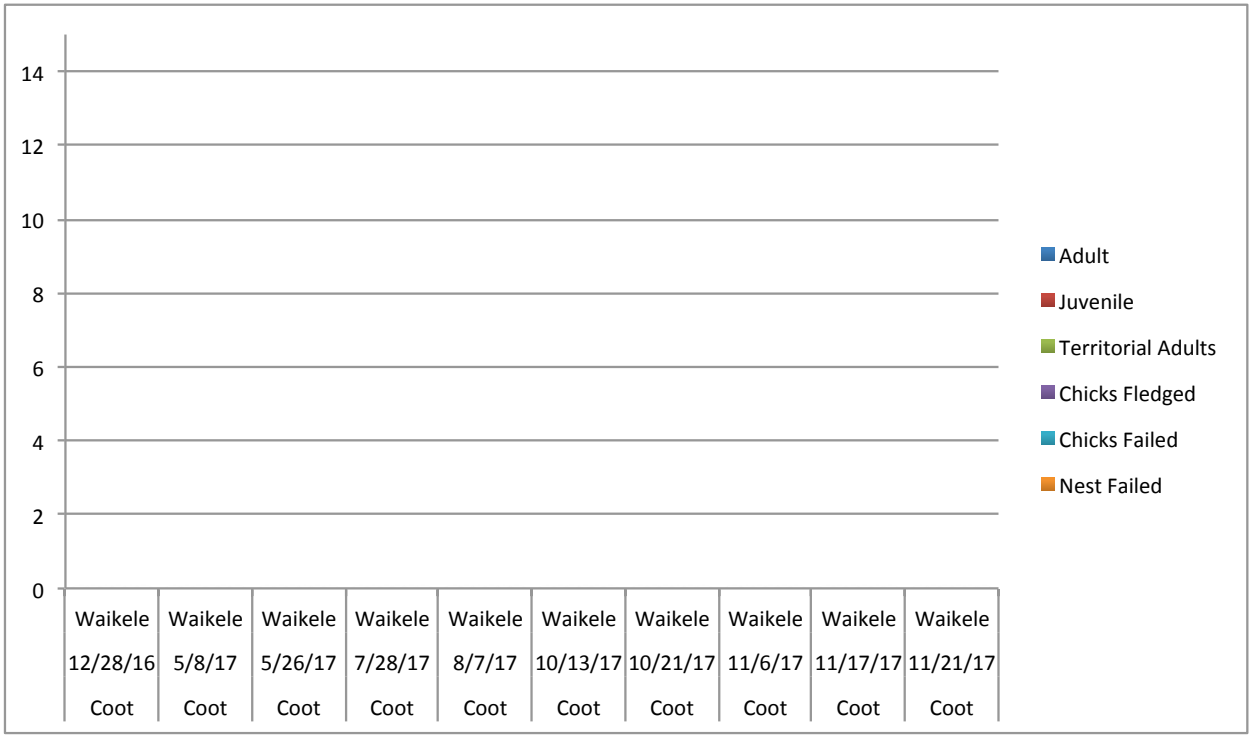


Figure 17: Coot survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Waikele Pond). No activity was noted in this survey site for any adult, juvenile, or chick Coot. Waikele's proximity to human factors may disrupt the unsocial lifestyle of the Coot and making it not attempt to inhabit the area.

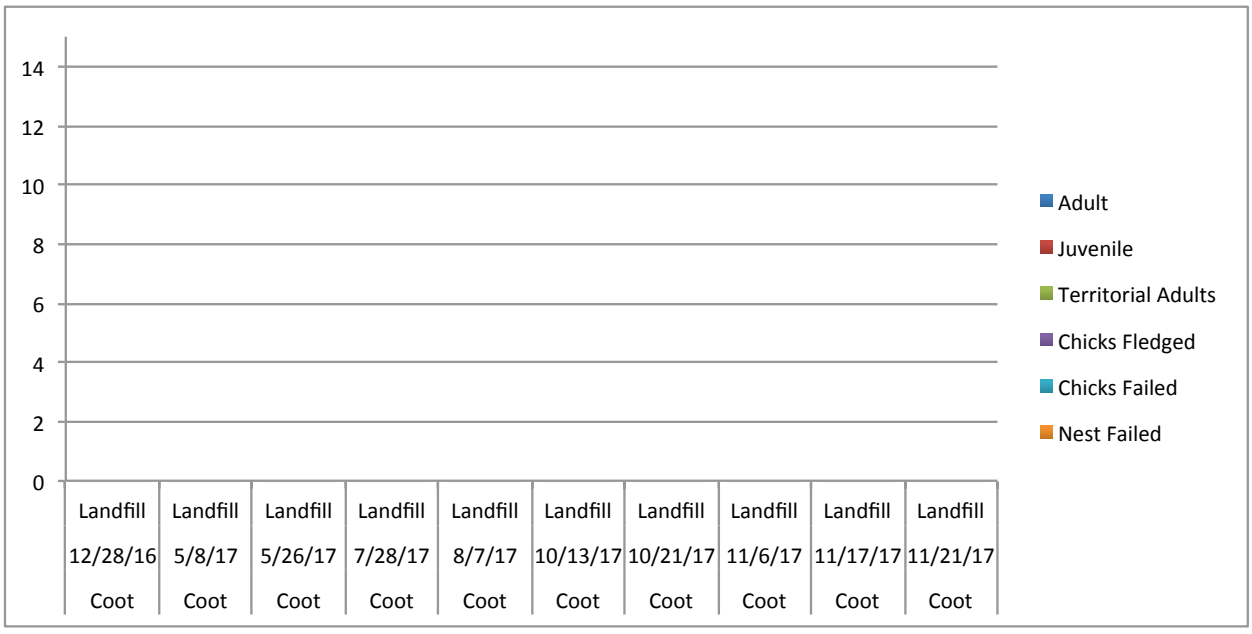


Figure 18: Coot survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Landfill). No activity was observed in this site since this area does not have any attractive habitat that would bring in Coot populations. Coots prefer deep water ponds or streams with vegetation on the perimeters and plenty of foraging areas within the pond. The Landfill sight does not contain any long standing pond and would not hold any wetland vegetation as long as the dry conditions persist.

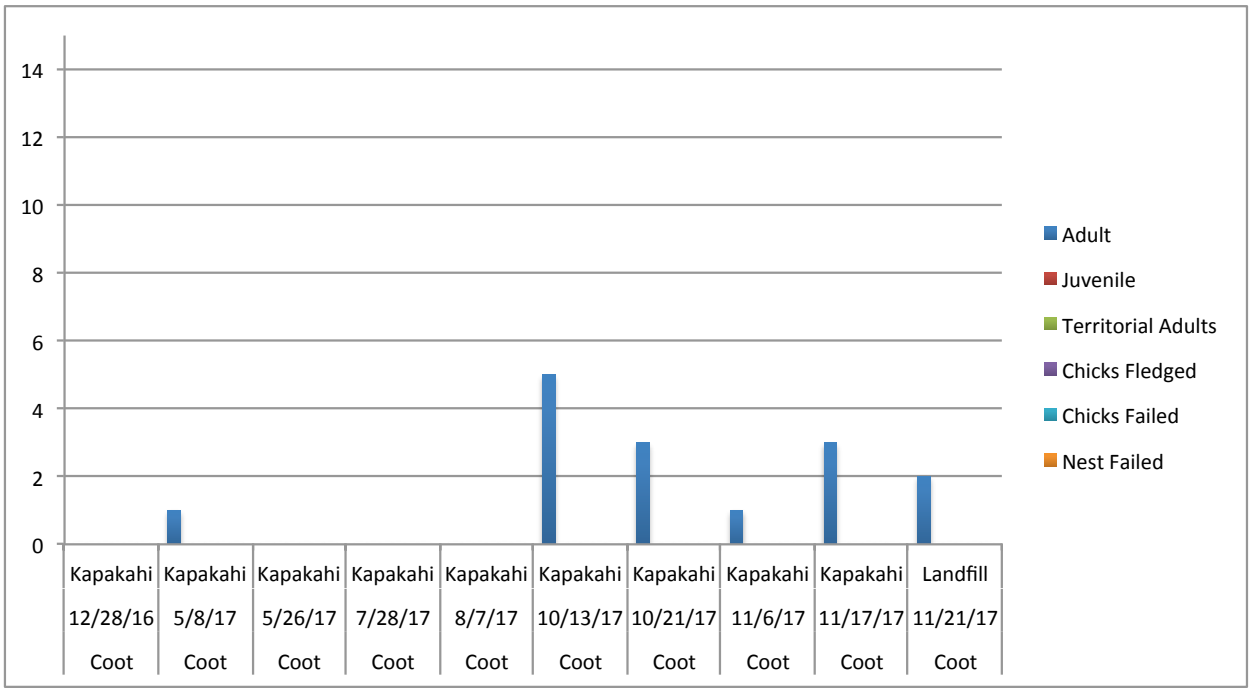


Figure 19: Coot survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Kapakahi Stream). This environment proved to be habitable for adult Coots, how ever no other activity involving nesting or fledging occurred in the survey year. It is possible that Coot will only utilize this area to forage since nests are threatened by predators ease of access to the stream.

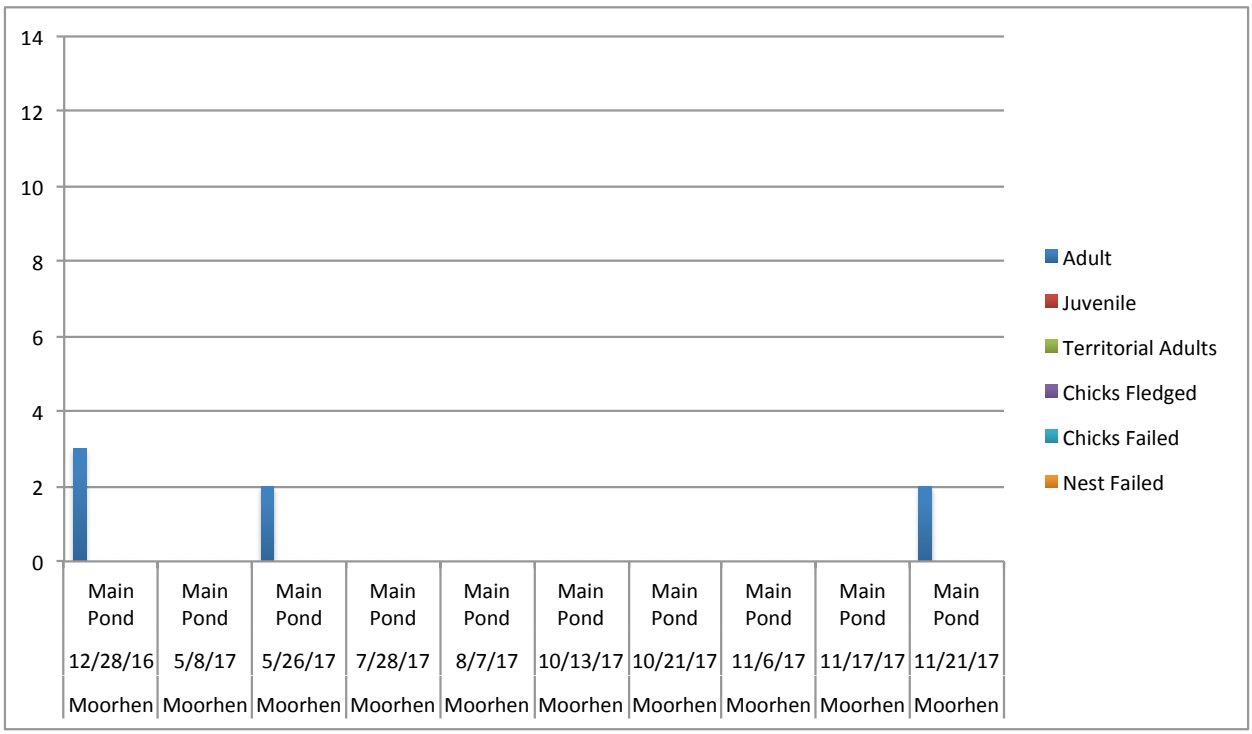


Figure 20: Gallinule survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Main Pond). Gallinules were not commonly sighted during the year. The Main Pond had proper environmental traits such as mudflat/vegetation to attract the species. The Gallinule does share an interest in the same type of habitat as the Stilt which could lead to the idea that Stilts may haze out the Gallinule during mating seasons. This could explain that only adult sightings have been noted and nesting success could prove to be difficult with other waterbird species around.

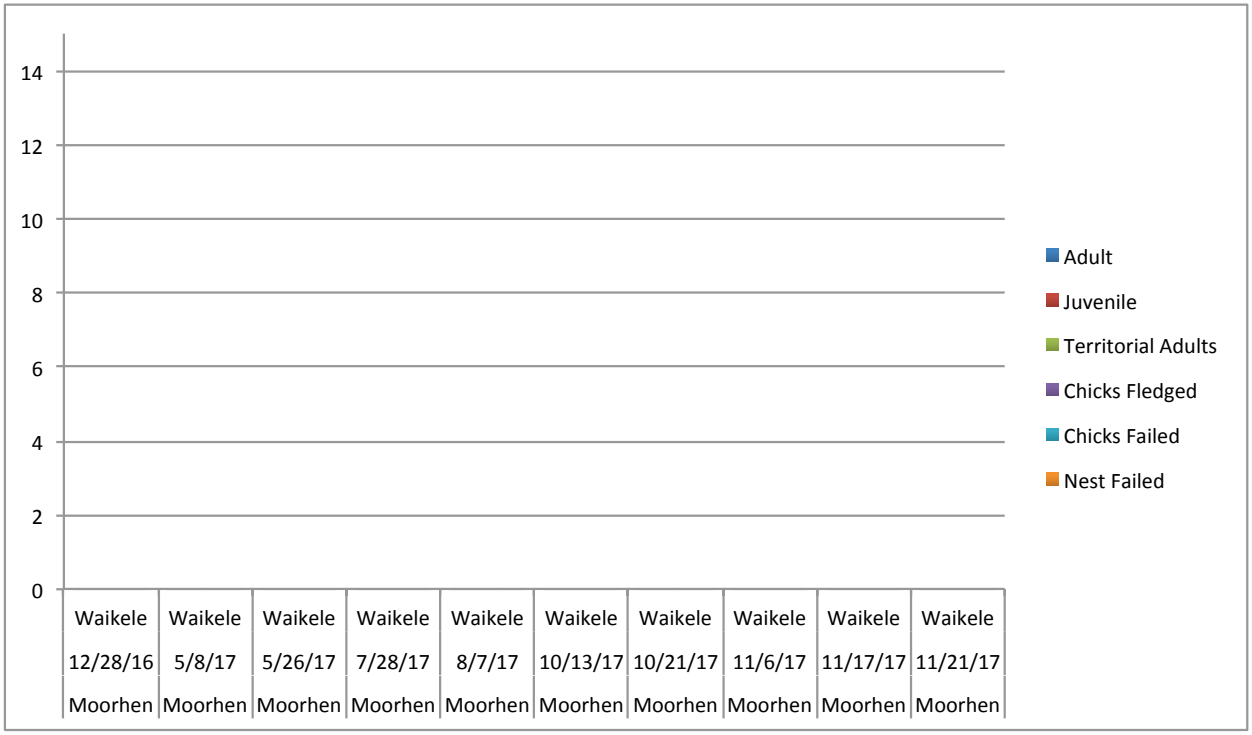


Figure 21: Gallinule survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Waikele Pond).Gallinule activity was not sighted in Waikele Pond which may have similar reason as the Coot numbers in this area, having such close proximity to the human population may have a direct impact on how bird species visualize preferred habitat.

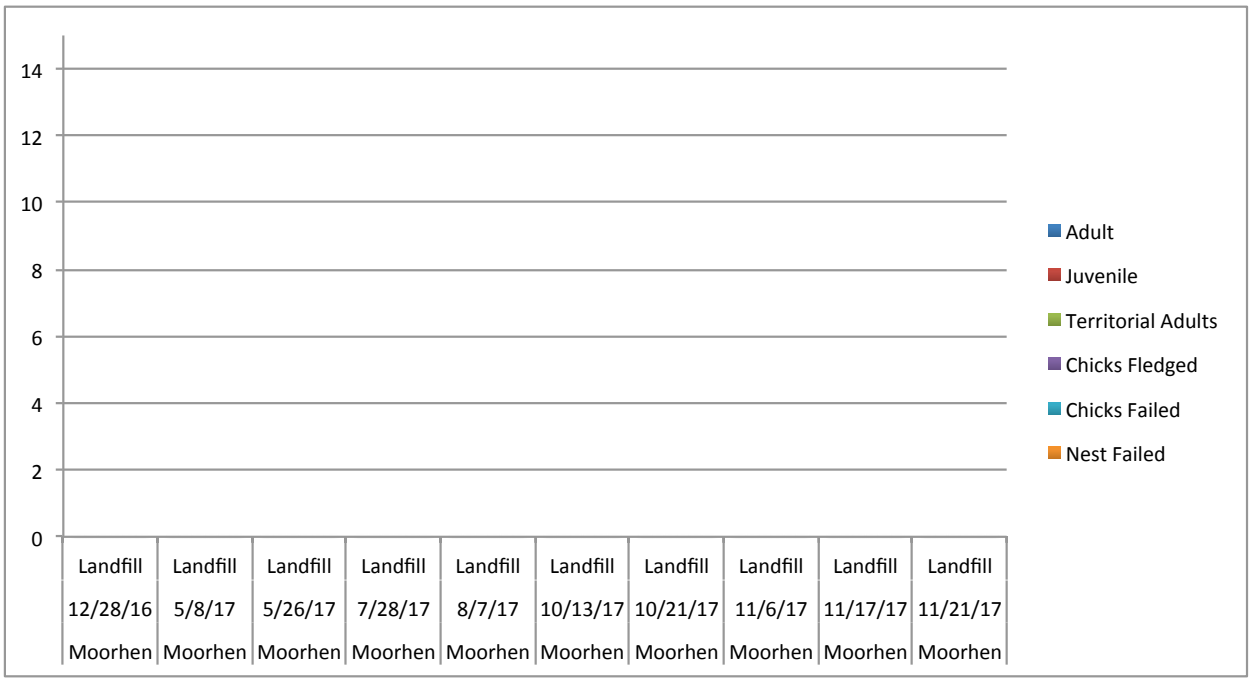


Figure 22: Gallinule survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Landfill). No activity is noted in this survey sight by the Gallinule population. The dry, unattractive habitat is host to many dry land grasses and trees that this species does not require to survive in the marsh. All the exposed dirt parcels do not provide any resources for the birds to forage let alone use the space to establish a nest. Without proper vegetation to build nests and source of water for food, the Gallinules have no reason to use this space without consequences.

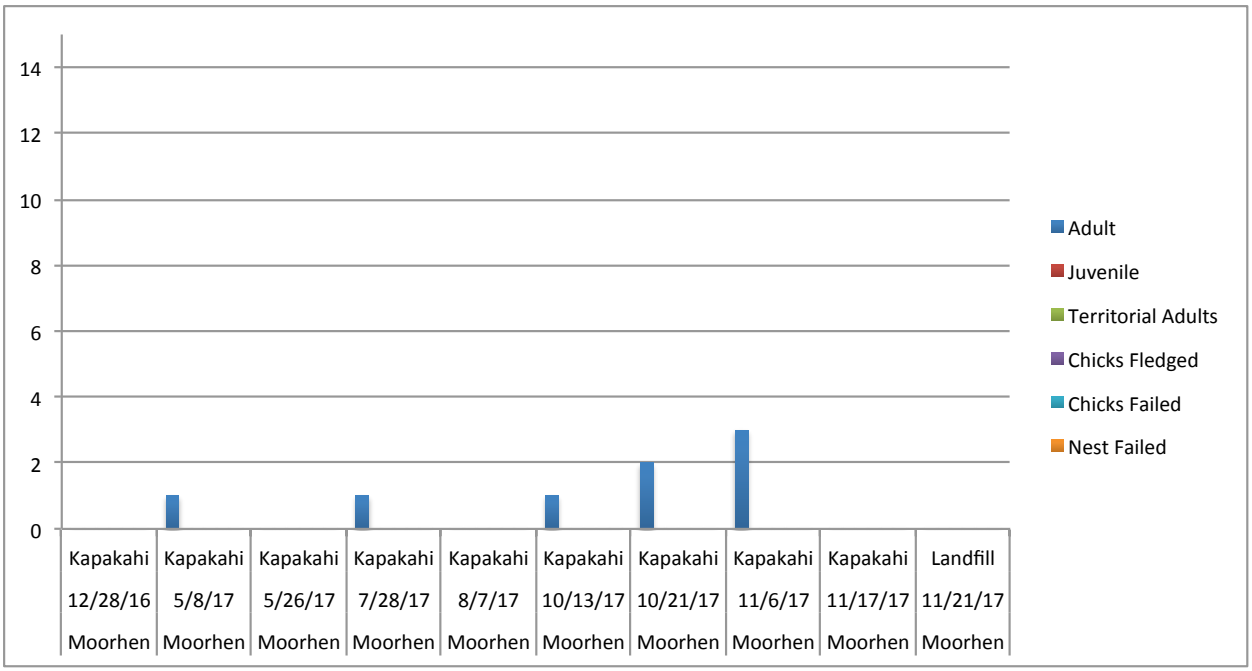


Figure 23: Gallinule survey numbers, nesting activity, and fledgling activity for Survey Year (2016 – 2017) at Pouhala Marsh (Kapakahi).A gradual increase in Gallinule populations occurs but there are no noted sightings of juveniles or chicks which cannot be associated with the birds using the Main pond as a nesting area. All that can be assumed is that it is probable that other adults are flying over from other sites to utilize the space in Pouhala Marsh.

From what is gathered from the above survey years (2006 – 2011), most nesting territories had occurred in the Main Pond of Pouhala (Figures: 6-8). The main surveyed water-birds seem to select the main pond due to several reasons of what this area provides. It has the largest body of exposed water, low-lying vegetation, buffer-zones protecting from predation, and enough area for water-bird disbursement. In (Figure: 6) high territories established coincided with birds congregating in the main pond due to water creating attractive mud-flats, water attracting food sources, and low vegetation for nest building. Do keep in mind, Landfill data is shown in established territories (Figure: 6), but that is a result of heavy rain events filling up the Landfill area creating a temporary pond. The Main pond and Waikele pond are both habitats that remain with water through most of the year. Data depicting the Waikele Pond numbers show a decrease in established territories for all water-bird species in the survey years of 2006 – 2011 (Figure: 7). Fledgling data in Waikele Pond demonstrates that Stilts were the only successful species to have chicks fledge; as years progress to 2011 numbers decrease in survivorship of the fledglings (Figure: 9). Water-bird fledgling figures also provide data that shows most of the successful fledglings are products from the Main Pond. Higher success rates are occurring with Stilt populations in this area. The Coots and Gallinules, having already low numbers, fluctuate dramatically from year to year, but are still mostly being provided by the Main Pond area (Figures: 10-11). Although water-birds from the main-pond are still subjected to having chicks and nests fail, it should be noted that the birds continuously utilize the Main Pond extensively, having more activity than that of the Landfill Area. The Landfill area may provide an exposed surface for potential nesting but will never have a stable water table for birds to continually use and create a habitable space.

Survey years between (2012 – 2016) had been completed but data was unable to be recovered for use. Recent surveys (2017) have been collected; results show that most of the water-birds use the Main Pond as their most active sight for foraging and loafing within this year. Stilt data reveals higher adult activity starting with 120 individuals in December 2016 and ending with over 20 individuals in November 2017 (Figure: 12). This population fluctuation coincides with rain events and droughts that occurred, but numbers still exceed those of Waikele, Landfill site, and Kapakahi Stream (appendix 1). The Main pond did not provide any other information about nesting or fledging activity. Waikele Pond data showed

smaller numbers never exceeding 14 individuals for the year (Figure: 13). During the month of May 2017, there were two stilt pairs with active territorial behavior within the Landfill area (Figure: 14). Each pair exhibited defensive barking and broken wing displays, however there were no visual signs of nests or chicks within the area. More than likely the nest/chick failed and no other nesting attempts were recorded for the remainder of the survey year. Stilts were not exhibited at Kapakahi Stream and no nesting occurred in the area.

Coots were sighted at the Main Pond and Kapakahi Stream for the survey year (2017) (Figures: 16 &19). Numbers remained relatively low never exceeding 2 individuals in the Main Pond and some surveys with no sightings in months. Kapakahi Stream has had a stable number of around 2 individuals for the more recent months. All of the sights within Pouhala have not encountered any nesting or fledging activity from the Coots. Gallinule activity was only sighted within the main pond and Kapakahi stream with average sightings of 2 individuals per sight (Figure 20 &23). The Main pond had larger sighting gaps between months while the Kapakahi site had more consistent sightings of individuals for the year. Nesting and fledgling activity was not seen in any of the Pouhala surveys sights for the year by the Gallinules.

8.0 Summary

Based off nesting information the current suitable habitat for water-birds is in the Main Pond area. Although nesting efforts are at a minimal status overall in Pouhala, the habitat that the Main Pond provides encourages varying numbers of stilts, gallinules, and coots to congregate within this area. If these birds are commonly sighted within this area, food resources, vegetation, water-levels, and preventative predation efforts are all supporting the water-birds' survival. The Main Pond contains various water depths and patchy vegetation allowing for partitioned areas for each bird species.

The main limiting factor affecting the Main Pond's ability to support nesting activity is overcrowding. This alone will compromise how waterbirds are dispersed in the wetland, thus affecting nesting territories, food resources, and ease of access for predation. It has been documented that large numbers of stilts inhabit this area, but stilts create large nesting territories that can result in hazing away other nesting pairs or even other bird species from utilizing the space. Without the space to accommodate the large influx of waterbirds, the number of adult bird species will mean nothing if only two to six pairs can nest at a time. Predator control has been confronted within Pouhala Marsh but without the installment of a predator proof fence dogs, cats, mongoose, and rats can all freely enter the sanctuary. Since most of the nesting territories occur on the perimeters (above tidal line) of the Main Pond where vegetation is abundant, it provides ease of access for predators to compromise nests and chicks. Of the 24 acres that the waterbirds use, large portions are becoming compromised with encroaching invasive plants that deter birds from using the area or ability to find food. Large mangroves, thick pickle weed patches, and grasses are some of the major invasive species if kept unmanaged will obstruct existing habitat. Fluctuating water levels may also affect the ability for birds to nest. During times of drought, birds can deem the Main Pond unsuitable for nesting and leave the area. Whereas heavy rains or rising tides can flood nests established in low lying mudflats. Waikele Pond and Kapakahi Stream are potential sites for successful waterbird habitats, but the levels of predation, pollution, and available space would not be able to contain a large growth in population. If overcrowding of these water species continues the success rate will continue to decrease. Population will reach a low stagnate number of which the area can support, however may result in loss of bird species if other limiting factors become more impactful in Pouhala Marsh.

The Landfill is an unutilized portion of the marsh because of its degraded habitat. It is ranges around 1.0 ft in elevation to that of the Main Pond and doesn't hold water. During a significant rain event, the Landfill area becomes muddy but soon after dries out. The fill or soil composition of the area may not allow for sufficient upward draw of groundwater that occurs in the Main and Waikele Ponds (Ducks Unl.

1997). The vegetation comprising this area is also not suitable to waterbird habitat. The survey data (Figure 1) clearly defines the preferred habitat of stilts to be that of a very shallow pooling of water to 3". Coots and moorhens also utilize this habitat type, though coots are more commonly observed in deeper water >1ft. Hamakua marsh data provides an example of a successful wetland habitat that exhibits loafing, foraging, and nesting behaviors by all waterbird species. The data examples provided (Appendix 3 – 5) insight of the preferred habitat types each main waterbird species. Higher concentration of birds were found in Mudflat/vegetation or waters exceeding that of 6". Unfortunately, the Landfill site provided neither type of habitat and has difficulty staying saturated during heavy raining seasons. Moorhens may not be able to fully utilize the Main pond area due to the high numbers of territorial stilts. However, the dry environment in the Landfill site can offer nothing to wetland accustomed bird species.

Soil tests completed by previous research groups have identified the material comprising the Landfill's dark reddish brown soil as clay and silty clay. This fill is essentially homogenized with littered wood waste, some discarded white goods (stoves, refrigerators, etc.), waste/asphalt concrete, car parts, cinder blocks, bottle glass, tin/aluminum cans, and other assorted metal waste (Ducks Unlimited, 1997).

Hydrology report of Pouhala Marsh was also conducted revealing two major inputs of water from the Koolau and Waianane Ranges (Ducks Unlimited, 1997). Water inputs that come directly to Pouhala Marsh are Waikele Stream, West Loch, and Rainfall. Waikele Stream and tidal fluctuations directly contribute to water levels within the wetland. Kapakahi Stream is cut off from the wetland by a dike. Both water sources do not have a direct impact to the potential Pond in the Landfill area. Tidal fluctuations, and rain events are major influences that help circulate the Pond water to stabilize to proper water chemistry for the wildlife. A more recent hydrology report explains these conclusions made in 2009 of the Main Pond in Pouhala. The average groundwater eleveation was 1.12 feetMSL; Surface water from Waikele Stream influence the ground water and surface water in Pouhala Marsh; Tides influence the groundwater in the marsh and surface from Kapakaki Stream; Total rainfall at the marsh during field investigation period was minimal, and not considered a significant water source; Evaporation during investigation period was substantial, and evaporation was considered a significant water sink (Oceanit, 2009). This research explained that the Landfill area must have a source of water in which it can sustain a wetland environment for waterbirds. Significant rain events have been its only source of creating a temporary pond but even then evaporation will continue diminish the Landfill's potential to have a pond without management. In the (Oceanit, 2009) research, it was suggested that excavating to the elevation of 0.9 feet MSL would have a high probability of retaining standing water in the Landfill site (Appendix 6). This land management technique would achieve preferred depths for the Hawaiian Stilt and could relieve areas of the Main Pond for other waterbird use.

So long as the Landfill site continues to stay unmanaged, waterbirds will only view the area as unsuitable and thus Pouhala Marsh will never be at its full potential to accommodate a threshold waterbird population. Therefore, the development of a multi-depth pond in the Landfill should open up a variety of available habitat for the waterbird species present.

9.0 Future Recommendations

In order to facilitate more successful nesting and fledging activity in Pouhala Marsh, the expansion and management of the Landfill Site into a proper pond area should occur. One of the major factors affecting the ability to nest is due to overcrowding nature of the Main Pond. The area has all the essential conditions for waterbirds to thrive but the space can only offer so much resources to a limited population. Expanding the Landfill site would create more opportunity for birds to carry-out their natural behaviors without being confined. Expanding the Landfill site may also provide a safe habitat for waterbirds. The area is located in the Southwest portion of Pouhala Marsh, being farther away from predation and anthropogenic factors that the Main Pond, Waikele Pond, and Kapakahi Stream continue to

face. Creating a pond in the Landfill site provides wildlife managers an opportunity to create preferred habitats. Having deeper-water perimeters will create a "moat" like buffer that can prevent predators from entering the sensitive interior pond and provide foraging habitat for Coots. Creating exposed elevated mudflats and planting native water plants along the perimeters and interior areas of the pond will allow a full utilization of the habitat. This will avoid the problem that the Main Pond faces in having the only nesting habitat on the perimeters. Having a new pond to mold from the beginning will also ensure that native plant life can be planted and thrive while ensuring invasive plants like mangrove and pickle weed are not introduced.

Soil sampling and water quality testing should be conducted to determine how the hydrology of the Landfill will affect the input and output of water as well as the distribution of vegetation. Determining where the input of water will be coming in from, Waikele Stream or Kapakahi Stream, and if tidal influence should play a role in the water chemistry are considering factors when creating suitable wetland habitat. Soil sampling and water quality testing are necessary to determine what plant life and food resources can thrive in a freshwater or brackish water environment. The main idea is how researches and land managers can replicate the habitat in the Main Pond or even perfect the concept of the existing one.

Other recommendations have been included by the research performed by the Oceanit Report in 2009. Alternative 1 suggests building one large pond with a deep section, allowing for extensive habitat, simple design, large area 5.3 acres plenty for variable habitat with large beach, and a similar design to existing wetland. The negative factors about this alternative include: no way to drain water in pond; water does not circulate well; and design is at a moderate cost (Appendix 6). Alternative 2 suggests building two ponds: a shallow pond and a deep pond within the Landfill site. The large pond is similar to the plan of Alternative 1, however the shallow pond can be drained into deep pond with a concrete sump. Circulation can occur due to tidal influence in deep pond. Both ponds will contain plenty of variable and extensive habitats. The negative aspects of this plan include: Ponds become more complex than plans established in Alternative 1; no easy way of draining deep pond; Fish growth in deep pound can be hard to control due to tidal influence; and design for this plan is most expensive (Appendix 7). Alternative 3 suggests building similar ponds like the Alternative 2 plan except the size and orientation of the ponds will be altered. The shallow and deep pond of Alternative 3 will be smaller than their counterparts in Plan 2. This plan would also maintain a variable and extensive habitat for bird species; would be the least expensive alternative; and shallow pond can be drained into deep pond with a concrete sump. Negative factors of this plan include the ponds being more complex that Alternative 1; no simple way of draining deep pond; and fish growth in deep pond can be hard to control due to tidal influences (Appendix 8).

Having the Landfill site become the start of a new developing wetland/pond for Pouhala would be a constructive management technique for the current population of waterbirds. The summation of all the research, surveys, and waterbird data suggests that current populations are affected by confined habitat use within the Main Pond. The current status of the Landfill area is inhabitable due to its inability to retain water and lack of wetland type vegetation. Any sort of improvement towards a wetland environment will prove to be a positive choice for Pouhala Marsh, rather than having the land stay unsuitable for the intended use of wildlife.

10.0 Literature Cited

- "Pouhala Marsh."*Pouhala Marsh*| Oahu Forestry and Wildlife Program, hbmpweb.pbrc.hawaii.edu/dlnr/projects/sanctuaries/pouhala

- Ducks Unlimited. 1997. Environmental and Enhancement Plan for Pouhala Marsh, Oahu, Hawaii. Prepared for Hawaii Division of Forestry and Wildlife, U.S. Fish and Wildlife Service, City and County of Honolulu. 150p.

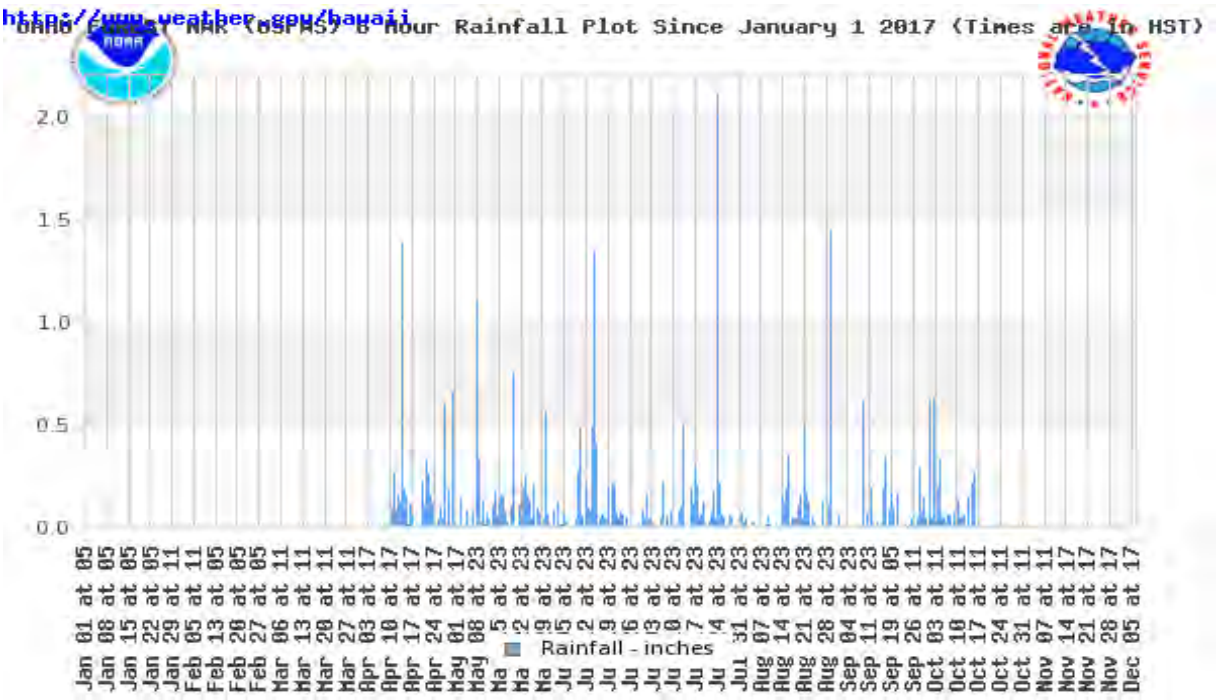
- Oceanit. 2009. Final Engineering Study Report Wetland Restoration at Pouhala Marsh, Oahu, Hawaii.

- U.S. Fish and Wildlife Service. 1985. Recovery Plan for the Hawaiian Waterbirds. U.S. Fish and Wildlife Service, Portland, OR

- Us Department of Commerce, NOAA, National Weather Service. "National Weather Service Weather Forecast Office. "Oahu Forest NWR (USFWS) Rainfall graphs, NOAA's National Weather Service, 7 Nov. 2004, http://www.prh.noaa.gov/hnl/hydro/pages/rra_graphs.php?station=OFRH1&mo=

Appendix:

1.0



Noaa Oahu forest NWR (USFWS) – OFRH1 Rainfall Graph for the start of January 1, 2017 to December 5, 2017. The estimated rainfall for this period is 39.74 inches. Most of the rain activity recorded occurred was during April 2017 to October 2017. In between this time frame, only five major rain events (above 1.0 inch of rain) which could have impacted the wetland at Pouhala. The summer months of May – August shows minimal rain activity which can result in drought like conditions and decreased water habitat in the Main and Waikele Ponds. Decrease in habitat can result in bird populations diminishing and minimal nesting activity in the wetland.

2.0

Picture depicts typical habitat issues of invasive plant species within Pouhala Marsh. Exposed mudflats and low lying waters can be overtaken by (*Batis maritimus)* and (Mangroves) resulting in habitat loss and insufficient areas of waterbird activity and nesting.

3.0

	Basin A	Basin B	Basin C	Basin D	Total
Stream	4	4	3	0	11
Stream Bank	0	0	0	0	0
Mudflat	0	0	0	0	0
Mudflat/Veg	0	0	0	0	0
0" - 3"	0	0	0	1	1
3" - 6"	0	2	0	0	2
> 6"	0	0	0	0	0

2017 Hawaiian Coot Hamakua Marsh Nesting report. The chart depicts the average number of Coots occurring in each basin throughout the survey period. The average number of Coots present within Hamakua Wildlife Sanctuary as a whole was 15. The chart also presents the fact that the coots prefer a more aquatic environment in the stream and 0– 6" of water. Coots are present in higher vegetation areas but they must be near a source of water.

4.0

	Basin A	Basin B	Basin C	Basin D	Total
Stream	0	0	4	0	4
Stream Bank	0	4	0	0	4
Mudflat	4	6	7	0	17
Mudflat/Veg	20	10	7	4	41
0" - 3"	4	3	0	0	7
3" - 6"	0	0	0	0	0
> 6"	0	0	0	0	0

2017 Hawaiian Gallinule Hamakua Marsh Nesting report. The chart depicts average number of Gallinules occurring in each basin throughout the survey period. The average number of Gallinules present within Hamakua Wildlife Sanctuary as a whole was 68. The chart also presents the fact that the Gallinules prefer vegetative patchy areas that are surrounded by muddy/dampened soils. Moorhens are occasionally found in deeper streams and water-ways but its more for commuting from one area to another.

5.0

	Basin A	Basin B	Basin C	Basin D	Total
Stream	0	0	0	0	0
Stream Bank	0	0	0	0	0
Mudflat	0	0	0	0	0
Mudflat/Veg	12	3	3	1	0
0" - 3"	0	0	0	0	0
3" - 6"	0	0	0	0	0
> 6"	0	0	0	0	0

2017 Hawaiian Stilt Hamakua Marsh Nesting report. The chart depicts average number of Stilts occurring in each basin throughout the survey period. The average number of Stilts present within Hamakua

Wildlife Sanctuary as a whole was 18. The chart also presents the fact that the Stilts prefer vegetative patchy areas that are surrounded by muddy/dampened soils. Stilts were using Basin A as their main area of foraging and loafing, but it was also noted that these birds frequently moved from each basin throughout the day.

6.0

Alternative 1 (OceanIt, 2009)

The first alternative is to build one large pond with a deep section. The total surface area of the pond will be approximately 5.3 acres, and the surface area of the deep section will be about 1 acre. The deep section will have about 6 inches to 1 foot of water while the rest of the pond will range from dry to 6 inches of water. The side slopes of the banks on the northwest and west sides of the pond will be constructed at a ratio of 5H:1V (a slope of 11 degrees, similar to a steep ocean beach). The side slopes of the other banks will be slightly graded at a minimum slope of 0.7% towards the deep section, similar to a very gentle ocean beach slope. The gently sloped area will create habitat in shallow waters (1 inch to 6 inches of water) for the Hawaiian Moorhen and Hawaiian Stilt. The deep section will create habitat for the Hawaiian Duck and Hawaiian Coot, with the water depth ranging from 6 inches to 1 foot. An unpaved access pathway with adequate width for light-duty maintenance vehicles will surround the pond. Table 4-1 shows the pros and cons of Alternative 1. Figure 4-1 shows the layout of Alternative 1.

Pros

- Extensive habitat
- Simple
- Large
- Similar to existing wetland
- Plenty of variable habitat with large beach

Cons

- No easy way to drain water
- Water does not circulate well
- Moderate cost

Table 4-1. Pros and cons of Alternative 1.

7.0

Alternative 2 (OceanIt, 2009)

The second alternative is to build two ponds: a shallow pond and a deep pond. The surface area of the shallow pond will be approximately 5.3 acres, and the surface area of the deep pond will be about 1.9 acres. The water level in the shallow pond will range from dry to 6 inches deep, and the water level in the deep pond will range from 6 inches to 1 foot. The two-pond system will provide separate habitats for the Hawaiian Moorhen and Hawaiian Stilt from the Hawaiian Duck and Hawaiian Coot. The side slopes of the banks on the northwest and west of both ponds will be constructed at a ratio of 5H:1V (a slope of 11 degrees, similar to a steep ocean beach). The bank slopes on the other side will be graded at a gentle slope. The beach of the shallow pond will have a minimum slope of 0.8%, and the beach of the deep pond will have a minimum slope of 1.4%, similar to a very gently sloping beach. The gently sloped area will accommodate individual waterfowl habitat preferences for different water levels. An unpaved access pathway with adequate width for light-duty maintenance vehicles will surround the ponds. Table 4-2 shows the pros and cons of

Alternative 2. Figure 4-2 shows the layout of Alternative 2.

Pros

- Large pond similar to Alternative 1
- Variable and extensive habitat
- Shallow pond can be drained into deep pond with a concrete sump
- Circulation due to tide in deep pond
- Plenty of variable habitat with large beach

Cons

- Ponds are more complex than Alternative 1
- No easy way of draining deep pond
- Fish growth in deep pond can be hard to control due to tidal influence
- Most expensive

Table 4-2. Pros and cons of Alternative 2.

8.0

Alternative 3 (OceanIt, 2009)

The last alternative is a shallow pond and a deep pond similar to those in the second alternative except for size and orientation of the ponds. The shallow and deep ponds of Alternative 3 are smaller than their counterparts in Alternative 2. The surface area of the shallow pond will be about 3.8 acres, and the surface area of the deep pond will be about 1.2 acres. The deep pond is located north of the shallow pond in Alternative 3 as opposed to being located west of the shallow pond in Alternative 2. The purpose of Alternative 3 is to provide a two-pond system on a smaller scale which should be cheaper to construct than Alternative 2. The two-pond system in Alternative 3 will retain the same habitat characteristics as the two-pond system in Alternative 2, such as isolation of the Hawaiian Moorhen and Hawaiian Stilt habitat from the Hawaiian Duck and Hawaiian Coot habitat. The side slopes of the banks on the northwest and west of the shallow pond and on the west, north, and south of the deep pond will be constructed at a ratio of 5H:1V (a slope of 11 degrees, similar to a steep ocean beach). The bank slopes of the other sides will be graded at a gentle slope. The beach of the shallow pond will have a minimum slope of 1%, and the beach of the deep pond will have a minimum slope of 2.1%, similar to a very gently sloping beach. The gently sloped area will accommodate individual waterfowl habitat preferences for different water levels. An unpaved access pathway with adequate width for light-duty maintenance vehicles will surround the ponds. Table 4-3 shows the pros and cons of Alternative 3. Figure 4-3 shows the layout of Alternative 3.

Pros

- Variable and extensive habitat
- Least expensive alternative
- Shallow pond can be drained into deep pond with a concrete sump

Cons

- Ponds are more complex than Alternative 1
- No easy way of draining deep pond
- Fish growth in deep pond can be hard to control due to tidal influence

Table 4-3. Pros and cons of Alternative 3.

This page intentionally
left blank.

APPENDIX C
PUBLIC COMMENTS AND RESPONSES

APPENDIX C

PUBLIC COMMENTS AND RESPONSES

Appendix C includes comment letters received during the circulation of the Draft EA in *The Environmental Notice*. For every written comment received from the public, agencies, and organizations, the State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife has provided a written response. The comments and responses to comments are included in the following pages.

OFFICE OF PLANNING
STATE OF HAWAII

OCT - 1 2018

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS 201809280721BE

September 28, 2018

To: Suzanne Case, Chairperson
Department of Land and Natural Resources

Attention: Dean Smith, Administrator
Division of Forestry and Wildlife

From: Leo R. Asuncion, Director
Office of Planning

Subject: Draft Environmental Assessment - Pouhala Marsh Restoration Project Phase I, West Loch of Pearl Harbor, Waipahu, Oahu;
TMK: (1) 9-3-001:002, 004, 006, and 012 (por.)

Thank you for the opportunity to provide comments on the Draft Environmental Assessment (Draft EA) for the proposed Pouhala Marsh restoration project. The Draft EA review material was sent to our office by letter, dated September 6, 2018.

It is our understanding that the State Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) proposes the restoration of a wetland pond in the Pouhala Marsh Wildlife Sanctuary, Pearl Harbor Complex, Oahu.

This restoration project will improve and enhance nesting habitat for four identified endangered species of Hawaiian waterbirds. This wetland restoration will provide a functioning ecosystem, which would be suitable habitat for Hawaiian waterbirds, such as the Hawaiian Moorhen, Hawaiian Stilt, Hawaiian Duck, and Hawaiian Coot. Restoration of the site will allow for environmental education programs, vegetation identification, avian surveys, and water quality studies.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Previous Comments.
   Our Pre-Consultation Draft EA response letter dated January 17, 2018 (DTS 201801171425RI), requested the Draft EA:

a) Discuss the project's ability to meet the objectives and policies of the Hawaii Coastal Zone Management (CZM) program, as listed in Hawaii Revised Statutes (HRS) § 205A-2;

b) Assess potential impacts of the proposed restoration activities on the Pouhala Marsh, adjacent Kapakahi Stream, and water quality (which should include site specific mitigation actions to prevent wastewater, sediment, soil, and debris from impacting the coastal ecosystem and State waters), and

c) Examine the project's compliance with the Special Management Area (SMA) use requirements, and consult with the Department of Planning and Permitting (DPP), City and County of Honolulu on SMA use permitting.

OP acknowledges that our comments cited above in our pre-consultation letter have been addressed in the Draft EA.

2. OP offers additional comments in regard to the Draft EA:

a) Federal Consistency
Our comments in our January 17, 2018, pre-consultation request letter stated that the Draft EA list all required permits and approvals for the proposed wetland restoration project. Section 2.3, page 22 of the Draft EA lists federal permits that include the Clean Water Act, Section 404, Department of the Army Permit - U.S. Army Corps of Engineers. This list also acknowledges the need for a Coastal Zone Management Act (CZMA) Consistency Determination. Please contact our office on the procedures for conducting a CZMA federal consistency review.

b) The Hawaii State Planning Act
Section 3.12, pages 49-50 examines the project and its consistency with Part I of the Hawaii State Planning Act, HRS Chapter 226. The Draft EA provides analysis on the project in relation to the following statutes:

- HRS § 226-11 - Objectives and policies for the physical environment--land-based, shoreline, and marine resources;
- HRS § 226-12 – Objectives and policies for the physical environment--scenic, natural beauty, and historic resources; and
- HRS § 226-13 – Objectives and policies for the physical environment--land, air, and water quality.

The Final Environmental Assessment (Final EA) should include a discussion on the project's ability to meet all parts of the Hawaii State Planning Act, as listed in HRS Chapter 226. These include the remaining statutes of Part I – Goals, Objectives, and Policies; Part II - Planning Coordination and Implementation (State Functional or Strategic Plans); and Part III – Priority Guidelines.

The discussion must examine the project's consistency with these statutes, clarify where conflicts exist, and detail the steps needed to resolve these conflicts. If DOFAW deems the remaining statutes of the Hawaii State Planning Act are not applicable to this project, the Final EA should affirmatively state such determination followed by discussion paragraphs.

We have no further comments at this time. If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

c: William Bow, Executive Project Manager, Bow Engineering & Development, Inc.

Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Telephone: (808) 941-8853
Fax: (808) 945-9299
www.bowengineering.com

October 17, 2018

Leo R. Asuncion, Director
State of Hawaii
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, Hawai'i 96804

Subject: Comments on the Draft Environmental Assessment (EA)
Pouhala Marsh Restoration, Phase 1
Waipahu, O'ahu
TMK 9-3-01:2; 9-3-01:12; 9-3-01:6 (portions)

Dear Leo R. Asuncion;

Thank you for your letter dated September 28, 2018 regarding the Office of Planning review of the Draft EA for the Pouhala Marsh Restoration Project. We offer the following responses to your comments:

1. **Previous Comments for Early Consultation.** We acknowledge your statement that comments made in the early consultation response letter submitted by the Office of Planning (OP) were addressed in the Draft EA.

2. **Comments on the Draft EA.**

   a. *Federal Consistency*: As set forth in the Draft EA, the project needs a Coastal Zone Management Act (CZMA) Consistency Determination. We will contact your office on the procedures for conducting a CZMA federal consistency review, as requested.

   b. *The Hawaii State Planning Act*: We note your statement that the Draft EA provides consistency analysis with the Hawaii State Planning Act, HRS Chapter 226. We have included a discussion on the project consistency with additional sections of the Hawaii State Planning Act in the Final EA, as requested. We have also included additional discussion in the Final EA regarding statutes that were not applicable to the proposed project.

Your letter and this response will be included in the Final EA upon its completion. Thank you for your participation in this process.

Sincerely,

BOW ENGINEERING & DEVELOPMENT, INC.

William F. Bow
Executive Project Manager / Chemist

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

SEP 2 8 2018

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

September 24, 2018

Bow Engineering & Development Inc.
ATTN: William Bow
1953 S. Beretania Street, PH-A
Honolulu, HI 96826

Dear Mr. Bow,

Subject: Pouhala Marsh Restoration Project- Phase I Draft Environmental Assessment

Thank you for the opportunity to review and comment. The Department of Design and Construction Facilities Division had some comments which have been attached for your review.

If you have any further questions regarding these comments, please contact Clifford Lau at 768-8483.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(745122)

control, but is not continuously lined with concrete. The mouth of the stream enters West Loch through the same forest of mangrove as Waikele Stream.

Water levels at Pouhala Marsh are affected by direct rainfall and tidal and stream waters. The two major water inputs for Pouhala Marsh are from the Ko'olau and Wai'anane Ranges (Ducks Unlimited, 1997). Water inputs that come directly to Pouhala Marsh are the Waikele Stream, West Loch, and rainfall. Waikele Stream and tidal fluctuations directly contribute to water levels within the marsh. Surface water from Kapakahi Stream does not influence the groundwater or surface water in the marsh due to a dike separating the stream and the marsh (DOFAW 2017; Oceanit 2009). Total rainfall at the marsh during the field investigation period was minimal, and rainfall was not considered a significant water source in the marsh. However, evaporation was substantial and was considered a significant water sink (Oceanit 2009).

Drainage

With raised berm what will be impact on flooding of the upstream areas?

The project site and upstream urban development is on relatively fla approximately seven acres of the project site is a slightly raised area d l. Runoff entering the marsh area generally flows from north to south (Bow Engineering 2018) (see Figure 9). Because of the raised fill on the project site, little to no ponding occurs and the project site remains dry under most conditions.

Wetlands

A review of the USFWS National Wetland Inventory Map was completed to identify the presence of wetlands within the vicinity of the project. While there is Estuarine and Marine Wetland identified for other areas of Pouhala Marsh, no potentially jurisdictional wetlands or wetlands of the United States were identified on the project site (see Figure 10) (USFWS 2018).

State Water Quality Standards

Wetlands located within the Pouhala Marsh Wildlife Sanctuary are State waters as listed in Appendix A of HAR, Chapter 11-54. Waters in the West Loch of Pear Harbor are classified by the DOH as "Inland waters, Class 1" subject to Class 1 water protection (DOH 2014)[6]. The objective for Class 1 Inland waters is that the waters remain in their natural state as nearly as possible with the absolute minimum of pollution from any human-cause source. To the extent possible, the wilderness character of these areas shall be protected. Activities resulting in a demonstrable increase in levels of point or nonpoint source contamination are prohibited (DOH 2014). The area can be further classified as Class 1.a. or 1.b., Inland Waters based upon the designation of Pouhala Marsh as a regulated wildlife sanctuary and its State land use designation as "protective subzone" under the Conservation District.

[6] State DOH letter also confirms this status in a comment letter submitted in response to early consultation dated January 26, 2018. See Appendix A.

Any impact on flooding of the the areas upstream which currently occurs in a storm?

Following establishment of the proposed pond[illegible] stream of the project site would either enter the proposed wetland pond [illegible] the west of the proposed stockpile embankment. If a storm event causes runoff and baseflow from tidal and stream waters to exceed the proposed wetland pond capacity, overflow would enter Kapakahi Stream and discharge to the waters of West Loch, Pearl Harbor. Runoff and baseflow diverted by the proposed stockpile embankment would flow to the west into the mangroves and eventually discharge to the waters of West Loch, Pearl Harbor (see Figure 9). The proposed pond would not result in an increase in stormwater since there would be no increase in impervious surfaces. Comparing existing drainage and proposed drainage impacts, the proposed pond would create an area for waters to settle instead of allowing existing sheetflow over the current fill. The proposed wetland pond and stockpile embankment would not create additional stormwater that would adversely affect adjacent City facilities and developed properties located east of Kapakahi Stream. Further, the marsh and new wetland pond would act as a buffer for pollutant sources and sediments in stormwater as it exits into West Loch (DOH CWB 2006). The proposed pond improvements would not be expected to cause an increase in sediment discharge from the project site to nearby surface waters.

The proposed wetland pond improvements should have a beneficial impact on water quality by providing a new wetland pond that would act as a filter for pollutants and sediments in stormwater from upland urbanized areas. As discussed above, there would be no increase in discharge of stormwater to Kapakahi Stream or Pearl Harbor over existing conditions.

Wetland restoration improvements planned under this project would have a positive beneficial impact on the larger Pouhala Marsh wetland by increasing overall wetland pond area. Increased open water areas and seasonal mud flats created would provide better habitat for endangered waterbirds to breed and forage within Pouhala Marsh. For a discussion of permitting pertaining to wetlands, see Section 3.4, *Biological Resources.*

Site-specific BMPs will be implemented during construction to prevent any wastewater, sediment, soil, and debris resulting from the proposed construction from adversely impacting the coastal ecosystem and State Waters in accordance with HAR Rules 11-54. Compliance with BMPs for construction would minimize impacts to water quality. No long-term or cumulative adverse effects to hydrology or water quality are anticipated with implementation of the proposed action.

3.3 NATURAL HAZARDS

Natural hazards in Hawai'i include earthquakes, volcanoes, tsunamis, and flooding from hurricanes and tropical storms. Climate change and the related sea level rise will also impact the Hawaiian Islands.

Earthquake and Volcanic Hazards

Most of the earthquakes in Hawai'i are directly related to volcanic activity and are caused by magma moving beneath the earth's surface. Numerous small earthquakes are reported each year, mostly on Hawai'i Island. According to FEMA earthquake hazard maps, the project area is located within Seismic Design Category D, which means it could experience strong shaking with sustained damage to poorly designed or built structures (FEMA 2017). The project area is not located adjacent to any active volcanoes.

Pouhala Marsh Restoration

SOURCE: Bow Engineering & Development, Inc. 2018

Figure 9
Project Site Drainage

1. Elementary (Kindergarten to 5th Grade) – 24 students
2. Middle (6th to 8th Grades) – 12 students
3. High (9th to 12th Grades) – 12 students

The following table provides the capacity, the actual 2017/2018 student enrollment, the projected enrollment for 2022-2023:

Student Population

School	Capacity	Actual Enrollment 2017-2018	Projected Enrollment 2022-2023
Jefferson Elementary	308	369	389
Washington Middle	1,021	801	626
Kaimuki High	1,055	703	741

How will this project meet park dedication requirements. The parks listed to do not have exces capacity to handle signifcant number of additional users as shown in past carrying capacity study done for Kapiolani Park.

The Applicant has determined that the student population generated completion date and beyond through 2023 will easily be accommo Intermediate and Kaimuki High School. Jefferson Elementary Sch capacity (2017-2018) and the projected number of elementary age the Project, 24, will increase the capacity projected for the 2022-2 the schools capacity.

9.1.3. Parks

Recreational opportunities will be provided on property for residents; however, it is expected that residents will use the surrounding park and recreational areas, particularly Kapiolani Park, Ala Wai, and Waikiki and Kuhio Beaches which are located approximately 1,000 feet away. Existing recreation areas are not expected to be adversely affected, as there is enough capacity to serve the general public.

9.1.4. Police

Initial response will be provided by patrol officers assigned to District 6, which operates out of the Police Substation located at 2405 Kalākaua Avenue next to Kuhio Beach, approximately 847 feet away from the Project Site. The administrative offices for District 6 operate out of the Alapai Headquarters.

9.1.5. Fire

The Waikiki Fire Station 7 with its engine and ladder company will provide primary response in case of an emergency. The Waikiki Fire Station is located 0.6 miles away and will be able to quickly respond to a fire on the Project Site.

Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Telephone: (808) 941-8853
Fax: (808) 945-9299
www.bowengineering.com

October 17, 2018

Robert J. Kroning, P.E., Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawai'i 96813

Subject: Comments on the Draft Environmental Assessment (EA)
Pouhala Marsh Restoration, Phase 1
Waipahu, O'ahu
TMK 9-3-01:2; 9-3-01:12; 9-3-01:6 (portions)

Dear Robert J. Kroning;

Thank you for your letter dated September 24, 2018 regarding the Department of Design and Construction review of the Draft EA for the Pouhala Marsh Restoration Project. We offer the following responses to your comments:

1. **Upstream flooding impacts from raised berm (pg. 2 of comment).** This comment asks what impact would occur on flooding of the upstream areas with construction of the raised berm. This particular section of the EA sets forth the existing environmental setting and existing drainage in the project area. Impacts of the proposed project on drainage and flooding are evaluated in "Impacts and Mitigation Measures" of this section and is further discussed below under comment #2. No changes to the environmental setting for drainage are necessary.

2. **Upstream flooding impacts from stormwater (pg. 3 of comment).** This comment asks if there would be any impact on flooding of the upstream areas that currently occurs in a storm. The EA states that the proposed project would not result in an increase in stormwater since there would be no increase in impervious surfaces. Further, the EA describes how the proposed wetland pond would create an area for waters to settle instead of allowing sheet flow. The proposed wetland pond and stockpile embankment would not create additional stormwater or impede stormwater flows that would adversely affect adjacent City facilities and developed properties located east of Kapakahi Stream. Therefore, there would be no impact on flooding of the areas upstream which currently occurs in a storm.

3. **Impact on flooding of upstream areas (pg. 4 of comment).** This comment provides a note on Figure 9 of the EA, asking what is the impact on flooding of upstream areas. This comment is addressed above in comment #2.

4. **Park dedication requirements (pg. 5 of comment).** As discussed in Section 3.10, *Utilities and Public Services*, of the EA, the proposed project would not result in an increase in population and associated increase in demand for park services. There would be no impact to parks or recreational opportunities, and no park dedication requirements are applicable.

Your letter and this response will be included in the Final EA upon its completion. Thank you for your participation in this process.

Sincerely,

BOW ENGINEERING & DEVELOPMENT, INC.

William F. Bow

Executive Project Manager / Chemist

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

September 13, 2018

Mr. William Bow, M.S.
Bow Engineering & Development
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Dear Mr. Bow:

SUBJECT: Environmental Assessment Pouhala Marsh Restoration, Phase 1

The State of Hawaii, Department of Land and Natural Resources has requested that we transmit our comments on the proposed Pouhala Marsh Restoration project to your office.

The Department of Parks and Recreation agrees with the U.S. Fish and Wildlife Service's identification that the Pouhala Marsh is a wetland of critical concern for protection and habitat enhancement and supports the proposed restoration improvements to improve and enhance the nesting habitat for Hawaiian waterbirds and ensuring that created wetlands maintain wetland functions and ecological values.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota

Michele K. Nekota
Director

MKN:jr
(743502)

cc: Jason Misaki, Department of Land and Natural Resources
Glenn Kajiwara, District III

Bow Engineering & Development, Inc.
1953 South Beretania Street, PH-A
Honolulu, Hawaii 96826

Telephone: (808) 941-8853
Fax: (808) 945-9299
www.bowengineering.com

October 17, 2018

Michele K. Nekota, Director
City and County of Honolulu
Department of Parks & Recreation
1000 Uluohia Street, Suite 309
Kapolei, HI 96707

Subject: Comments on the Draft Environmental Assessment (EA)
Pouhala Marsh Restoration, Phase 1
Waipahu, O'ahu
TMK 9-3-01:2; 9-3-01:12; 9-3-01:6 (portions)

Dear Michele K. Nekota;

Thank you for your letter dated September 13, 2018 regarding your review of the Draft EA for the Pouhala Marsh Restoration, Phase 1 Project. We acknowledge your statement that the Pouhala Marsh is a wetland of critical concern you support the proposed restoration project.

Your letter and this response will be included in the Final EA upon its completion. Thank you for your participation in this process.

Sincerely,

BOW ENGINEERING & DEVELOPMENT, INC.

William F. Bow

Executive Project Manager / Chemist

This page intentionally
left blank.