University of Hawai'i at Hilo Administration
Office of the Chancellor

UNIVERSITY of HAWAI'I® HILO

August 7, 2017

Mr. Scott Glenn, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Subject: Issuance of a Finding of No Significant Impact for the Final Environmental Assessment for Infrastructure Improvements at Maunakea Visitor Information Station TMK (3) 4-4-015:012 District of Hāmākua, Island of Hawai'i, State of Hawai'i

Dear Mr. Glenn:

The University of Hawai'i at Hilo has reviewed the Final Environmental Assessment and comments received on the Draft Environmental Assessment during the 30-day public comment period that ended on April 7, 2017. The University of Hawai'i at Hilo has determined that this project will not have significant environmental impacts and has approved the Final Environmental Assessment with a Finding of No Significant Impact determination. Please publish this notice in your next scheduled publication of *The Environmental Notice*.

We have enclosed a completed OEQC Publication Form (MS Word), one (1) copy of the document in pdf format on a CD; and one (1) hardcopy of the Final Environmental Assessment.

If you have any questions, please contact Stephanie Nagata, Office of Maunakea Management at 808-933-3195.

Sincerely,

Marcia Sakai

Marcia Sakai
Interim Chancellor

Attachments:
1. OEQC Agency Action Publication Form
2. Final EA: Infrastructure Improvements at Maunakea Visitor Information Station

c: Stephanie Nagata, OMKM, nagatas@hawaii.edu
Kristin Duin, SRGII, kduin@srgii.com

200 W. Kāwili St.
Hilo, Hawai'i 96720-4091
Telephone: (808) 932-7348
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AGENCY
PUBLICATION FORM

Project Name:	Final Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station
Project Short Name:	Infrastructure Improvements at Maunakea VIS
HRS §343-5 Trigger(s):	Use of Land in the Conservation District and Use of State Funds
Island(s):	Island of Hawai'i
Judicial District(s):	Hāmākua District
TMK(s):	(3) 4-4-015:012
Permit(s)/Approval(s):	Conservation District Use Permit, Grading Permit, Individual NPDES Permit, Building Permit
Proposing/Determining Agency:	University of Hawai'i at Hilo/ University of Hawai'i at Hilo
Contact Name, Email, Telephone, Address	Stephanie Nagata, Office of Maunakea Management; nagatas@hawaii.edu; 808-933-3195; 640 N. A'ohōkū Place, Room 203, Hilo, HI 96720
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Sustainable Resources Group Intn'l, Inc
Contact Name, Email, Telephone, Address	Kristin Duin, comments@srgii.com, 808-356-0552 111 Hekili Street, Suite A373, Kailua, HI 96734

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
Provide a description of the proposed action and purpose and need in 200 words or less.

The University of Hawai'i at Hilo is proposing a set of infrastructure improvements at Halepōhaku to accommodate and address the increase in the number of visitors to the mountain; ensure the safety of visitors and workers; prevent unintended impacts to natural, historic, and cultural resources on the Halepōhaku and adjacent parcels; and comply with the Board of Land and Natural Resources approved *Maunakea Comprehensive Management Plan*. The Proposed Action includes: removal of one longhouse; a new means of ingress and egress for vehicles to the VIS, including a new access lane and parking area, adjustments to existing VIS Parking Area 1, paving of an unimproved foot path to create a walkway connecting the new VIS Parking Area 2 with the VIS, and a new paved walkway to connect the new VIS Parking Area 2 to the existing longhouse, and drainage features; installation of two gates; and a new greenhouse. Project activities would occur on the University's leased lands. The access to the ingress/egress and the new parking area would be through access points identified in the Halepōhaku parcel lease.

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Final Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station

TMK (3) 4-4-015:012

District of Hāmākua, Island of Hawai‘i, State of Hawai‘i

August 2017

APPLICANT / APPROVING AGENCY:

University of Hawai‘i at Hilo
200 W. Kāwili St.
Hilo, HI 96720-4091

UNIVERSITY of HAWAI‘I HILO

CONSULTANT:

SUSTAINABLE RESOURCES GROUP INTN'L, INC.
111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Final Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station

TMK (3) 4-4-015:012
District of Hāmākua, Island of Hawai'i, State of Hawai'i

August 2017

CLASS OF ACTION:

Use of Land in the Conservation District
Use of State Funds

APPLICANT:

University of Hawai'i at Hilo
200 W. Kāwili St.
Hilo, HI 96720-4091

APPROVING AGENCY:

University of Hawai'i at Hilo
200 W. Kāwili St.
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CONSULTANT:

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Document Note

Modifications were made to the text that appeared in the *Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station* (February 2017) to address comments that were received during the public review period. Underlining represents substantial additions to the text and ~~strikeout~~ indicates deletions. Minor modifications, such as grammatical changes, which did not affect the meaning of the text or assessment of potential impacts are not indicated.

This document is prepared pursuant to:
Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes, and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules.

Contents

List of Tables

List of Figures

Acronyms

ADA	Americans with Disabilities Act
BLNR	Board of Land and Natural Resources
BMP	Best Management Practices
CDP	Community Development Plan
CDUP	Conservation District Use Permit
CMP	Comprehensive Management Plan
CRMP	Cultural Resources Management Plan
DLNR	Department of Land and Natural Resources, State of Hawai‘i
DOFAW	Division of Forestry and Wildlife
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HDOH	Hawai‘i Department of Health
HDOT	Hawai‘i Department of Transportation
HRS	Hawai‘i Revised Statutes
ISMP	Invasive Species Management Plan
IWS	Individual Wastewater System
MKMB	Maunakea Management Board
MKSS	Maunakea Observatories Support Services
NPDES	National Pollutant Discharge Elimination System
NRMP	Natural Resources Management Plan
OCCL	Office of Conservation and Coastal Lands
OMKM	Office of Maunakea Management
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
TCP	Traditional Cultural Property
UH	University of Hawai‘i
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VIS	Visitor Information Station

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1 PURPOSE OF AND NEED FOR ACTION

1.1 Background

The 19.3 acre Halepōhaku parcel (TMK (3) 4-4-015:012) is situated at an elevation of about 9,200 ft on the south slope of Maunakea. The parcel, located in the State Land Use Conservation District, is leased to the University of Hawai'i (UH) through 2041 by the State Board of Land and Natural Resources (BLNR) under General Lease No. S-5529, which describes the character of use as "premises leased to be used solely for permanent mid-level facilities, a construction camp, an information station as well as existing facilities purposes"(Figure 1). The facilities at Halepōhaku include the Onizuka Center for International Astronomy, a Visitor Information Station (VIS), dormitories, a commons building, a construction camp, and a maintenance facility. The mid-level facilities offer a place for people travelling to the summit of Maunakea to acclimate before going up and lodging for astronomers working at the summit. The 950 ft^2 VIS, a main stopping point for visitors to the mountain, contains an interpretive center and offers nighttime ~~nightly~~ stargazing that takes place in the paved parking area adjacent to the VIS. The VIS provides an opportunity for visitors to learn about the unique cultural and natural resources of Maunakea and how to enjoy the summit safely. The lower portion of Halepōhaku contains two unimproved gravel parking areas, one of which is used for overflow parking for the VIS and the other as a staging area for construction activities. The overflow parking is often used by commercial tour groups if the paved parking area adjacent to the VIS is full.

In addition to the mid-level facilities at Halepōhaku, the UH Management Areas on Maunakea are comprised of areas up the mountain including the Maunakea Science Reserve and the Maunakea Summit Access Road and associated management corridor. The Office of Maunakea Management (OMKM) was established in 2000 and is responsible for the day-to-day management of the UH Management Areas on Maunakea. OMKM is a department within UH Hilo, and OMKM staff report directly to the Chancellor of UH Hilo.

1.2 Purpose and Need

OMKM proposes a set of infrastructure improvements at Halepōhaku to address the increase in the number of visitors to the mountain; ensure the safety of visitors and workers; prevent unintended impacts to natural, historic, and cultural resources on the Halepōhaku and adjacent parcels; comply with the BLNR-approved *Maunakea Comprehensive Management Plan* (CMP) (Ku'iwalu 2009); and comply with the terms of General Lease No. S-5529. The Proposed Action includes: a new means of ingress and egress for vehicles to the VIS, a new access lane and parking area, paving of an unimproved path to provide access from the new parking area to the VIS, a new walkway to provide access from the new parking area to the longhouse, drainage features, gates, and a greenhouse~~, and relocation of a cabin~~. In accordance with the lease, the Proposed Action is intended to minimize erosion, define areas of use to prevent destruction of native vegetation through trampling, limit the spread of invasive species, and not waste other natural resources (i.e., destroy extant native species).[1]

[1] General Lease No. S-5529, Clause 5 states: "Waste and unlawful, improper or offensive use of premises. The Lessee shall not commit, suffer, or permit to be committed any waste, nuisance, strip or unlawful, improper or offensive use of the premises or any part, nor, without the prior consent of the Lessor, cut down, remove or destroy, or suffer to cut down, removed or destroyed, any trees now growing on the premises." In the lease, "*Waste* includes, but is not limited to (1) permitting the premises or any portion, to become unduly eroded or failure to take proper precautions or make reasonable effort to prevent or correct the

The proposed infrastructure changes are aimed at improving access and safety for visitors and workers by adding ingress and egress routes that facilitate traffic flow and building a new VIS Parking Area. The purpose of the project is to improve traffic flow; provide safer, more efficient parking; ~~replace unsafe, ad hoc, road shoulder parking that is resulting in degraded conditions,~~ and provide for safe access to the VIS from the new parking lot. The number of visitors to Maunakea has increased since the initial construction of the VIS and its 24-stall paved parking area (VIS Parking Area 1) in 1983. During the late afternoon, especially during the summer, many visitors come to view the sunset on the summit and across the Maunakea Summit Access Road from the VIS at Puʻukalepeamoa. After sunset many of these visitors, as well as others, arrive at the VIS for stargazing. The popularity of sunset viewing and stargazing is causing overcrowding at the VIS, both in terms of the number of vehicles and people. When VIS Parking Area 1 is full, vehicles currently park in the overflow gravel parking to the south of the VIS (VIS Parking Area 3). Prior to March 2017 vehicles also parked ad hoc ~~as well as~~ on the western road shoulder of the Maunakea Summit Access Road opposite the VIS, which is not part of the UH leased lands (Figure 2). ~~Parking on the western road shoulder opposite the VIS, which is not part of the UH leased lands, is~~ In March 2017 a guardrail was installed to prevent ad hoc parking because it was causing increased erosion and deterioration to the edges of the road pavement, and represented a risk to personal safety. Safety issues included: people walking along the road shoulder and crossing the road to get to the VIS, which is especially unsafe at night due to dark conditions; vehicles backing out of the area into oncoming traffic; and people standing in the road to retrieve warm clothing or other items out of car trunks.

Improving traffic conditions and visitor access to the VIS is important to maintaining a safe experience for visitors and workers. Management policy outlined in the *Mauna Kea Science Reserve Master Plan* (2000 Master Plan) states that parking areas would be increased incrementally at Halepōhaku as demand increases (Group 70 International, Inc. 2000). The CMP states that for safety reasons, all parking should be on the same side of the road as existing Halepōhaku facilities (Kuʻiwalu 2009). ~~Installation of a guardrail to eliminate ad hoc parking on the road shoulder of the Maunakea Summit Access Road opposite the VIS is scheduled to occur under the scope of a separate project.~~[2]

1.3 Environmental Assessment Process

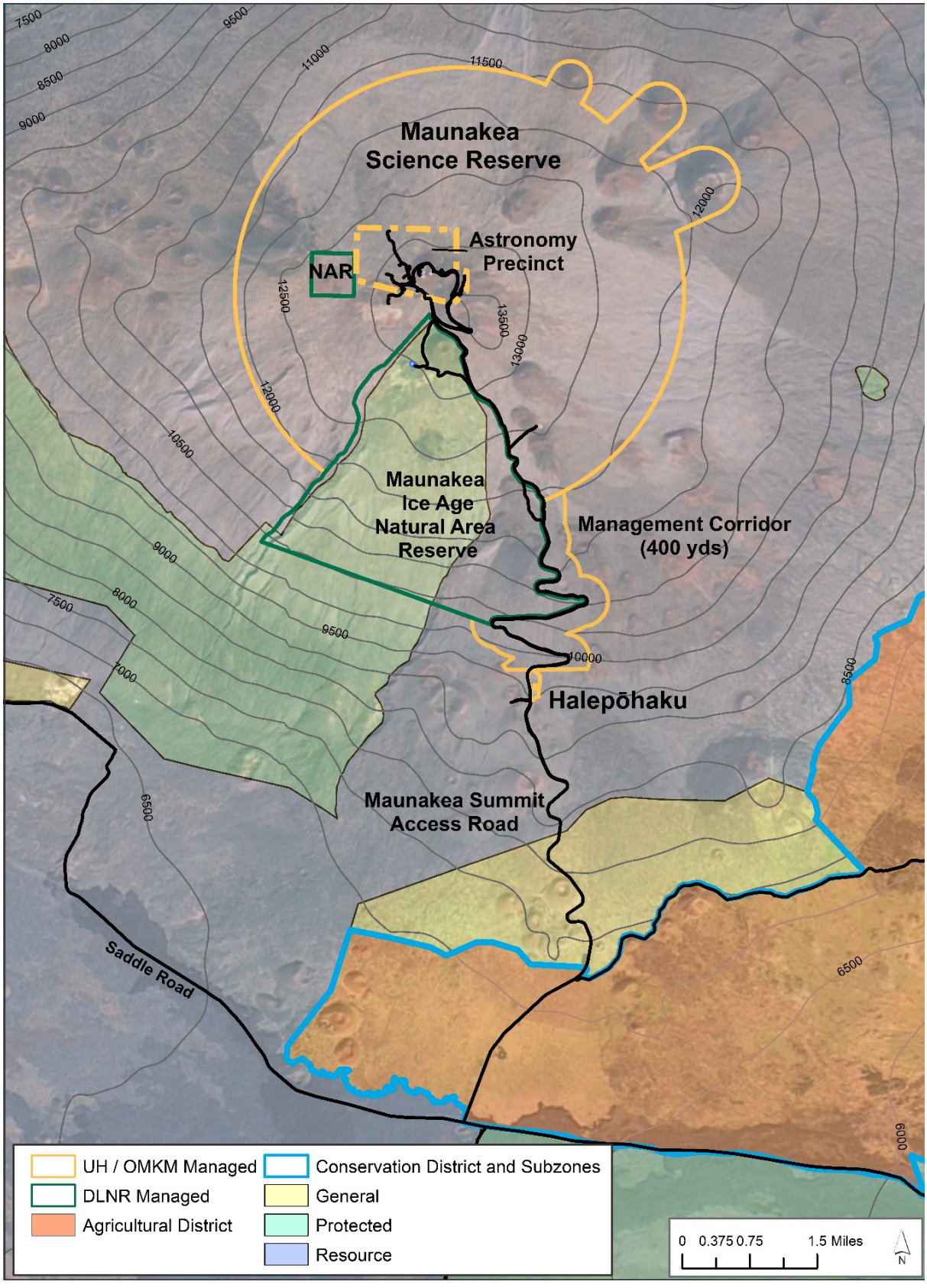
This Environmental Assessment (EA) process is being conducted pursuant to the Hawaiʻi Environmental Policy Act, Chapter 343, Hawaiʻi Revised Statutes (HRS), and its implementing regulations, Title 11, Chapter 200, Hawaiʻi Administrative Rules (HAR).[3] According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Development of an EA was triggered under the Hawaiʻi Environmental Policy Act and Chapter 343, HRS due to "use of land in the Conservation District" and "use of State funds".

erosion; (2) permitting a substantial increase in noxious weeds in uncultivated portions of the premises; and (3) failure to employ all of the usable portions of the premises."

[2] ~~The area where the guardrail will be installed is not part of the UH Management Areas on Maunakea. All permits for installation of the guardrail have been obtained.~~

[3] Specific sections of the HAR will be referenced as Title-Chapter-Section (i.e., HAR 11-200-8).

Figure 1. Location within the State Land Use Conservation District



Pursuant to HAR 11-200-8(a) State agencies can exempt certain types of actions from requirements to prepare an EA. The Proposed Action is not covered by UH's exempt classes of action and the preparation of an EA is required. In addition, the *Comprehensive Exemption List for the University of Hawai'i* also states that if an exempt action is proposed in a particularly sensitive environment, the exempt status of the action would be invalid.[4] The proposed project lies within federally designated critical habitat for the endangered palila (*Loxioides bailleui*). Critical habitat is listed as an environmentally sensitive area, triggering the requirement of an EA.

Section 5 of this document states the finding (anticipated finding, in the Draft EA) that no significant impacts are expected to occur. Section 5 lists each criterion and presents the findings (preliminary, for the Draft EA) for each made by UH Hilo, the proposing and approving agency. In the EA process, if the approving agency determines after considering comments to the Draft EA that, as anticipated, no significant impacts would likely occur, then the agency would issue a Finding of No Significant Impact (FONSI), and the action would be permitted to occur, pending other approvals and permits. If the agency concludes that significant impacts are expected to occur as a result of the Proposed Action, then an Environmental Impact Statement (EIS) would be prepared.

The Proposed Action is not being taken by a Federal agency, nor does it involve Federal lands or Federal funding, therefore procedural requirements under the National Environmental Policy Act and the National Historic Preservation Act do not apply.

1.4 Agency Coordination and Public Involvement

The following agencies and organizations were consulted in development of the EA (Appendix A). Consultation is ongoing during the EA review period.

U.S. Fish and Wildlife Service

The project site is located within federally designated critical habitat for the endangered palila. While formal consultation under Section 7 of the Endangered Species Act is not required, informal consultation with US Fish and Wildlife Service (USFWS) occurred between October 6, 2016 and October 24, 2016.

U.S. Geological Survey Pacific Islands Ecosystems Research Center

Wildlife biologist Paul Banko at the US Geological Survey (USGS) Pacific Islands Ecosystems Research Center, a palila expert, has been studying the bird, its habitat, and population and distribution changes for over 20 years. Consultation occurred between October 27, 2016 and November 4, 2016.

Hawai'i Department of Land and Natural Resources, Office of Conservation and Coastal Lands

During early scoping, concurrence was sought from Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) on all land use permitting requirements and the requirements for UH Hilo to complete an EA. Consultation began on September 20, 2016 and remains ongoing.

Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife

The Mauna Kea Forest Reserve surrounds the Halepōhaku parcel. DLNR Division of Forestry and Wildlife (DOFAW) manages parcels within the Forest Reserve system. Both the Forest Management Supervisor

[4] The *Comprehensive Exemption List for the University of Hawai'i* is found at: http://oeqc.doh.hawaii.gov/Shared%20Documents/Environmental_Council/Exemption_Lists_By_Department/State_Agencies/University-of-Hawaii-2001-03-14.pdf

and the Wildlife Biologist of the Hawai‘i Branch of DOFAW were consulted to provide any input or concerns regarding the Proposed Action. Consultation occurred between October 7, 2016 and November 3, 2016.

Hawai‘i Department of Land and Natural Resources, State Historic Preservation Division

Halepōhaku is known to contain historic properties. HRS Chapter 6E requires consultation with the State Historic Preservation Division (SHPD) (Section 4.2.7). Consultation began on September 28, 2016 and concluded on November 28, 2016 with SHPD issuing a letter stating that it is SHPD's determination that no historic properties would be affected by the proposed project with implementation of the SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai‘i Management Areas on Maunakea* (Gosser et al. 2014).

County of Hawai‘i Planning Department

The County of Hawai‘i Planning Department is charged with long-range planning for the County and review and revision of the *County of Hawai‘i General Plan*. Both the Planning Director and the Deputy Planning Director were consulted to provide any input or concerns regarding the Proposed Action. Consultation began January 18, 2017 and remains ongoing.

Kahu Kū Mauna Council

Kahu Kū Mauna Council is a volunteer community-based council whose members are from the native Hawaiian community. Kahu Kū Mauna Council members serve as advisors to the OMKM, MKMB, and the UH Hilo Chancellor on all matters impacting the cultural integrity of Maunakea. Kahu Kū Mauna Council members have been consulted on the proposed project throughout the planning stages, including being given the opportunity to provide alternatives to the overall project design and specifically the location of the new VIS Parking Area 2. Kahu Kū Mauna Council members first formally reviewed the proposed project at an August 19, 2015 meeting. Kahu Kū Mauna Council members were invited to express opinions on the proposed project at MKMB meetings where the topic was discussed. They will continue to be consulted throughout project development.

Public Involvement

The Maunakea Management Board (MKMB) is charged with providing the community with a sustained direct voice for the management of Maunakea. The general public is invited to attend MKMB meetings and agendas are made available to the public on the State of Hawai‘i, Office of Information Practices website prior to scheduled meetings.[5] A link to that website as well as the meeting minutes are posted on the OMKM website.[6] The proposed project has been discussed at five MKMB meetings, beginning on May 5, 2015. It was placed on the agenda for formal discussion on August 25, 2015. A motion on whether to proceed with conceptual design on the project was unanimously approved. Updates on the progress of project design and costs were presented at follow-up meetings on February 4, 2016 and May 11, 2016. The public will continue to have the ability to comment on the proposed project at any and all MKMB meetings.

In addition to community consultation at MKMB meetings, the Draft EA was published in the Office of Environmental Quality's *The Environmental Notice* on March 8, 2017 and the public was afforded a 30 day

[5] Agendas are available at http://calendar.ehawaii.gov/calendar/html/event/?currentViewtype=2&eventCollectionCode=uh_mkmb

[6] Meeting minutes are available at http://malamamaunakea.org/management/mauna-kea-management-board

comment period. Public comments received were reviewed by the team developing the EA and designing the proposed project, and resulted in some changes to the original proposal based on public perception that access to some parking and culturally significant areas could be limited.

2 ALTERNATIVES

This section describes the Proposed Alternative (Section 2.1) and No Action Alternative (Section 2.2). Alternatives considered and eliminated from detailed analysis are also described (Section 2.3).

2.1 Alternative 1 (Proposed Action)

The Proposed Action is located at Halepōhaku, identified by TMK No. (3) 4-4-015:012, and referred to as the 'project area' in this EA. The actual footprint of the Proposed Action is referred to throughout this EA as the 'project site'. The project site is bound on the west by Maunakea Summit Access Road, on the east by the approximate extent of existing cabins, to the south by the southern extent of the Halepōhaku in the construction staging area and gravel VIS Parking Area 3, and to the north by VIS Parking Area 1 (Figure 2). The project site also includes the proposed greenhouse further north of VIS Parking Area 1, to the south/southeast of the stone buildings. This site description encompasses the portion of the Halepōhaku parcel used for public services.

2.1.1 Project Description

In its entirety, the Proposed Action includes: removal of one longhouse; a new means of ingress and egress for vehicles to the VIS, including a new access lane and parking area, adjustments to existing VIS Parking Area 1, paving of an unimproved foot path to create a walkway connecting the new VIS Parking Area 2 with the VIS, and a new paved walkway to connect the new VIS Parking Area 2 to the existing longhouse, and drainage features; installation of ~~four~~ two gates; and a new greenhouse~~; and relocation of one cabin~~ (Figure 4 and Figure 5). The majority of project activities would occur on the UH leased lands. The access to the VIS ingress/egress and the new VIS Parking Area would be through existing, approved access points identified in the Halepōhaku parcel lease. The only portion that may overlap with lands managed by another entity is the portion where the new ingress/egress connects to the Maunakea Summit Access Road.[7]

Elements of the Proposed Action include:

Relocate or demolish existing building (northern-most longhouse (dormitory))

There are two longhouses (former dormitories and common room) located south of the VIS (Figure 2). The northern-most longhouse, currently used as office space by Rangers and VIS staff, would be removed to provide space for the new VIS Parking Area. The building would be relocated outside of the UH managed lands on Maunakea. Any required permits would be the responsibility of the receiving entity. If, for some reason, the building cannot be relocated, it would be demolished. The southern-most longhouse would continue to be used as a public presentation area and a storage area for VIS merchandise.

Construct access lane and parking area improvements

Visitors and workers access the VIS using the Maunakea Summit Access Road, which is the only road up to the summit from Saddle Road. Parking is limited in VIS Parking Area 1, adjacent to the north side of the

[7] The Maunakea Summit Access Road near Halepōhaku is owned by the State but maintained by the County of Hawai'i through a Memorandum of Understanding.

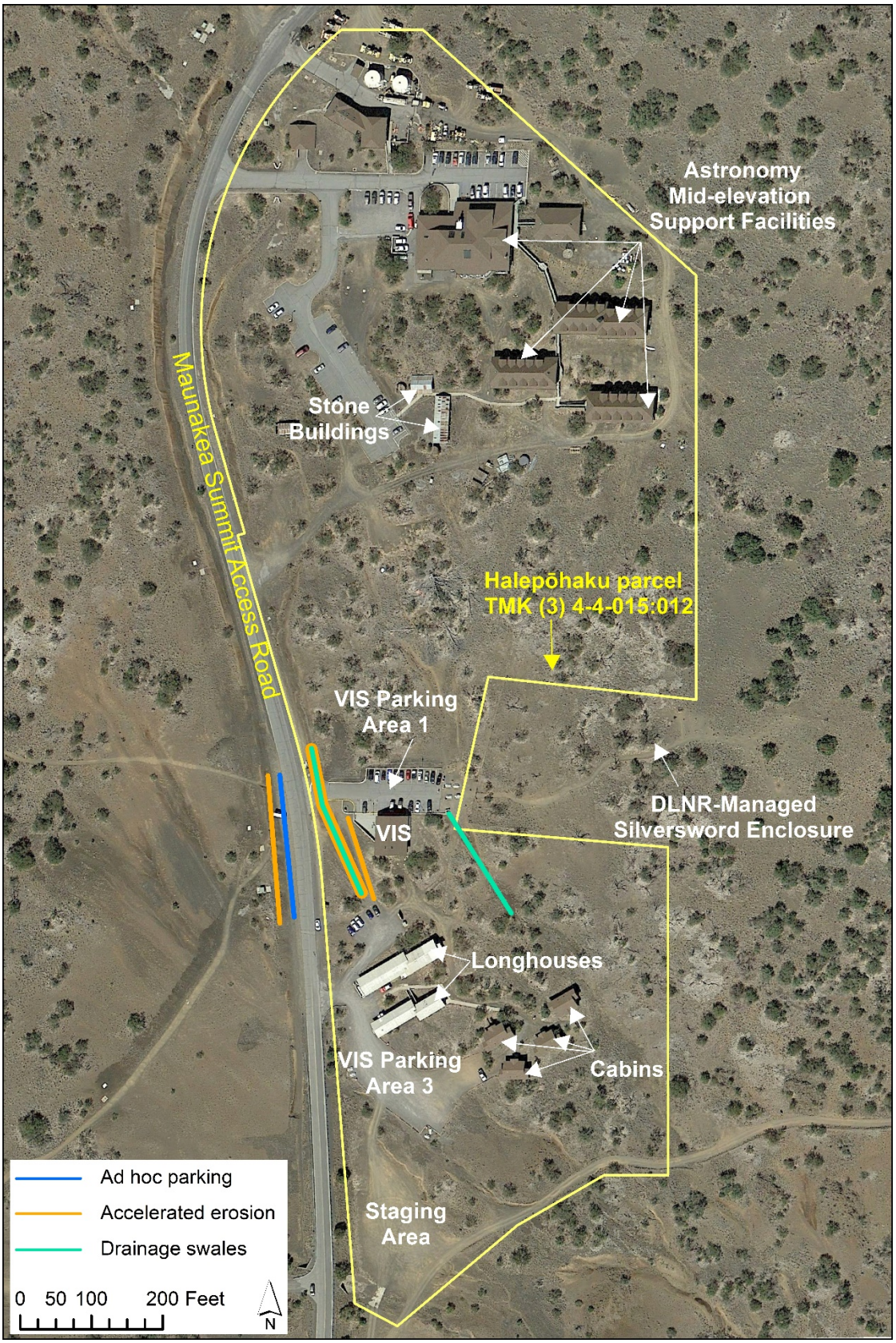
VIS, and prior to installation of the guardrail in March 2017, people often parked in the road shoulder area on the west side of Maunakea Summit Access Road.

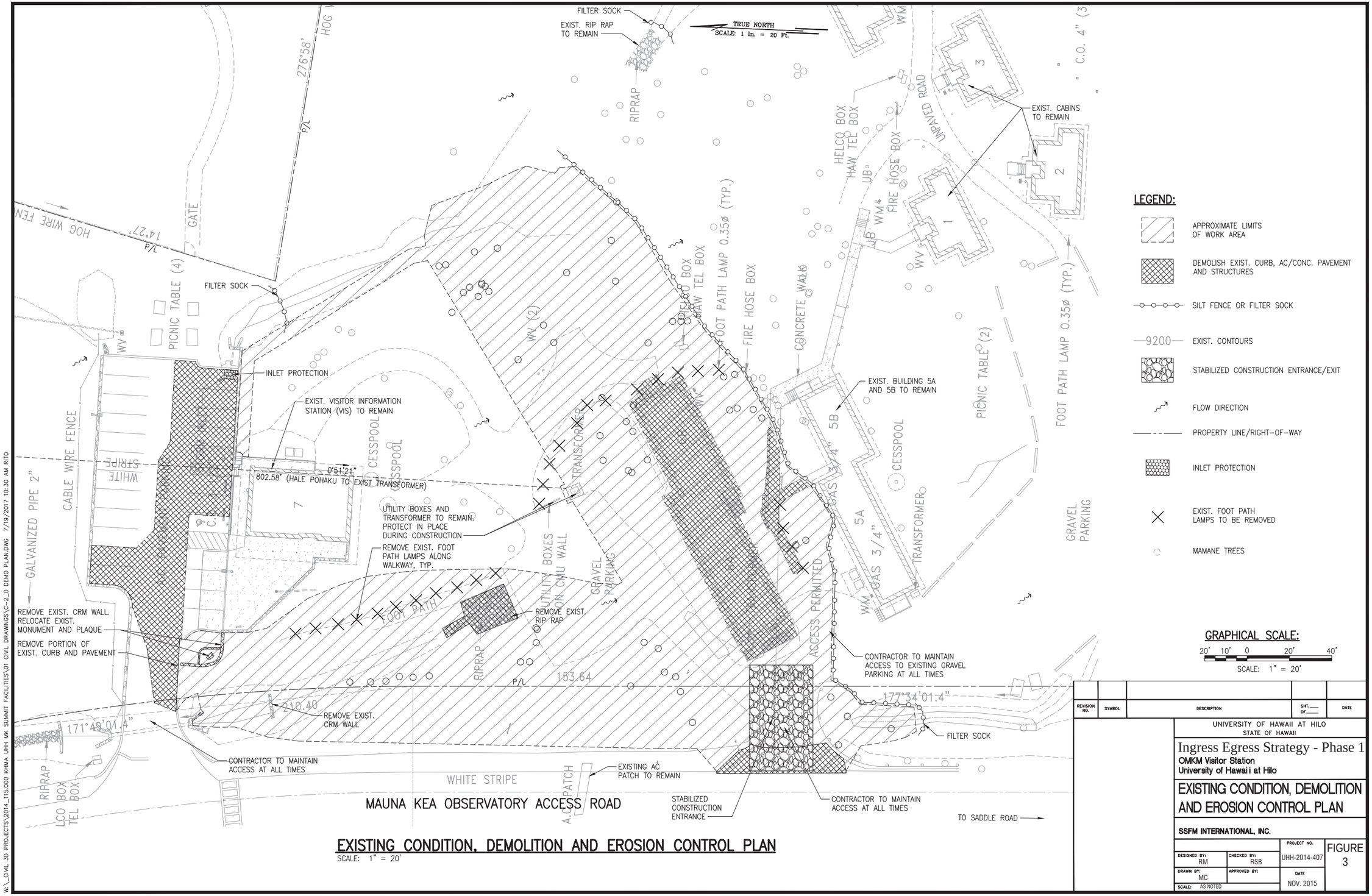
Proposed changes include construction of a new paved parking area (VIS Parking Area 2), with an associated new ingress/egress that ties into a new access lane to the VIS. The new 42 stall (41 regular, 1 accessible) VIS Parking Area 2 would be approximately 20,600 ft^2 and would accommodate personal vehicles and commercial tour vehicles. It would replace an unimproved dirt parking area, the northern-most longhouse, and some undeveloped area. The new paved VIS access lane would cover approximately 11,750 ft^2 and be 350 ft in length. It would run parallel with the Maunakea Summit Access Road, connecting the ingress/egress of the new VIS Parking Area 2 with the ingress/egress of the existing VIS Parking Area 1. The VIS access lane would be one-way heading north, and have a pullout that would allow vehicles to safely drop people off near the VIS and return to park in the lower VIS Parking Areas 2 or 3 via Maunakea Summit Access Road.

People would be able to walk from VIS Parking Areas 2 and 3 to the VIS via a new paved walkway connecting the east end of the new VIS Parking Area 2 to the existing stairs of VIS Parking Area 1. The walkway would be created by paving an existing unimproved footpath. The walkway is necessary to provide a safe and obvious path for foot traffic and would reduce the likelihood of several 'social trails' being created between the two parking areas. The entrance to the existing VIS Parking Area 1 from Maunakea Summit Access Road would remain, with slight modifications that connect it with the new VIS access lane. The existing VIS Parking Area 1 would be partially repaved and restriped to accommodate additional accessible parking spaces that meet standards of the Americans with Disabilities Act (ADA). Parking stalls in this lot would change from 23 regular and one accessible, to 18 ~~13~~ regular and four accessible~~; this includes the parking stalls being lost as a result of relocation of one of the former cabins to VIS Parking Area 1~~.

The southern longhouse contains areas used for public presentations, both as part of the nighttime stargazing program and for scheduled organizations (e.g. school groups, astronomy groups). The relocation of a cabin to VIS Parking Area 1 would have provided a space for public presentation closer to the VIS, thereby limiting health and safety risks arising from having visitors walk around the perimeter of the parking lot. Concerns were raised during the Draft EA public comment period that this relocated cabin would displace parking stalls nearest the VIS; potentially create unnecessary interaction between pedestrians and vehicles; and impair view planes to the north and east from the VIS building and adjacent lands. As a result of these concerns it was decided that the cabin would not be relocated and public presentations would continue to be held in the southern longhouse. To facilitate safe pedestrian access to this longhouse, and to comply with the ADA, the following features will be added. A ramp will be installed from the southeast corner of Parking Area 2 to the grade at the toe of this parking area. A five ft. wide concrete sidewalk will be poured in place and extend from the ramp landing on grade to the existing ADA ramp on the north side of the longhouse. The sidewalk will be aligned parallel to the southern edge of VIS Parking Area 2 and extend approximately 185 ft. An ADA parking stall will be added to VIS Parking Area 2 in the southeast corner next to the ramp. All geometries, slopes, and materials of the ramp and sidewalk will meet ADA standards. Safety concerns associated with continued use of the more distant presentation room will continue to be monitored.

Figure 2. Maunakea VIS Existing Conditions





LEGEND:

- APPROXIMATE LIMITS OF WORK AREA
- DEMOLISH EXIST. CURB, AC/CONC. PAVEMENT AND STRUCTURES
- SILT FENCE OR FILTER SOCK
- 9200 — EXIST. CONTOURS
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- FLOW DIRECTION
- PROPERTY LINE/RIGHT-OF-WAY
- INLET PROTECTION
- EXIST. FOOT PATH LAMPS TO BE REMOVED
- MAMANE TREES

GRAPHICAL SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

EXISTING CONDITION, DEMOLITION AND EROSION CONTROL PLAN

SCALE: 1" = 20'

REVISION NO.	SYMBOL	DESCRIPTION	SHT. OF	DATE

UNIVERSITY OF HAWAII AT HILO
STATE OF HAWAII

Ingress Egress Strategy - Phase 1
OMKM Visitor Station
University of Hawaii at Hilo

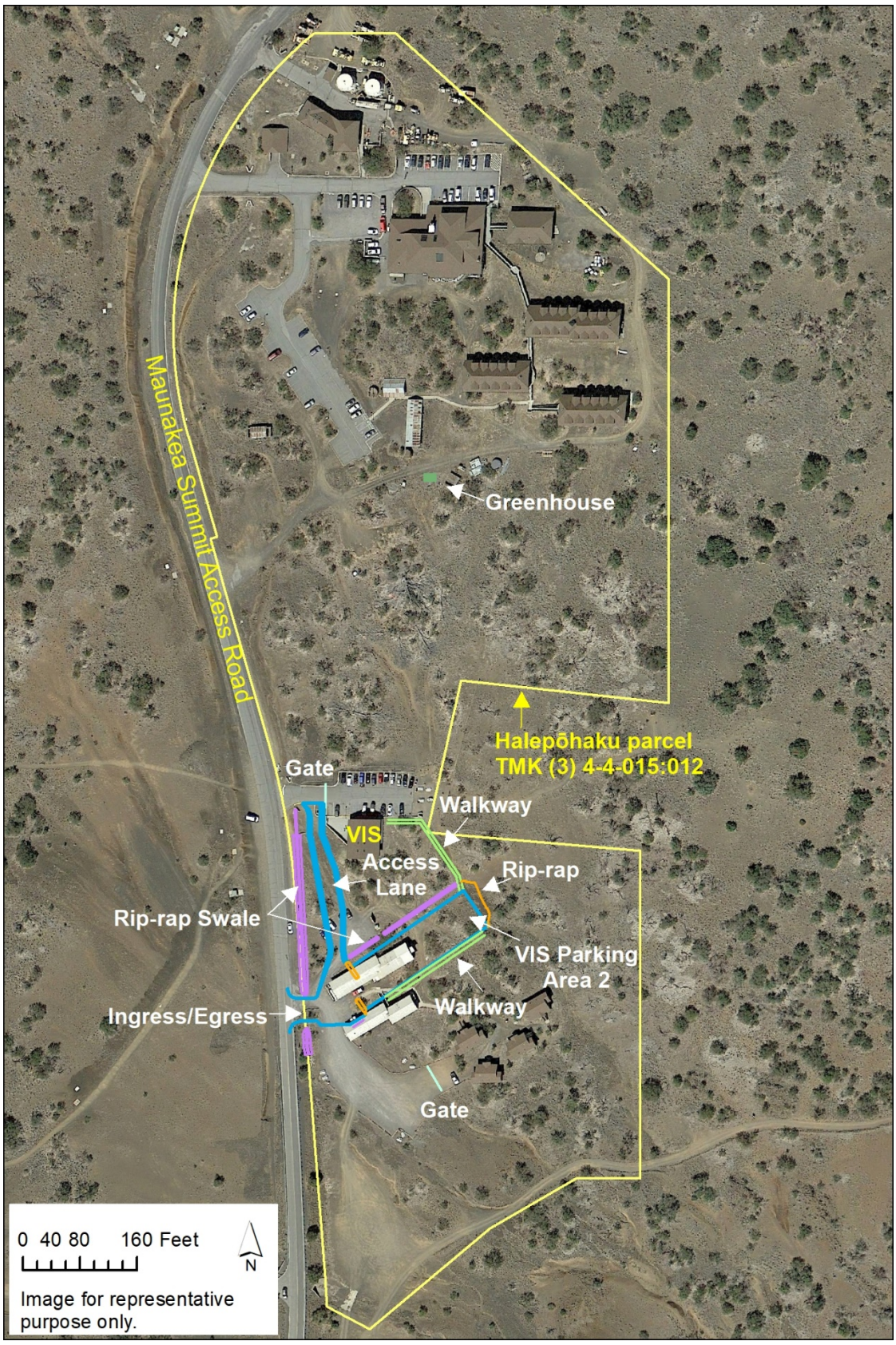
EXISTING CONDITION, DEMOLITION AND EROSION CONTROL PLAN

SSFM INTERNATIONAL, INC.

DESIGNED BY:	CHECKED BY:	PROJECT NO.	FIGURE
RM	RSB	UHH-2014-407	3
DRAWN BY: MC	APPROVED BY:	DATE: NOV. 2015	
SCALE: AS NOTED			

W:_CIVIL 3D PROJECTS\2014_115.000 KHMA UHH MK SUMMIT FACILITIES\01 CIVIL DRAWINGS\C-2_0 DEMO PLAN.DWG 7/19/2017 10:30 AM RITO

Figure 4. Maunakea VIS Infrastructure Improvements



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TRUE NORTH
SCALE: 1 In. = 40 Ft.

EXIST. CABINS TO REMAIN

ADA PARKING STALL, ACCESS AISLE, RAMP AND WALKWAY (SEE NOTE 1)

EXISTING GRAVEL PARKING

ACCESS LANE

MAUNA KEA OBSERVATORY ACCESS ROAD

TO SUMMIT

P/L

9200 9190 9180 9170 9160 9150

1 2 3 4 5A 5B 7

LEGEND:

- NEW PAVEMENTS
- NEW CONCRETE WALKWAY
- NEW GRAVEL ISLAND AND RIP-RAP SWALE
- PROPERTY LINE/RIGHT-OF-WAY
- NEW CRM WALL AND APRON
- NEW GATE

1. ADA ELEMENTS ARE PRELIMINARY AND HAVE NOT BEEN VERIFIED WITH TOPOGRAPHY.

GRAPHICAL SCALE:

40' 20' 0 40' 80'

SCALE: 1" = 40'

SSFM INTERNATIONAL
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

MAUNA KEA VISITOR INFORMATION STATION
INGRESS & EGRESS PHASE 1

VIS INGRESS/EGRESS EXHIBIT

SCALE: 1"=40'

DATE:

FIGURE 5

Paving of VIS Parking Area 2, the access lane, and the walkways would increase the impervious surface area in the project location. Drainage features, in the form of drywells, gravel islands, rip-rap lined swales, and culverts, would be installed to capture runoff with the goal of no net increase in runoff over existing conditions and preventing surficial erosion along drainageways. Features would include a rip-rapped lined swale with a culvert headwall between the Maunakea Summit Access Road and the new VIS access lane; gravel islands on the northeast and southwest sides of VIS Parking Area 2; a rip-rapped swale on the northwest side of the new VIS Parking Area 2; three drywells in the new VIS Parking Area 2; and culverts under the new parking area ingress/egress and the sidewalk (Figure 5).

Install gates

~~Four~~ Two gates would be installed at access points to parking areas near the VIS (Figure 4 and Figure 5). The gates would each measure approximately 32-36 ft in total length. One gate would be installed to enclose the staff parking area, and would generally be left closed. The other gate would be installed to close off VIS Parking Area 1 during evening stargazing activities and occasional routine maintenance; it would be left open at all other times. When closed, the gate would be staffed for ADA access or in case of emergency. This gate will be located so that it does not impede use of the access lane when open or closed. Safety concerns over the absence of standard traffic controls (i.e., no gate) to limit access to VIS Parking Area 2 will continue to be monitored. ~~(one separating the planned ingress/egress and the gravel VIS Parking Area 3, and two located along Maunakea Summit Access Road), would generally be left open during normal working hours. They are anticipated to be used as needed to secure the facilities during periods when the VIS is not open to the public, maintenance activities, special functions, or in case of an emergency (i.e., fire in a building).~~

Construct greenhouse

A greenhouse would be built to support ongoing native plant propagation and planting to enhance habitat in the UH Management Areas on Maunakea, as well as in the Mauna Kea Forest Reserve if desired by DLNR. The greenhouse would be a free-standing structure, approximately 375 ft^2, which would be anchored to the ground but would not require a foundation. The greenhouse would be oriented in the best manner to withstand high winds and may include hurricane ties to secure the roof, if deemed necessary. It would have electricity and water onsite. The small amount of electricity necessary to run timers for a ventilation system is anticipated to be met using solar power. Water needs would be met by connecting to existing Maunakea Observatories Support Services (MKSS) facilities. The greenhouse would be located near the MKSS support facilities, north of the VIS, so as to be away from general tourist activity but in an area appropriate for supervised public or volunteer events (Figure 4). It would be accessed via an existing dirt road. Funding for materials needed for both project-related plant propagation and long-term operation of the greenhouse would be provided by OMKM. OMKM staff, with assistance from partners and volunteers, will operate the greenhouse.

~~*Relocate one cabin to existing VIS Parking Area 1*~~

~~The four cabins are located to the southeast of the longhouses (Figure 4). One of the 40 ft x 25 ft cabins, Cabin 2 (southwestern-most), would be moved to the northeast part of VIS Parking Area 1 to provide additional space for accommodating VIS activities. The relocated cabin would require water, electricity, phone, and internet service. The utilities would be connected to the VIS and buried in a location to be determined, within the existing footprint of VIS parking and walkway areas, once the cabin has been moved. The previous cabin site would be restored as closely as possible to the condition of the land prior~~

~~to the construction of the cabin using any excess cinder from the grading of VIS Parking Area 2 and native vegetation.~~

2.1.2 Project Schedule and Cost

Construction is anticipated to begin in 2017. The construction period is listed as one year, however if there are no breaks in construction, the project is expected to have a construction period of approximately seven months, weather permitting. The construction schedule would be updated and refined if necessary as the project progresses through the permit process. The estimated construction cost for the infrastructure improvements is $1.53 million. Funding is being provided by the State legislature through Capital Improvement Project funds.

2.1.3 Required Under the Maunakea CMP

As the BLNR-approved management plan for the UH Management Areas, the CMP contains a set of management actions designed to protect the natural and cultural resources of Maunakea (Section 4.2.2). As required by the BLNR when it approved the CMP, OMKM submits annual reports on the status of the implementation of the CMP. Contractors, through their construction contracts with the applicant, must comply with all applicable requirements of the CMP. The following would be implemented as part of the construction.

Maunakea User Orientation

Prior to working on the mountain all personnel associated with any construction project are required to attend a mandatory 45-60 minute Maunakea User Orientation to inform them on the natural and cultural resources of Maunakea as well as the hazards of working on the mountain. All work would be performed in accordance with the principles and frequency established in the Maunakea User Orientation. Any person not behaving in a manner consistent with the principles established in the Maunakea User Orientation would be required to leave the project site.

Best Management Practices

All construction requires the implementation of Best Management Practices (BMPs) approved by both OMKM and applicable permitting agencies. The BMPs outlined for the Proposed Action are a combination of: BMPs promulgated by OMKM for all projects within UH Management Areas on Maunakea and includes both construction and post construction practices; as well as construction BMPs prepared pursuant to the National Pollutant Discharge Elimination System (NPDES), building, and grading permits, all of which are required for the project (Section 4.1; Appendix B).

Rock Movement Plan

All construction that occurs within the Astronomy Precinct requires a *Rock Movement Plan* approved by OMKM. Although the Proposed Action is not within the Astronomy Precinct, OMKM would require the contractor to develop a *Rock Movement Plan* that takes into consideration the need to minimize adverse impacts to cultural resources and invertebrate habitat. The *Rock Movement Plan* would detail excavation, grading activities, and materials storage, and include appropriate construction BMPs to be followed throughout the construction period.

Maunakea Invasive Species Plan

All construction requires compliance with the Maunakea Management Board approved *Maunakea Invasive Species Management Plan* (ISMP) (Vanderwoude et al. 2015). The ISMP details measures to be taken to avoid the introduction and spread of invasive species such as cleaning and inspection procedures

for machinery and materials; maintenance of the construction staging area; monitoring and control for invasive species; and trash removal. For example, prior to arriving at the UH Management Areas, all construction materials, equipment, crates, and containers carrying materials and equipment would be inspected by a trained biologist, selected by OMKM and approved by DLNR. The biologist would certify that all materials, equipment, and containers are free of any flora and fauna that may potentially have an impact on the Maunakea ecosystem. Inspections would occur below the Saddle Road junction.

Monitoring

All construction requires an on-site a construction monitor, whose responsibility would be to monitor compliance with the terms and conditions of any Conservation District Use Permit (CDUP) as related to construction activities, as well as any terms and conditions agreed to between the constructing entity and OMKM. The construction monitor would have the authority to order that any or all construction activity under a CDUP cease if there has been a violation of the terms or conditions of the CDUP or that the construction activity would unduly harm historical, natural, or cultural resources or burials. A construction monitor has been secured for the project, should it be approved. Project plans for the Proposed Action include the presence of an archeological monitor for all ground-disturbing work.

Materials Storage

All materials for the Proposed Action would be stored either within the proposed project site or in the existing construction staging area.

2.2 Alternative 2 (No Action)

Under the No Action Alternative, the new VIS Parking Area 2 and the VIS access lane, ingress/egress, drainage features, and the greenhouse would not be constructed. Under this alternative gates would not be installed and it would not be necessary to remove the northern-most longhouse ~~or relocate the cabin~~. Aside from VIS Parking Area 1, the manner in which people park and access the VIS would remain ill-defined (Figure 2). There would be no defined footpath or walkway for accessing the VIS from VIS Parking Area 3 and pedestrians would continue to wander throughout that area, trampling vegetation and causing ground disturbance. There would be no removal of māmane trees or other native vegetation, nor any additional construction-related ground disturbance. The No Action Alternative provides a baseline for comparison of impacts from the Proposed Action.

2.3 Alternatives Considered but Eliminated from Further Analysis

Alternative Locations

Installation of a new parking lot in other locations at Halepōhaku, such as to the north of the VIS near other parcel facilities, was considered. However, the facilities north of the VIS are not used nor are intended for use by visitors, and having them park in that area and wander around that part of the parcel would potentially be disruptive. Other portions of the parcel are not developed or heavily utilized by people and contain more intact habitat. The selection of the proposed site for VIS Parking Area 2 was carefully chosen based on proximity to the VIS and the Maunakea Summit Access Road, and existing physical condition (i.e., contains an already cleared dirt parking lot, resulting in the need for minimal additional grading; contains a large amount of disturbed area, minimizing the impacts to habitat). The proposed site appears to be the optimal location for providing alternative parking and safe access to the VIS and for minimizing disturbance to undeveloped portions of the parcel.

3 SETTINGS, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the affected (baseline) environment that is relevant to the potentially significant environmental consequences. The sources of information for the affected environment are scientific studies, previous environmental documents associated with the area, site surveys, and interviews and consultations (Section 1.4). Although all relevant environmental factors were considered, those that would not be impacted by the Proposed Action are not addressed in this EA. Impacted resources are presented by general categories: Environmental Setting, Infrastructure, Social and Economic Setting, and Historic and Cultural Resources.

Following the description of the existing condition of each resource, the environmental consequences (impacts) that could result from implementation of each of the alternatives are analyzed. For each potential impact, actions to mitigate them to make them less than significant, are presented. Impacts are generally mitigated through adhering to County, State and Federal laws; conditions of any DLNR approvals in the form of CDUPs or site plan approvals; stipulations of the CMP (Section 2.1.3); construction BMPs; and recommendations of the Kahu Kū Mauna Council.

3.1 Environmental Setting

3.1.1 Topography, Geology, Soils, and Geologic Hazards

The ground surface in the facilities area of Halepōhaku is covered with alluvial wash materials consisting of small cinder gravels, lava rock particles, and ash that are several centimeters deep in some locations. The soil is characterized by the Pohakulehu-Lanapohaku complex. The Pohakulehu series consists of deep or very deep, well drained soils that formed in volcanic ash and ʻaʻa lava. The Lanapohaku series consists of very deep, somewhat excessively drained soils that formed in volcanic ash and ʻaʻa lava. Soil erosion is moderate. The elevation of Halepōhaku parcel ranges from approximately 9,100 ft to 9,400 ft over the southern flank of the Mauna Kea volcanic edifice. Slopes within the footprint of the project area range from 0.5 to 15 percent and dip in a mostly north to south direction. Although there are three puʻu located in the vicinity of Halepōhaku, they are not located within the project area. The nearest puʻu is located approximately 850 ft west of the project area.

The entire island of Hawaiʻi is subject to geological hazards, especially lava flows and earthquakes. Halepōhaku lies within Zone 7 of the USGS lava flow hazard map (Wright et al. 1992). This zone is considered to have a low probability of coverage by lava flows outside of localized upwelling events, and although the volcano is only considered dormant and not extinct, there has been no recent evidence to support an eruption at Maunakea within the near future. The entire island is rated by USGS as Seismic Zone 4.[8] This zone is at risk from major earthquake damage especially to poorly designed or built structures. The project is located in an area that has no flood map listed on the Federal Emergency Management Agency's Flood Insurance Rate Maps.

Ad hoc parking on the western side of the Maunakea Access Road, a chronic source of erosion, was eliminated by the installation of a guardrail in March 2017 (Figure 6 and Figure 7).

[8] https://hvo.wr.usgs.gov/earthquakes/hazards/

Potential Impacts and Mitigation Measures

Site preparation of all areas to be paved would include ground disturbance in the form of grubbing to remove existing vegetation and some existing concrete walkways and riprap, grading, and trenching or excavation to install subsurface features (i.e., utility lines, gate posts, drywells). The grade of the proposed VIS Parking Area 2 would be sloped between 0.5 and 5 percent. The dip of the slopes would be aligned so that storm water runoff is directed into drywells that would be installed as part of the project. The proposed VIS access lane would have slopes ranging from 4 to 12 percent.

The amount of soil to be excavated to achieve the final grade would be minimal. Any excavated soil may be used within the project site to assist in achieving the proper grade, fill in holes from the piers of removed buildings (longhouse ~~and cabin~~), and any other project needs. Although it is not anticipated there would be any excess soil, any not used for the proposed project would be stockpiled for future use for greenhouse activities. Any fill that may need to be brought onto the site for grading or other activities would be locally sourced from the Pōhakuloa Training Area quarry (or similar nearby facility) and would be subject to requirements outlined in the ISMP.

The construction BMPs include measures that the contractor is required to follow to reduce and contain erosion during the construction phase (e.g., filter socks, silt fences, a stabilized construction entrance) (Figure 3). These measures may be detailed in building and grading permits, State and County regulations, or other development permits. Installation of sediment and erosion control measures would occur prior to any construction activities. Additionally, all grubbing and grading is planned for the summer of 2017, during the months with the lowest average rainfall, which would reduce the probability of sediment and erosion impacts from storm events during construction. Designs to minimize post-construction long-term erosion due to storm water runoff were incorporated into the infrastructure improvement plans (Section 3.1.2). Exposed slopes would be stabilized by compacting the soil and covering with native cinder.

Figure 6. <u>Previous</u> Ad Hoc Parking along Maunakea Summit Access Road

Figure 7. Guardrail along Maunakea Summit Access Road

~~Over the long term the Proposed Action would help minimize erosion occurring on the opposite (west) side of the Maunakea Summit Access Road from the VIS by providing alternative parking (Figure 6). Additionally, the Proposed Action includes installation of erosion controls to minimize erosion in the new VIS Parking Area 2, ingress/egress, and VIS access lane.~~

Gate and sign posts would be installed in holes and set in concrete. Erection of the greenhouse would require installation of several posts in the ground to stabilize the structure but no additional foundation work is required for the greenhouse. All holes would be 36 inches or less deep. The on-site archeologist would monitor the digging and excavation. All applicable BMPs would be employed to minimize erosion.

Geologic conditions impose no significant constraints on the Proposed Action. While an earthquake or volcanic eruption may cause damage to the proposed infrastructure improvements, the design does not in any way increase a chance of loss of life due to these events.

3.1.2 Drainage, Water Features, and Water Quality

There are no perennial surface waterbodies and no history of flooding in the Halepōhaku area. Total annual mean rainfall at Halepōhaku is 25.3 inches.[9] Surface water runoff from undisturbed areas within the project occurs when the rainfall rate exceeds the infiltration rate. The frequency of runoff events off these surfaces is unknown. Runoff is generated more frequently off developed and altered land surfaces

[9] Western Regional Climate Center for period 1949-2016, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?hi1065

within the project due to their impervious surfaces and compaction of soils, which reduces infiltration into the soil. Runoff from both undisturbed and developed surfaces is carried across the landscape in natural and manmade channels. Manmade storm water features such as swales and culverts have been constructed and located to move water away from the existing Halepōhaku buildings and parking areas. The project site does not discharge into a Municipal Storm Sewer System. The manmade drainage system connects with ephemeral natural channels that flow southeasterly away from the project area.

There are two existing man-made drainage channels within the project area (Figure 2). The first is an earthen swale that begins at approximately 9,350 ft elevation and is aligned parallel and along the east side of the Maunakea Summit Access Road (Figure 8). It passes under the existing ingress/egress to VIS Parking Area 1 via an 18 inch culvert. From the outlet of the culvert the swale alignment angles to the southeast away from Maunakea Summit Access Road to an open and undeveloped area south of VIS Parking Area 1. The swale terminates approximately 140 ft from the culvert outlet onto a riprap lined energy dissipater apron where flow is spread out and flows as sheet flow to an ephemeral channel. This swale captures runoff from portions of Maunakea Summit Access Road as well as the facilities and parking area in the upper part of Halepōhaku, and is prone to erosion (Figure 2). The second drainage channel is located on the east side of the VIS building and traverses southeasterly downslope. This drainage channel captures runoff from VIS Parking Area 1 and surrounding undeveloped areas. Runoff from the project area carried in the natural drainages southeast of the VIS building does not appear to be carried to the ocean due to infiltration along the channels between 9,000 and 6,500 ft elevations.

Figure 8. Existing Drainage Swale

Halepōhaku is located within the Onomea aquifer system of the East Mauna Kea aquifer sector. The highest known elevation of the regional aquifer on Maunakea is approximately 4,500 ft above sea level. This is for areas in the Maunaloa-Maunakea saddle region and there is no direct data for immediately under the project site, which may differ in depth to the regional aquifer. Localized perched or dike-impounded groundwater features may or may not be present in the project area. Groundwater levels are assumed to be at significant depths below the ground surface. There are no wells within the vicinity of the project area.

Potential Impacts and Mitigation Measures

The Proposed Action involves vegetation clearing, grading, and construction activities in which land disturbance exceeds one acre, thus the project requires an individual NPDES permit. A Stormwater Pollution Prevention Plan submitted as part of the application for the NPDES permit specifies BMPs to minimize storm water runoff during and post construction and the potential for erosion and sedimentation due to runoff (Section 4.1; Appendix B).

Although there are no permanent surface water resources in the project area, unimproved earthen drainages that route storm water runoff during rainy periods do exist. As part of the project, earthen drainages would be stabilized to minimize erosion and improve hydraulic conveyance. In addition, three drywells would be installed so that runoff generated within the project site would be discharged into the wells. This would result in no net increase of storm water runoff from the new parking area under all but the most extreme rainfall events. The drywell inlets would be fitted with BMPs to prevent sediment from entering the drywells. BMPs direct contractors not to perform any construction operation that would cause falling rocks, soil, or debris in any form to fall, slide, or flow into existing drainage systems or natural watercourses. Additionally, construction activities with the potential to produce polluted runoff would not be permitted during heavy rains or storm conditions that might generate storm water runoff. The project would utilize perimeter controls around the project site where storm water sheet flow from earth-disturbing activities would need to be intercepted. The perimeter controls would collect the sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing sediment migration offsite and preventing erosion from occurring outside the project boundaries. Filter socks would be placed to prevent sediment from being washed into constructed drywells and inlets. The construction monitor would ensure that the contractor conforms with all applicable provisions of the water quality and water pollution control standards contained in HAR 11-54, *Water Quality Standards*; HAR 11-55, *Water Pollution Control*; and Chapter 10 of the Hawai'i County Code, *Erosion and Sedimentation Control*, as well as any additional conditions imposed by the development permits for the project.

The Proposed Action would increase the amount of impervious surface by ~~0.28~~ 0.30 acres within the project site from 0.42 acres to ~~0.70~~ 0.72 acres. Under existing conditions the maximum discharge is 4.62 cubic feet per second (cfs), compared to an after construction value of 5.2 cfs. The overall net 0.58 cfs increase in runoff is off the new access road.[10] Under build-out conditions, the drainage design allows for runoff into and via the following features within the project area: three drywells, gravel islands, a new lined drainage swale, and an improved existing swale (Figure 4 and Figure 5). The drywells would be located and sized to capture runoff within the project area, while the two swales would carry runoff and discharge into natural drainage channels south of the project area. Gravel islands would be aligned to

[10] Hydrologic analysis and civil design work conducted for this project by SSFM International is used for the hydrological discussion presented herein.

intercept sheet flow, and prevent erosion by slowing water velocity and filtering runoff. A portion of the runoff from the VIS access lane would be directed into the drywell located at the northwest corner of VIS Parking Area 2. This drywell would be installed at the west end of a new interceptor swale that would be aligned parallel to and run along the north end of the new VIS Parking Area 2. The swale would be lined with riprap and would intercept sheet flow generated off the undeveloped 0.20 acre area south of the VIS building. The swale would be sloped to drain approximately one-third of the runoff intercepted into the drywell. The remainder of the runoff would be routed to the east and discharged at the northeast corner into an existing natural swale. This existing swale starts at the southeast corner of the VIS Parking Area 1 and is aligned in a southeasterly direction. The section of the swale that is adjacent to the east side of the new VIS Parking Area 2 would be fitted with riprap to protect the edge of the parking area and prevent erosion of the swale. There is no additional runoff from the build-out that would be routed into this swale.

Runoff generated off most of VIS Parking Area 2 would be routed into a second drywell that would be installed along and within the VIS Parking Area 2. A third drywell would be installed at the intersection of the southwest corner of the VIS Parking Area 2 and the new ingress/egress. Runoff from the western third of VIS Parking Area 2 and a portion of the new ingress/egress would be routed into this drywell. The existing swale that conveys water from VIS Parking Area 1 and its ingress/egress would be modified. The swale would be lined with riprap from the outlet of the existing driveway culvert at the VIS Parking Area 1 downslope 200 ft. The swale would run along the Maunakea Summit Access Road shoulder and be carried under the new ingress/egress to VIS Parking Area 2 via a 24-inch culvert and continue downslope to its outlet at an existing channel located immediately south of the construction staging area. Both the inlet and outlet of the 24-inch culvert would be fitted with a headwall and apron to prevent scouring and erosion. The swale would carry existing runoff and a portion of runoff generated off the VIS access lane.

3.1.3 Flora

Halepōhaku lies within the subalpine ecosystem on Maunakea. The vegetation is a mixture of māmane (*Sophora chrysophylla*) woodland and xerophytic scrub. Char (1999) describes māmane woodlands at Halepōhaku as clumps of māmane trees, 16 to 18 ft tall, interspersed with open areas of bare soil or rocky outcroppings. The māmane within the Halepōhaku parcel have multiple stems, in part due to browsing by feral ungulates, which has resulted in basal sprouting.[11] Due to this structure, in which one individual tree may have several mature stems originating from underground, the precise number of individual trees is difficult to determine. When conducting palila restoration research Dougill et al. (2014a) count all stems within a one meter radius as one tree. Using this method, the number of māmane within the project site is between 29 and 44. By counting each mature stem originating from underground as one single individual, the number of māmane within the project site is between 60 and 65. In many cases it is likely that several stems belong to a single tree, thus the count of 29 to 44 trees within the project site is likely the more accurate count.

Xerophytic scrub is comprised of low growing, drought tolerant shrubs. Understory plants tend to be denser under and around the clumps of māmane, with groundcover plants being primarily mixed bunch grasses forming upright tussocks. At Halepōhaku, the most abundant plant cover is non-native grasses, with needlegrass (*Nassella cernua*) and ripgut brome (*Bromus diandrus*) being the dominant species (Gerrish 2011). The most abundant native plant species include two native grasses, Hawai‘i bentgrass

[11] Basal sprouting refers to a type of vegetation growth in which shoots grow from a bud at the base of a tree or from adventitious buds in its roots.

(*Agrostis sandwicensis*) and pili uka (*Trisetum glomeratum*), as well as māmane trees. Native shrubs include pūkiawe (*Styphelia tameiameiae*) and ʻaweoweo (*Chenopodium oahuense*).

There are very few native species, mainly grasses, and no federally or State listed threatened or endangered plant species within the project site (Table 1). The Maunakea silversword (*Argyroxiphium sandwicense ssp. sandwicense*), federally and State listed as endangered, occurs at Halepōhaku within a DLNR-maintained enclosure due to out-planting, but is not found within the project site. Although māmane trees are not federally listed as threatened or endangered, they are a critical food source to federally and State listed birds including the endangered palila (*Loxioides bailleui*) and occur within the project site.

Invasive plant species are more prevalent, both in abundance and number of species, near the facilities at Halepōhaku than they are at elevations above Halepōhaku. Long-term efforts to control invasive weed species from being transported to and around Maunakea, and specifically from lower elevations to higher elevations, include a monthly volunteer weed pull at Halepōhaku. These weed pulls, which began in 2012, focus on reducing the number of non-native broadleaf species from around the parking areas and buildings at Halepōhaku. Grasses are left in place to hold the soil and to avoid impacts to native species growing amongst the invasive grasses. Removed plants are disposed of following County regulations for disposal of invasive species, with current policy dictating they be sent to one of the two County landfills and not be disposed of as greenwaste. The 1.5 acre construction staging area is a focus area for surveying for new introductions of non-native plant species, as items may be stockpiled here prior to being used in other parts of the UH Management Areas. This area is surveyed intensively for invasive invertebrates a few times a month by staff, who remove any newly introduced plant species upon discovery.

Table 1. Native Plant Species Found at Halepōhaku

Scientific Name	Hawaiian Name	Common Name	Origin	Located in Project Site
Trees and Shrubs				
Argyroxiphium sandwicense ssp. sandwicense	ʻāhinahina	Maunakea silversword	Endemic	No
Chenopodium oahuense	ʻāweoweo	goosefoot	Endemic	Yes
Dubautia ciliolata ciliolata	naʻenaʻe	lava dubautia	Endemic	Unknown
Geranium cuneatum hololeucum	hinahina	silver geranium	Endemic	No
Leptecophylla tameiameiae	pūkiawe	-	Indigenous	No
Sophora chrysophylla	māmane	-	Endemic	Yes
Asplenium trichomanes	olaliʻi	maidenhair spleenwort	Indigenous	No
Herbaceous Species				
Agrostis avenacea	heʻupueo	Pacific bentgrass	Indigenous	Unknown
Agrostis sandwicensis	-	Hawaiʻi bentgrass	Endemic	Unknown
Argemone glauca	pua kala	Hawaiian prickly poppy	Endemic	Unknown
Carex macloviana	-	St. Malo's sedge	Indigenous	Unknown
Deschampsia nubigena	-	alpine hairgrass	Endemic	Unknown
Pseudognaphalium sandwicensium	ʻenaʻena	-	Endemic	Yes
Stenogyne microphylla	-	littleleaf stenogyne	Endemic	Yes
Stenogyne rugosa	māʻohiʻohi	native mint, little leaf stenogyne	Endemic	Yes
Trisetum glomeratum	pili uka	mountain pili	Endemic	Yes

Potential Impacts and Mitigation Measures

Vegetation disturbance would be restricted to the extent necessary to complete the construction of the new VIS Parking Area 2, VIS access lane, and greenhouse. If each mature stem in a clump of māmane is considered individually, there are a total of 60 to 65 māmane stems that would be removed as part of the Proposed Action because they are located within the areas to be paved.[12] Removed māmane will be mulched and will remain on-site for use in greenhouse operations. All māmane under two inches in diameter, native shrubs and herbaceous species, except grasses, would be salvaged prior to the start of construction. This includes ʻaweoweo, pūkiawe, pua kala (*Argemone glauca*), māʻohiʻohi (*Stenogyne rugosa*), and littleleaf stenogyne (*Stenogyne microphylla*). The salvaged plants would either be planted in a new location outside of the project site, or saved in pots to be replanted along the edges of the project site once construction activities are complete. Although transplanting the existing mature māmane trees (larger than two inches in diameter) outside of the project site was investigated, they are likely too large to survive the process, and the amount of ground disturbance required to remove, transport, and plant them elsewhere was deemed undesirable by OMKM. It would also be a costly process with a low probability of success.

Figure 9. Māmane Seedlings

[12] The most conservative method of counting māmane within the project site was used to determine mitigation measures that would sufficiently account for tree removal, although the number of individual trees is likely closer to 29 to 44.

Māmane seedlings, grown from seed collected at Halepōhaku, would be out-planted into areas at Halepōhaku outside of the project site but within the project area, as well as potentially on adjacent State land, at a rate of at least two seedlings for every māmane removed.[13] OMKM would out-plant a minimum of 130 māmane seedlings during the first two years after construction commences. OMKM currently has approximately 80 seedlings that have been growing since late summer/fall of 2015, and those would be planted within three months of the end of construction (Figure 9). Only robust seedlings would be transplanted. No fertilizers or soil amendments would be used. Trees would be spaced seven to twenty feet apart to maximize connectivity for native invertebrates. Newly planted vegetation would be watered, weeded, and inspected for damage on a regular basis until established, which is likely to take four to six months. Mortality of planted species is expected to be very low due to the location being very accessible for watering and weeding. Any individuals that die or are failing to thrive would be replaced, with no less than an 80% survival rate (104 trees) at the end of the two-year mitigation period considered acceptable. Research conducted by Dougill et al. (2014b) on the restoration potential of palila habitat found that māmane regeneration was high in the habitat type found at Halepōhaku, indicating that conditions are favorable for transplanted seedling survival. Although this mitigation measure requires that a minimum of 130 māmane seedlings be planted, OMKM intends to plant more than that with the addition of a greenhouse and as part of the long-term habitat enhancement activities that are on-going at Halepōhaku.

The contractor would be required to adhere to the ISMP to minimize the introduction and spread of non-native plant species. Monthly volunteer weed pulls at Halepōhaku would target the land adjacent to the newly created VIS Parking Area 2 and VIS access lane.

3.1.4 Fauna

Māmane woodlands on Maunakea, including those at Halepōhaku are home to a wide variety of native invertebrates (insects, spiders), the native Hawaiian hoary bat (*Lasiurus cinereus semotus*), and a few species of native birds, including the endangered palila (Scott et al. 1986).

Table 2. Mammal Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence
Capra hircus	feral goat	Non-native	Known
Felis catus	feral cat	Non-native	Known Intermittent
Herpestes auropunctatus	mongoose	Non-native	Known Intermittent
Lasiurus cinereus semotus	ʻōpeʻapeʻa (Hawaiian hoary bat)	Endemic	Potentially
Mus domesticus	house mouse	Non-native	Known
Mus musculus	mouse	Non-native	Known
Ovis aries (also called Ovis ovis)	feral sheep	Non-native	Known
Ovis musimon	mouflon sheep	Non-native	Known
Rattus rattus	black rat	Non-native	Known
Sus scrofa	pig	Non-native	Known Intermittent

[13] Conservation District Rules require that "each tree is replaced on a one-to-one basis with trees that are appropriate to the site location" (Hawaii Administrative Rules 13-5-22).

Mammals

Ten mammal species occur or potentially occur at Halepōhaku (Table 2). The only indigenous land mammal in Hawai‘i, the Hawaiian hoary bat, is known to reside in this habitat type on Maunakea, but has not been recorded at Halepōhaku. The Hawaiian hoary bat is federally and State listed as endangered.

Birds

Nine native bird species occur or could potentially occur at Halepōhaku, four of which are federally and State listed as endangered (Table 3). Of these species, only palila, ‘amakihi (*Chlorodrepanis virens virens*), ‘apapane (*Himatione sanquinea*), and ‘i‘iwi (*Vestiaria coccinea*), all of which are honeycreepers, have been observed at Halepōhaku in recent times. Although two native bird species, the Hawaiian owl and the endangered Hawaiian hawk, could utilize habitat at Halepōhaku for foraging, they have never been recorded there and tend to occur downslope. These two wide ranging species are unlikely to breed in the project area due to the high elevation. Additionally, although the Hawaiian petrel (*Pterodroma sandwichensis*) has been observed in subalpine flows on Mauna Loa at 8,000 to 9,200 ft elevation, and occasionally in subalpine and alpine habitats on Maunakea, the species has not been spotted near Halepōhaku or within the Maunakea Science Reserve in recent times.

The most commonly observed native bird species at Halepōhaku, the ‘amakihi, is known to forage on a variety of food sources while the other three honeycreeper species (‘apapane, palila and ‘i‘iwi) are more specialized. The ‘apapane and ‘i‘iwi feed on nectar from māmane and naio (*Myoporum sandwicense*) flowers and may traverse the upper slopes of Maunakea searching for flowering māmane. Palila rely on seeds from māmane trees as well as insects that inhabit the trees. Hawai‘i ‘elepaio (*Chasiempis sandwichensis*) are insectivores and are mainly found in koa-‘ōhi‘a (*Acacia koa-Metrosideros polymorpha*) forests. ‘Amakihi, palila and Hawai‘i ‘elepaio all nest in māmane trees.

Table 3. Native Bird Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence	Legal Status
Asio flammeus sandwichensis	pueo (Hawaiian owl)	Endemic	Potentially	State Endangered (O‘ahu only)
Branta sandvicensis	nēnē	Endemic	Potentially	Federal / State Endangered
Buteo solitaries	‘io (Hawaiian hawk)	Endemic	Potentially	Federal /State Endangered
Chasiempis sandwichensis	Hawai‘i ‘elepaio	Endemic	Potentially	None
Chlorodrepanis virens virens (previously *Hemignathus virens virens*)	‘amakihi	Endemic	Known	None
Himatione sanquinea	‘apapane	Endemic	Known intermittent	None
Loxioides bailleui	palila	Endemic	Known intermittent	Federal / State Endangered
Pterodroma sandwichensis	‘ua‘u	Endemic	Unlikely	Federal /State Endangered
Vestiaria coccinea	‘i‘iwi	Endemic	Known intermittent	Proposed (Federal Threatened)

Surveys to determine population abundance and range of palila have been conducted annually on Maunakea since 1980.[14] Although the surveys are focused within the habitat of the 'core area' of higher palila use and population density, supplemental transects adjacent to the core area are also surveyed to investigate possible range expansion. One of the supplemental transects (#109) of a higher elevation than the current core range, is near Halepōhaku and provides insight on the use of the project site by palila (Figure 10). Surveys are conducted in January when māmane seedpods are most abundant at higher elevations, to coincide with when palila would be using the higher areas of their elevational range. The results show that although palila were detected along transect #109 fairly consistently until 1990, since then they have been detected only in 1997 and 2006. Other incidental observations of palila have occurred at Halepōhaku since 2000, but biologists currently consider use of this area to be intermittent and tied to times when either there is high māmane pod availability and birds move freely around a larger range, or there is low māmane pod availability within the palila core area and birds are utilizing a larger area to search for food. A discussion of designated critical habitat for palila, which includes Halepōhaku, is included in Section 3.1.5.

Although nēnē (*Branta sandvicensis*) have never been recorded at Halepōhaku, they do occur at lower elevations on Maunakea and could potentially move into the project site.

While only eight species of non-native birds have been recorded as occurring at Halepōhaku, chukar (*Alectoris chukar*), California quail (*Callipepla californica*), Erckel's Francolin (*Francolinus erckelii*), white eye (*Zosterops japonica*), red-billed leiothrix (*Leiothrix lutea*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*), it is likely some of the other eleven non-native bird species that are found in the māmane and māmane-naio woodlands, occur in the area of the project site seasonally. None of these species are protected by Federal or State laws.

Invertebrates

Although it is widely accepted that there are probably hundreds if not thousands of species of invertebrates that have yet to be identified in Hawai'i, there have been a few studies in the region that provide some information on this group. For example, more than 200 species of invertebrates have been collected within the māmane forests on Maunakea (SRGII 2009). While the available research makes it impossible to determine the number of species of invertebrates present in the project area, including the proposed project site, surveys aimed at describing invertebrate biodiversity at Halepōhaku, including non-native invasive invertebrates, have been ongoing since 2012 and occur four to twenty times per year. Recent surveys in the Halepōhaku area recorded 99 species on or around three native host plants ['āweoweo (*Chenopodium oahuense*), hinahina (*Geranium cuneatum*) and māmane (*Sophora chrysophylla*)] (Stever 2016).[15] Of these, approximately 30% are native species, with the majority of those being endemic; others are either non-native or their origin is unknown. While none of these species are listed as threatened or endangered at the Federal or State level, there are several that have been named *species of concern*.[16] Species of concern that have been found at Halepōhaku include four flightless species

[14] Data was collected at different times by different agencies including Hawai'i DLNR DOFAW, USFWS, American Bird Conservancy and USGS Wildlife Program.

[15] These species are the dominant native plants in Maunakea's subalpine region that are known to support high levels of invertebrate richness.

[16] Species of concern in an informal term not defined in the Endangered Species Act. The term commonly refers to species that Federal and State agencies consider to be at-risk of declining and appear to be in need of conservation efforts.

with limited dispersal ability (three *Nesosydne* sp. as well as the flightless brown lacewing (*Micromus usingeri*)); three yellow-faced bees (*Hylaeus difficilis*, *Hylaeus flavipes,* and *Hylaeus volcanicus*); and two newly discovered or rediscovered species (the black-veined agrotis noctuid moth (*Agrotis melanoneura*), previously thought to be extinct, and a *Phaeogramma* sp. not previously recorded.).

Surveys for non-native invertebrates are conducted quarterly at Halepōhaku in the form of perimeter searches around buildings, parking lots, and the construction staging area using baiting stations and hand searches (Figure 11). Of particular concern is early detection of the introduction of any aggressive competitors could become established and significantly adversely affect native insect populations in the high elevations on Maunakea, including Halepōhaku. For example, the invasive argentine ant (*Linepithema humile*), which preys upon and displaces native insects, has become an established, difficult to control pest in the subalpine areas on Haleakalā (a similar environment on Maui) and is present in other areas on the island of Hawai'i. Establishment of the argentine ant at Halepōhaku would likely significantly affect the native invertebrate population. Procedures and prevention strategies outlined in the ISMP are followed in order to avoid establishment of invasive invertebrates.

Potential Impacts and Mitigation Measures

Construction activities have the potential for short-term impacts to local fauna. These temporary impacts would be minimized by planned mitigation measures that are anticipated to result in a net benefit to local fauna once the project is constructed (see below). The Proposed Action provides for additional parking on the same side of street as the VIS as well as designated walkways. People would be less likely to use social trails and wander randomly through the parcel, thus the reduction in adverse impacts to native fauna due to redirecting human walking traffic patterns is considered beneficial. Mitigation measures would be implemented to ensure that no "take" of threatened or endangered species occurs.[17]

Mammals

Although Hawaiian hoary bats are not known to regularly occur within the project area, the contractor would ensure that all trees would be surveyed for the presence of bats immediately prior to tree removal. If a roosting bat is found present, the tree would not be removed until after the bat has left of its own accord. Because the project area is not considered regular habitat or roosting area for the Hawaiian hoary bat, no significant adverse impacts to the species are anticipated.

Birds

USFWS determined that negative impacts to palila from the proposed project are not anticipated. Palila are rarely seen utilizing the area and the factors included in the USFWS determination were: the project site is very small and in a developed area with continual human presence; the distance from the project site to the current 'core area' of higher palila use and population density (approximately two miles to the eastern edge of the core area as shown on Figure 10); and the large area of māmane habitat on Maunakea. While it is unlikely that endangered Hawaiian hawks or palila would breed at the project site, because clearing of shrubs and trees is planned and construction activities may occur during nesting periods, a qualified biologist or ornithologist would conduct a biological survey using USFWS approved methodology (including visual and audible methods) prior to any tree or shrub removal, to determine if nests are present. A copy of the completed survey would be submitted to USFWS prior to proceeding with

[17] Under Section 3(18) of the Endangered Species Act "take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct".

construction work. Should an active Hawaiian hawk or palila nest be discovered within 300 ft of the construction area, USFWS and DLNR DOFAW would be consulted prior to any construction work.

Use of the project area by ʻiʻiwi is likely seasonal and based on the number of māmane trees flowering in the area. USFWS determined that negative impacts to ʻiʻiwi or ʻiʻiwi habitat from the proposed project are not anticipated, given the large area of māmane habitat on Maunakea and the small area of the project site.

All project personnel would be apprised that nēnē could be in the vicinity of the project at any time during the year. If a nēnē should appear within 100 ft of ongoing work, all activity would be suspended until the nēnē leave the area of their own accord. Nēnē are unlikely to nest in the area as they prefer to use the same breeding areas (and nests) year after year; and there are no nēnē nests in the project area.

Invertebrates

The contractor would be charged with developing a *Rock Movement Plan* with an emphasis on moving as few rocks as possible to carry out the proposed project due to cultural consideration as well as to minimize disturbance to invertebrate habitat. The experts involved in collection and identification of invertebrates on Maunakea have reviewed the project description and stated that the Proposed Action would not adversely affect native invertebrate populations as habitat at the project site is found throughout Halepōhaku, including areas directly adjacent (J. Eiben, pers. comm., 2017).

Avoiding introduction of non-native invertebrates is a high priority due to the threat they present to native invertebrates. Introduction of non-native species is one of the main concerns associated with bringing in materials and equipment for construction. All prevention strategies detailed in the ISMP would be followed to prevent the introduction of new invasive species as well as the spread of existing invasive species (Section 3.1.5). These include inspection by a DLNR-approved biologist of all large deliveries and heavy equipment for the presence of invasive invertebrates. Inspection would be performed below the Saddle Road junction prior to arrival at the project site and any deliveries or equipment found to have invasive invertebrates would be refused entry until deemed clear, at the contractor's expense. Perimeter surveys for invasive invertebrates would continue to be conducted quarterly around Halepōhaku.

3.1.5 Habitat

The habitat of the project area is best described as a transitional zone between māmane woodland and scrub with the project site including both (Section 3.1.3). A long history of feral mammal browsing around Halepōhaku and in the adjacent areas Mauna Kea Forest Reserve has resulted in degraded conditions including a decrease in populations of native plant species, including māmane trees, and establishment of invasive weed species. However, due to heavy culling efforts of feral mammals in this area, māmane trees and some other habitat elements have begun to recover. As a result of historic feral ungulate browsing, māmane trees in the area exhibit extensive basal sprouting (multiple stems emerging from the soil) and some have died back during recent episodic droughts.

Habitat within the project site is generally considered degraded, although there are mature māmane trees that provide refuge and food for some species. Some of the project site lies within an area that contains previously existing infrastructure (gravel parking and the existing longhouse). Other portions have been subjected to trampling by visitors wandering around Halepōhaku, in part due to lack of adequate parking and defined walkways. The remainder is dominated by non-native plants although some natives are present. Focused efforts to restore habitat in the Halepōhaku parcel have been on-going in recent years.

Figure 10. Palila Critical Habitat on Maunakea

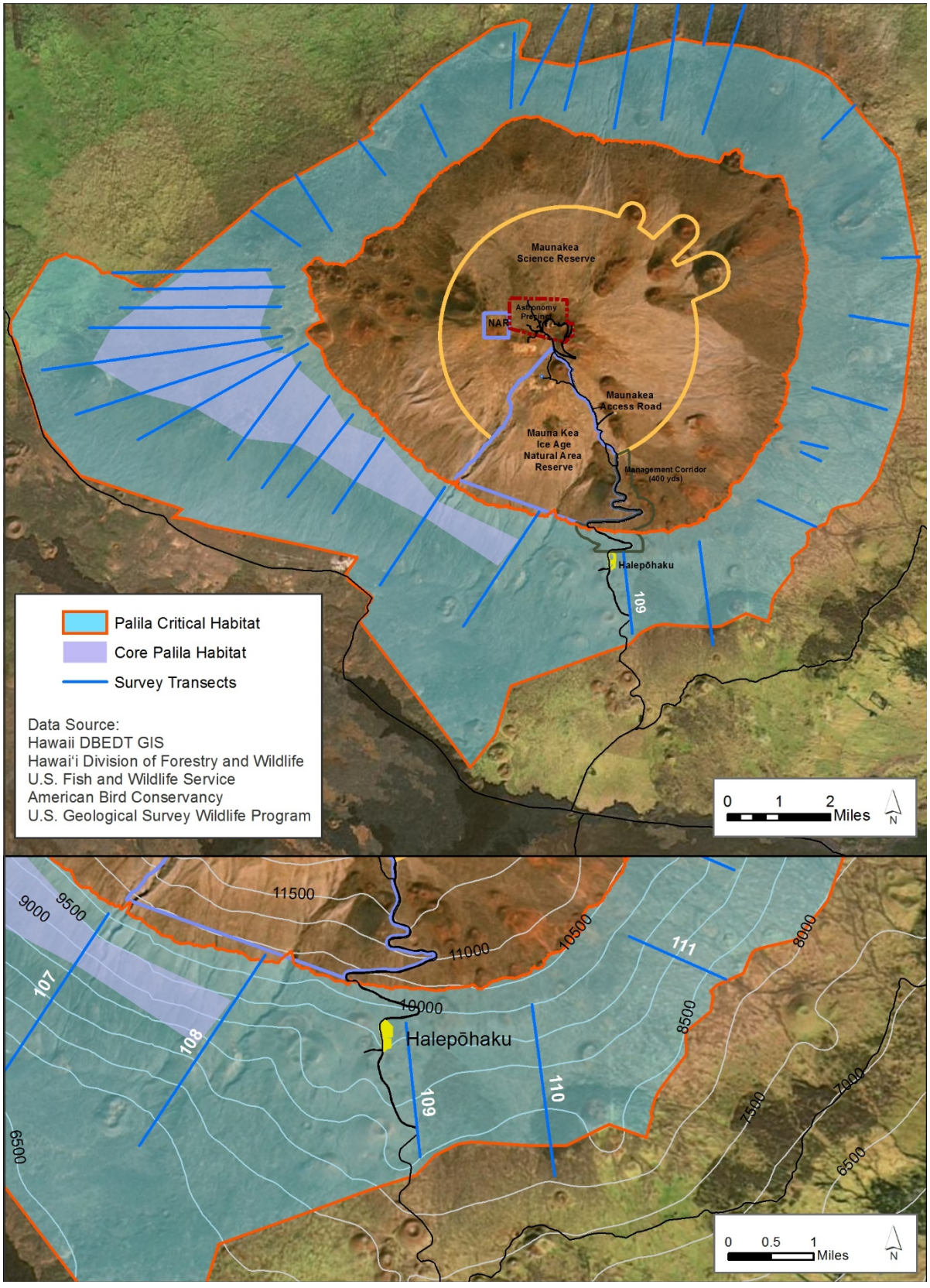


Figure 11. Perimeter Surveys for Non-native Invertebrates

All of the Halepōhaku parcel lies within federally designated palila critical habitat (Figure 10). Palila are the last surviving finch-billed honeycreeper species found in the main Hawaiian Islands; all other species of finch-billed honeycreepers have been extirpated. Palila are only found on the island of Hawai'i with over 95% of the population restricted to the southwest slope of Maunakea. They occur only in the dry māmane and māmane-naio forest between 6,500 and 9,250 ft elevation, with the highest densities at around 7,550 ft (DLNR 2005). Palila have evolved a specialized diet and feed primarily on māmane seeds, flowers, and associated invertebrates. In 1977, USFWS designated just under 60,200 acres between 5,500 ft and 10,000 ft elevations encircling Maunakea as critical habitat for the endangered palila. While the elevation of the project site is on the high edge of the current core range of this bird, during times of drought there is a greater tendency for birds to move around looking for food (P. Banko, pers. comm., 2016). Annual palila surveys at Halepōhaku indicate it is only an occasional visitor (Section 3.1.4). The area near the facilities at Halepōhaku is not considered preferred nesting habitat for palila or other native forest birds due to relatively constant human activity (USFWS, pers. comm., 2016).

Changes to habitat as a result of the introduction and expansion of invasive species is a major concern related to all of the UH Management Areas on Maunakea, especially when proposed projects require earthmoving and bringing in materials and equipment from outside of the area. OMKM has established an *Invasive Species and Control Program* to reduce this threat, and conducts regular monitoring and inspections of incoming equipment and materials to combat this threat.

Potential Impacts and Mitigation Measures

Potential impacts to habitat from construction activities may result from introduction and spread of invasive species. Contractors are required to follow all prevention strategies detailed in the ISMP and BMPs listed in approved permits to prevent the introduction of new invasive species as well as the spread of existing invasive species. This includes inspections of all loads and equipment.

Implementation of the Proposed Action would occur within approximately 2.0 acres of palila critical habitat (including areas to be left undisturbed). While the removal of 60 to 65 māmane within the project site represents an adverse impact to palila critical habitat, experts consulted stated that it is not significant because it is only affecting a small amount of habitat in an already developed area, it is not within the current 'core area' of higher palila use and population density (Figure 10), and there are mature māmane in the surrounding area (Appendix A). As much as possible, the location of trees was considered in the design process and an attempt was made to minimize the number of trees impacted.

Habitat enhancement of the areas immediately adjacent to the proposed infrastructure improvements would begin immediately after project completion and continue for the foreseeable future. These efforts would include surveying for and removal of non-native species and installation of native plants. Surveying for non-native invertebrates would be done using both hand searches and traps, as is the current practice at Halepōhaku. To mitigate the long-term impact, māmane tree seedlings would be out-planted to other areas at Halepōhaku (Section 3.1.3). Although māmane saplings are used sparingly by palila, as they become larger trees they would provide a resource base should more birds move into this area. Installation of native plants as part of ongoing habitat enhancement activities would be supported by the onsite greenhouse and over the long-term would benefit all native forest birds and invertebrates.

3.1.6 Scenic Resources

Scenic resources at Halepōhaku include on-ground resources, scenic vistas (including pu'u), and stargazing. The project area is highly scenic, with foreground views of māmane-naio forest and

background views of Maunakea and Maunaloa volcanoes. Halepōhaku supports numerous existing facilities that were constructed with consideration for minimizing visual impact. These facilities are not visible from other locations on the island. The Halepōhaku area is valued for its low light conditions at night that support stargazing opportunities (Section 3.1.8).

Potential Impacts and Mitigation Measures

The Proposed Action would minimally adversely affect scenic resources on either a short-term or long-term basis. On a short-term basis, the presence of additional construction equipment and temporary traffic control signs could be considered by some as an adverse impact on scenic resources. Over the long-term the presence of additional paved areas and loss of some tree cover constitutes an adverse impact on scenic resources, but is not significant. The *2000 Master Plan* provides a number of design guidelines to maintain the visual aesthetics of Halepōhaku. These guidelines aim to maintain the proportions of developments in Halepōhaku and help them blend into the physical landscape. The proposed infrastructure improvements were designed within the guidelines of the *2000 Master Plan*.

Four signs would be installed as part of the Proposed Action, a stop sign at the exit point of the VIS access lane to enter the Maunakea Summit Access Road and three designated parking accessible signs in VIS Parking Area 1. Existing signs and traffic direction indicators to be painted on the VIS access lane and VIS Parking Area 2 surfaces would direct traffic flow. All signs would conform to regulations set forth in HAR 13-5-22. Signs would not exceed 12 ft^2, be non-illuminated, be self-supporting, and be placed less than or equal to eight ft above finished grade. Signs are being installed in already disturbed areas that are frequented by visitors with the intent of ensuring safe traffic and pedestrian flow. A sign located adjacent to Maunakea Summit Access Road that indicates the location of the VIS would be removed to install a portion of the road-side drainage swale and then replaced in the same location.

The overall net impact of the Proposed Action to scenic resources would not be significant. The project site is mostly previously disturbed ground and contains some infrastructure. All infrastructure improvements would occur within the same area as existing infrastructure, and all improvements would be three ft or less in height, with the exception of the greenhouse, which would likely not be taller than ten ft, and the signs, which are required to be eight ft or less above grade. None of the infrastructure improvements would be visible from a distance. Over the long-term, planned habitat enhancement would improve local scenic resources and minimize the effect on scenic resources due to the loss of trees.

3.1.7 Air Quality

Maunakea has gained worldwide recognition for the air clarity in its high elevations. The persistent winds and location above the tradewind inversion assist in maintaining excellent air quality by dispersing volcano-induced vog and human derived pollutants. Contributors to air pollution at Halepōhaku include vehicle exhaust and airborne dust. Dust can become airborne via disturbance by vehicles, road grading, construction activities, or wind.

Potential Impacts and Mitigation Measures

The Proposed Action would not have a measurable effect on air quality within the region. Locally the only effect would be minimal and limited to the period of construction.

There would be a short term increase in vehicle exhaust emissions during construction activities, due to the use of heavy machinery and gas-powered tools and an increase in workers driving to the site. However, the increased traffic and use of vehicles on the site represents a minimal increase within the

overall area, and the trade winds quickly disperse air pollution. Implementation of the Proposed Action is unlikely to result increased vehicles emissions over the long-term as it would not in and of itself increase the number of vehicles using the area daily. Improved traffic flow should reduce the number of idling vehicles, resulting in lower emissions over the long-term.

Construction activities would likely create dust above normal levels, especially during grading of VIS Parking Area 2 and the VIS access lane. The work would be in conformance with the air pollution control rules of the Hawai'i Department of Health (HDOH) (HAR 11-60.1-33, *Fugitive Dust*) and the contractor would keep the project site and surrounding areas free from dust nuisances. During construction, the contractor would spray water on exposed surfaces to suppress dust when necessary. Should the amount of water needed exceed the amount available from MKSS, the contractor may bring an additional water truck on-site. Grading would cease whenever site conditions (such as excessive winds) do not allow compliance with the statute. Upon completion of the grading, local cinder and lava gravel would be applied as a subbase. Paving of areas within the project site would minimize dust generation from vehicles over the long-term. The VIS access lane would be paved as part of the initial phase of construction. Although VIS Parking Area 2 would not be paved immediately following grading, the gravel base that would be laid down following grading would suppress fugitive dust. VIS Parking Area 2 would be paved within one year of grading.

3.1.8 Light

The dark skies of Maunakea are a primary reason it is valued for stargazing. To facilitate its public stargazing program, VIS lights are red after dark, though still fairly bright. This balances safety with night vision. The VIS lights are turned off after closing at 10:00 pm. Visitors are requested to drive with headlights on at all times for maximum safety, but turn off headlights as soon as they park to minimize disturbance to stargazers and species in the area.

Potential Impacts and Mitigation Measures

The Proposed Action would not have a measurable effect on light quality within the region. The current construction contract prohibits the use of any additional temporary night-time lighting, including security or safety lighting. Construction would be scheduled during normal working daylight hours (7:00 am to 5:00 pm) and not require temporary lighting.

Since night-time lighting is prohibited by contract, the construction phase of the Proposed Action would not pose an increased risk of Hawaiian petrel fledgling fallout.[18] If it becomes necessary to amend the construction contract to accommodate for some night work, none would occur during the fledging season (September 15 through December 15).

Permanent lighting would be installed along the VIS access lane. New lighting would be the minimum amount required for safety. In addition, lighting would be shielded and red to minimize impacts to wildlife and stargazing.

3.1.9 Noise

Ambient noise levels at Halepōhaku areas are generally low, with vehicle traffic, wind, and short-term construction being the most pervasive contributors.

[18] 'Fallout' is the grounding of fledgling seabirds due to disorientation associated with being attracted to light.

Potential Impacts and Mitigation Measures

Construction activities would create intermittent, temporary noise during daylight hours. The use of heavy equipment and small power equipment would be required to perform most of the tasks of the Proposed Action. This noise may disturb resident astronomy personnel, especially any day sleepers that may be present. The on-site contractor superintendent would consult regularly with MKSS to anticipate, identify, and mitigate potential noise issues that could adversely impact the dormitory residents.

The only cultural practices that are known to occur within the area that could experience increased, intermittent, temporary noise are those that occur within the nearby silversword enclosure. As with other projects in UH Management Areas on Maunakea, quiet periods can be requested during construction to accommodate cultural practices. Concerned individuals can inquire at the VIS, go to the construction monitor, or contact OMKM directly.

The temporary noise generated from the construction activities associated with the proposed project is expected to exceed the maximum permissible sound levels of 78 decibels, as specified in HAR 11-11-46, *Community Noise Control*, and an approved Community Noise Permit from HDOH would be obtained.

3.1.10 Fire

Although wildfire has the potential to spread quickly in the dry shrublands and grassland ecosystems, vegetation cover within the project site is sparse with large spaces in between that diminish the risk of a wildfire spreading quickly. Non-native grasses also increase the risk of fire spreading over a larger area due to the source of fine fuels. However, these species also occur in patches with large spaces devoid of vegetation between them.

The majority of native vegetation in this area is not fire tolerant. Māmane trees are slightly fire tolerant, and if a fire does not kill the tree it can sprout back relatively quickly. A wildfire has not occurred around the facilities area at Halepōhaku since the modern facilities have been in place (not including the stone buildings).

MKSS staff are not trained in wildland fire fighting, however, they are trained on the proper response techniques should a fire occur. MKSS staff are instructed on the use of fire extinguishers and the locations of outdoor hoses and would attempt to extinguish any small fire. In the event of a large fire, or one involving hazardous materials, the protocol is to contact 911 so incident is reported to the Hawai‘i County Fire Department. By mutual agreement with the County, Pōhakuloa Training Area Fire and Emergency Services provides for initial response in the project area and if unavailable, the Hawai‘i County Fire Department responds.

Potential Impacts and Mitigation Measures

A wildfire ignited by construction vehicles or personnel has the potential to damage existing buildings and vegetation. The risk of igniting a fire would be minimized by requiring all running vehicles and machinery to remain on paved and gravel surfaces whenever possible. Machinery and vehicles may not be left running/idling while unattended. A water hose connected to a water source would be kept on site and accessible during all work periods. Fire extinguishers would also be kept in the vicinity of active construction. Any swaths of non-native vegetation along the edges of the proposed VIS Parking Area 2 would be either pulled or cut down using a mower or weed whacker and removed from the site to decrease the chance of hot exhaust systems or errant sparks from machinery igniting dry plant material. In the unlikely event of a wildfire, protocols in place for the UH Management Areas on Maunakea require

all fires to be reported immediately via 911 service to both the County and the Pōhakuloa Training Area fire departments for the quickest response time.

If a wildfire occurs and kills vegetation as a result of the Proposed Action, the burn area would be subject to immediate enhancement using native plants and seed to reduce potential for soil erosion and establishment of non-native plant species. ~~One benefit of implementing the Proposed Action would be that additional paved parking should reduce ad hoc parking in off-road areas, which may reduce the likelihood of hot car exhaust igniting dry grasses and starting a wildfire.~~ Additional māmane trees planted in the project area would not substantially increase fuel loads or likelihood of wildfires because they would be spaced apart when planted and litter is contained directly below the trees.

3.1.11 Climate Change

Over time, climate change could result in noticeable changes to the climate and vegetation zones of Maunakea. Current predictions indicate that drought frequency and intensity are expected to increase at higher elevations, and that the dry, subalpine habitat used by the palila would become even drier (Benning et al. 2002, Chu et al. 2010, Giambelluca and Luke 2007). Drought reduces māmane seed production and can contribute to the mortality of mature trees (Juvik et al. 1993), especially those that are already stressed by a range of factors (i.e., browsing (Banko et al. 2013); pathogens (Gardner and Trujillo 2001); and competition from invasive grasses and weeds (Banko et al. 2009)). Palila survival and reproduction decline during times of drought due to reduced māmane seed production (Banko et al. 2014). In addition, the transmission of mosquito-borne avian malaria, which is a direct threat to palila, is expected to increase. Surface temperatures in the high elevations of Hawai'i are rising, and it is the cool winter temperatures that currently keep the parasite that causes avian malaria under control. Climate change is likely to alter the palila's available habitat.

Potential Impacts and Mitigation Measures

The timing and magnitude of potential impacts related to climate change are not currently determinable. As related to this project, the potential impacts are most clearly related to the palila and its critical habitat. Halepōhaku is currently at the upper elevation of the core habitat palila utilize, but with climate change, the habitat would likely change. Potential future drier conditions and competition for resources from invasive species is likely to stress māmane trees, adding to the multiple environmental challenges of palila. Current efforts to protect palila are focused on increasing suitable habitat by fencing areas to exclude feral animals that browse on māmane trees, controlling invasive species, and trying to understand how māmane distribution may change in response to climate change. Removal of māmane trees in the project site is unlikely to be significant in terms of climate change. Additionally, any potential increase in the use of the project area by palila that is related to the effects of climate change would be supported by ongoing habitat enhancement efforts that would increase the number of māmane trees in the area and provide for more mature trees to be present in the future.

3.2 Infrastructure

3.2.1 Traffic and Parking

The Halepōhaku facilities are accessed by the Maunakea Summit Access Road, a 16.3 mile road that runs from Saddle Road (Hwy 200) to the summit area. The road is paved up to Halepōhaku, with the remaining 8.3 miles to the summit being gravel for 4.6 miles just above Halepōhaku and then paved for the remaining portion of the road to the summit. Vehicles travelling on the Maunakea Summit Access Road mainly

belong to people that work on Maunakea (i.e., astronomers, MKSS staff, OMKM Rangers) or kama‘āina and out-of-state visitors.

Rangers record the number of vehicles parked in the vicinity of the VIS each night during the peak period. On moderately busy nights, there are normally approximately 120 visitor vehicles and eight staff vehicles. On an extremely busy night there may be as many as 200 vehicles. The existing VIS Parking Area 1, provides 23 regular parking spots and one accessible parking spot, which are primarily used by visitors. Visitors also park in VIS Parking Area 3, the construction staging area (when it is not blocked off), and until recently, along the western unpaved shoulder~~s~~ of Maunakea Summit Access Road fronting the VIS (ad hoc parking). ~~Visitors parking on the road shoulder primarily use the area opposite the VIS, as the space is big enough to pull in horizontally, rather than parallel park.~~ Rangers and MKSS staff generally park in VIS Parking Area 3.

Figure 12. Parking Areas During a Busy Night

All commercial vehicles are required to stop at the VIS before proceeding to the summit. There are currently eight commercial operators that hold permits to conduct tours to the VIS and summit of Maunakea. Each of the permitted operators is allowed two evening tours per day, and three shuttles during daytime hours. The number of commercial vehicles within the UH Management Areas is not to exceed 18 at any time, and no more than two standard commercial tour vehicles or one modified commercial tour vehicle per tour operator are allowed in the VIS Parking Areas at any one time. On an average busy evening, eight to ten commercial vehicles would be at the VIS at one time. Commercial vehicles park primarily in VIS Parking Area 3. During a recent one year period, September 2015 to August

2016, the total number of permitted commercial vehicles recorded in the UH Management Areas was 6,019.

Potential Impacts and Mitigation Measures

During construction, regular traffic flow along the Maunakea Summit Access Road would be maintained, with temporary stoppages only upon advance approval from UH. Temporary signage would be placed on the Maunakea Summit Access Road to alert drivers to any road work ahead. Construction equipment would only be parked within the road right-of-way during actual working hours and would not obstruct the normal movement and sight distance of driving motorists. Any damage to existing pavement markings, roadways, parking or walkways would be repaired by the contractor. During construction, temporary barricades and directional signs would be used to direct visitors to open parking areas.

Implementation of the Proposed Action would provide a new parking lot for visitors in VIS Parking Area 2, replacing eliminated ad hoc parking on the unpaved shoulder of the west side of the Maunakea Summit Access Road. Ad hoc parking was eliminated in part due to safety considerations, as vehicles had to back out into oncoming traffic on the roadway to get out of the parking spots and pedestrians had to walk along and across the Maunakea Summit Access Road to get to the VIS. The infrastructure improvements would improve traffic flow by providing commercial vehicles with an accessible place to drop off and pick up passengers and safely turn their vehicle around to park in VIS Parking Area 3. ~~, and by reducing ad hoc parking on road sides, which requires vehicles to back out into oncoming traffic on the roadway. Increasing the amount of parking on the same side of the Maunakea Summit Access Road as the VIS will increase safety, as the number of pedestrians walking along and across the Maunakea Summit Access Road to get to the VIS would be significantly reduced.~~

3.2.2 Potable Water and Wastewater

There are no wells near Halepōhaku because the groundwater is at such a great depth that it is not considered economical to pump. MKSS maintains two 40,000 gallon water tanks that store water trucked in from Hilo for use at Halepōhaku. This water is available for purchase by the construction contractor at a rate of $0.09 per gallon.

The individual wastewater system (IWS) at Halepōhaku was designed and installed to meet the HDOH permit requirements for onsite wastewater treatment and disposal systems. Domestic wastewater is discharged into the system and the treated effluent is released into disposal fields. Settled sludge and solids in the septic tanks are pumped out on a regular basis and hauled off the mountain. The VIS has seven permanent toilets inside as well as three portable toilets outside of the VIS for visitor use. The portable toilets, which remain open for use when the VIS is closed, are regularly serviced (emptied and cleaned) once or twice a week as needed, and all waste is removed by truck from the mountain and hauled to a permitted treatment facility offsite.

Potential Impacts and Mitigation Measures

Additional water consumption would be required to control dust, wash down vehicles, and to provide water to newly planted vegetation. The contractor would use water purchased from MKSS. A water truck specifically designated for this project would only be brought onsite if necessary for distribution within the project site, or if water use is higher than anticipated and use of water from MKSS affects other applications. The commitment of water resources for dust control and vehicle washing would only be necessary during the construction period and water would be used as sparingly as possible to accomplish the task. All vehicles and equipment are required to be washed off-site below the Saddle Road junction

prior to being brought up the mountain. It is anticipated that the only vehicle wash down on the project site that would be necessary is to rinse the beds of the asphalt trucks after delivery. Impermeable lined sediment basins would be utilized to capture wash down water from asphalt trucks. The wash water would be allowed to evaporate and the remaining materials would be disposed of as solid waste at an approved disposal site.

Implementation of the proposed project would have no long-term effect on the existing IWS since no new facilities that connect to the existing IWS are being added and the onsite treatment and disposal system can accommodate higher waste loads than are currently produced. The addition of the greenhouse would require a minimal increase in water use over the long-term, as the species that would be housed are dryland species requiring minimal water.

3.2.3 Solid Waste

At Halepōhaku, all trash containers, both permanent and temporary, are required to be covered and secured at all times to prevent providing a food source for invasive fauna and reduce the likelihood of escaping debris. Trash generated from the facilities at Halepōhaku is removed daily by MKSS and disposed of at the sanitary landfill. Burning of rubbish is prohibited.

Potential Impacts and Mitigation Measures

No significant adverse impacts are expected to occur due to the generation of solid waste. Solid waste generation would increase temporarily during construction. Construction BMPs are required to include a solid waste management plan that conform to the rules and regulations of the County of Hawai'i, Solid Waste Division. Standard BMPs for construction projects on Maunakea require that all perishable trash, including food and food and beverage containers, be removed daily and that the contractor provide their own covered trash receptacles and ensure that the covers are always secured when not in use.

3.2.4 Petroleum Products

There are three underground fuel storage tanks at Halepōhaku (one 11,500 gallon tank of diesel fuel, and a 2,000 gallon tank and a 4,000 gallon tank that contain gasoline). The tanks, located in front of the maintenance utilities shop, have a sensor that monitors the system 24 hours per day for leaks. MKSS monitors the tanks to determine fuel amounts. The fuel pumps are on asphalt, facilitating easier clean up in the event of a spill.

Potential Impacts and Mitigation Measures

The contractor would purchase fuel from the onsite tanks at the market rate. The *MKSS Hazardous Materials Spill Plan*, which outlines procedures to follow in the event of a fuel spill, would be reviewed with the contractor prior to the start of construction. The contractor would be instructed to use the emergency pump shut-off in the event it is necessary. A spill kit is in place near the fuel pumps and the contractor would be required to clean up any petroleum products spilled, no matter how small the amount. The contractor would be instructed not to over fill tanks to help prevent fuel spills and required to use drip pans for all stationary equipment per standard BMPs for construction projects on Maunakea. In the event emergency response units are required, both the Pōhakuloa Training Area Fire and Emergency Services and the Hawai'i County Fire Department would be contacted by the 911 operator. HDOH and the Environmental Protection Agency in Hawai'i would be notified in the event of a spill that requires reporting.

3.3 Social and Economic Setting

3.3.1 Socioeconomic Characteristics

The nearest urban center to Halepōhaku is Hilo, located approximately 30 miles to the southeast. The most recent U.S. census conducted in 2010 listed the population at 43,263. The U.S. Census Bureau estimated the population of Hawai'i County was 196,428 in 2015.

3.3.2 Recreational Resources

Tourism and private recreational activities have increased at Maunakea over the past several decades due to better access and a greater number of organized commercial and educational tours. Counting the exact number of visitors to Maunakea is difficult because some people that stop at Halepōhaku visit the VIS, some people only acclimate in the parking area and never enter the VIS, and some visitors stop at the VIS before heading to the summit and then again on the way down. Random counts conducted over the past four years at the VIS, as well as a systematic count conducted over a one year period in 2015, indicate that the VIS has received between 224,000 to 300,000 visits per year. ~~In 2015 approximately 224,000 people visited Halepōhaku.~~ Approximately one quarter of these visitors were part of a commercial tour. Data collected between 2012 and 2016 shows that while the number of vehicles associated with independent visitors increased over that period, the number of vehicles associated with commercial tours did not. The hour prior to sunset and two hours after sunset are when the largest number of people are present at Halepōhaku.

Recreational opportunities in and around Halepōhaku include hiking, site-seeing and stargazing as well as engaging in educational experiences. The VIS houses informational displays and videos on the geology, ecology, and cultural significance of Maunakea as well as the history and work of the observatories. The nearby silversword enclosure contains a native plant garden and is open to the public (Figure 2). The VIS at Halepōhaku is open from ~~9:00 am~~ 12:00 pm to 10:00 pm, 365 days a year. There are telescopes at the VIS that are available for public use and a stargazing program is conducted four nights a week ~~nightly~~ in VIS Parking Area 1. Hikes on designated trails of varying lengths can be accessed from Halepōhaku. While some visitors hike only a short distance to Pu'ukalepeamoa (sometimes referred to as sunset hill), hikers can access the summit via the Maunakea Trail. Hunting frequently occurs in the Mauna Kea Forest Reserve, which surrounds Halepōhaku but does not overlap the parcel itself.

Potential Impacts and Mitigation Measures

Access to recreational resources would not be significantly adversely impacted due to implementation of the Proposed Action. Temporary and minimal adverse impacts to access are anticipated only during the construction phase. Construction work would be scheduled in phases, the order of which would be dictated both by the tasks to be completed as well as a desire to minimize interruption of normal VIS operations. A closure of VIS Parking Area 1 to vehicles and stargazers may be required for a few days to complete work in that area. The contractor would be instructed to, as best possible, provide safe access to the VIS for pedestrians, including disabled visitors, during any closure to VIS Parking Area 1.

Over the long term, implementation of the Proposed Action would result in improved safety of visitors accessing the VIS and trails in the area. Currently, there is the potential that some visitors do not heed warnings to acclimatize at Halepōhaku due to congested parking. Implementation of the Proposed Action would improve visitor safety by facilitating them stopping to acclimate and potentially entering the VIS to learn about health and safety concerns specific to the high elevation areas of Maunakea.

The number of visitors to Halepōhaku and the Maunakea summit has increased substantially, potentially due to improved access (i.e., road improvements). While implementation of the Proposed Action in and of itself is not likely to increase the number of visitors to Maunakea, it would support the safety of the increased number of visitors. It would also provide a more directed pedestrian and vehicle flow, which is expected to result in decreased adverse impacts to specific locations.

Implementation of the Proposed Action is not expected to result in changes to the number of commercial vehicles permitted on the mountain at any one time. It is not anticipated that the policy on the number of commercial vehicles allowed in the VIS Parking Areas would change. Changes to this policy would only be explored after an assessment of traffic flow, parking patterns, and pedestrian walkway use. Current overcrowding of the VIS with individual vehicles during peak use times makes changes unlikely.

3.4 Historic and Cultural Resources

Historic and cultural resources within the UH Management Areas include historic properties, areas and items of cultural significance, and burials and possible burials. The existing conditions of historic and cultural resources is based on a review of Cultural Impact Assessments prepared for other projects on and around Halepōhaku, archaeological investigations, ethnographic reports, and oral history interviews. A site visit confirmed existing conditions of historic properties are still accurate.

Traditional and Historic Context

There is limited information available regarding the traditional and historic use of Halepōhaku area. Maly and Maly (2005) discuss the construction of a *heiau* by the 15th century *ali'i-ai moku* (district high chief of Hawai'i) 'Umi-a-Liloa in the vicinity of Halepōhaku.

> *He ('Umi) also built a heiau (temple) below Pohaku Hanalei, it is called the ahua o Hanalei (altar of Hanalei); and on the side of Mauna Kea, by where one travels to Hilo, he built the third of his temples, at the place called Puukekee [also written Puu Keekee in historical texts]; and there at Mauna Halepohaku he built the fourth of his temples; there, it is said, Umi dwelt with his many people. It is said that Umi was a chief who dwelt upon the mountain, it was because of his love of his people, that he ('Umi) returned and dwelt in the middle of the island [Ahu-a-Umi], that is where he dwelt with his beloved people. His commoners lived alonq the shores, and they brouqht food for them (in the uplands), from one side of the island to the other...* [Ke Au Okoa; Mei 22, 1865; Maly, translator] (Maly and Maly 2005: 28-29).

Although stone for adze could be collected at many places on Maunakea, the Maunakea Adze Quarry (Keanakāko'i), the largest primitive rock quarry in the all of Polynesia, was known for having the highest quality of basalt. Radiocarbon dates from 23 specimens collected from eight sites around Maunakea, including Halepōhaku which is over three miles from the quarry, indicates that the gathering of basalt from the Maunakea adze quarry and the manufacture of adze on Maunakea occurred from as early as A.D. 1100 to as late as 1800 (McCoy et al 2009). It is unknown when the quarry fell out of use.

Maly and Maly (2005) contend that Maunakea likely had ancient trail systems (footpaths) all across the mountain that were utilized for travel to burial sites and the collection of resources such as adze stone, koa wood for canoes, and bird feathers. Lithic scatters and other artifacts indicate that some travelers did utilize the Halepōhaku parcel (see *Historic Properties*). Early recorded accounts of ascents of Maunakea provide little discussion of Halepōhaku. One well known ascent of the mountain was the trip made on horseback by Queen Emma in 1882. The trip started in Waimea and the party spent the night at Kalaieha

[the name for the area occupied by the Humu‘ula Sheep Station]. Although the journals do not describe the Halepōhaku area, it is assumed that the party passed through or close to Halepōhaku.

The Halepōhaku parcel has been utilized at least since the 1920s to support land use in the surrounding area. The Civilian Conservation Corps built the stone houses at Halepōhaku in 1936 and 1939 (Rosendahl 1999). The buildings provided a convenient overnight rest spot for hikers and ski enthusiasts. During this period the Civilian Conservation Corps also made improvements to the old Maunakea-Humu‘ula Trail from near the Humu‘ula Sheep Station at Kalaieha to the summit.

The road to the summit was completed in 1964. The first astronomy facility, the Lunar and Planetary Station, was built atop Pu‘u Poli‘ahu that same year. The Maunakea Science Reserve was established in 1968. The mid-level facilities at Halepōhaku were constructed prior to the establishment of the Science Reserve. Currently there are twelve observatories located on Maunakea.

Historic Properties

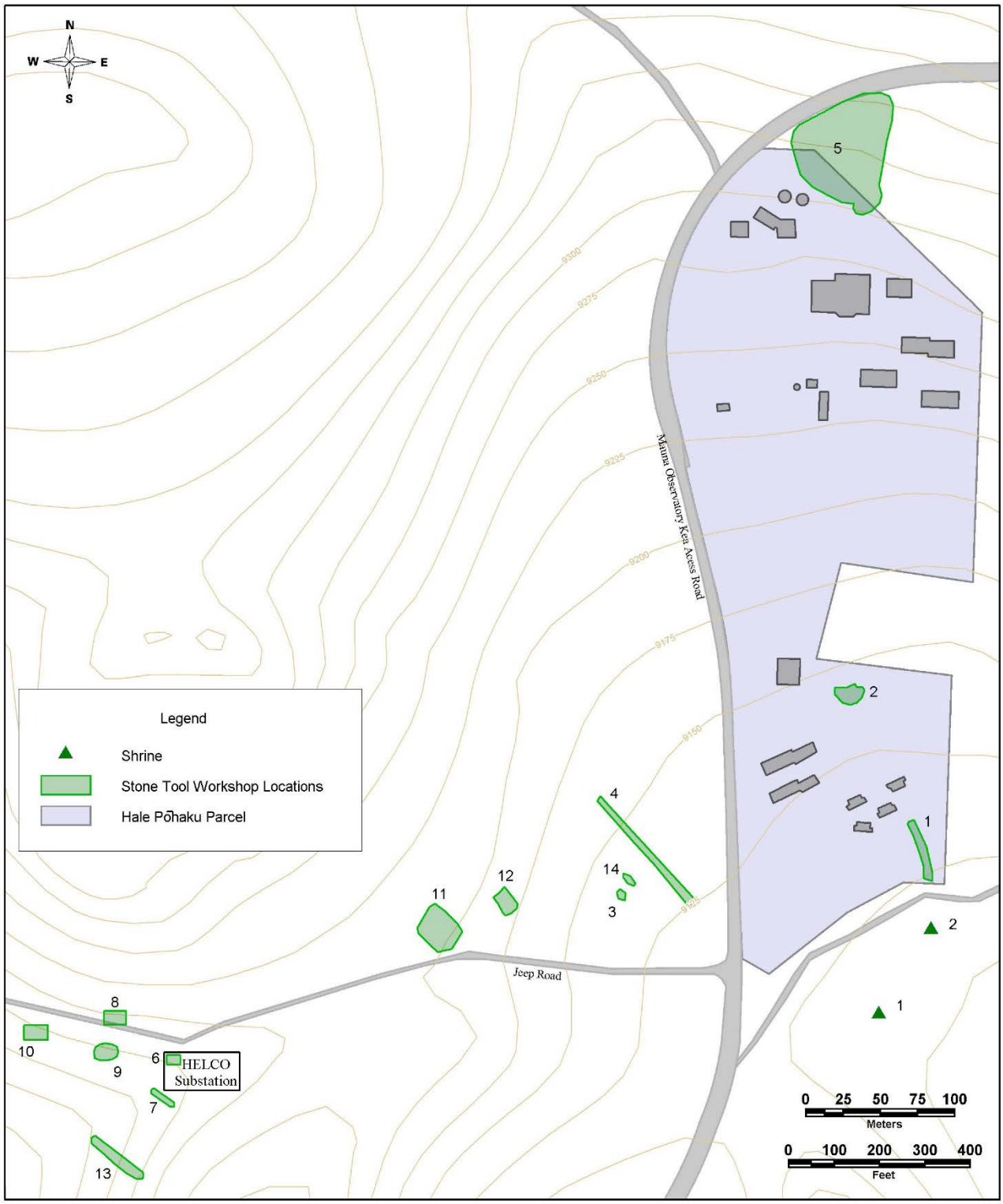
Nine archaeological studies (six surveys, two data recovery efforts, and one monitoring effort) have been conducted in the Halepōhaku parcel, including a 1990 reconnaissance survey that covered the entire parcel and the more recent *Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor* (2010) (Table 4). While the UH Management Areas on Maunakea are known to contain over 200 historic properties, only four historic properties have been recorded at Halepōhaku. The parcel contains a pre-contact site (State Inventory of Historic Property (SIHP) #50-10-23-16244: the Pu‘ukalepeamoa Complex) and the Halepōhaku Rest Camp and Comfort Station (i.e., three stone buildings).

Archaeologists identified the Pu‘ukalepeamoa Complex, a tool quarry/workshop complex in and around Halepōhaku, in 1984. The complex is believed to have been multifunctional, consisting of several temporary camp sites where adzes and octopus lure sinkers were manufactured. The complex consists of twelve lithic scatters and two shrines, located within the Halepōhaku parcel and in the adjacent Mauna Kea Forest Reserve (Figure 12). It is hypothesized that the area was used as a production center for adze makers since the location provided for essentials such as firewood and food (forest birds) that would not be found further up the mountain.

Table 4. Archaeological Investigations at Halepōhaku

Year	Project	Investigation	Reference
1979	Hale Pohaku Mid-Level Facilities Complex Development Plan	Reconnaissance survey	McCoy 1979
1984-85	Supplemental EIS for Construction Laborer Camp	Reconnaissance survey	McCoy 1985
1986	HELCO transmission line and substation	Reconnaissance survey	Bonk 1986
1987	HELCO transmission line and substation	Reconnaissance survey	Sinoto 1987
1987	HELCO transmission line and substation	Data Recovery	McCoy 1991
1990	Japan National Large Telescope Dormitories	Reconnaissance survey	Robins and Hammatt 1990
1993	Japan National Large Telescope Dormitories	Data Recovery	Hammatt and Shideler 2002
2005	Septic Tank Excavations	Monitoring	McCoy 2005
2010	Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor	Reconnaissance survey	McCoy et al. 2010

Figure 13. Historic Properties in the Halepōhaku Area
[from CRMP (PCSI 2009)]



The twelve lithic scatters are comprised of adze manufacturing by-products and octopus sinker by-products. The adze manufacturing by-products suggests a direct relationship with the Maunakea Adze Quarry in that the material is not from a local source, but is abundant in the quarry. The type of stone used for octopus sinkers, primarily dunite and gabbro, occurs within the nearby Pu'ukalepeamoa Complex. Neither the Pu'ukalepeamoa Complex, nor individual Site 50-10-23-10311, are listed on the Hawai'i Register of Historic Places or National Register of Historic Places, nor have they been nominated.

Within the Pu'ukalepeamoa Complex, SIHP #50-10-23-10311 is the only site that lies within the project site. This site, which covered approximately 3,229 ft^2, contained lithic scatters and was the subject of SHPD guided data recovery in 1993, including trenching to uncover any subsurface features. The data recovery, which yielded 40 total artifacts, was performed because slopewash and sheet erosion were gradually displacing some of the artifacts. Although it was believed that all surface features that were contained in SIHP #50-10-23-10311 were previously recovered, due to ongoing erosion in the area, and because a portion of the site would be subjected to grading and paving under the Proposed Action, an archeologist was contracted to survey the project site with emphasis on the location of SIHP #50-10-23-10311. On October 12, 2016, an archaeologist from Pacific Consulting Services, Inc. (PCSI) performed a pedestrian survey of the project site. The survey did not document any new historical properties (including artifacts) within the project site (Appendix C).

The stone buildings at Halepōhaku consist of three uncut stone and mortar structures with constructed roofs that date between 1936 and 1950. Although these stone buildings are considered by SHPD to be State historic properties, they are not listed on the National Park Service's National Registry of Historic Places. They are located on the northern portion of the Halepōhaku parcel (Figure 2).

Both the CMP and HRS Chapter 6E require that no historic properties, including shrines, be altered or destroyed.

Traditional Cultural Properties

SHPD has designated several prominent localities on Maunakea as Traditional Cultural Properties (TCP) due to their cultural significance to the Hawaiian people. All of the TCP are located in the summit area of Maunakea and with the closest one, Pu'u Lilinoe at 12,400 ft elevation, being over three miles from and 3,000 ft higher than the project area. No impacts from the Proposed Action to any of the TCP are anticipated.

Cultural Practices and Resources

The *Maunakea Cultural Resources Management Plan* (CRMP) (2009), a sub-plan of the CMP, was approved by BLNR on March 25, 2010. It was developed, in part, to create a greater understanding of Maunakea's rich cultural heritage including the preservation and management of its cultural resources. The CRMP describes traditional and customary, as well as contemporary cultural practices associated with Maunakea, with most being associated with higher elevations of the mountain and not within the project area. Traditional practices and beliefs are those that have been passed on through generations either orally or through practice. Contemporary practices are current practices and beliefs for which no clear specific basis in traditional culture can be established or demonstrated and may be based on either earlier traditional practices or non-Hawaiian traditions but have evolved and changed. The CRMP groups cultural and religious practices associated with Maunakea into the following categories: religious beliefs and practices; construction of *ahu* and *kūahu*; *piko* beliefs and practices; mortuary practices; pilgrimage,

prayer, offerings and the spiritual resonance of Maunakea; collection of water for healing; adze manufacture; navigation and orienteering; and hunting.

There are a few known cultural practices and resources associated with Halepōhaku and the nearby surrounding area. There is a contemporary *ahu* within the DLNR-managed silversword enclosure that is utilized by cultural practitioners (Figure 2). Two shrines (SIHP #50-10-23-10313 and SIHP #50-10-23-10315) identified as part of the Puʻukalepeamoa Complex are located just south of the Halepōhaku parcel within the Mauna Kea Forest Reserve near the dirt jeep road. Cultural practitioners may collect koʻokoʻolau and māmane for medicinal or cultural purposes, however, collections rarely, if ever, occur within the area immediately surrounding the facilities at Halepōhaku. Subsistence hunting and gathering are not practiced within the Halepōhaku parcel. Most cultural activities within the UH Management Areas take place during daylight hours, with a few occurring at night or in the early morning hours.

CMP requirements include maintaining and accommodating access for cultural practitioners to culturally significant sites on Maunakea. The CMP states that "Native Hawaiian traditional and customary practices shall not be restricted, except where safety, resource management, cultural appropriateness, and legal compliance considerations may require reasonable restrictions." For example, continued cultural practices at Maunakea are provided for as long as they do not result in the alteration or destruction of historic properties, or physical impacts, such as those that may result from leaving behind offerings of food or other debris. The CMP dictates that public access to Halepōhaku is unrestricted except at the private sleeping and eating areas.

Burials

To date no burials have been discovered at Halepōhaku, nor has there been any mention of any in recorded oral histories of ancestors. All known and reported burials within the UH Management Areas occur at higher elevations and near cinder cones. The *Burial Treatment Plan* for the UH Management Areas on Maunakea, finalized and approved by SHPD in 2014, states that the Halepōhaku parcel does not contain any burials (Collins and McCoy 2014). Extensive archaeological surveys of the parcel and a lack of burial markers or surface indicators of burials support this. Additionally, there are no known burials at the three puʻu closest to Halepōhaku.

Potential Impacts and Mitigation Measures

Significance criteria provided in HAR 11-200-12, detail that an action shall be determined to have a significant impact to cultural resources if it involves an irrevocable commitment to loss or destruction of any cultural resource; or substantially affects the cultural practices of the community or State. Factors identified in the CRMP and the CMP that are most likely to result in adverse effects to historical sites at Halepōhaku include mechanical earth moving, infrastructure maintenance, unauthorized artifact collection, natural erosion, and wind damage and impacts due to debris (rubbish). A portion of Site 50-10-23-10311 is located within the area that would be graded and paved for the new VIS Parking Area 2 and associated walkway.

Implementation of the Proposed Action would not adversely affect gathering of cultural resources or impede access to areas utilized for subsistence hunting and gathering. Access to the *ahu* and any cultural practices taking place within the nearby DLNR-managed silversword enclosure would not be affected.

The Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor (2010) and the reconnaissance survey by PCSI (2016) support the SHPD determination_that there are no historic

properties within the project site that would be significantly impacted. Implementation of the Proposed Action would not result in any adverse impacts to the two shrines (SIHP #50-10-23-10313 and SIHP #50-10-23-10315). Due to the distance between the shrines and the project site, the SHPD recommended buffer of 200 ft would be maintained. One benefit of the Proposed Action is that cultural practitioners desiring to visit the shrines may have better access as a result of improved parking conditions. The only part of the Proposed Action that would occur in the vicinity of the stone buildings is the greenhouse. The greenhouse would be located approximately 50 ft from the stone buildings. No part of the construction of or future functioning of the greenhouse would have any effect on the stone buildings due to the distance between them.

As required by the CMP, all persons involved with construction activities shall attend a mandatory training about the cultural and historical resources on Maunakea. As required by the CRMP, a sub-plan of the CMP, an independent qualified archaeologist would be retained by the contractor to monitor all ground disturbing activities for historic features such as artifact concentrations of shell or charcoal. Per HRS Chapter 6E, if the contractor encounters possible or suspected historical features, all work would immediately be suspended and OMKM would be notified, who in turn would notify SHPD. In addition, Kahu Kū Mauna Council would be consulted. If the feature is deemed significant, an appropriate mitigation plan (which may include recovery) would be developed jointly by SHPD and UH Hilo. A *Rock Movement Plan*, developed by the contractor and approved by OMKM, would be included in the construction BMPs.

Project plans for the Proposed Action include the presence of an archaeological monitor for all ground-disturbing work. The procedures detailed in the SHPD-approved *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea* would be followed (Grosser et al. 2014). The archaeological monitor would have the authority to order that any or all construction activity cease in the event any historic properties or human remains are encountered. In the unlikely event that any human remains or any burial goods over fifty years old are uncovered at any time after construction commences, the procedures set out in HRS Chapter 6E-43.6 and HAR 13-300-40 would be followed. This includes immediately suspending all work in the area and notifying OMKM, who in turn would notify SHPD. Work shall not commence until a treatment and disposition plan has been developed by SHPD in consultation with the Hawai'i Island Burial Council, Office of Hawaiian Affairs, OMKM, and any recognized descendants.

3.5 Secondary and Cumulative Impacts

The proposed infrastructure improvements are not expected to have secondary impacts such as population change, land development, or effects on public facilities and services.

Cumulative impacts result when implementation of several projects, whether past, current or foreseeable futures actions, individually have limited impacts but combine to produce more severe impacts or conflicts in mitigation measures.

There are currently no other projects planned for the Halepōhaku area during the anticipated construction period. Therefore, no significant cumulative impacts related to the Proposed Action in combination with existing facilities or executing other projects during the same timeframe are expected.

Habitat disturbance and increased vehicular and pedestrian traffic at Halepōhaku due to past, planned, and future projects have the potential to result in cumulative adverse impacts. Planning efforts (i.e., Master Plan and Management Plans) for this area have managed, and should continue to keep

development contained within a small area of already disturbed habitat. The CMP addresses existing and potential controls on public access through education and rule-making, though UH does not currently have legal authority to establish and enforce access and use policies. OMKM desires to confine impacts by guiding visitor traffic to specific areas of Halepōhaku. Potential future projects at Halepōhaku could include better delineating visitor use areas (e.g., establishing a nature trail) in order to keep the area of impact within a discrete footprint, manage impacts to those areas, and undertake habitat restoration in surrounding areas. Cumulative adverse impacts related to increased vehicular and pedestrian traffic at Halepōhaku are not expected to be significant due to coordinated planning efforts by OMKM that are vetted through the MKMB in consultation with Kahu Kū Mauna Council.

OMKM has considered the potential for future facilities at Halepōhaku for some time (see *2000 Master Plan*). An increase in visitors to Maunakea is likely over time, with the growing interest in astronomy as well as the area's natural and cultural resources. Although the *2000 Master Plan* calls for possible expansion of the VIS, funding for expansion and support of long-term operation costs is highly unlikely in the foreseeable future and thus expansion is not considered in this effects analysis. However, the addition of a stargazing deck to the east side of the VIS is likely, pending funding and required permits (i.e., Site Plan Approval from DLNR OCCL), within the next five years. A stargazing deck would improve the capacity for and quality of visitor experiences. A stargazing deck could be added without removing any additional māmane trees or disturbing previously undisturbed habitat. No adverse cumulative effects are anticipated as a result of implementing the Proposed Action combined with this future potential facility improvement.

Construction and decommissioning activities in the Astronomy Precinct would likely require utilizing the mid-level facilities at Halepōhaku. New or expanded facilities seem unlikely as in the past construction workers opted to stay at sea level or in their own homes. There are existing dorms and cabins at Halepōhaku that can house construction workers if necessary. Like-to-like renovations to existing facilities, if needed, would not require the removal of māmane trees, or disturbance of previously undisturbed areas. As no new facilities are planned or expected to be planned in the near future, adverse cumulative impacts are not expected. ~~These activities could require new, expanded, or renovated facilities to house workers. Additional facilities (new and expanded) in the Halepōhaku area may or may not require removal of māmane trees, as well potentially disturbance of previously undisturbed areas.~~ Any construction or decommissioning activities would use the existing construction staging area for storage of equipment and other supplies so no adverse cumulative effects are expected related to that.

Habitat enhancement activities would continue within the Halepōhaku parcel, with the potential for expanding efforts into adjacent Mauna Kea Forest Reserve, potentially mitigating any unforeseen cumulative effects. For palila specifically, ongoing regional efforts to increase population numbers (i.e., fencing, habitat enhancement, relocations) would mitigate any cumulative impacts of habitat loss in the seldom used Halepōhaku habitat. Traffic and an increase in workers would be temporary and all persons involved would be subject to stipulations set forth in the CMP and would not result in any long-term cumulative adverse effects. Parking on the western side of the Maunakea Summit Access Road was eliminated under the scope of a different project, as this is not part of the UH managed lands on Maunakea. Installation of the guardrail will likely reduce the unintended trampling and modification of vegetation and invertebrate habitat within the Mauna Kea Forest Reserve by visitors to the Maunakea VIS.

Implementing the Proposed Action in combination with other projects at and around Halepōhaku is not expected to result in significant adverse cumulative effects to natural, historic, or cultural resources as these are protected under State and Federal law as well as CMP requirements. Additionally, the mitigation measures that would be implemented with the Proposed Action minimize any such impacts.

4 RELATIONSHIP TO LAND USE REGULATIONS, PLANS, AND POLICIES

4.1 Permits, Approvals, and Compliance Required or Potentially Required

Associated permits being sought for this project include:

Conservation District Use Permit (CDUP). Implementation of the Proposed Action would require a CDUP. The application for this permit is being submitted during the review period of the Draft EA and approval is required by DLNR. If a CDUP is secured, OMKM would be responsible for overseeing compliance with all conditions listed in the CDUP and for reporting known or suspected violations to DLNR.

National Pollutant Discharge Elimination System Permit (NPDES) with associated best management practices (BMP). UH Hilo (Permittee) received an NPDES individual permit (Permit No. HI S000476), from the HDOH, valid from July 29, 2016 – July 28, 2021 authorizing the discharge of storm water associated with construction activities from the Maunakea Phase 1 Ingress/Egress project site located at the Maunakea VIS per terms and conditions outlined in the permit.

Accessible Parking. HDOH Disability and Communication Access Board must review and approve the project plan to ensure additional accessible parking meets required specifications.

Historic Preservation. Concurrence from SHPD that the proper protection or mitigation measures have been taken to protect and historic property or burial sites (Section 4.2.7).

Construction Permits. The Proposed Action would require several permits/approvals from the County of Hawai‘i Department of Public Works. The Proposed Action requires a grubbing/grading permit and a building permit from the Public Works Engineering Division. The permit for these activities requires an *Erosion and Sediment Control Plan* and review by SHPD. The Public Works Building division must approve all plans for electrical work. This project would also require a Community Noise Permit from HDOH.

Incidental Take Permit and Associated Habitat Conservation Plan. The University does not hold an Incidental Take Permit for the UH Management Areas on Maunakea. It is not anticipated, and highly unlikely due to planned mitigation measures as well as the infrequent visitation of threatened or endangered species to the project site, that any incidental “take” would occur due to implementation of the proposed project. Therefore, an Incidental Take Permit and associated Habitat Conservation Plan have not been pursued.

4.2 Consistency with Government Plans and Policies

4.2.1 Maunakea Science Reserve Master Plan

The *Maunakea Science Reserve Master Plan* was developed with input from various committees, the University, the public, and State government officials to serve as the policy framework for the responsible stewardship and use of University managed lands on Maunakea (Group 70 International, Inc. 2000). A significant portion of the *2000 Master Plan* is dedicated to what are referred to as “issues and opportunities for management.” This section, complete with recommendations, addresses management

authority, access, natural resources, cultural resources and practices, education and research, and recreation. The *2000 Master Plan* and associated Final EIS discuss the expansion of parking facilities at Halepōhaku. The proposed project is consistent with the *2000 Master Plan*.

4.2.2 Maunakea Comprehensive Management Plan

The *Maunakea Comprehensive Management Plan* provides a management framework for UH to address measures to protect the cultural, natural, and scientific resources on UH Management Areas on Maunakea (Kuʻiwalu 2009). The CMP was approved by the Hawaiʻi BLNR in April 2009. In 2010 the Hawaiʻi BLNR approved four sub-plans addressing: public access, cultural resources management, natural resources management, and decommissioning. The CMP, its sub-plans, and its framework and implementation for project development are the State's plans for lands on Maunakea under the University's management.

The CMP outlines management actions to protect, preserve, and enhance the cultural and natural resources of the UH Management Areas. It recognizes that projects in the Conservation District that may result in ground disturbance or impacts to historical sites or cultural practices may require some type of permit. The CMP outlines specific management actions to ensure compliance with permits, rules, and regulations (Section 2.1.3). The proposed project is consistent with the CMP and its sub-plans.

Addressing safe vehicular and pedestrian movement is a CMP requirement. Specific management actions that are called out in the CMP would be addressed by the proposed project. The *Managing Access Activities and Uses* section discusses how visitor parking on the shoulder of the road and in other undesignated areas may negatively impact the resources and cause erosion. One management action recommended to minimize and mitigate this is *ACT-2*: Develop a parking and traffic plan. Within the *Managing the Build Environment Section: Infrastructure and Maintenance* the CMP states that for safety reasons, all parking should be on the same side of the road as the existing Halepōhaku facilities. One recommended management action is *IM-9*: Evaluate the need for additional parking lots and vehicle pullouts and install if necessary.

4.2.3 Hawaiʻi State Plan

The Hawaiʻi State Plan, HRS Chapter 226, is a comprehensive plan that serves as a guide for the future long-range development of the State.[19] It identifies goals, objectives, policies, and priorities for the State with the intention of providing for wise use of Hawaiʻi's resources and guiding future development. The proposed project supports and is consistent with State Plan objectives and policies for the economy (visitor industry, Section 226-8) and the physical environment (land-based, shoreline, and marine resources, Section 226-11; scenic, natural beauty, and historic resources, Section 226-12; and land, air, and water quality; Section 226-13).

The proposed project involves improving traffic flow and parking in the vicinity of Halepōhaku on Maunakea. This region is one of scenic value for the natural beauty of the mountain slopes, the accessibility to the summit of Maunakea, and clear skies for star-gazing. This area is heavily visited by tourists. Safe driving, parking, and walking experiences are important factors to the experience of these visitors. The improvements associated with this project would contribute to the quality of this experience while maintaining public and visitor safety.

[19] http://planning.hawaii.gov/hawaii-state-planning-act/

The proposed project involves improvements in an already disturbed area, designed to minimize potential impacts to natural, historic, and cultural resources. Although māmane trees would be impacted within federally designated critical habitat, habitat enhancement efforts are being implemented to salvage and replace this important resource. No direct impacts to archaeological resources are anticipated as part of the construction activities. Scenic vistas in the vicinity of Halepōhaku would be preserved by containing improvements to the vicinity of existing infrastructure and being sensitive to the need for maintaining dark skies to support star-gazing activities. By facilitating access for residents and visitors to the VIS, these improvements would also promote safe and informed visitation to the high elevation areas of Maunakea.

4.2.4 State Land Use Law

The Hawai'i State Land Use Law, entitled *State Land Use Commission*, HRS Chapter 205, was adopted in 1961. The law is meant to preserve and protect Hawai'i lands, and encourage the uses to which the lands are best suited. All lands in the State of Hawai'i are classified into one of four land use designations: Urban, Rural, Agricultural and Conservation. The proposed project is located in the Conservation District.

HAR 13-5 regulates land use in the State's Conservation District for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use, to promote their long-term sustainability and the public health, safety and welfare. The Administrative Rules establish five subzones and describe the objective of the level of protection, permitted uses, and procedures to obtain permission for those uses. Halepōhaku is located in the resource subzone of the State Conservation District.

All elements of the proposed project are identified permitted land uses in the Resource Subzone of the Conservation District, pursuant to HAR 13-5-22 and HAR 13-5-24. Under *Structures and Land Uses, Existing* (P-8), moderate alteration of existing structures, facilities, uses and equipment; as well as construction of structures accessory to existing facilities or uses is permitted upon issuance of a CDUP from the Chair of DLNR. Under *Structures, Accessory* (P-9), construction of structures accessory to existing facilities or uses is permitted upon approval of a site plan by DLNR. Plans for implementation of the proposed land use were developed to adhere with the actions outlined in the CMP and its four sub-plans. These actions ensure that the proposed use continues to allow for the sustainable use of the natural resources of the area, the objective of the Resource Subzone.

The Draft EA is part of the process that would help determine the appropriate permitting path for the project. DLNR OCCL would review the Draft EA and confirm or modify the conclusions of the initial review. It should be noted that this determination is subject to further review once an application for a CDUP is submitted.

4.2.5 County of Hawai'i General Plan

The *County of Hawai'i General Plan* establishes the long-range goals and policies that guide development and appropriate uses of land for the County of Hawai'i. The plan was adopted by ordinance in 1989 and revised in 2005.[20] The General Plan recognizes the economic and employment contributions provided by the facilities managed by the University. The General Plan specifically calls for appropriate access to be

[20] The *County of Hawai'i General Plan* is reviewed every ten years and is currently undergoing review for possible amendment. Recommended amendments are expected to be released for public review in 2017. It is not anticipated that any amendments will change the consistency of the proposed project with the General Plan. http://www.cohplanningdept.com/general-plan/

provided for significant historic sites, objects of public interest, and public or private lands that have natural or scenic value. The proposed project is consistent with the goals, policies, and standards sets forth in the County's General Plan in that it provides safe access to educational facilities and recreational opportunities, provides for conservation of natural resources, and incorporates pollution controls within facilities development. It also furthers the General Plan's goal of maintaining the natural beauty of recreation areas by moving parking away from the adjacent State land and into the already developed area of Halepōhaku.

4.2.6 Hāmākua Community Development Plan (Draft)

The *Hāmākua Community Development Plan* (CDP), currently in draft form for public review, is a County policy document developed based on core values expressed by the community and a vision of what they would like to see in Hāmākua in 2030.[21] The *Hāmākua CDP* describes community objectives, which are the foundation of the CDP, and provides detailed strategies to meet those objectives. Conservation of natural resources and providing for outdoor recreation were among the core values listed and have been incorporated into the community objectives.

There are two community objectives listed in the *Hāmākua CDP* that are specifically supported by the proposed project. One of the community objectives related to the *ʻāina* is "protect, restore, and enhance watershed ecosystems, sweeping views, and open spaces from *mauka* forests to *makai* shorelines, while assuring responsible public access for recreational, spiritual, cultural, and sustenance practices." Another community objective is to develop and improve critical community infrastructure including utilities, healthcare, emergency services, affordable housing, educational opportunities and recreational facilities to keep our *ʻohana* safe, strong and healthy.

One of the strategies outlined to achieve these objectives is to expand parks and recreation improvements and trail development. Within that strategy, one policy set forth is to "seek to combine Park facility improvement projects with other needed facility improvements (e.g., ADA improvements with facility hardening, etc)." The proposed project includes several facets that improve facilities at the Maunakea VIS, one of them being ADA improvements.

The *Hāmākua CD*P includes a section that is specific to Maunakea, *Preserving Sacred Places: Waipiʻo Valley and Mauna Kea*. The section addresses natural and cultural resource protections and includes actions related to recreational opportunities at Maunakea and education of visitors. Implementing the proposed project allows for recreational users to park more safely while visiting the VIS and accessing surrounding areas while at the same time providing designated areas for driving, parking, and walking that should result in less long term damage to natural and cultural resources.

4.2.7 HRS Chapter 6E Historic Preservation

HRS Chapter 6E details the regulations for historic preservation for the State of Hawaiʻi. Before any State agency or its political subdivisions begin a project that may affect historic property, aviation artifact, or a burial site, the agency must advise SHPD and provide an opportunity for review of the effect of the

[21] The Hāmākua CDP Planning Area encompasses the judicial districts of Hāmākua and North Hilo, as well as Rural South Hilo. A CDP is an official plan authorized by the County of Hawai'i General Plan that translates the broad goals and objectives of the General Plan to the unique needs and conditions of a region. The *Hāmākua CDP* is adopted by County ordinance and is a long-range plan with a 20-yr time horizon.
http://www.hawaiicountycdp.info/hamakua-cdp/draft-cdp

proposed project. SHPD is to provide concurrence or non-concurrence within ninety days after the filing of a request. The proposed project shall not begin until SHPD has given written concurrence. The Chapter also details that the State report the finding of any historic property or burial and shall cooperate with the department in the investigation, recording, preservation and/or salvage. It specifies that any human skeletal remains (and any associated burial goods) discovered that appear to be over fifty years old, shall not be moved without the approval of SHPD. SHPD was consulted on the proposed project and on November 28, 2016 issued a memo with the determination that no historic properties would be affected by the proposed project with implementation of the SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Maunakea* (Gosser et al. 2014) (Section 1.4, 3.4, and Appendix A).

5 DETERMINATION, FINDINGS, AND REASONS

5.1 Determination

Based on the effects analysis (Section 3), and upon consideration of comments to the Draft EA, UH Hilo is expected to determine that the Proposed Action would not significantly alter the environment, as impacts would be minimal, and less than significant, and is expected therefore to issue a FONSI.

5.2 Significance Criteria

HAR 11-200-12 outlines those factors agencies must consider when determining whether an action has significant effects. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

1. *Involves an irrevocable commitment or loss or destruction of any natural or cultural resource.*
   Māmane habitat would be minimally impacted, however the loss of selected trees would be off-set by sustained habitat enhancement efforts in the immediate vicinity. Success of habitat enhancements would be augmented by the ability of staff to monitor and care for transplanted plants. USFWS, USGS, and DLNR DOFAW biologists were consulted and all concurred with the analysis that that although threatened and endangered species may occur occasionally within the project site, changes to habitat (including removal of māmane trees) is unlikely to significantly affect or alter populations due to infrequent, if any, utilization of the site. Due to mitigation measures to be followed, as well as the infrequent visitation of threatened or endangered species to the project site, no "take" of threatened or endangered species is anticipated to occur. The chosen site is an appropriate location for the Proposed Action due to the disturbed nature of the site. *The Archaeological Inventory Survey of the Mauna Kea Access Road Management Corridor* (2010) and the reconnaissance survey by PCSI (2016) support the SHPD determination that there are no historic properties within the project site that would be significantly impacted. There are no recognized cultural resources that would be lost or significantly impacted as a result of the Proposed Action. A benefit of the proposed project is that it would promote visitors stopping at the VIS, increasing the opportunity to educate visitors on the natural, historic, and cultural resources of Maunakea.

2. *Curtails the range of beneficial uses of the environment.*
   The proposed project expands the beneficial uses of the environment. Portions of an existing, disturbed area are being reconfigured to support safer access for those that want to learn about Maunakea by visiting the VIS, and for those who plan to travel to the summit. Infrastructure improvements would result in the overall footprint being marginally greater than the existing facilities

of an area that is mostly used for the same activities (accessing the VIS, parking, and visitors walking around Halepōhaku).

This action would result in recreation infrastructure available for community use after the conclusion of the UH lease. The project improvements would be left in place unless the State directs UH to remove them. The proposed project would not significantly curtail the range of beneficial uses of the environment.

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

   The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project's footprint is primarily in previously disturbed areas. It has been designed to minimize environmental impacts and fulfills aspects of these policies calling for protection and public enjoyment of the natural environment. By improving traffic flow and providing alternative parking areas, visitors have better access and safer options for visiting the VIS, which provides opportunity to "enrich understanding of the ecological systems and natural resources important to the people of Hawai'i" and promotes efforts to "prevent damage to the environment", as called for in Chapter 344, HRS. Relocating parking to designated areas would also reduce impact on the area's natural resources. This project is consistent with all elements of the State's long-term environmental policies and guidelines as expressed in Chapter 344, HRS and does not represent a significant conflict with any.

4. *Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.*

   The proposed project would have a positive impact on the economic and social welfare of the community by improving the long-term ability of the VIS to support safe recreational activities, both at Halepōhaku and at the summit of Maunakea. Access to participate in cultural practices would not be changed or adversely affected. It is not anticipated that the proposed project would have any significant adverse effects on cultural practices as the majority of known cultural practices occur at other areas on Maunakea (mainly at the higher elevations on the mountain) and none are known from within the project site.

5. *Substantially affects public health.*

   The Proposed Action involves only short-term, construction-related impacts to ambient air and noise levels, and no long-term significant impacts to public health and welfare are anticipated. The incorporation of recommended mitigation measures and BMPs during the construction period would minimize these temporary impacts to the local area, decreasing the likelihood of any significant effects.

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

   The proposed project would not result in any significant adverse effects or secondary impacts related to population growth or the need to expand public facilities.

7. *Involves a substantial degradation of environmental quality*.

   The project would not degrade the environment in any substantial or significant way. Construction activities associated with the proposed project are anticipated to result in relatively insignificant short-term impacts to noise, air quality, biological resources, and traffic in the immediate project

vicinity. The incorporation of recommended mitigation measures and BMPs during the construction period would minimize adverse impacts to the environmental quality. Over the long-term, moving parking to designated areas, directing pedestrian traffic, and enhancement efforts would improve habitat quality.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.*
   The project is not related to additional activities in the region in such a way as to produce or contribute to significant cumulative adverse effects or involve a commitment for larger actions. No other past, present, or planned future actions associated with these land uses have been identified that would contribute to significant adverse impacts for any of the resources considered in this EA. Implementation of the Proposed Action would not produce adverse effects that when combined with any foreseeable future projects, namely improvements to the VIS facilities, or further definition of where pedestrian traffic should be directed (e.g. nature trail), would result in significant adverse impacts for any of the resources considered in this EA.

9. *Substantially affects a rare, threatened or endangered species, or its habitat.*
   The project site falls within designated critical habitat for the endangered palila, a species reliant on māmane trees for survival. Although the proposed project would require removal of some māmane trees, adverse impacts to the palila are unlikely to be significant, as palila are only occasional visitors to this area, mature māmane trees surrounding the project site would not be impacted, and the overall quality of the habitat in this general area would not be significantly altered. While māmane habitat within the small (two acre) project site would be impacted, the loss of selected trees would be off-set by sustained habitat enhancement efforts throughout Halepōhaku and potentially the adjoining State land. The number and health of mature māmane trees surrounding the project site would not be adversely impacted. No 'take' of palila or any other State or federally listed species is anticipated.

10. *Detrimentally affects air or water quality or ambient noise levels.*
    Only minimal construction-related, short-term impacts on air quality and noise levels are anticipated. Mitigation measures would be implemented to minimize construction-related noise and dust impacts. Adverse impacts to water resources would be prevented through construction BMPs and adherence to permit requirements. No long-term, direct or indirect, significant adverse impacts to these resources are anticipated from implementation of the proposed project.

11. *Affects or is likely to suffer damage as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.*
    Although the project is located in an area with seismic risk, the entire Island of Hawai'i shares this risk. The project is being designed in accordance with standards appropriate to the geologic, hydrologic, and seismic settings and nearly all improvements are at ground level and would not pose any additional risk to life or property in the event of a seismic event. No significant adverse effects to environmentally sensitive areas are likely.

12. *Substantially affects scenic vistas and viewplanes identified in County or State plans or studies.*
    Although there are no scenic vistas or viewplanes within this area that are identified in County or State plans, many visitors value the views of surrounding pu'u, nearby Maunaloa and far-reaching vistas.

The Proposed Action would not significantly affect any of scenic vistas or viewplanes as a majority of improvements would be at ground level. ~~The only exception being the cabin that would be placed in the VIS Parking Area 1. The cabin is a small and existing structure, and moving it to a new location does not obstruct any valued scenic vistas.~~

13. *Requires substantial energy consumption*.
    Over the short-term, the project involves consumption of petroleum products to complete the construction work, none of which is considered substantial or excessive. Over the long-term energy consumption would consist use of petroleum products to power machinery necessary for maintenance, and the power necessary to keep any permanent lights within the walkway and VIS Parking Area 2 lit. Both would be minimal and not substantial. The greenhouse energy needs would be met using solar power. The project involves only minor energy use and no adverse significant effects are expected.

For the reasons above, the Proposed Action would not have significant adverse impacts in the context of HRS Chapter 343 and HAR Section 11-200-12.

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7 LIST OF PREPARERS

Kristin N. Duin, Principal
M.S. Energy and Resources (Resource Management Planning)
Experience: 22 years

Andrew P. Hood, Principal
M.S. Civil and Environmental Engineering (Water Resources Engineering)
Experience: 26 years

Michelle Roberts, Natural Resources Management Specialist
M.S. Ecosystem Science (Restoration Ecology)
Experience: 17 years

Appendix A. Consultation and Comments

Agencies, citizen groups, and individuals provided comments as part of the early consultation provisions of HAR Sections 11-200-9(a)(1), 11-200-9(b)(1), or 11-200-15, and statutorily prescribed public review periods.

Appendix A1 contains correspondence and comments in response to early consultation from USFWS, USGS Pacific Islands Ecosystems Research Center, DLNR-OCCL, DNLR-DOFAW, and DLNR-SHPD.

Appendix A2 includes comments received during the Draft EA public review period, along with responses.

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A1. Agency Consultation

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

7 October 2016

Rachel Rounds
Fish and Wildlife Biologist
Consultation and HCP Program
US Fish and Wildlife Service
Pacific Islands Field Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850
Via email: rachel_rounds@fws.gov

Subject: Request Input Regarding *Proposed Infrastructure Improvements at Maunakea Visitor Information Station* at Halepōhaku within Palila Designated Critical Habitat.

Dear Ms. Rounds:

Sustainable Resources Group Intn'l Inc. (SRGII) has been contracted by RIM Architects on behalf of the Office of Maunakea Management (OMKM) and the University of Hawai'i (UH) Hilo, to prepare an Environmental Assessment (EA) in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes (HRS), and its implementing regulations, Title 11, Chapter 200, Hawai'i Department of Health Administrative Rules (HAR) to analyze impacts of proposed infrastructure improvements at the Maunakea Visitor Information Station (Tax Parcel ID (3) 4-4-15:12). A detailed project description as well as a figure depicting the location of the improvements is attached.

The project site does not contain any Federally listed threatened or endangered plant species. Two species of Federally listed endangered birds and five species of Federal *species of concern* could potentially utilize habitat within and around the project site.

Table 1. Native Bird Species of Halepōhaku

Scientific Name	Common Name	Origin	Occurrence	Legal Status*
Asio flammeus sandwichensis	pueo (Hawaiian owl)	Endemic	Potential	FSOC
Buteo solitarius	'io (Hawaiian hawk)	Endemic	Potential	FE, SE
Chasiempis sandwichensis	Hawai'i 'elepaio	Endemic	Potential	FSOC
Chlorodrepanis virens virens (previously *Hemignathus virens virens*)	'amakihi	Endemic	Known	FSOC
Himatione sanquinea	'apapane	Endemic	Known intermittent	FSOC
Loxioides bailleui	palila	Endemic	Known intermittent	FE, SE
Vestiaria coccinea	'i'iwi	Endemic	Known intermittent	FSOC

* FE=Federally listed as Endangered, SE=State listed as Endangered, FSOC=Federal Species of Concern

Of these species, only 'amakihi is commonly known to occur. Although palila, 'apapane, and 'i'iwi have been observed at Halepōhaku in recent times, their occurrence is intermittent. Although the Hawaiian owl and the endangered Hawaiian hawk potentially utilize habitat at Halepōhaku for foraging, they have

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never been recorded there and Halepōhaku is located at the high end of their known elevational range. These two species are unlikely to breed in the project area due to the high elevation.

The project site does lie within Federally designated critical habitat for the palila. While the project site is located at a higher elevation than the current core area that endangered palilia are known to utilize, during times of drought there is a greater tendency for birds to move around looking for food (Banko personnel communication, 2016). Surveys to determine population abundance and range of palila have been conducted annually on Maunakea since 1998. Although the focus of the surveys is within the core habitat, supplemental transects adjacent to the core habitat are also surveyed to investigate possible range expansion. One of the supplemental transects traverses Halepōhaku, providing insight to the use by palila of the project site and near vicinity. The surveys are conducted in January when māmane seedpods are most abundant at higher elevations, so it would coincide with when palila would be using the higher areas of their elevational range. The survey results show that palila have only been intermittently detected at Halepōhaku in recent years.

The project will require removal of some māmane trees, a preferred food source of the palila. Māmane trees under two inches in diameter will be transplanted outside of the project site. To mitigate removal of larger māmane trees, trees will be replaced with māmane seedlings grown from seed collected at Halepōhaku at a ratio of at minimum two seedlings for every one tree removed. Seedlings will be outplanted within one year of the start of the project and occur over a two year period. Approximately 80 seedlings have already been germinated and are growing in pots at Halepōhaku. The planting of māmane trees will also benefit other native honeycreepers.

Although none of the seven recently ESA listed bee species have been documented as occurring at Halepōhaku during previous surveys, the native species *Hylaeus flavipes* has been known to occur. Habitat within the project site is not necessarily a preferred habitat of these native bee species but adjacent areas upslope do contain preferred habitat.

The purpose of this correspondence is to solicit any early input or concerns of the U.S. Fish and Wildlife Service regarding this project. We look forward to your comments. If you have any questions or require additional information please contact me at 808-356-0552 (phone) or kduin@srgii.com (email). Thank you in advance for your assistance.

Sincerely,

Kristin Duin
Principal

cc:
Stephanie Nagata, Office of Maunakea Management
Michelle Roberts, SRGII

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:
EPIF00-2017-TA-0014

OCT 2 4 2016

Ms. Kristin Duin
Sustainable Resources Group
111 Hekili Street, Suite A373
Kailua, Hawaii 96734

Subject: Comments on the Proposed Infrastructure Improvements at Maunakea Visitor Information Station at Halepohaku, Hawaii

Dear Ms. Duin:

We are providing comments on proposed infrastructure improvements at the Maunakea Visitor Information Center at Halepohaku, Hawaii by the Office of Mauna Kea Management (OMKM). We reviewed the proposed project pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). Our databases, including data compiled by the Hawaii Biodiversity and Mapping Program, and information in your letter, indicate the following listed species have been observed in the vicinity of the proposed project: the endangered palila (*Loxioides bailleui*) and a species proposed for listing as threatened, the iiwi (*Vestiaria coccinea*). Palila critical habitat is also designated at the project site. Native habitat near the project site may also serve as habitat for non-listed native birds and yellow-faced bees.

The OMKM proposes to improve infrastructure at facilities at Halepohaku on Maunakea to accommodate and support ongoing management activities in support of the Maunakea Comprehensive Management Plan, including increasing the number of visitors to the mountain. Actions would include improving traffic flow, building a new parking lot, paving of an unimproved foot path, construction of a new greenhouse, removal of one building, and movement of one cabin. All activities will occur on University of Hawaii (UH) leased lands. The greenhouse will support ongoing restoration and habitat enhancement efforts on UH managed lands on Maunakea.

Palila

The proposed project site is within the historical and current range of the palila. However, the project site with not within the current "core area" of higher palila use and population density. Palila are occasionally detected near the project site during annual surveys, but are not expected to be found at or near the project site on a regular basis. Palila would most likely be found near the project site if there is high mamane (*Sophora chrysophylla*) pod availability in the project area or if mamane pods are low within the palila core area. Given the large area of mamane on

Maunakea, the distance from the project site to palila core habitat, and the small area of the project site, we do not anticipate negative impacts to palila from the proposed project.

Iiwi

Iiwi may traverse the upper slopes of Maunakea searching for flowering mamane. Iiwi use of the project area is likely seasonal and based on the number of mamane trees flowering in the area. Given the large area of mamane on Maunakea, and the small area of the project site, we do not anticipate negative impacts to iiwi or iiwi habitat from the proposed project.

Palila Critical Habitat

The project site is located within palila critical habitat. The proposed project will include paving of a parking lot, construction activities, and removal of a few mamane trees. Palila critical habitat covers over 60,000 acres (24,000 ha) on Maunakea. The proposed project will affect one to two acres of palila critical habitat, in an already developed area. Therefore we anticipate minimal disturbance to critical habitat from the proposed action.

Because the project site is located in a developed area with continual human presence, we do not anticipate that the proposed project will have negative effects to palila, iiwi or palila critical habitat. Construction of a greenhouse and planting of mamane will have a beneficial effect on native forest birds and their habitats, and to palila critical habitat, and we thank you for your habitat restoration efforts on Maunakea.

Thank you for providing us with the opportunity to comment on this project. If you have questions regarding this letter, please contact Rachel Rounds, Fish and Wildlife Biologist, (phone: 808-792-9400, email: Rachel_Rounds@fws.gov).

Sincerely,

Michelle Bogardus
Island Team Manager
Maui Nui and Hawaii Islands

From: "Banko, Paul" <pbanko@usgs.gov>
Sent: Friday, November 4, 2016 1:07 PM
To: Michelle Roberts <mroberts@srgii.com>
Subject: Re: Infrastructure Improvements at Halepohuku and palila
Attachments: Palila Restoration Research_Banko &_HCSU TR46.pdf; Palila Habitat & Food Preferences_Hess &_Wilson J Ornithology_2014.pdf

Michelle - In response to your request for information or comments regarding proposed infrastructure improvements at Halepohaku, I can tell you that palila have not been detected on annual population surveys along the transect (109) passing close to the project area since 2006. Although palila were detected on surveys on transect 109 fairly consistently until 1990, they have been detected only in 1997 and 2006 since then. Nevertheless, palila have been observed incidentally in the area on multiple occasions in recent years by astronomy staff (Brooks Round, personal communication). Therefore, the plan to plant mamane to replace trees that may be removed from the project area seems warranted, given the continued use of the area by palila. For detailed information about the palila's habitat use patterns and general ecology, I attach two documents. Aloha - paul

On Thu, Oct 27, 2016 at 12:07 PM, Michelle Roberts <mroberts@srgii.com> wrote:

> Paul,
>
> Our firm, SRGII is preparing the Environmental Assessment for the Infrastructure Improvements at Halepohaku on Maunakea. I thank you for providing Fritz at OMKM with the information regarding palila distribution and other items, it has been quite useful. I have attached a letter of request, site description and site map to this email with the hope that you would be willing to provide some input or share any concerns you have on the project as part of the scoping effort. Any input will be used during the analysis of effects as well as is likely to be attached as an appendices to the EA.
>
> Mahalo, Michelle
>
> Michelle Roberts
> Sustainable Resources Group Intn'l, Inc.
> 808.772.1836 (direct)
> 808.356.0552 (ph/fx)
> www.srgii.com

--
Paul C. Banko Wildlife Biologist
U.S. Geological Survey
Pacific Island Ecosystems Research Center
808-985-6402
pbanko@usgs.gov

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

September 20, 2016

Samuel J. Lemmo, Administrator
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Kalanimoku Building
1151 Punchbowl St., Room 131
Honolulu, HI 96813

Subject: Request for Review and Concurrence of Land Use Requirements for *Proposed Infrastructure Improvements at Maunakea Visitor Information Station*.

Dear Mr. Lemmo:

Sustainable Resources Group Intn'l, Inc. (SRGII) has been contracted by RIM Architects on behalf of the Office of Maunakea Management (OMKM) and the University of Hawai'i (UH) Hilo to produce the appropriate compliance documents for an application for use within a conservation district. The purpose of the project is a compliance measure of the Comprehensive Management Plan to move all parking and drop-off of visitors to the same side of the road as the Visitor Information Station (VIS). The proposed project entails adding an access lane adjacent to the VIS and parallel to the existing Maunakea Access Road, construction of a parking area to replace displaced parking, paving of an unimproved foot path to create a walkway connecting the new parking area with the VIS; installing gates, and relocating up to two existing structures. Construction of a greenhouse is also proposed. It would be located near the MKSS support facilities, north of the VIS. The greenhouse would support ongoing restoration and habitat enhancement efforts on UH managed lands on Maunakea. All of this proposed activity is within the UH managed areas. We have included a project description as well as the identified land uses we believe to be correct based on the regulations set forth in HAR Title 13 Chapter 5, Section 22.

SRGII is requesting concurrence that, based on the project description, the identified land uses and associated requirements outlined are correct. Further, we request concurrence that because elements of the proposed action are not covered in any previous environmental assessments (EA) or environmental impact statements, and due to the triggers identified in the *Project Element and Applicable Regulations* table within the project description, that an EA would be required as part of the Conservation District Use Application. Please note that *Comprehensive Exemption List for the University of Hawaii* found on the Office of Environmental Quality website, states "As stipulated by Section 11-200-8(b) HAR, if an exempt action is proposed in a particularly sensitive environment...the exempt status of the action would be invalid." Environmentally sensitive areas include critical habitat. The proposed project lies within designated critical habitat for the palila (*Loxioides bailleui*). Please confirm that we have correctly identified the elements to be analyzed in the EA if OCCL concurs that an EA is required.

SRGII is available should you have questions or need more information. You may contact me at 808-778-7364 or kduin@srgii.com.

Sincerely,

Kristin Duin

Cc:
Stephanie Nagata, Office of Mauna Kea Management, nagatas@hawaii.edu
Kurt Mitchell, RIM Architects, kmitchell@rimarchitects.com
Andrew Hood, Sustainable Resources Group Intn'l, Inc., ahood@srgii.com

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DAVID Y. IGE
GOVERNOR OF HAWAII

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

KEKOA KALUHIWA
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
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:MC

Correspondence HA-17-83

NOV 10 2016

Kristin Duin
Sustainable Resources Group Intn'l, Inc.
111 Hekili Street, Suite A373
Kailua, HI 96734

Dear Ms. Duin,

SUBJECT: Proposed Infrastructure Improvements at Maunakea Visitor Information Station
Mauna Kea Science Reserve, Hāmakua, Ka'ohe, Hawai'i
TMK: (3) 4-4-015:012

The Department of Land and Natural Resources (DLNR) has reviewed the information you provided regarding the proposed infrastructure improvements at the Maunakea Visitor Information Station (VIS). The project area is in the Resource Subzone of the State Land Use Conservation Districts.

According to the information provided, Sustainable Reso ces Group Intn'l, Inc. (SRGII) has been contracted by RIM Architects on behalf of the Office of Mauna Kea Management (OMKM) to produce the appropriate environmental compliance and permitting documents for the proposed renovations at VIS. At this point SRGII is asking for clarification on DLNR's permitting requirements for land uses in the Conservation District.

The main elements of the project include either the relocation or demolition of one of the longhouses north of VIS, constructing a new access lane, constructing a new 42 stall paved parking lot with new access lanes, modifications to the existing 24 stall VIS parking lot, installing new walkways, installation of new gates, relocating one Subaru construction cabin to the existing VIS parking lot, building a new greenhouse, and conducting various drainage improvements.

The proposed project area lies within designated critical habitat for the palila *(Loxiodes bailleui)*.

Pursuant to Hawai'i Administrative Rules (HAR) HAR §13-5-31 *Permit applications*, the permit will require that an environmental assessment be carried out. OCCL notes that the attachment included with your correspondence, Table 1, PROJECT ELEMENTS AND APPLICABLE REGULATIONS, seems to indicate that some of the project elements would be exempt from being included in the Environmental Assessment (EA). We strongly advise against parceling out any elements of the project, and recommend that the application and EA cover the proposal in its entirety.

The Department will be able to determine the level of permitting needed once we have reviewed the draft Environmental Assessment.

Should you have any questions, please feel free to contact Michael Cain of OCCL at 587-0048.

Sincerely,

Kekoa Kaluhiwa, First Deputy
Department of Land and Natural Resources

Receipt acknowledged:

_____
Applicant's Signature

_____
Date

From: Mello, Joey S <joey.s.mello@hawaii.gov>
Sent: Thursday, November 3, 2016 7:55 PM
To: Kristin Duin; Hatayama, Jay M
Cc: 'Stephanie Nagata'; 'Michelle Roberts'
Subject: RE: Request Input Regarding Proposed Infrastructure Improvements at Maunakea Visitor Information Station at Halepōhaku within Palila Designated Critical Habitat.

Aloha Kristin:

I tried calling your listed number but could not get to voicemail.

Jay Hatayama and I have reviewed your documents regarding the proposed infrastructure improvements at Mauna Kea Visitor Information Station at Hale Pohaku. We concur with your preliminary findings for threatened and endangered flora and fauna with the following suggestions. Hawaiian Hoary Bat (like Hawaiian Hawk and owl) could potentially use the area even if not seen there. Nene could also visit the area on occasion. Both would be unlikely to be impacted.

thanks

Joaquin Mello
East Hawaii Wildlife Manager
Hawaii Department of Land and Natural Resources
Division of Forestry and Wildlife
808 974-4221, 808 974-4226 (fax)

From: Kristin Duin [mailto:kduin@srgii.com]
Sent: Friday, October 07, 2016 12:03 PM
To: Mello, Joey S <joey.s.mello@hawaii.gov>; Hatayama, Jay M <jay.m.hatayama@hawaii.gov>
Cc: 'Stephanie Nagata' <nagatas@hawaii.edu>; 'Michelle Roberts' <mroberts@srgii.com>
Subject: Request Input Regarding Proposed Infrastructure Improvements at Maunakea Visitor Information Station at Halepōhaku within Palila Designated Critical Habitat.

Aloha,

SRGII is seeking input from DLNR-DOFAW regarding proposed infrastructure improvements at Maunakea Visitor Information Station at Halepōhaku within palila designated critical habitat. Please see attached memo and project description.

A hard copy of this communication is also being sent to your attention. We look forward to your input.

Best,
Kristin

Kristin Duin
Sustainable Resources Group Intn'l, Inc.
808.778.7364 (direct)
808.356.0552 (ph/fx)
www.srgii.com

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

7 October 2016

Sean Naleimaile
Hawai'i Department of Land and Natural Resources
State Historic Preservation Division
40 Po'okela Street
Hilo, HI 96720
Via email: Sean.P.Naleimaile@hawaii.gov

Subject: Request Input Regarding *Proposed Infrastructure Improvements at Maunakea Visitor Information Station* at Halepōhaku.

Aloha Mr. Naleimaile:

Sustainable Resources Group Intn'l Inc. (SRGII) has been contracted by RIM Architects on behalf of the Office of Maunakea Management (OMKM) and the University of Hawai'i (UH) Hilo, to prepare an Environmental Assessment (EA) in accordance with the Hawai'i Environmental Policy Act, Chapter 343, Hawai'i Revised Statutes (HRS), and its implementing regulations, Title 11, Chapter 200, Hawai'i Department of Health Administrative Rules (HAR) to analyze impacts of proposed infrastructure improvements at the Maunakea Visitor Information Station (Tax Parcel ID (3) 4-4-15:12). A detailed project description as well as a figure depicting the location of the improvements is attached.

Halepōhaku contains one known historical site, the Pu'u Kalepeamoa Complex. A portion of the proposed project site (where the walkway joins the new parking lot) overlaps with one of the outlier sites of the Pu'u Kalepeamoa Complex (site 50-10-23-10, 311). This site, which covers approximately 300 square meters, contained lithic scatters and was the subject of SHPD guided data recovery in 1993, including trenching. The data recovery was performed due to increased erosion in the vicinity and yielded 40 total artifacts. The site is not known to contain any residual artifacts. The Data Recovery Report for this site is attached.

The purpose of this correspondence is to solicit any early input or concerns of the State Historic Preservation Division (SHPD) regarding this project. Of particular interest is comment on the lithic scatter site. An archeologist has been contracted to survey the site within the next two weeks to determine if any surface artifacts are present. Additionally, per the *Maunakea Comprehensive Management Plan*, an archeologist will be on-site monitoring all ground disturbance throughout the project.

We look forward to your comments. If you have any questions or require additional information please contact me at 808-356-0552 (phone) or kduin@srgii.com (email). Thank you in advance for your assistance.

Sincerely,

Kristin Duin
Principal

Cc:
Stephanie Nagata, Office of Maunakea Management
Michelle Roberts, SRGII

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

November 28, 2016

Duane Kanuha, Planning Director
County of Hawaii
101 Pauahi Street Suite 3
Hilo, HI 96720

LOG NO: 2015.04293
DOC NO: 1611SN06
Archaeology

SUBJECT**:** **Chapter 6E-8 Historic Preservation Review –**
County of Hawaii Grading Permit for OMKM VIS Phase I Ingress/Egress Improvements
Kukuihaele Ahupua'a, Hāmākua District, Island of Hawai'i
TMK: (3) 4-4-015:001 por.

Thank you for the opportunity to review this project that was originally received by our office on December 15, 2015. We apologize for the delay and appreciate your patience and for providing additional information. According to the submittal, a 1.42-acre portion of the 52,742-acre State-owned parcel will be graded in order to facilitate Phase I improvements to the Office of Mauna Kea Management (OMKM) Visitor Station (VIS) to improve ingress/egress routes and associated infrastructure.

A review of our records indicates that this project area has been included in several archaeological investigations. Several historic properties have been identified in the near vicinity of the proposed project area within the Mauna Kea Access Road Corridor. An inventory survey (McCoy et al. 2010) for the Mauna Kea Access Road Corridor (MKARC) identified three possible burial mounds (Sites 27867, 27868, and 27869) and one lithic scatter (Site 10314). These four sites are outside the current project boundaries. Two nearby shrines (Site 10313 and Site 10315), each with a 200-ft. preservation buffer, also will not be affected. However, Site 16244, which was identified within the Hale Pāhaku area (see McCoy et al. 2009), partially extends into the current project area. The Gosser et al. (2014) archaeological monitoring plan (AMP) identifies Site 50-10-23-16244 as consisting of two shrines and five lithic scatters comprised of adze and octopus sinker manufacturing by-products. This AMP, titled *Long-Term Historic Property Monitoring Plan for the University of Hawaii Management Areas on Mauna Kea, Ka'ohe Ahupua'a, Hāmākua District, Hawai'i Island, State of Hawai'i TMK: (3) 4-4-015:009, 12* (Gosser et al. 2014), was accepted by SHPD on July 8, 2014 (Log No. 2014.02812, Doc. No. 1406SN22). Although missing in the title, this AMP includes the subject parcel, TMK: (3) 4-4-015:001, the MKARC, as indicated on page 4.

Based on current information, **SHPD's determination is no historic properties affected** with implementation of the SHPD-accepted archaeological monitoring plan (Gosser et al. 2014). The permit issuance process may continue.

Please contact Sean Nāleimaile at (808) 933-7651 or at Sean.P.Naleimaile@hawaii.gov for any questions or concerns regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc. Warren H. W. Lee (public_works@hawaiicounty.gov)
Michelle Roberts (mroberts@srgii.com)
Robyn Ito (rito@ssfm.com)

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Appendix A2. Draft EA Comments and Responses

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:
File:

EPO 17-056

March 14, 2017

Ms. Kristin Duin
Sustainable Resources Group Intn'l, Inc.
111 Hekili Street, Suite A373
Kailua, Hawaii 96734
Email: comments@srgii.com

Dear Ms. Duin:

SUBJECT: Draft Environmental Assessment (DEA) for Infrastructure Improvements at Maunakea Visitor Information Station, Hamakua, Hawaii
TMK: (3) 4-4-015:012

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:
http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawaii/2010s/2017-03-08-HA-5B-DEA-Maunakea-Visitor-Information-Station-Improvements.pdf

We understand from the OEQC publication form project summary that *"The University of Hawai'i Hilo is proposing a set of infrastructure improvements at Halepohaku to accommodate and address the increase in the number of visitors to the mountain; ensure the safety of visitors and workers; prevent unintended impacts to natural, historic, and cultural resources on the Halepohaku and adjacent parcels; and comply with the BLNR-approved Maunakea Comprehensive Management Plan. The Proposed Action includes: a new means of ingress and egress for vehicles to the Visitor Information Station (VIS), a new access lane and parking area, paving of an unimproved path to provide access from the new parking area to the VIS, drainage features, a greenhouse, and relocation of a cabin. Project activities would occur on the University's leased lands. The access to the ingress/egress and the new parking area would be through access points identified in the Halepohaku parcel lease."*

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55)

at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: http://health.hawaii.gov/irhb/noise EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared. We request that you utilize all this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,

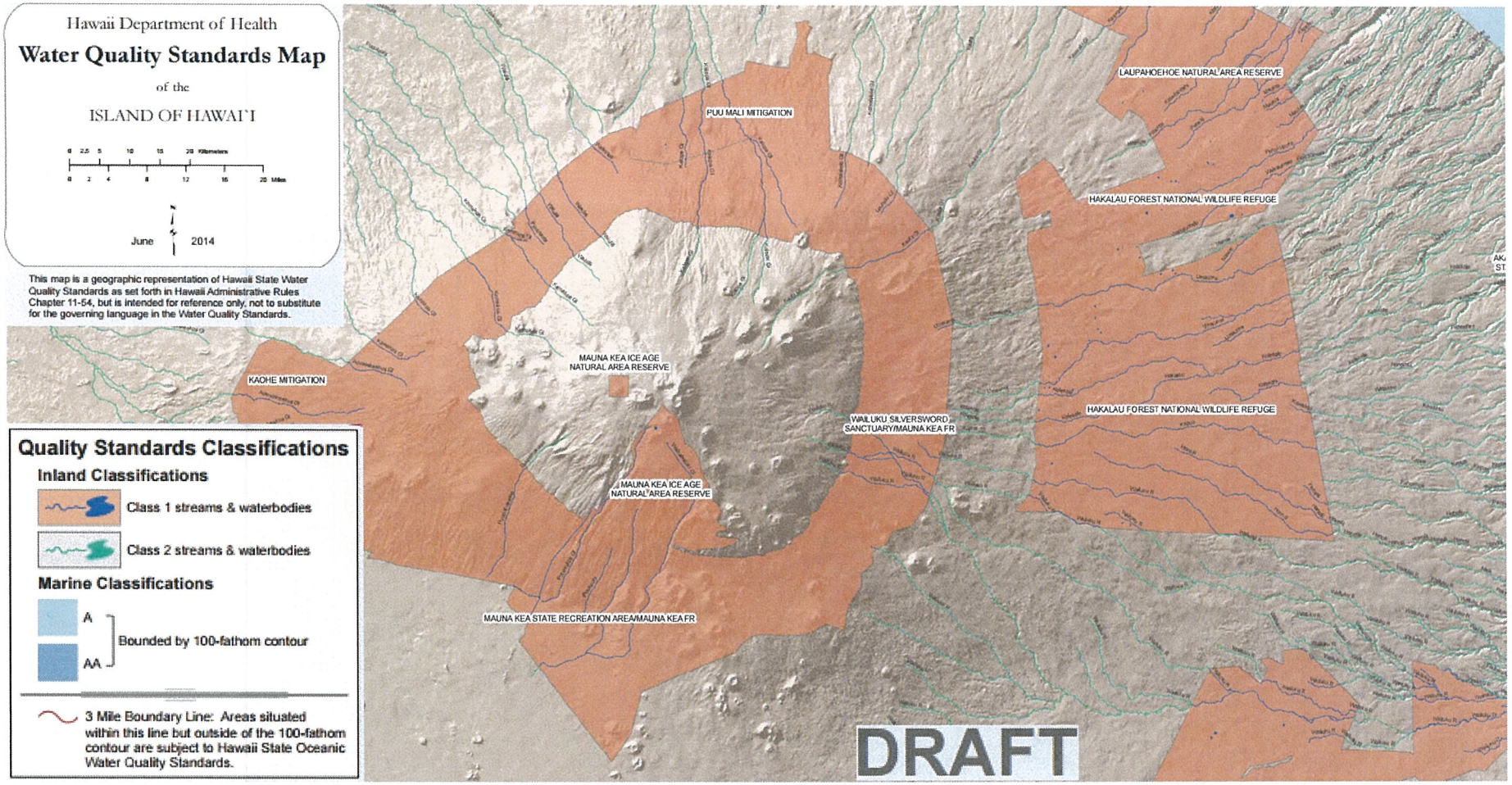
Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

Attachment 1: Clean Water Branch: Water Quality Standards Map - Hawaii
Attachment 2: OEQC viewer (of past EA's, EIS's in area)

c: Stephanie Nagata, UH Hilo (via email: nagatas@hawaii.edu)
DOH: DHO HI, CWB, IRHB {via email only}

Attachment 1: Clean Water Branch: Water Quality Standards Map - Hawaii



Attachment : OEQC viewer (of past EA's, EIS's in area)

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Laura Leialoha Phillips McIntyre
Program Manager
State of Hawaii Department of Health, Environmental Planning Office
P.O. Box 3378
Honolulu, HI 96801

Subject: Response to Comments on Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Ms. McIntyre,

Thank you for the comment letter dated March 14, 2017 on the *Draft EA: Infrastructure Improvements at Maunakea Visitor Information Station* in which you provided information about State and Federal environmental health land use guidance to ensure the project achieves sustainable, innovative, inspirational, transparent and healthy design. The references cited in your letter were utilized during the project design and the development of the EA. Applicable guidance and standard comments have been revisited and it was determined that no changes to the EA were required. The Draft EA states that temporary noise generated from the construction activities associated with the proposed project is expected to exceed the maximum permissible sound levels of 78 decibels, as specified in HAR 11-11-46, *Community Noise Control*, and an approved Community Noise Permit from HDOH would be obtained (EA Section 3.1.9).

Please note that based on public comments received, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed; not relocating the cabin to VIS Parking Area 1; and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue. The changes are reflected in the Project Description (EA Section 2.1.1) and the discussion of Flora (EA Section 3.1.3).

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM/UH Hilo, nagatas@hawaii.edu

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

From: Andrew Cooper <acooper@keck.hawaii.edu>
Sent: Tuesday, March 14, 2017 4:47 PM
To: 'comments@srgii.com'
Subject: Comments on the Draft EA for Infrastructure Improvements at Maunakea Visitor Information Station at Halepohaku on Maunakea

Comments on the Draft EA for Infrastructure Improvements at Maunakea Visitor Information Station at Halepohaku on Maunakea:

Better parking is something desperately needed at the Mauna Kea Visitor Information Station. As one who works daily on Mauna Kea and has volunteered thousands of hours at the VIS I am extremely familiar with the issue and the area impacted by this project.

The impact of the hundreds of visitors each day upon the area around the VIS has been neglected far too long. The safety issues involving the existing parking and traffic up and down the Mauna Kea Access Road cannot be understated.

With true concern I have read this EA containing the details of a new parking area for the visitor station. This is a well thought out plan that should have been built years ago.

There is nothing in this plan which appears to present an issue… The area to be utilized is already disturbed ground. The drainage plans seem well thought out, a true concern given the slope and the soft cinder soil. Thought has been put into vehicle and foot traffic flow to and from the visitor station, particularly important as much of this traffic occurs after dark.

Please see that this plan is quickly approved and built in order to improve safety.

Andrew Cooper
acooper@pobox.com
http://www.darkerview.com
Waikoloa, Hawaii

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Andrew Cooper
Waikoloa, Hawaii
acooper@pobox.com

Subject: Response to Comments on Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Mr. Cooper,

Thank you for the comment letter dated March 14, 2017 on the *Draft EA: Infrastructure Improvements at Maunakea Visitor Information Station* in which you stated that this is a well thought out plan that will improve safety. Many agree that visitor safety and the avoidance of unintended impacts to resources at Halepōhaku is important. The Proposed Action was developed with this in mind using a team of experts familiar with the conditions and resources present, and within the guidelines of the *Maunakea Comprehensive Management Plan* and all other applicable guidance and regulations. Please note that based on public comments received, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed, not relocating the cabin to VIS Parking Area 1 and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue.

This project's benefits include: 1) improving public safety by defining parking and walkways; and 2) decreasing habitat degradation throughout the parcel by delineating walkways and walk throughs; and 3) creating more effective and efficient parking. The University of Hawai'i believes that an Environmental Assessment and FONSI are appropriate for this project.

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

From: Cheryl B <burgharc@gmail.com>
Sent: Tuesday, March 28, 2017 11:06 AM
To: comments@srgii.com
Subject: Hale Pohaku Parking revisions

To Whom It May Concern:
OMKM Mission
To achieve harmony, balance and trust in the sustainable management and stewardship of Mauna Kea Science Reserve through community involvement and programs that protect, preserve and enhance the natural, cultural and recreational resources of Maunakea while providing a world-class center dedicated to education, research and astronomy.

Forgive me for not trusting that anyone in the OMKM or UH Hilo will fulfill the mission statement above. To date, there have been no signs of this being a credible expectation. Just because they say "they will do better" does not mean after all of these years we will actually see it.

My own personal experience with OMKM and issues that I have asked them to resolve as well as the DLNR about with no viable responsive action would be enough alone to give credence to my doubt. In addition, I have the stories and video evidence from hundreds of others to their total inability to manage, maintain and protect what they already have. Easily proven by a quick GOOGLE search.

Why would there be any trust when we know that they have already begun dangerous actions like the guardrail and removal of the crosswalk. We know the reasons but wanting support for the need of the new parking and direct action against protectors and tourists who visit is not sufficient for creating a dangerous situation now at Hale Pohaku.

I read through the many reports and understand what is written BUT there is no point in acting on them or giving support IF OMKM and UH Hilo can not be trusted to follow their own mission statement. I STRONGLY object to allowing them NOR their newly created hui to be in charge of anything for the Mauna. They have just not shown that they are capable of managing the Mauna with the care and respect and in a pono way.

Mahalo for your time.
Cheryl Burghardt

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Cheryl Burghardt
burgharc@gmail.com

Subject: Response to Comments on Draft Environmental Assessment on Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Ms. Burghardt,

Thank you for the comment letter on the Draft EA dated March 28, 2017 in which you express concerns about the entities responsible for stewarding Maunakea. OMKM and UH Hilo have been charged with managing the natural, historic, and cultural resources within the leased lands on Maunakea and do so through a Board of Land and Natural Resources approved plan (*Maunakea Comprehensive Management Plan (CMP)*). As required by the BLNR when it approved the CMP, OMKM has submitted annual reports on the status of the implementation of the CMP.

Many agree that visitor safety and the avoidance of unintended impacts to resources at Halepōhaku is important. The Proposed Action was developed with this in mind using a team of experts familiar with the conditions and resources present, and within the guidelines of the *Maunakea Comprehensive Management Plan* and all other applicable guidance and regulations.

Based on public comments, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed; not relocating the cabin to VIS Parking Area 1; and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue. The changes are reflected in the Project Description (Section 2.1.1) and the discussion of Flora (Section 3.1.3).

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

111 Hekili Street, Suite A373
Kailua, HI 96734
Tel/Fax: 808-356-0552 • www.srgii.com

Jessica Kirkpatrick
University of Hawai‘i at Hilo
TCBES Graduate Student
April 4th, 2017

Aloha,

Below are my four comments (2 pages) to the Draft EA for the Maunakea Visitor Information Station Improvements. The text in bold are the main topics, and the comments for each topic is explained below the bold text.

1) Figure 1 in the Draft EA: Map of the Location within the State Land Use Conservation District
Colors that outline parcels are not represented in the legend, and therefore should not be included, or should be described in the legend. The imagery parcel below Halepōhaku (DHHL?) is also not represented in the legend. Might want to convey this in a better way.

2) Relocation or demolition of the Northern most Longhouse building
The ant species *Cardiocondyla kagutsuchi* has been documented in the Halepōhaku lower parking area (near the stone cabins parking lot, Kirkpatrick & Klasner 2015), and has also been found on numerous occasions near the VIS Parking Area 3 between the Longhouses and Cabins (Unpublished, OMKM Invasive Species Reports 2014 & 2015). The demolishment or relocation of the Northern most Longhouse building could potentially unveil ant nests or other non-native invertebrates (this includes the European Honey Bee, *Apis mellifera* which could pose a risk to public health and safety). This action could potentially spread the ants or other unwanted invertebrates to the relocation site or the site where demolished materials are being held. Caution must be taken when the building is demolished or relocated. I recommend a thorough invasive species inspection (including baits) by an OMKM approved biologist of the building before and after the building is relocated or demolished to reduce the spread of ants and other non-native invertebrates. If ants or other non-native invertebrates are found before, during, or after relocation or demolition, I recommend to treat the area using OMKM control methods.

Citation: Kirkpatrick, J. and F. Klasner. 2015. 2013 Invasive Species and Native Arthropod Monitoring Report. Office of Mauna Kea Management.

3) Relocation of Cabin 2 to the VIS Parking Area 1
The cabins have not been included in OMKM’s Invasive Species Perimeter Surveys (Figure 10 in the Draft EA for VIS Improvements), and therefore potential invertebrate threats remain unknown. The ant species *Cardiocondyla kagutsuchi* has been documented in the Halepōhaku lower parking area (Kirkpatrick & Klasner 2015), and has also been found on numerous occasions near the VIS Parking Area 3 between the Longhouses and Cabins (Unpublished, OMKM Invasive Species Reports 2014 & 2015). Cabin 2 (along with the other cabins) may house ants (*Cardiocondyla kagutsuchi)* and other non-native invertebrates such as Yellow Jackets (*Vespula pennsylvanica)* and European Honey Bees (*Apis mellifera).*

In May 2012, an *A.mellifera* swarm was documented inside of the VIS (Kirkpatrick & Klasner 2015), and Cabin 2 could potentially house *A.mellifera* as well. The relocation of Cabin 2 to to VIS Parking Area 1 with *A.mellifera* could pose a threat to public health and safety. Also, the proximity of the Cabin's relocation site (VIS Parking Area 1) to the Silversword Enclosure is of concern, because if ants are present in the Cabin, they could spread ants to an area that has not had ants before and ants could potentially spread into the Silversword enclosure. Caution must be taken when the building is relocated. I recommend a thorough invasive species inspection (including baits) by an OMKM approved biologist of the building before and after the building is relocated from the Cabins original site to reduce the spread of ants and other non-native invertebrates. If ants or other non-native invertebrates are found before, during, or after relocation, I recommend to treat the area using OMKM control methods.

Citation: Kirkpatrick, J. and F. Klasner. 2015. 2013 Invasive Species and Native Arthropod Monitoring Report. Office of Mauna Kea Management.

4) Māmane restoration efforts

I recommend that māmane restoration is practiced in collaboration with the Maunakea Forest Restoration Project (MKFRP). MKFRP aims to restore habitat for the Palila, and have been doing so for some time now. From 1997- 2006, the USGS translocated Palila from the SW slope of Maunakea to Puʻu Mali (which is an area that MKFRP plants māmane and other native plants to restore Palila habitat). This study concluded that the "limited elevation range of māmane and food availability was likely the reason the population didn't persist" (http://dlnr.hawaii.gov/restoremaunakea/management/palila-management/). The MKFRP website explains that "māmane trees growing across a large elevational range are a good indicator of suitable palila habitat, and currently palila occur where the elevational distribution of the māmane forest is greatest" (http://dlnr.hawaii.gov/restoremaunakea/palila/māmane/).

It would be most efficient if OMKM collaborates with MKFRP to identify the best locations to out-plant māmane that would increase the elevation range of māmane for Palila in a way that connects and extends māmane habitat from the lower reaches of prime habitat to the higher elevations near Halepōhaku. Planting may require permission from DLNR and would likely be a distance away from HP however, this would help to restore habitat for Palila in the future, and these restoration efforts would be worthwhile. This action would also support climate change regimes; as mosquitos increase in elevation, Palila would have a continuous māmane habitat that ranges from the lower to higher elevations.

MKFRP has 68% average survival rate of māmane after one year, and they have planted over 70,000 seedlings from 2010- 2013 in Puʻu Mali and Kaʻohe restoration areas (http://dlnr.hawaii.gov/restoremaunakea/management/forest-restoration/). MKFRP's experience in restoration success could help OMKM to increase māmane survivorship and planting success for all restoration efforts.

Mahalo,

Jessica Kirkpatrick

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Jessica Kirkpatrick
jakirkpa@hawaii.edu

Subject: Response to Comments on Draft Environmental Assessment on Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Ms. Kirkpatrick,

Thank you for the comment letter on the Draft EA dated April 4, 2017 in which you express concerns related to invertebrates and māmane restoration, and indicate improvements that could be made to Figure 1. Responses to the items outlined in your letter are addressed within detailed comments presented below. Corresponding changes have been made to the EA text, and publication of a Final EA is forthcoming.

Figure 1, including the legend, has been revised to include suggested changes.

Relocation or demolition of the Northern most Longhouse building. Your concerns related to invertebrates regarding public health and safety and the need to avoid the spread of invasive species are noted. The *Maunakea Invasive Species Management Plan* was approved by the Maunakea Management Board in 2015 and is published on the OMKM website. The provisions of this plan will be adhered to during project implementation. Additionally, the following text has been added to the project BMPs, which are included in the EA (Appendix B) and reviewed with all personnel that would be involved with the proposed project.

Prior to relocation or demolition of the longhouse, the inside and outside perimeter of the building will be inspected by a qualified biologist/entomologist for any invasive invertebrates with a focus on species of concern including ants, bees and wasps. Inspection will include the use of baited traps. If species with the potential to cause harm to people or the environment are present, allowable methods will be used to treat nests and individuals prior to demolition or moving of structures. The entity that receives the longhouse will be informed of any findings and treatment methods used prior to the structure being relocated.

Relocation of Cabin 2 to the VIS Parking Area 1. The project description has been revised to no longer include relocation of the cabin to VIS Parking Area 1 (Section 2.1.1).

Māmane restoration efforts. OMKM has an ongoing dialogue with entities and individuals engaging in work regarding palila and māmane woodlands. Lessons learned during restoration and enhancement of māmane woodland habitat have been and will continue to be taken into consideration.

While OMKM recognizes that out-planting across a larger elevation gradient than exists at the Halepōhaku parcel is important, project mitigation efforts related to the planting of native species will be confined to the areas within UH managed land at Halepōhaku that can reasonably support vegetation without mortality due to human activity. The mitigation effort is being contained to the Halepōhaku parcel to ensure that OMKM is 100% responsible for its success. To ensure the highest level of survival, the māmane seedlings planted by OMKM within the Halepōhaku parcel will receive extra care such as watering and weeding. The average māmane survival rate cited was, in part, used as a basis for ensuring that the proposed restoration efforts exceed Hawai'i Administrative Rule (§13-5-22, P-11) requirements of one-to-one replacement of trees removed (Section 3.1.3).

The greenhouse will provide for the long-term, ongoing propagation of various native plant species that could be planted not only at Halepōhaku, but potentially on the DLNR-managed State lands surrounding Halepōhaku. The EA mentions the potential for expanding habitat enhancement efforts into the adjacent Forest Reserve [Section 1.3 (Draft EA, pg. 13, Lines 3-4); Section 3.5 (Draft EA, pg. 44, Lines 39-40)]. This will need to be coordinated with State of Hawai'i DLNR Division of Forestry and Wildlife (DOFAW).

Based on public comments, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed; not relocating the cabin to VIS Parking Area 1; and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue. The changes are reflected in the Project Description (Section 2.1.1) and the discussion of Flora (Section 3.1.3).

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

April 6, 2017

APPLICANT:
University of Hawai'i at Hilo
200 W. Kāwili St.
Hilo, HI 96720-4091
nagatas@hawaii.edu

CONSULTANT:
Sustainable Resources Group Intn'l, Inc.
111 Hekili Street, Suite A373
Kailua, HI 96734
www.srgii.com
comments@srgii.com

Aloha,

A review of the Draft Environmental Assessment (EA) for proposed Infrastructure Improvements at Maunakea Visitor Information Station, TMK (3) 4-4-015:012 District of Hāmākua, Island of Hawai'i, State of Hawai'i has led us to conclude that the present and future anticipated cumulative impact is significant, and this project, added to other anticipated projects, would significantly impact critical habitat for the palila, pave over historic sites, impede cultural access to public lands at the whim of the University, continue to drive increased visitor capacity, and increase the potential for invasive species introduction. At the same time that the Institute for Astronomy has cut the hours of the visitor center, and cut the number of star-gazing nights from seven to four, they now propose the close gates to the parking area to close the public (rightholders) out of public lands. The University purports that this proposal is intended to improve public health and safety, but the benefits are marginal, and do not outweigh the costs.

The impact of the University of Hawaii's management of UH leased lands has already caused significant, adverse, and substantial cumulative impact to the natural and cultural resources of Mauna Kea. The incremental removal of vegetation in critical habitat, the impact of disturbance on historic resources, and the failure to address the impact of the proposed project on the cultural, religious, and ceremonial practice of Native Hawaiian practitioners, all demonstrate that a FONSI should not be issued, No Action Alternative selected, and/or that an EIS should be

conducted for this project.

In response to the Draft Environmental Assessment (EA) for proposed Infrastructure Improvements at Maunakea Visitor Information Station, TMK (3) 4-4-015:012 District of Hāmākua, Island of Hawai'i, State of Hawai'i , we ask that the FONSI be denied, that the No Action Alternative be taken, and/or that that an EIS be conducted. Regarding the Draft EA, we submit the following comments:

1) **Purpose and Need for Action**

The UH Master Plan 2000 states that the Visitor Center (VIS) and grounds are managed by the University of Hawaii at Manoa's Institute for Astronomy. Why is the University of Hawaii at Hilo's Office of Mauna Kea Management proposing VIS infrastructure improvements on behalf of the University of Hawaii at Manoa's Institute for Astronomy?

With just over twenty years remaining on General Lease No S-5529, and with Governor Ige's stated intent to reduce the number of visitors, including commercial tours, to Mauna Kea, it is not clear in the section what justification can be made for construction of expanded parking areas. No mention is given to reducing the number of commercial tours, as outlined by the governor in 2016.

The stated purpose, *to address the increase in the number of visitors to the mountain*, cannot be justified, given the budgetary constraints of the Mauna Kea Support Services. According to an April 3, 2017 news report by Big Island Now, "The free stargazing program at the Maunakea Visitor Information Station on the Big Island will be reduced from seven to four nights a week beginning on April 17, 2017." It goes on to state that "Maunakea Observatories Support Services also cannot afford to continue to adequately staff stargazing every day of the week."

Given the mismanagement of public lands documented by the Legislative Auditor and acknowledged by the governor and the president of the University of Hawaii, over the course of the lease, it is not at all clear that the public health and safety will be assured by the proposed project.

The placement of an administrative building in the current visitor parking area would appear to be an administrative convenience, not a move to improve public health and safety.

The VIS interior is largely devoted to promotion and sales of merchandise. Its hours of

operation are not entirely relevant to public safety. Closure of a public parking area when the VIS is closed does not provide the public with access to toilets, water, space for acclimatization, nor does it allow access to areas used in cultural practice and ceremony.

References to the ad hoc shoulder parking, which has been obstructed by a guard rail recently constructed, does not justify the proposed project's destruction of cultural and historic properties, and the removal of trees used for foraging in the critical habitat of the endangered palila.

. *"Installation of a guardrail to eliminate ad hoc parking on the road shoulder of the Maunakea Summit Access Road opposite the VIS is scheduled to occur under the scope of a separate project."*

In fact, it seems clear that the guardrail was an ill-conceived attempt to justify the control and restriction of resident and tourist parking by gating the parking lot at will. It appears from the placement of gates and guardrail, that all parking for acclimation, and for visiting the silversword enclosure, and for cultural practice relating to the ahu and hale could be restricted to the point that all stopping in the area would obstruct the Mauna Kea Access Road. This does not improve public safety.

With placement of the guardrail and removal of the crosswalk, visitor access is impeded and visitor safety is imperiled while you acknowledge that visitors regularly cross the road to access Pu'u Kalepeamoa.

"While some visitors hike only a short distance to Pu'ukalepeamoa (sometimes referred to as sunset hill), hikers can access the summit via the Maunakea Trail." (page 37)

The new guardrail also restricts Practitioners from going to the Hale and the historic site conveniently and practically stops kupuna and disabled from that activity (in having to go around the "ends" of the guardrail to access the area). A cut in the guardrail large enough for access to the Hale and trails, along with re-instating the crosswalk, would be imperative to protecting public health and safety.

Did OMKM consult or request the guardrail emplacement and the removal of the crosswalk? What entity was responsible for these actions?

The project area is a known historic property utilized in the past for adze production, as evidenced by the recovery of lithic scatter and implements documented in the EA. The land is held in trust for the people of Hawaii; it is not owned by the State of Hawaii or the University. The land abuts a DLNR-managed site used for cultural ceremony and visited by thousands to view ahinahina (Mauna Kea silverswords).

The purpose of HAR 13-5 is to regulate land use in the conservation district for the purpose of conserving, protection and preserving important natural resources…to promote their long term sustainability…" Natural resource is defined to include cultural, historic and archaeological sites.

Converting a significant sacred cultural site into a paved parking lot for the convenience of commercial tours does not meet the intent of the law, and amounts to desecration.

2) Alternatives

Alternative 1

2.1.1Project Description:

What entity manages the land where the new ingress/egress connects to the Mauna Kea Access Road? The entity is not identified.

What entities manage the parcels adjacent to the Hale Pohaku site? These entities are not identified.

Construct access lane and parking improvements

As described later in the document, the proposed project area is a cultural and historic site, and and it is identified critical habitat for an endemic Hawaiian bird; the proposed project would grade and pave over the site in a way that would make it virtually impossible to utilize or relate to the site as it is today.

Relocate or demolish existing building (northern-most longhouse (dormitory)

Why would the Northern Longhouse be removed or demolished at a time when telescope decommissioning is anticipated in the near future, and over 100 construction workers are hoping to begin work on the TMT and would require housing? The need for construction housing and further habitat reduction planned to accommodate housing is discussed later in the document.

Construct Greenhouse

Not discussed in the EA is what entity or organization would be running or funding the operation of the greenhouse. The EA should be clear regarding the intent, scope and funding of

the greenhouse. What security will be in place for protection of rare and threatened plants?

Install gates

Installation of gates, and at the same time installing a guardrail on the opposite side of the Mauna Kea Access Road, signals the intent to disallow any stopping at the Hale Pohaku site outside VIS hours, which are now restricted. In light of the punitive closure of the restrooms and portable johns in 2015, it is clear that far from improving safety of residents, the OMKM intends to limit, not improve, access.

> *The other three gates (one separating the planned ingress/egress and the gravel VIS Parking Area 3, and two located along Maunakea Summit Access Road), would generally be left open during normal working hours. They are anticipated to be used as needed to secure the facilities during periods when the VIS is not open to the public, …*

This gate closure would preclude use of the restrooms, visitation to DLNR's silversword enclosure, cultural ahu, and hale. It would also restrict visitation to Pu'u Kalepeamoa when parking was restricted. If parking areas are gated when VIS is not open, where would visitors park to acclimatize?

Relocate one cabin to existing VIS Parking Area 1

By moving the "cabin" to the existing parking area, several issues would be exacerbated. The physical imposition of the cabin in the parking lot set aside for restroom access and handicapped parking is ugly and unnecessary. Visually, the DLNR silversword enclosure and significant cultural ahu would be impacted, and the structure across from the VIS would act as a imposing gateway to the cultural access of the ahu.

There are 23 parking places spaces now by the VIS. Removing six that are convenient to the VIS, and placing a structure in the area that impedes convenient parking, adjacent to the only entrance to the DLNR-managed enclosure where the ahu is located, makes no sense.

2.1.3
Rock Movement Plan

How will a biologist inspect 15 cubic yards of rock in a dump truck? There is a lot of Russian Thistle upwind from the quarry that is not on Mauna Kea. Will the material be inspected by the biologist before it is loaded into the dump truck?

Will the rock be tested for depleted uranium and other potential hazardous contaminants?

3.1 Environmental Setting

With regard to the walkway slope proposed to be 4-12%, we believe that for ADA access the slope should be no greater than 8%. Unless all commercial tour passengers are without disability, the slope should accommodate ADA requirements. Otherwise, commercial tour vans could justify the use of all the disability parking.

Will the walkway be constructed to ADA standards?

3.1.2 Drainage, Water Features and Water Quality

What is the impact of increased visitation of the VIS on the cesspool/ wastewater management?

Will all polluted waters from the drainage of the parking lot and access roadways be contained and filtered?

3.1.3 Flora

The proposed project would not only pave an area already impacted by expanded human use, it would remove more vegetation in the critical habitat of the palila. Mamane woodland at this site is critical habitat (food source) for palila. Palila have been recorded using the area. Numerous endemic species of flora on site. To be removed or salvaged are ʻaweoweo, pukiawe, pua kala, maʼohiʼoihi and little-leafed Stenogyne, and hinahina.

The environmental setting for the project area has been described as being “a transitional zone between two overlapping vegetation communities” (McCoy 1985:5-6)

The two communities are a sub-alpine xerophytic scrub and a Sophora chrysophylla (mamane) parkland. The treeless scrub is characterized by a variety of low shrubs: Styphelia tameiameiae (pūkiawe); Geranium cuneatum (noho-anu); Vaccinium reticulatum (ʻohelo); Raillardia ciliolate (naʻenaʻe), as well as a small fern, Pellaea ternifolia (kalamoho). In addition to the mamane and noho-anu, the parkland community contains Chenopodium oahuense (ʻaheahea), Coprosma montana (pilo), and a variety of native and exotic grasses and forbs.

The EA anticipates further segmentation of UH plans, in a reference to construction working housing for decommissioning at a later date. It states that more mamane trees could be removed for that project. This form of project segmentation demonstrates the same manner of incremental habitat loss that has led to significant, adverse and substantial cumulative impact on natural resources elsewhere on UH Managed Lands on Mauna Kea.

Removal 60-65 mamane trees that are tens to hundreds of years old cannot be replaced 2:1, particularly in the area adjacent to the human use area, often over-run by hikers, photographers, picnickers, and more. A far larger, fenced area of restoration should be funded, staffed and overseen for several years to assure establishment, should this project be permitted. A far greater replacement rate should be implemented, such as 20:1, to assure outplanting success over time. Any replanting to native flora in the area adjacent to human use is an effort that may be impacted by human activity, invasive species, grazing and trampling.

3.1.4 Fauna

The endangered hoary bat lives in the area and could be displaced from roosting and or nesting sites. A number of birds, including endangered palila, ʻamakihi, ʻapapane, and ʻIʼiwi are in the project area. The endangered Hawaiian hawk (ʻio), owl (pueo) and nene could use the area for foraging. Endangered petrel habitat is not known at this time.

How can habitat removal and disruption in critical habitat be justified, when further habitat removal is also expected for another project in the same general area on the same parcel?

A wide variety of native invertebrates, including several species of concern: Nesodyne, Micromus (flightless lacewings), endangered Hylaeus bees, newly discovered Agrotis, and Phaeogramma sp. Many forage on the plants that are proposed for removal.

The biggest concern with regard to the project and increased intensity of human use associated with visitation by commercial tours and particularly with visitors whose vehicles have not been cleaned, is the introduction of Argentine ant. With regard to this project we have concern regarding Pohakuloa quarry rock being brought in.

> *"Establishment of the argentine ant at Halepōhaku would likely significantly affect the native invertebrate population."*

The potential for invasive plants, animals and arthropods to change the ecosystem dynamics of Mauna Kea is tremendous, and would require additional staffing to address. Quarterly surveys for inverts is inadequate!

3.2.1 Traffic and parking

It is not clear from the EA how many parking spaces would be designated for commercial tours, visitors and staff in the proposed project area.

"The new 42 stall VIS parking Area 2 would be approximately 20,600 ft. and would accommodate personal vehicles and commercial tour vehicles."

Does the OMKM plan to increase the number of commercial tour permits as a re result of increased parking capacity?

Given that a recent fatality, and numerous other vehicular accidents have occurred on the Mauna Kea Access Road, a higher priority for CIP funding would appear to be a constructed runaway lane for cars and trucks whose brakes have failed descending the mountain. Governor Ige narrowly escaped a possible accident from a brake failure above Hale Pohaku when the vehicle he was riding in experienced a serious problem, prior to his transfer to another vehicle.

When considering the potential for overheating of brakes, such as the occurrence that led to a recent fatality, why would closure of visitor parking at mid-elevation ever be justified?

The administrative rules proposed by the OMKM in 2016 describe an enforcement authority. What rules would apply to enforcement of parking restrictions along the side of the access road when VIS gates are closed?

3.2.3 Solid Waste

According to news reports, nearly 300,000 visitors make their way to the VIS annually.

"In 2015 approximately 224,000 people visited Halepōhaku."

What is the current method of disposing of human waste?

Is all waste collected in toilets trucked out? What is the impact of closing the restrooms and portable toilets on the water quality of the area and its runoff? What impact did several weeks of human waste disposal in the open environment (due to punitive restroom closure) have on the natural and cultural resources? Given that

"Localized perched or dike-impounded groundwater features may or may not be present in the project area. Groundwater levels are assumed to be at significant depths below the ground surface."

What impact did exposed uncontained human waste have on the Onomea Aquifer and perched ground water that may or may not be present?

Given the conflicting reasons given by OMKM/IfA employees for several weeks of restroom

closure in 2015, none of which were intended to improve public safety, what criteria will be used for future punitive actions against the public?

If the gates were locked overnight and until noon, the result would be a nightly conversion of the outdoor area into a public toilet, again.

3.3.2 Recreational Resources

The EA claims that the VIS is open from 9 am to 10 pm, but the official website of the Institute for Astronomy states *"Open every day of the year from 12PM until 10PM at the 9,200 foot (2,800 meter) level, we provide health and safety information and education about Maunakea."*

"Hikes on designated trails of varying lengths can be accessed from Halepōhaku."

"Currently, there is the potential that some visitors do not heed warnings to acclimatize at Halepōhaku, due to congested parking (i.e., seeing vehicles parked ad hoc along the side of the road may lead visitors to infer that parking is full)."

It is not clear where hikers and photographers would be able to park and acclimatize if the VIS parking were gated at hours when the VIS is closed.

3.4 Historic and Cultural Resources

Due to repeated desecration of the sacred cultural sites of Mauna Kea, overwhelming outrage led to months-long efforts by Mauna protectors to heal and preserve the mountain's sacred nature. The ahu constructed by practitioners on the grounds of the DLNR-managed silversword enclosure is a site used by thousands for prayer and ceremony for those who are unable to ascend to higher elevations and those who continue the journey. For those who stop to pray, acclimate or prepare for ascent, access to parking at all times of the day and night are essential.

(From page 42: "There are a few known cultural practices and resources associated with Halepōhaku and the nearby surrounding area. There is a contemporary ahu within the DLNR-managed silversword enclosure that is utilized by cultural practitioners.")

"Access to the ahu and any cultural practices taking place within the nearby DLNR-managed silversword enclosure would not be affected."

Was there any effort to consult with cultural practitioners who conduct ceremony at the ahu to determine the impact the restriction of access would have? Closing the parking area with gates

would severely restrict Hawaiian cultural and religious access to a historical, cultural, religious and spiritual area who have a 24/7 requirement for use.

Minutes of the MKMB and KKM do not reflect an opportunity to review details the proposed project, nor does that review stand as evidence of consultation.

The historic nature of the project area means that the area had and continues to have cultural significance.

> *From Page 39-40*
> *Archaeologists identified the Pu'ukalepeamoa Complex, a tool quarry/workshop complex in and around Halepōhaku, in 1984. The complex is believed to have been multifunctional, consisting of several temporary camp sites where adzes and octopus lure sinkers were manufactured. The complex consists of twelve lithic scatters and two shrines, located within the Halepōhaku parcel and in the adjacent Mauna Kea Forest Reserve.*
> *It is hypothesized that the area was used as a production center for adze makers since the location provided for essentials such as firewood and food (forest birds) that would not be found further up the mountain. The twelve lithic scatters are comprised of adze manufacturing by-products and octopus sinker by- products. The adze manufacturing by-products suggests a direct relationship with the Maunakea Adze Quarry in that the material is not from a local source, but is abundant in the quarry. The type of stone used for octopus sinkers, primarily dunite and gabbro, occurs within the nearby Pu'ukalepeamoa Complex.*
>
> *"Factors identified in the CRMP and the CMP that are most likely to result in adverse effects to historical sites at Halepōhaku include mechanical earth moving, infrastructure maintenance, unauthorized artifact collection, natural erosion, and wind damage and impacts due to debris (rubbish). <u>A portion of Site 50-10-23-10311 is located within the area that would be graded and paved for the new VIS Parking Area 2 and associated walkway."</u>*

Both the CMP and HRS Chapter 6E require that no historic properties, including shrines, be altered or destroyed. ‘‘Recovery" of artifacts in the project area does not reduce the significance of the historic site to less than significant.

The highly divergent maps (Figures 4, 11, Figure 2 of PCSI on page C-4) do not clearly delineate the areas of historic "recovery", walkway, nor the areas of impact with any accuracy. For comparison of these figures, look at the walkway area in relation to the HP lease boundary. On one map the walkway is in the DLNR –managed enclosure.

#.5 Secondary and Cumulative Impacts

> *"Cumulative impacts result when implementation of several projects, whether past, current or foreseeable futures actions, individually have limited impacts but combine to produce more severe impacts or conflicts in mitigation measures."*
>
> *"Habitat disturbance and increased vehicular and pedestrian traffic at Halepōhaku due to past, planned, and future projects have the potential to result in cumulative adverse impacts. "*
>
> *"Construction and decommissioning activities in the Astronomy Precinct would likely require utilizing the mid-Level facilities at Halepōhaku. These activities could require new, expanded, or renovated facilities to house workers. Additional facilities (new and expanded) in the Halepōhaku area may or may not require removal of māmane trees, as well potentially disturbance of previously undisturbed areas. "*
>
> *"A (planned) stargazing deck would* ***improve the capacity for*** *and quality of* ***visitor experiences****".*

Our Conclusion:
It would seem from a review of this project that the present and future anticipated cumulative impact is significant, and this project, added to other anticipated projects, would continue to drive increased visitor capacity, reduce habitat, increase the potential for invasive species, pave over historic sites, and impede visitor and cultural access to public lands at the whim of the University. It purports to improve public safety, but the benefits are marginal, and do not outweigh the costs.

The impact of the University of Hawaii's management of UH leased lands has already caused significant, adverse, and substantial cumulative impact to the natural and cultural resources of Mauna Kea. The incremental removal of vegetation in critical habitat, the impact of disturbance on historic resources, and the failure to address the impact of the proposed project on the

cultural, religious, and ceremonial practice of Native Hawaiian practitioners, all demonstrate that a FONSI should not be issued, No Action Alternative selected, and/or that an EIS should be conducted for this project.

Thank you for the opportunity to comment.

Signed,

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SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

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Kurtistown, Hawaii 96760
dward@hawaii.edu

Subject: Response to Comments on Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Ms. Ward,

Thank you for the comment letter dated April 6, 2017 on the *Draft EA: Infrastructure Improvements at Maunakea Visitor Information Station*. Responses to the items outlined in your letter are addressed within detailed comments presented below in table format. Corresponding changes have been made to the EA text, and publication of a Final EA is forthcoming. Please note that one of your primary concerns, a perceived lack of access due to the installation of gates, has been addressed (see attached figure).

This project's benefits include: 1) improving public safety by defining parking and walkways; and 2) decreasing habitat degradation throughout the parcel by delineating walkways and walk throughs; and 3) creating more effective and efficient parking. The University of Hawai'i believes that an Environmental Assessment and FONSI are appropriate for this project.

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

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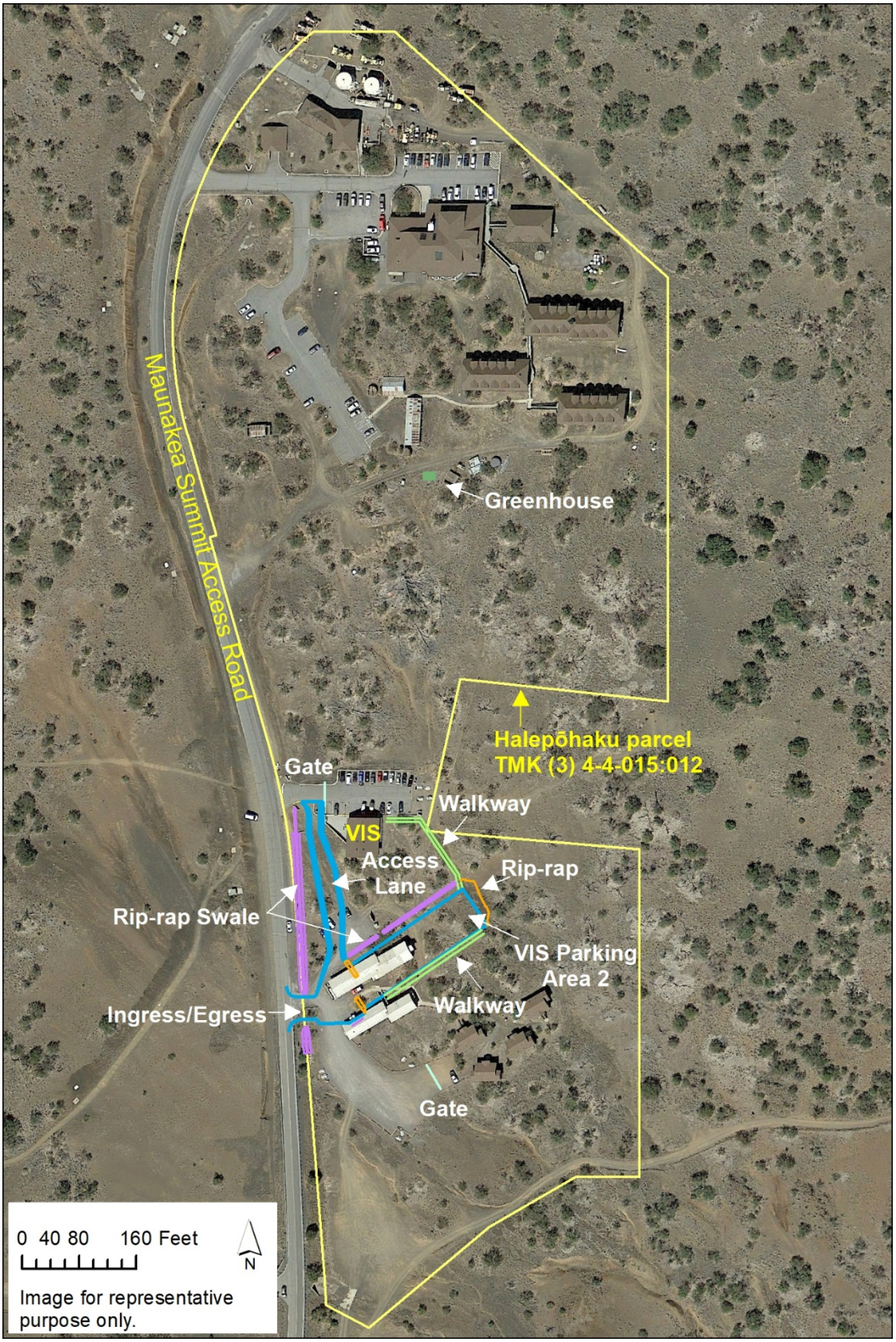
Figure 4. Maunakea VIS Infrastructure Improvements



Comment	Response
Collective responses submitted by a group of concerned citizens	**List of commenters:** (Kealoha Pisciotta and Mauna Kea Anaina Hou, Deborah J. Ward, Kaliko Kanaele, Clarence Kukauakahi Ching, Mehana Kihoi, Bimo Akiona, Temple of Lono c/o Lanny Sinkin, Chandell Asuncion, Tiffnie Kakalia, Leilani Lindsey-Kaapuni, William & Cindy Freitas, Amy R. Marsh, Christi Maumau, Cynthia Massa, Moku Loa Group of Sierra Club)
A review of the Draft Environmental Assessment (EA) for proposed Infrastructure Improvements at Maunakea Visitor Information Station, TMK (3) 4-4-015:0121 District of Hāmākua, Island of Hawai'i, State of Hawai'i has led us to conclude that the present and future anticipated cumulative impact is significant, and this project, added to other anticipated projects, would significantly impact critical habitat for the palila, pave over historic sites, impede cultural access to public lands at the whim of the University, continue to drive increased visitor capacity, and increase the potential for invasive species introduction. At the same time that the Institute for Astronomy has cut the hours of the visitor center, and cut the number of star-gazing nights from seven to four, they now propose the close gates to the parking area to close the public (rightholders) out of public lands. The University purports that this proposal is intended to improve public health and safety, but the benefits are marginal, and do not outweigh the costs. The impact of the University of Hawaii's management of UH leased lands has already caused significant, adverse, and substantial cumulative impact to the natural and cultural resources of Mauna Kea. The incremental removal of vegetation in critical habitat, the impact of disturbance on historic resources, and the failure to address the impact of the proposed project on the cultural, religious, and ceremonial practice of Native Hawaiian practitioners, all demonstrate that a FONSI should not be issued, No Action Alternative selected, and/or that an EIS should be conducted for this project. In response to the Draft Environmental Assessment (EA) for proposed Infrastructure Improvements at Maunakea Visitor Information Station, TMK (3) 4-4-015:0121District of Hāmākua, Island of Hawai'i, State of Hawai'i , we ask that the FONSI be denied, that the No Action Alternative be taken,	The gates were included in the project due to OMKM policy, outlined in the *Maunakea Sign Plan*, which requires OMKM to seek permission from DLNR/BLNR to install 'permanent traffic control devices' in the event that temporary barricades are regularly used. Temporary barricades (orange traffic cones and signage) are regularly used during periods of peak visitation to indicate that parking areas adjacent to the VIS are full. Installation of the gates would have eliminated the need to staff the temporary barricades during times when the parking areas are full. Taking into consideration public comment on the location of the gates, and the perception that they could be used to block access to all parking areas, the number and location of gates has been revised (see attached figure). The Proposed Action has been revised to include only two gates: one in VIS Parking Area 3 near the Subaru cabins, which would be used to delineate employee parking; and one on the western edge of VIS Parking Area 1. The gate on the edge of VIS Parking Area 1 would only be closed during the evening stargazing program to increase safety to stargazers that use the lot, as well as during occasional routine maintenance. The gate will not block access to the proposed access lane, nor any other parking areas. This gate will be staffed when closed during stargazing activities in case ADA or emergency access is needed and left open nightly after the conclusion of stargazing activities (Detailed in the revised Project Description Section 2.1.1). Although not all of the previous identified gates are being proposed, the concerns over safety remain. Portable barricades, traffic cones, and temporary signs indicating certain parking areas

Comment	Response
and/or that that an EIS be conducted. Regarding the Draft EA, we submit the following comments:	are full will continue to be used. Additionally, per existing practices, staff will be stationed at the entrance to the full parking areas to direct visitor traffic. As detailed in Section 5 of the Draft EA (Determinations, Findings and Reasons), the environmental analysis does not support the conclusion of a finding of a significant impact. Additionally, as identified on page 1 of the Draft EA, the project purpose is in part to prevent unintended resource impacts through better defining ingress/egress, clearly defining parking areas and walkways, and managing and preventing erosion. The Draft EA outlines best management practices (Appendix B) that will be followed to avoid adverse impacts as well as mitigation measures for unavoidable project impacts. Additionally, construction of long-term facilities will support native habitat enhancements with positive impacts that extend beyond the scope of the immediate project.
The UH Master Plan 2000 states that the Visitor Center (VIS) and grounds are managed by the University of Hawaii at Manoa's Institute for Astronomy. Why is the University of Hawaii at Hilo's Office of Mauna Kea Management be proposing VIS infrastructure improvements on behalf of the Institute for Astronomy?	The University of Hawai'i at Hilo was granted the funds to implement a project to improve visitor safety and the VIS after community expression of concerns on the issue. As the land management entity, OMKM coordinated with Maunakea Observatories Support Services (MKSS) which reports to the Institute for Astronomy on project development and implementation.
With just over twenty years remaining on General Lease No S-5529, and with Governor Ige's stated intent to reduce the number of visitors, including commercial tours, to Mauna Kea, it is not clear in the section what justification can be made for construction of expanded parking areas. No mention is given to reducing the number of commercial tours, as outlined by the governor in 2016.	As indicated in the EA, "Management policy outlined in the Mauna Kea Science Reserve Master Plan (2000 Master Plan) states that parking areas would be increased incrementally at Halepōhaku as demand increases (Group 70 International, Inc. 2000)." (Section 1.2 Draft EA, pg. 3, Lines 19-21). Visitors currently park in VIS Parking Area 1 and VIS Parking Area 3 (also known as the construction staging lot), and until recently, ad hoc along Maunakea Summit Access Road across the street from the VIS. The Purpose and Need for the project is discussed in Section 1.2. The proposed project is not expanding parking, but rather

Comment	Response
	improving parking efficiency and the safety of visitors. It also helps facilitate more safe passage for those on existing permitted commercial tours. These changes are necessary as the University cannot abandon their responsibility for public safety until their lease expires. The project also fulfills lease requirements to prevent improper use of the premises. By clearly and safely defining appropriate ingress, egress, parking, and walking areas, remaining portions of the parcel already impacted by increasing visitor use can be restored using native māmane and other plants grown in the proposed greenhouse. The project does not provide for either an increase or a decrease in the number of permitted commercial tours. For example, each of the eight permitted commercial tour operators are not to exceed two vehicles on the mountain during evening tour periods (4:30pm – 10:00pm). OMKM has been working with the Hawai'i Public Utilities Commission, Hawai'i County Police, and State of Hawai'i DLNR Division of Conservation and Resources Enforcement to reduce the number of commercial tours to Maunakea by eliminating unpermitted group tours through their certificate and permitting process. Data collected between 2012 and 2016 shows that while the number of vehicles associated with independent visitors increased over that period, the number of vehicles associated with commercial tours did not (Section 3.3.2). The project also ensures the terms of General Lease No. S-5529 will continue to be fulfilled throughout the full term. Per the lease, the State retains the option to identify disposition of facilities at its conclusion.
The stated purpose, *to address the increase in the number of visitors to the mountain*, cannot be justified, given the budgetary constraints of the Mauna Kea Support Services. According to an April 3, 2017 news report by Big Island Now, "The free stargazing program at the Maunakea Visitor	The changes to VIS hours and number of stargazing nights occurred after the Draft EA was released for public comment. These changes have been incorporated into the EA (Section 3.3.2).

Comment	Response
Information Station on the Big Island will be reduced from seven to four nights a week beginning on April 17, 2017." It goes on to state that "Maunakea Observatories Support Services also cannot afford to continue to adequately staff stargazing every day of the week."	The proposed project is not aimed at further increasing the number of visitors to Maunakea, but rather providing for increased safety of the existing level of visitors, which has increased incrementally over the past decade.
Given the mismanagement of public lands documented by the Legislative Auditor and acknowledged by the governor and the president of the University of Hawaii, over the course of the lease, it is not at all clear that the public health and safety will be assured by the proposed project.	By having all visitors park on the same side of the road as the VIS, and providing easier access from parking/drop-off areas to the VIS, visitor health and safety will be improved. The proposed action fulfills the State of Hawai'i BLNR approved *Comprehensive Management Plan* management action IM-9 "Parking and Pullouts", which states that for safety reasons all parking should be on the same side of the road as the existing Halepōhaku facilities (Section 1.2).
The placement of an administrative building in the current visitor parking area would appear to be an administrative convenience, not a move to improve public health and safety.	The project description has been revised to no longer include relocation of the cabin to VIS Parking Area 1 (Section 2.1.1). Safety concerns that prompted inclusion of the cabin relocation remain however, and will continue to be evaluated. The relocated cabin was intended to serve as a community 'presentation room', replacing the existing (remaining) presentation room in the southern longhouse. Having visitors walk, often after dark, between the VIS and lower longhouse around an active parking lot presents safety challenges as many visitors may be tempted to take shortcuts through the parking lot amongst vehicle traffic. Relocating the cabin to VIS Parking Area 1 would have eliminated the long walk amongst vehicular traffic. Public presentations will continue to be held in the southern longhouse. Because presentations will continue to be held in the southern longhouse, an ADA compliant walkway that connects VIS Parking Area 2 with the entrance to the southern longhouse has been added to the scope of work.

Comment	Response
	Cabins in their existing, current location are used for administrative purposes and these administrative uses will be unaffected by this project.
The VIS interior is largely devoted to promotion and sales of merchandise. Its hours of operation are not entirely relevant to public safety. Closure of a public parking area when the VIS is closed does not provide the public with access to toilets, water, space for acclimatization, nor does it allow access to areas used in cultural practice and ceremony.	VIS hours were changed after the Draft EA was released for public comment. The EA has been updated to reflect those new hours (Section 3.3.2). The University's lease for the mid-level area allows for the operation of a visitor information station. The lease does not allow the University to operate the area as a park or camp site. Access for cultural practice will not be restricted or limited. The gate at VIS Parking Area 1 will be open all day and night, 7 days a week except during public stargazing activities that occur in the parking lot, and during occasional routine maintenance. It will be staffed during closure for stargazing activities to allow for ADA access and in case of emergency. All parking areas, including VIS Parking Area 1 will remain accessible, even during hours the VIS is closed. Toilet access is currently provided at all times and implementation of the proposed project will not change this. A walkway from the new parking area to the VIS provides access to the DLNR silversword enclosure. The area where the new VIS Parking Area 2 is to be located is currently used to park vehicles and is where the upper of the two long buildings is located. It does not appear that cultural activities occur in this area, but they do take place in the silversword enclosure, which UH understands DLNR will continue to allow to remain accessible.
References to the ad hoc shoulder parking, which has been obstructed by a guard rail recently constructed, does not justify the proposed project's destruction of cultural and historic properties, and the removal of trees used for foraging in the critical habitat of the endangered palila. *"Installation of a guardrail to eliminate ad hoc parking on the road shoulder of the Maunakea Summit Access Road opposite the VIS is scheduled to occur under the scope of a separate project."*	This project was planned to provide safer access for visitors to the Halepōhaku facilities. The guardrail was installed under the scope of a separate project and the property is not part of the UH managed lands on Maunakea. It was installed to prevent ad hoc parking that was both unsafe for visitors and damaging to natural resources. Visitors have been observed standing in the road while

Comment	Response
In fact, it seems clear that the guardrail was an ill-conceived attempt to justify the control and restriction of resident and tourist parking by gating the parking lot at will. It appears from the placement of gates and guardrail, that all parking for acclimation, and for visiting the silversword enclosure, and for cultural practice relating to the ahu and hale could be restricted to the point that all stopping in the area would obstruct the Mauna Kea Access Road. This does not improve public safety.	accessing the trunk of their vehicle in the darkened evening (Section 1.2). During project consultation State of Hawai'i DLNR identified that no recognized trails exist in the Mauna Kea Forest Reserve across from the Halepōhaku parcel. The General Lease requires the University to manage the Halepōhaku parcel such that visitor impacts are not directed to undeveloped areas (as described on page 1 of the Draft EA). The Proposed Action has been revised and now only includes two gates, neither of which would preclude visitors from parking in any of the parking areas at any time, except as stated above, in VIS Parking Area 1 during stargazing activities that occur in the lot and during occasional routine maintenance. The gate will be staffed during closure for stargazing activities to allow for ADA access and in case of emergency (Section 2.1.1).
With placement of the guardrail and removal of the crosswalk, visitor access is impeded and visitor safety is imperiled while you acknowledge that visitors regularly cross the road to access Pu'u Kalepeamoa. *"While some visitors hike only a short distance to Pu'ukalepeamoa (sometimes referred to as sunset hill), hikers can access the summit via the Maunakea Trail. "* (page 37) The new guardrail also restricts Practitioners from going to the Hale and the historic site conveniently and practically stops kupuna and disabled from that activity (in having to go around the "ends" of the guardrail to access the area). A cut in the guardrail large enough for access to the Hale and trails, along with re-instating the crosswalk, would be imperative to protecting public health and safety. Did OMKM consult or request the guardrail emplacement and the removal of the crosswalk? What entity was responsible for these actions?	State of Hawai'i DLNR programs do not identify the presence of a designated trail to Pu'ukalepeamoa or elsewhere in the vicinity of the proposed project, other than the Humu'ula trail. Without permitted or designated improvements for recreational opportunities, the University lease terms for the Halepōhaku parcel and Mauna Kea Forest Reserve management goals for lands surrounding the Halepōhaku parcel obligate the University to manage its activities to avoid unpermitted or improper use of the surrounding lands and resources. MKSS, the entity responsible for overseeing the general maintenance and logistical services to all Mauna Kea observatories and the facilities at Halepōhaku, requested the guardrail installation on the land and roadway under the jurisdiction of the State of Hawai'i Department of Transportation (DOT). OMKM was aware of the project. The crosswalk was covered during paving activities and may be replaced following discussion with DLNR regarding their desire to provide access to the Forest Reserve and discussions with DOT regarding cutting a passage way in the

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	guardrail. In the event DOT approves a request, MKSS is willing to assist with installation of a crosswalk and creating an opening in the guardrail. The Hale is not within the UH managed lands, thus outside the scope of this project. The Hale can still be accessed by going around the guardrail. Should DLNR decide they would like to create an access point to the Forest Reserve through the guardrail, the Hale would be more accessible.
The project area is a known historic property utilized in the past for adze production, as evidenced by the recovery of lithic scatter and implements documented in the EA. The land is held in trust for the people of Hawaii; it is not owned by the State of Hawaii or the University. The land abuts a DLNR-managed site used for cultural ceremony and visited by thousands to view ahinahina (Mauna Kea silverswords). The purpose of HAR 13-5 is to regulate land use in the conservation district for the purpose of conserving, protection and preserving important natural resources…to promote their long term sustainability…" Natural resource is defined to include cultural, historic and archaeological sites. Converting a significant sacred cultural site into a paved parking lot for the convenience of commercial tours does not meet the intent of the law, and amounts to desecration.	Historic properties are discussed in Section 3.4. The proposed project site in its entirety has not been deemed a historic site. Recovery of artifacts from Site 50-10-23-10311, the only portion of the Pu'ukalepeamoa Complex to be impacted by the Proposed Action, was completed under State of Hawai'i DLNR SHPD permits in 1993. The site was revisited in 2016 to ensure no artifacts were present (Draft EA, Appendix C). DLNR SHPD reviewed the Proposed Action and issued a determination that no historic properties will be affected with implementation of the DLNR SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea*, which is required for the Proposed Action. The *Long-Term Historic Property Monitoring Plan* is currently being implemented according to the terms outlined therein. None of the investigations conducted during the development of the EA, nor the DLNR SHPD consultation, labeled Site 50-10-23-10311 or the larger Pu'ukalepeamoa Complex a "significant sacred cultural site". A Data Recovery Plan prepared by SHPD provided for all artifacts to be recovered from Site 50-10-23-10311 in 1993 because slopewash and sheet erosion were gradually displacing some of the artifacts. In 2016 archeologists confirmed that Site 50-10-23-10311 did not contain any new historical artifacts. While the site is listed on the Statewide Inventory of Historic Places, it is not listed on the Hawai'i Register of Historic Places or the National

Comment	Response
	Register of Historic Places, nor has it been nominated. The Register is the system used to identify, evaluate, and protect historic and cultural resources. Although it is known, as stated in the EA, that the DLNR enclosure is utilized by cultural practitioners, the number of visitors who enter the DLNR enclosure to view the ʻĀhinahina, or the number of cultural practitioners who visit the enclosure is unknown as there have been no formal studies or surveys. The lele in the DLNR enclosure is a modern feature built less than 50 years ago. Aside from intermittent noise that would occur during construction, impacts to cultural practices within the enclosure would not be affected. The project site has been previously disturbed and current use includes parking areas, ingress and egress to those parking areas, and foot traffic between the two longhouses and the VIS. The installation of the Parking Area 2, which is the portion of the project that would cover a part of Site 50-10-23-10311, is not being proposed to accommodate commercial tours, it is being proposed to provide for safe visitor parking for all visitors. (See Draft EA Section 2.3 for alternative locations that were considered).
2.1.1 Project Description: What entity manages the land where the new ingress/egress connects to the Mauna Kea Access Road? The entity is not identified.	Footnote 7 (Draft EA, pg 6) has been clarified to state "The Maunakea Summit Access Road near Halepōhaku is owned by the State but maintained by the County of Hawaiʻi through a Memorandum of Understanding." The University of Hawaiʻi manages the Halepōhaku parcel. As shown on Figure 5, the new ingress/egress will connect the Halepōhaku parcel to the roadway and be primarily under University of Hawaiʻi management.
2.1.1 Project Description: What entities manage the parcels adjacent to the Hale Pohaku site? These entities are not identified.	See Section 1.4 (Draft EA, pg 4, Lines 32-33): "The Mauna Kea Forest Reserve surrounds the Halepōhaku parcel. DLNR Division of Forestry and Wildlife (DOFAW) manages parcels within the Forest Reserve system."

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	The State retains ownership of the entire Maunakea Summit Access Road. It is managed by the County from Saddle Road to the north end of the Halepōhaku parcel. The University of Hawai'i has an easement to manage this road upslope of the Halepōhaku parcel.
2.1.1 Project Description: *Construct access lane and parking improvements* As described later in the document, the proposed project area is a cultural and historic site, and it is identified critical habitat for an endemic Hawaiian bird; the proposed project would grade and pave over the site in a way that would make it virtually impossible to utilize or relate to the site as it is today.	The proposed project site in its entirety has not been deemed a historic site. It contains a portion of a site where historic artifacts were recovered but SHPD determined that no historic properties will be affected with implementation of the DLNR SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea* (Section 3.4). The site has been previously disturbed and is considered developed land. The site is currently utilized for parking and for cars moving from one parking area to another. It also contains two longhouses. In addition, the site is utilized by pedestrians passing between the parking areas to other areas of Halepōhaku or the adjacent State lands. However, trails for pedestrian use throughout the proposed project site are currently ill defined, which is contributing to degradation of resources. Clearly defining areas of ingress/egress, parking, and walking will allow for restoration of remaining areas. This long-term ecosystem benefit will improve the quality of habitat for endemic and other native birds and biota.
2.1.1 Project Description: *Relocate or demolish existing building (northern-most longhouse (dormitory)* Why would the Northern Longhouse be removed or demolished at a time when telescope decommissioning is anticipated in the near future, and over 100 construction workers are hoping to begin work on the TMT and would require housing? The need for construction housing and further habitat reduction planned to accommodate housing is discussed later in the document.	The longhouses have not been used to support construction lodging for many years. There are no plans to use these buildings to house construction workers. They are currently used for ranger offices and storing supplies. There is also a public presentation room that is used for lectures in the southern longhouse. Due to a variety of factors, the best location for the proposed VIS Parking Area 2 overlapped with the northern longhouse, requiring its removal as part of the project. All current use of the northern longhouse can be accommodated by the remaining southern longhouse and in four existing construction cabins.

Comment	Response
	The cumulative impacts section of an EA requires consideration of any potential impacts of the proposed project with past, current, or foreseeable future actions. Construction and decommissioning activities in the Astronomy Precinct would likely require utilizing the mid-level facilities at Halepōhaku. Although these activities *could* require new, expanded, or renovated facilities to house workers, that type of expansion seems unlikely as in the past construction workers opted to stay at sea level or in their own homes. There are existing dorms and cabins at Halepōhaku that can house construction workers if necessary. Text has been added to the EA to clarify available housing for construction workers (Section 3.5).
2.1.1 Project Description: Construct Greenhouse Not discussed in the EA is what entity or organization would be running or funding the operation of the greenhouse. The EA should be clear regarding the intent, scope and funding of the greenhouse. What security will be in place for protection of rare and threatened plants?	Funding for materials needed for both project-related plant propagation and long-term operation of the greenhouse would be provided by OMKM. OMKM staff, with assistance from partners and volunteers, will operate the greenhouse. The intent of the greenhouse, as stated in the EA is "to support ongoing native plant propagation and planting to enhance habitat in the UH Management Areas on Maunakea, as well as in the Mauna Kea Forest Reserve if desired by DLNR." (Draft EA, pg 13, Lines 2-4). OMKM continues to explore opportunities to work with the State, Hawai'i Community College, and the Maunakea Forest Restoration Project for future restoration projects. No extra security is planned for the greenhouse. It is located outside of the main visitor area and will be monitored by rangers, MKSS staff, and OMKM staff. Propagation efforts will include native plants typically found in the area. Propagation of rare and threatened plants is not planned.
2.1.1 Project Description: Install gates Installation of gates, and at the same time installing a guardrail on the opposite side of the Mauna Kea Access Road, signals the intent to disallow any stopping at the Hale Pohaku site outside VIS hours, which are now	As described above, proposed gate locations and operations have been revised. Only two areas will have gates, and these will not be used to disallow any stopping at Halepōhaku outside VIS hours. The gate at VIS Parking Area 1 will be open all day and night, 7 days a

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restricted. In light of the punitive closure of the restrooms and portable johns in 2015, it is clear that far from improving safety of residents, the OMKM intends to limit, not improve, access. *The other three gates (one separating the planned ingress/egress and the gravel VIS Parking Area 3, and two located along Maunakea Summit Access Road), would generally be left open during normal working hours. They are anticipated to be used as needed to secure the facilities during periods when the VIS is not open to the public, …* This gate closure would preclude use of the restrooms, visitation to DLNR's silversword enclosure, cultural ahu, and hale. It would also restrict visitation to Pu'u Kalepeamoa when parking was restricted. If parking areas are gated when VIS is not open, where would visitors park to acclimatize?	week except during public stargazing activities that occur in the lot and during occasional routine maintenance. It will be staffed during closure for stargazing activities to allow for ADA access and in case of emergency. All parking areas, including VIS Parking Area 1 will remain accessible, even during hours the VIS is closed. Access to the DLNR enclosure will be available all day and night, 7 days a week either via the VIS parking lot or by the trail from the new parking area.
Relocate one cabin to existing VIS Parking Area 1 By moving the "cabin" to the existing parking area, several issues would be exacerbated. The physical imposition of the cabin in the parking lot set aside for restroom access and handicapped parking is ugly and unnecessary. Visually, the DLNR silversword enclosure and significant cultural ahu would be impacted, and the structure across from the VIS would act as a imposing gateway to the cultural access of the ahu. There are 23 parking places spaces now by the VIS. Removing six that are convenient to the VIS, and placing a structure in the area that impedes convenient parking, adjacent to the only entrance to the DLNR-managed enclosure where the ahu is located, makes no sense.	The proposed move of the cabin to the VIS parking lot was intended to provide a presentation room for free public programs, lectures, and other activities. This relocation would have provided a shortened walking corridor between the VIS and presentation buildings, thus eliminating the longer walk through the dark parking lot where vehicles are entering and leaving. In consideration of impacts detailed in submitted comments and other considerations, the Proposed Action no longer includes relocation of the cabin. An ADA compliant walkway that connects VIS Parking Area 2 with the entrance to the southern longhouse, where presentations will continue to be conducted, has been added to the scope of work. OMKM will continue to assess the situation and identify ways to address safety concerns resulting from the distance between the VIS and presentation room.
2.1.3 Rock Movement Plan How will a biologist inspect 15 cubic yards of rock in a dump truck? There is a lot of Russian Thistle upwind from the quarry that is not on Mauna Kea. Will the material be inspected by the biologist before it is loaded into the dump truck?	The *Maunakea Invasive Species Management Plan* (ISMP) discusses the process of bringing rock up to the higher elevations of Maunakea. Only imported rock that is "fresh crush" at the quarry (not stockpiled) is acceptable for use. The rock, processing site, and transport vehicle(s) are inspected using both visual methods and

Comment	Response
Will the rock be tested for depleted uranium and other potential hazardous contaminants?	baits for invasive species prior to coming onto UH managed lands. This process has been used for previous projects and the issues associated with it are the same. The practices in the ISMP and the project BMPs detail this. Projects on Maunakea follow the same basic procedures that USFWS, NPS, and others use, which include requesting a fresh run from the quarry, not rock that has been stockpiled. Use of rock procured from a fresh run significantly reduces the chance of ants being present, although the rock is still inspected for ants. Use of rock procured from a fresh run also reduces the possibility that it contains windblown seeds. The gravel will be under asphalt so it is unlikely that any seeds from invasive plants would be able to germinate. The EA and the ISMP detail that all materials, including rock, will be inspected by a trained biologist to detect the presence of any flora and fauna that may potentially have an adverse impact on the Maunakea ecosystem. There are no plans to test the rock for depleted uranium or other potential hazardous contaminants.
3.1 Environmental Setting With regard to the walkway slope proposed to be 4-12%, we believe that for ADA access the slope should be no greater than 8%. Unless all commercial tour passengers are without disability, the slope should accommodate ADA requirements. Otherwise, commercial tour vans could justify the use of all the disability parking. Will the walkway be constructed to ADA standards?	ADA access is provided for in VIS Parking Area 1 with four ADA-designated parking stalls. Commercial tour vans with ADA passengers will drop them off in VIS Parking Area 1. The vans will then depart and park in Parking Area 2 or 3 while their passengers are at the VIS. The new Parking Area 2 will also have one ADA space and an ADA compliant walkway to provide access to the southern longhouse where public presentations sometimes occur. The EA states that the new VIS access lane would have slopes ranging from 4 to 12 percent. There will be a four ft wide asphalt road shoulder adjacent to and running along the new access lane to be used for public and commercial bus and van drop-off and pickup. The access lane and the shoulder will be the same elevation and slope along their run and will be separated by a white stripe. This road shoulder is not intended to be ADA compliant.

Comment	Response
	The five ft wide walkway connecting the proposed VIS Parking Area 2 and the VIS is not designed for ADA access. ADA stalls are being provided in the existing VIS parking area. Commercial tour operators are required to comply with all existing rules and regulations. Commercial tour vans are not permitted to remain parked in ADA spaces without the appropriate placard. Commercial tour vans have not been observed to regularly park in the ADA parking in the VIS Parking Area 1, where there is currently only one ADA space. Should extended parking of commercial vehicles in ADA spaces become an issue, rules and regulations would be amended to prohibit that. Currently it is not an issue.
3.1.2 Drainage, Water Features and Water Quality What is the impact of increased visitation of the VIS on the cesspool/ wastewater management? Will all polluted waters from the drainage of the parking lot and access roadways be contained and filtered?	There is no anticipated increased visitation as part of this project. If visitation increases, the onsite treatment and disposal system (OSDS) comprised of a septic tank and leach field can accommodate higher waste loads. In addition to the seven toilets tied to the OSDS, there are three portable toilets. Both the OSDS and the portable toilets are routinely pumped out and the waste water is hauled to a permitted treatment facility offsite. There is no cesspool used in the OSDS. The OSDS is permitted by the Hawaii Department of Health Waste Water Branch. There are no expected adverse impacts to the environment from waste water management. Rain water runoff generated off the proposed new Parking Area 2 and access lane will be routed into three planned drywells. The runoff generated of the proposed parking lot and access road may contain contaminants associated with motor vehicles. Any potential contaminants in the runoff will either be contained in the drywells or filtered by the natural substrate as water percolates into the ground beneath the drywells. The bottom of the drywells is approximately 4600 feet above the nearest aquifers upper boundary. Runoff from existing drainage areas will be carried in proposed improved drainage features.

Comment	Response
3.1.3 Flora The proposed project would not only pave an area already impacted by expanded human use, it would remove more vegetation in the critical habitat of the palila. Mamane woodland at this site is critical habitat (food source) for palila. Palila have been recorded using the area. Numerous endemic species of flora on site. To be removed or salvaged are ‘aweoweo, pukiawe, pua kala, ma’ohi’oihi and little-leafed Stenogyne, and hinahina. The environmental setting for the project area has been described as being “a transitional zone between two overlapping vegetation communities” (McCoy 1985:5-6) The two communities are a sub-alpine xerophytic scrub and a Sophora chrysophylla (mamane) parkland. The treeless scrub is characterized by a variety of low shrubs: Styphelia tameiameiae (pūkiawe); Geranium cuneatum (noho-anu); Vaccinium reticulatum (‘ohelo); Raillardia ciliolate (na‘ena‘e), as well as a small fern, Pellaea ternifolia (kalamoho). In addition to the mamane and noho-anu, the parkland community contains Chenopodium oahuense (‘aheahea), Coprosma montana (pilo), and a variety of native and exotic grasses and forbs. The EA anticipates further segmentation of UH plans, in a reference to construction working housing for decommissioning at a later date. It states that more mamane trees could be removed for that project. This form of project segmentation demonstrates the same manner of incremental habitat loss that has led to significant, adverse and substantial cumulative impact on natural resources elsewhere on UH Managed Lands on Mauna Kea. Removal 60-65 mamane trees that are tens to hundreds of years old cannot be replaced 2:1, particularly in the area adjacent to the human use area, often over-run by hikers, photographers, picnickers, and more. A far larger, fenced area of restoration should be funded, staffed and overseen for several years to assure establishment, should this project be permitted. A	The determination that the loss of māmane trees at Halepōhaku as part of project activities is ‘non-adverse’ and ‘not negative’ was made in consultation with USFWS and USGS as explained in Section 3.1.5 (Draft EA, pg 28, Lines 27-33). OMKM will plant māmane seedlings within the UH managed Halepōhaku area and will be 100% responsible for their success. The Conservation District Rules require that “each tree is replaced on a one-to-one basis with trees that are appropriate to the site location” (Hawaii Administrative Rules 13-5-22). The proposed mitigation goes beyond that with a commitment of a two-to-one replacement (even if assuming outplanting survival matches Mauna Kea Forest Restoration Program stated māmane survival rates (68%)). To ensure the highest level of survival, the māmane seedlings planted by OMKM within the Halepōhaku parcel will receive extra care such as watering and weeding. Due to public comment regarding survival rates, OMKM has further detailed mitigation efforts, as reflected in changes to the EA, to include that of the 130 seedlings to be planted over a two-year period, a no less than 80% survival rate will be considered acceptable (104 trees). Should mortality of more than 20% of the seedlings occur, replacement seedlings on a one-to-one ratio will be planted until the 80% survival rate has been achieved. Based on previous māmane planting efforts in the area, survival rates will be determined at the end of the two-year mitigation period. The greenhouse will provide for the long-term, ongoing propagation of native plant species that could be planted not only at Halepōhaku, but potentially on the DLNR managed State lands surrounding Halepōhaku. Partnerships for this activity are being actively pursued and will provide for additional, future planting of native plant species, including māmane, beyond the scope of project-specific mitigation efforts.

Comment	Response
far greater replacement rate should be implemented, such as 20:1, to assure outplanting success over time. Any replanting to native flora in the area adjacent to human use is an effort that may be impacted by human activity, invasive species, grazing and trampling.	Salvage and replanting of all native plant species, not just māmane, is identified as part of the project (Draft EA pg 22). Propagation of native plants will include herbaceous and woody herbs and shrubs in addition to māmane, focusing on the most common local species identified in the 2011 Botanical Inventory by Gerrish. The cumulative impacts section of an EA requires consideration of any potential impacts of the proposed project with past, current, or foreseeable future actions. Construction and decommissioning activities in the Astronomy Precinct would likely require utilizing the mid-level facilities at Halepōhaku. Although these activities could require new, expanded, or renovated facilities to house workers, new or expanded facilities seem unlikely as in the past construction workers opted to stay at sea level or in their own homes. There are existing dorms and cabins at Halepōhaku that can house construction workers if necessary. As no new facilities are planned or expected to be planned in the near future, adverse cumulative impacts are not expected. Text has been added to the EA to clarify available housing for construction workers (Section 3.5).
3.1.4 Fauna The endangered hoary bat lives in the area and could be displaced from roosting and or nesting sites. A number of birds, including endangered palila, ʻamakihi, ʻapapane, and ʻlʼiwi are in the project area. The endangered Hawaiian hawk (ʻio), owl (pueo) and nene could use the area for foraging. Endangered petrel habitat is not known at this time. How can habitat removal and disruption in critical habitat be justified, when further habitat removal is also expected for another project in the same general area on the same parcel? A wide variety of native invertebrates, including several species of concern: Nesodyne, Micromus (flightless lacewings), endangered Hylaeus bees, newly discovered Agrotis, and Phaeogramma sp. Many forage on the plants that are proposed for removal.	The Proposed Action would delineate visitor use areas by having visitors stay within designated walkways and parking areas. Vegetation restoration would be performed in other areas of the parcel. While the EA discusses the species that occur or potentially occur within and near the project site, the species discussed only occasionally, if ever, utilize the habitat in the project site, due to both the degraded condition and the presence of humans. The palila, ʻamakihi, ʻapapane and iʻiwi have been observed in the Halepōhaku area in recent times, but are rarely seen. Of the four species, only the palila is endangered. Observations of palila have been sporadic, and biologists consider the use of the area around Halepōhaku to be intermittent. There have been no observations of pueo or the ʻio, but it is possible they could utilize habitat in the

Comment	Response
The biggest concern with regard to the project and increased intensity of human use associated with visitation by commercial tours and particularly with visitors whose vehicles have not been cleaned, is the introduction of Argentine ant. With regard to this project we have concern regarding Pohakuloa quarry rock being brought in. *"Establishment of the argentine ant at Halepōhaku would likely significantly affect the native invertebrate population."* The potential for invasive plants, animals and arthropods to change the ecosystem dynamics of Mauna Kea is tremendous, and would require additional staffing to address. Quarterly surveys for inverts is inadequate!	area. The Halepōhaku area is not considered a regular habitat or roosting area for the Hawaiian hoary bat and it is not known to regularly occur in this area. Experts including Federal and State agencies familiar with the conditions and resources present were consulted when drafting the EA. USFWS and USGS indicated that the removal of vegetation in the project site is not significant because it is only affecting a small amount of habitat for palila and any other species, is in an already developed area, and is where there are mature māmane in the surrounding environs [Section 3.1.5 (Draft EA, pg 28, Lines 29-32)]. Dr. Jesse Eiben, Asst. Prof. Applied Entomology UH Hilo, who has been conducting research on arthropods in the Halepōhaku area, indicated that the Proposed Action would not adversely affect native invertebrate populations as habitat at the project site is found throughout Halepōhaku and surrounding areas including areas directly adjacent to the project site [Section 3.1.4 (Draft EA, pg 27, Lines 16-18)]. Future projects at Halepōhaku would occur within the same developed area and would be guided by the *Master Plan* and the *CMP*. There are native *Hyleaus* in the area, but they are not the species listed as endangered. The endangered *Hyleaus* species are found in coastal areas. There is no anticipated increased visitation as part of this project, including commercial tours. The number of permitted commercial tours and commercial vehicles is limited to eight companies with each allowed the use of two 14 passenger vans per day during the sunset/star gazing period, which is the busiest period of tourist visitation. Defining visitor use areas by clearly identifying parking areas and walkways protects invertebrates as there will be less impact to surrounding area.

Comment	Response
	OMKM's ongoing implementation of the *Maunakea Invasive Species Management Plan*, which was approved by the Maunakea Management Board, will prevent, detect, and manage invasive species in areas affected by this project. This includes inspection of materials before they are brought onsite. It also includes *both* continuous monitoring and more intensive quarterly surveys. Invasive Species Perimeter Surveys in the Halepōhaku area are conducted quarterly so that the arrival of any invasive invertebrate species can be identified early on. This allows treatment to be initiated quickly to prevent widespread infestation, which would require aggressive treatment over a large area and potentially have an undesirable impact on native invertebrates.
3.2.1 Traffic and parking It is not clear from the EA how many parking spaces would be designated for commercial tours, visitors and staff in the proposed project area. *"The new 42 stall VIS parking Area 2 would be approximately 20,600 ft. and would accommodate personal vehicles and commercial tour vehicles."* Does the OMKM plan to increase the number of commercial tour permits as a re result of increased parking capacity? Given that a recent fatality, and numerous other vehicular accidents have occurred on the Mauna Kea Access Road, a higher priority for CIP funding would appear to be a constructed runaway lane for cars and trucks whose brakes have failed descending the mountain. Governor Ige narrowly escaped a possible accident from a brake failure above Hale Pohaku when the vehicle he was riding in experienced a serious problem, prior to his transfer to another vehicle. When considering the potential for overheating of brakes, such as the occurrence that led to a recent fatality, why would closure of visitor parking at mid-elevation ever be justified?	There are no plans to increase the number of commercial tour permits. The purpose of the project, and associated funding, is to address safety concerns for groups of visitors to Halepōhaku. There are other safety issues on the mountain, including altitude and vehicle issues. Maunakea Summit Access Road is on Forest Reserve land above and below Halepōhaku and DLNR shares responsibility for dealing with safety issues. OMKM would be happy to work with DLNR to discuss safety issues and potential traffic safety plans, to potentially include a runaway vehicle lane. There are signs posted regarding the use of 4-wheel drive vehicles. Proposed Administrative Rules for UH Managed Lands would prohibit use of 2-wheel drive vehicles such as the one used to transport Governor Ige on his unannounced visit to the summit. Such rules follow a separate, independent review and approval process. The Proposed Action has been revised to only include two gates. The gates will not be used to disallow any stopping at Halepōhaku outside VIS hours, so parking along the road will not be necessary.

Comment	Response
The administrative rules proposed by the OMKM in 2016 describe an enforcement authority. What rules would apply to enforcement of parking restrictions along the side of the access road when VIS gates are closed?	The gate to delineate a small employee parking area will likely be closed all the time to ensure parking for employees is available (Section 2.1.1).
3.2.3 Solid Waste According to news reports, nearly 300,000 visitors make their way to the VIS annually. *"In 2015 approximately 224,000 people visited Halepōhaku."* What is the current method of disposing of human waste? Is all waste collected in toilets trucked out? What is the impact of closing the restrooms and portable toilets on the water quality of the area and its runoff? What impact did several weeks of human waste disposal in the open environment (due to punitive restroom closure) have on the natural and cultural resources? Given that *"Localized perched or dike-impounded groundwater features may or may not be present in the project area. Groundwater levels are assumed to be at significant depths below the ground surface."* What impact did exposed uncontained human waste have on the Onomea Aquifer and perched ground water that may or may not be present? Given the conflicting reasons given by OMKM/IfA employees for several weeks of restroom closure in 2015, none of which were intended to improve public safety, what criteria will be used for future punitive actions against the public? If the gates were locked overnight and until noon, the result would be a nightly conversion of the outdoor area into a public toilet, again.	Due to the configuration of the VIS parking areas and the location of the VIS, counting the exact number of visitors to Maunakea is difficult. Some people that stop at Halepōhaku visit the VIS, some only acclimate in the parking area and never enter the VIS. Some visitors stop at the VIS before heading to the summit and then again on the way down. A visitor count of 300,000 is a rounded-up value given in some press releases and is the estimate of the number of entries into the VIS. The 224,000 visitors per year was derived by doing random counts at the VIS over the period of one year and subtracting a certain amount knowing that approximately one quarter of these are visitors entering the VIS twice during the same day (once on the way up to the summit and once on the way down, usually to attend stargazing activities). The EA has been revised to list a range of 224,000 to 300,000 visits per year over the past four years (Section 3.3.2). The onsite treatment and disposal system (OSDS), comprised of a septic tank and leach field, can accommodate higher waste loads than are currently produced. In addition to the seven toilets tied to the OSDS, there are three portable toilets. Both the OSDS and the portable toilets are routinely pumped out and the waste water is hauled to a permitted treatment facility offsite (Section 3.2.2). The proposed gates, now only two in number, will not be used to disallow any stopping at Halepōhaku outside VIS hours, so portable toilets outside of the VIS will be accessible (Section 2.1.1). Although it is outside of the scope of this project, monitoring of the impacts to natural and cultural resources from uncontained human waste showed minimal impact over the longer term. It is highly unlikely that there was any impact to aquifers beneath the site.

Comment	Response
3.3.2 Recreational Resources The EA claims that the VIS is open from 9 am to 10 pm, but the official website of the Institute for Astronomy states *"Open every day of the year from 12PM until 10PM at the 9,200 foot (2,800 meter) level, we provide health and safety information and education about Maunakea."* *"Hikes on designated trails of varying lengths can be accessed from Halepōhaku." "Currently, there is the potential that some visitors do not heed warnings to acclimatize at Halepōhaku, due to congested parking (i.e., seeing vehicles parked ad hoc along the side of the road may lead visitors to infer that parking is full)."* It is not clear where hikers and photographers would be able to park and acclimatize if the VIS parking were gated at hours when the VIS is closed.	The changes to VIS hours and number of stargazing nights occurred after the Draft EA was released for public comment. These changes have been incorporated into the EA Section 3.3.2. As described above, proposed gate locations and operations have been revised. The gate at VIS Parking Area 1 will only be closed during public stargazing activities that occur in the lot, and during occasional routine maintenance. It will be staffed during stargazing activities to allow for ADA access and in case of emergency. Parking Areas 2 and 3 will not have gates. Hikers and photographers will be able to park and acclimatize when the VIS is closed (Section 2.1.1).
3.4 Historic and Cultural Resources Due to repeated desecration of the sacred cultural sites of Mauna Kea, overwhelming outrage led to months-long efforts by Mauna protectors to heal and preserve the mountain's sacred nature. The ahu constructed by practitioners on the grounds of the DLNR-managed silversword enclosure is a site used by thousands for prayer and ceremony for those who are unable to ascend to higher elevations and those who continue the journey. For those who stop to pray, acclimate or prepare for ascent, access to parking at all times of the day and night are essential. *(From page 42: "There are a few known cultural practices and resources associated with Halepōhaku and the nearby surrounding area. There is a contemporary ahu within the DLNR- managed silversword enclosure that is utilized by cultural practitioners.")* *"Access to the ahu and any cultural practices taking place within the nearby DLNR- managed silversword enclosure would not be affected."* Was there any effort to consult with cultural practitioners who conduct ceremony at the ahu to determine the impact the restriction of access would have? Closing the parking area with gates would severely restrict	As described above, proposed gate locations and operations have been revised. The VIS parking areas will remain open all day and night, 7 days a week except VIS Parking Area 1, which will only be closed during times when stargazing activities occur in the lot and during occasional maintenance activities. The gate at VIS Parking Area 1 will be staffed during stargazing activities to allow for ADA access and in case of emergency. Other parking areas will remain accessible to provide for acclimatization, access to the ahu and other significant sites, and access for cultural and spiritual practices. A walkway leading from the new Parking Area 2 to the VIS will be installed and will also provide access to the silverword enclosure (Section 2.1.1).

Comment	Response
Hawaiian cultural and religious access to a historical, cultural, religious and spiritual area who have a 24/7 requirement for use.	
3.4 Historic and Cultural Resources Minutes of the MKMB and KKM do not reflect an opportunity to review details the proposed project, nor does that review stand as evidence of consultation.	As described in the EA, the proposed project was formally reviewed by the Kahu Kū Mauna Council on August 19, 2015 and was discussed at a minimum of five Maunakea Management Board meetings beginning on May 5, 2015 (Section 1.4 Draft EA, pg. 5, Lines 16-22 and 28-33). In addition, the public review period for the EA provides an opportunity for changes based on public comment.
3.4 Historic and Cultural Resources The historic nature of the project area means that the area had and continues to have cultural significance. *From Page 39-40* *Archaeologists identified the Pu'ukalepeamoa Complex, a tool quarry/workshop complex in and around Halepōhaku, in 1984. The complex is believed to have been multifunctional, consisting of several temporary camp sites where adzes and octopus lure sinkers were manufactured. The complex consists of twelve lithic scatters and two shrines, located within the Halepōhaku parcel and in the adjacent Mauna Kea Forest Reserve.* *It is hypothesized that the area was used as a production center for adze makers since the location provided for essentials such as firewood and food (forest birds) that would not be found further up the mountain. The twelve lithic scatters are comprised of adze manufacturing by-products and octopus sinker by- products. The adze manufacturing by- products suggests a direct relationship with the Maunakea Adze Quarry in that the material is not from a local source, but is abundant in the quarry. The type of stone used for octopus sinkers, primarily dunite and gabbro, occurs within the nearby Pu'ukalepeamoa Complex.* *"Factors identified in the CRMP and the CMP that are most likely to result in adverse effects to historical sites at Halepōhaku include mechanical earth moving, infrastructure maintenance, unauthorized artifact collection, natural erosion, and wind damage and impacts due to debris (rubbish). A*	DLNR SHPD reviewed the Proposed Action and issued a determination that no historic properties will be affected with implementation of the DLNR SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea*, which is required for the Proposed Action (Appendix A). Recovery of artifacts from Site 50-10-23-10311, the only portion of the Pu'ukalepeamoa Complex to be impacted by the Proposed Action, was performed under DLNR SHPD guidance in 1993. The site was revisited in 2016 to ensure no artifacts were present (Appendix C). The two shrines present just south of the Halepōhaku parcel will not be affected by the Proposed Action and a buffer of 200 ft. will be provided, as indicated by DLNR SHPD (Section 3.4). The following text was added to the EA in Section 3.4: Neither the Pu'ukalepeamoa Complex, nor individual Site 50-10-23-10311, are listed on the Hawai'i Register of Historic Places or National Register of Historic Places, nor have they been nominated. Changes to Figure 2 of the PCSI report have been made.

Comment	Response
portion of Site 50-10-23-10311 is located within the area that would be graded and paved for the new VIS Parking Area 2 and associated walkway." Both the CMP and HRS Chapter 6E require that no historic properties, including shrines, be altered or destroyed. "Recovery" of artifacts in the project area does not reduce the significance of the historic site to less than significant. The highly divergent maps (Figures 4, 11, Figure 2 of PCSI on page C-4) do not clearly delineate the areas of historic "recovery", walkway, nor the areas of impact with any accuracy. For comparison of these figures, look at the walkway area in relation to the HP lease boundary. On one map the walkway is in the DLNR –managed enclosure.	
#.5 Secondary and Cumulative Impacts *"Cumulative impacts result when implementation of several projects, whether past, current or foreseeable futures actions, individually have limited impacts but combine to produce more severe impacts or conflicts in mitigation measures."* *"Habitat disturbance and increased vehicular and pedestrian traffic at Halepōhaku due to past, planned, and future projects have the potential to result in cumulative adverse impacts. "* *"Construction and decommissioning activities in the Astronomy Precinct would likely require utilizing the mid-Level facilities at Halepōhaku. These activities could require new, expanded, or renovated facilities to house workers. Additional facilities (new and expanded) in the Halepōhaku area may or may not require removal of māmane trees, as well potentially disturbance of previously undisturbed areas. "* *"A (planned) stargazing deck would* ***improve the capacity for*** *and quality of* ***visitor experiences****".* Our Conclusion:	The project will not impede visitor access, including cultural practitioners. Visitors will continue to have access to all the areas they currently visit. The Proposed Action complies with the *Maunakea Public Access Plan*, a sub-plan of the CMP (Section 3.4). If a permit for a stargazing deck were to be sought and approved, it would provide safer conditions and improve the visitors' experience. It is not intended to increase the number of visitors (Section 3.5). The cumulative impacts section of an EA requires consideration of any potential impacts of the proposed project with past, current or foreseeable futures actions. Construction and decommissioning activities in the Astronomy Precinct are currently being discussed and must be disclosed in an EA along with potential impacts. Text has been added to the EA to clarify that although these activities could require new, expanded, or renovated facilities to house workers, at this time it is anticipated that construction or decommissioning activities in the Astronomy Precinct are NOT expected to require new or expanded facilities to house workers. In the past construction workers have opted to stay at sea level or in their own homes. Additionally, there are existing dorms and cabins at Halepōhaku that can house construction workers if necessary. Routine maintenance and like-to-like renovations to existing

Comment	Response
It would seem from a review of this project that the present and future anticipated cumulative impact is significant, and this project, added to other anticipated projects, would continue to drive increased visitor capacity, reduce habitat, increase the potential for invasive species, pave over historic sites, and impede visitor and cultural access to public lands at the whim of the University. It purports to improve public safety, but the benefits are marginal, and do not outweigh the costs.	facilities, if needed, are anticipated to occur independently from this project or other Astronomy Precinct activities (Section 3.5).
The impact of the University of Hawaii's management of UH leased lands has already caused significant, adverse, and substantial cumulative impact to the natural and cultural resources of Mauna Kea. The incremental removal of vegetation in critical habitat, the impact of disturbance on historic resources, and the failure to address the impact of the proposed project on the cultural, religious, and ceremonial practice of Native Hawaiian practitioners, all demonstrate that a FONSI should not be issued, No Action Alternative selected, and/or that an EIS should be conducted for this project.	The project site has been previously disturbed and is developed land. This includes both paved and unpaved parking areas, footpaths, buildings, vehicles access, equipment storage, and public gathering spaces. The overall effects of this project were reviewed for potential significant, adverse, or substantial cumulative impacts as defined by the State of Hawai'i (HRS Chapter 343). Based on this review, of past, proposed, and potential future projects as identified in the EA, it was determined that an EIS is not warranted. Experts including Federal and State agencies familiar with the conditions and resources present were consulted when drafting the EA. USFWS and USGS review indicated that the removal of vegetation in critical habitat is not significant because it is only affecting a small amount of habitat in an already developed area. There are mature māmane in the surrounding area and the proposed project includes substantial restoration mitigation efforts [Section 3.1.5 (Draft EA, pg 28, Lines 29-32)]. DLNR SHPD issued a determination that no historic properties will be affected with implementation of the SHPD-accepted *Long-term Historic Property Monitoring Plan for the University of Hawai'i Management Areas on Mauna Kea* [Section 1.4 (Draft EA, pg. 5, Lines 3-7) and Appendix A]. This project will not impede cultural, religious and ceremonial practice, access will not be restricted or blocked (Section 3.4).

Comments Regarding Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station

April 7, 2017

Personal opinions as a private citizen:
Jesse Eiben, PhD. Asst. Prof. Applied Entomology UH Hilo, CAFNRM

Overview: I support the finding of no significant impact of natural resources, with some suggestions to mitigation efforts.

Detailed Overview:

My comments on this EA are focused on the natural resources of which I have direct knowledge and theoretical insight over trends based on scientific literature and analysis. Overall, I do not see evidence that this construction project will lead to wholesale elimination of any specific floral or faunal resource. I agree that there will likely be no significant impact on the natural resources of the upper sub-alpine ecosystem on Maunakea from these proposed construction activities if mitigations are strictly adhered to with some suggests to those mitigations (see below for specific recommendations).

Given the threats (invasive species introduction, direct footprint impacts, and fire risks, specifically) posed directly by humans in this subalpine environment currently, I feel this project can lead to an overall improvement in managing the human impacts on the natural environment. The University of Hawaii (UH) only manages a small land parcel in this region, and I feel that defined parking and buildings access points will be a boon to regulated access to ensure people (visitors and regulated users of facilities) can be properly directed to natural resource conservation information. If invasive species inspections or mandatory education efforts (such as some media like the video at Hanauma Bay on Oahu) are deemed necessary or possible in the future, having a defined University managed area where all people access the Maunakea region in an orderly fashion, then this process can be streamlined on UH managed areas.

Specific Comments regarding flora and invertebrate fauna:

1. **No unique arthropods identified only within the proposed construction area**. Our arthropod biodiversity research work in the Hale Pohaku region within and adjacent to the proposed construction area has found no support for specific unique endemic arthropods within the Hale Pohaku parcel. Generally, endemic insects in this region are tied to endemic host plants, with high likelihood of finding the same arthropod taxa on any given plant surveyed. These endemic insects are regularly encountered, and I see no evidence that out-planted or translocated trees or shrubs will be any less likely to be inhabited by arthropods in the future by readily available source-pools of arthropods adjacent to the construction areas. This also holds true for the flightless insects, as source point plants are reasonably close to the Hale Pohaku parcel.
2. **Because of fire and invasive species risks, Mamane Restoration should be conducted outside of Hale Pohaku parcel to be a proper mitigation**. I believe that human activities in this region are a risk for introducing non-native invasive ants and other

potential (yet unknown) invasive species regardless of this constriction project due to the high use of this area people. The Invasive Species Management Plan is a valuable resource for risk reduction and I am happy to see this implemented. However, the chance of invasive species establishment or fire will still be higher along the road corridor, and will be a higher risk regardless of the high quality of UH land management. I suggest that Mamane and other shrub plant restoration or out-planting locations be established and supported by UH farther from the proposed construction area. In my opinion, a better mitigation will include a firm agreement between UH and DLNR (DOFAW and/or DHHL) for Mamane out-planting of at least ~130 trees in an area of more degraded habitat than is what is found in the Hale Pohaku environment.

   a. **Justification**: If in the scenario of argentine ant establishment (or other manageable invasive species detection) around the Access Road around 9,000 ft, I consider arthropod eradication and potential non-target arthropod mortality to be an acceptable outcome for ant eradication effort to preserve the ecosystem integrity more generally. That means the mitigation of planting 130 Mamane trees within Hale Pohaku region will not be a suitable habitat mitigation for endemic arthropods in the event of invasive species management action (or fire) related to the unlikely event of invasive ant establishment and eradication efforts.

3. **Mulch Mamane trees after endemic insects have had a chance to use/merge from the cut tree**s. If this construction plan is approved, and Mamane trees are removed (~40-60 trees), the current proposal is to 'mulch' the trees in place for potential use in potting media for tree restoration efforts. This is a reasonable potential use of the Mamane, however, Mamane trees may be used by endemic Cerambycidae beetles (Long-horned beetles), *Plagithmysus blackburni*, after they have been cut down as hosts for larvae. I suggest not mulching the trees immediately to allow developing larvae in trees to emerge successfully as adults. This may take 1-2 years, so I suggest allowing large Mamane branches to remain in piles small enough to not be a fire hazard for 2 years before mulching.
4. ***Hylaeus* bees are common, but there is an additional species not mentioned, and these bees likely have specific rock habitat that is not outlined in the rock management plan**: Page 26 Line 2: The *Hylaeus* bees found at Hale Pohaku also include *H. difficilis*. *H. volcanicus* is misspelled in the document. Also important to note is the idea that *Hylaeus* bees can be ground nesting and are likely using rock outcrops and associated 'stable' soil in those outcrops as nesting areas. The numbers of *Hylaeus* bees in this area are high, so I do not see a substantial risk of eliminating bees from this ecosystem by the physical impacts of this proposed construction project. I suggest trying to leave substantial rock outcrops intact if possible as a mitigation to preserve potential nesting locations.

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Dr. Jesse Eiben, PhD.
Assistant Professor of Applied Entomology UH Hilo, CAFNRM
50 Alani St.
Hilo, HI 96720
varanusmoss@msn.com

Subject: Response to Comments on Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Dr. Eiben,

Thank you for the comment letter dated April 7, 2017 on the *Draft EA: Infrastructure Improvements at Maunakea Visitor Information Station* in which you stated that you support the finding of no significant impact of natural resources, with some suggestions to mitigation efforts. Please note that based on public comments received, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed; not relocating the cabin to VIS Parking Area 1; and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue. The changes are reflected in the Project Description (EA Section 2.1.1) and the discussion of Flora (EA Section 3.1.3).

We agree with the assessment that more clearly defining parking and building access points will improve management of human impacts on the natural environment. We appreciate your expertise and advisement on the Proposed Action, with emphasis on the results of your arthropod biodiversity work. Responses to your specific comments are detailed below.

Māmane Restoration: Outplanting māmane away from the road corridor is desirable. However, it is also important to perform habitat enhancements throughout the Halepōhaku parcel to reestablish vegetation and associated biological organisms that may have been adversely affected over time by foot and vehicle traffic.

Mitigation efforts related to the planting of native species will be confined to the areas within UH managed lands at Halepōhaku that can reasonably support vegetation without mortality due to human activity. The mitigation effort is being contained to the Halepōhaku parcel to ensure that OMKM is 100% responsible for its success. To ensure the highest level of survival, the māmane seedlings planted by OMKM within the Halepōhaku parcel will receive extra care such as watering and weeding.

The greenhouse will provide for the ongoing propagation of native plant species that could be planted not only at Halepōhaku, but potentially on the DLNR managed State lands surrounding Halepōhaku. The EA mentions the potential for expanding habitat enhancement efforts into the adjacent Forest Reserve [Section 1.3 (Draft EA, pg. 13, Lines 3-4); Section 3.5 (Draft EA, pg. 44, Lines 39-40)]. This activity will need to be coordinated with the State of Hawai'i DLNR Division of Forestry and Wildlife (DOFAW), with whom a partnership is being actively pursued. A formal partnership would include all of the appropriate permissions and required plan approvals to allow for the installation of native plant species, including māmane, beyond the project-specific mitigation effort.

Invasive Species Perimeter Surveys are conducted regularly so that the arrival of any invasive invertebrate species can be identified early on (Section 3.1.4). This allows treatment to be initiated quickly to prevent widespread infestation, which would require aggressive treatment over a large area and potentially have an undesirable impact on native invertebrates.

While there is a risk of fire associated with human activity in the area, MKSS staff is trained in methods to suppress small fires, lowering the risk of a large catastrophic wildfire (Section 3.1.10).

Use of Cut Māmane Trees. OMKM will consider the suggestion of not mulching māmane trees immediately after removal to allow for the development of larvae of endemic species. Any piling of large māmane branches will need to consider the potential for fire hazard or disturbance by visitors.

Hylaeus bees. Corrections on *Hylaeus* species have been made to the EA. The Proposed Action would not disturb substantial rock outcrops (Section 3.1.4).

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

Subject: Notice of Determination: Anticipated Finding of No Significant Impact to the Environment for Infrastructure Improvements at Maunakea Visitor Information Station at Halepohaku on Maunakea, TMK (3) 4-4-015:012, District of Hamakua, Island of Hawai'i.

Comments by Rick Warshauer, PO Box 192, Volcano, Hawaii 96785; 7APRIL2017

This EA for the subject proposal is totally discombobulated. It makes little sense in any form. The components are strung together in a non-sensible manner, and the purposes defy good reason. The document should be rejected and the process started over. The producer of the document should be replaced with one who can make sense from the list of components and one who can reach a rational plan that avoids damage to habitats and still meets the real requirements of the proposed expenditures of a million and a half dollars on the series of questionable subprojects.

The biological portion is especially egregious in presentation, logic (or lack thereof), and factual basis. Of particular shortcoming is the casual way it disregards the Critical Habitat of the palila, a critically endangered bird with a withering population and progressively degrading habitat. No knowledge of the history and requirements of the species or its habitat is reflected in the brief discussions. Nor is there reference any of the many and long discussions over the last few decades regarding the context of the management and mismanagement of its habitat within the document's flippant references to the project's impacts on the habitat or its significance as Critical Habitat. The writers did not even bother to examine the footprint of the project area to count the number of trees to be eliminated by the project. Instead, they vaguely referenced a study that mentioned mamane trees on Mauna Kea and extrapolated a range of 29-65 trees to be killed. The so called mitigation plans to "compensate" for the destruction of scores of mature, essential mamane trees and other associated habitat plants are ludicrous and biologically unsound. Planting 2-3 mamane seedlings per mature tree removed and expecting replacement in such an arid environment is ridiculous. Equally ridiculous is the expectation that smaller native shrubs and life forms can be dug up from the development area and transplanted nearby successfully. The discussions are not supported by any credible evidence and experience of those who have attempted mitigation in such a stressful arid environment as that near the top of the mamane zone on Mauna Kea. It resembles another inept attempt at ecological analysis by yet another two-bit engineer. Only the reviews by a couple of government agencies match its incompetence.

The last time a project in the Critical Habitat proposed removal of mamane trees within the Critical Habitat of the palila, it proposed and implemented a mitigation plan that replaced displaced habitat with addition of adjacent mature mamane tree habitat previously outside the designated Critical Habitat, plus set aside other adjacent degraded habitat area for a sustained and systematic replanting of mamane. The latter proved to be so challenging to implement that many years later it is only slowly coming to pass. All of the mitigation efforts for this re-alignment of the Saddle Road within the palila Critical Habitat cost millions of dollars and was well thought out by experts. The proposed project at Hale Pohaku, while significantly smaller in scale, is the same displacement of Critical Habitat elements, but without critical thought or a commitment to adequate budget or guarantee of successful outcome.

Clearly, this EA is woefully inadequate on these grounds alone and deserves to be rejected as a FONSI.

SUSTAINABLE RESOURCES GROUP INTN'L, INC.

August 7, 2017

Rick Warshauer
Volcano, Hawaii
frwvolcano@gmail.com

Subject: Response to Comments on Draft Environmental Assessment: Infrastructure Improvements at Maunakea Visitor Information Station, Hāmākua, Hawaii.

Aloha Mr. Warshauer,

Thank you for the comment letter dated April 7, 2017 on the *Draft EA: Infrastructure Improvements at Maunakea Visitor Information Station* in which you expressed your concerns about the proposed project, with particular emphasis on māmane trees and critical habitat of the palila. Please note that based on public comments received, some changes have been made to the proposed scope of work and are reflected in changes to the EA text. These include a reduction in the number of gates to be installed; not relocating the cabin to VIS Parking Area 1; and elaboration that if at least an 80% survival rate of māmane (104 trees) is not achieved at the end of the two-year mitigation period, mitigation planting of māmane will continue. The changes are reflected in the Project Description (EA Section 2.1.1) and the discussion of Flora (EA Section 3.1.3). Your specific concerns are addressed below.

Biological Section of EA. The biological portion of the EA was prepared after consulting with personnel from USFWS, and USGS Biological Resources Division and conducting due diligence. We disagree with the commenter that Critical Habitat of the palila is disregarded. Sections 3.1.4 and 3.1.5 of the Draft EA present a succinct discussion on the history and habitat requirements of the palila. It was not necessary or required within the EA to present a historical accounting of meetings and discussions regarding management of habitat of the palila or other flora and fauna.

The footprint of the proposed project site was carefully examined and a detailed count of māmane trees within the footprint was made. Due to previous browsing activity at the site the trees exhibit a multi-stem growth habitat and it is difficult to determine which stems are part of one individual, therefore a range is the most appropriate representation. See Section 3.1.3 (Draft EA, pg 20, Lines 19-30).

The mitigation activities were well thought out and will be implemented by OMKM (Section 3.1.3). Although flora restoration is a challenge in the harsh and dry environment of the project area, the strategies are based on direct experience by OMKM, and review of other efforts including those as part of mitigation for the Saddle Road realignment.

OMKM recognizes that out-planting across a larger area then exists at the Halepōhaku parcel is beneficial, yet project-specific mitigation efforts related to the planting of native species will be confined to the areas within UH managed land at Halepōhaku that can reasonably support vegetation without mortality due to human activity. The mitigation effort is being contained to the Halepōhaku parcel to ensure that OMKM is 100% responsible for its success. The Conservation District Rules require that "each tree is replaced on a one-to-one basis with trees that are appropriate to the site location" (Hawaii Administrative Rules 13-5-22). The proposed mitigation goes beyond that with a commitment of a two-to-one replacement. To ensure the highest level of survival, the māmane seedlings planted by OMKM within the Halepōhaku parcel will receive extra care such as watering and weeding.

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Due to public comment regarding survival rates, OMKM has further detailed mitigation efforts, as reflected in changes to the EA, to include that of the 130 seedlings to be planted over a two-year period, a no less than 80% survival rate will be considered acceptable (104 trees). Should mortality of more than 20% of the seedlings occur, replacement seedlings on a one-to-one ratio will be planted until the 80% survival rate has been achieved. Based on previous māmane planting efforts, survival rates will be able to be determined by the end of the two-year mitigation period.

The greenhouse will provide for the ongoing propagation of native plant species that could be planted not only at Halepōhaku, but potentially on the DLNR managed State lands surrounding Halepōhaku. Partnerships for this activity are being actively pursued and will provide for installation of native plant species, including māmane, beyond the project-specific mitigation effort.

OMKM and biologists have thought this through and are committed to providing resources to maintain the site. Small māmane have successfully been transplanted on Maunakea. Transplanting and propagation of māmane seedlings, and propagation of other native herbs and shrubs to facilitate ecosystem recovery in the surrounding area is a reasonable mitigation strategy.

This project's benefits include: 1) improving public safety by defining parking and walkways; and 2) decreasing habitat degradation throughout the parcel by delineating walkways and walk throughs; and 3) creating more effective and efficient parking. The University of Hawai'i believes that an Environmental Assessment and FONSI are appropriate for this project.

We very much appreciate your review of the document. The announcement of the Final EA's availability will appear in *The Environmental Notice*, a bi-monthly publication of the Office of Environmental Quality Control (OEQC). A copy of the Final EA will be available in OEQC's document library (http://oeqc.doh.hawaii.gov/). If you have any questions about the EA, please contact me at 808-356-0552.

Sincerely,

Kristin Duin
Principal

Cc: Stephanie Nagata, OMKM, nagatas@hawaii.edu

Appendix B. Best Management Practices

This appendix contains Best Management Practices as outlined in the Stormwater Pollution Prevention Plan submitted as part of the application for the NPDES permit as well as the Conservation District Use Application.

BMPs will insure compliance with any permit requirements, environmental policy documents, and the CMP mandate. Construction activity that requires BMPs includes clearing and grubbing of the project site; grading of an ingress and egress, new parking area, and a new access road; and installation of electrical equipment, signs, posts for the greenhouse and gates. BMPs that will be used during construction and implementation of the proposed land use are outlined in this section as well as detailed in the NPDES (Permit No. HI S000476) from Hawai'i Department of Health, valid from July 29, 2016 – July 28, 2021.

INVASIVE SPECIES PREVENTION AND CONTROL

The *Maunakea Invasive Species Management Plan* will be applied to this project, including all prevention and inspection requirements identified therein. These requirements include but are not limited to the actions identified below.

CLEANING & INSPECTION

When shipping supplies and equipment to UH Management Areas on Maunakea, operators are required to:

- Minimize materials and dunnage included to the minimum required for safe and secure delivery. If minimizing materials is not possible, then be prepared to remove packing materials for the invasive species inspection.
- Clean vehicles and deliveries. Cleaning includes removal of all plant, animal, and earthen materials on supplies and equipment prior to arrival on Maunakea. Once cleaned and inspected, if diverted to another job outside of Maunakea, vehicle and cargo must be re-cleaned and re-inspected prior to returning to Maunakea.
- Inspect construction equipment and supplies. Inspections are conducted by a DLNR-approved biologist below the Maunakea Summit Access Road - Saddle Road junction, as defined in the *Maunakea Invasive Species Management Plan*.
- Clean and inspect personal belongings. Items are to be cleaned and inspected by the operator prior to entering the Saddle Road.

EMERGENCY ACTION

Should an invasive species be found on vehicles or equipment within Maunakea, the operator is to stop, immediately leave Maunakea, and return to a location below Saddle Road junction where the vehicle or equipment can be cleaned.

If plant, animals, or earthen materials are observed at any time, contain and securely seal the package or delivery (using garbage bag, plastic wrap, etc.), and contact OMKM staff immediately. The contaminated package or delivery is not permitted to proceed to Maunakea until re-inspected and approved by a DLNR-approved biologist.

OMKM Rangers and staff may conduct vehicle inspections on Maunakea at any time to verify cleanliness; this includes unattended vehicles. Vehicle owners will be notified if any concerns are identified.

LONGHOUSE RELOCATION

Prior to relocation or demolition of the longhouse, the inside and outside perimeter of the building will be inspected by a qualified biologist/entomologist for any invasive invertebrates with a focus on species of concern (i.e. ants, bees, and wasps). Inspection will include the use of baited traps. If species with the potential to cause harm to people or the environment are present, allowable methods will be used to treat nests and individuals prior to demolition or moving of structures. If relocated, the recipient will be informed of any findings and treatment methods used prior to the structure being relocated.

MATERIALS STORAGE AND WASTE MANAGEMENT

If not properly managed, solid and hazardous materials and waste used and stored in construction areas could impact cultural and biological resources, aesthetic and visual characteristics, and water quality in the surrounding area.

To minimize the potential for damage or contamination, construction contractors will implement these measures/methods for materials and waste storage. Materials will be stored in a manner so as to minimize their impact on the surrounding environment.

- The contractor will implement measures to minimize storm water pollution in accordance with a Storm Water Pollution Prevention Plan (SWPPP) attached to the Individual National Pollutant Discharge Elimination System (NPDES) permit.
- When not in use vehicles, machinery and appropriate construction materials will be stored in the Halepōhaku Construction Staging Area.
- "Roll-off" containers will be equipped with secure tops and lids to ensure no debris can escape, including during high winds. Outdoor trash receptacles/containers will be secured to the ground with attached/secured lids and plastic liners to assure that the receptacle, its lid, or its contents will not blow away and the contents will not be exposed to storm water.
- "Roll-off" and other trash containers will be pressure washed immediately prior to every delivery to a site on Maunakea (within 96 hours of delivery) and delivered empty (free of trash or any detectible residue).
- Construction materials and supplies in the Halepōhaku Construction Staging Area will be covered with heavy tarps. Steel cables attached to anchors that are driven into the ground may also be used to secure materials. Materials will be secured at the close of each work-day, and throughout the day during periods of high winds.
- Dumpsters will be collected on a regular basis (weekly) before containers become completely full. If trash and debris begin to exceed dumpster capacity, the dumpsters will be emptied more frequently or more facilities will be brought onto the site.
- Food waste and food containers will be collected separately and removed daily (i.e., food waste, lunch containers, wrappers, etc. will not be disposed of with regular construction debris).
- Waste containers will be picked up and transported off-site by licensed contractors and disposed of at appropriate facilities. Waste containers will be removed from the site within 24 hours if biological materials are identified (by odor, sight, pest aggregations, etc.).
- The contractor will be required, through its construction contract, to provide appropriate and adequate hazardous material training that includes proper and safe handling, correct use and environmental protection methods, safety data sheets, and approved methods for disposal and transport.
- The contractor will be required to ensure that loose tools or equipment are not left unattended and are properly stored at the end of the day.

COMPONENTS OF MATERIALS STORAGE MANAGEMENT

Generally, all materials will be stored per the manufacturer's recommendations and per all county, state, and federal requirements.

BULK ERODIBLE MATERIALS

Bulk erodible materials are generally excavated rock/soil and imported aggregate or other fill materials.

- Contracts must specify and vendors use of 'fresh crush' gravel or fill whenever such materials may be used. Invasive species inspections must also be completed prior to use.
- Aggregate, sand, and other materials necessary for concrete batching, bedding for conduits and other buried utilities, and base course may be imported and used as components of concrete and similar construction materials and uses; however, imported aggregates, sand, and other materials not used for those purposes will be removed from the construction sites once concrete batching is complete. While at the construction sites, these materials will be stored in containers or lined areas to minimize the potential for spillage and to keep them isolated from the environment. Invasive species protocols also apply to such aggregate materials.
- All materials are to be managed per local, state, and federal requirements as well as permit requirements, such as the NPDES permit for the project.
- Sediment controls (socks, bags, etc.) may NOT contain biological material such as compost, wood shavings, excelsior, or similar materials. Materials to be used must be submitted to OMKM for approval in advance.
- Imported materials will be stockpiled in a designated location if it cannot immediately be put to use. The designated location providing adequate setback from waterways and drain inlets.
- Excavated material/stockpiles will be protected when (a) material will not be added or subtracted to a stockpile for a period greater than twenty four (24) hours, and (b) when a significant rain event occurs. Protection measures will include:
    - If the material being stockpiled is deemed wind erodible, the stockpile will be covered with tarps and tarps held in place with rocks, ropes, wood, or other suitable material that can withstand high winds in the summit region.
    - Isolation devices including fiber roll/sock, and/or silt fence will be used around the stockpile.

PETROLEUM PRODUCTS, OTHER CHEMICALS, AND HAZARDOUS MATERIALS

The policies detailed in the SWPPP govern the management of these materials.

- Petroleum and hazardous materials required for the work will be stored properly in tightly sealed containers that are clearly labeled.
- Storage areas for petroleum products, other chemicals, and hazardous materials will have the following attributes:
    - Be clearly labeled (preferably in original containers), including appropriate warning placards, and tightly sealed when not in use.
    - Be covered and elevated at least 6-inches off the ground surface (i.e., on pallets).
    - Have secondary containment.
    - Be placed away from storm water conveyances and drains.
    - Have a spill kit, appropriate to the type and volume of products stored.
    - Meet all local and state solid-waste management regulations.
    - Whenever possible, all of a product will be used up before disposing of the container. If the product is a hazardous material, surplus product must be disposed of following

manufacturers' or local and State recommended methods for proper disposal prior to disposing of the container.

- The storage of petroleum products or hazardous materials outside of designated areas will not be allowed. These materials are only to be removed from designated storage areas during times of active use and returned promptly when that use is complete.
- The hazardous waste material storage area will be inspected weekly and after storms.
- Additional measures related to petroleum and hazardous materials storage include:
  - An accurate and up-to-date inventory of such materials at the site will be maintained. The inventory of such materials on-site will be kept to a minimum, only enough product required to do the job will be stored on-site.
  - Safety Data Sheets for all materials stored in the area will be available to site workers.
  - Substances will not be mixed with another unless recommended by the manufacturer.
- Paving and painting will be avoided during wet weather.
- Paint washing effluent will not be permitted to be discharged directly onto the ground or in any drainages.
- Clean water based paint application equipment in an impermeable containment area where dried paint can be readily removed.

SPILL PREVENTION AND RESPONSE

- Vehicles and equipment will be inspected on each day of use for any leaks or problems that could lead to a leak.
- Contractor and its subcontractors who will be doing the refueling shall include in their work plans measures to minimize the potential impact of a spill or unintentional release of hazardous materials on the surrounding environment. To prevent overflow due to expansion with changes in elevation, all fuel tanks shall not be more than three-quarters full prior to transport to the summit.
- Contractor will provide appropriate spill and response education and training to their personnel. The education and training includes standard spill prevention practices and spill response procedures. The contact information for Federal, State and County organizations and emergency response teams that should be notified in the event of a spill is included in Contractor's safety plan.
- Contractor and applicable subcontractors will have appropriate spill response materials and equipment stored and available at the locations where lubricating materials and fuel are stored and used, including water and equipment transport vehicles and associated support equipment.
- A spill kit will be kept with the equipment and work vehicles that travel to the Project sites in case of accidents.
- Clean up response to spills will be done promptly. The project acknowledges that if a Reportable Quantity is exceeded, the appropriate authorities (including OMKM) will be notified. All spills, regardless of quantity, will be logged and reported to the Construction Monitor.

EROSION, WATER QUALITY AND AIR QUALITY

The policies and procedures to prevent erosion and maintain water quality are detailed in the SWPPP govern the management of these materials.

- The overall construction sequence shall begin with the installation of sediment and erosion control measures, which shall include a stabilized construction entrance/exit, silt fences, and filter socks (Figure 3). All control measures will be put in place and made operational prior to earth disturbing activities. Vehicles will be restricted to using the designated entry/exit point.
- The construction entrance/exit will consist of a stabilized pad of aggregate underlain with filter cloth located at the entrance/exit to the contractor staging area. The purpose of a stabilized construction entrance/exit is to reduce or eliminate the tracking of sediment onto adjacent paved roadways. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into storm water conveyances and production of airborne dust.

Maintenance of BMPs:

- BMPs shall be inspected prior to forecast rain, daily during extended rain events, once every seven calendar days, and within 24 hours after a storm event of 0.25 inches or greater.
- After inspection, routine maintenance and repairs shall be initiated immediately, and completed by the close of the next work day. Replacements or significant repairs shall be implemented by no later than seven calendar days from the time of discovery.

For Silt Fence and Filter Socks:

- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment shall be removed when the sediment accumulation reaches one-half of the above ground height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Repair or replace silt fence and/or filter sock if it becomes damaged.
- Significant washout may indicate the need for additional BMPs such as a compost blanket or additional silt fence.
- Silt fence and/or filter sock shall remain in effective operating condition and shall be protected from activities that would reduce its effectiveness until project disturbed areas are stabilized.

For Construction Entrance/Exit:

- Inspect roads adjacent to site daily. Sweep to remove visible accumulated sediment. Where sediment has been tracked-out from the site onto the surface of off-site streets, other paved areas, and sidewalks, the contractor shall remove the deposited sediment by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. The contractor shall remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. The contractor will refrain from hosing or sweeping tracked-out sediment into any stormwater drain inlet or surface water.
- If construction entrance/exit is clogged with sediment, aggregate will be separated from sediment and sediment disposed of and aggregate put back in place.
- Replace gravel material when surface voids are visible.
- Temporary stabilized construction entrance shall remain in effective operating condition and shall be protected from activities that would reduce its effectiveness until project disturbed areas are stabilized.

General:

- Erosion control methods that include use of biological material (hay bales, compost, wood shavings, excelsior tubes, etc.) are not permitted.
- Stabilization of any exposed slopes shall be done by compacting the soil and covering with native cinder.
- Contractors are not to perform any construction operation that would cause falling rocks, soil, or debris in any form to fall, slide, or flow into existing drainages or natural watercourses. Additionally, construction activities with the potential to produce polluted runoff will not be permitted during heavy rains or storm conditions that might generate storm water runoff. The project will utilize perimeter controls around the project site where stormwater sheet flow from earth-disturbing activities will need to be intercepted. The perimeter controls will collect the sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing sediment migration offsite and preventing erosion from occurring outside the project boundaries. Filter socks will be placed to prevent sediment from being washed into constructed drywells and inlets. The construction monitor will ensure the contractor conforms with all applicable provisions of the water quality and water pollution control standards contained in HAR 11-54, *Water Quality Standards*; HAR 11-55, *Water Pollution Control*; and Chapter 10 of the Hawai‘i County Code, *Erosion and Sedimentation Control*.
- Wash out runoff must be contained. Disposal of wash water via percolation is prohibited. Create a concrete/asphalt truck was out area on-site, prior to pouring concrete, with a pre-fabricated impervious container or impermeable membrane, to hold all wash-out water. Concrete/asphalt truck wash water will be left to allow water to evaporate and the dried concrete left behind will be properly disposed of at an approved disposal site.
- Construction activities with the potential to produce polluted runoff will not be permitted during heavy rains or storm conditions that might generate storm water runoff.
- The contractor shall comply with HAR 110-60. 1-33 *Fugitive Dust*. Water shall be applied to control dust when necessary. If water use to control dust is generating run-off, the method or amount will be adjusted to prevent run-off.

Removal of BMPs:

- Disturbed areas will be stabilized with native cinder.
- Silt fence and/or filter sock will be removed when no longer needed. Remove sediment accumulation and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.
- Remove gravel and filter fabric at completion of construction and restore the area.

Long term:

Designs to minimize post-construction long-term erosion due to runoff were incorporated into the infrastructure improvement plans. Under build-out conditions, the drainage design allows for runoff into and via the following features within the project area: three drywells, gravel islands, a new lined drainage swale, and an improved existing swale (Figure 4 and Figure 5). The drywells will discharge runoff within the project area, while the two swales carry runoff and discharge into natural drainage channels south of the project area. Gravel islands will be aligned to intercept sheet flow, and prevent erosion via slowing water velocity and filtering runoff. A portion of the runoff from the VIS access lane will be directed into the drywell located at the northwest corner of VIS Parking Area 2. This drywell will be installed at the west end of a new interceptor swale that will be aligned parallel to and run along the north end of the new VIS Parking Area 2. The swale will be lined with riprap and will intercept sheet flow generated off the

undeveloped 0.20 acre area south of the VIS building. The swale will be sloped to drain approximately one-third of the runoff intercepted into the drywell. The remainder of the water will be routed to the east and discharged at the northeast corner into an existing natural swale. This swale starts at the southeast corner of the VIS Parking Area 1 and is aligned in a southeasterly direction. The section of the swale that is adjacent to the east side of the new VIS Parking Area 2 will be fitted with riprap to protect the edge of the parking area and prevent erosion of the swale. There is no additional runoff from the build-out that will be routed into this swale.

Runoff generated off most of VIS Parking Area 2 will be routed into a second drywell that will be installed along and within the VIS Parking Area 2. A third drywell will be installed at the intersection of the southwest corner of the VIS Parking Area 2 and the new ingress/egress. Runoff from the western third of VIS Parking Area 2 and a portion of the new ingress/egress will be routed into this drywell. A new riprap swale will be installed from the outlet of the existing swale culvert outlet at the VIS Parking Area 1. The swale will run along the Maunakea Summit Access Road shoulder and be carried under the new ingress/egress to VIS Parking Area 2 via a 24 inch culvert and continue downslope to its outlet at an existing channel located immediately south of the construction staging area. This swale will carry existing condition runoff and a portion of runoff generated off the VIS access lane.

ADDITIONAL DISTURBANCE AND ENCROACHMENT

- Contractor is to minimize the existing terrain disturbance as much as possible. Toe of cut and fill as shown on the design drawing is the extent of the terrain disturbance required to maintain elevation and slope. The contractor shall not go beyond the edge of disturbance with any equipment, vehicle, etc. and take all means to minimize the disturbance of the natural terrain. The NPDES permit outlines steps to prevent disturbance of land beyond that which is necessary. Construction contractors will submit their plans and procedures that will be implemented to comply with the Project NPDES. Items to be addressed are: the requirement for flagging of the planned limits of the disturbance by surveyors and the location of nearby property boundaries prior to the start of construction and monitoring of construction activities to verify no disturbances beyond the flagged/designated area.
- During the construction phase, any ground disturbing activity will be monitored by an archaeological monitor.
- The contractor will submit a *Rock Movement Plan* based of parameters set by OMKM.

CULTURAL AND NATURAL RESOURCE PROTECTION REQUIREMENTS

CULTURAL AND NATURAL RESOURCES TRAINING PROGRAM

- All personnel, and all contractor, supplier and vendor personnel performing work on Maunakea as part of the project will undergo cultural and natural resource training, provided by OMKM, before performing work at the site.
- All work will be performed in accordance with the principles and frequency established in the Maunakea User Orientation. Any person not behaving in a manner consistent with the principles established in the Maunakea User Orientation will be required to leave the project site.

CULTURAL, ARCHAEOLOGICAL AND ENVIRONMENTAL MONITORING PLAN

- The project will provide independent archaeological monitor.
- Should historic properties such as artifacts, burials, or concentration of charcoal be encountered during work activities, work shall cease immediately and the find shall be protected from further damage. The contractor shall immediately contact OMKM who will contact SHPD (808-692-8015),

which will assess the significance of the find and recommend an appropriate mitigation measure when necessary.

- The project will provide a construction monitor who will report any violations of contract, BMPs, or other issues that may impact natural and cultural resources directly to OMKM, and UH Hilo. Any violations of conditions stipulated in the Conservation District Use Permit (CDUP) will be reported to DLNR.

Appendix C. Archaeology Survey of the Project Site

PACIFIC CONSULTING SERVICES, INC.

720 Iwilei Road, Suite 424, Honolulu, Hawaii 96817
www.pcsihawaii.com telephone 808.546.5557

January 11, 2017

Andrew P. Hood
Sustainable Resources Group Intn'l. Inc.
111 Hekili Street, Suite A373
Kailua HI 96734

Subject: *Results of a Site Visit to Hale Pōhaku in Support of an Environmental Assessment (EA) for The Mauna Kea Visitor Information Station Infrastructure Ingress/Egress Phase 1 Improvement Areas, Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i* (TMK: (3) 4-4-015:09).

Dear Mr. Hood:

Under contract to Sustainable Resources Group International, Inc. (SRGII), Pacific Consulting Services, Inc. (PCSI) has prepared this summary report of a site visit in support of the above-referenced project. An archaeological pedestrian survey was conducted within an approximately 7.3-acre project area that includes seven proposed improvement areas (Figures 1 and 2). The fieldwork was conducted on 12 October 2016 by Richard Nees, BA. Dennis Gosser, MA, served as the Principal Investigator.

Project Location and Description

The proposed project is at the Mauna Kea Visitor Information Station (VIS) within the Hale Pōhaku mid-level facility, which is at an elevation of 9,150 feet along the Mauna Kea Observatory Access Road (see Figure 2).

The proposed project components include:

1. Removal of northern longhouse;
2. Construction of a new 20,600 ft ^{2} parking lot (VIS Parking Lot 2) in place of the demolished buildings and extending east;
3. Construction of a new ingress/egress and a new access lane to the VIS. The new paved VIS access lane will cover approximately 11,750 ft^2 and be 350 ft in length. It will run parallel with the Maunakea Summit Access Road;
4. The existing VIS Parking Area 1 will be partially repaved and restriped to accommodate additional accessible parking spaces that meet standards of the Americans with Disabilities Act;
5. Construction of a paved walkway connecting the east end of the new VIS Parking Area 2 to the existing stairs of VIS Parking Area 1;
6. Installation and modification of drainage features; and
7. Installation of security gates.

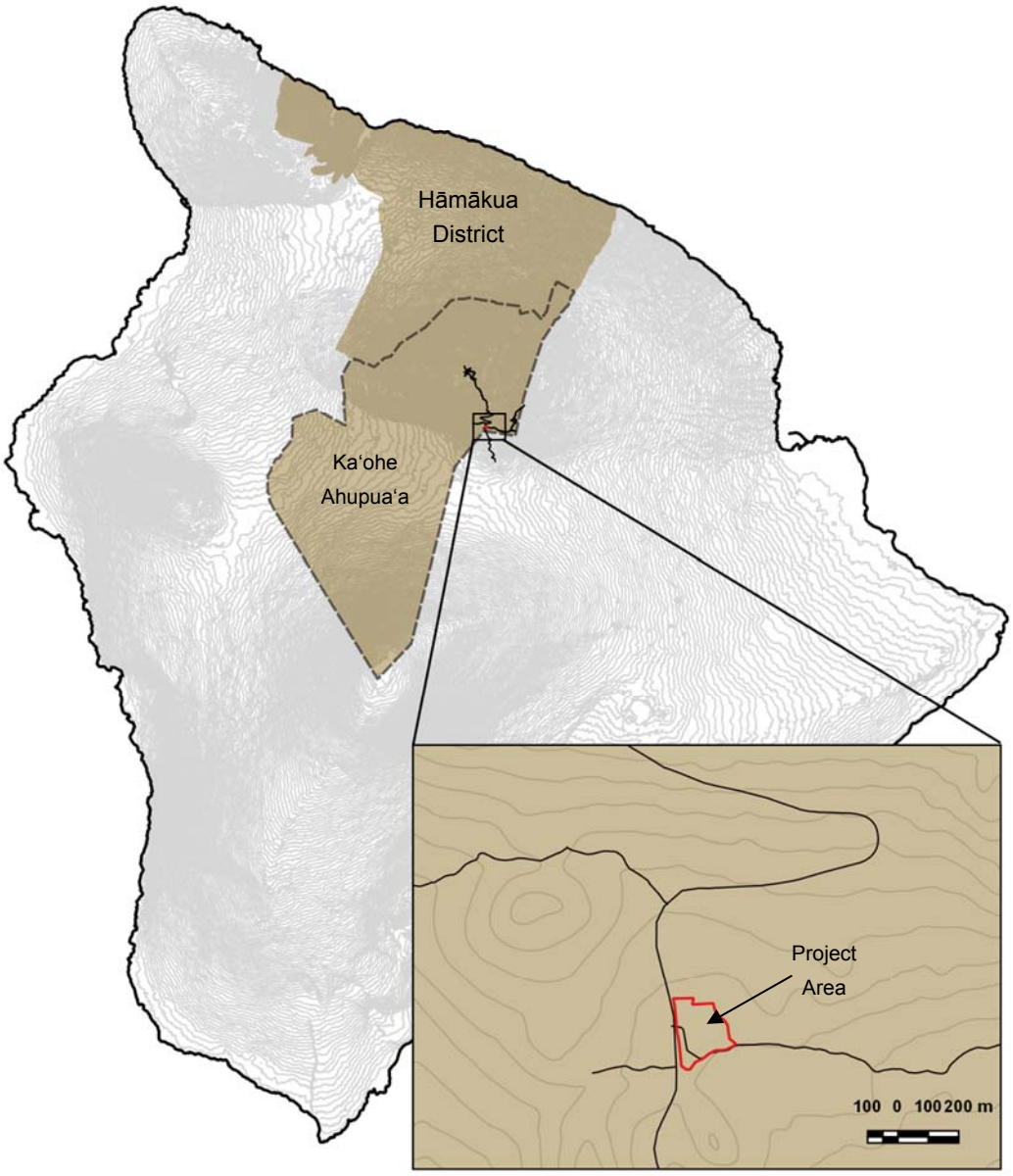


Figure 1. Project Area Location.

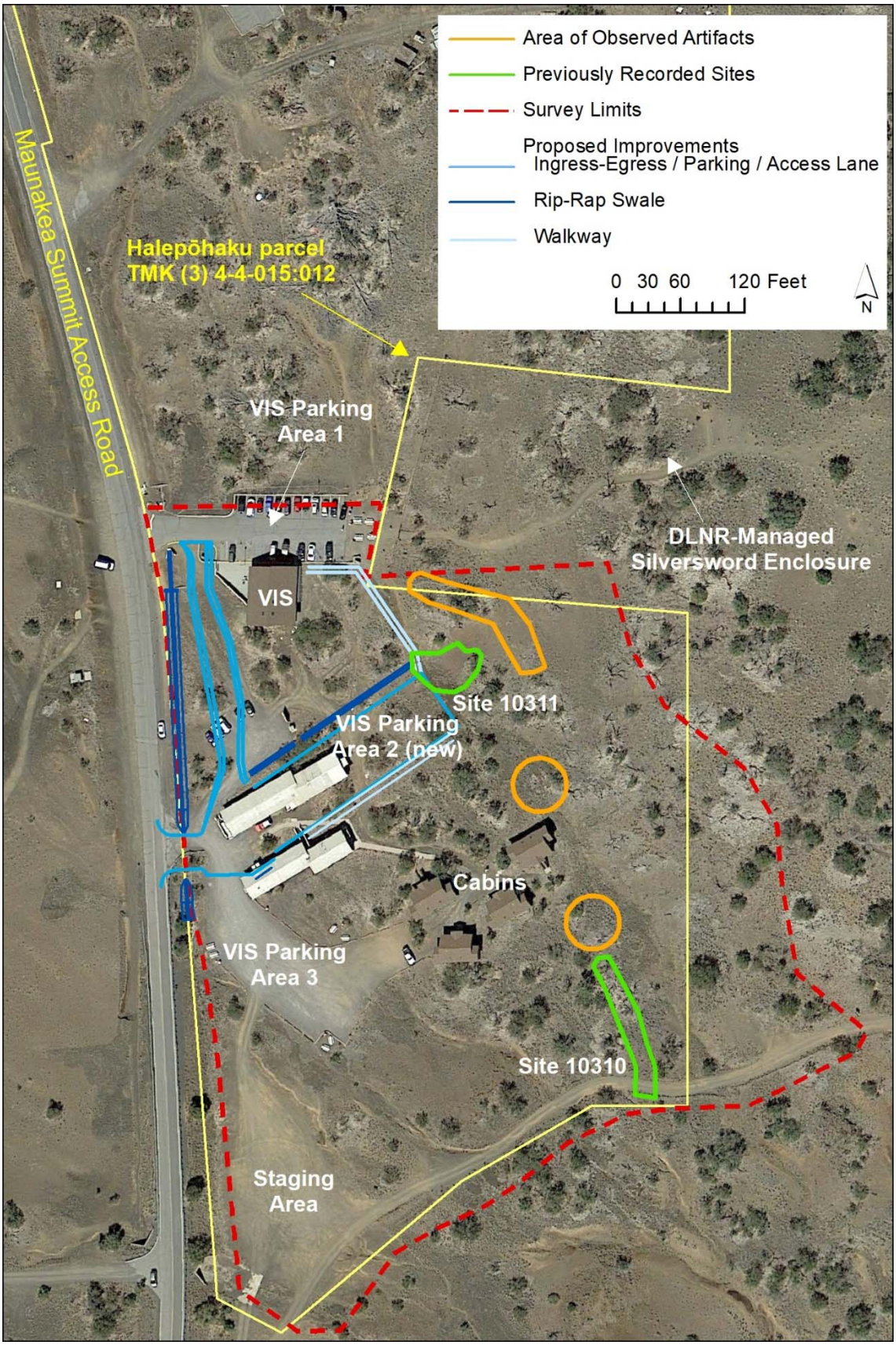


Figure 2. Archaeological Survey Area.

Project Area Environment

1. The environmental setting for the project area has been described as being “a transitional zone between two overlapping vegetation communities” (McCoy 1985:5-6):

> The two communities are a sub-alpine xerophytic scrub and a *Sophora chrysophylla* (*mamane*) parkland. The treeless scrub is characterized by a variety of low shrubs: *Styphelia tameiameiae* (*pūkiawe*); *Geranium cuneatum* (*noho-anu*); *Vaccinium reticulatum* (*ʻohelo*); *Raillardia ciliolate* (*naʻenaʻe*), as well as a small fern, *Pellaea ternifolia* (*kalamoho*). In addition to the *mamane* and *noho-anu*, the parkland community contains *Chenopodium oahuense* (*ʻaheahea*), *Coprosma montana* (*pilo*), and a variety of native and exotic grasses and forbs.
>
> There have been significant changes in the Hale Pohaku landscape and ecology in modern times, including the decimation of the *mamane* forest and sub-alpine scrub community by feral sheep, goats, and pigs. Both of these vegetation communities are rejuvenating since the forced “removal” of the sheep and goats, though the effects are still evident in patches of dead *mamane* trees and the gullying that has resulted from the removal of the ground cover.

In the immediate area of the proposed improvement areas vegetation consists of sub-alpine xerophytic scrub, and includes *māmane* trees and a variety of native and exotic grasses. Soils within the project area include shallow Pohakulehu-Lanapohaku series ashy sandy loams.

Previous Archaeological Studies and Recorded Historic Properties

McCoy (1985) conducted three archaeological surveys of the general Hale Pōhaku area between July 1984 and July 1985. Five lithic scatters and two shrines were recorded on both sides of the Mauna Kea Observatory Access Road and were collectively designated the Pu’u Kalepeamoa Site. Two of the scatters, designated as SIHP (Statewide Inventory of Historic Places) Sites 50-10-23-10,310 and -10,311) are located near the current project area.

In 1990 Robins and Hammatt (1990) conducted an archaeological reconnaissance survey of the mid-level facilities for the proposed Japanese National Large Telescope. The survey identified and confirmed the two previously recorded sites documented by McCoy (McCoy 1985).

In 1993, Hammatt and Shideler (2002) conducted data recovery excavations at Sites 10,310 and 10,311 to mitigate adverse impacts associated with the construction of dormitory buildings at Hale Pōhaku (Hammatt and Schideler 2002:1). At Site 10,310, one 1-m^2 excavation unit recovered three lithic artifacts from the surface and four additional lithic artifacts from the upper 7 cm of the deposit. A second 1-m^2 excavation unit recovered no cultural material (Hammatt and Schideler 2002:10). Nine additional lithic artifacts were recovered from the surface of the site (Hammatt and Schideler 2002:25).

At Site 10,311, one 1-m^2 excavation unit recovered one lithic artifact from 12 cm below surface and a second 1-m^2 excavation unit recovered 16 lithic artifacts from the surface and no subsurface cultural material (Hammatt and Schideler 2002:17). Twenty-three

additional lithic artifacts were recovered from the surface of the site (Hammatt and Schideler 2002:25).

In 2009, Hammatt (2009) conducted an archaeological survey of a portion of the current study area that included Building 6 south to the unimproved road. No significant historic properties were identified and one modern *ahu* (cairn) was recorded.

Methods

The archaeological surface survey area was bound on the north by the existing VIS parking lot, on the west by the Mauna Kea Observatory Access Road, on the south by an unimproved road approximately 165 m south of the VIS, and on the east by an arbitrary line approximately 170 m east of the Mauna Kea Observatory Access Road. Visibility within the survey area was unimpeded. Several areas within the survey area have been used as unpaved parking areas, which has resulted in some erosion and soil deflation.

During the survey, a Garmin 64st Global Positioning System (GPS) unit was used to track the survey coverage as well as locate field observations. In addition, the known boundaries of the two historic properties were uploaded into the GPS unit to determine if they were accurately located.

Results

No cultural material was recorded within the footprint of seven proposed construction elements. In addition, no cultural material was recorded within the known boundaries of Sites 10,310 or 10,311. It is likely that archaeological data recovery excavations and surface collections (Hammatt and Shideler 2002) removed all visible archaeological material from these site areas; excavations documented a shallow and sparse subsurface cultural component at both sites.

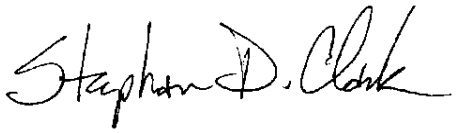
During the current survey, five dispersed traditional lithic artifacts were observed on the surface more than 15 m east of the proposed construction components. The artifacts (left in place) include two basalt manuports, one dunite/gabbro core, one basalt flake, and one possible basalt bird cooking stone.

Summary and Recommendations

A pedestrian archaeological survey of an approximately 7.3-acre area near the Hale Pohaku mid-level facility on Mauna Kea recorded no historic properties within seven proposed construction components. Likewise, the survey recorded no evidence of cultural material within the boundaries of two known historic properties, Sites 10,310 and 10,311, within the project area. Data recovery excavations and surface collections were undertaken at each of the known historic properties (Hammatt and Shideler 2002) to mitigate the adverse impact of a construction project to the north of the current study area.

Five dispersed traditional lithic artifacts were recorded more than 15 m east of the proposed construction. No further work is recommended.

Sincerely,



Stephan D. Clark
Manager, Cultural Resources
Pacific Consulting Services, Inc.
Honolulu

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