

CONSERVATION DISTRICT USE PERMIT APPLICATION

WINTERER SINGLE FAMILY RESIDENCE

TMK: (3) 3-2-004: 037

Lands of Pihā, District of North Hilo, Island of Hawai‘i



(Aerial Photo Map Showing the Subject Property and Site of the Proposed Winterer Single Family Residence near the Hilo Forest Reserve at Ninole, North Hilo, Hawai‘i)

Applicant: Sean Winterer

Prepared by: James M. Leonard
J M Leonard Planning, LLC

April 2022

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- B. CULTURAL IMPACT ASSESSMENT REPORT

WINTERER SINGLE FAMILY RESIDENCE - CONSERVATION DISTRICT USE
APPLICATION

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CONSERVATION DISTRICT USE APPLICATION (CDUA)

All permit applications shall be prepared pursuant to HAR 13-5-31

File No.:

Acceptance Date:

180-Day Expiration Date:

Assigned Planner:

for DLNR Use

PROJECT NAME

Conservation District Subzone: **Resource**

Identified Land Use: **Single-Family Residence; Landscaping**

(Identified Land Uses are found in Hawai'i Administrative Rules (HAR) §13-5-22 through §13-5-25)

Project Address: **32-620 Pīhā-Kahuku Road
Ninole, Hawai'i**

Tax Map Key(s): **(3) 3-2-004:037**

Ahupua'a: **Pīhā**

District: **North Hilo**

County: **Hawai'i**

Island: **Hawai'i**

Proposed Commencement Date: **11/01/23**

Proposed Completion Date: **12/31/24**

Estimated Project Cost: **\$ 440,000.00**

TYPE OF PERMIT SOUGHT



Board Permit



Departmental Permit

ATTACHMENTS

\$2,500 Application Fee. 2.5% of project cost for Board Permits, but no less than \$250, up to a maximum of \$2500; \$250 for Departmental Permits (*ref §13-5-32 through 34*).

\$ _____ Public Hearing Fee (*\$250 plus publication costs; ref §13-5-40*)

☒ 20 copies of CDUA (*5 hard + 15 hard or digital copies*)

☒ Draft / Final Environmental Assessment (EA) or Draft / Final Environmental Impact Statement (EIS) or Statement of Exemption

☒ State Historic Preservation Division HRS 6E Submittal Form
(dlnr.hawaii.gov/shpd/review-compliance/forms)

☐ Management Plan or Comprehensive Management Plan (*ref §13-5-39*) if required

☐ Special Management Area Determination (*ref Hawai'i Revised Statutes 205A*)

☐ Shoreline Certification (*ref §13-5-31(a)(8)*) if land use is subject to coastal hazards.

☐ Kuleana documentation (*ref §13-5-31(f)*) if applying for a non-conforming kuleana use.

☐ Boundary Determination (*ref §13-5-17*) if land use lies within 50 feet of a subzone boundary.

REQUIRED SIGNATURES

Applicant

Name: Sean Winterer

Title; Agency: Owner/Applicant

Mailing Address: 15-2735 Ono Street
Pahoa, Hawai'i 96778

Contact Person & Title: Sean Winterer

Phone: (310) 721-8697

Email: sean_ca2000@yahoo.com

Interest in Property: Property Owner

Signature: _____

Date: 03-25-2022

Signed by an authorized officer if for a Corporation, Partnership, Agency or Organization

Landowner (if different than the applicant)

Name: [SAME AS APPLICANT]

Title; Agency:

Mailing Address:

Phone:

Email:

Signature: _____ Date: _____

For State and public lands, the State of Hawai'i or government entity with management control over the parcel shall sign as landowner.

Agent or Consultant

Agency: J M Leonard Planning, LLC

Contact Person & Title: James M. Leonard, Principal

Mailing Address: 56 Laukona Street
Hilo, Hawai'i 96720

Phone: (808) 896-3459

Email: jmleonard@mac.com

Signature: _____

Date: 3/25/22

For DLNR Managed Lands

State of Hawai'i

Chairperson, Board of Land and Natural Resources

State of Hawai'i

Department of Land and Natural Resources

P.O. Box 621

Honolulu, Hawai'i 96809-0621

Signature: _____ Date: _____

CERTIFICATION

I hereby certify that I have read this completed application and that, to the best of my knowledge, the information in this application and all attachments and exhibits is complete and correct. I understand that the failure to provide any requested information or misstatements submitted in support of the application shall be grounds for either refusing to accept this application, for denying the permit, or for suspending or revoking a permit issued on the basis of such misrepresentations, or for seeking of such further relief as may seem proper to the Land Board.


I hereby authorize representatives of the Department of Land and Natural Resources to conduct site inspections on my property. Unless arranged otherwise, these site inspections shall take place between the hours of 8:00 a.m. and 4:30 p.m.



Signature of authorized agent(s) or if no agent, signature of applicant

AUTHORIZATION OF AGENT

I hereby authorize James M. Leonard to act as my representative and to bind me in all matters concerning this application.



Signature of applicant(s)

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PROPOSED USE

Please provide an executive summary of the proposed land use. Attach any site plans, landscaping plans, photographs, maps, and construction plans as needed.

The applicant, Sean Winterer, proposes to construct a single-family residence and related improvements on his 17.24-acre property in the State Conservation District, Resource Subzone, in the Lands of Pīhā, North Hilo District of the Island of Hawaii. The property is described as Lot 2 of the Pīhā Homestead Subdivision (TMK parcel: (3) 3-2-004:037) and is located in Ninole near the 1,700-foot elevation and accessed from an extension of the Pīhā-Kahuku Road, which extends along the south-east property boundary. A single lot, Lot 1 of the Pīhā Homestead Subdivision, is located between the subject property and the Hilo Forest Reserve, which extends *mauka* of the Pīhā Homestead Subdivision. Waikaumalo Stream and its associated gulch extends near the northwest property boundary and the smaller Kahaeha Stream crosses nearly midway through the property. The adjacent property to the northeast is developed with a single-family residence and assorted out-buildings, and the adjacent property to the southwest is currently under development with a planned single-family residence and associated utility and landscape improvements. **The Island and Regional, TMK and Vicinity Location Maps**, showing the location of the property, are presented in **Figures 1, 2, and 3**.

The **Site Plan** for the Subject Property, as shown in **Figure 4**, includes a single-family residence, driveway, water storage and propane gas tanks, related utilities and landscaping improvements within a less than an acre portion near the property's southeast boundary with the Pīhā-Kahuku Road. A pig-proof, hog wire fencing is also planned at the perimeter of the house site, together with a rock wall entry feature and constructed metal gate at the project entry. The proposed 2-bedroom, 2-bath, residence will have a total living space of approximate 1,693 square feet in size and will include a kitchen, dining and living area, pantry and closet areas, a storage loft, several lanai, exterior stairs, and a 2-car carport with a utility/storage room. The home would be largely self-sufficient in terms of power and utility requirements. The home would be powered with roof mounted solar photovoltaic panels, which would be mounted on the carport roof, and would include a water catchment system and individual wastewater system to meet the residence's potable water and wastewater disposal requirements. Telecommunications would be provided via a satellite dish. The **Total Development Area**, per the Conservation District rules, is **2,604 Sq. Ft.**, which includes the total areas for the residence (1,693 Sq. Ft.), carport and utility storage (480 Sq. Ft.), potable water and propane storage tanks (207 Sq. Ft.), and garden planters (224 Sq. Ft.). The **Floor Plans and Elevation Drawings** for the proposed residence and carport are shown in **Figures 5 through 10**.

A total area of less than half an acre of the property will be used for construction of the home and its related improvements, which have been planned and designed to fit the site and minimize the grading requirements on this especially challenging site. In particular, the home is designed with a post and pier type construction to better fit the home to the site, rather than visa-versa, and the carport is separated from the house, to best fit this structure to the site and, thus, minimize the grading required for its foundation and driveway approach. Also, due to the use of on-site power generation and telecommunication systems, as well as locating the power, water storage and wastewater treatment systems near the house, no additional grading or trenching for underground utility lines outside the proposed house site would be required.

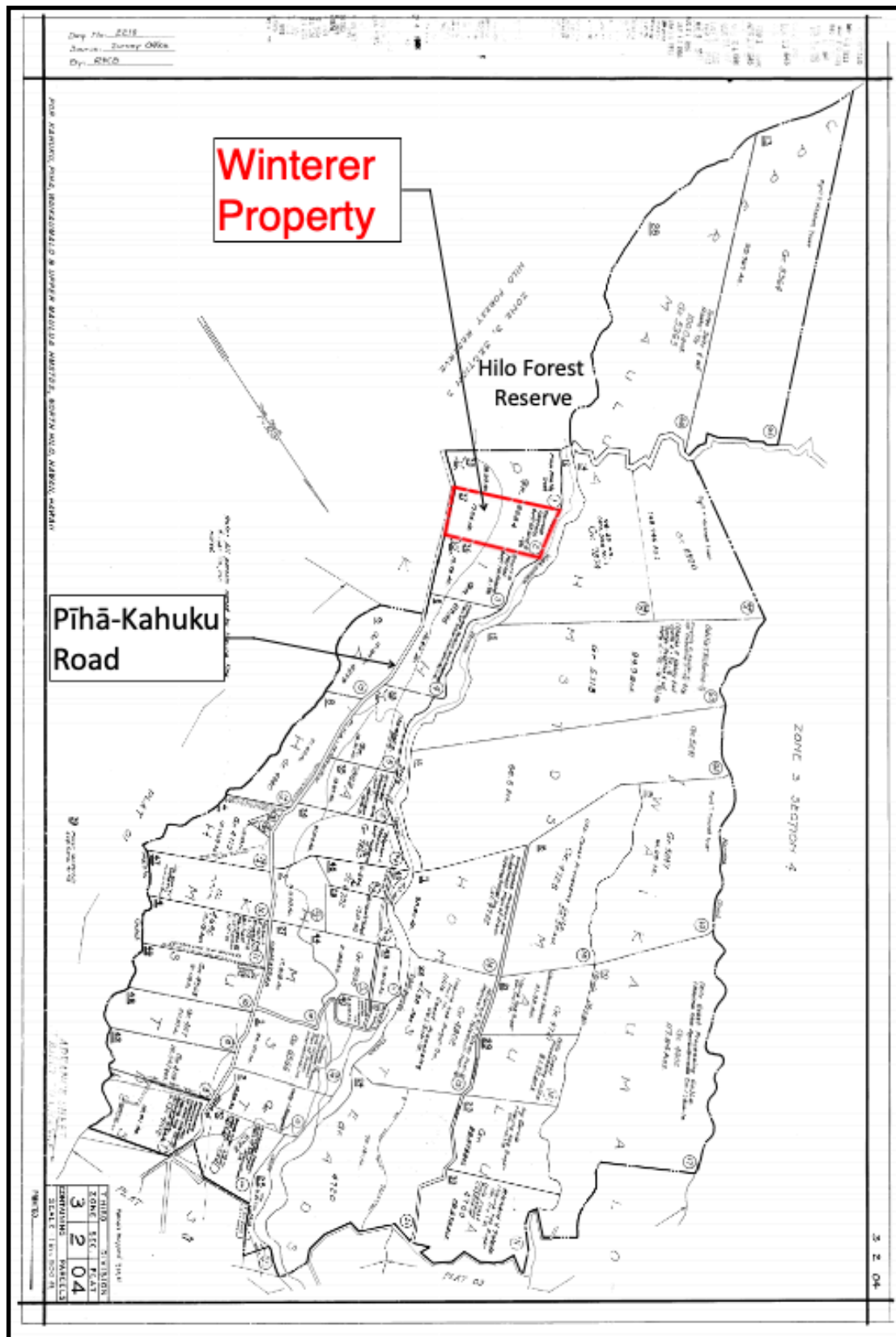
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APPLICATION



Figure 1 Island/Regional Location Map
Winterer Single-Family Residence

Conservation District
Use Permit Application

WINTERER SINGLE FAMILY RESIDENCE - CONSERVATION DISTRICT USE APPLICATION



**Figure 2 TMK Location Map
Winterer Single-Family Residence**

Conservation District
Use Permit Application

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APPLICATION

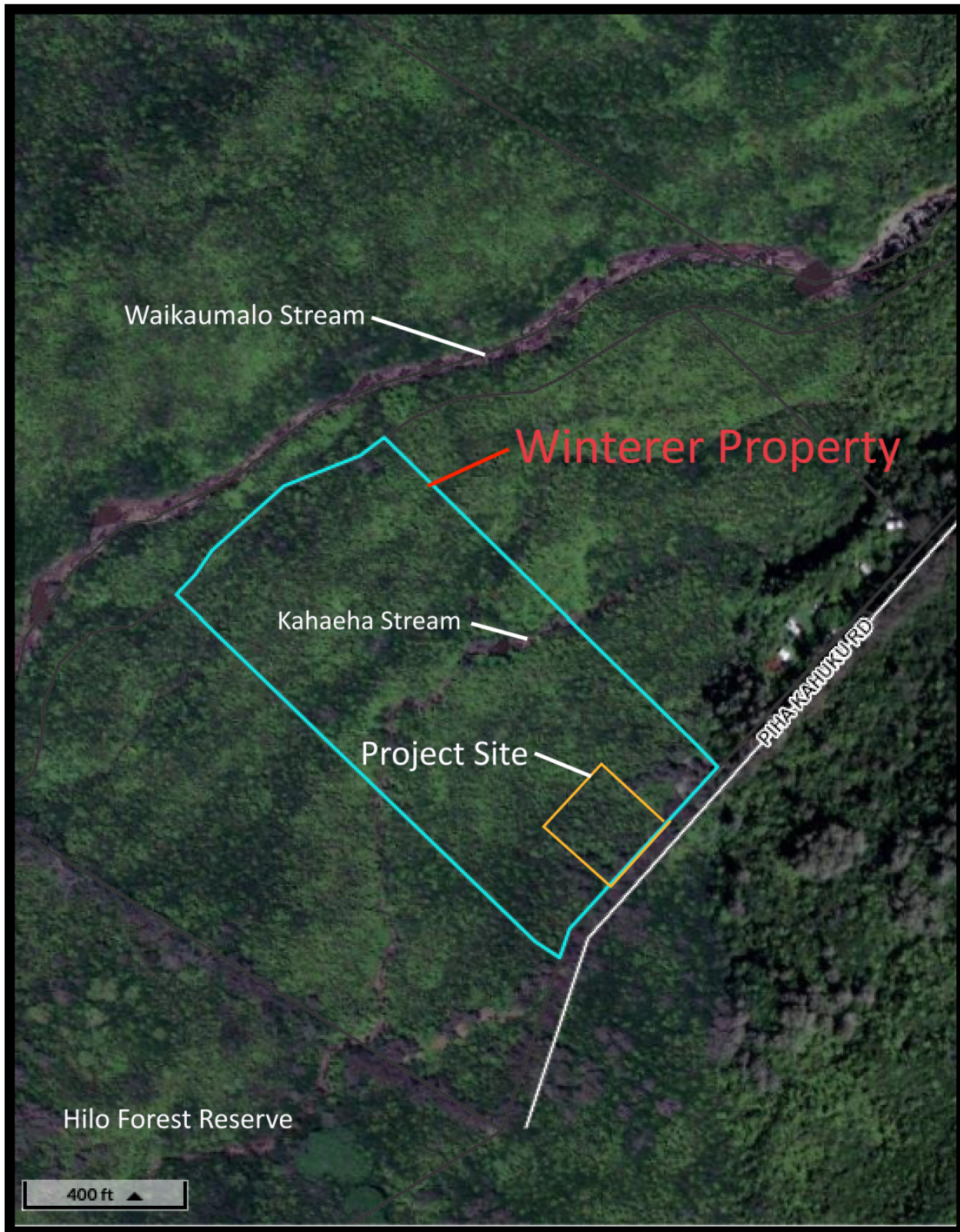
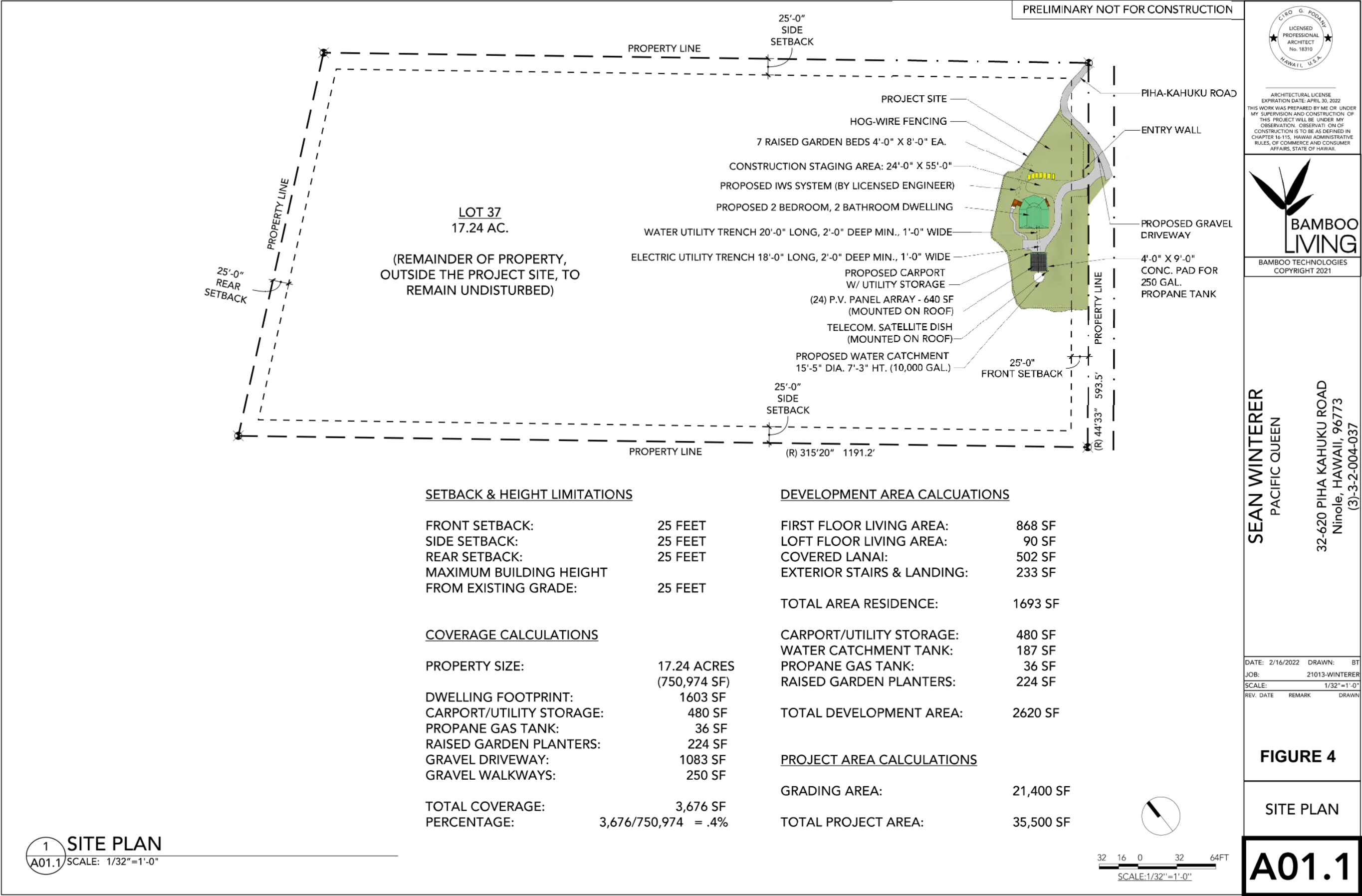


Figure 3 Vicinity Location Map
Winterer Single-Family Residence

Conservation District
Use Permit Application



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(3)-3-2-004-037

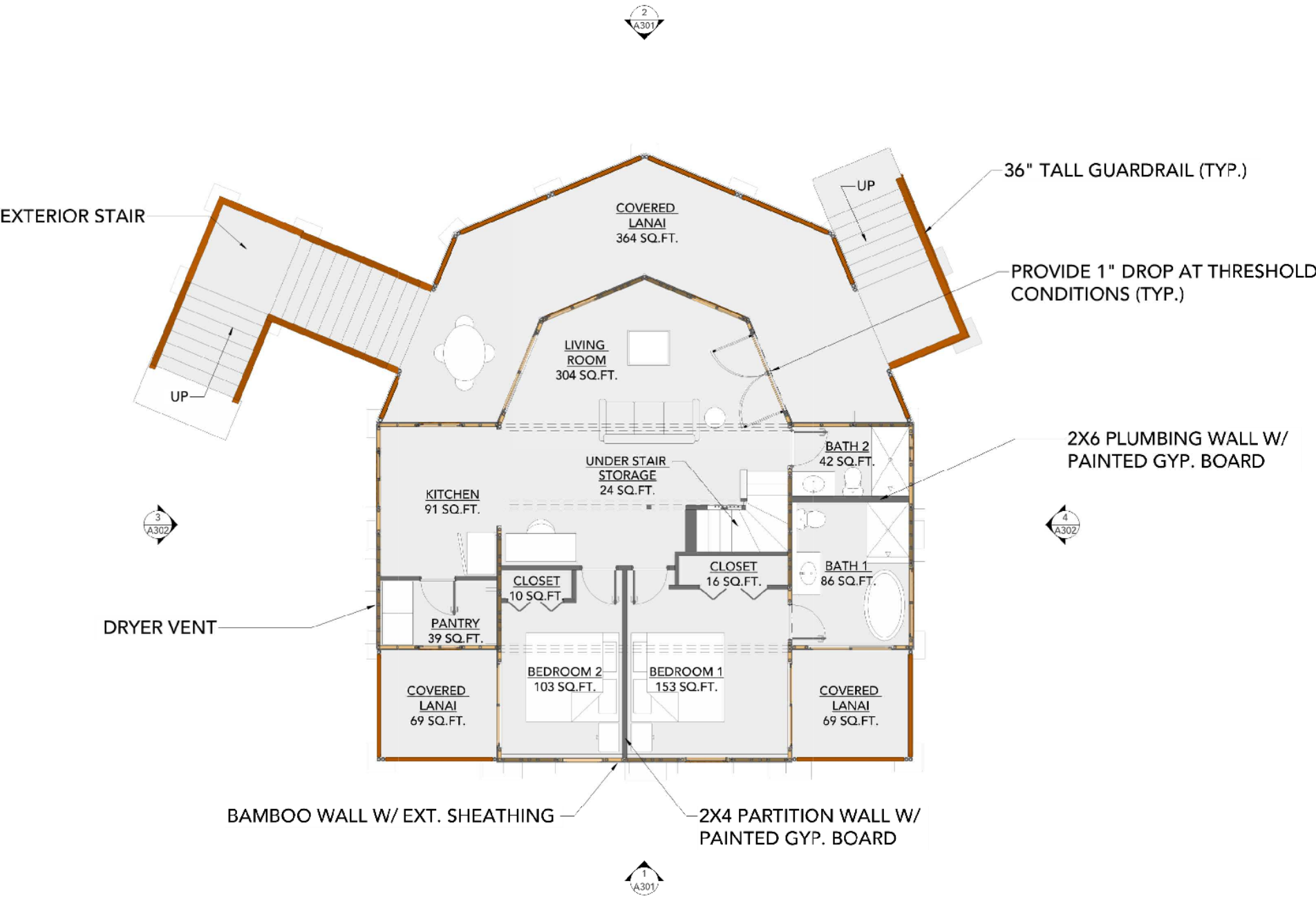
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SCALE: 1/8" = 1'-0"

FIGURE 5

1st FLOOR
PLAN

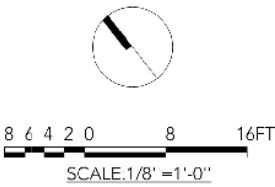
A02.1

SHEET SIZE: 24X36



RESIDENCE
1st FLOOR PLAN

1
A02.1 SCALE: 1/8" = 1'-0"



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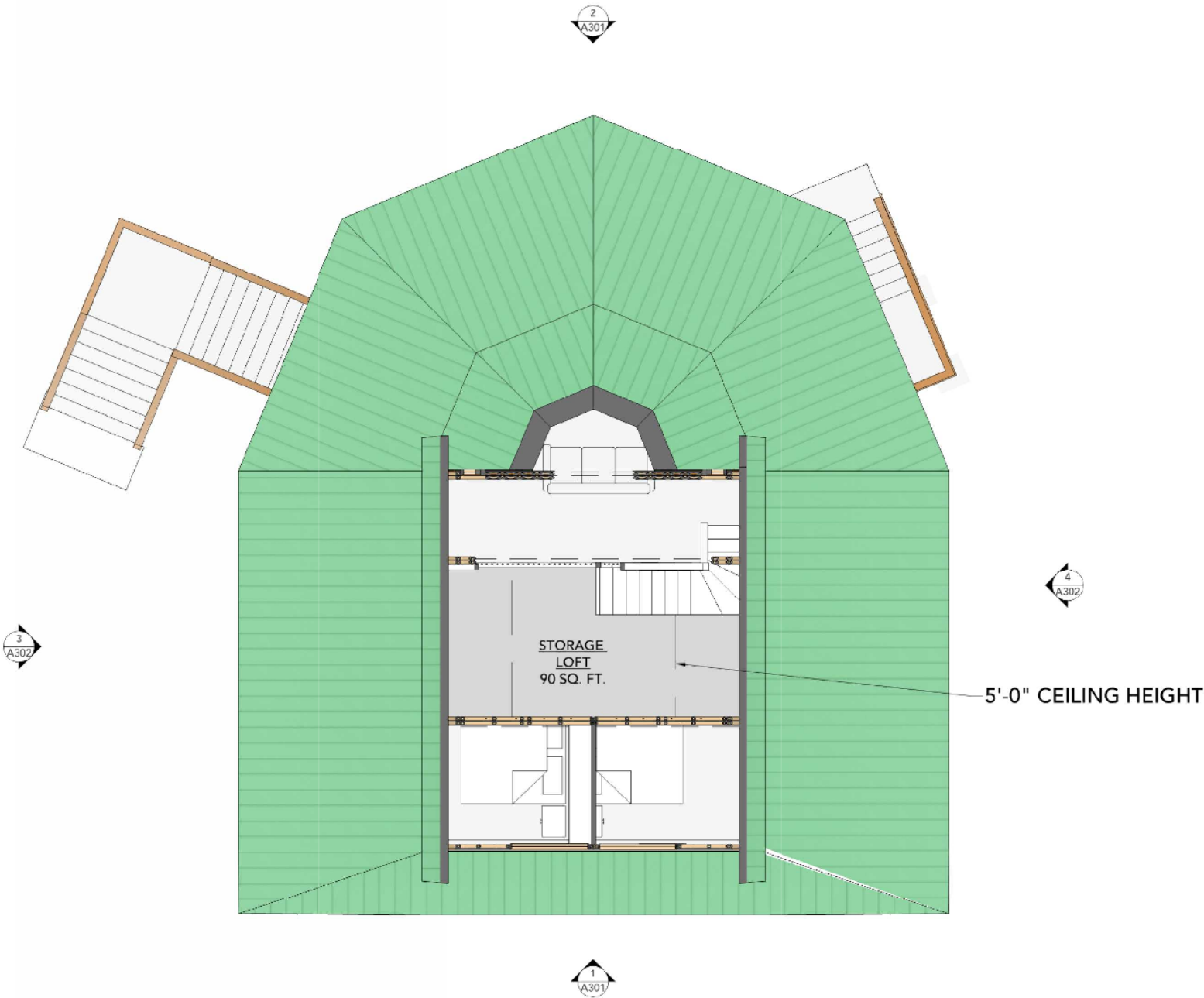
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FIGURE 6

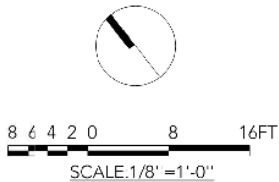
LOFT PLAN

A02.2

SHEET SIZE: 24X36



RESIDENCE
LOFT PLAN
1
A02.2 SCALE: 1/8" = 1'-0"



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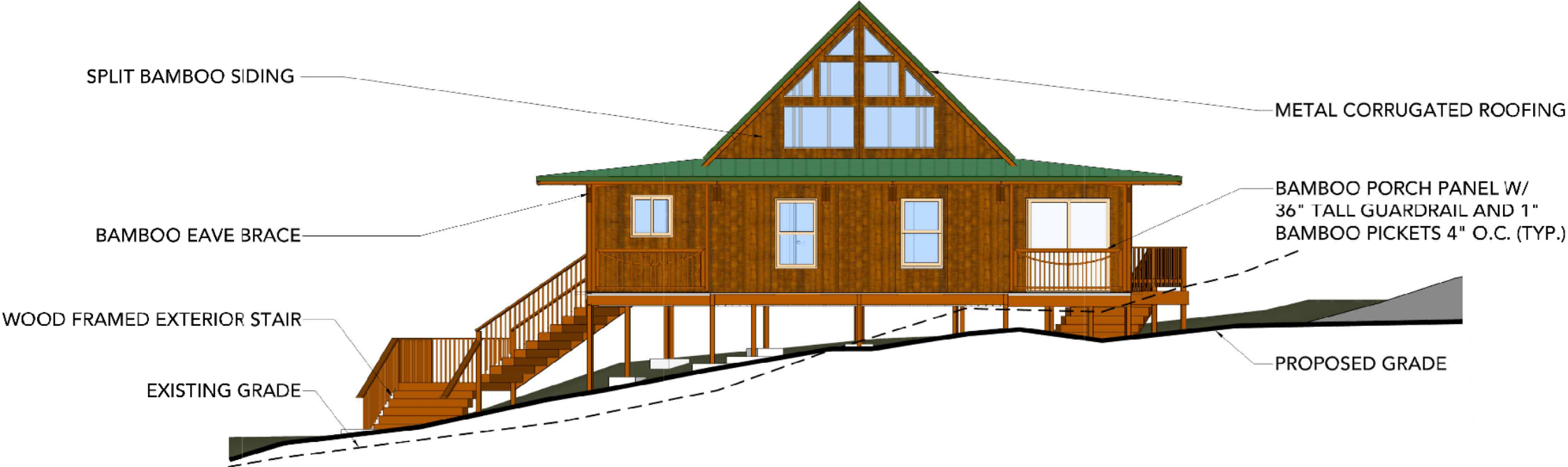
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FIGURE 7

EXTERIOR
ELEVATIONS

A03.1

SHEET SIZE: 24X36



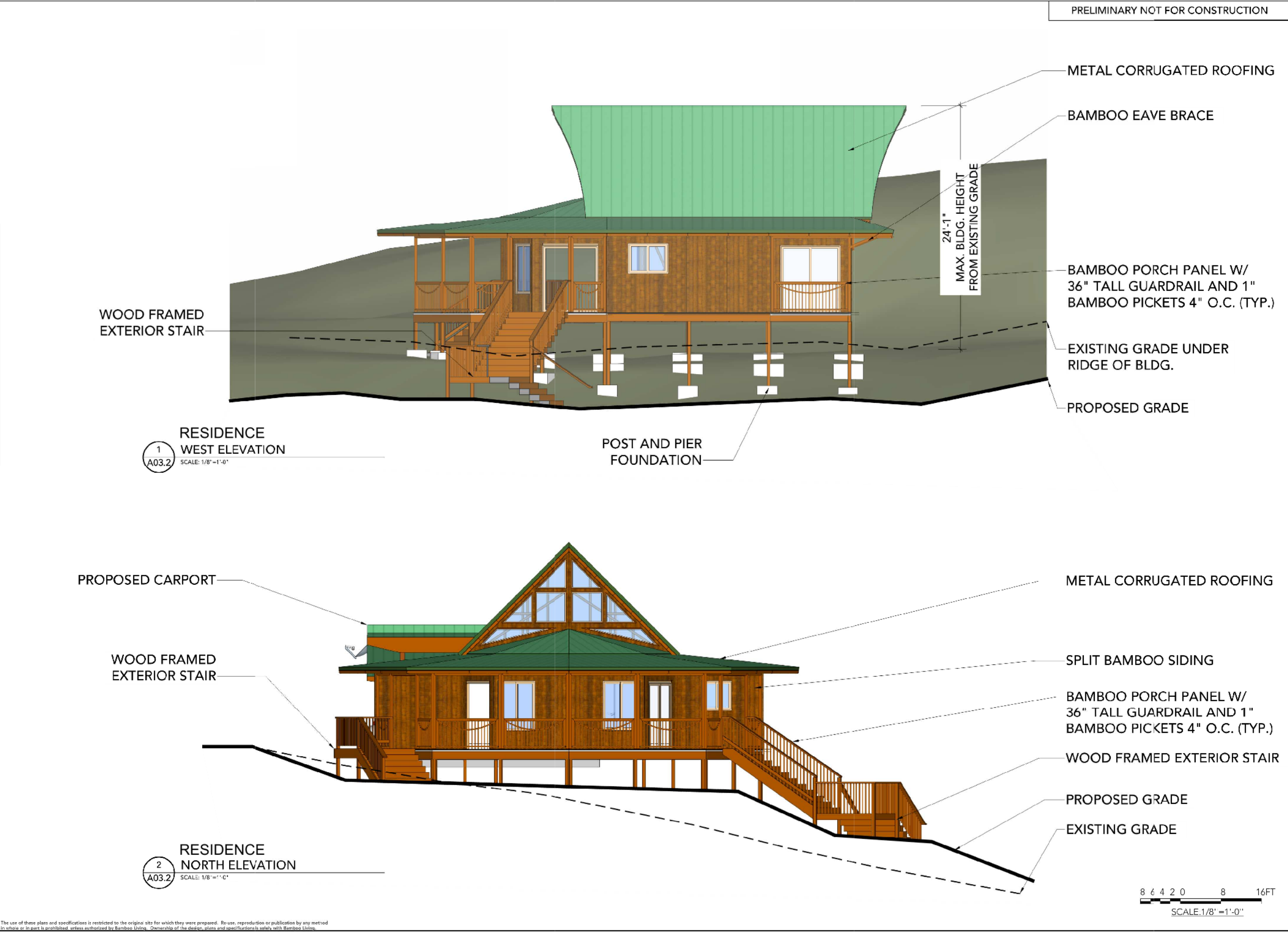
1
A03.1
RESIDENCE
SOUTH ELEVATION
SCALE: 1/8"=1'-0"



2
A03.1
RESIDENCE
EAST ELEVATION
SCALE: 1/8"=1'-0"

8 4 2 0 8 16FT
SCALE: 1/8"=1'-0"

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SCALE: 1/8"=1'-0"
REV. DATE REMARK DRAWN

FIGURE 8

EXTERIOR ELEVATIONS

A03.2

SHEET SIZE: 24X36

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CITRO G. FODAY

LICENSED PROFESSIONAL ARCHITECT

No. 18310

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CUSTOM PORTE COCHERE

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(3)-3-2-004-037

DATE: 2/11/2022

DRAWN: BT

JOB: 21013-WINTERER

SCALE: 1/8"=1'-0"

REV. DATE

REMARK

DRAWN

FIGURE 9

ELEVATIONS

A03.4

SHEET SIZE: 24X36

TELECOM. SATELLITE DISH (MOUNTED ON ROOF)

P.V. PANELS (MOUNTED ON ROOF)

CORRUGATED METAL ROOF

17'-7" MAX. BLDG. HEIGHT FROM EXISTING GRADE

LP SMARTSIDE

PROPOSED GRADE

EXISTING GRADE

CARPORT/ UTILITY STORAGE NORTH ELEVATION

2 A03.4 SCALE: 1/8"=1'-0"

PROPOSED WATER CATCHMENT TANK (10,000 GAL.)

TELECOM. SATELLITE DISH (MOUNTED ON ROOF)

LP SMART SIDE

P.V. PANELS (MOUNTED ON ROOF)

CORRUGATED METAL ROOFING

PROPOSED GRADE

CARPORT/ UTILITY STORAGE WEST ELEVATION

2 A03.4 SCALE: 1/8"=1'-0"

8 6 4 2 0 8 16FT
SCALE: 1/8"=1'-0"

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CUSTOM CARPORT

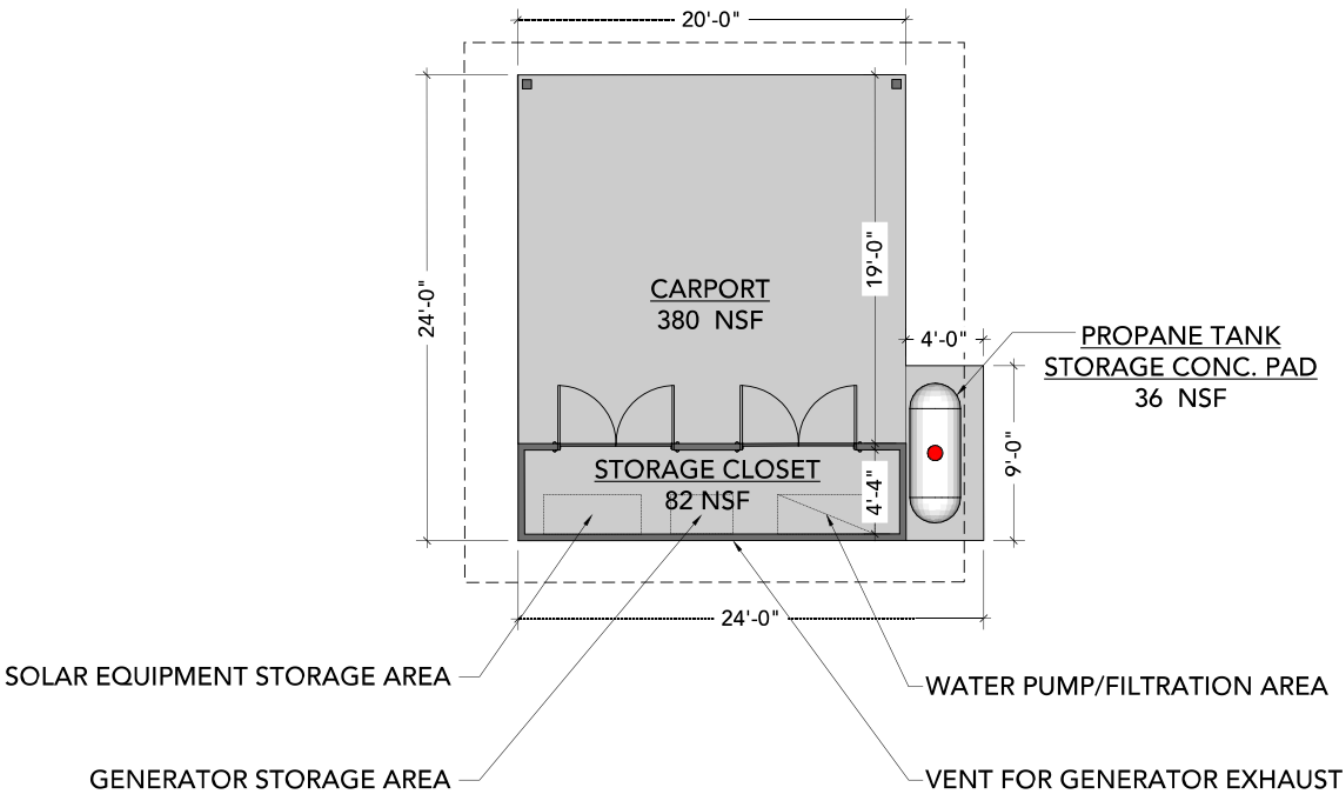
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JOB: 21013-WINTERER	
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	DRAWN

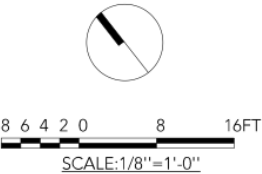
FIGURE 10
CARPORT
FLOOR PLAN

A02.3

SHEET SIZE: 24X36



1 CARPORT FLOOR PLAN
A02.3 SCALE: 1/8"=1'-0"



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The home and its related improvements are located towards the central portion, thus well removed (at least 200-feet) from the nearest property boundary and would be over 325-feet, at their closest point, from Kahaeha Stream, which crosses roughly through the middle of the property. Importantly, most of the property, totaling over 16-acres, including the areas between the Project Site and Kahaeha Stream, as well as the remainder of the property northwest of the stream, would be left undisturbed.

It is also worth noting that the proposed house site and access driveway have been planned with the aim of minimizing the potential disturbance to the native vegetation, especially the native ‘ōhi’a (*Metrosideros polymorpha*) that are a major component of the tree canopy on this largely forested property. While the area of the Project Site is particularly infested by invasive plants, the owner recognizes that a number of ‘ōhi’a will need to be removed in the course of developing home site. The potential impact to the ‘ōhi’a in this area, however, has been minimized by restricting the area of the property to be disturbed, careful siting of the structures and driveway, including a significant number new ‘ōhi’a plantings as part of the planned landscaping, and leaving the remainder of the property outside the Project Site, undisturbed, thereby preserving much the native forest, as it is. Importantly, those ‘ōhi’a trees that would be planted as part of the landscaping would all be grown onsite from existing ‘ōhi’a, using an air-layering process, which is detailed below in the discussion on the landscaping and native species protection for the Project. Additionally, so as to control the spread of the fungus responsible for the Rapid ‘Ōhi’a Death (ROD) disease that has devastated thousands of acres of ‘ōhi’a throughout the Island, special precautions, as recommended by DLNR’s Division of Forestry and Wildlife (DOFAW) and detailed below, will be implemented by the owner’s contractors throughout the construction process. A summary of the Project’s plans and requirements for on-site access, landscaping, and utility related improvements, including their associated trenching and grading requirements, are described in detail below.

UTILITIES: In terms of the supporting utilities, the house will remain largely self-sufficient by obtaining power from 24-roof-mounted photovoltaic (PV) panels, domestic water from a roof-catchment and water storage system, wastewater treatment through an on-site individual septic system and telecommunications from a satellite dish that would be mounted on the carport. The solar PV array covering approximately 640 Sq. Ft. will be mounted to the roof of the carport with the batteries, solar electrical equipment and back-up generator stored in the utility room at the back of the carport. Some use of propane gas, which will be from propane gas tank located on a 20 sq. ft. concrete base located adjacent to the carport, is also planned to support a back-up generator, gas stove, oven, and back-up water heater.

The domestic water supply would be provided from a roof catchment system, as is commonly used for homes in this area. A 10,000-gallon potable water storage tank, which would be located adjacent to the carport, would encompass an area of approximately 187 square feet and would be set on a pad of crushed rock to provide a stable and level base. The proposed 10,000 gallons of water storage is expected to be more than adequate in this area of especially high rainfall, averaging over 200 inches annually, to meet the expected demand based on the family’s projected average daily use of less than 240 gallons per day, while also providing sufficient reserve capacity to meet the fire-flow requirements for the planned residence.

Wastewater would be treated by an individual septic system located adjacent to the residence, which would be designed and installed in conformance with requirements of the State Department of Health. The septic system would have a tank capacity of 1,000 gallons and an absorption field that extends over an area of approximately 320 square feet. The trenching requirements for the septic system are included below within table showing the Project’s full trenching requirements.

SITE PREPARATION (Clearing, Grading or Grubbing, Trenching, and Construction Staging): Grubbing and grading at the site, as shown in the **Grading Plan in Figure 11**, will occur in the areas of the driveway and parking/turnaround; the potable water tank; house site; carport; construction staging area and the areas of the trenching required for the septic system and wastewater transmission lines, comprising a total area of approximately 21,400 square feet or just under a half (0.49) an acre. As noted above, the proposed residence, carport and access improvements have been designed and planned with the goal of fitting to the existing topography and, thus, minimizing the amount of grading required. Additionally, the applicant will require that the construction contractor implement the following best management practices as part of the construction of the home to minimize the potential for erosion and sedimentation throughout the construction process.

- The total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot.
- All points of egress and ingress to a site shall be protected by a stabilized construction entrance.
- The disturbance area will be marked during construction with orange fencing on the west, south and north (and bounded by the unpaved Pīhā-Kahuku Road extension on the east) to avoid disturbance to the ground or vegetation beyond the disturbance area.
- Slope protection shall be used on areas with slopes greater than 50% and on areas of moderate slopes that are prone to erosion. The contractor will take special precautions, including use of a dual-layer sedimentation control to prevent any sediment leaving the work areas, particularly towards the direction of nearby streams.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff; and
- Cleared areas will be replanted or otherwise stabilized as soon as possible, prior to removing erosion and sediment measures.
- Stockpiles shall not be located within drainage ways or other areas of concentrated flows. Sediment trapping shall be used around the base of all stockpiles.
- Dust control should be applied to reduce dust emissions to keep the surroundings free of dust.

The individual septic system and potable water storage tank are located adjacent to the house site to help minimize the amount trenching for transmission lines and, thus, the amount of ground disturbance required. Furthermore, the extracted material from the trenching will be used to refill trenched areas and to blend the areas with the surrounding topography to avoid the need for any off-site disposal of materials. A summary of the Project's **Utility Related Trenching Requirements**, including the linear dimensions for utility lines and the affected area for utility trenching, are provided below within **Table 1**.

The staging area for the construction equipment and storage of materials, as indicated on the **Site Plan in Figure 4** and the **Grading Plan in Figure 11**, would be confined to an approximately 30' x 50' area coinciding with the planned patio area in the area between the house and raised garden planters, thereby further limiting the total area of disturbance on the site.

LANDSCAPING AND NATIVE SPECIES PROTECTION: The **Landscape Plan** for the proposed residence, **as shown in Figure 12**, is aimed at reestablishing the natural character of the site through the eventual removal of the invasive species, such as strawberry guava (*Psidium cattleianum*), melastoma (*Melastoma candidum*), Koster's curse (*Clidemia hirta*) that would otherwise come to dominate the current landscape, and replanting disturbed areas with the native trees and ground covers that are common to the area, particularly the native ō'hi'a and the uluhe (*Dicranopteris linearis*) and hapu'u ferns (*Cibotium* spp.) that we're once a major part of a diverse native forest in the area. A home garden area is also planned at the periphery of the house site, which would consist of raised bed

MINIMUM BMP CHECKLIST FOR SMALL PROJECTS

- (A) STABILIZED CONSTRUCTION ENTRANCE**
ALL POINTS OF EGRESS AND INGRESS TO A SITE SHALL BE PROTECTED BY A STABILIZED CONSTRUCTION ENTRANCE.
- (B) STOCKPILES AREA**
STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS OR OTHER AREAS OF CONCENTRATED FLOWS. SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED AROUND THE BASE OF ALL STOCKPILES.
- (C) DUST CONTROL**
DUST CONTROL SHOULD BE APPLIED TO REDUCE DUST EMISSIONS. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES: CHAPTER 11-60, "AIR POLLUTION CONTROL"
- (D) SEDIMENT BARRIERS OR TRAPS**
SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED DOWN SLOPE OF ALL DISTURBED AREAS AND AROUND THE BASE OF ALL MATERIAL STOCKPILES AND IN GENERAL FOLLOWS EXTENT OF GRADING PER PLAN
- (E) SLOPE PROTECTION**
SURFACE FLOW FROM ABOVE AN EXPOSED AREA SHALL NOT BE ALLOWED TO FLOW OVER THE SLOPE WITHOUT PROTECTION. SLOPE PROTECTION SHALL BE USED ON AREAS WITH SLOPES GREATER THAN 50% AND ON AREAS OF MODERATE SLOPES THAT ARE PRONE TO EROSION.
- (F) TEMPORARY STABILIZATION**
IS NOT REQUIRED WHEN THE DISTURBED AREA WILL BE WORKED WITHIN A 14 DAY PERIOD. STABILIZATION IS REQUIRED FOR DISTURBED AREAS AT FINAL GRADE AND FOR THOSE AREAS THAT WILL NOT BE WORKED WITHIN A 14 DAY PERIOD.
- (G) PERMANENT STABILIZATION**
ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO REMOVING EROSION AND SEDIMENT MEASURES. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND AREAS OF DISTURBED SOIL WHICH RESULT FROM THE REMOVAL OF THE TEMPORARY MEASURES SHALL BE IMMEDIATELY PERMANENTLY STABILIZED.

GRADING TABLE

CUT: 700 CY, MAX HEIGHT = 5'

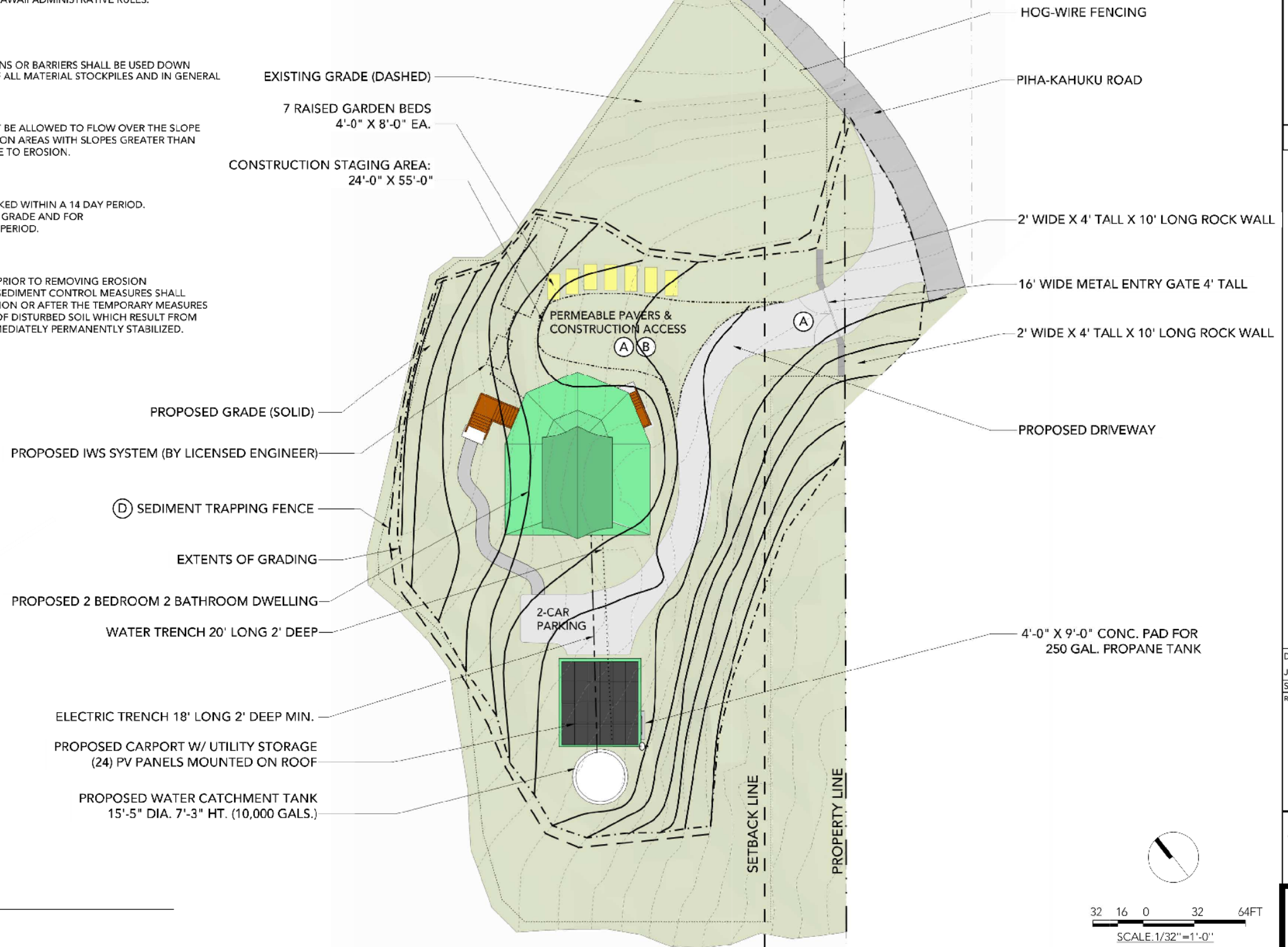
- TRENCHES: 6 CY
- ROAD WORK: 300
- STRUCTURES: 394

FILL: 700 CY, MAX HEIGHT = 4'

- ROAD WORK: 300
- STRUCTURES: 400

GRADING SITE PLAN

(A01.2) SCALE: 1/32"=1'-0"



PRELIMINARY NOT FOR CONSTRUCTION



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EXPIRATION DATE: APRIL 30, 2022
THIS WORK WAS PREPARED BY ME OR UNDER
MY SUPERVISION AND CONSTRUCTION OF
THIS PROJECT WILL BE UNDER MY
OBSERVATION. CIRCULATE ON UP
CONSTRUCTION IS TO BE AS DEFINED IN
CHAPTER 16-115, HAWAII ADMINISTRATIVE
RULES, OF COMMERCE AND CONSUMER
AFFAIRS, STATE OF HAWAII.



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SEAN WINTERER
PACIFIC QUEEN

DATE: 2/16/2022	DRAWN: BT
JOB: 21C13-WINTERER	
SCALE: 1/32"=1'-0"	
REV. DATE	REMARK DRAWN

FIGURE 11

GRADING SITE
PLAN 2

A01.2

SHEET SIZE: 24X36

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PLANT LIST

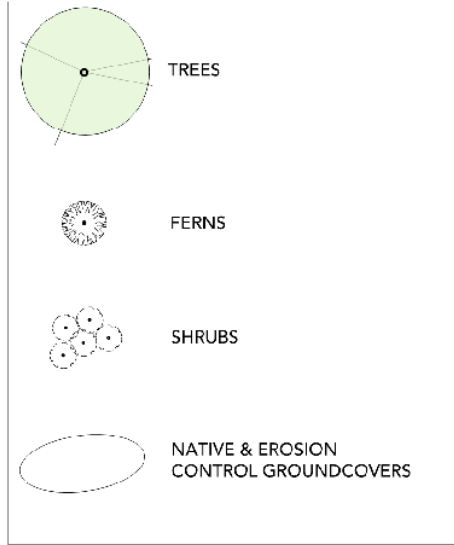
COMMON / HAWAIIAN NAME	BOTANICAL NAME
TREES:	
'OHIA	(METROSIDEROS POLYMORPHA)
CITRUS	(CITRUS SPP.)
SHARWIL AVOCADO	(PERSEA AMERICANA)
BANANA	(MUSA X PARADISIACA)
PAPAYA	(CARICA PAPAYA)
COFFEE	(COFFEA ARABICA)
MACADAMIA	(MACADAMIA INTEGRIFOLIA)
KOA	(ACACIA KOA)
LOULU	(PRITCHARDIA BECCARIANA)
KOPIKO	(PSYCHOTRIA HAWAIIENSIS)
MAMAKI	(PIPTURUS ALBIDUS)
PILO	(COPROSMA SPP.)

FERNS:	
HAPU'U PULU	(CIBOTIUM GLAUCUM)
KUPUKUPU	(NEPHROLEPIS CORDIFOLIA)

SHRUBS:	
AIKANENE	(COPROSMA ERNODEOIDES)
NAUPAKA	(SCAEVOLA GAUDICHAUDII)
KOLEA	(MYRSINE LESSERTIANA)

NATIVE & EROSION CONTROL GROUNDCOVERS:	
PEANUT GRASS	(ARACHIS PINTOS)
ULUHE	(DICRANAPTERIS LINEARIS)

LANDSCAPE PLANT LEGEND



1 LANDSCAPE PLAN
A01.3 SCALE: 1/32"=1'-0"



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SEAN WINTERER
PACIFIC QUEEN
32-620 PIHA KAHUKU ROAD
Ninole, HAWAII, 96773
(3)-3-2-004-037

DATE: 2/16/2022 DRAWN: BT
JOB: 21C13-WINTERER
SCALE: 1/32"=1'-0"
REV. DATE REMARK DRAWN

FIGURE 12
LANDSCAPE PLAN

A01.3

SHEET SIZE: 24X36

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TABLE 1

Winterer Residence- Utility Related Trenching Requirements

	Length (Ft.)	Width (Ft.)	Depth (Ft.)	Affected Area (Sq. Ft.)	Total Area (Sq. Ft.)
Septic System					
Tank	8	5	6	40	
Absorption Field	28	12	2	336	
Sewer Line	30	1	2	<u>30</u>	
				406	406
Underground Water Lines					
Potable	30	1	2	30	30
Electrical Power Line	30	1	2	30	30
TOTAL AREA					466 Sq. Ft.

planters for vegetables and herbs and clusters of tropical fruit trees, including avocado, citrus, banana, and papaya. Additionally, in order to protect the landscaped and garden areas from potential damage from feral pigs that are abundant in the area, hog-wire fencing is planned at the perimeter of the house site together with a rock-wall entry feature and constructed metal gate is planned at the project entry.

The new ‘ōhi’a plantings would be grown from the existing trees, onsite, by a trained arborist using an air-layering process, as detailed below. Additionally, in an effort to control the spread of the fungus responsible for the Rapid ‘Ōhi’a Death (ROD) disease that has affected forests throughout the Island, those precautions and protocols, as recommended by DLNR’s Division of Forestry and Wildlife (DOFAW), will be implemented by the owner’s contractors throughout the site preparation and construction process. These recommended protocols include the following:

- Prior to construction, identify and flag any ‘ōhi’a near the construction site to ensure their branches are not damaged or broken during the construction;
- Treat any unavoidable scars to prevent infestation from the fungus;
- Stack all removed ‘ōhi’a for disposal onsite by means of burying or chipping, not removing any ohia from the site; and
- Decontaminate boots and work tools prior to entering the construction site and after leaving.

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE APPLICATION

In order to insure that no ō'hi'a trees are either brought to the site for planting or removed from the property for use or disposal, either of which could promote the spread of the ROD disease, all new ō'hi'a to be planted as part of the Project landscaping will be grown onsite and, in concert with the above protocols, all ō'hi'a trees that are removed in the course of site preparation will be disposed of onsite by means of burying or chipping. The air-layering process for growing new ō'hi'a plantings would involve the following steps:

- A selection will be made of healthy, mature ō'hi'a trees to determine suitability for air layering.
- Suitable specimens will show vigorous growth, have attractive foliage and flowers, and show no signs of decay.
- Mature branches will be selected that are about a finger's width in diameter.
- An incision will be made in a ring around the branch to girdle it, making sure the cut is not too deep but removes the bark and the cambium layer down to the sapwood.
- Rooting hormone will be dusted onto the wound.
- The incision around the branch will then be covered with clean, moist moss and covered tightly with aluminum foil.
- In about three months the branch will be checked. The moss under the foil should be filled with a dense root ball.
- The branch will be cut about an inch lower than the root ball and then will be planted in a pot with sterile, moist soil until the branch is thoroughly rooted. All potted plants will be kept onsite until replanting.
- Once the cloned ō'hi'a trees are established in the pots, they will be transplanted to suitable onsite locations, as indicated per the Landscape Plan, for reforestation.

PROJECT TIMETABLE: The site preparation and home construction is planned to begin soon after construction related permits and plan approvals are obtained, which is expected to be within a year from receipt of the Conservation District Use Permit being sought through this application, and all work on the site is expected to be completed within a year from the start of construction.

EXISTING CONDITIONS

Please describe existing conditions on the parcel (existing access; buildings, structures, and utilities; geology, topography and soils; hydrology; flora and fauna; natural hazards; and historic and cultural resources.) Attach maps, site plans, topo maps, biological or archaeological surveys as appropriate.

The 17.24-acre property is located near the *mauka* end of Pīhā-Kahuku Road, at about 1,700 feet in elevation. A number of farms and residences, as well as water supply and communication facilities, are present on Pīhā-Kahuku Road, which is a County-owned and maintained facility for most of its length, up to about 1,200 feet from the property, at which point, according to the Department of Public Works, the road is outside the County's jurisdiction and maintenance is the responsibility of the adjoining property owners. The property is bordered by Waikaumalo Stream and its associated gulch to the northwest; by a parcel to the northeast that is developed with a single-family residence and assorted outbuildings; by a portion of the Pīhā-Kahuku Road Right-of-Way (ROW) along the southeast; and by another 18.3-acre parcel to the southwest that is currently under development with a planning single family residence and associated landscape and utility improvements. The property is crossed near its midsection by Kahaeha Stream, a tributary of the larger Waikaumalo Stream. The Project Site and area of the proposed home and related improvements, as indicated on the **Vicinity Location Map, Figure 3**, is within a less than an acre portion of the property adjacent to the Pīhā-Kahuku Road Right-of-Way (ROW).

Geology, Soils and Climate

The property is situated on the southeastern flank of Mauna Kea. The lava flows underlying the property are dated from prior to 14,000 years ago, although areas several miles upslope from the site have more recent surface flows that are dated as 4,000 to 10,000 years old. (Wolfe and Morris 1996). All lava flows in this area are mantled with a thick layer of volcanic ash derived from Kohala and Mauna Kea volcanoes (USGS-HVO: 2009). Soil in the area is classified as Kaiwiki, highly organic, hydrous silty clay loam, with 6 to 20 percent slopes. These deep, well-drained Andisol soils are formed of weathered volcanic ash overlying bedrock. According to the U.S. Soil Conservation Service, Kaiwiki hydrous silty clay loams are characteristically fairly well drained but have medium to high runoff such that localized boggy conditions can quickly develop when the soil is compressed by cultivation, vehicles or animals. The terrain over most of the project area is characterized by a moderate northwest slope that extends towards Kahaeha Stream near the middle of the property. The property area receives an average of about 205 inches of rain annually, with temperatures at this elevation generally ranging between 55 to 68 degrees Fahrenheit through the year.

Geologic and Flood Hazards

In terms of exposure to geologic hazards, the entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. The volcanic hazard for the project area, as assessed by the U.S. Geological Survey, is determined to be in Zone 8 on a scale of descending risk from 1 to 9 (Heliker 1990:23). The relatively low hazard risk is because Mauna Kea is an inactive volcano. Zone 8 includes areas that have had no lava flows in the last 750 years, and only a few percent covered by lava in the past 10,000 years. Thus, the risk of volcanic hazard here is very low.

The entire Island of Hawai'i experiences high seismic activity and is at risk from major earthquake damage (USGS 2000), especially to structures that are poorly designed or built, as the 6.7-magnitude quake of October 2006 and the more recent 6.9 quake of May 2018 demonstrated. The portion of the property site proposed for improvement is on a slightly flattened topographic ridge that descends along

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE APPLICATION

a moderate slope in the direction of the middle of the property. There are no steeper slopes in the area of the proposed structures, such that there does not appear to be a substantial risk at the site from subsidence, landslides or other forms of mass wasting.

In relation to potential for flooding or flood related risks, the floodplain status for many areas of the Island of Hawai'i has been determined by the Federal Emergency Management Agency (FEMA), which produces the National Flood Insurance Program's Flood Insurance Rate Maps (FIRM). The flood zones for this region were recently mapped, and digital maps and reports are available from the Department of Land and Natural Resources at <http://gis.hawaiiinfip.org/fhat/>. The property, as shown on the **Flood Zone Map in Figure 13** is within Flood Zone X, areas outside the mapped 500-year floodplain. Also, being at and above the 1,700-foot elevation, there is no risk of tsunami inundation. The property is also outside both the tsunami evacuation and any dam evacuation zone.

Notwithstanding the flood zone designation for the property, the two steep stream channels and, potentially, the lower portion of the stream banks on either side are subject to periodic stream flooding. Waikamalo Stream is just outside the northwestern edge of the property and over 1,000 feet from the Project Site and Kalaeha Stream, which crosses lengthwise through the middle of the property is more than 350 feet away and at a lower elevation from the lowest point of the project area to the top of the stream gulch at its closest point. As such the proposed action does not appear to be at any risk of stream flooding, which is restricted to the steep stream channels and does not overtop the high banks. Nevertheless, there is a growing potential for even larger and more frequent tropical storms as a result of a changing climate. In order to deal with the potential for larger and more frequent tropical storms, the access road in the area where it extends onto the property has been reinforced and the home has been designed to withstand hurricane force winds. Additionally, trees with the potential to fall on the home would be removed, particularly any of the large non-native paperbark trees located in the area directly upslope from the house site.

Flora

The project area is completely undeveloped and is thickly vegetated. At present, the vegetation of the project site is a mixed native-non-native forest dominated by 'ōhi'a, strawberry guava (*Psidium cattleianum*) and paperbark (*Melaleuca quinquenervia*). There is a dense shrub layer dominated by the non-native *Melastoma candidum*, but also containing a significant cover of uluhe and hapu'u. On the ground, non-native grasses and weeds dominate, including the highly invasive Koster's curse (*Clidemia hirta*). A number of the native ferns and a few of the non-native ferns are present as epiphytes, that is; growing in the trees. Few native tree species, other than 'ōhi'a, such as kawau (*Ilex anomala*), are only found in scattered locations and are some of the few remnants of a once diverse native forest. Among native plants on the site, only ferns have retained a rich diversity, with 16 species and all but one of them native. All the native plants found on the property are common to the region, on the island, and for most, throughout the Hawaiian Islands. A complete **List of Plant Species** found on the project site and the immediately surrounding area is provided below, in **Table 2** and the general vegetative character of the site is shown in the **Site Photos in Figure 14**.

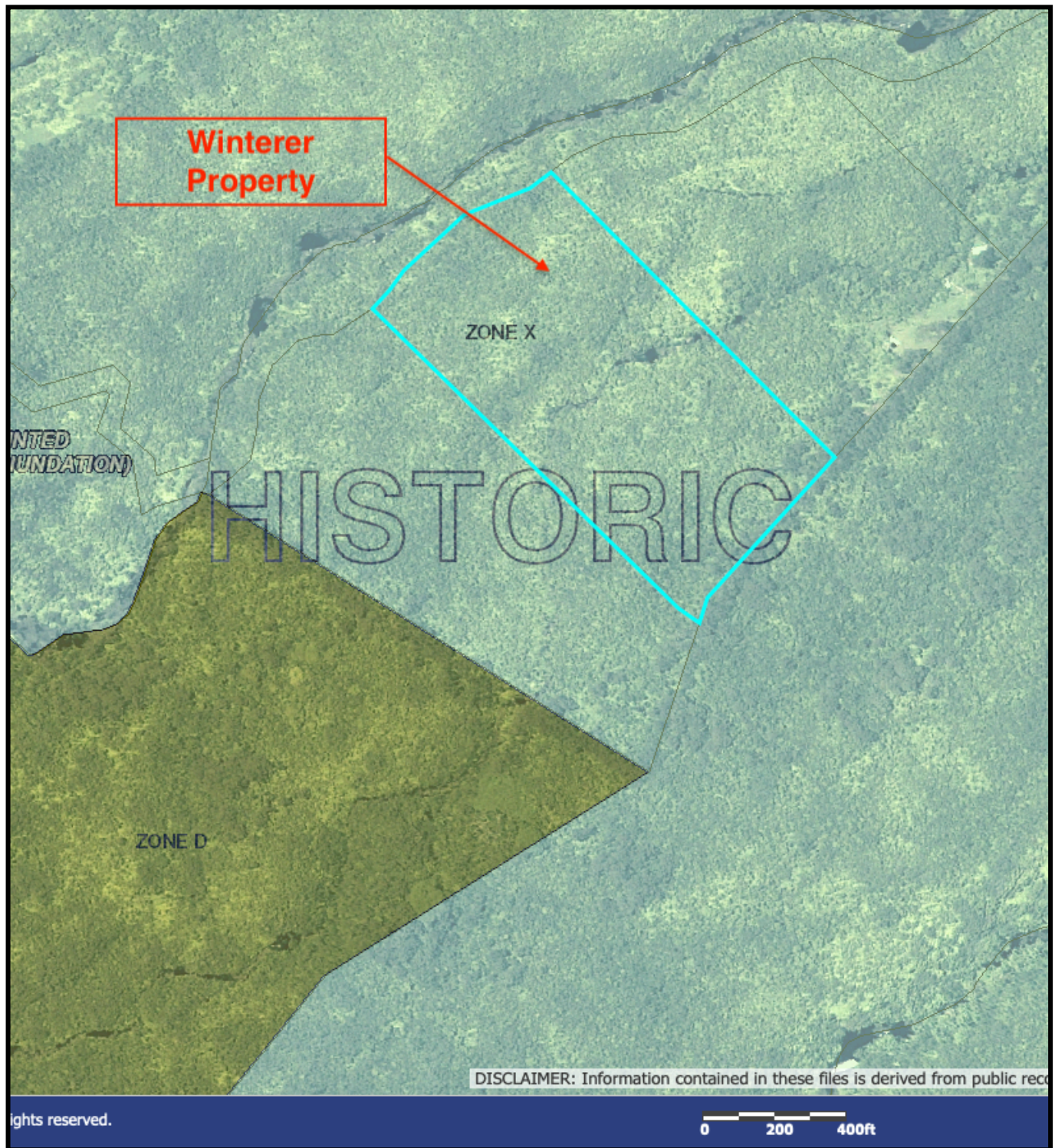


Figure 13 Flood Zone Map
Winterer Single Family Residence

Conservation District
Use Permit Application

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE
APPLICATION

Table 2. Plant Species Observed on Project Site

Scientific Name	Family	Common Name	Life Form	Status*
<i>Adenophorus hymenophylloides</i>	Grammitidaceae	Palani Huna	Fern	E
<i>Adenophorus pinnatifidus</i> var. <i>pinnatifidus</i>	Grammitidaceae	Wahine Noho Mauna	Fern	E
<i>Adenophorus tamariscinus</i>	Grammitidaceae	Wahine Noho Mauna	Fern	E
<i>Ageratum conyzoides</i>	Asteraceae	Ageratum	Herb	A
<i>Arundina graminifolia</i>	Orchidaceae	Bamboo Orchid	Herb	A
<i>Andropogon virginicus</i>	Poaceae	Broomsedge	Herb	A
<i>Axonopus fissifolius</i>	Poaceae	Carpet Grass	Herb	A
<i>Christella parasitica</i>	Thelypteridaceae	Christella	Fern	E
<i>Cibotium glaucum</i>	Dicksoniaceae	Hapu'u Pulu	Fern	E
<i>Cibotium menziesii</i>	Dicksoniaceae	Hapu'u Mea	Fern	E
<i>Clidemia hirta</i>	Melastomataceae	Koster's Curse	Herb	A
<i>Crotalaria pallida</i>	Fabaceae	Smooth Rattle Pod	Herb	A
<i>Cyperus halpan</i>	Cyperaceae	Sharp Edge Sedge	Herb	A
<i>Cyperus polystachyos</i>	Cyperaceae	Manyspike Flatsedge	Herb	I
<i>Dicranopteris linearis</i>	Gleicheniaceae	Uluhe	Fern	I
<i>Digitaria sp.</i>	Poaceae	Digitaria	Herb	A
<i>Elaphoglossum crassifolium</i>	Lomariopsidaceae	Hoe a Maui	Fern	E
<i>Erechtites valerianifolia</i>	Asteraceae	Erechtites	Herb	A
<i>Eucalyptus robusta</i>	Myrtaceae	Eucalyptus	Tree	A
<i>Falcataria moluccana</i>	Fabaceae	Albizia	Tree	A
<i>Fimbristylis dichotoma</i>	Cyperaceae	Fimbristylis	Herb	I
<i>Grammitis tenella</i>	Grammitidaceae	Kolokolo	Fern	E
<i>Heliocarpus popayanensis</i>	Malvaceae	White Moho	Tree	A
<i>Ilex anomala</i>	Aquifoliaceae	Kawau	Tree	I
<i>Lepisorus thunbergianus</i>	Polypodiaceae	Pakahakaha	Fern	I
<i>Ludwigia octovalvis</i>	Onagraceae	Kamole	Herb	A
<i>Melaleuca quinquenervia</i>	Myrtaceae	Paperbark Tree	Tree	A
<i>Mimosa pudica</i>	Fabaceae	Sensitive Plant	Herb	A
<i>Metrosideros polymorpha</i>	Myrtaceae	'Ōhi'a	Tree	E
<i>Nephrolepis exaltata</i>	Nephrolepidaceae	Kupukupu	Fern	I
<i>Nephrolepis multiflora</i>	Nephrolepidaceae	Sword Fern	Fern	A
<i>Ophioderma pendulum</i>	Ophioglossaceae	Adder's Tongue	Fern	I

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<i>Paspalum urvillei</i>	Poaceae	Vasey Grass	Grass	A
<i>Plantago major</i>	Plantaginaceae	Common Plantain	Herb	A
<i>Psidium cattleianum</i>	Myrtaceae	Strawberry Guava	Tree	A
<i>Persicaria capitata</i>	Polygonaceae	Knotweed	Shrub	A
<i>Psilotum nudum</i>	Psilotaceae	Moa	Fern Ally	I
<i>Schizachyrium condensatum</i>	Poaceae	Tufted Beardgrass	Herb	A
<i>Spermacoce assurgens</i>	Rubiaceae	Buttonweed	Herb	A
<i>Sphaerocionium lanceolatum</i>	Hymenophyllaceae	Palai Hinahina	Fern	E
<i>Sphenomeris chinensis</i>	Lindsaeaceae	Pala‘ā	Fern	I
<i>Sporobolus indicus</i>	Poaceae	Sporobolus	Herb	A
<i>Torenia glabra</i>	Scrophulariaceae	Torenia	Tree	A

A=Alien E=Endemic I=Indigenous END=Federal and State Listed Endangered

Figure 14. Site Photos



14A. View southwest of the property frontage along the extension of Piha-Kahuku Road which extends over the southeastern corner of the property and is lined with the large paperbark trees on either side .

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE
APPLICATION



14B. View west in the area of the proposed house site where there is a more level topography, fewer trees and a dense ground cover predominately of uluhe fern.



14C. View northwest from the northern face of the house site where a typical mix of the Asian Melastoma, Strawberry Guava, Koster's Curse, interspersed with clusters of native 'Ōhi'a, are found.



14D. View north from the lower elevation of the Project Site, towards the remainder of the property, to be left undisturbed, where a similar mix of the invasive and natives and greater tree density is found.

Figure 14 SITE PHOTOS
Winterer Single Family Residence

Conservation District
Use Permit Application

Fauna

Regarding the avifauna that may be found on the site, based on several visits conducted over the project area by Geometrician Associates in 2021, which included systematic timed bird observations, very few individual birds were detected on the property and only four bird species: Japanese white-eyes (*Zosterops japonicus*), northern cardinals (*Cardinalis cardinalis*), Japanese bush warblers (*Cettia diphone*), and red-billed leiothrix (*Leiothrix lutea*).

The formerly federally endangered Hawaiian hawk (*Buteo solitarius*), still listed as endangered by the State of Hawai'i, is a raptor that hunts in all parts of the Hāmākua Coast. Some of the tall trees on the property could theoretically provide nesting habitat. As the biological surveys occurred during the hawk nesting season (March 1-September 30), a hawk survey was conducted by Geometrician Associates by scanning visually for nests and playing amplified hawk call playback in multiple locations, however, no hawks were seen or heard and no hawk nests were observed.

The relatively low elevation on the project site leads to warm temperatures that promote mosquitos, which are inimical to most of the smaller native forest birds. None were identified, but it is highly likely that the property is occasionally utilized by the Hawai'i 'amakihi (*Hemignathus virens*), as some populations of this native honeycreeper appear to have adapted to the mosquito borne diseases of the Hawaiian lowlands.

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The threatened Hawaiian goose or nēnē (*Branta sandwicensis*) has also become very common on many Hawaiian Islands and can be found at elevations ranging from sea level to sub-alpine areas above 7,000 feet. Historically, flocks moved between high elevation feeding habitats and lowland nesting areas. Nests consist of a shallow scrape lined with plant material and down. Breeding pairs usually return to the previous year's nest site, typically in dense vegetation. Nēnē have an extended breeding season, and nesting may occur in all months except May, June, and July. Because of the lack of grassy areas or water bodies, the project site appeared to be very unlikely habitat for nēnē browsing and particularly for nesting. Surveys did not observe any signs of nēnē and they are very unlikely to be present.

As with all of the island of Hawai'i, several threatened or endangered pelagic seabirds may overfly the Ninole area between the months of May and November, including the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered band-rumped storm petrel (*Oceanodroma castro*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*). These seabirds hunt over the ocean during the day and fly to higher elevations at night to nest. The Hawaiian petrel (as well as the band-rumped storm petrel) generally nest on the Big Island well above 5,000 feet in elevation. Some Hawaiian petrel nests, however, have recently been found at lower elevations of the Kohala mountains. Both the Newell's shearwater and Hawaiian petrel are known to burrow under ferns on forested mountain slopes. These burrows are used year after year, usually by the same pair of birds. Although capable of climbing shrubs and trees before taking flight, they need an open downhill flight path through which they can become airborne. Although once abundant on all the main Hawaiian Islands, most Newell's shearwater colonies today are found in the steep terrain between 500 to 2,300 feet on Kaua'i. Band-rumped storm petrels have recently been discovered to be nesting on the Mauna Loa side of the saddle between this mountain and Mauna Kea. Each of these seabirds may fly over on their way to and from mountain nesting areas and the open ocean. Despite the presence of uluhe ferns at the project site, the dense strawberry guava and Asian melastome understory precludes an open downhill flight path and makes the habitat unsuitable for these seabirds.

The primary cause of mortality in these seabird species in Hawai'i is thought to be predation by alien mammals at the nesting colonies. Collision with man-made structures is another significant cause. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting and the disorientated seabirds may collide with manmade structures and, if not killed outright, they become easy targets of predatory mammals including cats and mongooses.

Some native waterbirds may also be present in some locations on or near the property, particularly near Waikāmalalo Stream, located just beyond the far northwestern property boundary or along the lesser Kahaeha Stream, which crosses the property. Along the Hilo-Hāmākua Coast, in general, waterbirds are found in streams, estuaries, natural and artificial ponds, and wetlands. The most common native waterbird is the indigenous black-crowned night heron, or 'auku'u (*Nycticorax nycticorax hoactli*). This bird is also likely to be found at times in the streams that cross or border the property. It is also not unusual to spot the wide-ranging, friendly but endangered Hawaiian goose or nēnē (*Branta sandwicensis*) in various parts of the Island. Far less likely to be seen along the streams are two endangered waterbirds that are occasionally found along the Hāmākua coast: the Hawaiian duck or koloa maoli (*Anas wyvilliana*), and the Hawaiian coot or 'alae ke'oke'o (*Fulica alai*). Of these, only the koloa maoli are found in streams somewhat similar to Waikāmalalo. No waterbirds were observed during any of the field visits to the property.

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE APPLICATION

It is highly likely that the Hawaiian hoary bat (*Lasiurus cinereus semotus*), the only native Hawaiian land mammal, is sometimes present on the property. Bats have been found throughout the Hāmākua coast and in most areas on the island of Hawai‘i. They may forage for flying insects on the Winterer property on a seasonal basis and may also roost in trees and large shrubs. Bats are often visible while they are feeding on flying insects near dusk and dawn at various locations around the island of Hawai‘i. While no bats were observed in the course of the fauna survey, which took place in full daylight and did not use any detection equipment, it is assumed that Hawaiian hoary bats are present at least some of the time, as they have been frequently seen and detected by ultrasound and radar in ō‘hi‘a-uluhe-strawberry guava-Asian melastome forests. Hawaiian hoary bats are vulnerable to disturbance during the summer pupping season and require special mitigation measures.

Aside from the Hawaiian hoary bat, all mammals found in the project area are introduced species, including feral cats (*Felis catus*), feral pigs (*Sus scrofa*), small Indian mongooses (*Herpestes a. auropunctatus*) and various species of rats (*Rattus* spp.). Several species of non-native reptiles and amphibians are also likely present. Coqui frogs (*Eleutherodactylus coqui*) were heard and an undetermined skink lizard (Family: Scincidae) was seen. None of these non-native vertebrates are of conservation concern and all are deleterious to native flora and fauna.

With regards to the presence of aquatic species associated with the streams that border or cross the property, no activity will occur within 1,000 feet of Waikaumalo Stream itself, and Kalaeha Stream, one of three smaller tributary streams to Waikaumalo Stream, is over 350 feet away and separated by a heavily forested area. While this smaller stream is not listed in the Hawai‘i Stream Assessment or Hawai‘i Watershed Atlas, reconnaissance of the stream by Geometrician Associates found abundant native shrimp or ōpaekala‘ole (*Atyoida bisulcata*), which often inhabit the middle and upper reaches of streams in the Hawaiian Islands. Various insects, including a not conclusively identified native damselfly (*Megalagrion* sp., probably *M. blackburnii*) and a non-native *Tetragnatha* stream spider were among other fauna observed in the stream. No non-native fish, amphibians or crustaceans were observed and no threatened or endangered species were recorded.

Archaeological, Historical and Cultural Resources

An archaeological survey of the project area was conducted by ASM Associates in July 2021. While the project area has a thick vegetative cover, the entire project area was fully accessible at the time of the survey, the boundaries of the parcel were clearly identifiable, and the vegetation cover only moderately limited ground visibility. No archaeological remains of any kind were identified on the surface of the study area as a result of the pedestrian survey. Given these findings, the archaeologists concluded that construction of the proposed single-family residence and its associated improvements would have no effect on any historic properties and recommended that no further work was required. A copy of the **Draft Archaeological Assessment Report**, which is to be submitted to the State Historic Preservation Division (SHPD) for review and approval, is attached for reference as **Appendix A** to this application. Additionally, in meeting the submittal requirements for this application, a **SHPD, HRS 6E Submittal Form** has been completed and included with this application submittal for this purpose. As a precaution, in the unlikely event that any unanticipated resources are unearthed during development activities, the applicant will ensure that SHPD will be contacted in accordance with the procedures outlined in Hawai‘i Administrative Rules 13§13–280.

In order to determine if the proposed construction and use of the property could potentially impact any cultural resources or practices in the area, a Cultural Impact Assessment Study (Study) of the property and its history was prepared in September 2021 by ASM Affiliates. The Cultural Impact Assessment, which contains the archival and documentary research, as well as communications and interviews with those organizations and individuals having particular knowledge of the project area, its cultural resources, practices and beliefs, sought to identify any cultural resources or practices occurring on or near the site that may be affected by the construction of the proposed residence and associated facilities and, if present, to recommend appropriate actions and strategies that may help to mitigate any such impacts.

In describing the general cultural landscape in the area of the property and its surroundings and in identifying the traditional and customary practices, valued cultural resources of the area, historical records indicate that the forested areas of Pīha were traditionally utilized by bird hunters and canoe carvers to gather native bird species and koa logs. The gathering of koa wood to make canoes is an ongoing cultural practice, however, there is no indication that such practice is occurring within Pīha Ahupua'a or the subject parcel. The traditional practice of gathering native bird species is no longer actively practiced, which is a direct result of historical socio-political changes that led to the demise of the practice itself in conjunction with the changes in the local ecology. While the gathering of native bird species for cultural purposes is no longer practiced, the artisanal crafts (i.e. Hawaiian feather work) associated with this practice continue but does not take place within the subject parcel. While these traditions are not actively practiced within Pīha, recognizing these practices reinforces the importance of Pīha's culturally valued forested lands to the area's native inhabitants.

Furthermore, the forest in its entirety, was and still is, a valued cultural resource. The forest provided an abundance of plant resources and helped to capture water, which were essential to the practices of the area's native inhabitants. In addition to the tangible resources, the forest was and still is revered for it is considered a place where the myriad of gods in all their plant forms dwelled. Respect for the forest's tangible and intangible resources was traditionally demonstrated by limiting access to certain cultural practitioners who had a particular responsibility and who carried out the appropriate cultural protocols.

Access into the forest was from established trails that traditionally (based on the historical records) appears to have, for the most part, followed the ahupua'a boundaries. As the cultural practices that relied on these trails waned (i.e. bird hunting and koa harvesting), so did the use of the trails. As noted by some of the consulted informants, identifying any pre-contact or historic period trail is exceptionally difficult due to the substrate and vegetation. Furthermore, the archaeological assessment survey conducted on the subject parcel did not identify any trails or other historic properties in the study area.

Following the establishment of the Hilo Forest Reserve (ca. 1906) and Pīha Homestead (ca. 1915), the Pīha-Kahuku Road was laid out, the alignment of which coincides with the subject parcel's southern boundary. As stated in the Na Ala Hele Trail and Access Program Pīha-Kahuku Road abstract, prepared in 2018, the Pīha-Kahuku Road is a public road that provides public access into the Hilo Forest Reserve. The results from the consultation revealed that following the establishment of the Pīha Homestead and throughout the sugar plantation era, area residents utilized the Pīha-Kahuku Road and other trails, some of which followed the various streams including Waikaumalo and Kalaeha to access the subject parcel and the greater Hilo Forest Reserve for subsistence purposes, specifically pig hunting. Given the subject parcel is forested and undeveloped, several of the parties consulted as part of the Cultural Impact Assessment (CIA) study described accessing the forest resources in the past for subsistence purposes.

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Additionally, the parties interviewed as part of this and prior CIA studies described these individuals accessing the streams for subsistence purposes. It was noted that the streams in the area, including Waikaumalo and Kalaeha, were accessed to gather freshwater, watercress, 'opae, and prawns. However, it was further specified by one of the informants that obtaining freshwater from the stream is no longer possible because of poor water quality. It is unclear if watercress is still found along portions of the streams, however, the gathering of 'opae and stream prawns appears to be actively practiced along Waikaumalo, which extends outside of the parcel's northwest boundary.

To summarize the findings of the CIA, the forest resources in the area are culturally important, both as the site of traditional cultural practices, which may not necessarily be occurring today but should not be foreclosed, and also for current practices, particularly hunting by local residents for subsistence and recreation. The key to these resources is access to the Hilo Forest Reserve, which is public land set aside for watershed protection but is also actively managed for recreation, gathering and hunting.

Investigations of the property and its history did not reveal any cultural resources or practices taking place within the Project Site itself, which is less than an acre of moderately degraded forest. No consulted individuals with ties to and/or history with the area had any specific information concerning the area of the Project Site, and no archaeological features were found to be present. No gathering of plant or animal material is noted from the Project Site.

With regards to the proposed recommendations and mitigative measures provided by the CIA Study, the CIA Study noted that the Project Site encompasses a relatively small portion of the entire parcel, thus may result in a lighter impact on the area's forest resources. Nevertheless, the CIA Study recommends that the landowner make efforts to preserve the native forest in the areas outside of the project area footprint and that any landscaping planned within the Project Site incorporate native plants suitable to the local ecology. Concerning the Piha-Kahuku Road, which borders the subject parcel's southeastern boundary, it is reiterated within the CIA Study that this is a public roadway that provides local hunters and other practitioners access into the Piha portion of the Hilo Forest Reserve and, thus, there should be no efforts to block or restrict access along this roadway. The landowner should also anticipate that vehicles may park along this roadway periodically as access to the forest reserve is by foot only.

Concerning stream resources, the project area is sufficiently distant from both Waikaumalo and Kalaeha Streams that any cultural practices associated with these streams would not be impacted by the proposed development. However, as these streams are part of the larger cultural landscape of Piha and the Hilo Paliku region, all precautions should be taken to protect the health and flow of the stream.

It should be noted with regards to the above recommendations, the Applicant is proposing that all the proposed improvements as shown on the proposed Site Plan, would be fully contained of the Project Site and that the remainder of the property, outside the Project Site, would remain undisturbed, and that the landscaping planned within the project area would incorporate, predominately, native plants that are suitable to the local ecology. Additionally, the proposed action would in no way block or restrict access along the adjacent portion of Piha-Kahuku Road. In fact, considering that this last portion of the road is outside the County's jurisdiction and the property owners along this portion have the responsibility for its upkeep and maintenance, the owner, by constructing his home on the property, will also be contributing towards its regular maintenance and upkeep, thus ensuring that the road remains open and accessible to the public.

A copy of the **Cultural Impact Assessment Report** for the Winterer Property is included for reference within **Appendix B** of this application.

EVALUATION CRITERIA

The Department or Board will evaluate the merits of a proposed land use based upon the following eight criteria (Ref. Section 13-5-30 ©):

- 1. The Purpose of the Conservation District is to conserve, protect and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. (Ref. Section 13-5-1)**
How is the proposed land use consistent with the purpose of the conservation district.

The proposed use of the subject property for the construction of a single-family residence is an identified use within the Conservation District. The owner is committed to management of the site in a manner that will help conserve, protect and preserve the natural and cultural resources that may be present on or near the property. The primary natural and cultural resources associated with the area of the property are the upland forest resources, particularly those within the Hilo Forest Reserve lands that are near the property, and the potential for the public and State agencies to access these resources from the adjacent public road. The proposed use and planned improvements on the subject property will not impact the State agencies or public's ability to access or utilize the Forest Reserve lands that extend from the end of Piha-Kahuku Road which borders and provides access to this property. In fact, although the Piha-Kahuku Road is considered to be a County Road, because the final section of the Piha-Kahuku Road, including the portion that borders the property and extends to the boundary with the State Forest Reserve, lays beyond the County's jurisdiction, it is the property owners who abut this portion that are responsible for the necessary maintenance and repair to the road in this area. In this manner, the owner, by constructing his home and residing on the property, will also be contributing on an ongoing basis to the maintenance and repair of this portion of the Piha-Kahuku Road leading to the Forest Reserve lands, which will only serve to enhance the ability for State agencies and public to access the adjacent lands for management or cultural purposes.

- 2. How is the proposed use consistent with the objectives of the subzone of the land on which the land use will occur? (Ref. Sections 13-5-11 through 13-5-15)**

The objective of the Resource subzone "...is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas."

Single family residences are an identified use in the Resource subzone under HAR 13-5-24, R-8, which states:

(D-1) A single family residence that conforms to design standards as outlined in his chapter.

The design and construction of the proposed single-family residence, which conforms to the design standards in 13-5-41, will ensure the sustained use of the natural resources in the project area by mitigating potential impacts, as delineated in this application and the enclosed Environmental Assessment. Additionally, construction of the owner's residence on the property will allow for the continual monitoring and management of the property in a manner that is protective of the of natural resources that are present.

The proposed dwelling will be built to comply with all Federal, State and County regulations and is designed to ensure that the structure will be safe and to minimize the potential risks from natural hazards to the inhabitants.

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In accordance with the design standards within HAR 13-5-41, Exhibit 4, the total floor area for the proposed residence will be less than 5,000 square feet, and the maximum height of the structure will be less than 25-feet. Additionally, the minimum side, front, and rear yard setbacks of 25 feet will be met. The property is not located near the coast and, therefore, coastal setback requirements are not applicable. Also, in conformance with the Design Standards, the proposed residence has been designed to be compatible with the surrounding environment by incorporating such measures as:

- Use of appropriate landscaping with the use of primarily native species to help blend the structure with the surrounding environment.
- Use of “earth-tones” in the selection of roof and building colors.
- Use of a (DOH approved) wastewater collection system.
- Limiting the disturbed area to only those areas required for the construction of the residence and related infrastructure and siting and designing the structure in consideration of the existing topography, thereby minimizing the amount of grading required.
- Conforming with all applicable building and grading code, and setback requirements.

In this way, the proposed residence would be in general conformance with the Department’s design standards for a single-family residence in the State Conservation District, as delineated in HAR 13-5-41, Exhibit 4. The owner recognizes that, with the separation of the carport from the residence, the design does not conform to the criteria that calls for all structures to be connected, however, this separation of the carport is intended to minimize the amount of grading required for the carport and driveway approach, which is another compatibility measure and an primary goal in the planning and design of the home.

3. Describe how the proposed land use complies with the provisions and guidelines contained in Chapter 205A HRS, entitled “Coastal Zone Management”.

With regard to the manner in which the proposed use complies with the provisions and guidelines contained in Chapter 205A, HRS, entitled: Coastal Zone Management, most of the objectives, policies and guidelines of the Coastal Zone Management (CZM) program are specifically focused on the protection of coastal resources, such as the coastal recreational, historic, scenic, and marine resources, as well as beaches and ecosystems; or speak to the government’s regulatory or management functions, such as managing development, providing public facilities in suitable locations, or promoting public participation in the management of coastal resources.

As noted previously in this Application, being located at the approximately 1,700-foot elevation and over 3 miles from the coast, the property is far removed from coastal areas and should have little or no potential impact on the coastal resources. Nevertheless, the applicant recognizes that it is possible that projects located well inland can have an impact to water quality should erosion and sedimentation occurring during the construction process impact nearby streams, which, in turn, could find its way to the coastal waters. Regarding the erosion and sedimentation control measures for the project, the applicant has taken extra precautions in the planning and siting of the home to minimize the grading required to place the home on the site and will be using a post and pier type construction that will further minimize the grading that would otherwise be required to create a house pad. Additionally, the applicant will require that the construction contractor implement the following best management practices as part of the construction of the home.

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- The total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot.
- All points of egress and ingress to a site shall be protected by a stabilized construction entrance.
- The disturbance area will be marked during construction with orange fencing on the west, south and north (and bounded by the unpaved Pihā-Kahuku Road extension on the east) to avoid disturbance to the ground or vegetation beyond the disturbance area.
- Slope protection shall be used on areas with slopes greater than 50% and on areas of moderate slopes that are prone to erosion. The contractor will take special precautions, including use of a dual-layer sedimentation control to prevent any sediment leaving the work areas, particularly towards the direction of nearby streams.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff; and
- Cleared areas will be replanted or otherwise stabilized as soon as possible, prior to removing erosion and sediment measures.
- Stockpiles shall not be located in drainage ways or other areas of concentrated flows. Sediment trapping shall be used around the base of all stockpiles.
- Dust control should be applied to reduce dust emissions to keep the surroundings free of dust.

It is also important to note that the project site is sufficiently removed (over 350 feet) from the top of the gulch containing Kaheaha Stream, which traverses the property, so as to have no potential impact to the stream and waters crossing the property. In this respect, the proposed action would be fully compliant with the provisions and guidelines contained in Chapter 205A pertaining to Coast Zone Management.

4. Describe how the proposed land use will not cause substantial adverse impacts to the existing natural resource within the surrounding area, community or region.

Because of the relatively limited nature of the project that will be confined to a relatively small portion of property, as well as the lack of any native terrestrial ecosystems and threatened or endangered plant species on the property, construction and use of the property for a single-family residence is not likely to cause adverse biological impacts. As noted, the existing vegetation on the site consists of a mix of native and non-native species which, over time, are becoming dominated by the more invasive non-native species, such as paperbark, strawberry guava, asian malestoma, and Koster's curse. Those native species that are present, consisting primarily of the native 'ōhi'a and various ferns, are commonly found in the region, on the island, and mostly throughout the Hawaiian Islands. Those native 'ōhi'a that would be removed in the course of preparing the house site, would be largely replaced with new 'ōhi'a plantings as part of the planned landscaping for the house. In an effort to prevent the potential spread of the persistent fungus that is responsible for the Rapid 'Ohi'a Death (ROD) disease that has devastated thousands of acres of 'ōhi'a on the Island, all new 'ōhi'a plantings will be grown by a trained arborist from cuttings taken from 'ōhi'a found onsite so that no new 'ōhi'a would need to be brought in. Additional precautions to be implemented to limit the potential spread of ROD disease, as recommended by DLNR's Division of Forestry and Wildlife (DOFAW), include:

- Prior to construction, identify and flag any other 'ōhi'a near the construction site to ensure their branches are not damaged or broken during the construction.
- Treat any unavoidable scars to prevent infestation of the fungus.
- Stack all removed 'ōhi'a for disposal onsite by means of burying or chipping, not removing any 'ōhi'a from the site; and
- Decontaminate boots and work tools prior to entering the construction site and after leaving.

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Although a biological survey has determined that no rare, threatened or endangered faunal species are on or near the project site, it is recognized that certain endangered and regionally widespread terrestrial vertebrates, such as the Hawaiian hoary bat, Hawaiian duck, and Hawaiian hawks, could over-fly and be present on the property at times. In order to avoid potential impacts to such Island-wide ranging species, the applicant will commit to certain conditions pertaining to the timing of land clearing activities and use of exterior lighting, which are expected to be proposed as part of the CDUP. Specifically, these would include:

- Construction will refrain from activities that disturb or remove shrubs or trees taller than 15 feet between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance.
- If land clearing occurs between the months of March and September, inclusive, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian hawk nests are present, no land clearing will be allowed until October, when hawk nestlings will have fledged.
- Any exterior lighting will be shielded from shining upward, in conformance with Hawai'i County Code § 14 – 50 et seq., to minimize the potential for disorientation of seabirds.

Given that the home and related improvements have been planned and designed to fit to the natural contours of the site, a minimal amount of grading will be required and will be limited to the area of driveway turnaround area, house site and the associated water, power and septic utility systems. No effect on any stream ecosystems will occur because of the physical and topographic separation between the house site and nearest stream, the vegetated setback area between the proposed areas of disturbance and the nearest stream that will be protected and left undisturbed, and the planned precautions for preventing soil runoff during construction, especially in the direction of the stream. As such, through the careful site planning and design of the proposed single-family residence together with the owner's commitment towards the responsible management of the site, construction of the proposed residence and the owners use of the property will effectively serve to conserve, protect and preserve the natural resources of the area.

5. Describe how the proposed land use, including buildings, structures, and facilities, is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The subject parcel is a portion of a long-standing homestead subdivision with lots of various sizes accessed from a public road. In the initial Territorial survey map, the subject property was described as Lot 2 of the Piha-Kahuku Homestead Subdivision, which was created in the early 1900's and includes roughly 45 large-acreage lots that extend on either side of the Pīhā-Kahuku Road from the Old Mamalahoa Highway, at the *makai* end, to the Hilo Forest Reserve, which borders the Lot 1 of the subdivision at its *mauka* end. Presently, there are several farms, as well as water storage and communications facilities on Pīhā-Kahuku Road, including in the area of the property.

The proposed project would consist of a relatively small residence that would utilize less than sixpercent of the total property area for the home and its related improvements. The home and related improvements have been designed to fit to the existing topography and in accordance with the compatibility conditions and criteria of the Single-family Residential Standards (Chapter 13-5, HAR, Exhibit 4) so as to be compatible with its environs and appropriate to the existing conditions of the property. Other than the house site and a small adjacent area for a home garden, most of the property would be left undisturbed, and the completed single-story home would not be visible from any of the

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surrounding properties in the subdivision. The proposed action, therefore, would allow for the residential use of the property in a manner that would very much be compatible with the character of the surrounding area and appropriate to the capabilities of the parcel.

6. Describe how the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon.

As noted above, the area to be used for the home and its related improvements would utilize less than six percent of the full property area in an area that is also at the upper elevations of the property and far removed from the nearest streams, so as to experience little or no potential danger of flooding. Also, as noted earlier, the property is becoming dominated by invasive species with only a few remnants of the original native forest vegetation remaining. Construction of the single-family residence would afford the owner the opportunity to occupy and use the property as his primary residence and, thus, serve as a steward of the land to help protect against the further spread of invasive plants and encourage the regeneration of the native forest vegetation. Further, in that only a small fraction of the property will be utilized, there will be no significant impact to the existing natural beauty and open space characteristics of the land other than improving opportunities to appreciate these particular characteristics of the land.

7. If applicable, describe how subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.

The proposed action involves the construction of a single-family residence on a single lot and does not require further subdivision and, therefore, would not increase the intensity of land use in the Conservation District.

8. Describe how the proposed land use will not be materially be detrimental to the public health, safety and welfare.

The public use of the area is limited to those who may use the adjacent Pihā-Kahuku Road as a means of accessing the State Forest Reserve lands situated *mauka* of the property. While, according to the DOFAW East Hawaii Program Manager, there is no formal access from this road to the State Forest lands, the owner recognizes that portions of the road are occasionally used by hunters to access the State lands, generally through adjacent private properties along this road, including the subject property. As noted above, the County of Hawaii currently only maintains the lower portions of Pihā-Kahuku Road and it falls to the individual property owners along this *mauka* portion to maintain this section, which the applicant has committed to do so. The planned construction of the owner's residence on the property, while not directly impacting this road, would require the owner to contribute to the ongoing maintenance of the portion of the road leading to his property, to the benefit of those who use the road as a means for accessing the area of the State Forest Reserve for hunting purposes.

Furthermore, construction of the proposed residence and use the property as the owner's primary residence would allow the owner to better manage and maintain the property, which would continue to become overgrown with invasive trees, shrubs and plants that would eventually overtake any native species that remain. Overall, the proposed use of the subject property would not threaten any cultural or biologically sensitive areas, or in any way be detrimental to the health, safety and welfare of the public.

CULTURAL IMPACTS

Articles IX and XII of the State Constitution, other state laws, and the courts of the State require government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups.

Please provide the identity and scope of cultural, historical and natural resources in which traditional and customary native Hawaiian rights are exercised in the area.

With regards to the overall cultural landscape of the general area, historical documentation that was prepared as part of the Cultural Impact Assessment, reveals that the upland forest lands, referred to as the *wao* of Pihā, were used for the procurement of special resources and were specifically utilized for bird-catching and the hewing and carving of *koa* wood for canoes. Although the traditional cultural practices and craft specialization associated with these traditions are no longer practiced in Pihā, the recognition of their previous practice and importance reinforces the importance of the *mauka* Pihā lands to the Hawaiian people. Boundary Commission testimonies for Pihā in 1875 revealed that an old trail utilized by bird catchers extended along the boundary of Pihā and Kahuku Ahupua'a, which coincides with the alignment of the Pihā and Kahuku Road ROW along the southeastern boundary of the Winterer property. According to the testimony, a canoe road in Nanue, the *ahupua'a* that begins slightly to the southeast of the Winterer property where Kahuku terminates, extended *mauka* and led to a place named Ka'ahina where canoes were made. The presence of these trails in the general area and their association with known traditional customs and practices in the area emphasize Pihā's significance as a cultural landscape and its value to the Hawaiian people's cultural identity.

The nearby forest lands, which are slightly *mauka* of the Winterer property (beyond the adjacent lot), have been protected under Conservation as the Hilo Forest Reserve since 1905. The lands and watersheds, the protection of which were the primary reason for the establishment of the Forest Reserve, remained virtually untouched by the flourishing sugar industry that dominated the more *makai* lands of Pihā and adjacent areas in the prior century. Protected within these forests are many of the same natural resources that were present during the Pre-contact and early Historic Periods. Prior to the establishment of the Hilo Forest Reserve, however, large populations of feral animals, particularly pigs, wreaked havoc on the health of the forest. While the creation of the Forest Reserve focused primarily on the protection of the forest watersheds, it provided the added benefit of controlling the feral pig population through the subsequent establishment of DOFAW, which manages various natural areas, forests, game management reserves, wildlife sanctuaries, and public bird/mammal hunting areas throughout the State of Hawai'i. Although no evidence was uncovered as part of the Cultural Impact Assessment, currently, the Hilo Forest Reserve may be utilized for gathering other forest resources, such as wood or lei materials.

Concerning the Pihā-Kahuku Road that extends along the property's southeastern boundary, as emphasized in the Cultural Impact Assessment (CIA) that was prepared for this project (found in Appendix B), the Pihā-Kahuku Road is a public roadway that provides local hunters and other practitioners access into the Pihā portion of the Hilo Forest Reserve and, thus, there should be no efforts to block or restrict access along this roadway. According to the CIA, the landowner should also anticipate that vehicles may park along this roadway periodically as access to the forest reserve is by foot only.

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In this regard, as was noted, the County of Hawaii currently only maintains the lower portions of Pihā-Kahuku Road and, thus, it falls to the individual property owners along this *mauka* portion to maintain this section, which the applicant has committed to do so. The planned construction of the owner's residence on the property will, thereby, require the owner to contribute to the ongoing maintenance of the portion of the road leading to his property, which will only serve to benefit those who use the road as a means for accessing the area of the State Forest Reserve for hunting purposes. Additionally, nothing being proposed as part of the proposed action that would in any way block or restrict access along this Road.

Identify the extent to which those resource, including traditional and customary Native Hawaiian rights, will be affected or impaired by the proposed action.

A Cultural Impact Assessment of the property and its history did not reveal any cultural resources or traditional and customary Native Hawaiian practices on the project site itself. No consulted individuals with ties to and history with the area had any specific information concerning this property other than the hunting that occurs in the nearby Forest Reserve lands, and no archaeological features are present. A stream is present on the property but is far removed from the project site and will not be affected by any aspect of the proposed action.

What feasible action, if any, could be taken by the BLNR in regard to your application to reasonably protect native Hawaiian rights?

The BLNR, through its permitting process for the Conservation District and the applicant's agreement to comply with the requirements of the Conservation District Use Permit, can insure that the approved work in no way affects or impairs the exercise of traditional or customary Native Hawaiian rights in the property area, to the extent that such practices are provided by Hawaii statutory or case law.

The applicant is aware that the exercise of traditional, customary or religious practices of native Hawaiians in the immediate area of the property is provided for by the State Constitution and State law and expects that a condition ensuring that the protection of such practices will be codified within the requested Conservation District Use Permit approval.

OTHER IMPACTS

Does the proposed land use have an effect (positive or negative) on public access to and along the shoreline and along any public trail.

The subject property, being located over 3 miles from coast, near the 1,700-foot elevation, is not a coastal property. Additionally, historical documentation conducted as part of both the Archaeological Assessment and the Cultural Impact Assessment reports did not identify any public trails on or near the property that might be affected by the planned single-family home or related improvements. As such, the proposed action would have no effect on public access to or along the shoreline and/or on any public trail.

Does the proposed use have any effect (positive/negative) on beach processes?

As noted, the proposed action, being located on an upland property that is over 3-miles from the coast, would have no impact on coastal areas or beach processes.

Will the proposed use cause increased sedimentation?

All runoff from impermeable surfaces will be retained on site and absorbed into the generally porous ground. It should be noted that the driveway to the property will remain as a gravel drive, thereby, encouraging water retention on the site and minimizing the potential for water runoff and erosion. The area of the proposed improvements comprises a relatively small portion, less than 5 percent, of the property and the remaining area will be left undisturbed and would, thus, serve as a vegetative buffer between the project site and adjacent properties. A stream is present on the property but is sufficiently removed, approximately 325 feet from the project site at its closest point, so as not to be affected by any aspect of the proposed action. The applicant will ensure that the construction contractor performs all earthwork and grading in conformance with State and County regulations and grading for the driveway and house site will include practices to minimize the potential for erosion and sedimentation, including:

- The total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot.
- All points of egress and ingress to a site shall be protected by a stabilized construction entrance.
- The disturbance area will be marked during construction with orange fencing on the west, south and north (and bounded by the unpaved Pihā-Kahuku Road extension on the east) to avoid disturbance to the ground or vegetation beyond the disturbance area.
- Slope protection shall be used on areas with slopes greater than 50% and on areas of moderate slopes that are prone to erosion. The contractor will take special precautions, including use of a dual-layer sedimentation control to prevent any sediment leaving the work areas, particularly towards the direction of nearby streams.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff; and
- Cleared areas will be replanted or otherwise stabilized as soon as possible, prior to removing erosion and sediment measures.
- Stockpiles shall not be located in drainage ways or other areas of concentrated flows. Sediment trapping shall be used around the base of all stockpiles.
- Dust control should be applied to reduce dust emissions to keep the surroundings free of dust.

As such, given the combination of the existing site conditions and protective measures that would be in place and followed in the course of construction, any threat of increased runoff or sedimentation from the property would be negligible.

Will the proposed use cause any visual impact on any individual or community?

The subject property is located in a relatively remote and heavily wooded area and the proposed house site is located midway between its boundaries with the adjoining properties and set back and down slope from the adjoining public road. Additionally, all setback and height standards and compatibility criteria, as set forth in HAR Chapter 13-5, Exhibit 4, will be adhered to in the planning and design of the home. In that the proposed single-story home would be located in the midst of a remote and forested area and set back from the nearest public road and the adjoining properties, it should not be visible to nor cause any visual impact to any individual or community.

Please describe any sustainable design elements that will be incorporated in the proposed land use (such as the use of efficient ventilation and cooling systems; renewable energy generation; sustainable building materials; permeable paving materials; efficient energy and water systems; efficient waste management systems; et al.).

The proposed residence is planned with ample fenestration so as to promote the use of natural lighting and ventilation. Being located at a higher, thus cooler elevation, with sufficient opportunity through the design of the home to provide natural ventilation in all living areas, there will be no need for cooling systems that would otherwise dramatically increase the energy demand within the home. The residence will be largely self-sufficient in terms of power and water use. Electrical power to the home will be generated onsite with the use of roof-top photovoltaic panels, with a back-up generator and battery storage system; and water would be collected by means of a roof-catchment and storage system. In that much of the energy for the home will be provided by on-site systems, the home is being designed with the efficient use of power and resources in mind through the use of passive-design features of the house itself and the use of energy efficient lighting and appliances. Permeable paving materials will be used for the patio in the area adjacent to the home and the driveway to the home will be graveled so as to act as a permeable surface. The wastewater from the house will be managed on-site by an individual wastewater system that would be designed and installed meet or exceed all State regulatory requirements.

If the project involves landscaping, please describe how the landscaping is appropriate to the Conservation District (e.g. use of indigenous and endemic species; xeriscaping in dry areas; minimizing ground disturbance; maintenance or restoration of the canopy; removal of invasive species; habitat preservation and restoration; et al.).

As noted above, the area of grading will be limited to the area of the house site, septic system, water tank, carport and the driveway, thereby, minimizing the area of ground disturbance. The proposed residence and related improvements have also been planned and designed to minimize the potential disturbance of native vegetation. Land-clearing would be minimal and confined to an area of about a half of an acre and the remainder of the lot, totaling nearly 17 acres, would be left undisturbed.

At the present, the vegetation over this heavily vegetated property consists of a mixed native-non-native forest dominated by 'ōhi'a, strawberry guava and paperbark. There is a dense shrub layer dominated by the non-native and invasive *Melastoma candidum*, but also containing a significant cover of uluhe and hapu'u ferns. On the ground, non-native grasses and weeds dominate, including the highly invasive Koster's curse.

As shown on the **Landscape Plan, in Figure 7**, the landscape for the proposed residence is aimed at reestablishing the natural character of the site through the eventual removal of the invasive species, such as strawberry guava, melastoma, and Koster's curse that would otherwise come to dominate the current landscape, and replanting disturbed areas with the native trees and ground covers that are common to the area, particularly the native 'ōhi'a and the uluhe and hapu'u ferns that were once a major part of a diverse native forest in the area. This emphasis in the use of native species that are common to the area as part of the landscape plan for the property is aimed at restoring the native habitat and natural character of the site. A home garden area is also planned at the periphery of the house site, which would consist of raised bed planters for vegetables and herbs and clusters of tropical fruits that are appropriate for the area.

The new 'ōhi'a plantings would be grown from the existing trees, onsite, by a trained arborist using a proven air-layering process, as described previously. Additionally, in an effort to control the spread

WINTERER SINGLE-FAMILY RESIDENCE - CONSERVATION DISTRICT USE APPLICATION

of the fungus responsible for the Rapid 'Ōhi'a Death (ROD) disease that has affected forests throughout the Island, those precautions and protocols, as recommended by DLNR's Division of Forestry and Wildlife (DOFAW) for working in around the 'ōhi'a, will be implemented by the owner's contractors throughout the site preparation and construction process to insure that any 'ōhi'a removed are properly disposed of on site, the existing 'ōhi'a are protected, and no new 'ōhi'a are brought to the property from elsewhere. Importantly, construction of a residence on the property will allow for ongoing monitoring and management of the property to help control the spread of invasive plants that are progressively dominating the existing landscape in the area, thus protecting and promoting those native species that remain or are replanted as part of the project landscaping.

Please describe the Best Management Practices that will be used during construction and implementation of the proposed land use.

Grading for the home construction will include practices to minimize the potential for sedimentation, erosion and pollution of any nearby stream waters. Land clearing and construction activities would occur on less than 0.37 acres of the project site and is expected to take less than three days. The applicant will ensure that the contractor performs all earthwork and grading in conformance with:

- (a) "Storm Drainage Standards," County of Hawai'i, October 1970, and as revised.
- (b) Applicable standards and regulations of Chapter 27, "Flood Control," of the Hawai'i County Code,
- (c) Applicable standards and regulations of the Federal Emergency Management Agency (FEMA),
- (d) Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control," of the Hawai'i County Code, and
- (e) Any additional control measures imposed by the Board of Land and Natural Resources and the Department of Public Works.

Additionally, as part of construction, the applicant will require that the construction contractor implement the following best management practices:

- The total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot.
- All points of egress and ingress to a site shall be protected by a stabilized construction entrance.
- The disturbance area will be marked during construction with orange fencing on the west, south and north (and bounded by the unpaved Pīhā-Kahuku Road extension on the east) to avoid disturbance to the ground or vegetation beyond the disturbance area.
- Slope protection shall be used on areas with slopes greater than 50% and on areas of moderate slopes that are prone to erosion. The contractor will take special precautions, including use of a dual-layer sedimentation control to prevent any sediment leaving the work areas, particularly towards the direction of nearby streams.
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff; and
- Cleared areas will be replanted or otherwise stabilized as soon as possible, prior to removing erosion and sediment measures.
- Stockpiles shall not be located in drainage ways or other areas of concentrated flows. Sediment trapping shall be used around the base of all stockpiles.
- Dust control should be applied to reduce dust emissions to keep the surroundings free of dust.

Please describe the measures that will be taken to mitigate the proposed land use's environmental and cultural impacts.

The Winterer property does not contain any physical features, springs, *pu'ū*, or caves that might be of cultural importance, and there is no cultural values or associates related to the mixed native and non-native vegetation found on site. The Kahaeha Stream crosses roughly midway through the property but would not be affected by the planned development of the property, especially with the protective measure in place that will protect against the potential of any erosion or sedimentation from the area of the project site, the considerable distance, over 325 feet, from the edge of the stream gulch at its closest point, and the large heavily vegetated area that will remain undisturbed between the project site and the stream bed. As a result of the cultural impact assessment that was prepared for the property, no cultural activities were identified with the property and the proposed undertaking will produce no adverse effect to any native Hawaiian cultural practices. Similarly, an Archaeological Assessment Survey of the property found no evidence of archaeological resources on the site that would be of historical or cultural significance. Additionally, no public trails are present on or near the property, nor would public access to the upland forest resources that are *mauka* of the property be impeded or impaired.

No rare, threatened, or endangered plant species are present. Although several natives are present, the potential area impacted is limited and the home and related improvements have been planned have been planned so as to minimize the impact to the native *ō'hi'a* at the site. The owner wishes to preserve and enhance the native vegetation by more than replacing as part of the landscaping for the project the native *ō'hi'a* removed through the site development process, and through gradual thinning of invasive and weedy species and promotion of native species through planting or simple weeding. With minimal care and input, the native component of the vegetation is expected to increase at the site. The project avoids sensitive locations near the local streams, and, in fact, no activities whatsoever are proposed for the vast majority (over 95%) of the property that extends outside the project site to the northwest boundary near Waikaumalo Stream. The precautions for preventing impacts to water quality or potential adverse impacts to the aquatic biological resources in stream waters during construction include: requiring contractors to perform all earthwork and grading in conformance with all applicable Federal, State and County regulations and implementation of Best Management Practices (BMPs) noted above.

The Applicant recognizes that, as with all of East Hawai'i, several endangered native terrestrial vertebrates may be present in the general area and may overfly, roost, nest, or utilize resources of the property. These include the endangered Hawaiian hawk (*Buteo solitarius*), the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered band-rumped storm petrel (*Oceanodroma castro*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*). In order to avoid potential impacts to these endangered but regionally widespread terrestrial vertebrates, the applicant will commit to certain conditions, which are expected to be proposed for the CDUP. Specifically:

- Construction will refrain from activities that disturb or remove shrubs or trees taller than 15 feet between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance.
- If land clearing occurs between the months of March and September, inclusive, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian hawk nests are present, no land clearing will be allowed until October, when hawk nestlings will have fledged.

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- Any exterior lighting will be shielded from shining upward, in conformance with Hawai'i County Code § 14 – 50 et seq., to minimize the potential for disorientation of seabirds.

Further, as noted above in relation to the removal of existing and re-planting of new 'ōhi'a on the property as part of the planned landscaping for the property, particular attention will be given towards preventing the potential spread of the fungus responsible for the Rapid 'ōhi'a Death (ROD) disease. Specifically, all new 'ōhi'a plantings will be grown by a trained arborist from cuttings taken from 'ōhi'a found onsite; that is, no new 'ōhia will be brought to the site and those 'ōhi'a that will need to be removed in the course of clearing the area of the house site will be disposed of onsite. Additionally, the precautions recommended by DLNR's Division of Forestry and Wildlife (DOFAW) for controlling the spread of the ROD disease will be followed by the owner and his contractors in the site preparation and construction of the home, which include:

- Prior to construction, identify and flag any other 'ōhi'a near the construction site to ensure their branches are not damaged or broken during the construction;
- Treat any unavailable scars to prevent infestation of the fungus;
- Stack all removed 'ōhi'a for disposal onsite by means of burying or chipping; and
- Decontaminate boots and work tools prior to entering the construction site and after leaving.

SINGLE FAMILY RESIDENTIAL STANDARDS

Single Family Residences must comply with the standards outlined in HAR Chapter 13-5, Exhibit 4. Please provide preliminary architectural renderings (e.g. building footprint, exterior plan view, elevation drawings; floor plan, etc.) drawn to scale.

See Figures 5-9 showing building footprints, floor plan, and elevations drawings of the proposed residence and carport structures.

SIZE OF LOT: 750,974 Sq. Ft. (17.24 Acres)

	Existing	Proposed	Total
Proposed Building Footprint	-0-	1,922 Sq. Ft. (Includes the areas of the residence and carport/utility storage footprint)	1,922 Sq. Ft
Paved Areas / Impermeable Areas	-0-	207 Sq. Ft. (Includes areas of the water and propane tanks)	207 Sq. Ft
Landscaped Areas	-0-	18,492 Sq. Ft. (Includes area of gravel drive, landscaping, patio, paths, garden and tree plantings)	18,492 Sq. Ft.
Unimproved Areas	750,974 Sq. Ft. (Total Property Area)	-21,400 Sq. Ft. Total Proposed Improved (Graded) Area	729,574 Sq.Ft. (Remaining Unimproved Area)

SETBACKS : Front: **25'** Side: **25'** Back: **25'**

SHORELINE PROPERTIES: N/A – The proposed action is not in a shoreline or coastal area.

MAXIMUM DEVELOPABLE AREA

The Maximum Developable Area includes all floor areas under roof, including first, second, and third stories, decks pools, saunas, garage or carport, and other above ground structures.

Maximum Developable Area, based on Exhibit 4: **5,000 Sq. Ft.**

Actual Developable Area of proposed residence: **2,640 Sq. Ft (Total Development Area)**

Actual height of the proposed building envelope as defined in Exhibit 4: **24'-10" Ft.**

COMPATIBILITY

Provide justification for any proposed deviation from the established residential standards.

The proposed design and standards for the Winterer Single Family Residence, as planned, would be largely compliant with the Single-Family Residential Standards listed in HAR Sec. 13-5, Exhibit 4, with the proposed deviation of separating the carport structure from the residence. While the Compatibility Standards call for the consolidation of all uses within a single, connected structure, the carport and utility storage structure has been separated from the residence structure so as to better fit this structure to the land on what might be considered a very challenging site, thereby, minimizing the amount of grading required for its foundation and driveway approach, which is a separate compatibility goal within the residential standards.

How is the design of the residence compatible with the surrounding area?

As noted above, the proposed residence has been designed to be compatible with the surrounding area through implementation of the following recommended design compatibility measures:

- * Use of appropriate landscaping to help blend the structures with the surrounding environment and restore the native character of the site, including the use of native plants that are common to the area as part of the landscaping, and the extensive use of the native ‘ōhi’a plantings, grown from the trees onsite, that would more than replace those trees removed through the site preparation process;
- * Use of “earth-tones” in the selection of roof and building colors;
- * Use of a (DOH approved) wastewater collection system;
- * Limiting the disturbed area to only those areas required for the construction of the driveway, residence and supporting structures; and siting the structures in consideration of the existing topography so as to minimize the amount of grading required;
- * Preserving those existing areas containing native vegetation by siting the home and related improvements so as to minimize the amount of native trees needing to be removed, using a preponderance of native species as part of the landscape plan for the home, and leaving the remainder and vast majority of the forested lot undisturbed;
- * Conforming to all applicable building, grading, and setback requirements.

If grading is proposed, include a grading plan which provides the amount of cut and fill. Has grading or contouring been kept to a minimum?

A general **Grading Plan** for the Project Site, as shown in **Figure 11**, has been prepared and the home and related improvements have all been planned and designed with the goal of carefully fitting the improvements to the site to minimize the amount of grading required. Also, while the overall design seeks to minimize the need to either import or export materials (soils) by balancing the cut and fill requirements, an estimated 700 cubic yards of crushed rock (gravel) material will be needed to be brought to the site to construct the gravel driveway and create a level foundation for the planned water storage tank, carport and residence. Importantly, due to the use of on-site power generation and telecommunication systems and the efficient siting of required power generation, water storage and wastewater treatment systems in relation to the house and carport, no additional grading or trenching for underground utility lines, outside the proposed house site, would be required. With regards to any trenching required within the area of the house site for power lines, water pipelines, and for the septic system, the extracted materials (spoils) will all be used at the house site to refill the trenched areas and to blend the areas with the surrounding topography. In this way, none of the extracted materials at the house site would need to be disposed of elsewhere.

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APPENDICES

A. ARCHAEOLOGICAL ASSESSMENT

B. CULTURAL IMPACT ASSESSMENT

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APPENDIX A

ARCHAEOLOGICAL ASSESSMENT

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An Archaeological Assessment of a Portion of Lot 2 of the Pīhā Homesteads

TMK: (3) 3-2-004:037 (por.)

Pīhā Ahupua‘a
North Hilo District
Island of Hawai‘i

DRAFT VERSION



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ASM Project Number 37470.00

An Archaeological Assessment of a Portion of Lot 2 of the Pīhā Homesteads

TMK: (3) 3-2-004:037 (por.)

Pīhā Ahupua‘a
North Hilo District
Island of Hawai‘i

EXECUTIVE SUMMARY

At the request of Mr. Sean Winterer (landowner), ASM Affiliates conducted an Archaeological Inventory Survey of a roughly 1-acre portion of the conservation zoned Lot 2 of the Pihā Homesteads (TMK: (3) 3-2-004:037) located in Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i (Figures 1, 2, and 3). Due to the parcel’s zoning status, a Conservation District Use Application (CDUA) is being prepared along with an associated Environmental Assessment (EA) in accordance in Hawai‘i Revised Statutes (HRS) Chapter 343 for the proposed development of a single-family dwelling, and this document is intended to inform that application process. This study was undertaken in accordance with Hawai‘i Administrative Rules (HAR) §13-284, and complies with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13-276. Fieldwork for the current study was conducted on July 27, 2021, by Lauren Kepa‘a, B.A. and Johnny Dudoit, B.A. under the direct supervision of Matthew R. Clark, M.A. (Principal Investigator). No historic properties were identified within the current project area; thus, with respect to the HRS Chapter 6E-42 historic preservation review process, it is the conclusion of this study that the development of a single-family dwelling within the current project area on a portion of TMK: (3) 3-2-004:037 will have no effect on historic properties. It is our recommendation that no further historic preservation work needs to be conducted prior to or during project implementation. In the unlikely event that significant archaeological resources are discovered during the proposed development activities, work shall cease in the area of the discovery and the DLNR-SHPD shall be contacted pursuant to HAR 13§13-280-3.

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1. INTRODUCTION

At the request of Mr. Sean Winterer (landowner), ASM Affiliates conducted an Archaeological Inventory Survey (AIS) of a roughly 1-acre portion of the conservation zoned Lot 2 of the Pihā Homesteads (TMK: (3) 3-2-004:037) located in Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i (Figures 1, 2, and 3). Due to the parcel’s zoning status, a Conservation District Use Application (CDUA) is being prepared along with an associated Environmental Assessment (EA) in accordance with Hawai‘i Revised Statutes (HRS) Chapter 343 for the proposed development of a single-family dwelling (Figure 4), and this document is intended to inform that application process. This study was undertaken in accordance with Hawai‘i Administrative Rules (HAR) §13-284 and complies with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13-276. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawai‘i Planning Department. According to HAR §13-284-5(b)(5)(A), when no archaeological sites are found during an AIS, the results of the AIS shall be reported as an Archaeological Assessment. This report contains background information outlining the project area’s physical and cultural contexts, a presentation of previous archaeological work in the vicinity of the project area, and current survey expectations based on that previous work. Also presented is an explanation of the project’s methods and a description of the findings, followed by recommendations and a determination of effect for the proposed project.

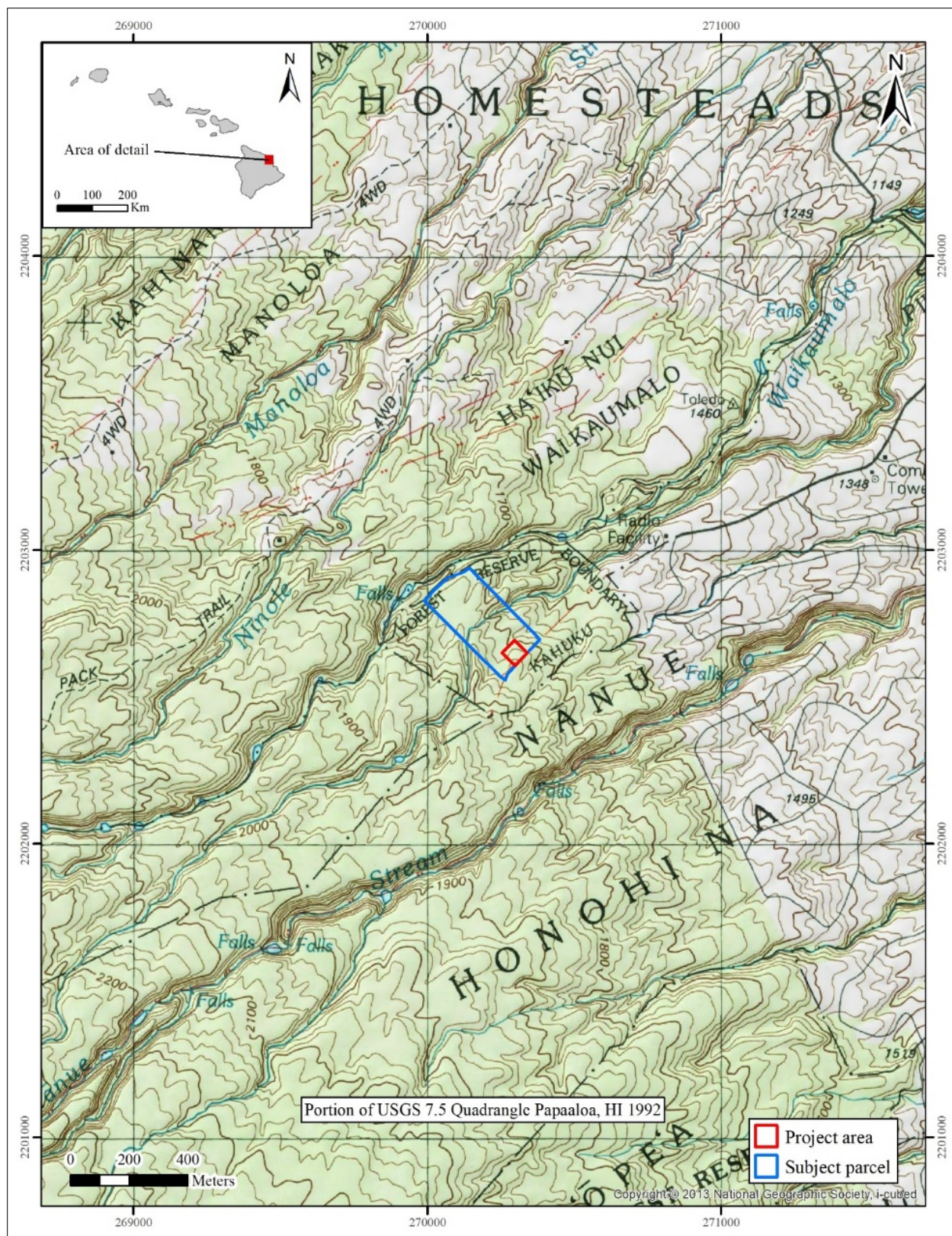


Figure 1. Project area location.

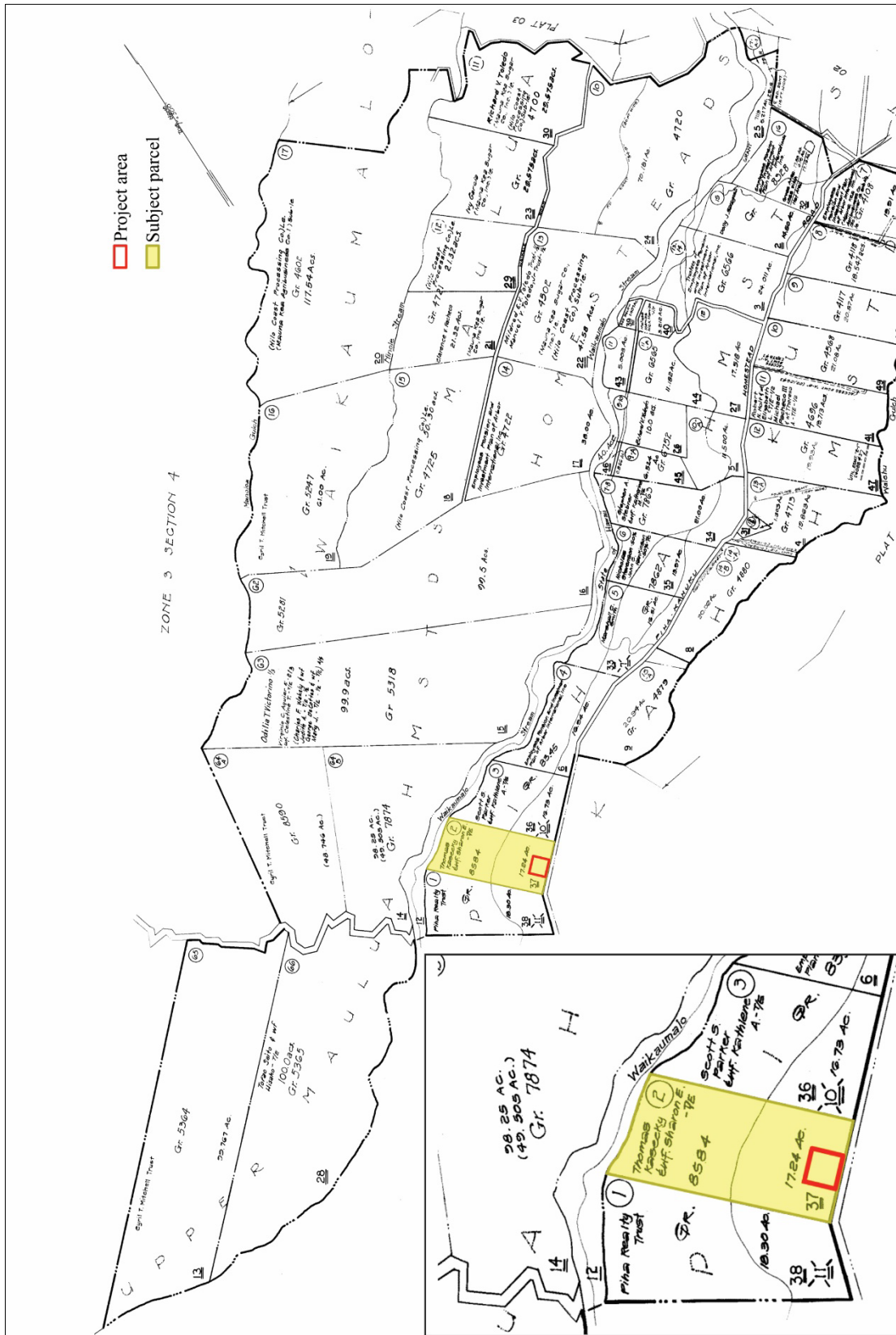
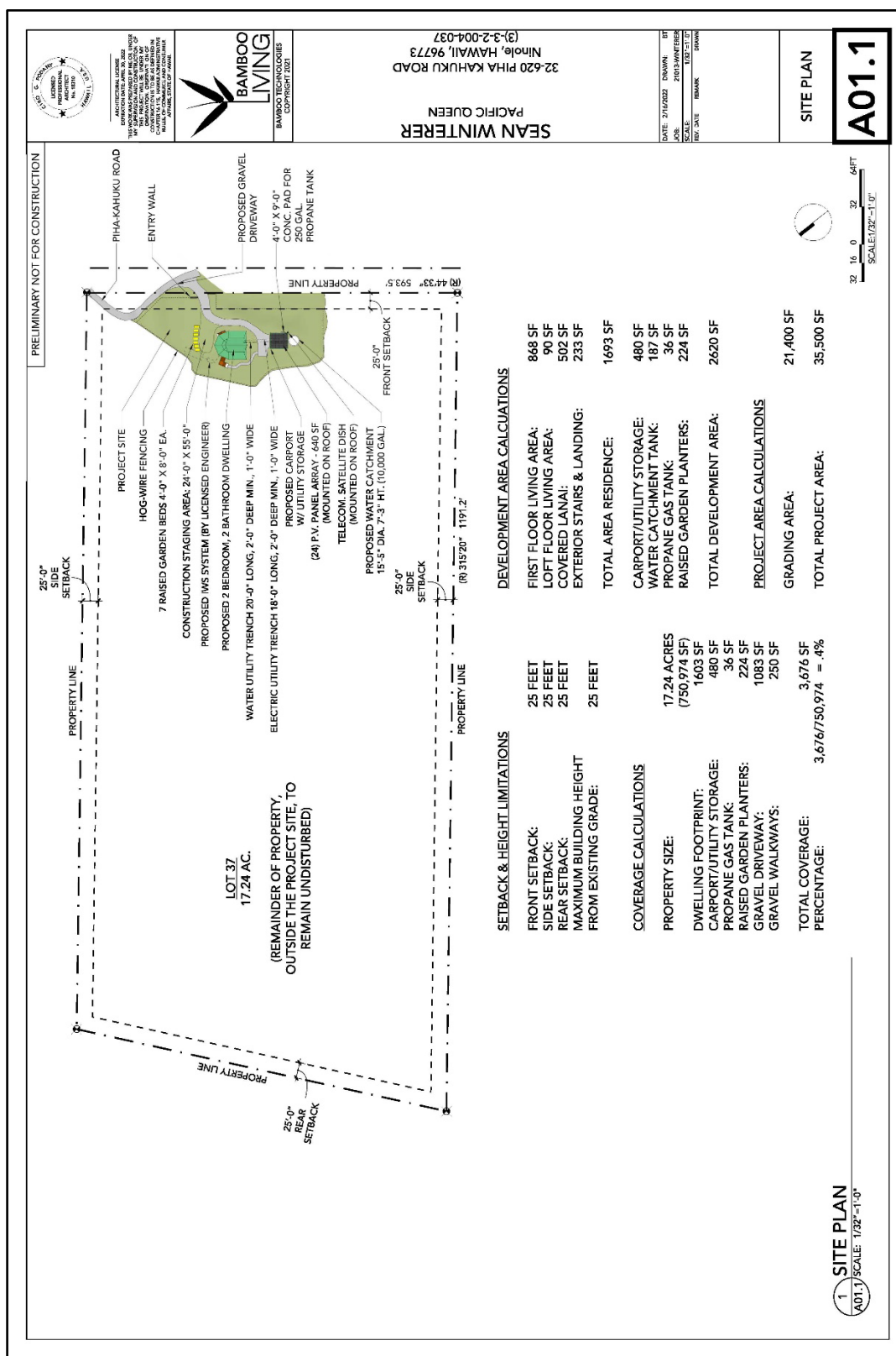




Figure 3. Google Earth™ satellite image showing project area location (outlined in red).



PROJECT AREA DESCRIPTION

The project area consists of a roughly 1-acre portion of Lot 2 of the Pihā Homesteads (TMK: (3) 3-2-004:037), Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i (see Figures 1, 2, and 3). The overall subject parcel comprises 17.24 acres and is situated within the southwestern portion of the subdivision. It is bounded to the northeast and southwest by properties that are designated within the State Conservation District. The parcel (036) to the northeast is developed with a single-family residence and assorted out-buildings and the southwest parcel (038) is partially improved with an access driveway and has approval of a Conservation District User Permit for the construction of a single-family residence and related utility and landscape improvements (see Figure 2). The subject parcel is bounded on the south by the Pihā-Kahuku Road, which provides access to the project area (Figure 5), and to the north by Waikamalo Stream situated within a thin, 40-acre conservation-zoned parcel (012) owned by the State of Hawai‘i (see Figure 2). The project area is located along the central section of the southeastern boundary adjacent to the northwestern edge of Pihā-Kahuku Road, roughly 4.6 kilometers (2.85 miles) inland of the coast at an elevation of roughly 525 meters (1,722 feet) above sea level.

The underlying geology of this portion of North Hilo is formed of mixed ‘a‘ā and *pāhoehoe* basaltic substage lava flows, mapped as Hāmākua Volcanic Series (Sherrod et al. 2007), that originated from Mauna Kea Volcano between 64,000 and 300,000 years ago during the Pleistocene epoch (labeled Qhm in Figure 6). Soils that have formed on these lava flows are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Figure 7). These deep, well-drained Andisol soils are formed of weathered volcanic ash overlying bedrock (Soil Survey Staff 2020). The terrain within the majority of the project area is characterized by a moderate northwest slope that extends to a narrow gully with intermittent water flow (flowing at the time of the current study) that meanders along portions of the northern project area boundary (Figure 8).

The climate at this elevation in North Hilo is generally cool, with temperatures averaging between 55° to 68° Fahrenheit throughout the year (Giambelluca et al. 2014). The lands in the vicinity of the project area receive a mean annual rainfall of approximately 5,285 millimeters (208 inches), with the highest rainfall occurring during the autumn and spring months of November and March, and the least amount of rainfall occurring during the summer month of June. Trade winds often blow from east to west across this region, except when *kona* winds are blowing (typically during the summer months), and the wind pattern is reversed.

The project area is currently undeveloped and is thickly vegetated primarily with an overstory of strawberry guava (*Psidium cattleianum*) interspersed with ‘ōhi‘a (*Metrosideros polymorpha*) and paperbark (*Melaleuca quinquenervia*) trees. Ground cover consists predominantly of eastern gamagrass (*Tripsacum dactyloides*), malabar melastome (*Melastoma malabathricum*), soapbush (*Melastoma candidum*), and *uluhe* (false staghorn; *Dicranopteris linearis*) (Figures 9 and 10) mixed with decaying, moss covered, logs that cover the underlying ground surface. The northeastern corner of the project area is covered with a thick growth of *uluhe* and has significantly less tree cover (Figure 11). To facilitate a topographic survey of the project area, prior to the current archaeological survey fieldwork, land surveyors had performed partial vegetation clearing by hand within the project area across several roughly linear transect lines (Figure 12). That vegetation clearing allowed for easier access to the project area and improved the ground visibility within the cleared areas.



Figure 5. Southern boundary of project area along the edge of Pihā-Kahuku Road, view to the southwest.

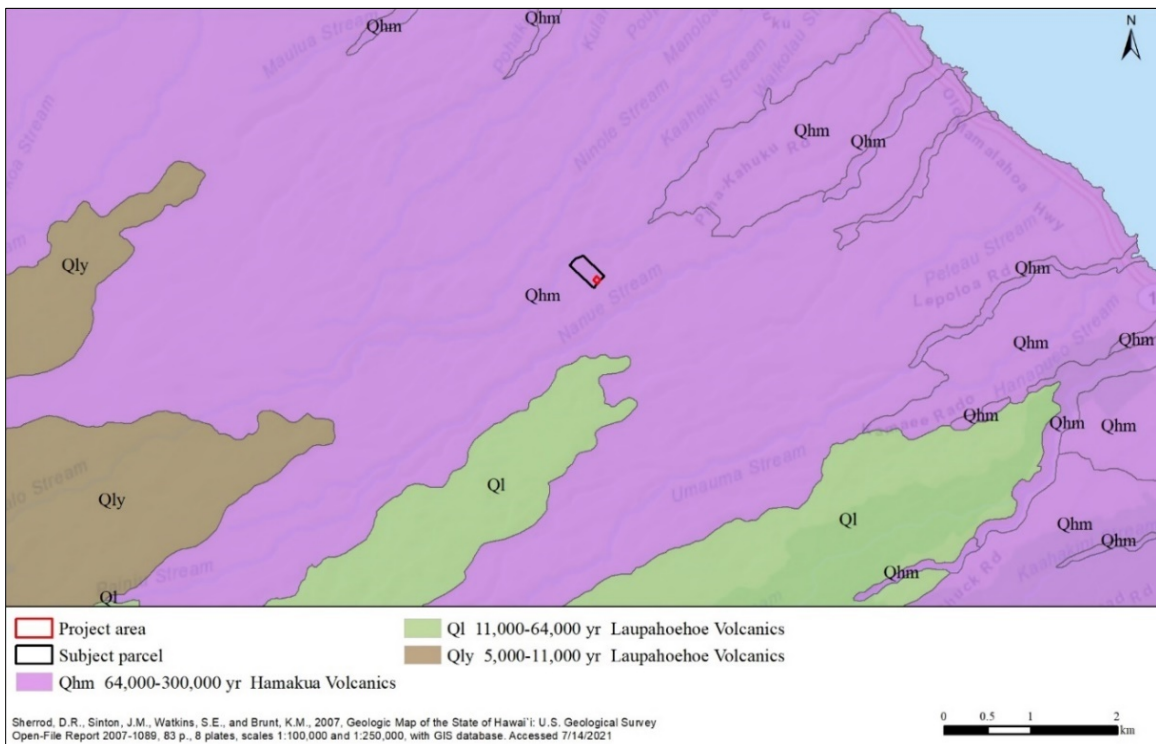


Figure 6. Geological units in the current project area (Sherrod et al. 2007).

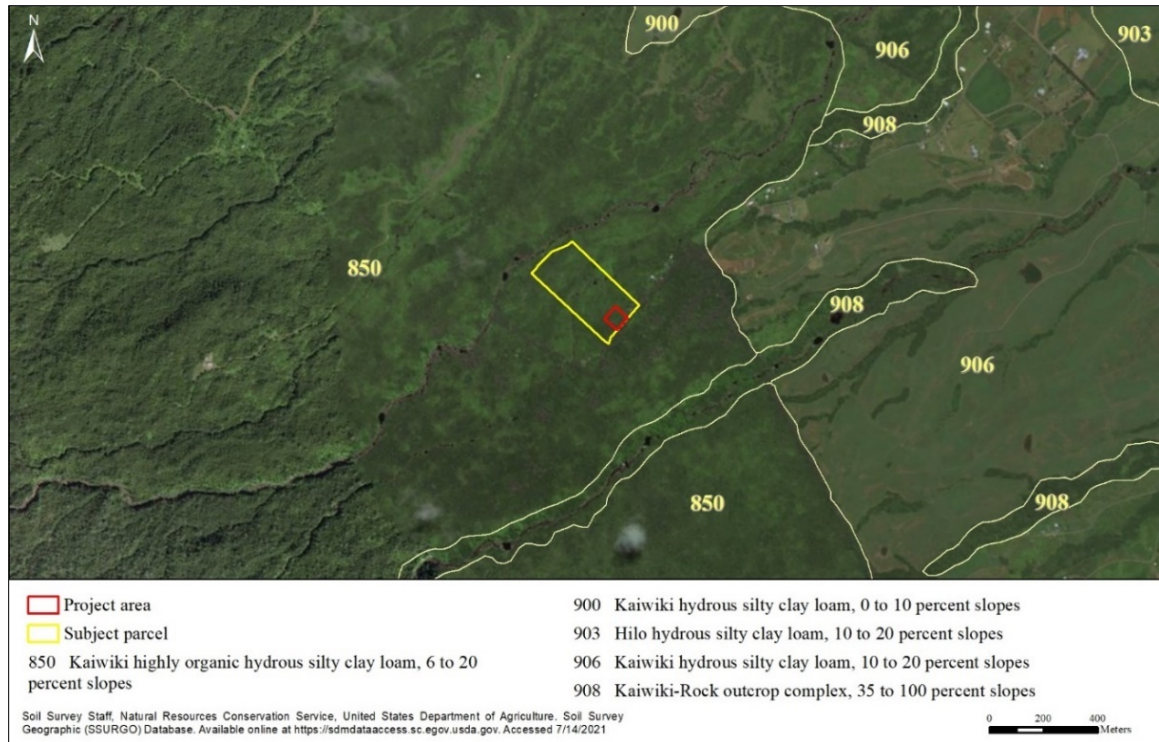


Figure 7. Soils within the project area (Soil Survey Staff 2019).



Figure 8. Gully along the northern project area boundary, view to the southwest.



Figure 9. Vegetation pattern in central portion of the project area, view to the south.



Figure 10. Standard vegetation pattern in northwestern portion of the project area, view to the southwest.



Figure 11. Typical vegetation pattern in northeastern corner of the project area, view to the west.



Figure 12. Typical landscape in surveyor-cleared areas, view to the west.

2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the current project area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical context for the North Hilo region that includes specific information regarding the known history of Pihā Ahupua‘a and the project area is presented. This is followed by a discussion of relevant prior archaeological studies conducted in the vicinity of the project area.

CULTURE-HISTORICAL CONTEXT

The chronological summary presented below begins with the peopling of the Hawaiian Islands and includes a presentation of a generalized model of Hawaiian Prehistory containing legendary references to and a discussion of the general settlement patterns for North Hilo. The discussion of prehistory is followed by a summary of historical events in the district that begins with the arrival of foreigners in the islands and then continues with the history of land use in North Hilo in the vicinity of Pihā after contact. The summary includes a discussion of the changing lifeways and population decline during the Early Historic Period, a review of land tenure in the study *ahupua‘a* during the *Māhele ‘Āina* of 1848, and the subsequent transition into a residential subdivision in the last half of the twentieth century.

A Generalized Model of Hawaiian Prehistory

While the question of the timing of the first settlement of Hawai‘i by Polynesians remains unanswered, the current archaeological consensus derives from various sources of information (i.e., archaeological, genealogical, mythological, oral-historical, radiometric). With data from advances in palynology and radiocarbon dating techniques, Kirch (2011) and others (Athens et al. 2014; Wilmshurst et al. 2011) have argued that Polynesians arrived in the Hawaiian Islands, sometime between A.D. 1000 and A.D. 1200 and expanded rapidly thereafter. Other versions of the peopling of the islands, including various native Hawaiian traditions, place the event earlier in time—and as early as the creation of the world (e.g., Beckwith 1951; Liliuokalani 1978; Malo 1951). What is more widely accepted is the answer to the question of where Hawaiian populations came from and the transformations they went through on their way to establishing a uniquely Hawaiian culture. The initial migration to Hawai‘i is believed to have occurred from Kahiki (the ancestral homelands of Hawaiian gods and people) with long-distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). In these early times, Hawai‘i’s inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). This was a period of widespread environmental modification when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). According to Fornander (1969), the Hawaiians brought from their homeland certain Polynesian customs and belief: the major gods Kāne, Kū, Lono, and Kanaloa; the *kapu* system of law and order; and the concepts of *pu‘uhonua* (places of refuge), *‘aumakua* (ancestral deity), and *mana* (divine power).

As currently understood, the settlement of the islands involved a gradual shift in residential patterns from seasonal, temporary habitation to the permanent dispersed habitation of both coastal and upland areas. Following the initial settlement period, areas with the richest natural resources became populated and perhaps crowded, and the population began expanding to the Kona (leeward side) and more remote areas of the island (Cordy 2000). As the population grew, so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were eventually settled, and the more marginal leeward areas were being developed. During this expansion period, additional migrations to Hawai‘i occurred from Tahiti in the Society Islands. Rosendahl (1972) has proposed that settlement at this time was related to the seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites focused on agriculture were occupied during the winter months. An increasing reliance on agricultural products may have caused a shift in social networks as well, which increasingly supported the exchange of upland agricultural products for marine resources. Hommon (1976) argues that kinship links among coastal settlements became less important than those with the *mauka-makai* (upland-coastal) settlements. This shift is believed to have resulted in the establishment of the *ahupua‘a* system sometime during the A.D. 1400s (Kirch 1985), which added another component to an already well-stratified society.

Pihā Ahupua‘a and the Greater ‘Okana of Hilo Palikū

The current project area is situated in Pihā Ahupua‘a on the windward slopes of Mauna Kea Volcano within the traditional *moku* of Hilo, one of six *moku* of Hawai‘i Island (Figure 13). Pihā, which literally translates as “flotsam” (Pukui et al. 1974:184), meaning any floating material carried by flood waters or the sea, is within an area traditionally referred to as Hilo Palikū, or “Hilo of the upright cliff” (Pukui et al. 1974:46). Pihā is one of many *ahupua‘a* extending inland from the coast of North Hilo with boundaries that generally follow the meanderings of the gulches and encompass the tablelands in between. Pihā is bounded to the south by Kahuku, Nanue, and Honohina *ahupua‘a*, to the west by Humu‘ula Ahupua‘a, to the north by Mauluanui, Waikaumalo, and Pua‘akuloa *ahupua‘a*, and to the east by the Pacific Ocean (see Figure 13). The Hawaiian proverb, “*Hilo, mai Mawae a ka pali o Maulua*” details the extent of the district spanning from Mawae, the southernmost boundary, to Maulua as the northernmost boundary (Pukui 1983:108). Handy et al. (1991:538) further describe the *moku* of Hilo:

Hilo as a major division of Hawai‘i included the southeastern part of the windward coast most of which was in Hamakua, to the north of Hilo Bay. This, the northern portion, had many scattered settlements above streams running between high, forested kula lands, now planted with sugar cane. From Hilo Bay southeastward to Puna the shore and inland are rather barren and there were few settlements. The population of Hilo was anciently as now concentrated mostly around and out from Hilo Bay, which is still the island’s principal port. The Hilo Bay region is one of lush tropical verdure and beauty, owing to the prevalence of nightly showers and moist warmth which prevail under the northeasterly trade winds into which it faces. Owing to the latter it is also subject to violent oceanic storms and has many times in its history suffered semidevastation from tidal waves unleashed by earthquake action in the Aleutian area of the Pacific.

Traditionally, the *moku* of Hilo was divided into three ‘*okana* (land divisions) with place names that have their origins in legendary times. The three divisions are (from north to south): Hilo Palikū, Hilo One, and Hilo Hanakahi. As previously mentioned, the location of the current project area coincides with the ‘*okana* of Hilo Palikū (Hilo of the upright cliffs), which extends north from the Wailuku River to Ka‘ula Gulch (Maly and Maly 2006). This region is characterized by its rugged and steep coastline, with its sheer cliffs broken only by a string of narrow steam-cut gulches that pour down from the slopes of Mauna Kea. As described by Pukui (1983:107):

Hilo iki, pali ‘ele‘ele.

Little Hilo of the dark cliffs.

Hilo-pali-ku, or Hilo-of-the-standing-cliffs, is always green because of the rain and mists.

A unique aspect of the Hilo Palikū region, which mirrors that of the adjacent district of East Hāmākua, is the presence of numerous, narrow *ahupua‘a* that extend from the coast to about the 3,000-foot elevation. These *ahupua‘a* are characterized by their sloping *kula* lands with their boundaries following the natural contours or ridgelines of the gulches (Cordy 1994). Several *ahupua‘a* extended further inland, essentially cutting off the lower *ahupua‘a* at their *mauka* most end. In *Pele and Hi‘iaka*, Emerson recounts the following *mele* that Hi‘iaka sang while journeying between Hilo and Puna through the forest territory of the *mo‘o* Pana‘ewa, which mentions the project area vicinity:

Pau ke aho i ke kahawai lau o Hilo:

He lau ka pu‘u, he mano ka iho‘na;

He mano na kahawai o Kula‘i-po;

He wai Honoli‘i, he pali o Kama-e‘e,

He pali no Koolau ka Hilo-pali-ku;

He pali Wailuku, he one ke hele ia;

He one e ke‘ehia la i Wai-olama.

One’s strength is exhausted, climbing, climbing

The countless valleys and ridges of Hilo,—

The streams without number of Ku-la‘i-po,

The mighty water of Hono-li‘i, the precipice walls of Kama-e‘e

And the pali of Ko‘olau: Such a land is Hilo-pali-ku.

The banks of Wailuku are walls;

The road to its crossing but sand;

Sandy the way at Wai-o-lama. (1915:32-33)

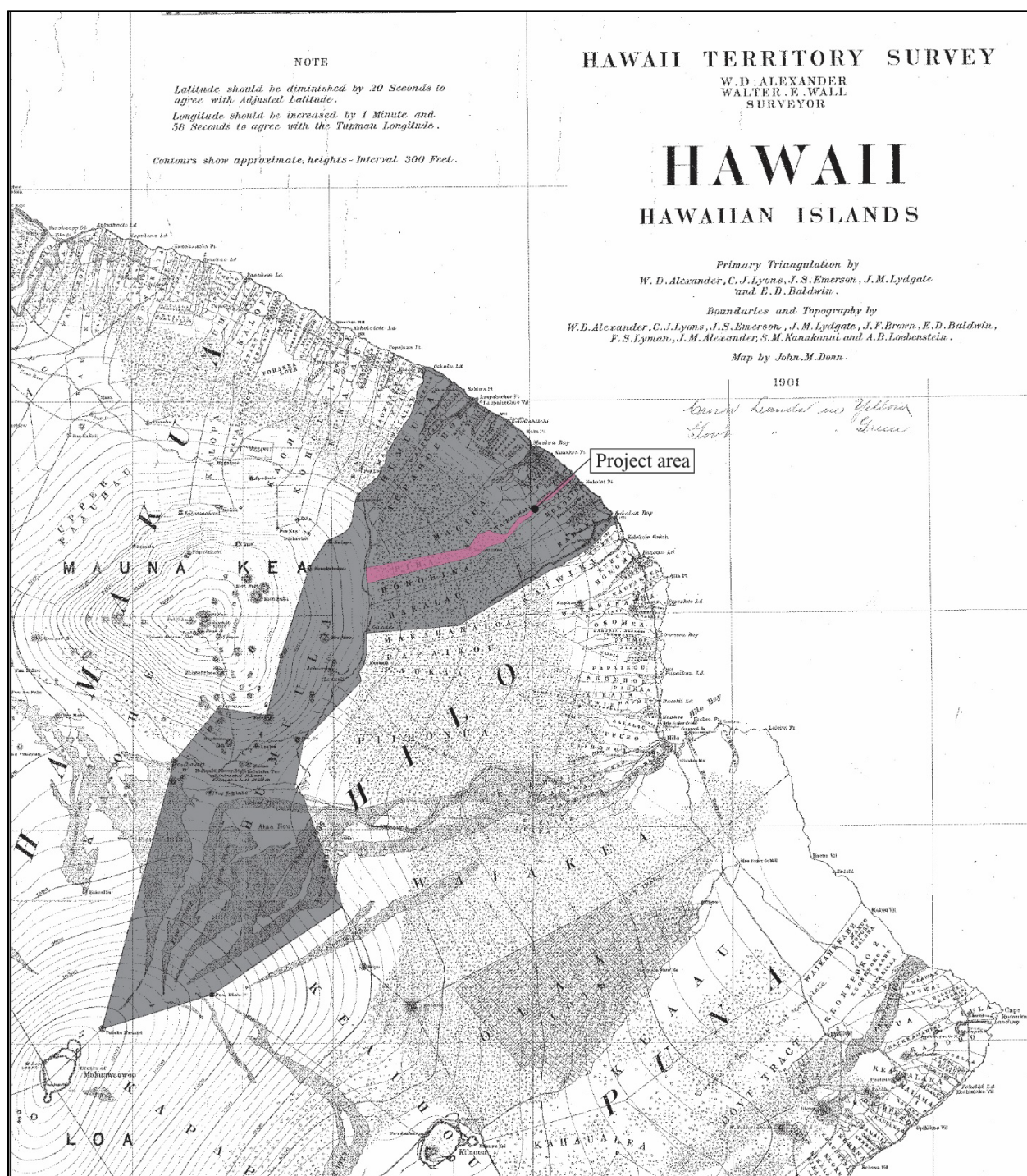


Figure 13. Hawai'i Registered Map No. 2060 (shaded gray; Donn 1901) showing the location of the project area within Pihā Ahupua'a (shaded pink) and the *moku* of North Hilo (shaded gray).

Kepā and Onaona Maly provide additional information pertaining to the ancient land division of Hilo Palikū in the following translation of an excerpt from a legendary account called “*Ka ‘ao Ho ‘oniua Pu ‘uwai no Ka-Miki*” (“The Heart Stirring Story of Ka-Miki”). This legend was originally published in Hilo’s Hawaiian Language newspaper *Ka Hōku o Hawai‘i*:

Of Hilo Paliku it is said, one becomes short of breath traveling through Hilo, for there are many (400) hills, many (4,000) areas to descend, and many (40,000) streams, indeed while swimming through the waters of Hilo one becomes out of breath, but one is never out of water at Hilo! (Maly and Maly 2006:13)

The other two ancient land divisions are located to the south of the current project area. Hilo-one, or sandy Hilo, extends along the shoreline of Hilo Bay between the Wailoa and Wailuku rivers (Edith Kanaka‘ole Foundation 2012); while Hilo Hanakahi, “Hilo, [land of] chief Hanakahi” (Pukui and Elbert 1986:129), extends from the Wailoa River and includes Keaukaha.

The *ahupua‘a* was traditionally the principal land division that functioned for both taxation purposes and furnished its residents with nearly all of the fundamental necessities. *Ahupua‘a* are land divisions that typically incorporated all of the ecozones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua‘a* land division typically incorporated all of the ecozones, their size and shape varied greatly (Cannelora 1974). Hawaiian scholar and historian Samuel Kamakau (1976:8-9) summarized the types of ecozones that could be found in a given *ahupua‘a*:

Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (‘*ano*). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahea*, and makai of the *kuahea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao ‘eiwa*, and makai of that the *wao ma ‘ukele*. Makai of the *wao ma ‘ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the ‘*ama‘u*, fern belt, and makai of the ‘*ama‘u* the ‘*apa‘a*, grasslands.

A solitary group of trees is a *moku la‘au* (a “stand” of trees) or an *ulu la‘au*, grove. Thickets that extend to the *kuahiwi* are *ulunahale*, wild growth. An area where *koa* trees suitable for canoes (*koa wa‘a*) grow is a *wao koa* and *mauka* of there is a *wao la‘au*, timber land. These are dry forest growths from the ‘*apa‘a* up to the *kuahiwi*. The places that are “spongy” (*naele*) are found in the *wao ma ‘ukele*, the wet forest.

Makai of the ‘*apa‘a* are the *pahe‘e* [*pili* grass] and ‘*ilima* growths and makai of them the *kula*, open country, and the ‘*apoho* hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the ‘*ae kai*, the water’s edge.

That is the way *ka po‘e kahiko* [the ancient people] named the land from mountain peak to sea.

Within Pihā, and all other *ahupua‘a*, the *maka‘āinana* (commoners; *Lit.* people that attend the land) who lived on the land had rights to gather resources for subsistence and tribute (Jokiel et al. 2011). As part of these rights, the *ahupua‘a* residents were also required to supply resources and labor that supported the royal communities of regional and/or island kingdoms. The *ahupua‘a* became the equivalent of a local community, with its own social, economic, and political significance, and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During this annual procession, the highest chief of the land sent select members of his retinue to collect *ho‘okupu* (tribute and offerings) in the form of goods from each *ahupua‘a*. The *maka‘āinana* who resided in the *ahupua‘a* brought their share of *ho‘okupu* to an *ahu* (altar) that was symbolically marked with the image of a *pua‘a* (pig). *Ahupua‘a* boundaries, in most instances, were established along rational lines, following mountain ridges, hill, rivers or ravines, however, Chinen (1958:1) reports that “oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division.” *Ahupua‘a* were ruled by *ali‘i* ‘*ai ahupua‘a* or chiefs who controlled the *ahupua‘a* resources; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land (Malo 1951). *Ahupua‘a* residents were not bound to the land nor were they considered the property of the *ali‘i*. If the living conditions under a particular *ahupua‘a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal

support and loyalty of his or her supporters. *Ahupua'a* lands were in turn, managed by an appointed *konohiki* or lesser chief-landlord, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *po'o lawai'a* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of the area's resources from physical and spiritual depletion.

Many *ahupua'a* were further divided into smaller land units termed '*ili* and '*ili kūpono* (often shortened to '*ili kū*). '*Ili* were created for the convenience of the *ahupua'a* chief and served as the basic land unit, which *hoa'āina* (native tenants) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As the '*ili* themselves were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate '*ili* was maintained within the '*ohana*, regardless of any change in title of the *ahupua'a* chief (Handy et al. 1991). Malo (1951) recorded several types of '*ili*: the '*ili pa'a*, a single intact parcel and the '*ili lele*, a discontinuous parcel dispersed across an area. Whether dispersed or wholly intact, the '*ili* land division required a cross-section of available resources, and for the *hoa'āina*, this generally included access to agriculturally fertile lands and coastal fisheries. While much of the same resource principles applied to the '*ili kūpono*, these land units were politically independent of the *ahupua'a* chief. This designation was applied to specific areas containing resources that were highly valued by the ruling chiefs, such as fishponds (Handy et al. 1991).

The *ali'i* who presided over the *ahupua'a* (*ali'i-ai-ahupua'a*), in turn, answered to an *ali'i ai moku*, or chief who claimed the abundance of the entire *moku* or district (Malo 1951). On Hawai'i Island, there are six traditional *moku*: Kona, Ka'ū, Puna, Hilo, Hāmākua, and Kohala. Although each respective *moku* contained multiple *ahupua'a*, they were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). Other land units were also used. In what is now South Kohala, for example, the *kalana* was a division of land that was smaller than a *moku* but composed of several *ahupua'a* and '*ili āina*. The term '*okana* was also sometimes used interchangeably with *kalana* (Lucas 1995; Pukui and Elbert 1986), but Kamakau (1976), equates a *kalana* to a *moku* and stated that '*okana* was merely a subdistrict.

This form of district subdividing was integral to Hawaiian life and structurally supported the resource management planning by *ali'i* and *konohiki*. As knowledge of place developed over the centuries and was passed down intergenerationally by direct teaching and experience, detailed information of an area's natural cycles and resources were retained and well-understood. Decisions were based on generations worth of highly informed knowledge and sustainably adapted to meet the needs of a growing population. This highly complex land management system mirrors the unique Hawaiian culture that coevolved with these islands.

As Pihā encompasses both *mauka* agricultural and forest resources and *makai* fisheries, residents were once able to procure nearly all that they needed to sustain their families and contribute to the larger community from within the land division while also supporting the ruling *ali'i* of the *moku*. The windward district of Hilo provided an abundance of the most basic life-giving element *wai* from which life could be sustained. Maly and Maly (2006:7) noted that during the Precontact and even into the early Historic periods, the area from the shoreline to about the 3,000-foot elevation "supported residential and agricultural activities"...while the "upper forest regions...were frequented by travelers, collectors of natural resources, and for a wide range of cultural practices..." and add that:

A system of trails, running *mauka-makai* (between mountains and shore), a near-shore trail (the *ala loa*), and trails skirting the upper forest region were established as well. All of the large *ahupua'a* supported *mauka-makai* trails, while smaller *ahupua'a*, shared trails, and access to the larger upland regions.

Over time, as the populations of desirable coastal locations increased, early Hawaiians expanded their settlements into upland regions and more marginal areas. As competition for resources intensified, so too did political competition that resulted in conflict and further expansion into upland areas as political exiles sought asylum in remote places and hidden lava tubes (Burchard and Moblo 1994). Although the boundaries of the Hilo District are strictly political, the lands encompassed by it possess a unique environment that played a large role in determining the boundaries and shaping its history from the time of Polynesian settlement to the modern day.

Early Historic Accounts of Pihā and the Greater '*Okana of Hilo Palikū*

Following the death of Kamehameha I in 1819, the Hawaiian religious and political systems underwent a radical transformation; Ka'ahumanu proclaimed herself "*Kuhina nui*" (Prime Minister), and within six months the ancient *kapu* system was overthrown. In October of 1819, seventeen Protestant missionaries had set sail from Boston to Hawai'i. They arrived in Kailua-Kona on March 30, 1820 to a society whose spiritual system has just been overturned.

2. Background

Many of the *ali'i*, who were already exposed to western material culture, welcomed the opportunity to become educated in a western-style and adopted their dress and religion. As missionaries began to introduce Christian concepts and beliefs they also set forth the process of rendering a once purely oral language into written form and literacy was quickly taken up as a national endeavor (Nogelmeier 2010). Soon, many *ali'i* were rewarding these early missionaries with land and positions in the Hawaiian government. During this period, the demands of the *ali'i* to cut sandalwood overburdened the *maka'āinana*, who were weakening with the heavy production, exposure, and famine just to fill the coffers of the *ali'i* who were no longer under any traditional constraints (Kuykendall and Day 1976; Oliver 1961). The lack of control of the sandalwood trade soon led to the first Hawaiian national debt, as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). The Hawaiian culture was well on its way towards Western assimilation as industry in Hawai'i went from the sandalwood trade, to a short-lived whaling industry, to the more lucrative, but environmentally destructive sugar industry.

Some of the earliest written descriptions of Hilo come from the accounts of the first Protestant Missionaries to visit the island. These written accounts penned by early visitors to the Island of Hawai'i offer insight into what life may have been like for the Hawaiians of Pihā and Hilo Palikū. Such accounts describe the *'okana* of Hilo Palikū as incredibly verdant and rich in fresh, flowing water, which was frequently noted as carving through mountain streams and emptying into the sea. Also mentioned in these accounts was the surprisingly large population that lived along the coast from South Hilo to Laupāhoehoe, north of Pihā, particularly in the vicinity of the many steep-sided gulches. Many of the individuals who traveled north or south along the coast to or from the Hāmākua District commented upon the rugged terrain, inescapably treacherous and everlasting. Ever-flowing streams and waterfalls fed by frequent mountain rainfall allowed for richly cultivated ravines and gulches, splendidly planted in *kalo*, *mai'a* (banana), and occasionally, *kō* (sugarcane).

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai'i seeking out communities in which to establish church centers for the growing Calvinist mission (Ellis 2004). Ellis estimated that at the time of his visit, about 2,000 people lived in 400 houses or huts along the coastline at Hilo Bay in the *'okana* of Hilo One (ibid.). Ellis described the residential and land use practices he observed while in the Hilo ("Hiro") District, which is applicable to the project area vicinity, thusly:

Hiro, which we had now left, though not so extensive and populous as Kona, is the most fertile and interesting division on the island.

The coast from Waiakea to this place is bold and steep, and intersected by numerous valleys or ravines; many of these are apparently formed by the streams from the mountains, which flow through them into the sea. The rocks along the coast are volcanic, generally a brown vesicular lava. In the sides and bottoms of some of the ravines, they were occasionally of very hard compact lava, or a kind of basalt.

This part of the island, from the district of Waiakea to the northern point, appears to have remained many years undisturbed by volcanic eruptions. The habitations of the natives generally appear in clusters at the opening of the valleys, or scattered over the face of the high land. The soil is fertile, and herbage abundant.

The lofty Mouna-Kea, rising about the centre of this division, forms a conspicuous object in every view that can be taken of it. The base of the mountain on this side is covered with woods, which occasionally extend within five or six miles of the shore. . . rain is frequent in this and the adjoining division of Hamakua, which forms the centre of the windward coast, and is doubtless the source of their abundant fertility. The climate is warm. Our thermometer was usually 71° at sun-rise; 74° at noon; and 72° or 73° at sun-set. Notwithstanding these natural advantages, the inhabitants, excepting at Waiakea, did not appear better supplied with the necessities of life than those of Kona, or the more barren parts of Hawai'i. They had better houses, plenty of vegetables, some dogs, and a few hogs, but hardly any fish, a principle article of food with the natives in general. (1827:353-354)

Another early written account by Ellis describes the stretch of land between South Hilo and Laupāhoehoe, north of the current project area, as a fertile, verdant, and well-watered countryside with a sizeable population:

The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, with the streams meandering through them into the sea, presented altogether a most agreeable

prospect. The cost was bold, and the rocks evidently volcanic. We frequently saw water gushing out of hollows in the face of the rocks, or running in cascades from the top to the bottom. (1827:343)

One year after Ellis' tour, the ABCFM established a base church in Hilo. From that church (Hāili), the missionaries traveled to the more remote areas of the Hilo and Puna Districts. David Lyman, who came to Hawai'i in 1832, and the Reverend Titus Coan who arrived in 1835 were two of the most influential Congregational missionaries in the *moku* of Puna and Hilo. As part of their duties, they compiled census data for the areas within their missions. In 1836, Coan traveled to Hilo and recorded the following observations of the overall district with its lush uplands dissected by steep precipices carved by formidable torrents of rain:

HILO, the northern wing of this field, is a district including about thirty miles of its shore line. It is covered with a deep rich soil, clothed with perennial green of every shade, watered with the rain of heaven and grooved by about eighty water channels that run on an angle of some three degrees, leaping over hundreds of precipices of varied heights, from three or four feet to 500, and plunging into the sea over a cliff rising in height, from the sand beach of the town, to 700 or 800 feet along the northern coast-line.

For many years after our arrival, there were no roads, no bridges, and no horses in Hilo, and all my tours were made on foot. . . In passing through the district of Hilo, the weather was sometimes fine and the rivers low, so that there was little difficulty in traveling. The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended and ascended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger.

But the streams were the most formidable obstacles. In great rains, which often occurred on my tours, when the winds rolled in the heavy clouds from the sea, and massed them in dark banks on the side of the mountain, the waters would fall in torrents at the head of the streams and along their channels, and the rush and the roar as the floods came down were like the thunder of an army charging upon the foe. (1882:31-32)

Coan (1882) continued his observations of the Hilo countryside and remarked upon the expansion of agricultural pursuits in the region to include commercial sugar cultivation with the development of mills and plantation houses which could be seen from along the coastline:

We have foliage of every shade of green, all intermingled; the plumes of the lofty cocoa and royal palms waving, and the leaves of the mango, the bread-fruit, the alligator-pear, the rose apple, the tamarind, the loquat, the plum, the pride of India, the eucalyptus, and trailing and climbing vines, with many-tinted flowers, all glistening and fluttering in the bright sun and the soft breezes of our tropical abode.

Formerly, all our streams were crossed as best they might be, or suffered to run and roar, to sparkle and foam, to leap their precipices, and to plunge undisturbed into the sea. Over these brooks and rivers, in town, and through the district of Hilo, more than fifty bridges have been built, some of them costing four thousand dollars.

Once our fertile soil produced very little except *kalo* and the sweet potato, with a few indigenous fruits; now fruits and vegetables have increased ten-fold in variety and value. But the great staple product of the district is sugar.

During our residence here there have been erected seventeen sugar mills with their feeding plantations, whose total value would probably be more than one million of dollars, and whose products might be more than two millions.

If our Government would take hold earnestly of road-making, with the aid of private enterprise, the value of Hilo soil and of our industries might be increased more than four-fold in as many years.

Sailing along the emerald coast of Hilo, one sees the smoke-stacks of the sugar mills, the fields of waving canes almost touching one another, and the little white villages attached to each plantation, lending the charm of beauty and variety to the scenery. (1882:122-123)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled through Hilo Palikū and described the landscape of this *'okana*:

The coast to the north of Hilo is slightly peculiar: it is a steep bluff, rising about two hundred feet; this is cut into small breaks here called "gulches," within which the villages are generally

situated, and the natives grow banana and taro. In some places they cultivate small patches of sugar-cane, which succeed well.

These gulches are ravines, from eight hundred to one thousand feet deep, which have apparently been worn by water-courses: they extend back into the woods, and have made the country impassable for either vehicles or riders on horseback, for no sooner is one passed than another one occurs. There is no landing for boats, for all along the shore the surf beats on the rocks with violence. (1845:206)

Another missionary named Hiram Bingham spent over twenty years in the Hawaiian Islands and wrote a memoir in 1847 which recounted his experiences as well as those reported to him by his colleagues. Of Hilo, Bingham wrote:

“Hilo is one of the most picturesque and verdant districts in the Sandwich Islands. . . the land rises rapidly from the sea, to the centre of the island, where it is crowned by the lofty Mauna Kea, which is usually mantled in snow. Travelling in Hilo is very difficult and dangerous, on account of the numerous ravines and precipices, by which the land is everywhere broken. All these ravines form channels for so many rivers or torrents, which come leaping and foaming along their rocky beds, dashing down innumerable precipices, and urging their noisy way to the ocean. In times of great rains, these streams run rapidly, and rush along with such maddening energy, as to prevent swimming or fording them. When there is less rain, they are shallow, and can be forded, at certain places, or passed by leaping from rock to rock, with which their beds are filled. While passing through the district, for thirty or thirty-five miles, I took occasion to number the principal ravines over which I passed; and without measuring, or pretending to accuracy, I reduced them, according to the best of my judgement, to the following classifications; 14 were from 200 to 1000 feet deep; 16 were from 50 to 100; and 22 were from 20 to 50. All these 63 ravines are the channels of streams of water. In many places, the banks of the ravines are perpendicular, and can only be ascended by climbing with the utmost care, and descended only by letting one’s self down, from crag to crag, by the hands. In times of rain, these precipices are very slippery and dangerous, and in many places the traveller is obliged to wind his way along the sides of a giddy steep, where one step, of four inches from the track, would precipitate him to a fearful depth below.” (1848:488-489)

These early nineteenth century historical accounts describe traditional settlement locations appearing in clusters at the opening of the valleys or scattered over the *kula* lands amongst a well-cultivated countryside. By the mid-1830s, it becomes evident that although still relatively intact, traditional lifeways in at least the southern portion of Hilo were on the verge of change particularly with the introduction of commercialized sugar agriculture and development of early plantation infrastructure. With respect to Hilo Palikū, early accounts illustrate a stark contrast between the landscape of this *‘okana* compared to the other *‘okana* belonging to Hilo; primarily the result of the abundant, raging stream channels meandering through the many sheer cliffsides that characterized the rugged, remote uplands. This relative inaccessibility, at least up until the last quarter of the nineteenth century, served to preserve the *‘okana* of Hilo Palikū from drastic changes relating to rapid, non-native population influx and destructive commercial development activities which were actively occurring in the southern portion of the *moku* during this time.

The Legacy of the *Māhele ‘Āina* of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840 the first Hawaiian constitution had been drafted and the Hawaiian Kingdom shifted from an absolute monarchy into a constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, the King (Kamehameha III) and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). This change was further promoted by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be taken from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the King, the chiefs and *konohiki*, and their tenants (the *maka ‘āinana* or common people). In 1845 the legislature created the “Board of Commissioners to Quiet Land Titles” (more commonly known as the Land Commission. All land claims, whether by chiefs for entire *ahupua‘a* or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the February 14, 1846, but the deadline was extended several times for chiefs and *konohiki* (Soehren 2005).

The King and some 245 chiefs (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18,

1847 (King n.d.). Once the King and his chiefs accepted the principles of the Privy Council, the *Māhele* 'Āina (Land Division) was completed in just forty days (on March 7, 1848). The names of all of the *ahupua'a* and 'ili *kūpono* (nearly independent 'ili land division within an *ahupua'a*, that paid tribute to the ruling chief and not to the chief of the *ahupua'a*) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the *Māhele* Book (Soehren 2005). As this process unfolded, King Kamehameha III, who received roughly one-third of the lands of Hawai'i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased by his subjects to live on. Accordingly, the day after the division with the last chief was recorded in the *Buke Māhele* (*Māhele* Book), King Kamehameha III commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the King, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their awards. The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as "Government Land," while the lands retained by Kamehameha III became known as "Crown Land," and the lands received by the chiefs became known as "*Konohiki* Land" (Chinen 1958:vii; 1961:13). All lands awarded during the *Māhele* were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission. Pihā Ahupua'a does not appear in the *Buke Māhele* and was never assigned or awarded during the 1848 division of lands. However, the ownership of Pihā was the center of controversy when the trustees of Bishop Estate claimed that *ahupua'a* (along with other lands) had been continuously held and claimed by Bernice Pauahi Bishop's ancestors (Rowland 2018). To settle this dispute a compromise was reached by which the Minister of the Interior conveyed certain other lands to the Trustees, and they, in turn, conveyed the land of Pihā (and other lands) to the Hawaiian Kingdom government. Thus, it was not until December 20, 1890, that Pihā was included as Government Land.

Native tenants of the lands that had been distributed among the Crown, the various *Konohiki*, and the Government could claim and acquire title to parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered these *kuleana* parcels as Land Commission Awards. Claims for *kuleana* had to be submitted during a two-year period that expired on February 14, 1848 to be considered. All of the land claimants were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered, and the LCAw. numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the *kuleana* lands. The work of hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly 2000). In the meantime, as the new owners of the lands on which the *kuleana* were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The "Enabling" or "*Kuleana* Act," passed by the King and Privy Council on December 21, 1849, clarified the native tenants' rights to the land and resources, and the process by which they could apply for fee-simple interest in their *kuleana*. The work of the Land Commission was completed on March 31, 1855. A total of 13,514 *kuleana* were claimed by native tenants throughout the islands, of which 9,337 were awarded (Maly 2000). No *kuleana* parcels were awarded within Pihā Ahupua'a, thus, there are none situated within the current project area.

Boundary Commission Testimony (1862-1876)

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Hawaiian Kingdom to legally set the boundaries of all the *ahupua'a* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English. Although hearings for most *ahupua'a* boundaries were brought before the Boundary Commission and later surveyed by Government employed surveyors, in some instances, the boundaries were established through a combination of other methods. In some cases, *ahupua'a* boundaries were established by conducting surveys on adjacent *ahupua'a*. In cases where the entire *ahupua'a* was divided and awarded as Land Claim Awards and or Government issued Land Grants (both which required formal surveys), the Boundary Commission relied on those surveys to establish the boundaries for that *ahupua'a*. Although these surveys aided in establishing the boundaries, they lack the detailed knowledge of the land that is found in the Boundary Commission hearings.

On February 8, 1875, on the application of J. Dominis, agent of the Crown Lands and administrator for the estate of M. Kekuanaoa, the Boundary Commission met at the court house in Hilo to settle the boundaries of Pihā Ahupua'a

(Boundary Commission 1875:325-330). Several older residents of the area provided testimony at the hearing including Ku, Hemahema, Kalualoha, and Kupahu, as well as D.H. Hitchcock, the Government Surveyor who surveyed the Pihā boundaries (Figure 14). Hitchcock testified that he surveyed the boundaries of Pihā Ahupua‘a in October of 1874 with Ku as his *kama‘āina* (person familiar with the land). Hitchcock also took Kalualoha with him while surveying a portion of the Nanue boundary, and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku were generally agreeable regarding the boundaries, so only took Ku with him. From the testimony we learn that the boundary delineating Kahuku and Pihā *ahupua‘a* (forming the southeastern boundary of the current project area) was once marked by an “old trail” used by bird catchers to access the forest, and that the owner of Nanue Ahupua‘a, Alapai, disputed the *mauka*-eastern boundary of Pihā Ahupua‘a as described by Ku and depicted by D.H. Hitchcock in Figure 14. The following summary of the 1875 Boundary Commission testimony for Pihā focuses on the Kahuku boundary of the *ahupua‘a*, which is adjacent to the southeastern boundary of the current project area.

Ku, described in the boundary commission records as “an old man” born during the time of Kamehameha I, stated that he had learned the boundaries of Pihā from his grandfather, Hue and his father, Mahiai, both of whom were bird catchers, and indicated that his older brother Koia was once *konohiki* of the *ahupua‘a*. Ku accompanied Hitchcock during the boundary survey and pointed out the boundaries to him, showing him a stone *ahu* at the *mauka* corner of Pihā (where the *ahupua‘a* is cut off by Humu‘ula) that his brother had built during the reign of Kamehameha II. With regards to the trail along the Pihā/Kahuku boundary, Ku testified that (*italicization and bolding added for emphasis*):

... My grandfather made the road on **Honohina** to **Moohalohalo**, and I made the road to **Hopuwai**, **Kahuku** bounds **Piha** on **Hilo** side at shore, there is a small gulch there called **Alanaio** on boundary, thence runs up gulch a short distance above road to head of it, thence up old trail to **Kaawau**, thence bounded by **Nanue** up old trail to **Nenelu** old *kauhale* [group of houses], thence up trail to **Waipahoe** a *kahawai* [stream/gulch] and *kauhale*, the old trail does not reach to the gulch, but turns to the left. . .

When cross-examined Ku clarified that:

... **Piha** and **Nanue** join at Kawau cutting off **Kahuku**. I have stated that the *mauka* boundary of **Nanue** is at **Kaahina** not at **Nahuina** of **Waipahoe**. There is an old *kauhale kalaiwaa* [group of canoe carvers’ houses] at this place, this is the boundary I have always known. **Nanue** had no old road. The birds in olden times belonged to **Piha** and not to **Nanue**.

Hemahema, described as a “quite old man” in the testimony, stated that he had learned the boundaries of Pihā from his father, Waiwai, who was the *konohiki* of “these lands to Pohakupua [six *ahupua* northwest of Pihā],” and that he had gone bird catching with his grandfather on the lands. He testified that bird catchers from Pihā and Maulua *ahupua‘a* (adjacent to the northwestern *mauka* boundary of Pihā) used to catch birds in common. With regards to the trail along the Hilo side boundary of Pihā, Hemahema stated that (*italicization and bolding added for emphasis*):

... **Kahuku** bounds **Piha** at the shore at **Hilo** side, a small gulch, boundary runs up trail to **Nahuina** where **Piha** and **Nanue** join and **Kahuku** ends, thence boundary runs up trail to **Kaahina** near **Waipahoe**, this is as far as I ever knew about **Nanue**. . .

When cross-examined Hemahema clarified that:

... **Nahuina** and **Kumukawau** are the same. . . From **Kawau** boundary between **Nanue** and **Pihā** runs up old trail to **Kaahina** this is as far as I ever knew **Nanue** to run. It is where **Hakai** made a canoe. I heard from **Kihili**, **Napihe** and **Kulaipahu** that this was the *mauka* end of **Nanue**. Hapai *ma* said the same thing.

Kalualoha, described as an “old man” in the testimony, stated that he had learned the boundaries of Pihā from “Kaulanahiai, Koia, and Waikane, now dead.” Kalualoha, who was the father-in-law of Alapai, the owner of Nanue Ahupua‘a at that time, disagreed with the boundary testimony of Ku and Hemahema, and went with Hitchcock to point out what he believed to be the correct boundary between Nanue and Pihā to be (see Figure 14). Kalualoha testified that (*italicization and bolding added for emphasis*):

... **Piha** and **Nanue** join each other at **Kawau** an old trail into the woods, thence boundary runs up this trail to **Waipahoe**, thence boundary runs up this stream to **Mahuia** *kauhale* on **Piha**, thence boundary runs up to **Koapololei**, thence up old trail to upper edge of woods to **Kalapaohelo**, to a place called **Kaluaalu**. . . In olden times the birdcatchers used to go up the **Honohina** and **Piha** roads, they could not go up the **Nanue** as the road was so bad. The canoe road of **Nanue** ran to *mauka* of **Kaahiwa**, there it ended. But the roads on **Honohina** and **Piha** ran way *mauka*. . .

Kupahu, the uncle of Alapai (the owner of Nanue Ahupua'a), who was described as a "quite old man" in the testimony, stated that he knew a little about the boundaries of Pihā because he "went up the road to Kalapaohelo after beef", and that Koia, his guide, pointed out the boundaries to him. Kupahu's testimony only addressed the mauka-eastern boundary of Pihā where it joins Nanue. He stated that, "... Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place..." At the conclusion of the testimony, it was decided by R. A. Lyman, the Commissioner of Boundaries, that the boundaries of Pihā as given by Ku be accepted, and that the notes of the survey be filed (see Figure 14) and the Certificate of Boundaries be issued accordingly.

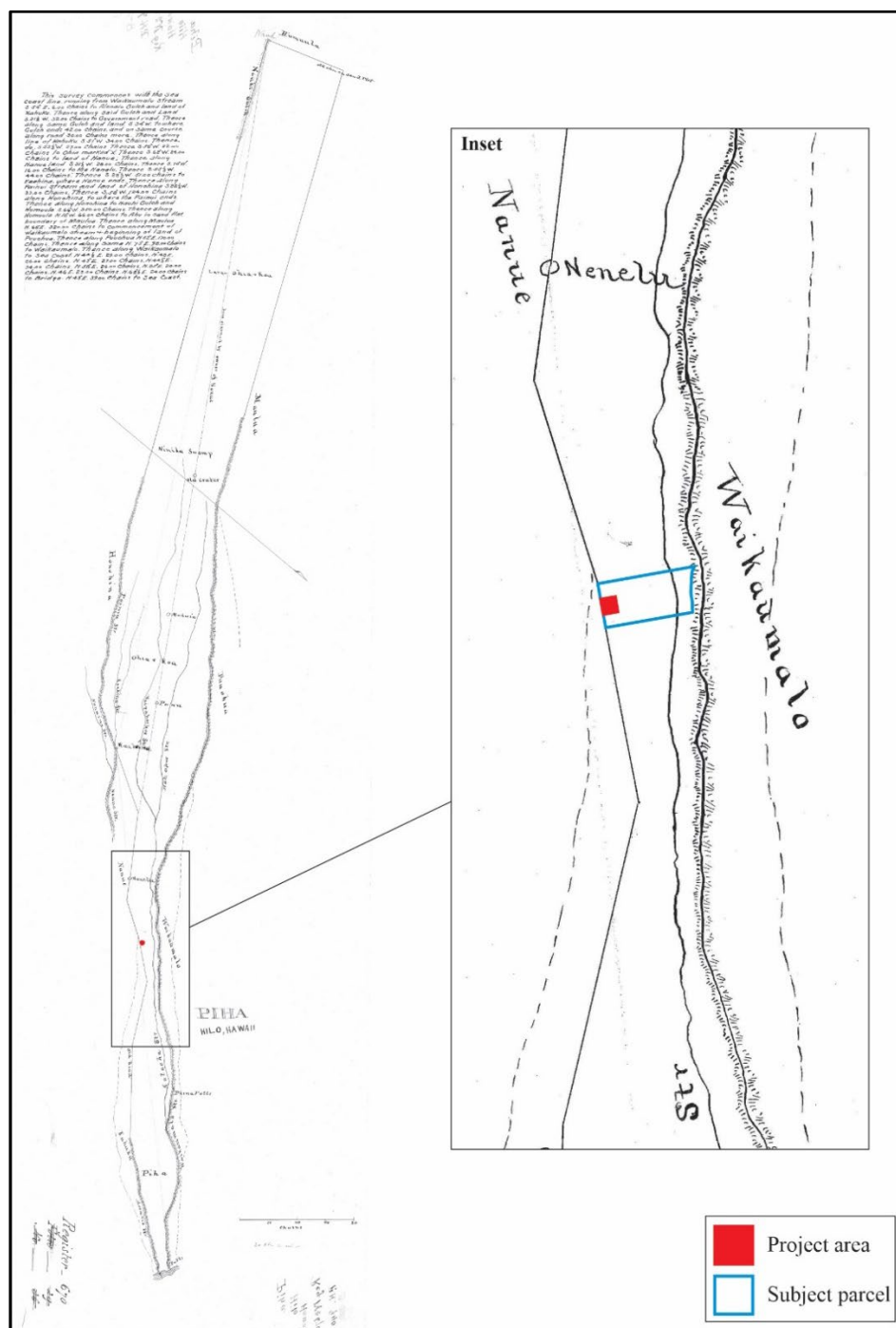


Figure 14. Hawai'i Registered Map No. 670 prepared by Hitchcock in 1874 showing approximate location of the project area within Pihā Ahupua'a (Hitchcock 1874).

Later Historic Accounts of Pihā and the Greater ‘Okana of Hilo Palikū

The decades that followed the *Māhele ‘Āina* of 1848 are characterized by a growing detracting to traditional subsistence activities, undoubtedly the result of the relatively swift expansion of the non-native population in southern portions of Hilo that occurred throughout the nineteenth century. Rapid growth of the overall Hilo District, fueled by the development of landing wharves in South Hilo, further expanded the district’s collective legacy as a focal point of intensive trade and commerce, particularly in the vicinity of Hilo Bay which was ranked as the third most frequented port for whaling vessels in need of repair and reprovisioning. With an increasing population and popularity, historical accounts from the end of the nineteenth century were no longer largely limited to the missionary population who had established a religious stronghold in the district. Rather, accounts from this time derive from the increasing number of curious travelers who recounted their experiences during a time when traditional lifeways were being transmuted by increasing modernization and urbanization.

Despite the rapid development of South Hilo, accounts from the latter part of the nineteenth century portray the ‘okana of Hilo Palikū in the stretch between Hakalau and Laupāhoehoe, and in the general vicinity of the project area, as an area still largely immune from the swift effects of urbanization with barely a population to speak of. Travelers to Hilo Palikū often remarked upon the rain-plundered landscape dissected by deeply cut ravines and gulches. Access through this portion of Hilo was provided only by a narrow trail suitable only for foot or travel by horseback which offered many a traveler nothing less than a harrowing experience. Isabella Bird visited Hilo in 1873 and published her experiences in *The Hawaiian Archipelago: Six Months Among the Palm Groves, Coral Reefs, & Volcanoes of the Sandwich Islands*. In the following excerpt, Bird provided a colorful depiction of an adventure along the treacherous precipices spanning between Laupāhoehoe and Hakalau *ahupua‘a*:

We crossed one gulch in which the water was strong, and up to our horses’ bodies, and came upon the incorrigible Kaluna, who, instead of catching his horse, was recounting his adventures to a circle of natives, but promised to follow us soon. D. then said that the next gulch was a rather bad one, and that we must not wait for Kaluna, but ride fast, and try to get through it. When we reached the *pali* above it, we heard the roaring of a torrent, and when we descended to its brink it looked truly bad, but D. rode in, and I waited on the margin. She got safely across, but when she was near the opposite side her horse plunged, slipped, and scrambled in a most unpleasant way, and she screamed something to me which I could not hear. . . but the brave animal struggled through, with the water up to the top of her back, till she reached the place where D.’s horse had looked so insecure. In another moment she and I rolled backwards into deep water, as if she had slipped from a submerged rock. I saw her fore feet pawing the air, and then only her head was above water. I struck her hard with my spurs, she snorted, clawed, made a desperate struggle, regained her footing, got into shallow water, and landed safely. It was a small but not an agreeable adventure.

We went on again, the track now really dangerous from denudation and slipperiness. The rain came down, if possible, yet more heavily, and coursed fiercely down each *pali* track. Hundreds of cascades leapt from the cliffs, bringing down stones with a rattling sound. We crossed a bridge over one gulch, where the water was thundering down in such volume that it seemed as if it must rend the hard basalt of the *palis*. Then we reached the lofty top of the great Hakalau gulch, the largest of all, with the double river, and the ocean close to the ford. . . (1880:107-108)

Two years later, a journalist by the name of Henry Martyn Whitney published the very first guidebook to the islands in 1875, entitled *The Hawaiian Guide Book, For Travelers: Containing A Brief Description of the Hawaiian Islands, Their Harbors, Agricultural Resources, Plantations, Scenery, Volcanoes, Climate, Population, and Commerce*. An excerpt from his book describes his treacherous trek through Hilo Palikū from Laupāhoehoe, passing *makai* of the project area:

From Laupāhoehoe on the north to Puna on the south extends this large and fertile district [Hilo], where the trade winds are neutralized by the mountains, and where the rain falls in such abundance as to keep the land perpetually green to the water’s edge. Except at Hilo Bay, the coast is composed of bold bluff cliffs from a hundred to upwards of 1000 feet high; these are higher on the north and the *pali*, at Laupāhoehoe, is a remarkable one. . . On the other cliff, one mile distant, you discern horsemen and decide that the road to Hilo lies over there, but how to get there. This wall extends inland for miles, a stream rolls down its precipitous valley, plainly one must go down before getting up the other side. At length the ribbon road wound downward on the shelving roof of the valley appears. From twenty minutes to half an hour will be occupied in the descent, according

as you risk the neck of horse and rider. More than a score, some say fifty similar valleys, with twice this number of similar ribbon windings, miniature Alpine passes, lie between Laupāhoehoe and Hilo village.

Mountain torrents rush through each of these passes, and one of the wonders of this volcanic country lies in these gulches, with their gothic steepes that disrupt the land for three score miles or less, piercing the land's centre. The number of waterfalls is beyond estimate, their height varies from tens to thousands of feet, and many of the streams literally *leap* into the sea. A mere sprinkle at the beach often increases, higher up the mountain, to a heavy rain, and the stream may rush in torrents for a mile and then resume the common course of a brook. It is not uncommon for the traveler to be detained by a swollen stream for half a day. In olden times the streams were crossed by stepping stones. "La Paz" says of this overland route: "As we rode along, the rain poured, rattling among the leaves, pattering among the impromptu pools and drains, the torrents tumbled from the hills or leaped through chasms, over frightful rocks, with a thundering sound that jarred the cavernous earth; the ocean waves came surging and groaning against the beetling cliffs like a wail of despair, and our horses kept tumbling over a corduroy road of mud ridges and holes of water, alternating with the regularity of rice rows; a succession of mud ridges and miniature hog wallows.

"Before reaching the Scotchman's gulch, we passed a deep chasm, where some rough stone piers indicated where the apology for a bridge had formerly stood. Through this swept a mad and foaming torrent, near four feet deep, whirling and rushing past gigantic balsaltic bounders, a cataract above, a waterfall below; we passed between this Scylla and Charybdis, and came near being carried away by the foaming flood. We have crossed the Rocky Mountains six times, the Sierra Madre of Mexico often, the volcanic chain of Central America three times and the Andes twice; and we here most solemnly protest that we have never traveled a road that gave the traveler more ups and downs on a sliding scale than the pathway from Laupāhoehoe to Hilo." (1875:70-72)

As illustrated in nearly every accounting regarding Hilo Palikū, the 'okana's abundance of streams, valleys, and gulches made for a difficult and treacherous pass. In "Ka Huakaihele ike i na Makaainana o Hilo" (A Sightseeing Tour to Visit the Common Folk of Hilo), an account authored by G.K. Mahoe (1876) and serialized in the Hawaiian language newspaper *Ka Lahui Hawaii*, Mahoe recounted his travels through the region:

...ua pale ae au i ka loa o ke alahale, ua manao ole ae hoi i na pali hauliuli o Hilo paliku, na piina, na ihona, na alu, na kahawai, na kualono, a me na pupu, ua hele hookahi ia no e a'u, me ka manao ole i ka luhi a me ka inea o ka hele ana, oiai, ma ka hoomaopopo ana i ka loa mai Hilo one a hiki i Laupāhoehoe, me he mea la, ua aneane no i ke kanakolu mile. A mai kuhihewa hoi ka poe heluhelu, he papu a he laumania hoi ke ano o ka waiho ana o ka aina, aole, aka, he puu kinikini, he alu, he kapekepeke ke alanui.

... I am protected from the long path ahead, I did not think twice of the dark cliffs of Hilo Palikū, the inclines, the descents, the ravines, the streams, the mountaintops, and the cleared fields, I moved alone, without thinking much of the strain and discomfort of traveling, although, when I recalled the length between Hilo One and Laupāhoehoe, those thirty miles came and went. The reader should not be mistaken, the lands that are passed along the way are not clear and smooth, rather, there are many hills, gulches, and twisting roads. (1876:1)

The road extending from Hilo One towards Laupāhoehoe in Hilo Palikū was described in George Bowser's *Hawaiian Kingdom Statistical and Commercial Directory* (Bowser 1880) as a treacherous but beautiful journey, containing several adequate landings for boats, and prime agricultural land suited for the potential cultivation of commercial crops. Bowser further remarked upon the sparse native population of this region:

On the way to Laupāhoehoe the road is not first-rate, even in the fine weather I enjoyed on my trip, besides which there are a great number of deep gulches, the sides of which are very steep. The track is certainly very rugged and uneven; but, then, to make up for it, the scenery with a parallel in the world. All the way from Hakalau to Laupāhoehoe, the country is as yet unsettled by the white man, although in that stretch of about fourteen miles of coast, by a width of a great many miles inland, the land is suitable for the culture of sugar, coffee, wheat, oats, barley and many minor crops, and only wants the presence of capital and industry to make it a veritable paradise. Good landing can be obtained about every two miles along the coast, places which only require the expenditure of from three to ten thousand dollars to make the landing facilities good in any weather and all times of the

year. The only inhabitants of this wide tract are some thirty native[s], who own among them about 3,000 acres, of which they cultivate about 150. The rest of the land belongs principally to the King and to members of the royal family. (1880:536)

It is evident from Bowser's (1880) account that Hilo Palikū remained largely untouched by foreign lifeways until the latter part of the nineteenth century. Despite this, the region's fertile, largely unmodified, expansive landscape and promising economical enterprises did not go unnoticed. As noted by Henry Whaley Nicholson (1881:194) who was affiliated with the Royal Planter's Association, "this tract of land has fine grazing qualities, and is well adapted to the cultivation of cane and coffee: but the few roads are execrable, and means of transport laborious." It wasn't long before the region's landscape and abundant waters would integrate into a profitable, burgeoning enterprise propelled forward by envisioned entrepreneurs.

Pihā Ahupua'a During the Late Nineteenth and Early Twentieth Centuries and a Concise History of the Pihā Homesteads and the Current Project Area

Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Hawaiian Kingdom, which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations incorporated in the Islands. In 1878, Claus Spreckels, with W.G. Irwin & Company as its agent, established the Hakalau Plantation Company on 9,000 acres of land located along the North Hilo coast, 16 miles from Hilo (Dorrance and Morgan 2000). The fields of the Hakalau Plantation Company ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (*mauka*) limits. The Hakalau Mill, built in 1890 on the shore at the foot of a 200-foot bluff of Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (*ibid.*). The cane was flumed from the various fields to the mill site, where it was then processed. Initially, until 1913 when a railroad connecting the plantation to the port at Hilo was built, the plantation shipped its product from the Hakalau Landing to Honolulu via inter-island vessels that anchored offshore.

The lands contained within Pihā Ahupua'a, totaling 4,250 acres, were leased to the Hakalau Plantation Company on February 11, 1892 (see C.S.F. 449). The *makai* lands of the *ahupua'a* were cleared and used for the cultivation of sugarcane, but the fields of the Hakalau Plantation Company never extended as far *mauka* as the current project area, which remained as forest land into the present-day. The degradation of native forests were a catalyst for change in Hilo, and effects related to deforestation had been ongoing since the early 1800s. As a result, efforts were made to restore the upland forests to a natural, healthy habitat and preserve Hilo's valuable stream-fed watersheds in order to facilitate and sustain both agricultural pursuits and the well-being of the mounting population. Consequently, a proclamation recommending that 110,000 acres of land in the Districts of North and South Hilo be reserved from development was signed by Lt. Governor A.L.C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created. The reserve, which encompasses lands *mauka* of the current project area, was described by the Division of Forestry in 1906 as follows:

The Hilo Forest Reserve embraces the area of heavy forest on the lower slopes of Mauna Kea, lying between the 1855 and 1881 Lava Flows back of Hilo Town and the Hamakua District line, and extending from a line varying in elevation from 1,750 to over 2,000 feet, drawn back of and above the sugar plantations to another line along the upper edge of the woods, at an elevation of approximately 6,000 feet. The water from this reserve is of great importance to all the plantations along the coast, being at present used for the most part for fluming cane to the mill. From the character of the country many of the streams could be utilized for the production of power. This will be an important consideration when the Hilo District comes to be developed, as it is sometime bound to be. The object of the Hilo Forest Reserve is to protect the sources of this important water supply. (Division of Forestry 1906:25)

Shortly after the creation of the Hilo Forest Reserve, and just as the plantation's lease on its Pihā lands was set to expire, large tracts of land were set aside within government lands like Pihā (and other parts of Hilo) by the newly formed Territory of Hawai'i (formed in 1900) to create homesteads. The process for obtaining homestead lots was clarified by the Organic Act of 1900, a law enacted at a time in the islands (and in the United States congress) when there was growing concern regarding the consolidation of land ownership within the plantation system, and its reliance on foreign labor (Horwitz et al. 1969). Survey of the anticipated Pihā homestead tract commenced in 1912 and was completed by 1913, when the Survey Department of the Territory of Hawai'i reported that "the land of Piha was subdivided into 28 lots, comprising 393.81 acres, 5 miles of roads containing 20.44 acres, and flumes and ditches and remnant covering 5.95 acres" (Department of the Interior 1914a:679) (Figure 15). The Pihā-Kahuku Homestead Road,

created as part of the Pihā Homesteads subdivision and situated along the southeastern boundary of the project area separating it from the Kahuku Homesteads subdivision (see Figure 15), appears to follow the route of the older trail delineating the Pihā and Kahuku *ahupuaʻa* boundary as indicated during Boundary Commission testimony proceedings provided for Pihā during the late nineteenth century.

Not long after the formal subdivision of the Pihā Homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., questioned the legitimacy of the boundary between the homesteads and adjoining lands owned or controlled by the company, which they felt had been encroached upon. Additional surveys of the Pihā homestead tract, involving extensive triangulation work, were then made during the early part of 1914, until the matter was decided to the satisfaction of all parties involved (Department of the Interior 1914b). Later that year, in June 1914, fifteen lots (Lots 9 through 28) within the *makai* third of the newly created Pihā Homesteads subdivision were made available for homesteading and sold at auction. The eight additional lots (Lots 1 through 8) situated in the more *mauka* remainder of the homesteads (Figure 16), were not applied for despite the claim that the Pihā Homestead lots were available for homesteading in 1912 and were not set for 10-year lease at public auction until the following year in June 1915 (Honolulu Star-Bulletin 1916). One month later, on July 14, 1915, a general ten-year lease for Lots 1 through 8 was purchased at auction by the Hakalau Plantation Company who also purchased 10-year leases on four additional lots (Lots 13 through 16) of the adjoining Kahuku Homesteads (Department of the Interior 1916). Collectively, all of the Pihā Homestead lots were to be taken only by Special Homestead Agreement, which had stipulations for an annual lease payment of \$50 as well as a requirement to fence all lot boundaries (Herald 1915).

The Hakalau Plantation Company's lease, for unknown reasons, was never fully executed and Lots 1 through 8 were eventually sold off to various homesteaders. The current project area is situated within a portion of Lot 2 of the Pihā Homesteads (see Figure 16; Figure 17). Lot 2, a 17.24-acre parcel, was sold jointly with Lot 1 (an 18.3-acre parcel adjacent to Lot 2 to the west) to William Breithaupt on August 23, 1916, as Grant No. 8584 for \$324.00. Several other members of the Breithaupt family purchased lands within Pihā Homesteads as well, including Otto Breithaupt (Lots 5 and 6; Grant 7862), Ella Breithaupt (Lots 7 and 8, Grant No. 7863), and August K. Breithaupt (Grant No. 8328; Lots 15 and 16). It appears that less than a month after William Breithaupt's purchase, on September 8, 1916, Lots 1 and 2 were leased to Mike Lehuanui under Special Homestead Agreement No. 1252 but later transferred back to Breithaupt's possession three years later on September 10, 1919 (Rivenburgh 1917). Territory of Hawai'i tax records indicate that Lots 1 and 2 (and thus the current project area) were initially identified as belonging to TMK: (3) 3-2-004:011 and were transferred from William Breithaupt to August Breithaupt on September 21, 1936.

Around this time and until the first half of the twentieth century, the Hakalau Plantation Company continued to operate on lands situated *makai* of the current project area. By the early 1940s, nearly 40 percent of the of the sugarcane on the plantation was being cultivated by independent growers, some of whom had purchased various Pihā Homestead lots. In 1943, the neighboring Wailea Milling Company (also started by Claus Spreckels) was merged into the Hakalau Plantation Company, expanding the operation, and by 1944 the plantation had reached its maximum production, producing 26,000 tons of sugar that year (Dorrance and Morgan 2000). On April 1, 1946, the Hakalau Mill and the railroad connecting the plantation to Hilo were severely damaged by a *tsunami* triggered by an earthquake in the Aleutian Islands. The mill was eventually rebuilt, but the railroad was shut down indefinitely and the product was then trucked to the docks at Hilo.

Six years following the *tsunami* in January 1952, Lots 1 and 2 were transferred from August Breithaupt's estate to Ella Breithaupt and eventually fell under the care of her own respective estate. By January 1953, six months prior to Ella Breithaupt's death (Honolulu Star-Bulletin 1953), a number of lots also presumably within the Pihā Homesteads subdivision (including Lots 1 and 2) were being managed by her son and estate trustee, Graven Breithaupt, and collectively amassed under TMK: (3) 3-2-004:001. During this time, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepe'eke'ō Sugar Company (Dorrance and Morgan 2000), and sugar continued to serve as the dominant commercial industry in this portion of Hilo, although the project area remained uncultivated (Figure 18). In 1963, Lots 1 and 2 were part of 120.69-acres of land subsequently dropped into TMK: (3) 3-2-004:006 (along with Lots 3 through 8). Tax records are somewhat ambiguous but do indicate that 113.19 of the 120.69 acres were leased by Graven Breithaupt to Yoshinobu and his wife Tsutayo Yamada (Figure 19) along with their son, Bob Takeshi Yamada, for a period of 80 years beginning on July 1, 1963, while the remaining 7.5-acres was reserved for another lessee by the name of Makoto Tawara. It appears that during this year, most of the lands encompassed by Parcel 006 were classified as undeveloped forest (totaling 52.21 acres), while 38.18 acres of the parcel consisted of gulch lands (presumably Kalaeha Stream/Gulch, which bisects the subject parcel). Twenty-five acres was listed as pasture, while the remaining 5.3 acres was identified as cane land.

2. Background

Although Yoshinobu Yamada had previous experience as a cane planter prior to his lease of the lands presumably encompassing, or in the immediate vicinity, of the project area, and later worked for and retired from Mauna Kea Sugar Company as a service truck helper (Hawaii Tribune-Herald 1985; Hilo Tribune-Herald 1934), it appears that the lands within and surrounding the current project area were never utilized for the cultivation of sugarcane by the Yamada family. However, Makoto Tawara, the additional lessee who received the remaining 7.5-acres of land within Parcel 006, is listed as a sugarcane grower in tax records spanning between 1953 and 1961 for Lots 7 and 8. Based upon these records, it is likely that the 7.5-acres of land leased to Tawara were not for lands within the project area, but rather for lands within Lot 8 which he likely continued leasing for an indeterminate period as an independent grower for the plantation. It can thereby be suggested that from 1963 until at least 1968, the only utilization of the remainder of the lands encompassed within Parcel 006 (Lots 1 through 7) were for pastoral use or were left fallow as undeveloped forest and gulch lands. A USGS topographic map from 1966 depicts the project area within a forest, indicating that it remained undeveloped until this time (Figure 20).

Land use for the current project area is vague in the years following, and it appears that by 1970 the current project area was removed from the Parcel 006 designation, which by this time details land use for just 30 acres of land. Despite the continued expansion and operation of the sugarcane growing operation in *makai* lands and with the merging of Pepe'eke'ō Sugar Company into the Mauna Kea Sugar Company by C. Brewer & Co. into the Mauna Kea Agribusiness Company in 1973, it appears that the project area lands remained out of reach for the industry and sustained as an undeveloped, forested landscape until the present day (Figures 21 and 22).

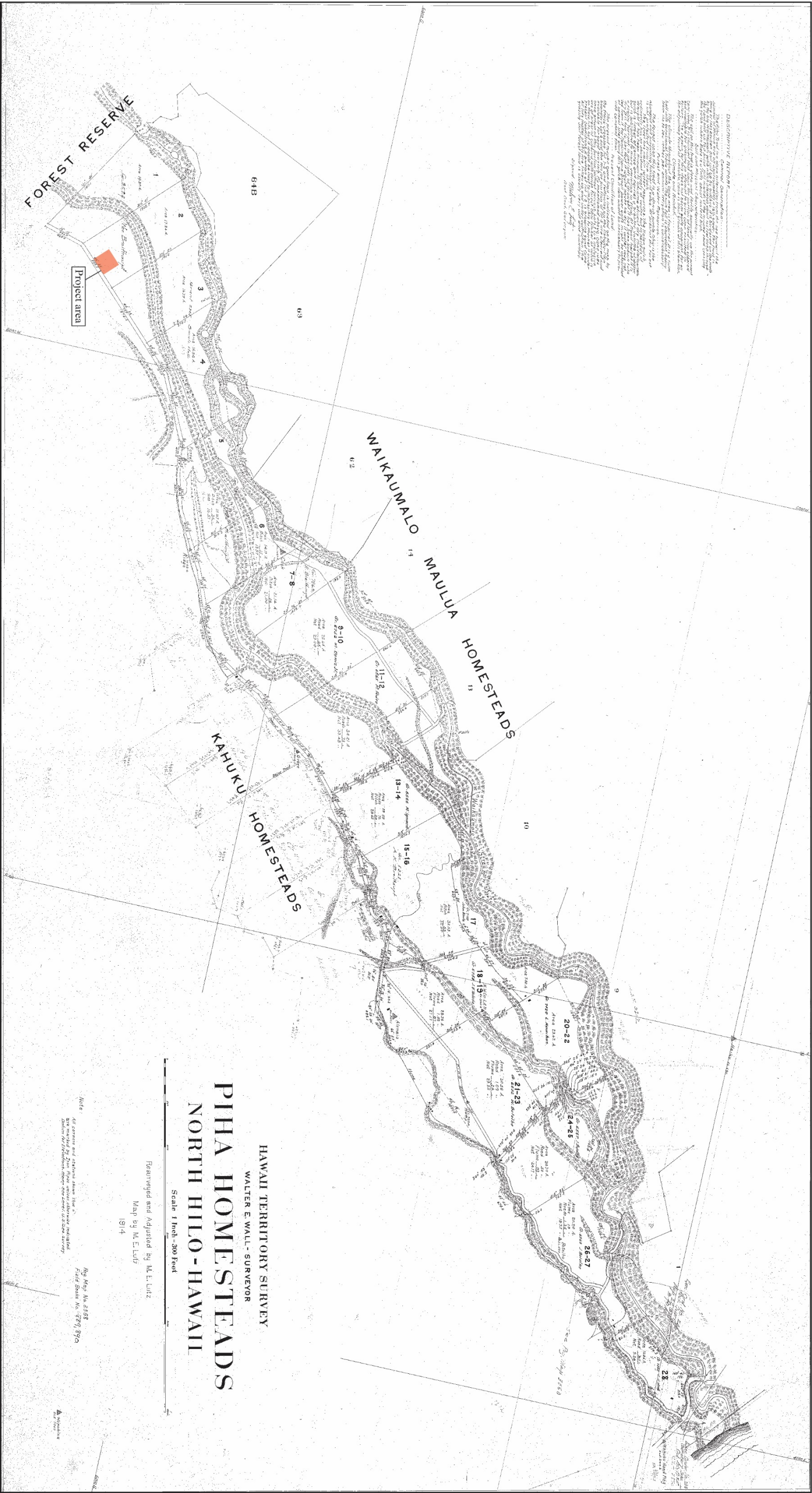


Figure 15. Hawai'i Registered Map No. 2568 prepared in 1914 by M.E. Lutz showing the location of the current project area within Piha Homesteads (Lutz 1914).

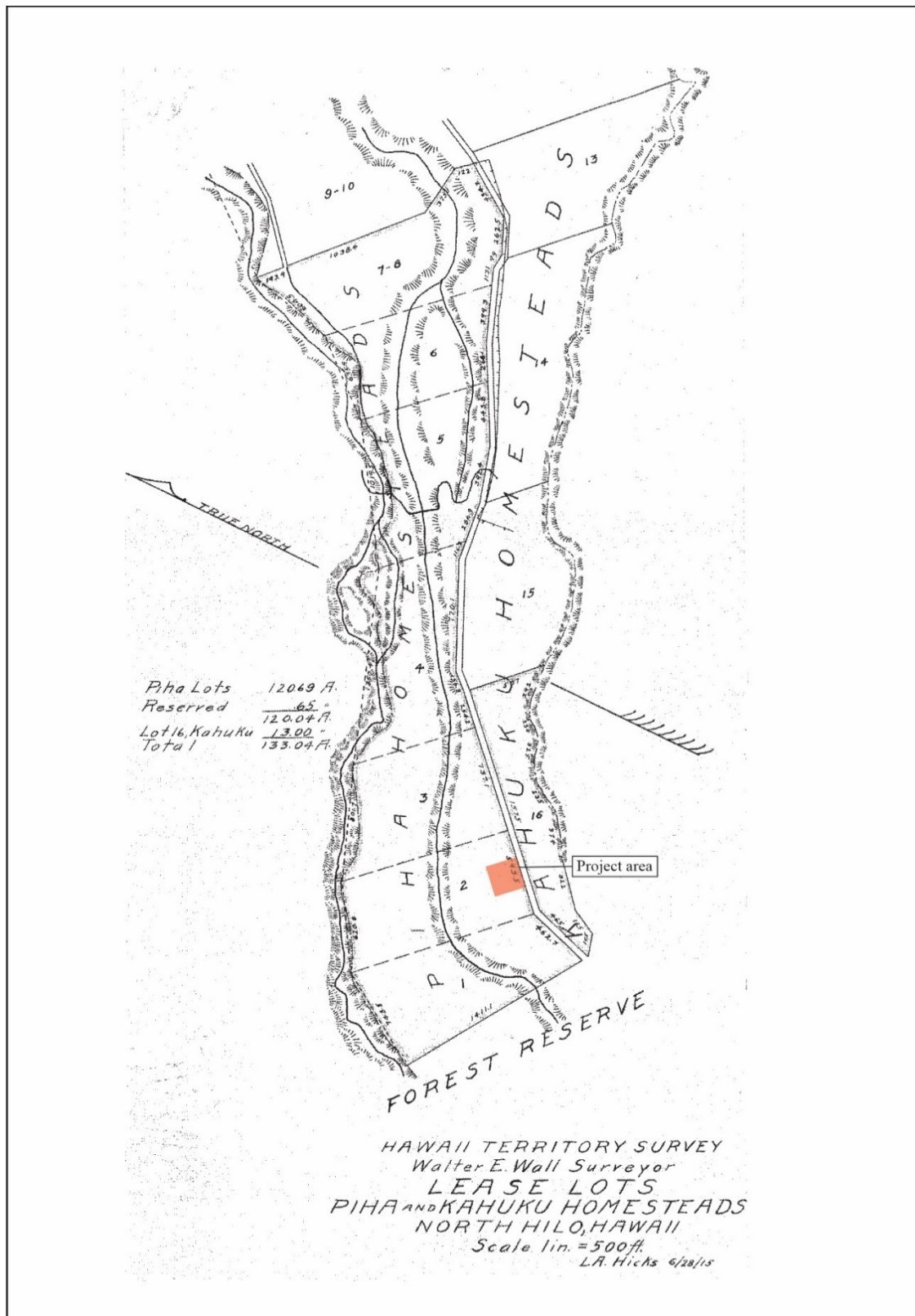


Figure 16. Map prepared on June 28, 1915 by L.A. Hicks showing the project area within Lot 2 of the Pihā-Kahuku Homesteads (Hicks 1915).



Figure 17. Portion of HTS Plat Map No. 799 prepared in 1922 by Jos. Iao showing the project area within Pihā Homesteads (Hockley 1922).

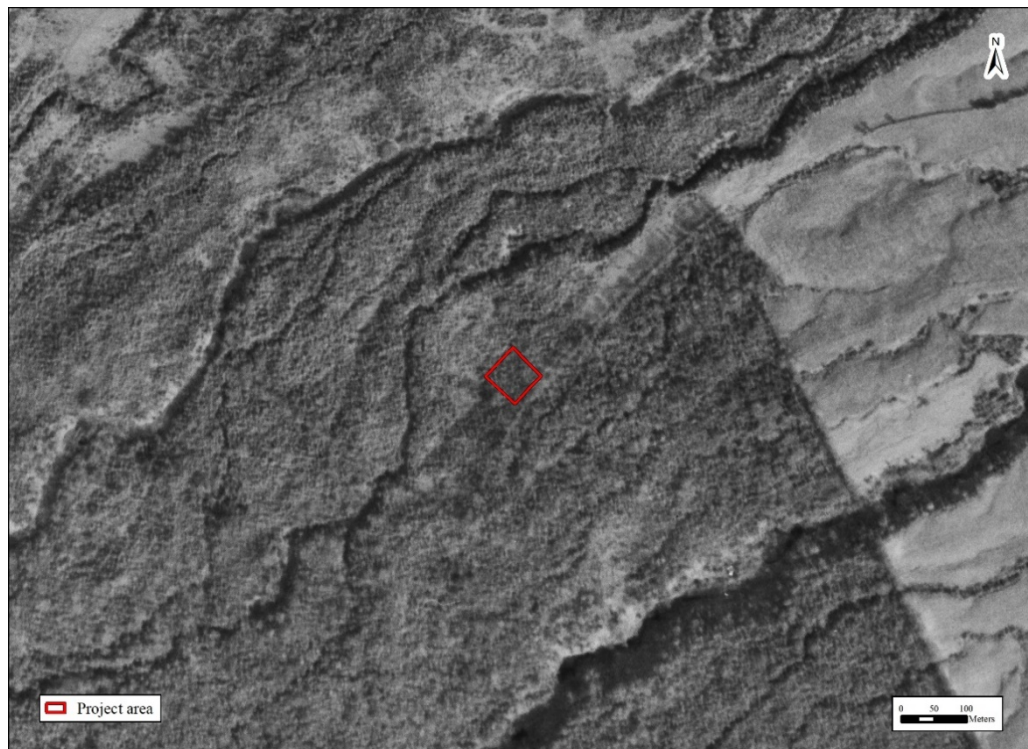


Figure 18. 1954 USGS aerial photograph showing the location of the project area.



Figure 19. Photograph of Yoshinobu and Tsutayo Yamada (Hawaii Tribune-Herald 1976).

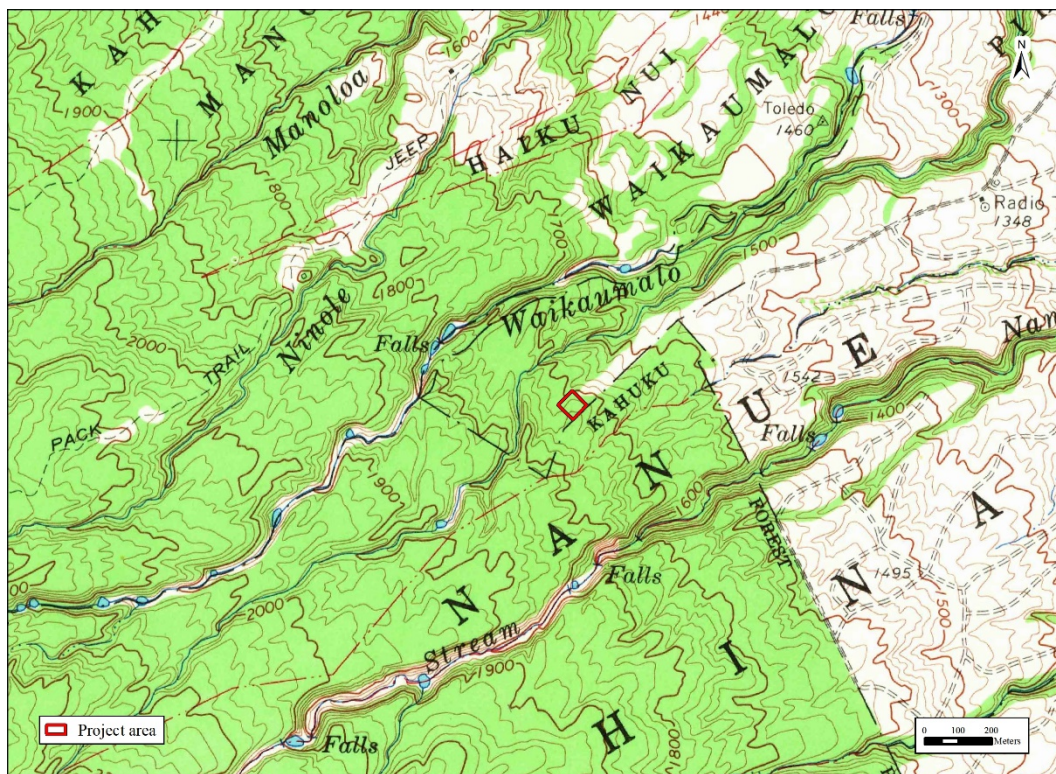
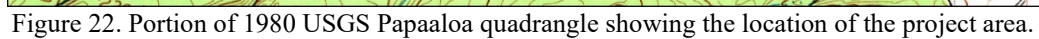
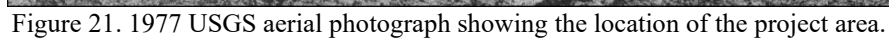


Figure 20. Portion of 1966 USGS Papaaloa quadrangle showing the location of the project area.



PREVIOUS ARCHAEOLOGICAL STUDIES

There have been no previous archaeological studies conducted within the current project area and very few studies conducted anywhere within the district of the North Hilo at similar elevations. The first archaeological work conducted in East Hawai'i was that of the early twentieth-century *heiau* researchers Thrum and Stokes (Stokes and Dye 1991; Thrum 1908). Neither investigator was able to identify *heiau* within Pihā Ahupua'a or, for that matter, within the broader region between Hilo One and Hilo Palikū in the vicinity of Laupāhoehoe Ahupua'a. In the early 1930s, A.E. Hudson, working under the aegis of the Bishop Museum, also conducted archaeological investigations in East Hawai'i, surveying primarily along the coast of the district (Hudson 1932). He found little in the region *makai* of the project area, although he did note the presence of a .25 mile square area of *kalo* terracing in the upper reaches of Hakalau Gulch situated east of the current project area. According to Hudson (ibid.:218), there was formerly a *papamū* (*kōnane* game board) in the bottom of Hakalau Gulch, and the gulch was at one time identified as a robber's stronghold.

More recently, Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an archaeological study of approximately 595 acres of land within Hakalau Nui Ahupua'a in the South Hilo District, situated between Hawai'i Belt Road and the 1,500-foot elevation contour. Low-level aerial (helicopter) survey was conducted over some of the uncultivated, forested portions of that study area, and other uncultivated areas were inspected using "variable-coverage (partial to 100%) variable-intensity ground survey" (Walker and Rosendahl 1994a). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites resources were identified during the study.

In 1996, International Archaeological Research Institute, Inc. (IARII; Tomonari-Tuggle 1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current project area and outside of Pihā Ahupua'a. Very little archaeological work was undertaken during the study; however, Tomonari-Tuggle did provide a predictive model for site distribution within the upland forests of Hilo and indicated that such forested areas were utilized primarily for the collection of special resources:

... Traditionally these resources would have been birds (for featherwork) and hardwoods (for tools and canoes). In historical times, birds and hardwoods would have continued as resources, with the addition of cattle for meat and hides. The upland forests may also have been transited by individuals going from the coast to the upper slopes or summit of Mauna Kea. . .

These transitory activities would likely have left neither a substantial nor easily recognized archaeological record. Further, the density and rapid regrowth of vegetation in the rainforest would also make any remains virtually impossible to identify once abandoned. (ibid.:67)

Specific site types discussed by Tomonari-Tuggle (1996) that were surmised to have been encountered within the upland forests of the Hilo included temporary shelters used by bird catchers, canoe builders, bullock hunters, scientists, travelers, surveyors, shrines or other religious structures, ponds and waterholes, roads and trails, bullock pits, surveyor's marks and ranch structures. Tomonari-Tuggle (ibid.) described the lowest forest zone, in which the current project area is situated, as the wet '*ōhi'a* zone. This zone, characterized primarily by '*ōhi'a* forest and bog lands extending up to 4,000 feet in elevation, was indicated to have been an area largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

A review of reports and correspondence on file at the DLNR-SHPD office in Hilo indicates that only two archaeological studies have been conducted in the vicinity of the current project area, but that DLNR-SHPD has previously written "no effect" letters for at least seven parcels within the Pihā and Kahuku Homesteads (Figure 23). These "no effect" letters include a:

1. November 1, 1996 letter for TMK: (3) 3-2-004:025 (Log No. 18344 Doc No. 9610ms04); and
2. April 24, 1998 letter for TMK: (3) 3-2-004:027 (Log No. 21307 Doc No. 9804PM15); a
3. June 1, 1998 letter for TMK: (3) 3-2-004:039 (Log No. 21050 Doc No. 9802PM03); and
4. August 18, 1998 letter for TMK: (3) 3-2-004:041 (Log No. 22025 Doc No. 9807ms17); a
5. June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (Log No. 27706 Doc No. 0105ms08); a
6. December 31, 2010 letter for TMK: (3) 3-2-004:045 (Log No. 28884 Doc No. 0112PM10); and an
7. April 17, 2013 letter for TMK: (3) 3-2-004:046 (Log No. 2013.2304 Doc No. 1304SN05)

The reason generally given for DLNR-SHPD's belief that the proposed development of these parcels would have "no effect" on significant historic sites, was that a review of aerial photographs revealed that intensive cultivation of sugarcane had significantly altered the landscape. DLNR-SHPD undertook no archaeological survey of the parcels listed above.

In 2018, ASM Affiliates (Clark 2018) conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pihā Homesteads located west of the current project area (see Figure 23). While no archaeological resources were identified within the project area as a result of the study, Clark (ibid.) did note that the alignment of the Pihā-Kahuku Road was identified adjacent to the eastern boundary of the project area.

Most recently, in 2019, ASM Affiliates (Ka'uhane and Clark 2019) conducted an archaeological survey of a roughly 3.2-acre portion of Lots 13-14 of the Pihā Homesteads located to the northeast of the current project area (see Figure 23). As a result of the study, no archaeological resources were identified within the project area, and it was determined that the proposed development would not affect historic properties.

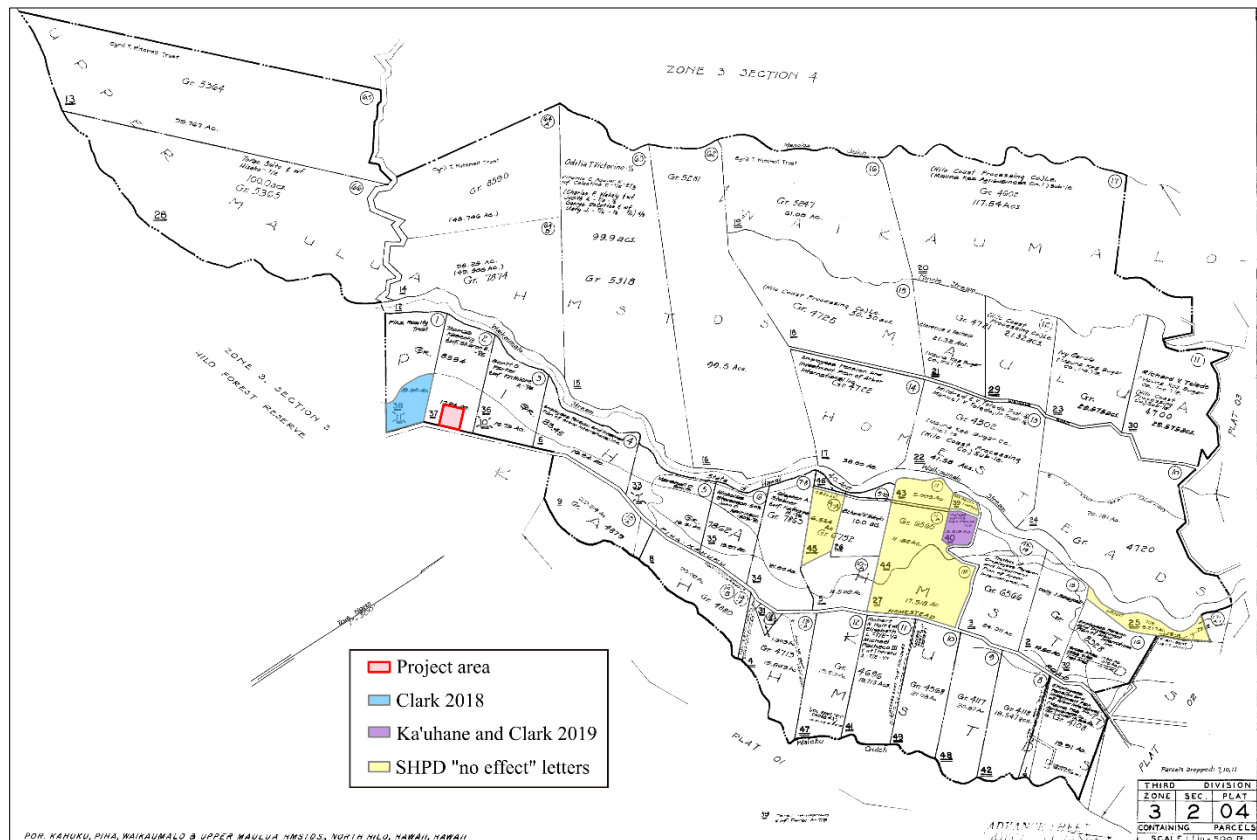


Figure 23. Previous archaeological studies conducted in the vicinity of the project area.

3. PROJECT AREA EXPECTATIONS

Based on the culture-historical context and the findings of previous archaeological studies presented above, a set of archaeological expectations for the current project area is now presented. As discussed by Tomonari-Tuggle (1996), the upland forest areas of Hilo were used traditionally for catching birds and gathering forest resources, both of which are transitory activities that are unlikely to have left a substantial, or easily recognizable, archaeological record. As indicated in the 1875 Boundary Commission testimony for Pihā Ahupua'a, access to the forest lands was facilitated by a bird catcher's trail that followed the boundary between Kahuku and Pihā *ahupua'a* immediately adjacent to the southeastern boundary of the project area (approximating the route of the existing Pihā-Kahuku Homestead Road, which remains a public right-of-way). This trail once intersected with a canoe maker's trail from Nanue Ahupua'a near the *mauka* boundary of Kahuku Ahupua'a, southwest of the current project area. While the actual Precontact/early Historic trail routes, if they ever entered the project area at all, are likely to be difficult to identify archaeologically given the thickly vegetated terrain and disturbance resulting from the development of the Pihā-Kahuku Homestead Road, rock constructions once built adjacent to the trails, such as temporary shelters or cairns, may be encountered. An examination of historical records indicates that the project area likely remained entirely undeveloped despite ongoing commercial cultivation of sugarcane in lands *makai* of the project area. However, Historic use of Lot 2 of the Pihā Homesteads, which was originally purchased by William Breithaupt in 1916 as Grant No. 8584 before being

subsequently transferred to various other family members and leased to four additional individuals during the mid-twentieth century, may be marked by archaeological features related to ranching, habitation, or other early twentieth-century homesteading activities.

4. FIELDWORK, CONCLUSION, AND RECOMMENDATIONS

Fieldwork for the current study was conducted on July 27, 2021, by Lauren Kepa‘a, B.A. and Johnny Dudoit, B.A. under the direct supervision of Matthew R. Clark, M.A. (Principal Investigator). Fieldwork consisted of an intensive (100%) coverage survey of the entire surface of the project area utilizing systematic southeast to northwest oriented pedestrian transects with fieldworkers spaced at 10-meter intervals. The entire project area was accessible at the time of the survey, and the boundaries of the parcel were clearly identifiable in the field, and vegetation cover only moderately limited ground visibility.

No historic properties were identified within the current project area; thus, with respect to the HRS Chapter 6E-42 historic preservation review process, it is the conclusion of this study that the development of a single-family dwelling within the current project area on a portion of TMK: (3) 3-2-004:037 will have no effect on historic properties. It is our recommendation that no further historic preservation work needs to be conducted prior to or during project implementation. In the unlikely event that significant archaeological resources are discovered during the proposed development activities, work shall cease in the area of the discovery and the DLNR-SHPD shall be contacted pursuant to HAR 13§13-280-3.

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APPENDIX B

CULTURAL IMPACT ASSESSMENT

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A Cultural Impact Assessment for the Single-Family Residential Development of Lot 2 within the Pihā Homesteads

TMK: (3) 3-2-004:037

Pihā Ahupua‘a
North Hilo District
Island of Hawai‘i

FINAL VERSION



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A Cultural Impact Assessment for the Single-Family Residential Development of Lot 2 within the Pīhā Homesteads

TMK: (3) 3-2-004:037

Pīhā Ahupua‘a
North Hilo District
Island of Hawai‘i

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1. INTRODUCTION

At the request of Mr. Sean Winterer (landowner), ASM Affiliates (ASM) has prepared this Cultural Impact Assessment (CIA) for the development of a single-family residence on a roughly 1-acre portion of a 17.2-acre conservation zoned parcel, identified as Tax Map Key (TMK) (3) 3-2-004:037, located in *mauka* (upland) section of the Pihā Homesteads, Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i (Figures 1, 2, and 3). Due to the parcel’s zoning status, a Conservation District Use Application (CDUA) is being prepared for the proposed single-family residential development (Figure 4) in accordance with Hawai‘i Revised Statutes (HRS) Chapter 343 and this CIA is intended to inform the application process.

This CIA report has been prepared according to the standard specified in the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impacts*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997 (OEQC 1997). Act 50, which was proposed and passed as Hawai‘i State House Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, specifically acknowledges the State’s responsibility to protect native Hawaiian cultural practices. Act 50 further states that “environmental assessments...should identify and address effects on Hawaii’s culture, and traditional and customary rights” and that “native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Furthermore, Articles IX and XII of the State’s constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

This report is divided into four main chapters, beginning with an introduction that includes a description of the proposed project area. To provide a physical and cultural context, section two of this report includes a cultural and historical background for the general study area, which includes background information for Pihā Ahupua‘a and the greater district of North Hilo. This section also includes a presentation of prior studies conducted within the vicinity of the proposed development activity. The results of the consultation process are presented in section three of this report and section four concludes with a discussion of potential cultural impacts as well as appropriate actions and strategies that may help to mitigate any such impacts.

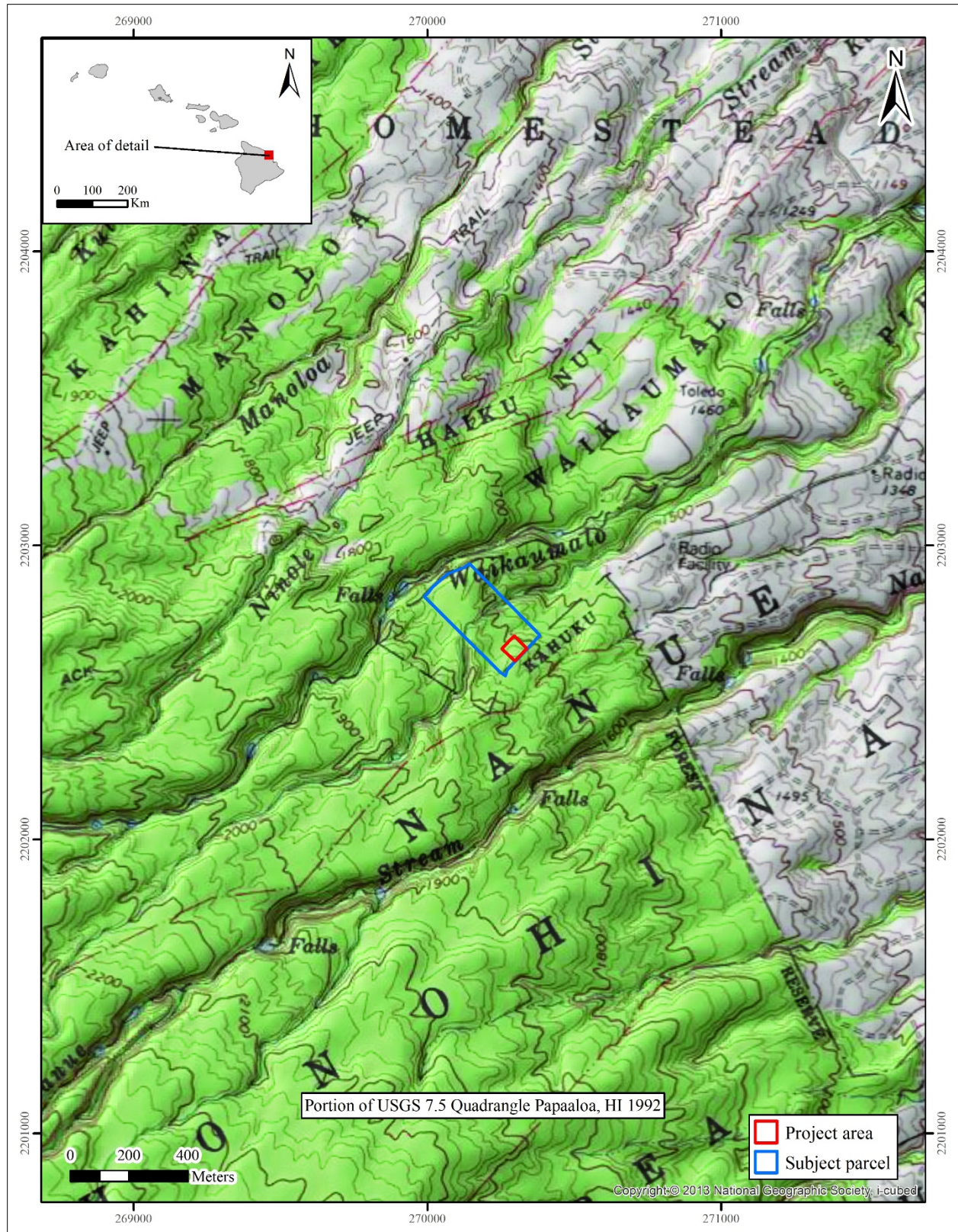


Figure 1. Regional location map showing project area and subject parcel.

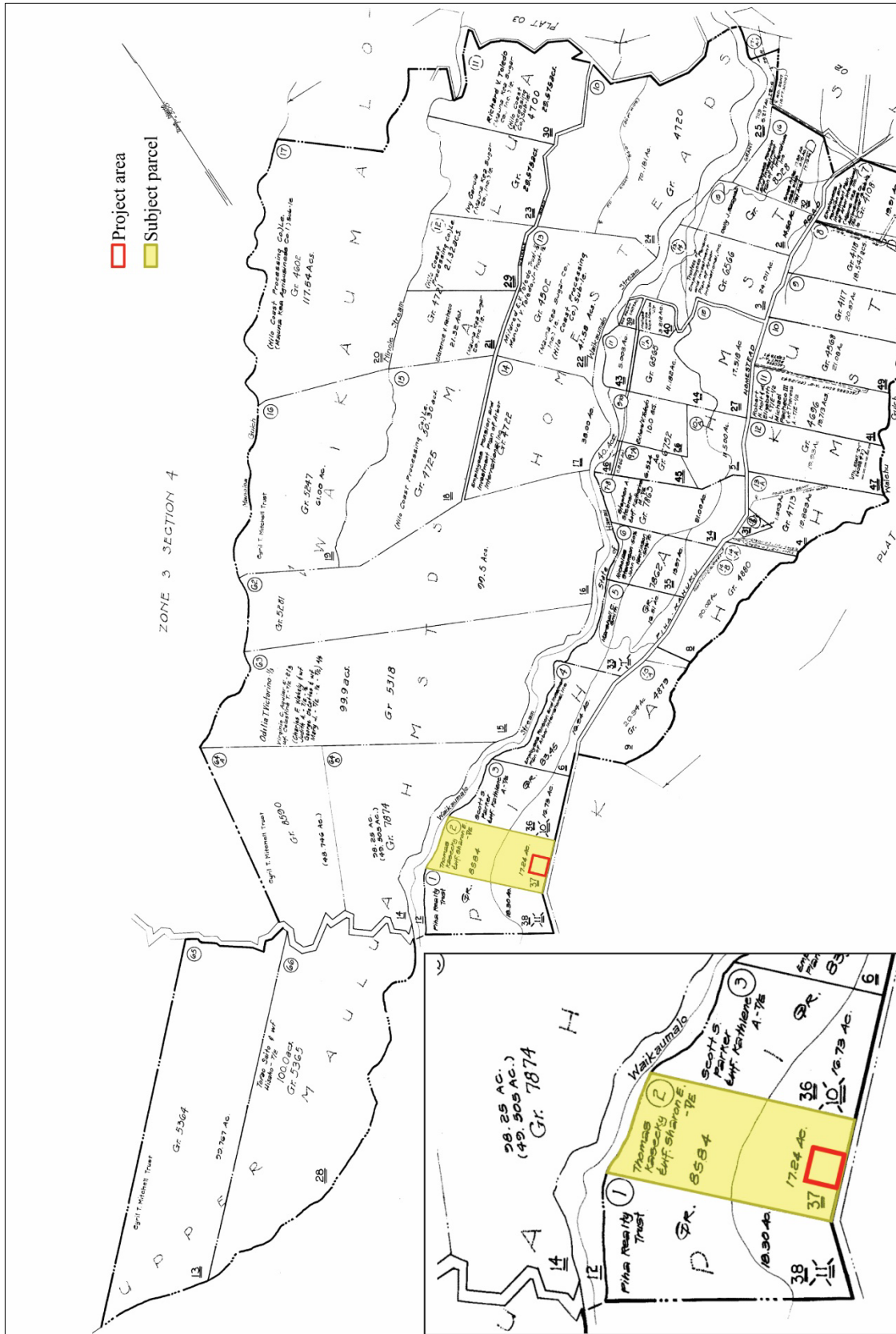


Figure 2. Tax Map (3) 3-2-04 showing the subject parcel (037) and project area.



Figure 3. Google Earth™ aerial image showing subject parcel and project area.

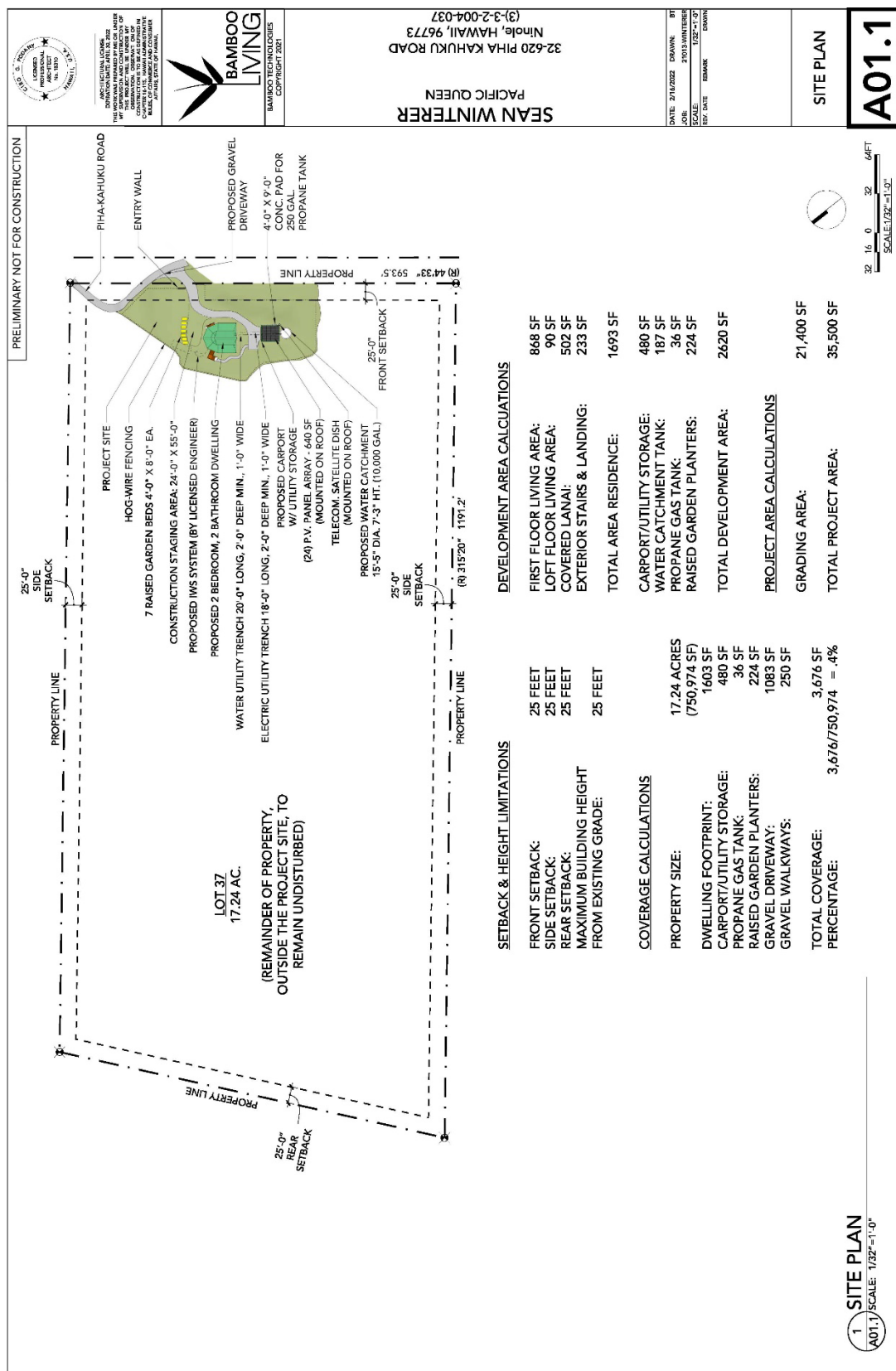


Figure 4. Proposed development plans.

PROJECT AREA DESCRIPTION

The project area consists of a roughly 1-acre portion of Lot 2 of the historic Pihā Homesteads (TMK: (3) 3-2-004:037), located in Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i (see Figures 1, 2, and 3). The overall subject parcel comprises 17.24 acres and is situated within the southwestern (*mauka*) portion of the Pihā Homesteads subdivision. It is bounded to the northeast and southwest by properties that are designated within the State Conservation District. The parcel (036) to the northeast is developed with a single-family residence and assorted out-buildings and the southwest parcel (038) is partially improved with an access driveway and has approval of a Conservation District User Permit for the construction of a single-family residence and related utility and landscape improvements (see Figure 2); the construction of which is expected to begin by the end of the year 2021. The subject parcel is bounded on the south by the unimproved portion of the Pihā-Kahuku Road, which provides access to the project area (Figure 5), and to the north by Waikaumalo Stream (see Figure 3) situated within a thin, 40-acre conservation-zoned parcel (012) owned by the State of Hawai‘i (see Figure 2). The project area is located along the central section of the southeastern boundary adjacent to the northwestern edge of Pihā-Kahuku Road (see Figure 2), roughly 4.6 kilometers (2.85 miles) inland of the coast at an elevation of roughly 525 meters (1,722 feet) above sea level.

The geology of this portion of North Hilo is formed of mixed ‘a‘ā and *pāhoehoe* basaltic substage lava flows, mapped as Hāmākua Volcanic Series (Sherrod et al. 2007), that originated from Mauna Kea Volcano between 64,000 and 300,000 years ago during the Pleistocene Epoch (labeled Qhm in Figure 6). Soils that have formed on these lava flows are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Figure 7). These deep, well-drained Andisol soils are formed of weathered volcanic ash overlying bedrock (Soil Survey Staff 2020). Terrain within the majority of the project area is characterized by a moderate northwest slope that extends to a narrow gully with intermittent water flow that meanders along portions of the northern project area boundary. This gully delineates the project area from the remainder of the subject parcel to the northwest (Figure 8).

The climate at this elevation in North Hilo is generally cool, with temperatures averaging between 55° to 68° Fahrenheit throughout the year (Giambelluca et al. 2014). The lands in the vicinity of the project area receive a mean annual rainfall of approximately 5,285 millimeters (208 inches), with the highest rainfall occurring between the months of November and March, and the least amount of rainfall occurring in June. Trade winds often blow from east to west across this region, except when *kona* winds are blowing (typically during the summer months), and the wind pattern is reversed.

Terrain within much of the project area is generally characterized by a gentle to moderate slope towards the northwest although the topography in the northeastern corner of the project area slopes moderately to the northeast. The project area is currently undeveloped and is thickly vegetated primarily in an overstory of strawberry guava (*Psidium cattleianum*) stands interspersed with ‘ōhi‘a (*Metrosideros polymorpha*) and paperbark (*Melaleuca quinquenervia*) trees. Ground cover beneath the overstory consists predominantly of decaying logs as well as eastern gamagrass (*Tripsacum dactyloides*), malabar melastome (*Melastoma malabathricum*), soapbush (*Melastoma candidum*), and uluhe (false staghorn; *Dicranopteris linearis*) (Figures 9 and 10) that largely obscure the underlying ground surface, while the northeastern corner of the project area is predominantly shrouded by a thick overgrowth of uluhe and significantly less tree cover.



Figure 5. Pihā-Kahuku Road marking the southern project area boundary, view to the southwest.

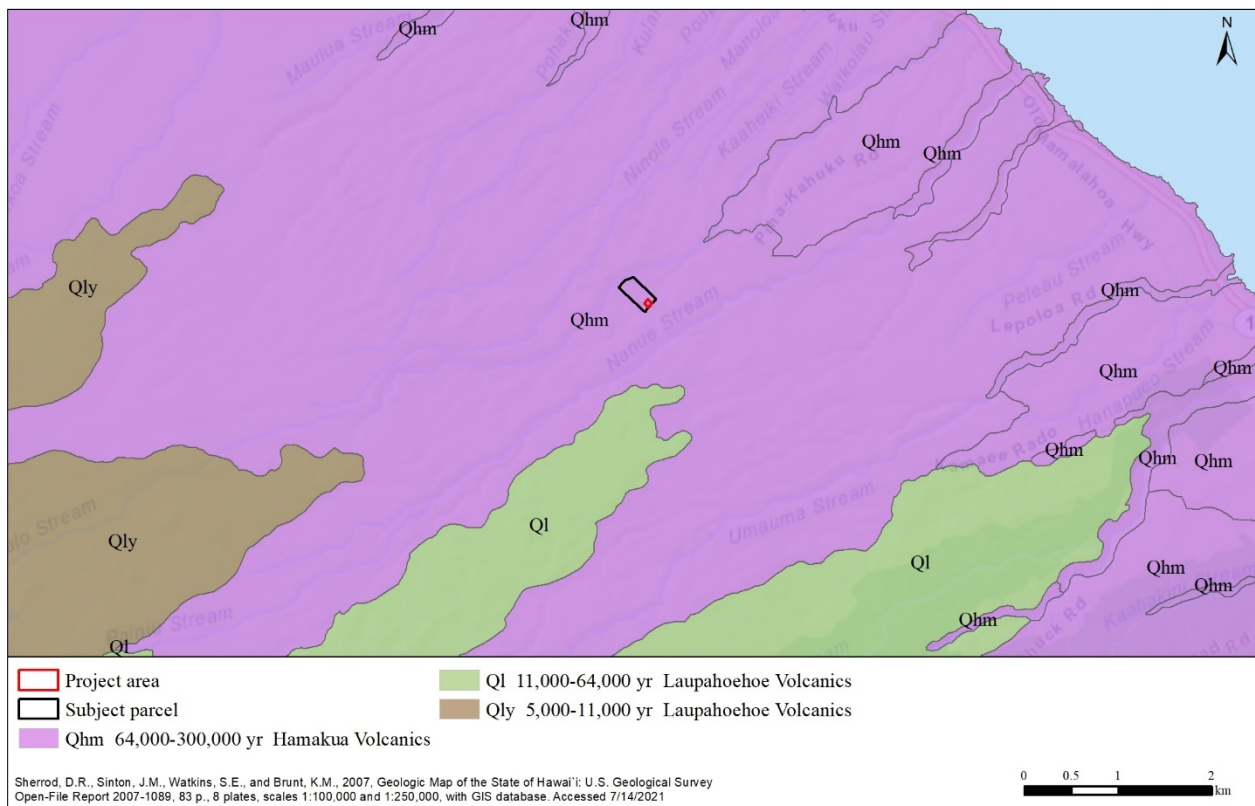


Figure 6. Geology underlying the project area.

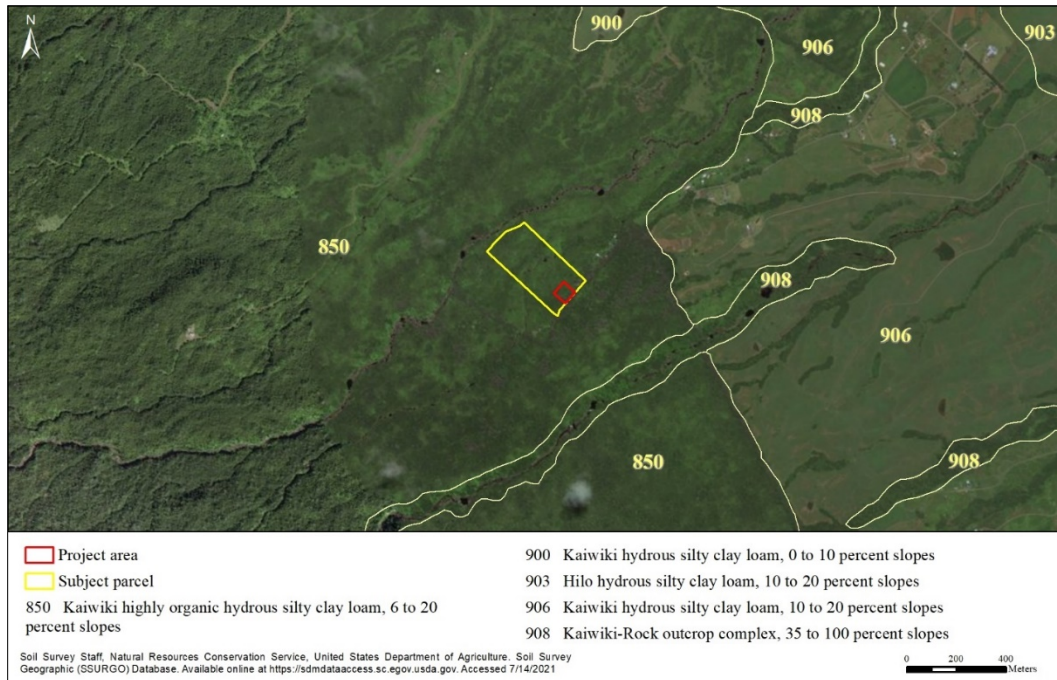


Figure 7. Soils in the project area.



Figure 8. Gully located to the north of the project area boundary, view to the southwest.



Figure 9. Typical vegetation pattern in the central portion of the project area, view to the south.



Figure 10. Typical vegetation in the northeast corner of the project area, view to the southeast.

2. BACKGROUND

As specified in the OEQC (1997) *Guidelines for Assessing Cultural Impacts*, “...the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment.” For this cultural impact assessment, the *ahupua‘a* of Pihā is considered the study area, while the entirety of TMK: (3) 3-2-004:037 is referred to as the subject parcel and proposed 1-acre development footprint is referred to as the project area.

To generate a set of expectations regarding the nature of cultural resources that might be encountered within the current project area and to establish a context within which to assess the significance of such resources, the background section begins with a general culture-historical context. This is followed by culture-historical background information concerning the history of Pihā. A background of Hilo Palikū, the broader regional designation in which Pihā is situated, also falls within the parameters of the OEQC guidelines and ensures that a broader set of cultural practices and histories are considered. Following this background section is a discussion of relevant prior archaeological studies that have been conducted in the vicinity of the project area.

RESEARCH METHODS

The culture-historical context and summary of previously conducted archaeological and cultural research presented below are based on research conducted by ASM Affiliates at various physical and digital repositories. Primary English language and Hawaiian language resources were found at various state agencies, including the State Historic Preservation Division, Hawai‘i State Archives, and the Department of Accounting and General Services Land Survey Division. Digital collections provided through the Office of Hawaiian Affairs Papakilo and Kīpuka databases, Waihona ‘Āina, the Ulukau Hawaiian Electronic Library Ulukau, the Hawai‘i Genealogical Indexes, and Newspapers.com provide further historical context and information. Lastly, secondary resources curated at ASM’s Hilo office offer general information regarding the history of land use, politics, and culture change in Hawai‘i, enhances the broad sampling of primary source materials that are cited throughout this CIA.

CULTURE-HISTORICAL CONTEXT

The following subsections are intended to provide a general overview of Hawaiian origins, settlement, expansion, and describes some of the broad sociopolitical and cultural transformations that developed over time. The discussion continues with a summary of traditional ideologies associated with the land and the evolution of uniquely Hawaiian land stewardship practices. It is within this context that the history specific to the lands of Pihā is developed.

Generalized Model of Hawaiian Origins and Settlement

While the question of when Hawai‘i was first settled by Polynesians remains contested, scholars working in the fields of archaeology, folklore, Hawaiian studies, and linguistics have offered several theories. With advances in palynology and radiocarbon dating techniques, Kirch (2011), Athens et al. (2014), and Wilmshurst et al. (2011) have argued that Polynesians arrived in the Hawaiian Islands sometime between A.D. 1000 and A.D. 1200. This initial migration on intricately crafted *wa‘a kaulua* (double-hulled canoes) to Hawai‘i from Kahiki, the ancestral homelands of Hawaiian deities and peoples from southern Pacific Islands, occurred at least from initial settlement to the 13th century. According to Fornander (1969), Hawaiians brought from their homeland certain Polynesian customs and beliefs: the major gods Kāne, Kū, Lono, and Kanaloa (who have cognates in other Pacific cultures); the *kapu* system of political and religious governance; and the concepts of *pu‘uhonua* (places of refuge), *‘aumakua* (ancestral deity), and *mana* (divine power). Archaeologist Kenneth Emory who worked in the early to mid-20th century reported that the sources of early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). However, Emory’s theory is not universally accepted, as Hawaiian scholars in the past and present have argued for a pluralistic outlook on ancestral Hawaiian origins from Kahiki (Case 2015; Fornander 1916-1917; Kamakau 1866; Kikiloi 2010; Nakaa 1893; Poepeo 1906).

While stories of episodic migrations were widely published in the Hawaiian language by knowledgeable and skilled *kū‘auhau* (individuals trained in the discipline of remembering genealogies and associated ancestral stories), the cultural belief that living organisms were *hānau ‘ia* (born) out of a time of eternal darkness (*pō*) and chaos (*kahuli*) were brought and adapted by ancestral Hawaiian populations to reflect their deep connection to their environment. As an example, the *Kumulipo*, Hawai‘i’s most famed *ko‘ihonua* (a cosmogonic genealogical chant), establishes a birth-rank genealogical order for all living beings (Beckwith 1951; Liliuokalani 1978). One such genealogical relationship

that remains widely accepted in Hawai‘i is the belief that *kalo* (taro) plants (in addition to all other plants, land animals, and sea creatures), are elder siblings to humans (Beckwith 1951). This concept of hierarchical creation enforces the belief that all life forms are intimately connected, evidencing the cultural transformations that occurred in the islands through intensive interaction with their local environment to form a uniquely Hawaiian culture.

In Hawai‘i’s ancient past, inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). Following the initial settlement period, communities clustered in the *ko‘olau* (windward) shores of the Hawaiian Islands where fresh water was abundant. Sheltered bays allowed for nearshore fisheries (enriched by numerous estuaries) and deep-sea fisheries to be easily accessed (McEldowney 1979). Widespread environmental modification on land also occurred as early Hawaiian *kanaka mahi‘ai* (farmers) developed new subsistence strategies, adapting their familiar patterns and traditional tools to work efficiently in their new home (Kirch 1985; Pogue 1978). Areas with the richest natural resources became heavily populated overtime, resulting in the population’s expansion to the *kona* (leeward) side of the islands and to more remote areas (Cordy 2000).

As populations expanded, major socioeconomic changes occurred, such as the development of complex social stratification systems and intensive land modification. During this expansion period, additional migrations to Hawai‘i occurred from the islands of Tahiti. Rosendahl (1972) proposed that settlement at this time was seasonally recurrent, in which coastal sites were occupied in the summer to exploit marine resources and upland agricultural sites were maintained during the winter months. An increasing reliance on agricultural products may have caused a shift in social networks as noted by Hommon (1976), who argued that kinship links between coastal settlements disintegrated as those links within the *mauka-makai* (upland-coastal) settlements expanded to accommodate the exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the *ahupua‘a* system sometime during the 15th century (Kirch 1985). The implications of this model include a shift in residential patterns from seasonal, temporary habitation, to the permanent dispersed habitation of both coastal and upland areas.

Overview of Traditional Hawaiian Land Management Strategies

Adding to an already complex society was the development of traditional land stewardship systems, including the *ahupua‘a*. The *ahupua‘a* was the principal land division that functioned for both taxation purposes and furnished its residents with nearly all subsistence and household necessities. *Ahupua‘a* are land divisions that typically include multiple ecozones from *ma uka* (upland mountainous regions) to *ma kai* (shore and near shore regions), assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua‘a* land division typically incorporated all of the eco-zones, their size and shape varied greatly (Cannelora 1974). Noted Hawaiian historian and scholar Samuel Kamakau summarized the ecozones that could be found in a given *ahupua‘a*:

Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (‘*ano*). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahea*, and makai of the *kuahea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao ‘eiwa*, and makai of that the *wao ma ‘ukele*. Makai of the *wao ma ‘ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the ‘*ama‘u*, fern belt, and makai of the ‘*ama‘u* the ‘*apa‘a*, grasslands.

A solitary group of trees is a *moku la‘au* (a “stand” of trees) or an *ulu la‘au*, grove. Thickets that extend to the *kuahiwi* are *ulunahale*, wild growth. An area where *koa* trees suitable for canoes (*koa wa‘a*) grow is a *wao koa* and mauka of there is a *wao la‘au*, timber land. These are dry forest growths from the ‘*apa‘a* up to the *kuahiwi*. The places that are “spongy” (*naele*) are found in the *wao ma ‘ukele*, the wet forest.

Makai of the ‘*apa‘a* are the *pahe‘e* [*pili* grass] and ‘*ilima* growths and makai of them the *kula*, open country, and the ‘*apoho* hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the ‘*ae kai*, the water’s edge.

That is the way *ka po‘e kahiko* [the ancient people] named the land from mountain peak to sea. (Kamakau 1976:8-9)

The *maka‘āinana* (commoners, literally the “people that attend the land”) who lived on the land had rights to gather resources for subsistence and tribute within their *ahupua‘a* (Jokiel et al. 2011). As part of these rights, residents

were required to supply resources and labor to *ali'i* (chiefs) of local, regional, and island chiefdoms. The *ahupua'a* became the equivalent of a local community with its own social, economic, and political significance and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During the time of *Makahiki*, the paramount *ali'i* sent select members of his/her retinue to collect *ho'okupu* (tribute and offerings) in the form of goods from each *ahupua'a*. The *maka'āinana* brought their share of *ho'okupu* to an *ahu* (altar) that was marked with the image of a *pua'a* (pig), serving as a physical visual marker of *ahupua'a* boundaries. In most instances, these boundaries followed mountain ridges, hill, rivers, or ravines (Alexander 1890). However, Chinen (1958:1) reports that “oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division.” These ephemeral markers, as well as their more permanent counterparts, were oftentimes named as evidenced in the thousands of boundary markers names that are listed in Soehren (2005).

Ahupua'a were ruled by *ali'i 'ai ahupua'a* or chiefs who controlled the *ahupua'a* resources. Generally speaking, *ali'i 'ai ahupua'a* had complete autonomy over the *ahupua'a* they oversaw (Malo 1951). *Ahupua'a* residents were not bound to the land nor were they considered property of the *ali'i*. If the living conditions under a particular *ahupua'a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal support and loyalty of his or her supporters. In turn, *ahupua'a* lands were managed by an appointed *konohiki*, oftentimes a chief of lower rank, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *po'o lawai'a* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of an area's resources from environmental and spiritual depletion.

Many *ahupua'a* were divided into smaller land units termed '*ili* and '*ili kūpono* (often shortened to '*ili kū*). '*Ili* were created for the convenience of the *ahupua'a* chief and served as the basic land unit which *hoa'āina* (caretakers of particular lands) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As '*ili* were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate '*ili* was maintained within the '*ohana*, regardless of the succession of *ali'i 'ai ahupua'a* (Handy et al. 1991). Malo (1951) recorded several types of '*ili*, including the '*ili pa'a* (a single intact parcel) and '*ili lele* (a discontinuous parcel dispersed across an area). Whether dispersed or wholly intact, '*ili* required a cross-section of available resources, and for the *hoa'āina*, this generally included access to agriculturally fertile lands and coastal fisheries. '*Ili kūpono* differed from other '*ili* lands because they did not fall under the jurisdiction of the *ahupua'a* chief. Rather, they were specific areas containing resources that were highly valued by the ruling paramount chiefs, such as fishponds (Handy et al. 1991).

Ali'i 'ai ahupua'a, in turn, answered to an *ali'i 'ai moku* (chief who claimed the abundance of the entire *moku* or district) (Malo 1951). Hawai'i Island is comprised of six *moku* (districts) that include Kona, Ka'ū, Puna, Hilo, Hāmākua, and Kohala. Although a *moku* comprises multiple *ahupua'a*, *moku* were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). While the *ahupua'a* was the most common and fundamental land division unit within the traditional Hawaiian land management structure, variances occurred, such as the existence of the *kalana*. By definition, a *kalana* is a division of land that is smaller than a *moku*. *Kalana* was sometimes used interchangeably with the term '*okana* (Lucas 1995; Pukui and Elbert 1986), but Kamakau (Kamakau 1976) equates a *kalana* to a *moku* and states that '*okana* is merely a subdistrict. Despite these contending and sometimes conflicting definitions, what is clear is that *kalana* consisted of several *ahupua'a* and '*ili 'āina*.

This form of district subdividing was integral to Hawaiian life and the product of advanced natural resource management systems. As populations resided in an area over centuries, direct-teaching and extensive observations of an area's natural cycles and resources were retained, well-understood, and passed down orally over the generations. This knowledge informed management decisions that aimed to sustainably adapt subsistence practices to meet the needs of growing populations. The *ahupua'a* system and the highly complex land management system that developed in the islands are but one example of the unique Hawaiian culture that developed in these islands.

Intensification and Development of Hawaiian Land Stewardship Practices

Hawaiian philosophies of life in relation to the environment helped to maintain both natural, spiritual, and social order. In describing the intimate relationship that exists between Hawaiians and '*āina* (land), Kepā Maly writes:

In the Hawaiian context, these values—the “sense of place”—have developed over hundreds of generations of evolving “cultural attachment” to the natural, physical, and spiritual environments. In any culturally sensitive discussion on land use in Hawai'i, one must understand that Hawaiian

culture evolved in close partnership with its' natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture and nature begins.

In a traditional Hawaiian context, nature and culture are one in the same, there is no division between the two. The wealth and limitations of the land and ocean resources gave birth to, and shaped the Hawaiian world view. The *āina* (land), *wai* (water), *kai* (ocean), and *lewa* (sky) were the foundation of life and the source of the spiritual relationship between people and their environs. (Maly 2001)

The *‘ōlelo no ‘eau* (proverbial saying) “*hānau ka ‘āina, hānau ke ali ‘i, hānau ke kanaka*” (born was the land, born were the chiefs, born were the commoners), conveys the belief that all things of the land, including *kanaka* (humans), are connected through kinship links that extend beyond the immediate family (Pukui 1983:57). *‘Āina* or land, was perhaps most revered, as noted in the *‘ōlelo no ‘eau* “*he ali ‘i ka ‘āina; he kauwā ke kanaka*,” which Pukui (Pukui 1983:62) translated as “[t]he land is a chief; man is its servant.” The lifeways of early Hawaiians, which were dependent entirely from the finite natural resources of these islands, necessitated the development of sustainable resource management practices. Over time, what developed was an ecologically responsive management system that integrated the care of watersheds, natural freshwater systems, and nearshore fisheries (Jokiel et al. 2011).

Disciplined and astute observation of the natural world became one of the most fundamental stewardship tools used by Hawaiians of the ancient past. The vast knowledge acquired through direct observation enabled them to detect and record the subtlest of changes, distinctions, and correlations in the natural world. Examples of their keen observations are evident in the development of Hawaiian nomenclature to describe various rains, clouds, winds, stones, environments, flora, and fauna. Many of these names are geographically unique or island-specific, and have been recorded in *oli* (chants), *mele* (songs), *pule* (prayers), *inoa ‘āina* (place names), and *‘ōlelo no ‘eau* (proverbial sayings). Other Hawaiian arts and practices such as *hula* (traditional dance), *lapa ‘au* (traditional healing), *lawai ‘a* (fishing), *mahi ‘ai* (farming) further aided in the practice of knowing the rhythms and cycles of the natural world.

Comprehensive systems of observing and stewarding the land were coupled by the strict adherence to practices that maintained and enhanced the *kapu* and *mana* of all things in the Hawaiian world. In Hawaiian belief, all things natural, places, and even people, especially those of high rank, possessed *mana* or “divine power” (Pukui and Elbert 1986:235; Pukui et al. 1972). *Mana* was believed to be derived from the plethora of Hawaiian gods (*kini akua*) who were embodied in elemental forces, land, natural resources, and certain material objects and persons (Crabbe et al. 2017). Buck (1993) expanded on this concept noting that *mana* was associated with “the well-being of a community, in human knowledge and skills (canoe building, harvesting) and in nature (crop fertility, weather etc.)” (c.f. Else 2004:244).

To ensure the *mana* of certain resources, places, and people, *kapu* of various kinds were implemented and strictly enforced to limit over-exploitation and defilement. Elbert and Pukui (1986:132) defined *kapu* as “taboo, prohibitions; special privilege or exemption.” Kepelino noted that *kapu* associated with *akua* (deities) applied to all social classes, while *kapu* associated with *ali ‘i* were applied to the people (in Beckwith 1932). As *kapu* dictated social relationships, they also provided “environmental rules and controls that were essential for a subsistence economy” (Else 2004:246). The companion to *kapu* was *noa*, translated as “freed of taboo, released from restrictions, profane, freedom” (Pukui and Elbert 1986:268). Some *kapu*, particularly those associated with maintaining social hierarchy and gender differentiation were unremitting, while those *kapu* placed on natural resources were applied and enforced according to seasonal changes. The application of *kapu* to natural resources ensured that such resources remained available for future use. When the *ali ‘i* or the lesser chiefs (including *konohiki* and *po ‘o lawai ‘a*) determined that a particular resource was to be made available to the people, a decree was proclaimed indicating that *kapu* had been lifted, thereby making it *noa*. Although transitioning a resource from a state of *kapu* to *noa* allowed for its use, people were expected to practice sustainable harvesting methods and pay tribute to the paramount chief and the *akua* associated with that resource. *Kapu* were strictly enforced and violators faced serious consequences including death (Jokiel et al. 2011). Violators who escaped execution sought refuge at a *pu ‘uhonua*, a designated place of refuge or an individual who could pardon the accused (Kamakau 1992). After completing the proper rituals, the violator was absolved of his or her crime and allowed to reintegrate back into society.

In summary, the layering and interweaving of beliefs, land stewardship practices, and the socio-political system forms the basis of the relationship shared between the Hawaiian people and the land. It is through the analysis of these dynamic elements that we develop an understanding of the complexity of place.

PĪHĀ AHUPUA‘A AND THE GREATER ‘OKANA OF HILO PALIKŪ

The project area is located within the *ahupua‘a* of Pīhā, in the *moku* (district) of North Hilo (Figure 11), on the windward coast of Hawai‘i Island in a region traditionally known as Hilo Palikū (Hilo of the upright cliffs). Hilo Palikū describes the rugged and steep coastline, with its sheer cliffs broken only by a string of narrow steam-cut gulches that pour down from the slopes of Mauna Kea. Pīhā, which literally translates as “flotsam” (Pukui et al. 1974:184), meaning any floating material carried by floodwaters or the sea, is one of many land divisions (*ahupua‘a*) extending inland from the coast of North Hilo with boundaries that generally follow the meandering gulches, and encompass the tablelands in between. Pīhā Ahupua‘a is bounded on the southeast end by Nanue Ahupua‘a and at its southwest end by Honohina Ahupua‘a. Pīhā is cut off at its *mauka* (west) end by the expansive Humu‘ula Ahupua‘a. Along its northern boundary, Pīhā is bounded by three *ahupua‘a*; they are, from east to west, Pua‘akuloa, Waikaumalo and Mauluanui.

Pīhā Ahupua‘a is situated within the traditional *moku* (district) of Hilo, which is one of six *moku* of Hawai‘i Island. The Hawaiian proverb, “*Hilo, mai Mawae a ka pali o Maulua*” details the extent of the district spanning from Mawae, the southernmost boundary, and Maulua its northernmost boundary (Pukui 1983:108). Handy and Handy (1991:538) provides a general description of the Hilo District:

Hilo as a major division of Hawai‘i included the southeastern part of the windward coast most of which was in Hamakua, to the north of Hilo Bay. This, the northern portion, had many scattered settlements above streams running between high, forested *kula* lands, now planted with sugar cane. From Hilo Bay southeastward to Puna the shore and inland are rather barren and there were few settlements. The population of Hilo was anciently as now concentrated mostly around and out from Hilo Bay, which is still the island’s principal port. The Hilo Bay region is one of lush tropical verdure and beauty, owing to the prevalence of nightly showers and moist warmth which prevail under the northeasterly trade winds into which it faces. Owing to the latter it is also subject to violent oceanic storms and has many times in its history suffered semidevastation from tidal waves unleashed by earthquake action in the Aleutian area of the Pacific.

The light and fertile soil is formed by decomposing lava, with a considerable portion of vegetable mould. The whole is covered with luxuriant vegetation, and the greater part of it formed into plantations, where plantains, bananas, sugar-cane, taro, potatoes and melons, come to the greatest perfection. Groves of cocoa-nut and bread-fruit trees are seen in every direction, loaded with fruit, or clothed with luxuriant foliage. (Ellis in Handy and Handy 1972:539)

Traditionally, the *moku* of Hilo was divided into three *‘okana* (sub-districts). Beginning in the north is Hilo Palikū, an area that extends north of the Wailuku River to Ka‘ula Gulch, oftentimes characterized by its upright and densely vegetated cliffs and broad *kula* (plains) lands (Figure 12). The second *‘okana* is Hilo One, or “sandy Hilo,” famed for its black sand beach that extends along Hilo Bay between the Wailoa and Wailuku Rivers. The final *‘okana* is Hilo Hanakahi, which extends south of Wailoa River to include Keaukaha (Edith Kanaka‘ole Foundation 2012).

The low-lying coastal area and *kula* lands of North Hilo thrived with traditional Hawaiian habitation and cultivation. Within the larger gulches and *kula* (broad plateaus) regions, were lush, fertile lands well suited for agriculture. The staple traditional crop, *kalo* (taro), was cultivated in irrigated terraces along the stream edges while *‘uala* (sweet potato), *mai‘a* (banana) and *kō* (sugarcane) were grown in the wet *kula* lands of the lower forest zone (Handy et al. 1991). The region had an abundance of *kukui* (candlenut), *‘ulu* (breadfruit), and *niu* (coconut) groves and was also rich in marine resources. Handy and Handy (1972), in drawing from a description given by early missionary William Ellis, provide yet another description of the fertile landscapes of Hilo:

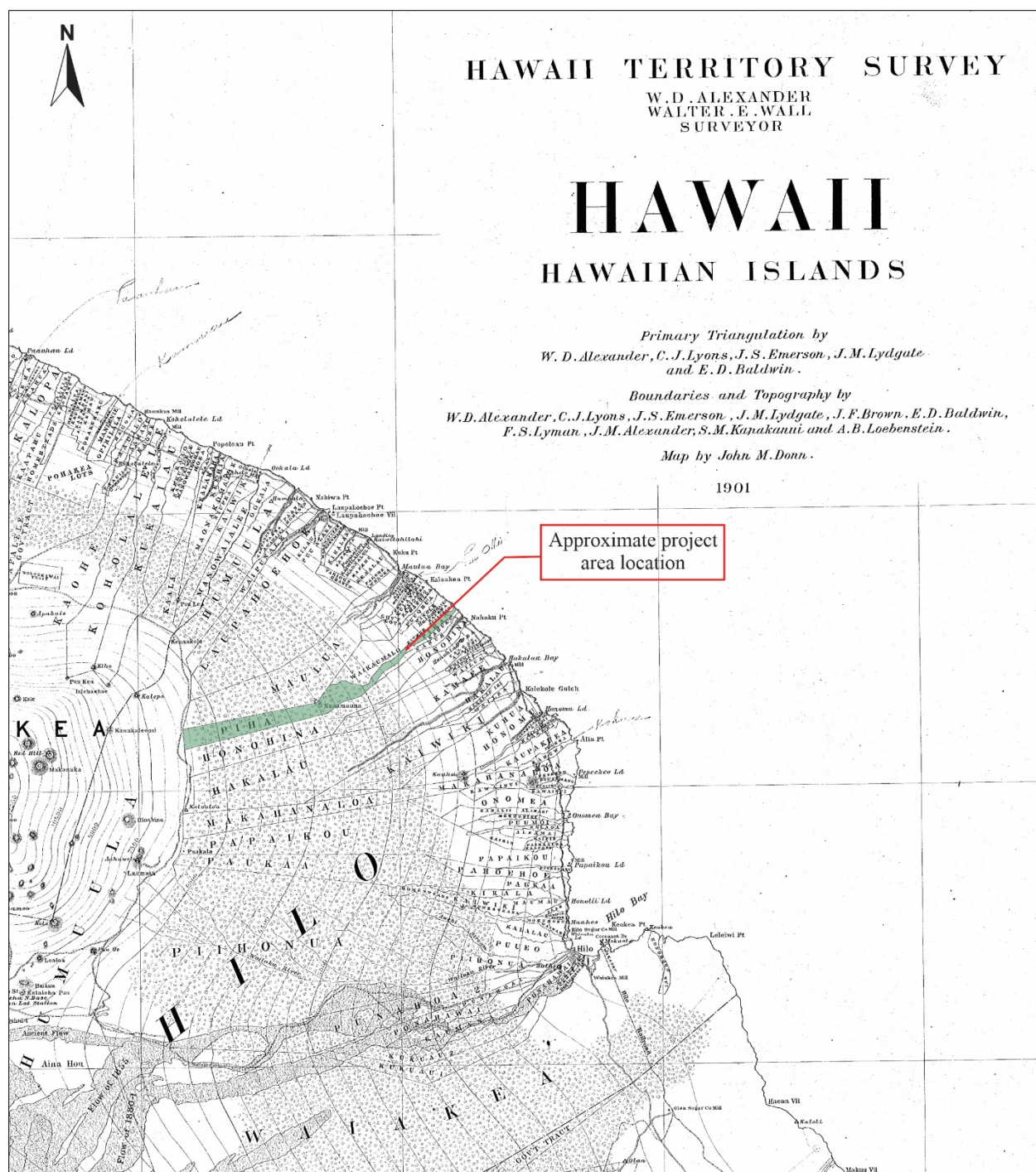


Figure 11. Portion of Hawai'i Registered Map No. 2060 by J. M. Donn (1901) from 1901 showing the approximate project area location in Pihā Ahupua'a.



Figure 12. Aerial image showing the landscape of Hilo Palikū with cliffs, expansive *kula* lands, and project area, view to the southwest (photo by L. Brandt).

The abundance of streams, valleys, and gulches in the Hilo Palikū region made for a difficult and treacherous pass. In *Ka Huakaihele ike i na Makaainana o Hilo* (A Sightseeing Tour to Visit the Common Folk of Hilo), an account by G.K. Mahoe (1876) of his travels throughout Hilo that was serialized in the Hawaiian language newspaper *Ka Lahui Hawaii*, he described Hilo Palikū as such:

...ua pale ae au i ka loa o ke alahēle, ua manao ole ae hoi i na pali hauiuli o Hilo paliku, na piina, na ihona, na alu, na kahawai, na kualono, a me na pupu, ua hele hookahi ia no e a'u, me ka manao ole i ka luhi a me ka inea o ka hele ana, oiai, ma ka hoomaopopo ana i ka loa mai Hilo one a hiki i Laupahoehoe, me he mea la, ua aneane no i ke kanakolu mile. A mai kuhihewa hoi ka poe heluhelu, he papu a he laumania hoi ke ano o ka waiho ana o ka aina, aole, aka, he puu kinikini, he alu, he kapekepeke ke alanui.

...I am protected from the long path ahead, I did not think twice of the dark cliffs of Hilo Palikū, the inclines, the descents, the ravines, the streams, the mountaintops, and the cleared fields, I moved alone, without thinking much of the strain and discomfort of traveling, although, when I recalled the length between Hilo One and Laupāhoehoe, those thirty miles came and went. The reader should not be mistaken, the lands that are passed along the way are not clear and smooth, rather, there are many hills, gulches, and twisting roads. (Mahoe 1876:1)

A similar sentiment of Hilo Palikū's rugged terrain and countless streams is expressed in the account titled *Kaao Hooniua Puuwai no Ka-Miki* (The Heart Stirring Story of Ka-Miki) (in Maly and Maly 2006). The authors, Kihe and Wise play on an old numerical expression to emphasize the many hills, descents, and waterways:

O Hilo Palikū kāhi i 'ōlelo 'ia ai; Pau ke aho i ka hele o Hilo he lau ka pu'u, he mano ka ihona, he kini nā kahawai, a e 'au no ho'i i ka wai o Hilo a pau ke aho, a 'ohe e pau ka wai!

Of Hilo Palikū it is said, one becomes short of breath traveling through Hilo, for there are many (400) hills, many (4,000) areas to descend, and many (40,000) streams, indeed while swimming through the waters of Hilo one becomes out of breath, but one is never out of water at Hilo!

King David Kalākaua provided a concise description of this region's geography, but also included a description regarding the density of the population there in his book *The Legends and Myths of Hawaii* (Kalākaua 1888):

The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys, with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau, boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals of one or two miles with deep almost impassable gulches, whose waters reach the ocean either through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and streaking the coast from Hilo to Waipio with lines that seem to be molten silver from the great crucible of Kilauea.

In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was cultivated from the sea upward to the line of frost. A few kalo patches are still seen, and bananas grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the rock-bound front of Hamakua. (Kalākaua 1888:284)

A unique aspect of the Hilo Palikū region, which mirrors that of the adjacent district of East Hāmākua, is its numerous narrow *ahupuaʻa* that extend from the coast to about the 3,000-foot elevation. These *ahupuaʻa* are characterized by their sloping *kula* lands with their boundaries following the natural contours or ridgelines of the gulches (Cordy 1994). A few *ahupuaʻa* extended further inland, essentially cutting off the lower *ahupuaʻa* at their *mauka* most end. There are three very large *ahupuaʻa* in the Hilo District, namely Humuʻula, Piʻihonua, and Waiākea that comprises the interior portion of the district (see Figure 11) extending along the slopes of both Mauna Kea and Mauna Loa (Lyons 1875). The practice of subdividing the land into carefully managed sections provided its inhabitants with a variety of nearshore marine and upland forest resources. As Maly and Maly (2006:9) note, “in this system, the people learned to live within the wealth and limitations of their natural environment, and were able to sustain themselves on the land and ocean.”

Traditional Place Names, Rains, and Winds for Pihā Ahupuaʻa and Hilo Palikū

The *inoa* (names) of *wahi* (places), *ua* (rains), and *makani* (winds) within a particular *ahupuaʻa* or broader region evidence the long-term relationship of various communities to their immediate environment. Geographer Katrina-Ann R. Kapāʻanaokalāokeola Nākoa Oliveira offers a concise description regarding the natural environment as it was understood by Native Hawaiians of the past:

Ancestral Kānaka recognized the connection between the heavens, lands, and oceans and how all three were interconnected and interdependent upon one another. In spite of the interwoven nature of the sky, land, and sea, however, Kānaka of ancestral times did not have a term that directly translates to what we have come to know today as “environment.” Rather, the *Hawaiian Dictionary* offers two phrases that approximate the notion of environment: (1) “‘ano o ka nohona” and (2) “nā mea e hoʻopuni ana.” ‘Ano o ka nohona refers to the nature of one’s relationship to one’s surroundings or places. Nā mea e hoʻopuni ana relates to everything that surrounds or encircles a person. (Oliveira 2014:64)

Reacquainting ourselves with these *inoa ʻāina* (place names), *inoa ua* (rain names), and *inoa makani* (wind names) allow us to appreciate the environment as it was once observed by ancestral Hawaiian populations. In Pihā, a few *inoa ʻāina* are listed by Soehren (2005) as markers for the boundaries of these *ahupuaʻa*. The *inoa ʻāina* documented for Pihā sheds light on the area’s native flora, stream and geologic resources, and other cultural features. The *inoa ʻāina* for Pihā are listed below in Table 1:

Table 1. Place Names in Pihā Ahupuaʻa

Place Name	Translation and Notes
ʻAlanaio	Translated as “the naio (<i>Myoporum sandwicense</i>) path.” A gulch that serves as the boundary between Pihā and Kahuku.
Haleʻōpae	Translated as “shrimp house.” A stream that served as a boundary between Pihā and Puʻuʻōhua.
Kaʻahina	Translated as “to fall down and tumble.” A stream marking the boundary of Pihā and Nanue.
Kaʻalāiki	Translated as “small lava stones.” A place located in the area of Haleʻōpae.

Table 1 continues on next page.

Table 1. continued.

<i>Place Name</i>	<i>Translation and Notes</i>
Kāwa‘u	Translated as “kāwa‘u (<i>Zanthoxylum dipetalum</i>) tree.” A boundary point between Pīhā, Nanue, and Kahuku ahupua‘a.
Kumu‘ōhi‘a	Translated as “‘ōhi‘a (<i>Metrosideros polymorpha</i>) tree.” A boundary point between Pīhā and Pu‘u‘ōhua.
Nāhuina	Translated as “the junction.” A boundary point between Pīhā, Nanue, and Kahuku.
Nenelu	Translated as “boggy swamp.” A boundary point and old village site between Pīhā and Nanue.
Nīnika	Translated as “nīnika (<i>Lythrum maritimum</i>) bush.” A boundary point near Pu‘u‘ōhua between Pīhā and Maulua.
‘Ōhi‘apuka	Translated as “‘ōhi‘a (<i>Metrosideros polymorpha</i>) opening. A boundary between Pīhā and Nanue.
Pa‘iniu	Translated as “pa‘iniu (<i>Astelia spp.</i>) bush.” A stream that served as the boundary between Pīhā and Honohina.
Pīhā	Translates as “flotsam.” Name of the subject <i>ahupua‘a</i> .
Waikaumalo	Translated as “waters where loin cloths are suspended.” A stream that serves as the boundary between Pīhā and Waikaumalo.
Waipāhoehoe	Translated as “smooth lava water.” A stream and former village site that served as the boundary between Pīhā and Nanue.

End of Table 1.

In terms of *inoa ua*, Hilo Palikū and the larger *moku* of Hilo is renowned in oral expressions such as *mele* (song), *oli* (chants), and *‘ōlelo no‘eau* (proverbs and poetical expressions) for its abundance of rain and fresh water. Akana and Gonzalez (2015) in *Hānau Ka Ua*, a collection of Hawaiian rain names, describe the cultural significance of rain:

Our kūpuna [ancestors] had an intimate relationship with the elements. They were keen observers of their environment, with all of its life-giving and life-taking forces. They had a nuanced understanding of the rains of their home. They knew that one place could have several different rains, and that each rain was distinguishable from another. They knew when a particular rain would fall, its color, duration, intensity, the path it would take, the sound it made on the trees, the scent it carried, and the effect it had on people. (Akana and Gonzalez 2015:xv)

Numerous *‘ōlelo no‘eau* found in Pukui (1983) describe the characteristics of Hilo’s many rains which are listed below in Table 2. Pukui’s (1983) proverbial sayings are complimented by specific rain names documented by Akana and Gonzalez (2015), which are listed in Table 3. As shown in Table 3, the rain names for Hilo Palikū are descriptive in that they point out nuances and in some instances served as seasonal predictive indicators to mark changes or availability of certain marine resources.

Table 2. ‘Ōlelo No‘eau associated with Hilo’s rains from Pukui (1983)

<i>‘Ōlelo No‘eau</i>	<i>Literal/Figurative Translation</i>
<i>‘Ele‘ele Hilo, panopano i ka ua.</i>	Dark is Hilo, clouded with the rain (Pukui 1983:40)
<i>Halulu me he kapua‘i kanaka la ka ua o Hilo.</i>	The rain of Hilo makes a rumbling sound like the treading of feet. (ibid.:53)
<i>Hana Hilo i ka po‘i a ka ua.</i>	Hilo works on the lid of the rain. Refers to the constant showers typical of Hilo district on Hawai‘i. (ibid.:54)
<i>Hilo ‘āina ua lokuloku.</i>	Hilo of the pouring rain. (ibid.:107)
<i>Hilo i ka ua kinakinai, ka ua mao ‘ole.</i>	Hilo of the constant rain, where it never clears up. (ibid.)
<i>‘Au umauma o Hilo i ka wai.</i>	Hilo has breasted the water. To weather the storm. The district of Hilo had many gulches and streams and was difficult to cross. (ibid. 28)
<i>Pau ke aho i ke kahawai lau o Hilo.</i>	One’s strength is exhausted in crossing the many streams of Hilo. Said of or by one who is weary with effort. First uttered by Hi‘iaka in a chant when she found herself weary after a battle with the lizard god Pana‘ewa. (ibid.:287)

Table 3. Rain names associated with Hilo Palikū from Akana and Gonzalez (2015)

<i>Rain Name</i>	<i>Literal/Figurative Translation</i>
‘Awa‘awa	Translates as “bitter.” Refers to a cold and dark rain or mist.
He‘enehu	Translates as “sliding anchovy.” Refers to a misty rain in the early morning off the coastline at a time when nehu fish are in abundance.
Ho‘olua	Translates as “to do twice.” Refers to heavy rains that fall during strong northerly winds (which are also known as ho‘olua).
Kinai	Translates as “to quench or extinguish.” Refers to a constant rain that continues for long hours.
Kualua	Translates as “repeating twice.” Refers to rain over the sea that is accompanied by wind.
Lanipili	Translates as “clinging sky.” Refers to cloudbursts or heavy rain that lasts for days.
Lanipōlua	Translates as “very dark sky.” Refers to misty rain that falls when forests are obscured by low-lying clouds.
Lauhīnana	Translates as “bracts of the hīnana flower.” Refers to a rain associated with the area of Honomū.
Lokuloku	Translates as “pouring rain.” A generic term referring to heavy showers accompanied by wind. (Lila 1872:3)
Nāulu	Translated as “vexed.” Refers to sudden heavy showers.
Ulumano	Translated as “growing exponentially.” A rain that travels inland from the sea that is an indicator of the abundance of ‘ōhua (juvenile fish).

Of the rains that are listed above, the Nāulu is explicitly associated with Hilo Palikū, as expressed in a *mele kū‘auhau*, or genealogical chant, written for Queen Emma Kaleleonālani:

<i>Hāne‘e mai Liloa me he Uluaunui lā</i>	Liloa sags like an Uluaunui
<i>Me he kuāua Nāulu nui i pano Hilo Pali Kū</i>	Like a heavy Nāulu shower that obscured Hilo Pali Kū. (Nogelmeier in Akana and Gonzalez 2015:187)

Whereas *Hānau Ka Ua* provides us with a comprehensive listing of rain names across the Hawaiian Islands, there is no comparable publication for wind names to date. Similar to the rain names, wind names are often descriptive in that they reflect subtle distinctions such as direction, temperature, and intensity. Listed in Table 4 are wind names that can be found in an array of Hawaiian and English language primary sources:

Table 4. Wind names associated with Hilo Palikū

<i>Wind Name</i>	<i>Literal/Figurative Translation</i>
‘A‘alahonua	Translates as “fragrant earth.” A wind that carries the fragrance of soil and foliage after the rain. (Alvarado 2005)
Kēpia	Translates as “dandruff.” A wind associated with Hilo Palikū. (Nawaa 1904)
Kolonahe	Translates as “crawling slowly.” A generic term for a gentle breeze (Lila 1872).
Uluaunui	Translates as “to grow increasingly.” a strong northerly wind that makes landing by boat difficult.
Uluau	Translates as “to grow increasingly.” Associated with Hilo Palikū in the <i>mo‘olelo</i> of Kuapaka‘a. (Kuapuu 1861:24)
Ho‘olua	Translates as “to do twice.” Refers to strong northerly winds that may include rain. (Malo 1903:35)
Hau	Translates as “ice.” A wind that blows downward from the mountains (Malo 1903:35)
Māluaki‘iwai	“Translate as “water-collecting seabreeze.” A sea breeze accompanied by showers. (Alvarado 2005:5).

Traditional Accounts

Traditional *mo'olelo* (accounts) offer a rich resource for understanding the cultural landscape, land use, and practices of an area and informs our understanding of how peoples of the past expressed their relationships to their lands and environment. An exhaustive search through published resources and historical Hawaiian language newspapers resulted in no *mo'olelo* or *mele* that directly named the *ahupua'a* of Pihā. However, there are several *mo'olelo* that speak of events that take place in the neighboring *ahupua'a* and the greater 'okana of Hilo Palikū and some of these *mo'olelo* have been summarized below.

Ke Ka'ao Ho'oniua Pu'uwai no Ka-miki- The Heart Stirring Story of Ka-Miki

The adjacent *ahupua'a* of Maulua, located to the north of Pihā, is noted in the account titled *Ke Ka'ao Ho'oniua Pu'uwai no Ka-miki* (The Heart Stirring Story of Ka-Miki), which was a series published in the Hawaiian language newspaper *Ka Hōkū o Hawai'i* between 1914 and 1917. *Ka-Miki* was likely authored during the late 1800s through the early 1900s by noted Hawaiian scholars John Wise and J.W.H.I. Kihe. Although the account is not considered to be from time immemorial, Maly (1997), who translated the *mo'olelo* from Hawaiian into English, states the following regarding the value of the information contained therein:

...the authors used a mixture of local legends, tales, and family traditions in association with place names to tie together fragments of site specific stories that had been handed down over the generations. Thus, while in many cases, the personification of individuals and their associated place names may not be “ancient,” the site documentation within the “story of Ka-miki” is of both cultural and historical value. (Maly 1997:5)

In relating the story for lands of Maulua, Maly and Maly (2006) detailed the following narrative taken from the story of Ka-Miki. As a preamble to this story, Maly and Maly (2006:13) explain:

“*Kaao Hooniua Puuwai no Ka-Miki*” (The Heart Stirring Story of Ka-Miki) is about two supernatural brothers, Ka-Miki (The quick, or adept, one) and Maka'iole (Rat [squinting] eyes), who traveled around the island of Hawai'i along the ancient *ala loa* and *ala hele* (trails and paths) that encircled the island. During their journey, the brothers competed in contests alongside the trails they traveled, and in famed *kahua* (contest arenas) and royal courts, against 'ōlohe (experts skilled in fighting or in other competitions, such as running, fishing, debating, or solving riddles, that were practiced by the ancient Hawaiians). They also challenged priests whose dishonorable conduct offended the gods of ancient Hawai'i. Ka-Miki and Maka'iole were empowered by their ancestress, Ka-uluhe-nui-hihi-kolo-i-uka (The great entangled growth of *uluhe* fern which spreads across the uplands), a body-form of the goddess Haumea (the creative force of nature—also called Papa and Hina—who was a goddess of priests and competitors).

After passing through the southern portion of the Hilo District, Ka-Miki and his companions, Maka'iole, Keahialaka, and Hilo Hanakāhi make their way to the compound of the chief and foremost 'ōlohe, Maulua-a-pio (for whom the *ahupua'a* of Maulua was named). In attempting to secure a contest for Ka-Miki, Hilo Hanakāhi traveled ahead of his companions to meet with his teacher, Maulua-a-pio. A meeting was agreed upon and Ka-Miki was invited into the *hālau le'ale'a* (competition long-house) of Maulua-a-pio where they partook in a meal and some 'awa. After their feasting, Maulua-a-pio decided that he wanted to challenge the youthful Ka-Miki to a contest. In their first show of knowledge and wits, Ka-Miki began to name the winds associated with these lands, chanting thusly:

He lā makani ka ho'i kāia o Koholālele, ke lele nei ka huna o ke kai iluna o nā pali, pali kahakā a ke koa'e e lele ai i ka ho'ōulu a ka Ulumano ka makani ho'ōulu-a o nā makalae. E 'ino, 'ino paha auane'i o Hilo, 'ino ke ala, ua ku nā pali laumania a ka lawai'a nihi ai ku'uku'u i ke kaula a ke 'aki ala i ka niho! –

This is indeed a windy day at Koholālele, the sea mist flies above the cliffs, steep cliffs from which the tropic birds fly rising on the *Ulumano*, the wind which rises from the shores. It is perhaps a storm, a storm in Hilo, a storm along the paths on the sheer cliffs on which the fishermen tie their ropes and let them down to the nipping teeth [waves]. (Maly and Maly 2006:14)

Despite Ka-Miki declaring the presence of an impending storm, Maulua-a-pio rejects Ka-Miki's claim stating, “Where it the storm, all is calm, there are no waves upon the shore, the cool *Malanai* breeze blows along the cliff of the *hula'ana*” (cliff trail which one swims). The two opponents continued their debate and in due time, they began discussing the names of other 'ōlohe of the Hilo Palikū region.

“**Kalele-a-Welokā** is the *‘ōlohe* who is filled with knowledge and strength, he is the *kaulana ‘āina* (champion who maintains peace in the land) of the chief Palikū-a-Kīko‘oko‘o. He has a full muscular body, like the mysterious *koa* trees which surround Hilo, there is no other like him.”

Ka-Miki then told Maulua, “He is indeed a great warrior, but the Kona wind is coming to scatter the branches of this *koa* tree.” Maulua told Ka-Miki, “Where is this Kona wind which will knock over the tall dark *koa* of Hilo? This wind may knock over the *koa* of *‘Umikoa*, but not the great *‘ōlohe*, the *a‘u* (sword fish) which leaps upon the waves, the *‘ahi kananā* (fierce tuna fish) of the deep sea, the *manō niuhi* (great man eating shark) of the dark ocean depths!”

Maulua continued debating with Ka-Miki, and Hilo Hanakāhi called to his teacher, “I have fully explained the nature of this one who is here before you. If you continue in this manner, you will become like the little pebble knocked over in *kōnane*, and set aside in a little bundle.” Maulua did not answer, but instead leapt to try and surprise attack Ka-Miki. Though he tried all manner of *lua* (techniques), Maulua was worn out and bound by KaMiki, unable to move.

Ka-Miki told Maulua, “You have been bound in the net, twined from the hair of Ka-uluhe-nui-hihi-kolo-i-uka.” With a smile, Ka-Miki then thanked Maulua for the test, telling him, “You are one of the best competitors I have met, there is but one problem, you are quickly worn out, you have no strength (a play on the name of the land Maulua, where one becomes wearied from traveling the steep valley cliffs). Therefore, let this test between Ka-Miki and Maulua be ended, unless you be killed like one who travels the precipitous cliff trail of Nu‘alolo, falling like the fire brands of Kāmaile, or the flying fire darts, the fluttering tribute of Makua-iki. Because you are a teacher of Hilo Hanakāhi, my traveling companion, I will release you.” (Maly and Maly 2006:15)

After defeating Maulua, Ka-Miki and his companions proceeded with their journey, challenging other *‘ōlohe* who resided in the areas beyond Maulua. While the above-described narrative tells of the ancient trails, place names, and traditional activities, the following narrative describes a grueling battle taking place in the lands of Hilo Palikū between Poli‘ahu, the goddess of the snow-covered mountain and her fiery rival, Pele.

Rivalry Between Pele and Poli‘ahu and the Formation of Land in Hilo Palikū

A *mo‘olelo* describing the formation of land between Laupāhoehoe and ‘Onomea is captured in the story titled Pele and the Snow-Goddess published by William Drake Westervelt in his book *Hawaiian legends of Volcanoes* (Westervelt 1916). This account, which features information about other snow goddesses, tells specifically of how Poli‘ahu, the snow goddess of Mauna Kea gained control over the northern section of Hawai‘i while Pele, the goddess of lava, retained dominance over the volcanically active southern part of the island. As a preamble to the telling of this story, Westervelt (1916:55) relates that these:

...stories are nature-myths derived from the power of snow and cold to check volcanic action and sometimes clothe the mountain tops and upper slopes with white, which melted as the maidens came down closer to the sea through lands made fertile by flowing streams and blessed sunshine.

Poli‘ahu, who often dawned and mantle of pure white *kapa* (tapa) cloth, was “best-known among the maidens of the mountains” (Westervelt 1916:57). She had a particular affection for the eastern cliffs of Hawai‘i Island along the North Hilo and Hāmākua coast. The snow goddess would periodically descend the mountain and sported amongst mortals, mingled with the chiefs and people, and participated in the local festivities including *he‘e hōlua* (*hōlua* sledding). On one such occasion, Poli‘ahu and the other snow maidens:

...had come down Mauna Kea to a sloping hillside south of Hamakua. Suddenly in their midst appeared a stranger of surpassing beauty. Poliahu welcomed her and the races were continued. Some of the legend tellers think that Pele was angered by the superiority, real or fancied, of Poliahu. (Westervelt 1916:60)

While in the presence of the mysterious woman, Poli‘ahu felt the ground grow warm and she immediately knew that the woman before her was none other than her enemy, Pele. In her fury, Pele tossed aside her disguise “and called for the forces of fire to burst open the doors of the subterranean caverns of Mauna Kea” (Westervelt 1916:60). Pele sent fountains of molten fire to the summit of the mountain causing Poli‘ahu to flee to the summit to smother the fires with her snow mantle. Pele’s raging fires captured a portion of Poli‘ahu’s mantle, however, the snow-goddess managed to regain her mantle and strength and once more attempted to cast it over the mountain. The fight between the two powerful goddesses caused the earth to shake violently sending great waves of water over the land and the cliffs to slide into the sea. Poli‘ahu summoned the help of the other snow maidens, Lilinoe, Waiau, and Kahoupokāne

and they appeared as a great mass of clouds laden with frozen moisture. The snow goddesses sent torrents of snow to rain down on Pele's fires transforming the molten streams tracking towards the sea into hardened black lava. At last, the might of the snow maidens forced Pele's fires back into its depths and:

Thus the ragged mass of Laupāhoehoe was formed, and the great ledge of the arch of Onomea, and the different sharp and torn lavas in the edge of the sea which mark the various eruptions of centuries past.

Poliahu in legendary battles has met Pele many times. She has kept the upper part of the mountain desolate under her mantle of snow and ice, but down toward the sea most fertile and luxuriant valleys and hillside slopes attest the gifts of the goddess to the beauty of the island and the welfare of men. (Westervelt 1916:62)

From this battle, tradition says that despite Pele's attempt to overthrow Poli'ahu with her great fires, she will always be defeated. As such, "Pele's kingdom has been limited to the southern half of the island" while Poli'ahu rules the northern portion in which the project area is situated (Westervelt 1916:62). The following account, which is centered on the Hilo Palikū regions tells of a visit made by the gods Kū and his wife Hina, in their forms which Hawaiian named Kuahailo and Hinaaukekele, to Laupāhoehoe located north of Pihā.

An Account for Kuahailo and Hinaaukekele

He Moolelo Kaao no Kuahailo a me Hinaaukekele, Kana Kaikamahine Hanauna (An account for Kuahailo and Hinaaukekele, his female relative) is a story that recounts the establishment of the highest-ranking genealogical lines of Hawai'i. Published as a weekly serial in the Hilo-based Hawaiian language newspaper *Ka Hoku o Hawai'i* from July 18, 1918, to March 13, 1919, the *mo'olelo* follows Kuahailo and Hinaaukekele along their journey from their ancestral home of Kuaihelani to the various islands of Hawai'i.

The segment of the *mo'olelo* in Hilo Palikū takes place midway through the narrative and was published in installments between January 30, 1919, and February 27, 1919. At this point in the *mo'olelo*, Hinaaukekele and her husband, Kahikikuaokalani, resided in Waipi'o Valley. Their journey to Hilo Palikū began with a dialogue between Hinaaukekele and Kahikikuaokalani, where she expressed her desire to visit her grandmother, Hailikulamanu, and other relatives who lived in the 'okana of Hilo Hanakahi. Kahikikuaokalani agreed with Hinaaukekele to visit their relatives. They made their way to Hilo Hanakahi atop a traveling 'ōhi'a tree filled with *lehua* blossoms. According to the *mo'olelo*, the tree grew out of Hinaaukekele's 'iwe (placenta, afterbirth) that her mother, Hinauluohia, planted near their home in Paliuli.

As the couple traveled to Hilo Hanakahi, Kahikikuaokalani heard the yelling and cheering of many people coming from the valley of Laupāhoehoe (located to the north of the project area). He asked Hinaaukekele to instruct her traveling 'ōhi'a tree to stop where all the commotion was coming from. In his curiosity, Kahikikuaokalani searched out the source of the cheering. He discovered that the noise was of bystanders who were cheering on two exceptionally skilled surfers, one from Hilo One and one from Hilo Palikū, who were competing against each other. The waves at Laupāhoehoe were well known across Hawai'i Island and were the same waves that were favored by the famed *ali'i*, 'Umi, generations later.

When Hinaaukekele and Kahikikuaokalani arrived, the people of Laupāhoehoe shifted their attention away from the surfers and rushed towards the beautiful travelers atop the moving 'ōhi'a tree. What made these travelers even more extraordinary was the fact that they were accompanied by numerous forest-dwelling birds and four low-lying rainbows. When Hinaaukekele inquired about the commotion, some spectators responded that they were celebrating the fact that their surfer, a Hilo Palikū man by the name of Kekuaiwa, beat Kenao, the surfer from Hilo One, and won forty *kapa* cloths and a long canoe in the process. When Hinaaukekele asked how Kekuaiwa won, the people responded that it was because he was more skilled at surfing in the rough waters of Laupāhoehoe as opposed to the calmer waters of Hilo One. Furthermore, Hinaaukekele inquired about the ruling chief of the area, in which the people of Laupāhoehoe responded that there was no ruling chief who lived in the valley but that they were subjects of Kanakea, a chiefess who resided in Hilo. Kanakea knew of Hinaaukekele, as she was the one who was sent to retrieve Kahikikuaokalani from O'ahu.

Hinaaukekele then proceeded to tell the people of Laupāhoehoe to have the two surfers compete once more. The spectators enthusiastically followed these instructions and told the local *konohiki* (head man of an *ahupua'a*) what they heard from these distinguished travelers. In turn, the *konohiki* told the surfers to take to the waves again, and the surfers agreed without complaint.

When Kekuaiwa and Kenao reached the wave break, both were intent on outdoing their competitor to become the champion of the waves. Kekuaiwa did not think twice about Kenao, for he surfed in the waters of Laupāhoehoe since he was a child. As a wave neared, Kenao paddled to a spot where the waves were easier to ride. Kekuaiwa knew what Kenao was doing and prepared himself for the competition ahead. Onshore, the majority of spectators believed that Kekuaiwa would win once more since he won the first time.

Enthused by the energy of the crowd and surfers, Kahikikuaokalani proposed to Hinaaukekele that they pick who they believed would win the surf competition. When Kahikikuaokalani told Hinaaukekele that she could pick first, she laughed, teasing him by saying that he only wanted her to choose Kekuaiwa, the obvious choice since he won the first competition, because he could rebuke her for choosing the former winner. Kahikikuaokalani laughed at Hinaaukekele's remarks and told his beloved that he was letting her choose first as a gesture of honor and respect and that either of the surfers could win.

When the couple looked down at the surfers who were poised to catch the next wave, Hinaaukekele used her thoughts to secretly call her magical grandmother to let the surfer from Hilo One win the competition. When an excellent surfing wave neared, the two surfers caught it. They both rode splendidly. As they neared the shore, it was clear that the surfer from Hilo Palikū, Kekuaiwa, would win the competition. But as they neared the shore, Kekuaiwa saw a human hand emerge from the sea and snatched his board down into the depths. Kenao was thus the winner of the second round.

The spectators ashore were shocked to the point of speechlessness due to the outcome of the surfing competition. They could not explain how Kekuaiwa lost to Kenao. So too was Kahikikuaokalani puzzled by this turn of events, as he had no way of knowing that it was Hailikulamanu, Hinaaukekele's grandmother, who intervened. When the surfers came back to land, Hinaaukekele instructed someone to tell the surfers to come to her and Kahikikuaokalani. Kenao happily obliged to this request, but Kekuaiwa was furious about his loss and did not want to see these visitors out of embarrassment.

Kahikikuaokalani was still pondering the outcome of the competition. He realized in time that Hinaaukekele must have had something to do with Kenao's win, so he asked Hinaaukekele if he could leave and find Kekuaiwa, which she allowed him to do so. When he found Kekuaiwa, Kahikikuaokalani explained that it was because of Hinaaukekele's magical abilities that resulted in his loss during the surfing competition. Kekuaiwa then described how a human hand grabbed his board and pulled him down. In response, Kahikikuaokalani explained to Kekuaiwa that he had nothing to be ashamed of because it was his decision to bet against Hinaaukekele that resulted in his (Kekuaiwa's) loss. Kahikikuaokalani continued by describing how Hinaaukekele used her thoughts to call out to her grandmother to assist Kenao in winning the competition.

When Kahikikuaokalani returned to Hinaaukekele, she laughed because she knew that her secret was exposed. She turned to Kenao and asked him if he wanted to accompany them to Hilo One, in which he humbly declined due to their superior rank. From there Hinaaukekele and Kahikikuaokalani continued on their journey through Hilo Palikū until they reached Hilo One.

Lastly, the following account, although not mythological in nature, utilizes a famed saying that was said to have originated from the ancient days when Hilo's people were active in canoe carving.

Pau Kuhihewa Iā Hilo Palikū-Completely Mistakened by Hilo Palikū

One of the sayings for the Hilo Palikū region is "pau kuhihewa iā Hilo Palikū," which translates to "Hilo Palikū is completely mistaken." In historical sources, authors used this saying as an expression of disdain for someone who lies or does keep promises. In August of 1900, an author under the penname "Hawaii Oiaio" published an article that explains the origins and usage of "pau kuhihewa iā Hilo Palikū. In his article titled "Pau Ole Kuhihewa Iā Hilo Palikū," Hawaii Oiaio addresses it to members of the Aloha 'Āina political party, including Joseph Nawahī, William White, John Richardson, Thomas Clark, Reverend John Kalana Hihio, J. Nazareka, David Kalauokalani, James Kaulia, Robert Wilcox, and William Auld, which he chastises for their pro-Kingdom politics. Although the excerpt that is included below focuses on the story of the Hilo Palikū saying, the overall message of the article encourages readers to pursue leadership positions within the newly formed government of the Territory of Hawai'i:

O ka huaolelo a hopunaolelo maluna ae e kau ae la, "Pau kuhihewa ia Hilo Paliku," he huaolelo kaulana loa keia mai ka wa kahiko loa mai o ko kakou aina, mawaena o na ho loh [sic] elua, e lilo i mau halekipa, a i mau aikane "Punakeonaona, ina no Maui, Oahu, Kauai ke kanaka i hoaikane me ko Hilo, a ina paha ma Maui kahi i launa ai, alaila, ua mopopo [sic] no i ke kanaka o Hilo ka makemake o ka hoaloha o Maui he waa alaila, pane aku la ke kanaka o Hilo, he wahi waa no ko 'u makemake no ia, e lawe koke mai hoi ha oe, ae, ua pono.

Oi kali aku ke kanaka o Maui a, a hala ae ana he anahulu, a hala aku ana ua anahulu, pau ka palena o ka pono, o kau nae kai puhi aku la ia iala, a hoka iho la ke kanaka o Maui. Pane iho la ke kanaka o Maui, he lohe akahi no a ike maka, nolaila, ua ailolo na kanaka o Maui, Oahu, Molokai, Lanai, Kuai i ko Hilo Poe i ka hoopunipuni, pili nae keia i ka poe kalaiwaa.

The saying and sentence located above, “Hilo Palikū is mistaken completely,” it is a legendary saying from the ancient times of our land, that arouse between two friends, who became best friends, and later became companions. “Punakeonaona, indeed if the person from Maui, Oahu, and Kauai befriended Hilo’s [person], and if on Maui is where they enjoy each others company, and then, the person in Hilo would know that their Maui friend is in need of a canoe, and then, the Hilo people responds, I definitely have a canoe that was painted black, I will leave and then return, and then, the person from Maui responded, that is what I desire, please bring it quickly, indeed, it is needed.

Whilst the person from Maui waited, a month passed, and another month passed, he reached his limit and became furious and disappointed. The person from Maui told the person from Hilo, I heard you but I have yet to see it with my own eye, therefore, the people of Maui, Oahu, and Lanai were scorned. Hilo’s people, in particular the canoe carvers, trade in lies. (Oiaio 1900:6)

Although the saying is one that does not see people from Hilo Palikū as favorable or honest, it is one that speaks of the region’s long history of interisland exchange and communication.

The Legacy of the *Māhele* ‘Āina of 1848

By the mid-19th-century, the Hawaiian Kingdom was an established center of commerce and trade in the Pacific, recognized internationally by the United States and other nations in the Pacific and Europe (Sai 2011). As Hawaiian political elites sought ways to modernize the burgeoning Kingdom, and as more Westerners settled in the Hawaiian Islands, major socioeconomic and political changes took place, including the formal adoption of a Hawaiian constitution by 1840, the change in governance from an absolute monarchy to a constitutional monarchy, and the shift towards a Euro-American model of private land ownership. This change in land governance was partially informed by ex-missionaries and Euro-American businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. *Mō‘ī* (Ruler) Kamehameha III, through intense deliberations with his high-ranking chiefs and political advisors, separated and defined the ownership of all lands in the Kingdom (King n.d.). They decided that three classes of people each had one-third vested rights to the lands of Hawai‘i: the *Mō‘ī*, the *ali‘i* and *konohiki*, and the native tenants (*hoa‘āina*). In 1846, King Kamehameha III formed the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission) to adopt guiding principles and procedures for dividing the lands, grant land titles, and act as a court of record to investigate and ultimately award or reject all claims brought before them (Bailey in Commissioner of Public Lands 1929). All land claims, whether by chiefs for an entire *ahupua‘a* or *‘ili kūpono* (nearly independent *‘ili* land division within an *ahupua‘a*, that paid tribute to the ruling chief and not to the chief of the *ahupua‘a*), or by *hoa‘āina* for their house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1846) to be considered. This deadline was extended several times for chiefs and *konohiki*, but not for native tenants (Soehren 2005).

The King and some 245 chiefs spent nearly two years trying unsuccessfully to divide all the lands of Hawai‘i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.; Kuykendall 1938). Once Kamehameha III and his chiefs accepted the principles of the Privy Council, the *Māhele* ‘Āina (Land Division) was completed in just forty days (on March 7, 1848). The names of nearly all of the *ahupua‘a* and *‘ili kūpono* of the Hawaiian Islands, as well as the names of the chiefs who claimed them, were recorded in the *Buke Māhele* (*Māhele* Book) (Buke Māhele 1848; Soehren 2005). As this process unfolded, King Kamehameha III, who received roughly one-third of the lands of Hawai‘i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased for fee simple title by his subjects. Accordingly, the day after the division when the name of the last chief was recorded in the *Buke Māhele*, the King commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike Kamehameha III, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their Land Commission Awards (LCAw.). The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as “Government Land.” The lands personally retained by the King became known as “Crown Land.” Lastly, the lands received by the chiefs became known as “Konohiki Land” (Chinen 1958:vii; 1961:13). To expedite the work of the Land Commission, all lands awarded during the *Māhele* were

identified by name only, with the understanding that the ancient boundaries would prevail until the lands could be formally surveyed.

Pīhā Ahupua‘a appears to have gone unclaimed as it does not appear in the *Buke Māhele* and was never assigned or awarded during the 1848 division between the King and chiefs. However, the ownership of Pīhā was the center of controversy when the Trustees of Bishop Estate claimed that Pīhā (along with other lands) had been continuously held and claimed by Bernice Pauahi Bishop’s ancestors (Rowland 2018). To settle this dispute, a compromise was reached by which the Minister of the Interior conveyed certain other lands to the Trustees, and they, in turn, conveyed the land of Pīhā (and other lands) to the Hawaiian Kingdom government. Thus, it was not until December 20, 1890, that Pīhā was included as Government Land (Rowland 2018).

As the *Mō‘ī* and *ali‘i* made claims to large tracts of land during the *Māhele*, questions arose regarding the protection of rights for the native tenants. To address this matter, on August 6, 1850, the *Kuleana* Act or Enabling Act was passed, allowing native tenants to claim a fee simple title to any portion of lands which they physically occupied, actively cultivated, or had improved (Garovoy 2005). Additionally, the *Kuleana* Act clarified rights to gather natural resources, as well as access rights to *kuleana* parcels, which were typically landlocked. Lands awarded through the *Kuleana* Act were and still are, referred to as *kuleana* awards or *kuleana* lands. The Land Commission oversaw the program and administered the *kuleana* as Land Commission Awards (Chinen 1958). Native tenants wishing to claim land were required to register their claim in writing (either in the Hawaiian or English language) by submitting a register to the Land Commission who assigned the claimant a number, and that number was used to track the claimant through the entire claims process. Subsequently, the claimant had to get supporting testimony from two individuals (typically neighbors) to confirm their claim to the land. The document generated as part of this process was known as a Native or Foreign Testimony depending upon the language used by the claimant. Upon successful submittal of the required documents, the Land Commission rendered their decision, and if successful, the tenant was issued the LCAw. No claims were made for *kuleana* lands within Pīhā Ahupua‘a. **Commission of Boundaries (1862-1876)**

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawai‘i to legally set the boundaries of all the *ahupua‘a* that had been awarded, by name only, as a part of the *Māhele*. Subsequently, in 1874, the Boundary Commission was authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents who learned of the boundaries from their ancestors. The boundary information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and simultaneously transcribed into English. Although hearings for most *ahupua‘a* boundaries were brought before the Boundary Commission and later surveyed by Government employed surveyors, in some instances, the boundaries were established through a combination of other methods. In some cases, *ahupua‘a* boundaries were established by conducting surveys on adjacent *ahupua‘a*. Or in cases where the entire *ahupua‘a* was divided and awarded as Land Claim Awards and or Government-issued Land Grants (both of which required formal surveys), the Boundary Commission relied on those surveys to establish the boundaries for that *ahupua‘a*. Although these small-scale surveys aided in establishing the boundaries, they lack the detailed knowledge of the land that is found in the Boundary Commission hearings.

On February 8, 1875, upon the application of J. Dominis, agent of the Crown Lands and administrator for the estate of M. Kekuanaoa, the Boundary Commission met at the courthouse in Hilo to settle the boundaries of Pīhā Ahupua‘a (Boundary Commission 1874:325-330). Several older residents of the area provided testimony at the hearing including Ku, Hemahema, Kalauloha, Kupahu, and D. H. Hitchcock, the Government Surveyor who surveyed the Pīhā boundaries. Hitchcock testified that he surveyed the boundaries of Pīhā in October of 1874 with Ku as his *kama‘āina* (person familiar with the land). Hitchcock also took Kalauloha with him along a part of the Nanue boundary and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku agreed regarding the boundaries, so only took Ku with him. From the testimony, we learn that boundary between Kahuku and Pīhā (forming the eastern boundary of the current study area) was once marked by an “old trail” used by bird catchers to access the forest and that the owner of Nanue Ahupua‘a, Alapai, disputed the *mauka*-eastern boundary of Pīhā Ahupua‘a as described by Ku and depicted by Hitchcock’s 1875 map (Figure 13). The following summary of the 1875 Boundary Commission testimony for Pīhā concentrates on the Kahuku boundary of the *ahupua‘a*, which is adjacent to the eastern boundary of the current study area.

Ku, described in the boundary commission records as “an old man” born during the time of Kamehameha I, stated that he had learned the boundaries of Pīhā from his grandfather, Hue, and his father, Mahiai, both of whom were bird catchers, and that his older brother, Koia, was once *konohiki* of the *ahupua‘a*. Ku accompanied Hitchcock during the boundary survey and pointed out the boundaries to him, showing him a stone *ahu* at the *mauka* corner of Pīhā (where

the *ahupua'a* is cut off by Humu'ula) that his brother had built during the reign of Kamehameha II (ca. 1819-1824). With regards to the trail along the Pihā/Kahuku boundary, Ku testified that:

...My grandfather made the road on Honohina to Moohalohalo, and I made the road to Hopuwai, Kahuku bounds Piha on Hilo side at shore, there is a small gulch there called Alanaio on boundary, thence runs up gulch a short distance above road to head of it, thence up old trail to Kaawau, thence bounded by Nanue up old trail to Nenelu old kauhale [group of houses], thence up trail to Waipahoe a kahawai [stream/gulch] and kauhale, the old trail does not reach to the gulch, but turns to the left...(ibid.: 325)

When cross-examined Ku clarified that:

...Piha and Nanue join at Kawau cutting off Kahuku. I have stated that the mauka boundary of Nanue is at Kaahina not at Nahuina of Waipahoe. There is an old kauhale kalaiwaa [group of canoe carvers' houses] at this place, this is the boundary I have always known. Nanue had no old road. The birds in olden times belonged to Piha and not to Nanue. (ibid.: 326)

Hemahema, described as a "quite old man" in the testimony, stated that he had learned the boundaries of Pihā from his father, Waiwai, who was the *konohiki* of "these lands to Pohakupua [six *ahupua'a* northwest of Pihā]," and that he had gone bird catching with his grandfather on the lands. He testified that bird catchers from Pihā and Maulua *ahupua'a* (adjacent to the northwestern *mauka* boundary of Pihā) used to catch birds in common. With regards to the trail along the Hilo side boundary of Pihā, Hemahema stated that:

...Kahuku bounds Piha at the shore at Hilo side, a small gulch, boundary runs up trail to Nahuina where Piha and Nanue join and Kahuku ends, thence boundary runs up trail to Kaahina near Waipahoe, this is as far as I ever knew about Nanue...(ibid.: 327)

When cross-examined Hemahema clarified that:

...Nahuina and kumukawau are the same...From Kawau boundary between Nanue and Piha runs up old trail to Kaahina this is as far as I ever knew Nanue to run. It is where Hakai made a canoe. I heard from Kihili, Napihe and Kulaipahu that this was the mauka end of Nanue. Hapai ma said the same thing. (ibid.: 327)

Kalualoha, described as an "old man" in the testimony, stated that he had learned the boundaries of Pihā from "Kaulanahia, Koia, and Waikane, now dead." Kalualoha, who was the father-in-law of Alapai, the owner of Nanue Ahupua'a at that time, disagreed with the boundary testimony of Ku and Hemahema, and went with Hitchcock to point out what he believed to be the correct boundary between Nanue and Pihā to be. Kalualoha testified that:

...Piha and Nanue join each other at Kawau an old trail into the woods, thence boundary runs up this trail to Waipahoe, thence boundary runs up this stream to Mahuia kauhale on Piha, thence boundary runs up to Koapololei, thence up old trail to upper edge of woods to Kalapaohelo, to a place called Kaluaalu...In olden times the birdcatchers used to go up the Honohina and Piha roads, they could not go up the Nanue as the road was so bad. The canoe road of Nanue ran to mauka of Kaahiwa, there it ended. But the roads on Honohina and Piha ran way mauka...(ibid.: 329)

Kupahu, the uncle of Alapai (the owner of Nanue Ahupua'a), stated that he knew a little about the boundaries of Pihā because he "went up the road to Kalapaohelo after beef" (page 329), and that Koia, his guide, pointed out the boundaries to him. Kupahu's testimony only addressed the *mauka*-eastern boundary of Pihā where it joins Nanue. He stated that "...Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place..." (ibid.: 329).

At the conclusion of the testimony, it was decided by R. A. Lyman, the Commissioner of Boundaries, that the boundaries of Pihā as given by Ku be accepted, that the notes of the survey be filed, and Certificate of Boundaries be issued accordingly.

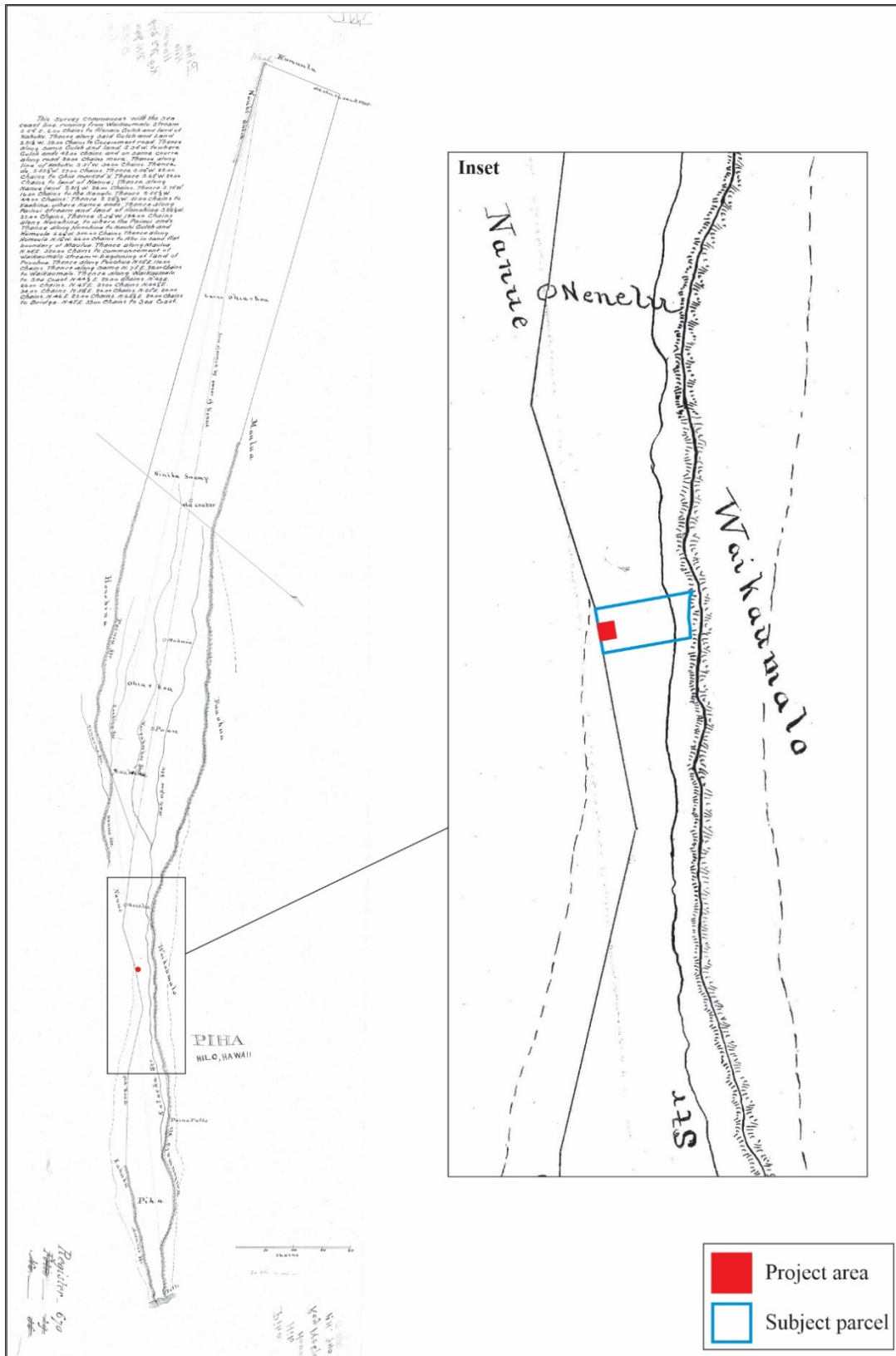


Figure 13. Hawai'i Registered Map No. 670 prepared by Hitchcock (1874) in 1874 showing the approximate location of the project area within Pihā Ahupua'a.

Historical Accounts of Pihā and the Greater North Hilo District

Written accounts penned by early visitors to the Island of Hawai‘i offer insight into what life may have been like for the Hawaiians of Pihā and North Hilo. Such accounts describe North Hilo as incredibly verdant and rich in fresh, flowing water, which was frequently noted as carving through mountain streams and emptying into the sea. Also remarked upon was the population that lived along the coast from South Hilo to Laupāhoehoe (to the north of Pihā), particularly in the vicinity of the many steep gulches. Many of the individuals who traveled along this region commented upon the rugged terrain, inescapably treacherous and everlasting. Ever-flowing streams and waterfalls fed by frequent mountain rainfall allowed for richly cultivated ravines and gulches, planted in taro, banana, and occasionally sugarcane.

In 1823, British missionary William Ellis and other members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai‘i seeking out communities in which to establish church centers for the growing Calvinist mission (Ellis 2004). Ellis estimated that at the time of his visit, about 2,000 people lived in 400 houses or huts along the coastline at Hilo Bay (ibid.). Ellis described the residential and land-use practices he observed while in the Hilo (“Hiro”) District, which is applicable to the study area vicinity, thusly:

Hiro, which we had now left, though not so extensive and populous as Kona, is the most fertile and interesting division on the island.

The coast from Waiakea to this place is bold and steep, and intersected by numerous valleys or ravines; many of these are apparently formed by the streams from the mountains, which flow through them into the sea. The rocks along the coast are volcanic, generally a brown vesicular lava. In the sides and bottoms of some of the ravines, they were occasionally of very hard compact lava, or a kind of basalt.

This part of the island, from the district of Waiakea to the northern point, appears to have remained many years undisturbed by volcanic eruptions. The habitations of the natives generally appear in clusters at the opening of the valleys, or scattered over the face of the high land. The soil is fertile, and herbage abundant.

The lofty Mouna-Kea [Mauna Kea], rising about the centre [*sic*] of this division, forms a conspicuous object in every view that can be taken of it. The base of the mountain on this side is covered with woods, which occasionally extend within five or six miles of the shore. . . rain is frequent in this and the adjoining division of Hamakua, which forms the centre of the windward coast, and is doubtless the source of their abundant fertility. The climate is warm. Our thermometer was usually 71° at sun-rise; 74° at noon; and 72° or 73° at sun-set. Notwithstanding these natural advantages, the inhabitants, excepting at Waiakea, did not appear better supplied with the necessities of life than those of Kona, or the more barren parts of Hawai‘i. They had better houses, plenty of vegetables, some dogs, and a few hogs, but hardly any fish, a principle article of food with the natives in general. (ibid.:263-264)

Another early written account by Ellis describes the stretch of land between South Hilo and Laupāhoehoe, north of the current study area, as a fertile, verdant, and well-watered countryside with a sizeable population:

The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, with the streams meandering through them into the sea, presented altogether a most agreeable prospect. The coast was bold, and the rocks evidently volcanic. We frequently saw water gushing out of hollows in the face of the rocks, or running in cascades from the top to the bottom. (Ellis 1826:316)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled to northern Hilo and described the landscape of this region:

The coast to the north of Hilo is slightly peculiar: it is a steep bluff, rising about two hundred feet; this is cut into small breaks here called “gulches,” within which the villages are generally situated, and the natives grow banana and taro. In some places they cultivate small patches of sugar-cane, which succeed well.

These gulches are ravines, from eight hundred to one thousand feet deep, which have apparently been worn by water-courses: they extend back into the woods, and have made the country impassable for either vehicles or riders on horseback, for no sooner is one passed than another one

occurs. There is no landing for boats, for all along the shore the surf beats on the rocks with violence. (Wilkes 1845:206)

Journalist Henry M. Whitney published the very first guidebook to the islands in 1875, titled *The Hawaiian Guide Book, For Travelers: Containing A Brief Description of the Hawaiian Islands, Their Harbors, Agricultural Resources, Plantations, Scenery, Volcanoes, Climate, Population, and Commerce*. An excerpt from his book describes his treacherous trek from Laupāhoehoe to Hilo, passing through the vicinity of the study area:

From Laupāhoehoe on the north to Puna on the south extends this large and fertile district [Hilo], where the trade winds are neutralized by the mountains, and where the rain falls in such abundance as to keep the land perpetually green to the water's edge. Except at Hilo Bay, the coast is composed of bold bluff cliffs from a hundred to upwards of 1000 feet high; these are higher on the north and the pali, at Laupāhoehoe, is a remarkable one. . . On the other cliff, one mile distant, you discern horsemen and decide that the road to Hilo lies over there, but how to get there. This wall extends inland for miles, a stream rolls down its precipitous valley, plainly one must go down before getting up the other side. At length the ribbon road wound downward on the shelving roof of the valley appears. From twenty minutes to half an hour will be occupied in the descent, according as you risk the neck of horse and rider. More than a score, some say fifty similar valleys, with twice this number of similar ribbon windings, miniature Alpine passes, lie between Laupāhoehoe and Hilo village.

Mountain torrents rush through each of these passes, and one of the wonders of this volcanic country lies in these gulches, with their gothic steepes that disrupt the land for three score miles or less, piercing the land's centre. The number of waterfalls is beyond estimate, their height varies from tens to thousands of feet, and many of the streams literally *leap* into the sea. A mere sprinkle at the beach often increases, higher up the mountain, to a heavy rain, and the stream may rush in torrents for a mile and then resume the common course of a brook. It is not uncommon for the traveler to be detained by a swollen stream for half a day. In olden times the streams were crossed by stepping stones. "La Paz" says of this overland route: "As we rode along, the rain poured, rattling among the leaves, pattering among the impromptu pools and drains, the torrents tumbled from the hills or leaped through chasms, over frightful rocks, with a thundering sound that jarred the cavernous earth; the ocean waves came surging and groaning against the beetling cliffs like a wail of despair, and our horses kept tumbling over a corduroy road of mud ridges and holes of water, alternating with the regularity of rice rows; a succession of mud ridges and miniature hog wallows.

"Before reaching the Scotchman's gulch, we passed a deep chasm, where some rough stone piers indicated where the apology for a bridge had formerly stood. Through this swept a mad and foaming torrent, near four feet deep, whirling and rushing past gigantic basaltic bounders, a cataract above, a waterfall below; we passed between this Scylla and Charybdis, and came near being carried away by the foaming flood. We have crossed the Rocky Mountains six times, the Sierra Madre of Mexico often, the volcanic chain of Central America three times and the Andes twice; and we here most solemnly protest that we have never traveled a road that gave the traveler more ups and downs on a sliding scale than the pathway from Laupāhoehoe to Hilo." (Whitney 1875:70-72)

The road to Laupāhoehoe from South Hilo was also described in George Bowser's *Hawaiian Kingdom Statistical and Commercial Directory* (Bowser 1880) as a treacherous but beautiful journey, containing several adequate landings for boats, and prime agricultural land suited for the potential cultivation of commercial crops:

On the way to Laupāhoehoe the road is not first-rate, even in the fine weather I enjoyed on my trip, besides which there are a great number of deep gulches, the sides of which are very steep. The track is certainly very rugged and uneven; but, then, to make up for it, the scenery with a parallel in the world. All the way from Hakalau to Laupāhoehoe, the country is as yet unsettled by the white man, although in that stretch of about fourteen miles of coast, by a width of a great many miles inland, the land is suitable for the culture of sugar, coffee, wheat, oats, barley and many minor crops, and only wants the presence of capital and industry to make it a veritable paradise. Good landing can be obtained about every two miles along the coast, places which only require the expenditure of from three to ten thousand dollars to make the landing facilities good in any weather and all times of the year. The only inhabitants of this wide tract are some thirty native[s], who own among them about 3,000 acres, of which they cultivate about 150. The rest of the land belongs principally to the King and to members of the royal family. (Bowser 1880:536)

King David Kalākaua (Kalākaua 1888) described the lands of the northern portion of Hilo as he recounted the tale of ‘Umi-a-Liloa presented in his book, the *Legends and Myths of Hawai‘i*. His description of the region is taken from a time when North Hilo and Hāmākua were in the thick of the commercial sugar industry, but mentions the presence of scattered *lo‘i kalo* and bananas:

The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys, with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau, boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals of one or two miles with deep almost impassable gulches, whose waters reach the ocean either through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and streaking the coast from Hilo to Waipio with lines which seem to be molten silver from the great crucible of Kilauea.

In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was cultivated from the sea upward to the line of frost. A few *kalo* patches are still seen, and bananas grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the rock-bound front of Hamakua. (Kalākaua 1888:284)

Pihā Ahupua‘a During the Late Nineteenth and Twentieth Centuries

Following the conversion of Hawaiian land to fee-simple ownership and the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawai‘i, which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations were incorporated in the islands. In 1878, Claus Spreckels, with W. G. Irwin & Company as its agent, established the Hakalau Plantation Company on 9,000 acres of land located along the North Hilo coast, 16 miles from Hilo (Dorrance and Morgan 2000). The fields of the Hakalau Plantation Company ranged from 250 feet above sea level along the shoreline bluffs to about 2,000 feet above sea level at their western (*mauka*) limits. The cane was flumed from the various fields to its mill site, where it was then processed. The Hakalau Mill, constructed in 1890 on the shore at the foot of a 200-foot bluff overlooking Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (Dorrance and Morgan 2000). Initially, and continuing until 1913 when a railroad connecting the plantation to the port at Hilo was built, the plantation shipped its product from the Hakalau Landing to Honolulu via inter-island steam-powered vessels that anchored offshore.

The lands of Pihā Ahupua‘a (containing 4,250 acres) were leased to the Hakalau Plantation Co. on February 11, 1892 (Brown 1892), and the *makai* lands were cleared and used for the cultivation of sugarcane. The fields of the Hakalau Plantation Company never reached as far *mauka* as the current project area, rather it remained as forest throughout the late 19th century and into the present. The degradation of the native forests was a catalyst for change in Hilo, and the effects related to deforestation had been ongoing since the early 1800s following the introduction of cattle and other ungulates by early European visitors (Bergin 2004). The importance of the forest lands and their role in preserving the watershed for agricultural purposes and the well-being of the people, in general, was recognized quite early on by the newly formed Territorial Government of Hawai‘i (formed in 1900), and by the burgeoning sugar industry. Consequently, a proclamation recommending that 110,000 acres of land in the Districts of North and South Hilo be reserved from development was signed by Lieutenant Governor A. L. C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created. The Hilo Forest Reserve was described thusly by the Division of Forestry in 1906:

The Hilo Forest Reserve embraces the area of heavy forest on the lower slopes of Mauna Kea, lying between the 1855 and 1881 Lava Flows back of Hilo Town and the Hamakua District line, and extending from a line varying in elevation from 1,750 to over 2,000 feet, drawn back of and above the sugar plantations to another line along the upper edge of the woods, at an elevation of approximately 6,000 feet. The water from this reserve is of great importance to all the plantations along the coast, being at present used for the most part for fluming cane to the mill. From the character of the country many of the streams could be utilized for the production of power. This will be an important consideration when the Hilo District comes to be developed, as it is sometime bound to be. The object of the Hilo Forest Reserve is to protect the sources of this important water supply. (Division of Forestry 1906:25)

After the creation of the Hilo Forest Reserve, and just as the plantation’s lease on its Pihā lands was set to expire, large tracts of government land were set aside like Pihā (and other parts of Hilo) by the territorial government to create

homesteads. The process for obtaining homestead lots was clarified by the Organic Act of 1900, a law enacted at a time in the islands (and in the United States congress) when there was growing concern regarding the consolidation of land ownership within the plantation system, and its reliance on foreign labor (Horwitz et al. 1969). Survey of the anticipated Pihā Homestead Tract commenced in 1912 and was completed by 1913, when the Survey Department of the Territory of Hawai‘i reported that “the land of Piha was subdivided into 28 lots, comprising 393.81 acres, 5 miles of roads containing 20.44 acres, and flumes and ditches and remnant covering 5.95 acres” (Department of the Interior 1914a:679). The location of the subject parcel with respect to the larger Pihā Homestead tract is shown in Hawai‘i Registered Map 2568 from 1914 (Figure 14). The Pihā-Kahuku Homestead Road, created as part of the homesteads subdivision and situated along the southeastern boundary of the project area separating it from the Kahuku Homesteads subdivision (see Figure 14), likely followed the route of the older trail delineating the Pihā and Kahuku *ahupua‘a* boundary as indicated during Boundary Commission testimony proceedings provided for Pihā during the late nineteenth century.

Not long after the formal subdivision of the Pihā Homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., questioned the legitimacy of the boundary between the homesteads and adjoining lands owned or controlled by the company, which they felt had been encroached upon. Additional surveys of the Pihā homestead tract, involving extensive triangulation work, were then made during the early part of 1914, until the matter was decided to the satisfaction of all parties involved (Department of the Interior 1914b). Later that year, in June 1914, fifteen lots (Lots 9 through 28) within the *makai* third of the newly created Pihā Homesteads subdivision were made available for homesteading and sold at auction. The eight additional lots (Lots 1 through 8) situated in the more *mauka* remainder of the homesteads and includes the subject parcel, identified as Lot 2 of the Pihā Homestead (Figure 15), were not applied for despite the claim that the Pihā Homestead lots were available for homesteading in 1912 and were not set for 10-year lease at public auction until the following year in June 1915 (Honolulu Star-Bulletin 1916). One month later, on July 14, 1915, a general ten-year lease for Lots 1 through 8 was purchased at auction by the Hakalau Plantation Company who also purchased 10-year leases on four additional lots (Lots 13 through 16) of the adjoining Kahuku Homesteads (Department of the Interior 1916). Collectively, all of the Pihā Homestead lots were to be taken only by a Special Homestead Agreement, which had stipulations for an annual lease payment of \$50 as well as a requirement to fence all lot boundaries (Herald 1915).

For unknown reasons, the Hakalau Plantation Company’s lease was never fully executed and Lots 1 through 8 were eventually sold off to various homesteaders. Lot 2 (the subject parcel), a 17.24-acre parcel, was sold jointly with Lot 1 (an 18.3-acre parcel adjacent to Lot 2 to the west) to William Breithaupt on August 23, 1916, as Grant No. 8584 for \$324.00 (Figure 16). Several other members of the Breithaupt family also purchased lands within Pihā Homesteads, including Otto Breithaupt (Lots 5 and 6; Grant 7862), Ella Breithaupt (Lots 7 and 8, Grant No. 7863), and August K. Breithaupt (Grant No. 8328; Lots 15 and 16). It appears that less than a month after William Breithaupt’s purchase, on September 8, 1916, Lots 1 and 2 were leased to Mike Lehuanui under Special Homestead Agreement No. 1252 but later transferred back to Breithaupt’s possession three years later on September 10, 1919 (Rivenburgh 1917). Territory of Hawai‘i tax records indicate that Lots 1 and 2 (the current project area) were initially identified as belonging to TMK: (3) 3-2-004:011 and were transferred from William Breithaupt to August Breithaupt on September 21, 1936.

In 1939, the Territorial government appropriated monies for the construction of the Pihā-Kahuku Road and by 1941, a survey was undertaken to establish a formal alignment (Rowland 2018). This resulted in portions of the road being realigned particularly in the vicinity of Lots 18 & 19, Lots 21 & 23, Lots 24 & 25, and Lots 26 & 27 (see Hawai‘i Registered Map No. 3060), all of which are located *makai* of the project area. The interest in the abandoned section of the original Pihā-Kahuku Road was relinquished by the government in lieu of newly established alignment (Rowland 2018).

Around this time and until the first half of the 20th century, the Hakalau Plantation Company continued to operate on lands situated *makai* of the current project area. By the early 1940s, nearly forty percent of the sugarcane on the plantation was being cultivated by independent growers, some of whom had purchased various Pihā Homestead lots. In 1943, the neighboring Wailea Milling Company (also started by Claus Spreckels) was merged into the Hakalau Plantation Company, expanding the operation, and by 1944 the plantation had reached its maximum production, producing 26,000 tons of sugar that year (Dorrance and Morgan 2000). On April 1, 1946, the Hakalau Mill and the railroad connecting the plantation to Hilo were severely damaged by a *tsunami* triggered by an earthquake in the Aleutian Islands. The mill was eventually rebuilt, but the railroad was shut down indefinitely and the sugarcane was then trucked to the docks at Hilo.

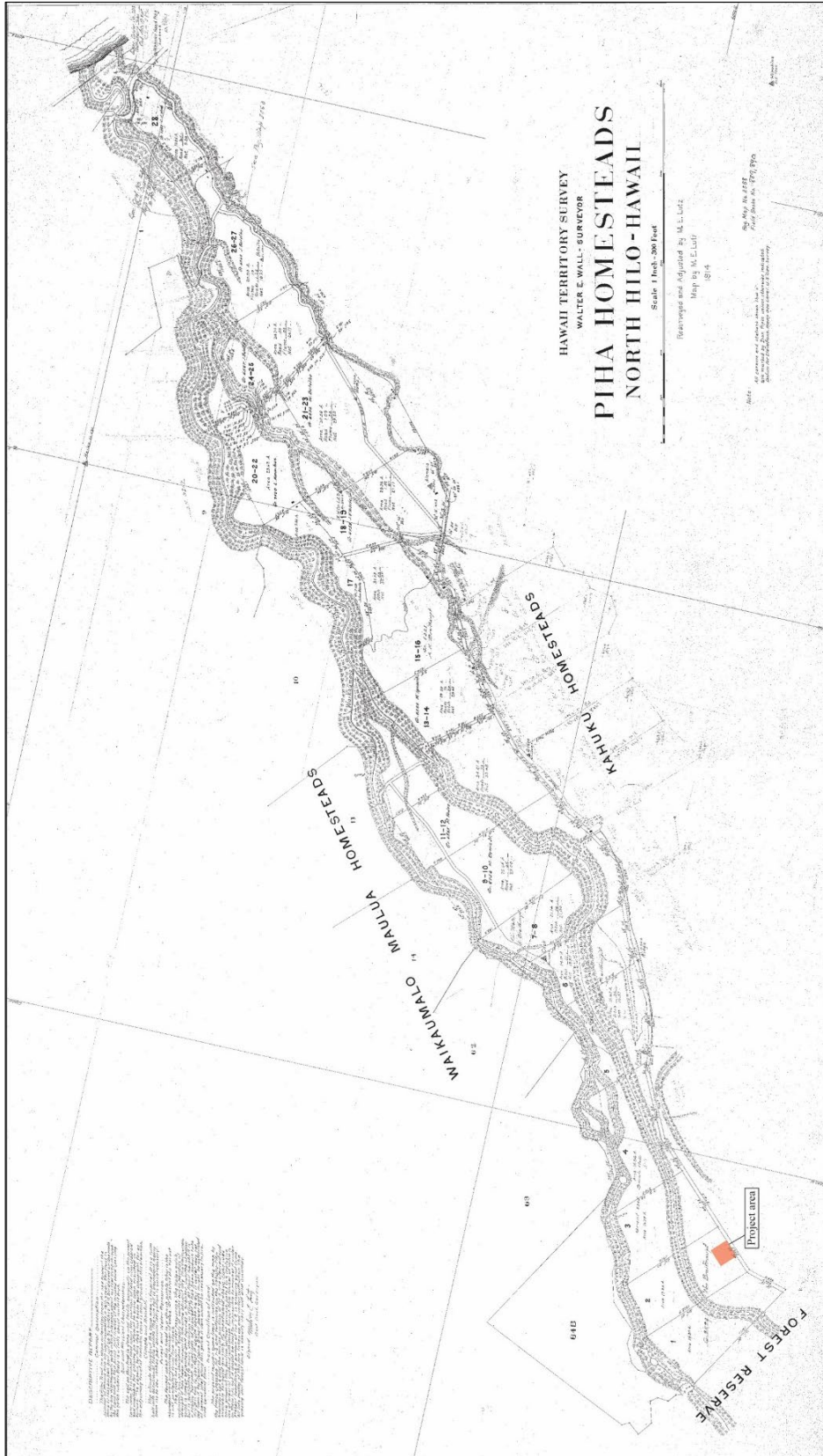


Figure 14. Hawai'i Registered Map No. 2568 prepared in 1914 by M.E. Lutz showing the location of the current project area within Lot 2 of the Piha Homesteads (Lutz 1914).

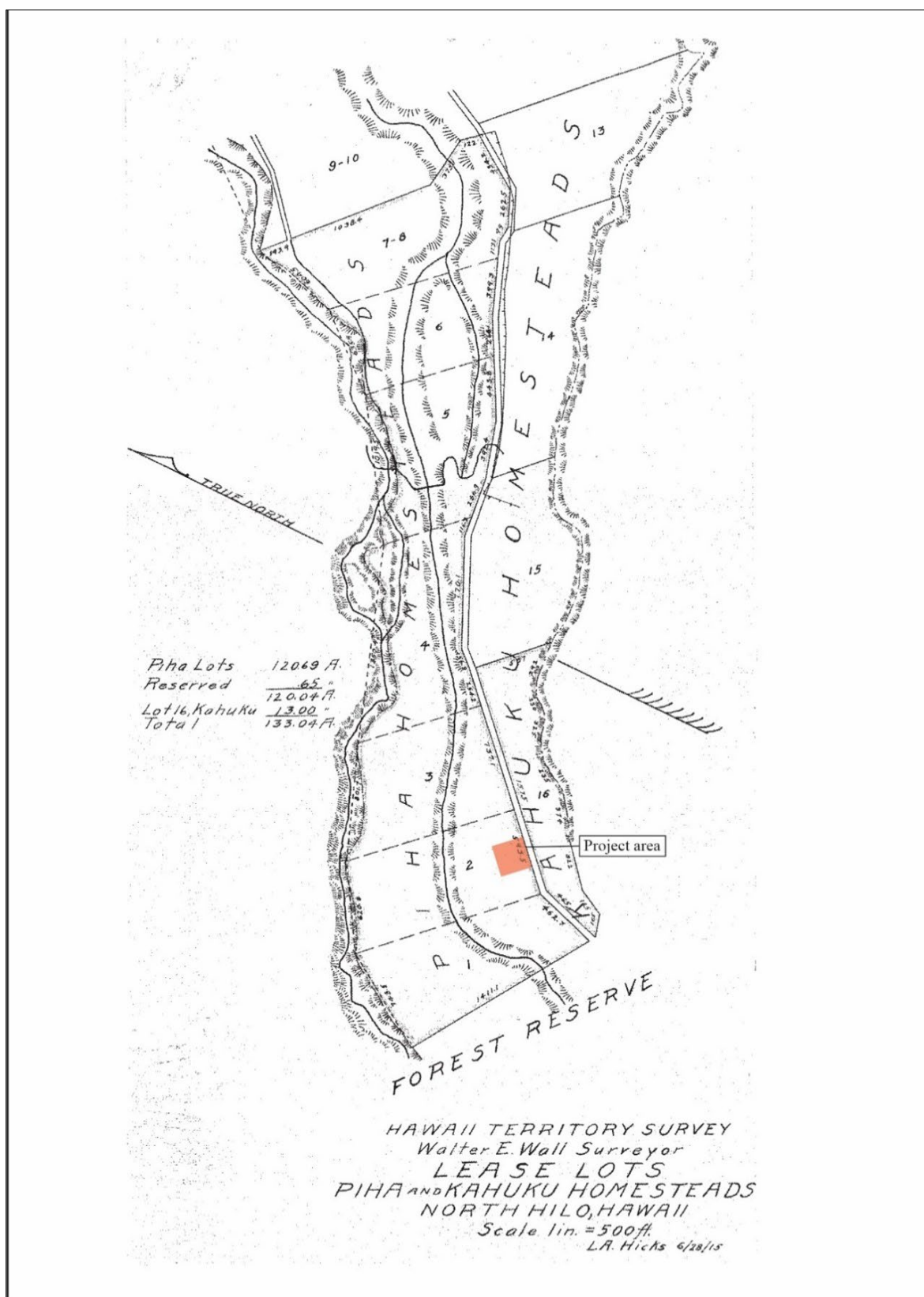


Figure 15. June 28, 1915, map by L. A. Hicks (1915) showing project area within Lot 2 of the Pihā Homestead.

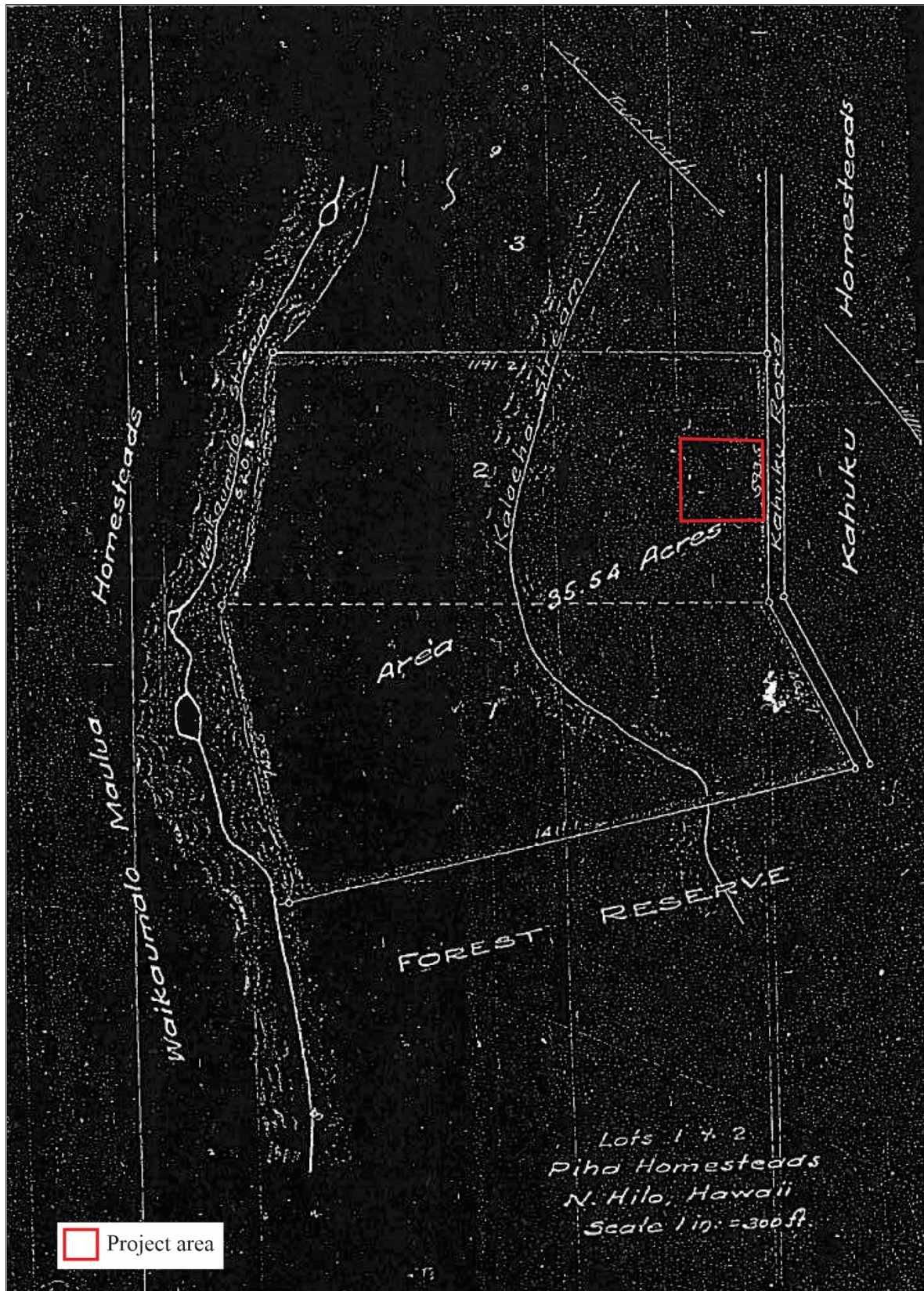


Figure 16. Project area shown within Lot 2 of the Pihā Homesteads originally sold to William Breithaupt (Rowland 2018).

Six years following the *tsunami* in January 1952, Lots 1 and 2 were transferred from August Breithaupt's estate to Ella Breithaupt and eventually fell under the care of her own respective estate. By January 1953, six months prior to Ella Breithaupt's death (Honolulu Star-Bulletin 1953), a number of lots also presumably within the Pihā Homesteads subdivision (including Lots 1 and 2) were being managed by her son and estate trustee, Graven Breithaupt, and collectively amassed under TMK: (3) 3-2-004:001. During this time, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepe'eke'ō Sugar Company (Dorrance and Morgan 2000), and sugar continued to serve as the dominant commercial industry in this portion of Hilo, although the project area remained uncultivated (Figure 17). In 1963, Lots 1 and 2 were part of 120.69-acres of land subsequently dropped into TMK: (3) 3-2-004:006 (along with Lots 3 through 8). Tax records are somewhat ambiguous but do indicate that 113.19 of the 120.69 acres were leased by Graven Breithaupt to Yoshinobu and his wife Tsutayo Yamada along with their son, Bob Takeshi Yamada, for a period of 80 years beginning on July 1, 1963, while the remaining 7.5-acres was reserved for another lessee by the name of Makoto Tawara. It appears that during this year, most of the lands encompassed by Parcel 006 were classified as undeveloped forest (totaling 52.21 acres), while 38.18 acres of the parcel consisted of gulch lands (presumably Kalaeha Stream/Gulch, which bisects the subject parcel). Twenty-five acres was listed as pasture, while the remaining 5.3 acres was identified as cane land.

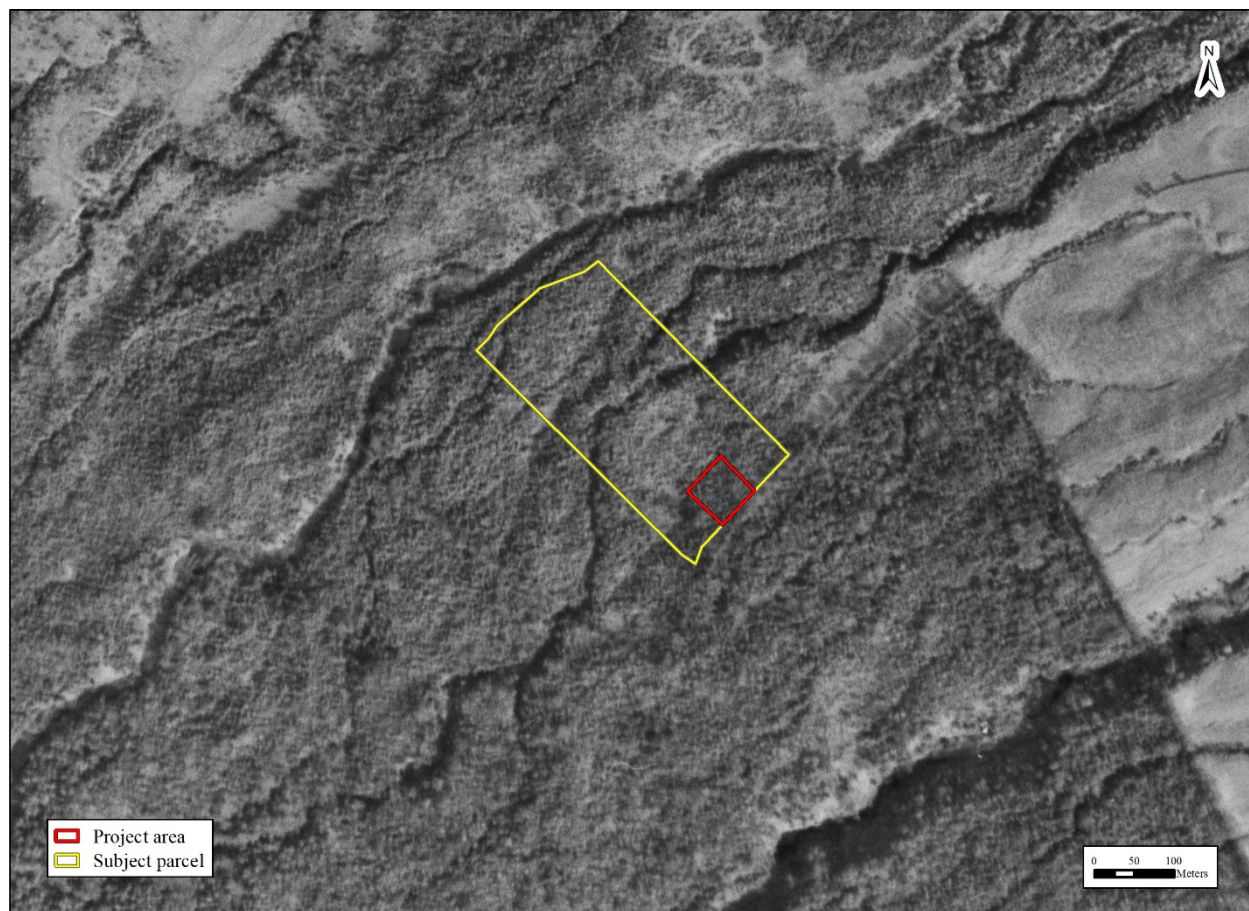


Figure 17. 1954 USGS aerial photograph showing the location of the project area.

Although Yoshinobu Yamada had previous experience as a cane planter prior to his lease of the lands (presumably encompassing or in the immediate vicinity of the project area), and later worked for and retired from Mauna Kea Sugar Company as a service truck helper (Hawaii Tribune-Herald 1985; Hilo Tribune-Herald 1934), it appears that the lands within and surrounding the current project area were never utilized for the cultivation of sugarcane by the Yamada family (see Figure 17). However, Makoto Tawara, the other lessee who received the remaining 7.5-acres of land within Parcel 006, is listed as a sugarcane grower in tax records spanning between 1953 and 1961 for Lots 7 and 8. Based on these records, it is likely that the 7.5-acres of land leased to Tawara were not for lands within the project area, but rather for lands within Lot 8 which he likely continued leasing for an indeterminate period as an independent grower for the plantation. It can thereby be suggested that from 1963 until at least 1968, the only utilization of the

2. Background

remainder of the lands encompassed within Parcel 006 (Lots 1 through 7) were for pastoral use or were left fallow as undeveloped forest and gulch lands. A USGS topographic map from 1966 depicts the project area within a forest, indicating that it most likely remained undeveloped until this time (Figure 18).

Land use for the current project area is vague in the years following, and it appears that by 1970 the current project area was removed from the Parcel 006 designation which by this time details land use for just 30 acres of land. Despite the continued expansion of the sugarcane growing operation in the *makai* lands of Pihā and with the merging of Pepe'ekeo Sugar Company into the Mauna Kea Sugar Company by C. Brewer & Co. into the Mauna Kea Agribusiness Company in 1973, it appears that the project area lands remained out of reach for the industry and sustained as an undeveloped, forested landscape until the present day (Figures 19 and 20). In 1994, the Mauna Kea Agribusiness Company harvested its last crop and closed its operations marking the end of Hilo's long-standing sugar industry.

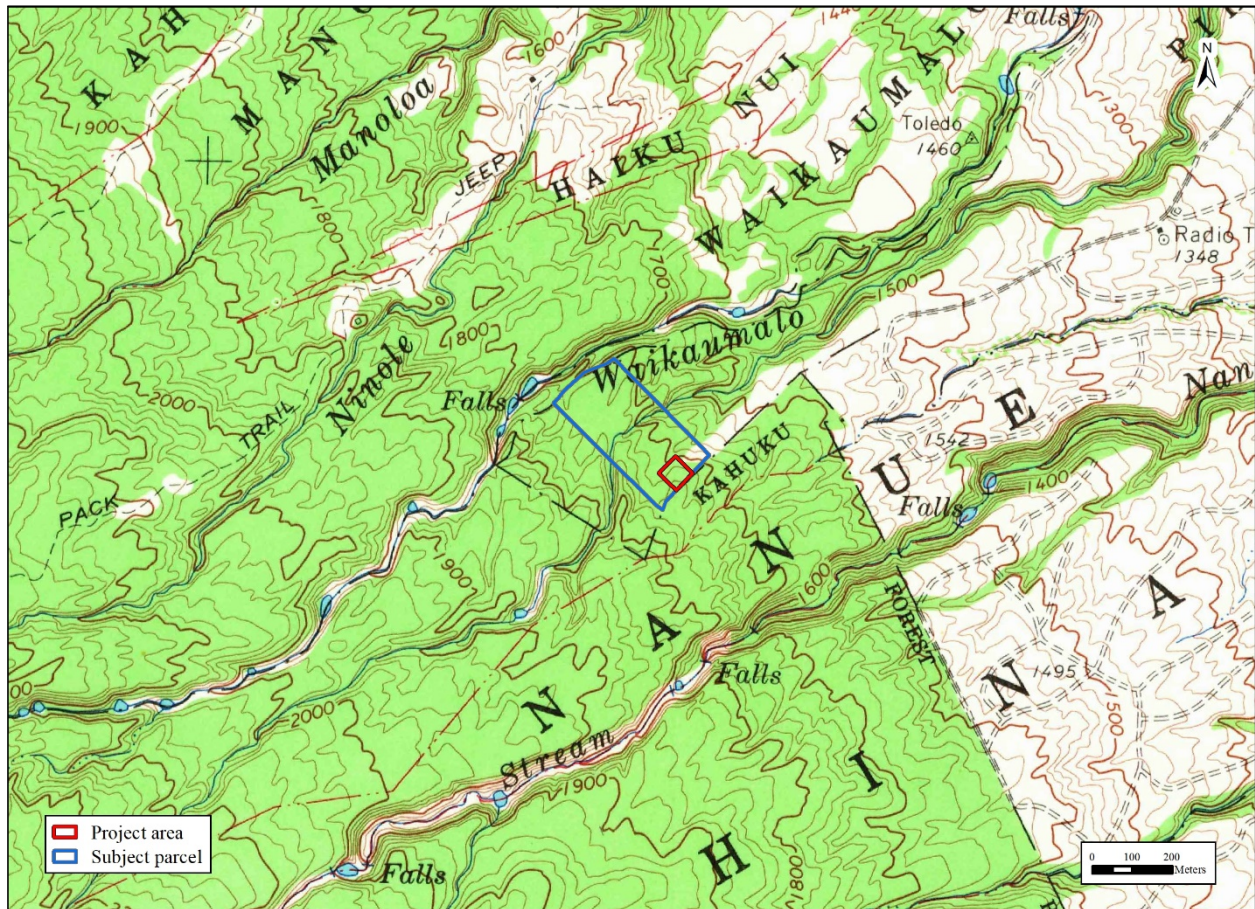


Figure 18. Portion of 1966 USGS Papaaloa quadrangle showing the location of the project area.

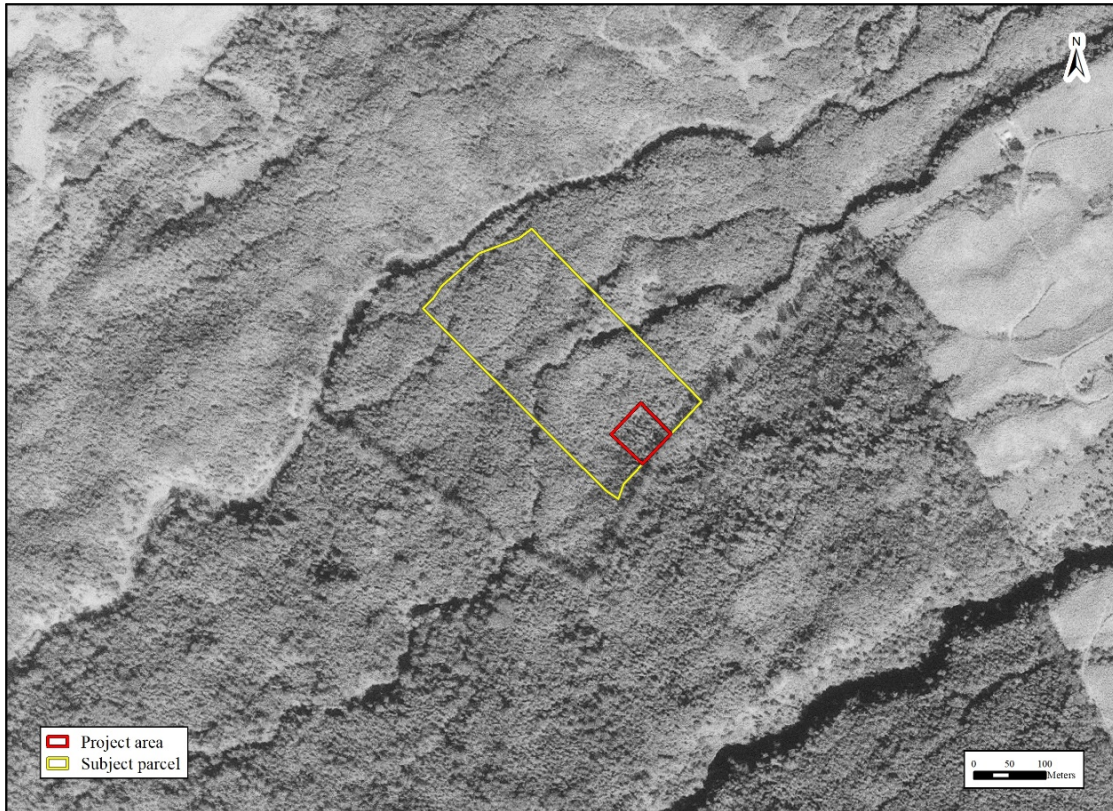


Figure 19. 1977 USGS aerial photograph showing the location of the project area.

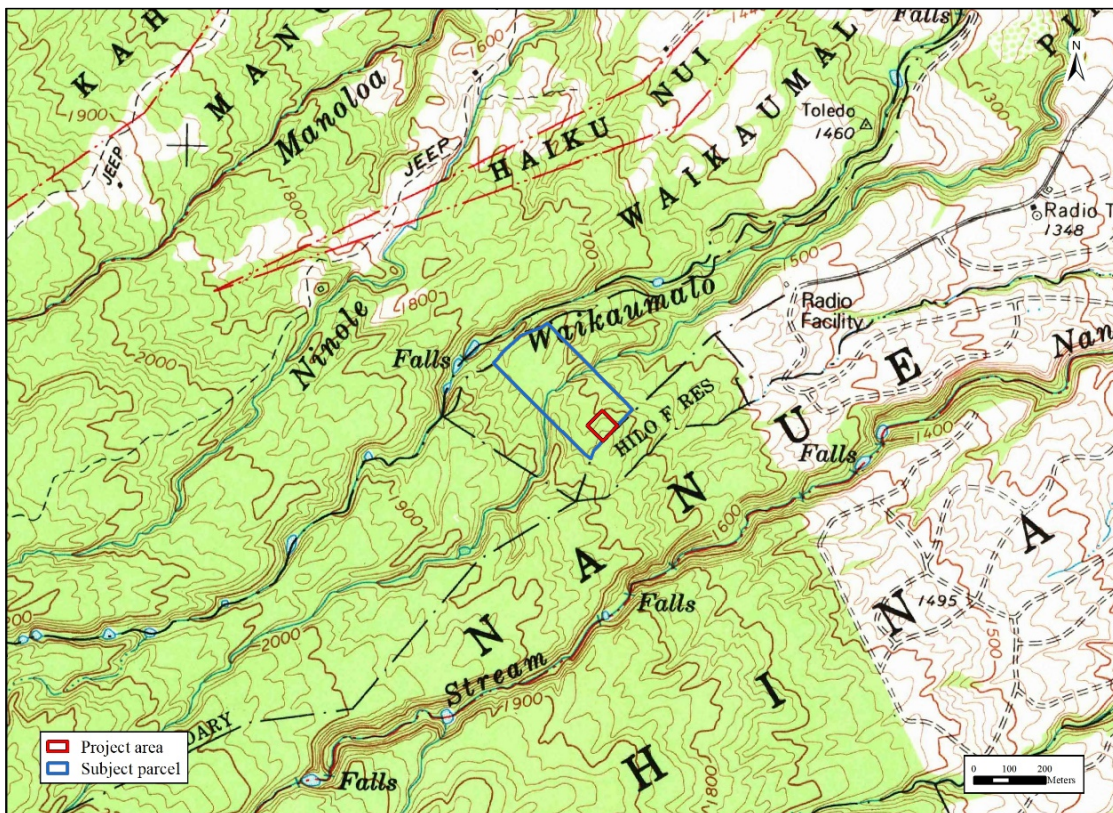


Figure 20. Portion of 1980 USGS Papaaloa quadrangle showing the location of the project area.

SUMMARY OF PREVIOUS STUDIES

There have been no previous archaeological studies conducted within the subject parcel and very few studies conducted anywhere within the district of the North Hilo at similar elevations. The first archaeological work conducted in East Hawai'i was that of the early twentieth-century *heiau* researchers Thrum and Stokes (Stokes and Dye 1991; Thrum 1908). Neither investigator was able to identify *heiau* within Pihā Ahupua'a or, for that matter, within the broader region between Hilo One and Hilo Palikū in the vicinity of Laupāhoehoe Ahupua'a. In the early 1930s, A.E. Hudson, working under the aegis of the Bishop Museum, conducted archaeological investigations in East Hawai'i, surveying primarily along the coast of the district (Hudson 1932). He found little in the region *makai* of the project area, although he did note the presence of a .25 mile square area of *kalo* terracing in the upper reaches of Hakalau Gulch situated east of the project area. According to Hudson (1932:218), there was formerly a *papamū* (*kōnane* game board) in the bottom of Hakalau Gulch, and the gulch was at one time identified as a robber's stronghold.

More recently, Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an archaeological study of approximately 595 acres of land within Hakalau Nui Ahupua'a in the South Hilo District, situated between Hawai'i Belt Road and the 1,500-foot elevation contour. Low-level aerial (helicopter) survey was conducted over some of the uncultivated, forested portions of that study area, and other uncultivated areas were inspected using "variable-coverage (partial to 100%) variable-intensity ground survey" (Walker and Rosendahl 1994a). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites resources were identified during the study.

In 1996, International Archaeological Research Institute, Inc. (IARII; Tomonari-Tuggle 1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current project area and outside of Pihā Ahupua'a. Very little archaeological work was undertaken during the study; however, Tomonari-Tuggle did provide a predictive model for site distribution within the upland forests of Hilo and indicated that such forested areas were utilized primarily for the collection of special resources:

... Traditionally these resources would have been birds (for featherwork) and hardwoods (for tools and canoes). In historical times, birds and hardwoods would have continued as resources, with the addition of cattle for meat and hides. The upland forests may also have been transited by individuals going from the coast to the upper slopes or summit of Mauna Kea. . .

These transitory activities would likely have left neither a substantial nor easily recognized archaeological record. Further, the density and rapid regrowth of vegetation in the rainforest would also make any remains virtually impossible to identify once abandoned. (Tomonari-Tuggle 1996:67)

Specific site types discussed by Tomonari-Tuggle (1996) that were surmised to have been encountered within the upland forests of the Hilo included temporary shelters used by bird catchers, canoe builders, bullock hunters, scientists, travelers, surveyors, shrines or other religious structures, ponds and waterholes, roads and trails, bullock pits, surveyor's marks and ranch structures. Tomonari-Tuggle (1996) described the lowest forest zone, in which the current project area is situated, as the wet '*ōhi'a* zone. This zone, characterized primarily by '*ōhi'a* forest and bog lands extending up to 4,000 feet in elevation, was indicated to have been an area largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

A review of reports and correspondence on file at the DLNR-SHPD office in Hilo indicates that only two archaeological studies have been conducted in the vicinity of the current project area, but that DLNR-SHPD has previously written "no effect" letters for at least seven parcels within the Pihā and Kahuku Homesteads (Figure 21). These "no effect" letters include a:

1. November 1, 1996 letter for TMK: (3) 3-2-004:025 (*Log No. 18344 Doc No. 9610ms04*); and
2. April 24, 1998 letter for TMK: (3) 3-2-004:027 (*Log No. 21307 Doc No. 9804PM15*); a
3. June 1, 1998 letter for TMK: (3) 3-2-004:039 (*Log No. 21050 Doc No. 9802PM03*); and
4. August 18, 1998 letter for TMK: (3) 3-2-004:041 (*Log No. 22025 Doc No. 9807ms17*); a
5. June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (*Log No. 27706 Doc No. 0105ms08*); a
6. December 31, 2010 letter for TMK: (3) 3-2-004:045 (*Log No. 28884 Doc No. 0112PM10*); and an
7. April 17, 2013 letter for TMK: (3) 3-2-004:046 (*Log No. 2013.2304 Doc No. 1304SN05*)

The reason generally given for DLNR-SHPD's belief that the proposed development of these parcels would have "no effect" on significant historic sites, was that a review of aerial photographs revealed that intensive cultivation of sugarcane had significantly altered the landscape. DLNR-SHPD undertook no archaeological survey of the parcels listed above.

In 2018, ASM Affiliates (Clark 2018) conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pihā Homesteads located west of the current project area (see Figure 21). While no archaeological resources were identified within the project area, as a result of the study, Clark (2018) did note that the alignment of the Pihā-Kahuku Road was identified adjacent to the eastern boundary of the project area. In conjunction with the archaeological survey, ASM also prepared a Cultural Impact Assessment study (Tam Sing and Rechtman 2018) for the subject parcel. Culture-historical background information was prepared, and an interview was conducted with Mr. Ian Cole of the Department of Land and Natural Resources, Division of Forestry and Wildlife. Mr. Cole related that the area to the west of the subject parcel was within Unit C of the Hilo Forest Reserve and that it is accessed by various hunters. It was concluded that the proposed project (the construction of a single family dwelling) would not impact any traditionally valued cultural or historical resources or any cultural practices and beliefs.

More recently, in 2019, ASM Affiliates (Ka‘uhane and Clark 2019) conducted an archaeological survey of a roughly 3.2-acre portion of Lots 13-14 of the Pihā Homesteads located to the northeast of the current project area (see Figure 21). As a result of the study, no archaeological resources were identified within the project area, and it was determined that the proposed development would not affect historic properties. A Cultural Impact Assessment study was also conducted for the subject parcel in which background information was prepared and interviews were conducted with local hunters Mr. Jed Cariaga and his partner, Ms. Natalie Tavares (Ka‘uhane and Brandt 2019). Mr. Cariaga shared stories of meeting with local *kupuna* (elders) including Mr. Souza who shared historical information with them about the area. He noted that the streams and gulches, including Waikaumalo and Kalaeha, are one of the ways they have accessed the *mauka* regions to hunt and also to gather stream resources including ‘ōpae (shrimp) and freshwater prawns. Mr. Cariaga described encountering portions of the former sugar plantation flume system and freshwater springs within the stream, possible gravesites, and a *ko‘i* (adze). He related information shared with him by Mr. Souza who described a big lake in the upper portion of Pihā where folks from the community would ride their mules to, hunt, and smoke meat. Concerning cultural practices and resources on the property, Mr. Cariaga noted that pig hunting is one of the known ongoing practices and that access into the reserve should remain open to the public.

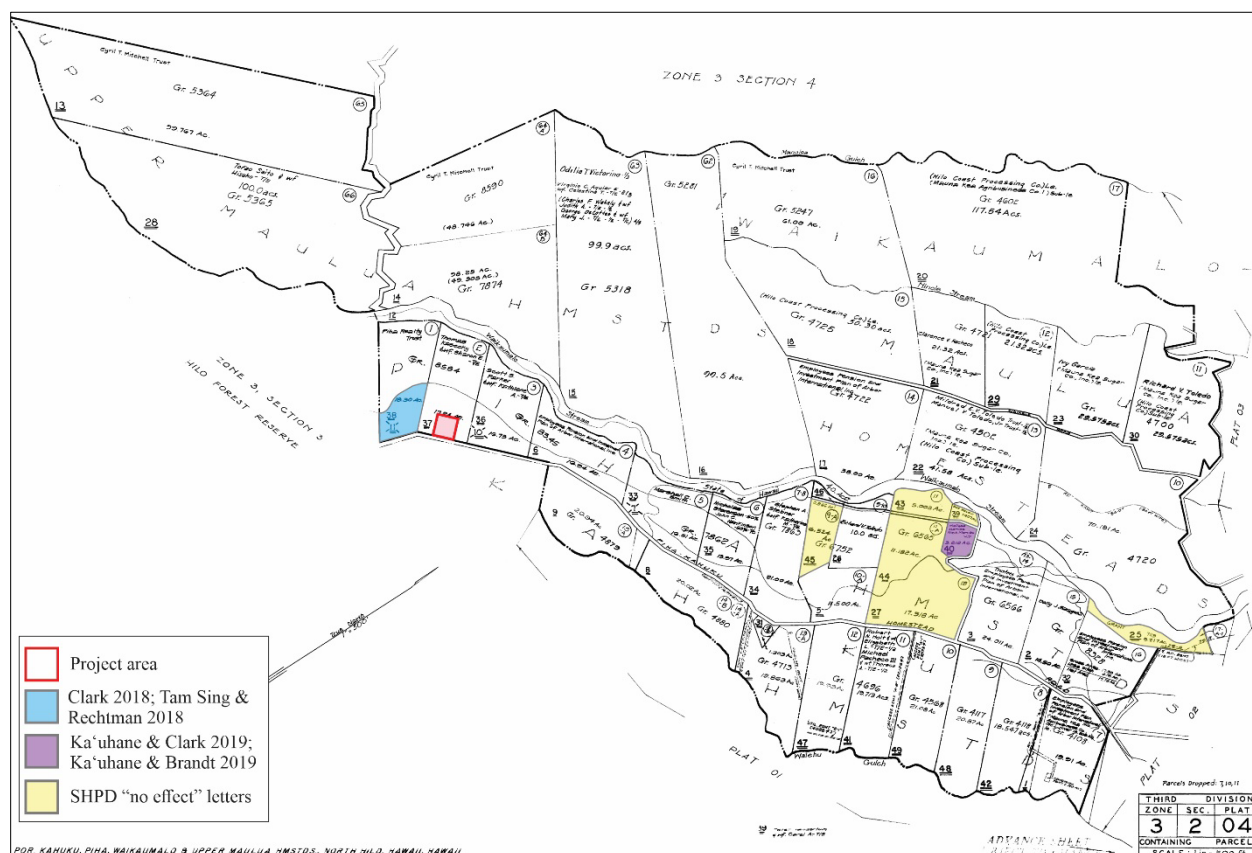


Figure 21. Location of previous studies conducted within Pihā Ahupua‘a.

3. CONSULTATION

Gathering input from community members with genealogical ties and long-standing residency or relationships to the study area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC (1997) *Guidelines for Assessing Cultural Impacts*, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present authors' further contention that the oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties. Thus, it is the researcher's responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary. This section of the report begins with a description of the level of effort undertaken to identify persons believed to have knowledge of the study area, followed by the interview methodology. This section of the report concludes with a presentation of the interview summaries, all of which have been reviewed and approved to be included in this study by the interviewees.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current study area, a public notice was submitted to the Office of Hawaiian Affairs (OHA) on July 14, 2021 for publication in their monthly newspaper, *Ka Wai Ola*. The public notice was published in the August edition of *Ka Wai Ola* and a copy of the public notice is included as Appendix A in this report. As of the date of the current report, no responses have been received from the public notice.

Additionally, ASM staff attempted to contact seven individuals and one organization via email and/or phone whose names are listed below in Table 5. These individuals were identified as persons who were long-time residents of the area and believed to have knowledge of past land-use, history, or other cultural information. Of the eight individuals/organization contacted, four agreed to participate in this study. The names of the individuals who agreed to be interviewed as part of this study are Mr. Ian Cole, Mr. Jackson Bauer, Mr. Steven Bergfeld, and Mr. Victor Souza Jr. (see interview summaries below).

Table 5. Persons contacted for consultation

<i>Name</i>	<i>Affiliation</i>	<i>Date Contacted</i>	<i>Notes</i>
Jackson Bauer	DLNR- Nā Ala Hele Trails and Access	9/2/2021	see summary below
Honohina	n/a	9/2/2021	no response
Hongwanji			
Susan Forbes	Hakalau Home	9/2/2021	forwarded email to other community members
Ian Cole	DLNR- Wildlife Program Manager	9/2/2021	see summary below
Keola Medeiros	Hunter	9/2/2021	left voicemail no response
Steve Bergfeld	DLNR- Hawai'i Branch Manager	9/2/2021	see summary below
Victor Souza Jr.	Local resident/hunter	9/3/2021	see summary below
Drean Barley	Local resident	9/7/2021	no response

INTERVIEW METHODOLOGY

While interviews for CIAs are typically held in persons and sometimes accompanied by a site visit, in light of the COVID-19 pandemic and state social distancing recommendations, all interviews were conducted via phone. Prior to the interview, ASM staff provided information about the nature and location of the proposed project and informed the potential interviewees about the current study. The potential interviewees were informed that the interviews were completely voluntary and that they would be given an opportunity to review their interview summary prior to inclusion in this report. With their consent, ASM staff then asked questions about their background, their knowledge of past land use, and history of the project area, as well as their knowledge of any past or ongoing cultural practices. The informants were also invited to share their thoughts on the proposed development and offer mitigative solutions. Below are the interview summaries that have been reviewed and approved by the consulted parties.

IAN COLE

On September 2, 2021, ASM staff, Lokelani Brandt contacted Mr. Ian Cole, the Department of Land and Natural Resources (DLNR) East Hawai'i Wildlife Program Manager. In the brief telephone conversation, Mr. Cole shared that there is a public right-of-way that allows entry into the Hilo Forest Reserve which is used primarily by local hunters. Mr. Cole noted that DLNR had more recently installed a hunter check-in station located in the vicinity of the Coast Guard chainlink fence. Mr. Cole added that he was not sure how frequently hunters utilize this area but since they have installed the hunter check-in station, the DLNR now has some data regarding its use. Aside from the information shared, Mr. Cole was not familiar with the subject parcel or the history of the area. He recommended ASM staff contact local hunter, Mr. Keola Medeiros and Mr. Steve Bergfeld as he believed they would know more about this area.

JACKSON BAUER

ASM staff, Lokelani Brandt conducted a telephone interview with Mr. Jackson Bauer, the DLNR Nā Ala Hele Trails and Access Specialist on September 2, 2021. Mr. Bauer explained that historically there were trails that extended into the forest and that for the most part, appear to have followed the *ahupua'a* boundaries. He shared that because of the local substrate and vegetation, findings physical evidence of the trail is difficult. He believes that prior to the plantation and homestead, the subject parcel was likely intact native forest and access to the uplands of Pihā would have been for specific cultural practices including bird hunting and *koa* (*Acacia koa*) harvesting. He also suspects that those who came into this forested area did so periodically and likely stayed for short durations; thus leaving little to no evidence of their time there and if any of the evidence was organic in nature, it has most likely decomposed. He went on to add that during the 20th-century, land use in the project area vicinity changed when the homestead was created. He described that in 2018, Nā Ala Hele prepared an abstract for TMK parcel 038 (located along the subject parcel's (*mauka*) western boundary) in which it was found that in 1941, the original Pihā-Kahuku Road was realigned to its current location and today, this road (which runs along the subject parcel's southeastern boundary) is the agreed-upon public access road to the forest reserve. Mr. Bauer emphasized that although this portion of the road (in the immediate vicinity of the subject parcel) is not paved, it is a public County road and that any development must not impede upon its boundaries or block access into the forest reserve. Lastly, Mr. Bauer provided a copy of the 2018 Nā Ala Hele Trail and Access System Pihā-Kahuku Road abstract which was prepared for Lot 1 (TMK: (3) 3-2-004:038), which is included in Appendix B of this report as well as CSF and Registered Maps (some of which have been utilized in this report).

STEVEN BERGFELD

At the recommendation of Mr. Ian Cole, on September 2, 2021, ASM staff, Lokelani Brandt conducted a phone interview with Mr. Steven Bergfeld. Mr. Bergfeld is the DLNR's Hawai'i Branch Manager and has hunted in the Pihā portion of the Hilo Forest Reserve. Mr. Bergfeld noted that his father-in-law, Mr. Victor Souza Jr. who grew up at the bottom of Pihā-Kahuku Road, in Pihā Homestead, along with his late father (Victor Souza Sr.) and late uncle Jules Souza and other community members have and continue to hunt in this portion of the forest reserve. Mr. Bergfeld shared that in the past they used to hunt on the subject parcel and other parts of the forest reserve. He briefly shared some memories of family members camping in the uplands of Pihā where they would ride horses and hunt. He described that in the past, they would drive up the Pihā-Kahuku Road and cross the pasture owned by Mr. Aguiar and walk up the old road and from there they would hunt. Otherwise they would enter the forest from Pihā-Kahuku Road to access the forest reserve. Mr. Bergfeld added that the DLNR has recently installed a hunter check-in station and is now beginning to gather data on the hunting activity in this area. As such, the DLNR does not have much historical data on the local hunting activity. Nonetheless, he stated that it is important for landowners who live in the vicinity of the forest reserve to know that even though they may not see a lot of hunters, hikers, cultural gatherers or other forest users and activity regularly, in the interest of these individuals, ensuring unobstructed access to the forest reserve is vital.

VICTOR SOUZA JR.

At the recommendation of Mr. Steven Bergfeld, ASM staff Lokelani Brandt conducted a telephone interview with Mr. Victor Souza Jr. Mr. Souza was born and raised in Pihā on a homestead property originally obtained by his grandmother located at the *makai* end of the homestead. Mr. Souza shared fond memories of growing up in Pihā and hunting in the forest reserve. When asked about his early memories of the area, Mr. Souza stated that the subject parcel

was always forested and that he would hike on the old trails, some of which followed the streams and plantation ditches and flumes to enter the forest. He noted that pigs were the only thing they hunted in this forest.

Mr. Souza fondly described the Pihā forest as “being so much more beautiful” when compared to today. He shared that today the forest has lots of noxious weeds but growing up he remembered seeing large *hāpu’u* (*Cibotium glaucum*), ‘ōlapa (*Cheirodendron trigynum*), large koa (*Acacia koa*) and ‘ōhi’a (*Metrosideros polymorpha*). He recalled that before *waiawī* (strawberry guava; *Psidium cattleianum*) and other noxious weeds arrived in this forest, it was much more open and clear. He commented that during the plantation era, there was always access to the forest but after the closure of the plantation, access became limited.

In addition to the forest being more pristine, he described accessing the streams to obtain drinking water during their hunting trips. He remembered their hunting trips being very long, sometimes from sun up to sun down, and packing a container of orange juice mix and a large jug. He described collecting fresh spring water from the stream and mixing it with his orange juice mix which he would enjoy while on their hunting expeditions. He stated that growing up, the stream water was clean and that they didn’t have to worry about things like “lepto” (leptospirosis). When asked about other uses of the streams, he shared that they used to gather ‘ōpae (shrimp) and watercress that were planted in patches along the stream. He recalled the ‘ōpae being prepared “poke” style or fried. He noted that today, he no longer sees ‘ōpae and that the streams have become filled with algae. Mr. Souza spoke about Waikaumalo Stream and another tributary “vein” that extended in the subject parcel that they called “Make-man stream” which can be translated as dead-man Stream. Mr. Souza related the following story, which he had learned from his family as a child, about two hunters that went into the forest. While on their return trip, one of the hunters who had become tired decided to go to the tributary stream to get some water. As the hunter knelt down and bent over to take a drink of water, he was pulled forward by the weight of his pack and drowned in the stream. Being that the hunter didn’t return home, the community went in search of the man who was later found in the stream. From that day, the stream (likely Kalaeha stream) became known as Make-man stream.

Mr. Souza remembered going to the forest as a young boy accompanied by his uncles (father’s brothers) David and Johnny Souza and his dad Victor Sr. He noted that they taught him how to hunt and navigate the forest using the old trails. He shared that his family would hunt between the areas of Hakalau all the way to ‘O’okala and that one of the practices of the hunters was to maintain the trails. Mr. Souza spoke specifically about a trail known as “Paperbark Trail.” In describing the route of this trail, Mr. Souza stated that the trail went along Waikaumalo stream to the hunting area which was marked by a paperbark tree and orchids and anthuriums, the latter two of which were planted by his family members. He shared that while growing up, hunting was a particularly important activity, especially during the mid-1940s (~1946) when the plantation workers went on strike. He described that during the strike, the community members would rotate their hunting expeditions and that they had set up a camp in an area further *mauka* with a “lake” surrounded by Alexander palm trees. The pigs that they caught were then brought down from the mountains and taken to the local “soup kitchen” where they were prepared into a meal and distributed to the community. He said that in this way, “the whole community had food.” He opined that the pigs that they harvested from this forest were always healthy and that they never really dealt with sick pigs which is more common today. He added that during World War II, while he was training for the Vietnam War, they would hunt and catch pigs for the military. Mr. Souza reflected how hunting provided food for their family and that the meat was prepared in many ways including sausage, pork water cress soup, and salt pork.

He reflected that “everything changes” and felt that he had grown up in the best of times, having enjoyed the forest, the food that the land provided, and the community. He shared that sometimes his grandkids go up the stream to swim but because of the poor water quality, he encourages them to stay out. Mr. Souza’s final comments were “everything changes.”

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include “...subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs” (OEQC 1997:1). The guidelines also identify the types of cultural resources, associated with cultural practices and beliefs that are subject to assessment. These include other types of historic properties, both man-made and natural, submerged cultural resources, and traditional cultural properties. The origin of the concept and the expanded definition of traditional cultural property is found in *National Register Bulletin 38* published by the U.S. Department of Interior-National Park Service (Parker and King 1998). An abbreviated definition is provided below:

“Traditional cultural property” means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community’s history and contribute to maintaining the ethnic community’s cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

“Traditional” as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. “Cultural” refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term “Property” defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of “Property” wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties.

As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this CIA has adopted the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant, the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- a Be associated with events that have made an important contribution to the broad patterns of our history;
- b Be associated with the lives of persons important in our past;
- c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- d Have yielded, or is likely to yield, information important for research on prehistory or history;
- e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa‘akai O Ka ‘Āina* v Land Use Commission court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

SUMMARY OF CULTURE-HISTORICAL BACKGROUND

The culture-historical background information gathered as part of this study revealed that traditionally, Pihā Ahupua‘a extended across various ecological zones that included, but were not limited to, the *wao kānaka*, *wao lipo*, *wao nāhele*, *wao kele*, and the *wao akua*. Based on the substrate and native vegetation, the project area appears to be within the *wao lipo*, a zone recognized by its tall trees. Due to the widespread presence of water and muddy conditions, the project area also appears to contain elements of the *wao kele*, defined as the rain belt region of a forest. Traditionally, these zones were not accessed regularly by the general populace, rather it was reserved for specific Hawaiian cultural practices including *kia manu* (bird catching), the hewing and carving of *koa* wood for canoes and likely other

hardwood species, and gathering of non-timber plants. The harvesting of native birds for subsistence, artistic, and symbolic purposes was an important part of certain traditional practices (Gomes 2016). Perhaps, the most famed traditional use of native birds involved the use of their feathers from which spectacular royal insignia including *ahu 'ula* (feathered capes), *mahi 'ole* (feathered helmets), *lei* (garlands), *kāhili* (feathered standards), and other adornments were intricately crafted.

Furthermore, Pihā is not explicitly referenced in traditional accounts, however, its precontact and mythic history can be traced, by its association, to the greater *'okana* of Hilo Palikū. Celebrated for its cliffs, wind-swept *kula* lands dissected by its many gulches and streams, and forested uplands, the native inhabitants adapted their horticultural and habitation practices to this rugged environment. Settlements were often scattered above the streams on the *kula* lands and along the coast. Planting areas were separated with wetland *kalo* being planted in irrigated terraces along the stream embankments while non-irrigated plants such as dryland *kalo*, *'uala*, *mai 'a*, *kō*, and *'ulu* were planted within the upper portion of the stream embankments and on the *kula* lands.

At the time of the *Māhele 'Āina* of 1848, Pihā went unclaimed but later, a dispute arose with the Trustees of the Bishop Estate who claimed that Pihā along with other lands had been continuously held by the ancestors of Bernice Pauahi Bishop. This dispute was settled and the Minister of the Interior conveyed Pihā along with other lands to the Hawaiian Kingdom government, thus establishing Pihā as Government Land. Boundary Commission testimonies gathered in 1875 revealed that an old trail, traditionally utilized by bird catchers extended along the Pihā-Kahuku boundary while a trail utilized by canoe carvers was along the Nanue boundary—the *ahupua 'a* that begins only slightly to the northeast of the subject parcel where Kahuku terminates—extended *mauka* and led to a place named Ka'ahina where canoes were made.

In the decades following the privatization of land as a result of the *Māhele 'Āina*, the landscape of North Hilo particularly in the area between the coast and up to roughly the 2,000-foot elevation was cleared to make way for the growing sugar plantation industry. However, within Pihā sugar appears to have been cultivated only to about the 1,500-foot elevation, just *makai* of the subject parcel. In 1892, the Hakalau Plantation Co. secured a lease for the approximately 4,250-acre Pihā Ahupua'a, thus marking the beginning of sugar cultivation in this area. By 1906, the Territorial Government established the Hilo Forest Reserve whose *makai* Pihā boundary is located to the west of the subject parcel. Between 1912 and 1914, a survey staking out the boundaries of the Pihā Homestead was completed and the lower portion of the *ahupua 'a* was subdivided into 28 lots. The subject parcel is Lot 2 of the Pihā Homestead track, which was sold to William Breithaupt, along with Lot 1, on August 23, 1916, as Grant No. 8584 for \$324.00. Lot 2 (along with several other lots within the Pihā Homestead) was held by the Breithaupt family for many decades however, it appears that the subject parcel was never developed and has remained as forested land until the present-day.

IDENTIFICATION OF TRADITIONAL AND CUSTOMARY PRACTICES, VALUED CULTURAL RESOURCES

The information from the culture-historical background information in conjunction with the results of the consultation process revealed the following with respect to traditional and customary practices and valued cultural resources.

Bird Hunting, Koa Logging, and the Cultural Value of the Forest

Historical records indicate that the forested areas of Pihā were traditionally utilized by bird hunters and canoe carvers to gather native bird species and *koa* logs. The gathering of *koa* wood to make canoes is an on ongoing cultural practice, however, there is no indication that such practice is occurring within Pihā Ahupua'a or the subject parcel. The traditional practice of gathering native bird species is no longer actively practice, which is a direct result of historical socio-political changes that led to the demise of the practice itself in conjunction with the changes in the local ecology. While the gathering of native bird species for cultural purposes is no longer practiced, the artisanal crafts (i.e. Hawaiian feather work) associated with this practice is still ongoing but does not take place within the subject parcel. While these traditions are not actively practiced within Pihā, recognizing these practices reinforces the importance of Pihā's culturally valued forested lands to the area's native inhabitants.

Furthermore, the forest in its entirety, was and still is, a valued cultural resource. The forest provided an abundance of plant resources and helped to capture water, which were essential to the lifeways of the area's native inhabitants. In addition to the tangible resources, the forest was and still is revered for it is considered a place where the myriad of gods in all their plant forms dwelled. Respect for the forest's tangible and intangible resources was traditionally demonstrated by limiting access to certain cultural practitioners who had a particular responsibility and who carried out the appropriate cultural protocols.

Trails, Roads, and Hunting

Access into the forest was from established trails that traditionally (based on the historical record) appears to have, for the most part, followed the *ahupuaʻa* boundaries. As the cultural practices that relied on these trails waned (i.e. bird hunting and *koa* harvesting), so did the use of the trails. As noted by Mr. Bauer, identifying any precontact or historic period trail is exceptionally difficult due to the substrate and vegetation. Furthermore, the archaeological inventory survey conducted on the subject parcel did not identify any trails or other historic properties.

Following the establishment of the Hilo Forest Reserve (ca. 1906) and Pihā Homestead (ca. 1915), the Pihā-Kahuku Road was laid out, the alignment of which is coterminous with the subject parcel's southern boundary. As stated in Nā Ala Hele Trail and Access Program Pihā-Kahuku Road abstract prepared in 2018 (see Appendix B), the Pihā-Kahuku Road is a public County road that provides public access into the Hilo Forest Reserve. However, unlike other parts of this road located *makai* (east) of the subject parcel, the County does not actively maintain that portion of the road adjacent to the subject parcel's southern boundary. The results from the consultation revealed that following the establishment of the Pihā Homestead and throughout the sugar plantation era, area residents utilized the Pihā-Kahuku Road and other trails, some of which followed the various streams including Waikaumalo and Kalaeha to access the subject parcel and the greater Hilo Forest Reserve for subsistence purposes, specifically pig hunting. Given the subject parcel is forested and undeveloped, several of the parties consulted as part of this study (and prior CIA studies) described accessing the parcel in the past for subsistence purposes. As shared by Mr. Souza, the trails that they used to access the forest reserve was maintained by the local hunters and were sometimes marked by certain plants including orchids and anthuriums.

Stream Resources

The parties interviewed as part of this study (and prior CIA studies) described accessing the streams for subsistence purposes. It was noted that the streams including Waikaumalo and Kalaeha were accessed to gather freshwater, watercress, *ʻōpae*, and prawns. It was further specified by Mr. Souza that obtaining freshwater from the stream is no longer possible because of poor water quality. It is unclear if watercress is still found along portions of the streams, however, the gathering of *ʻōpae* and stream prawns appears to be actively practiced along Waikaumalo.

PROPOSED RECOMMENDATIONS AND MITIGATIVE MEASURES

The following recommendations and mitigative measures are provided to ensure the above-described cultural practices, valued cultural resources, and beliefs are protected. It is understood that the project area footprint does not encompass the entire parcel, thus it is believed that this approach may result in a lighter impact on the area's forest resources. In light of this, it is recommended that the landowner make efforts to preserve the native forest in the areas outside of the project area footprint and that any landscaping planned within the project area incorporate native plants suitable to the local ecology.

Concerning the Pihā-Kahuku Road (which is coterminous with the subject parcel's southeastern boundary), it will be reiterated here that this is a public roadway that provides local hunters and other practitioners access into the Pihā portion of the Hilo Forest Reserve. There should be no efforts to block or restrict access along this roadway. The landowner should anticipate that vehicles may park along this roadway periodically as access into the forest reserve is by foot only.

Concerning stream resources, the project area is sufficiently distant from both Waikaumalo and Kalaeha streams that any cultural practices associated with these streams would not be impacted by the proposed development. However, as these streams are part of the larger cultural landscape of Pihā and the Hilo Palikū region, all precautions should be taken to maintain the health and flow of the stream.

In summary, the recommendations provided above are intended to ensure that the proposed development activities considered the concerns and thoughts shared by the consulted parties. These recommendations are also intended to support the landowner in being mindful of the cultural, social, and environmental uniqueness of Hawaiʻi. Conducting background research, consulting with community members, and taking steps towards mitigating any potential cultural impacts is done so in the spirit and practice of *Aloha ʻĀina*, a contemporary movement founded on traditional practices and beliefs that emphasize the intimate relationship that exists between Native Hawaiians and the *ʻāina* (land). If the landowner assumes ownership of their right and responsibility, we recommend it be done so in that same spirit and practice. Attention to, and implementation of the above-described issues and measures relative to the above-identified cultural resources, practices, and beliefs will help to ensure that no such resources, practices, or beliefs will be adversely affected by the proposed development.

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APPENDIX A.
***KA WAI OLA* PUBLIC NOTICE**

**CULTURAL IMPACT
ASSESSMENT FOR ROUGHLY
17.2-ACRE PARCEL IN PIHĀ
AHUPUA‘A, NORTH HILO
DISTRICT, ISLAND OF
HAWAI‘I**

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for a single-family residence being proposed on a portion of a roughly 17.2-acre parcel (TMK: (3) 3-2-004:037 located in Pihā Ahupua‘a, North Hilo District, Island of Hawai‘i. Please contact ASM Affiliates if you would like to participate or contribute to this study by sharing your mana‘o about any cultural or historical resources or other information you believe may be relevant. This includes, but not limited to, knowledge of past land use, history, traditional cultural uses of the proposed project area; or those who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property. If you have and can share any such information please contact Lokelani Brandt (lbrandt@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

APPENDIX B.
NĀ ALA HELE PĪHĀ KAHUKU ROAD ABSTRACT
PREPARED FOR TMK: (3) 3-2-004:038



NA ALA HELE

Hawai'i Trail & Access System

December 14, 2018

Ref: H18:14 Piha Kahuku

TO: Kylee Widemann, Hawaii Island Forestry Associate

FROM: Doris Moana Rowland, Na Ala Hele Trails and Access Program Abstractor *DMR*

SUBJECT: Comments regarding Conservation District Use Application
(CDUA) HA-3830 for the Ramos Single Family Residence situate at Piha,
North Hilo, Island of Hawaii, designated as Tax Map Key: 3-2-004:038

Available records disclose the Piha Kahuku Road (also known as Kahuku Piha Road) that adjoins the southern boundary of the subject parcel is a public county road that provides direct access to the Hilo Forest Reserve. The basis for this opinion is discussed below together with a brief history as to how the government acquired the ahupuaa of Piha.

The land of Piha 1 & 2

The land of Piha 1&2 was never assigned or awarded at the time of the Mahele of 1848. Controversy arose over the ownership of this land when the Trustees of the Estate of Bernice Pauahi Bishop claimed this land as an heir to certain lands which had been continuously held and claimed by her ancestors. In order to settle the controversy a compromise was proposed whereby the Minister of the Interior conveyed other lands to the Trustees who in turn conveyed the land of Piha (besides other lands) to the Kingdom of Hawaii on December 20, 1890. Thus the land of Piha was made a part of the Government land of the Kingdom of Hawaii. Unaware of this settlement, the author of the Archaeological Assessment of the subject CDUA erroneously categorized the land of Piha as Crown land.

The survey of the Piha Tract began in 1912 was completed by 1913. In 1915 William Breithaupt applied for and received Special Homestead Agreement No. 1252. Upon successful completion of all requirements of this agreement, the government sold the subject parcel to Breithaupt in fee simple in 1924. Land Patent (Grant) No. 8584 was issued to Breithaupt by the Governor of the Territory of Hawaii (see attachment). The Piha-Kahuku Road was identified in Grant 8584 as the Kahuku-Piha Road being 40 feet wide, running outside of the Breithaupt parcel along its southern boundary. This road is also shown on Registered Map No. 2568 (RM 2568) titled "Piha Homesteads" dated 1914 (see attached). Both the survey sketch made a part of Grant 8584 and RM 2568 show the road provides direct access to the Forest Reserve.

Division of Forestry & Wildlife • Dept. of Land & Natural Resources • 1151 Punchbowl Street • Honolulu, Hawaii 96813

Piha Kahuku Road is a public county road

The government laid out and appropriated money in 1939 for construction of the Piha Kahuku Road, which today is a public county road pursuant to Chapter 264-1, Hawaii Revised Statutes. This section provides that "public highways are of two types: (1) State or federal-aid highways which are all those under the jurisdiction of the department of transportation, and (2) County highways, which are all other public highways."

Section 264-2, Hawaii Revised Statutes, then provides that "the ownership of all county highways is transferred to and vested in the respective counties in which the county highways lie." This language was enacted by Act 221, 1965 Hawaii Session Laws 338.

The subject CDUA reports the portion of Piha Kahuku in the vicinity of the Ramos parcel is overgrown up to the boundary of the State Forest Reserve property. While the condition of the road may not be ideal, it is my opinion based on the evidence in the documents and maps I have reviewed, the Piha Kahuku Road is a public road that provides direct access to the Forest Reserve. As a public road access is secure for all persons who wish to enter the Forest Reserve.

Please contact me at 587-0057 if you have any questions or concerns regarding the Piha Kahuku Road.

Land Patent No. 6584

(Grant)

Issued On

SPECIAL HOMESTEAD AGREEMENT

By THIS PATENT the Governor of the Territory of Hawaii, in conformity with the laws of the United States of America and of the Territory of Hawaii, makes known to all men that he has this day granted and confirmed unto

WILLIAM BREITHAUP

for the consideration of— his — having paid into the Treasury the sum of

THREE HUNDRED TWENTY-FOUR AND 00/100 Dollars, \$ 324.00 —,

and for the further consideration of his having complied with the terms and conditions of Special Homestead Agreement No. 1252, all in accordance with the provisions of Section 73 of the Hawaiian Organic and Section 352 et seq. of the Revised Laws of Hawaii of 1915,

all of the land situate at PIHA HOMESTEADS in the District of NORTH HILO Island of HAWAII bounded and described as follows:

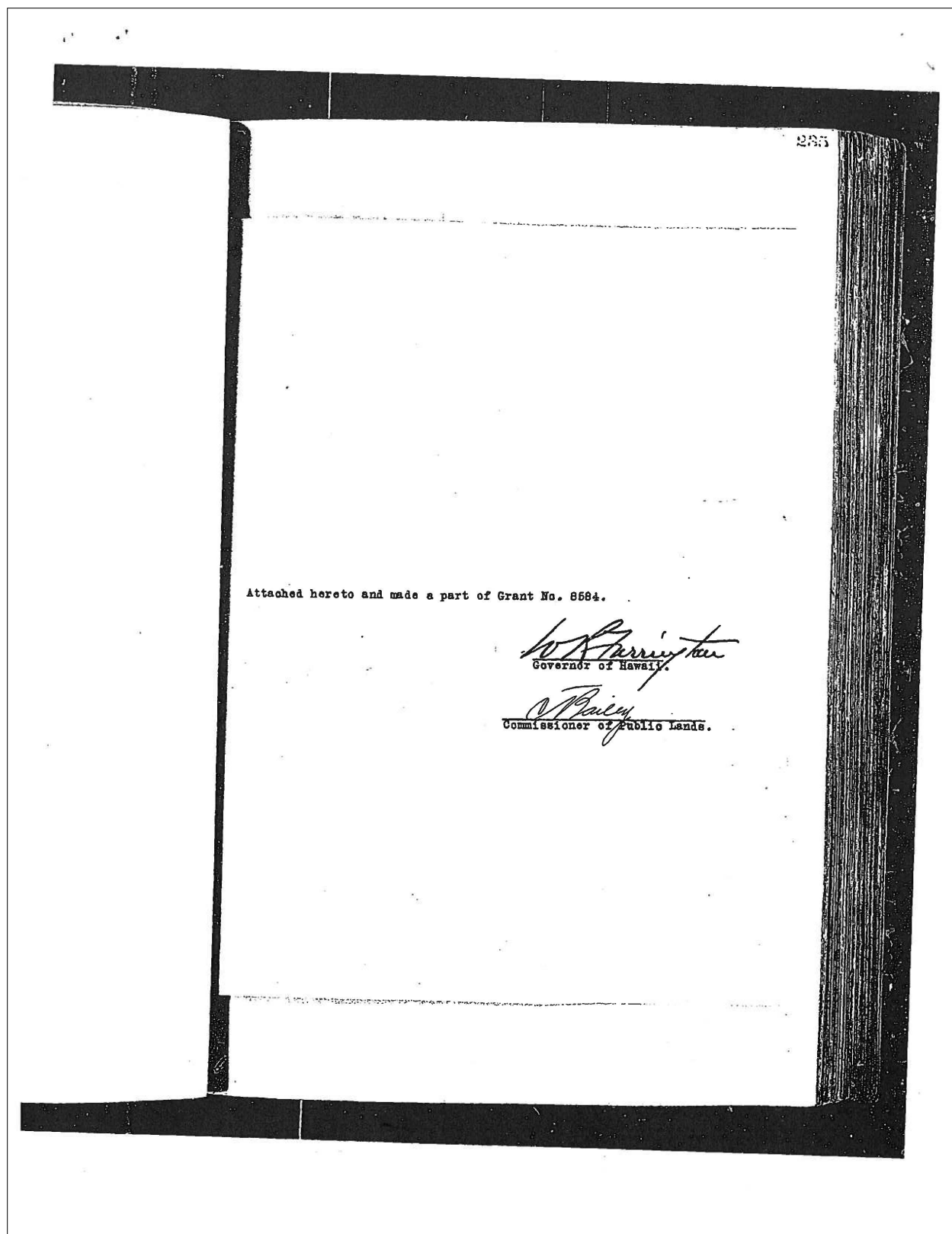
Lots 1 & 2, Reg. Map 2568, First Land Dist.

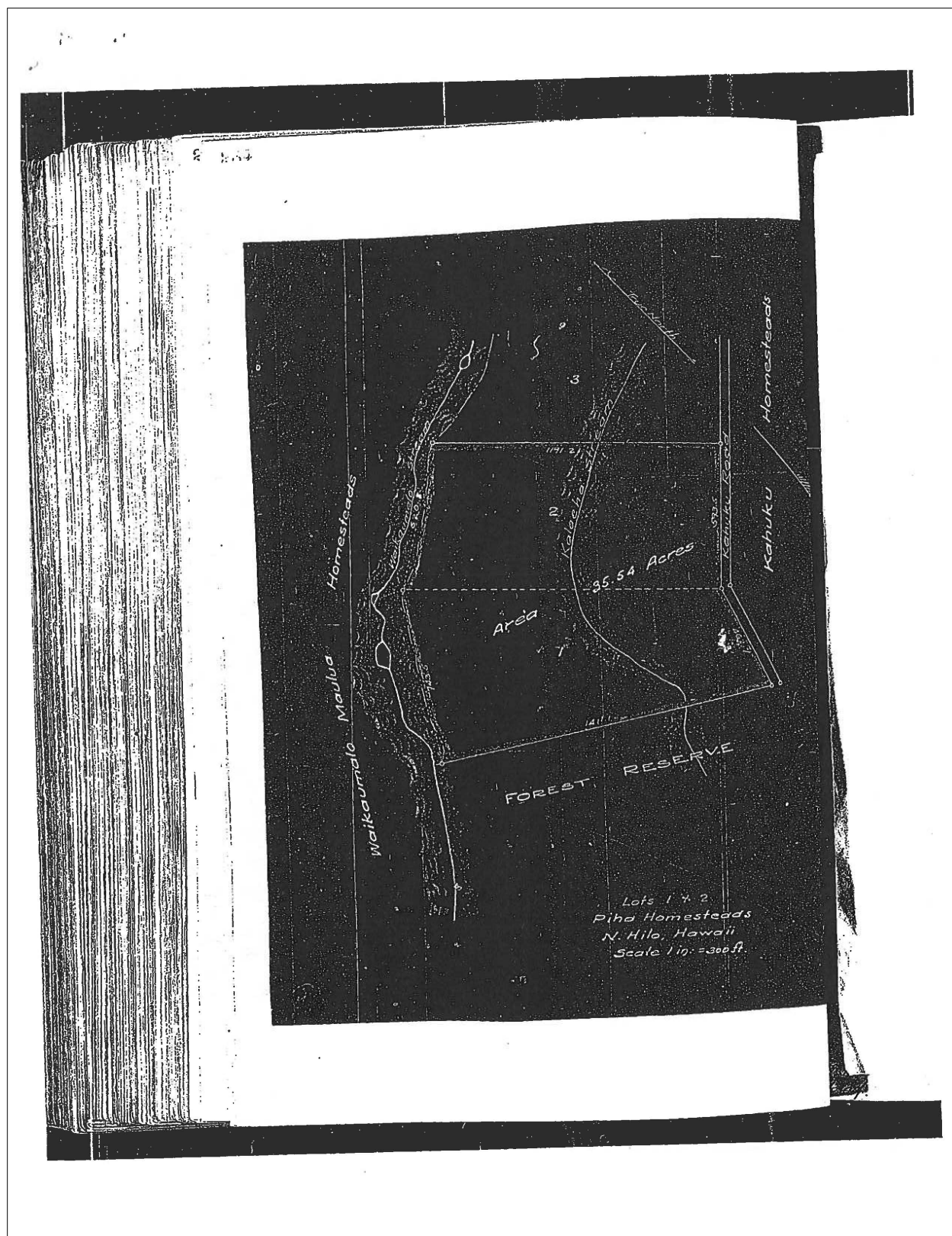
Beginning at a 2 inch galvanized iron pipe at the East corner of Lot 2, the South corner of Lot 3, and on the North side of the Kahuku-Piha 40 foot road, the coordinates of said point of beginning referred to Government Survey Trig. Station "Baiku" being 8748.7 feet South and 6736.9 feet West, as shown on Government Survey Registered Map No. 2568, and running by true azimuths:

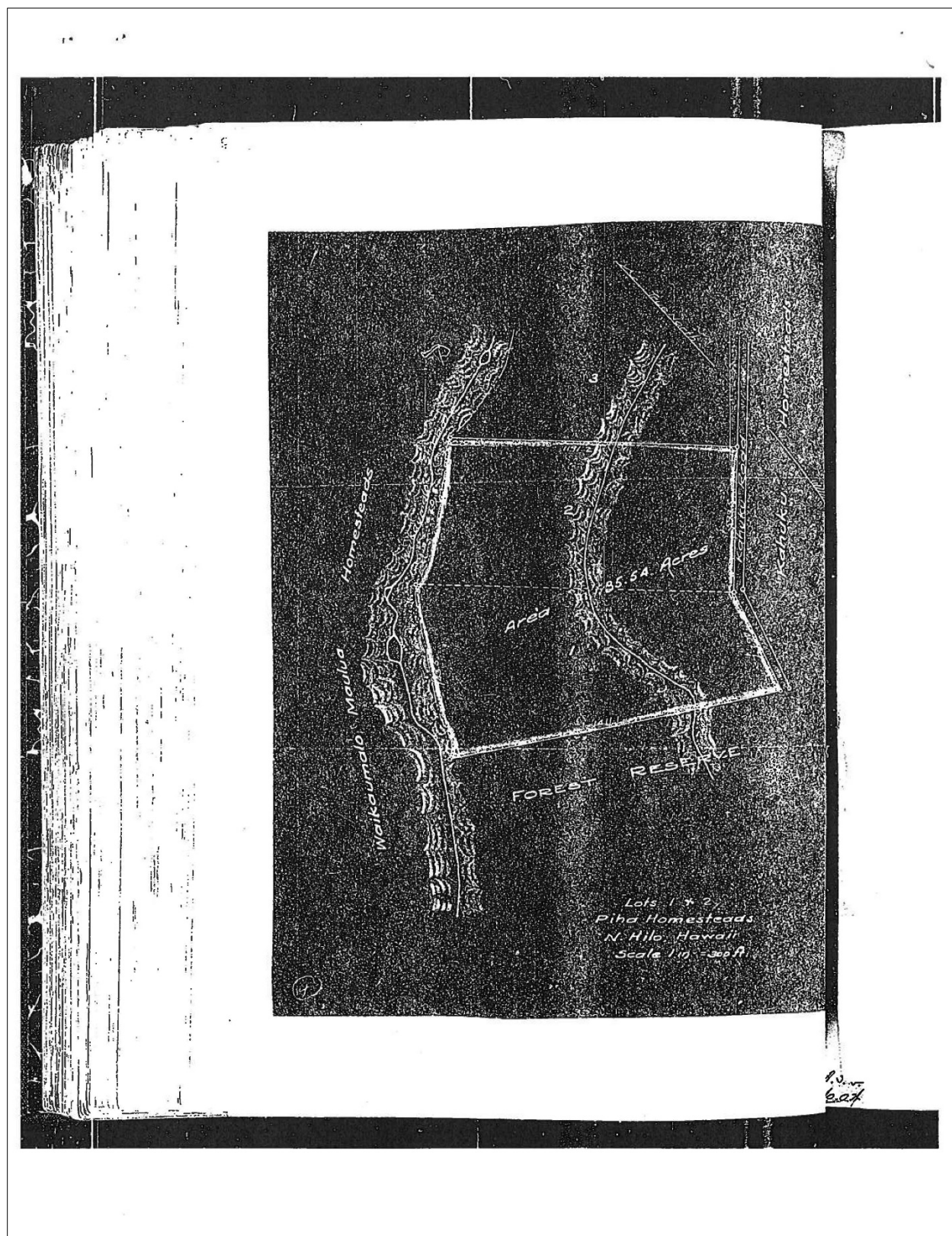
1. 44° 33' 593.5 feet along the Kahuku-Piha Road to a pipe;
2. 16° 18' 462.7 feet along the Kahuku-Piha Road to a pipe on Forest Reserve boundary;
3. 121° 40' 1411.1 feet along Forest Reserve to a pipe on top of the South edge of the Waikaumalo Gulch;
4. Thence along the top of the South edge of Waikaumalo Gulch to a pipe, the direct azimuth and distance being: 211° 41' 743.5 feet;
5. Thence still along the top of the South edge of the Waikaumalo Gulch to a pipe, the direct azimuth and distance being: 236° 47' 30" 620.8 feet;
6. 315° 20' 1191.2 feet along Lot 3 to the point of beginning.

AREA 35.54 ACRES.

Excepting and reserving therefrom the Kalasha Stream and all riparian rights in and to this stream and the waters thereof.







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Kahuku Homesteads

Containing 35.54 Acres, more or less.

TO HAVE AND TO HOLD the above granted Land unto the said

WILLIAM BREITHAUP

and — his — heirs and assigns forever;

Subject, however, to the conditions contained in Section 73 of the Hawaiian Organic Act, and more particularly of that portion thereof which reads as follows:

"No public land for which any such certificate (of occupation), (right of purchase) lease, or (cash freehold agreement or special homestead) agreement is issued after May 27, 1910, or any part thereof or interest therein or control thereof shall, without the written consent of the commissioner and governor, thereafter, whether before or after a homestead lease or patent has been issued thereon, be or be contracted to be in any way, directly or indirectly, by process of law or otherwise, conveyed, mortgaged, leased or otherwise transferred to or acquired or held by or for the benefit of any alien or corporation; or, before or after the issuance of a homestead lease or before the issuance of a patent, to or by or for the benefit of any other person; or, after the issuance of a patent, to or by or for the benefit of any person who owns, holds, or controls, directly or indirectly, other land or the use thereof the combined area of which and the land in question exceeds eighty acres. The prohibitions of this paragraph shall not apply to transfers or acquisitions by inheritance or between tenants in common. Any land in respect of which any of the foregoing provisions shall be violated shall forthwith be forfeited and resume the status of public land and may be recovered by the Territory or its successors in an action of ejectment or other appropriate proceedings."

IN WITNESS WHEREOF, The Governor of the Territory of Hawaii has hereto set his hand and caused the Great Seal of the Territory to be hereunto affixed, this

22nd day of December, A. D. 1924

BY THE GOVERNOR:

C. Bailey
Commissioner of Public Lands.

Approved as to form:

A. H. H. H.
1st Deputy Attorney General.

