

Hāmākua Land Sale:

KOHOLĀLELE

DRAFT ENVIRONMENTAL ASSESSMENT

Prepared for:
County of Hawai'i
Department of Finance

Prepared by:



April 2010

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SUMMARY

Project Name:	Hāmākua Land Sale: Koholālele
Location:	Koholālele, Hāmākua District, Island and County of Hawai‘i, TMK: (3) 4-2-005:001, approximately 1,040 acres
Landowner:	County of Hawai‘i
Proposing Agency:	County of Hawai‘i, Department of Finance
Accepting Authority:	Mayor or designee, County of Hawai‘i
Proposed Action:	Sale of County lands
Existing Use:	Fallow former sugarcane land overgrown with Guinea grass, ironwood trees, and other invasive weeds
Land Use Designations:	
State Land Use District:	Agriculture
Hawai‘i County Zoning:	A-40a
County General Plan:	Important Agricultural Lands
Alternatives Considered:	Hawai‘i County has considered four alternatives: no action, selling, exchanging, or leasing. To meet the objective of encouraging productive agricultural use of the Site, the alternatives of selling, exchanging, or leasing are viable alternatives. However, leasing for agricultural purposes would require some infrastructure costs and increased resources for property management. With the plans to offer agricultural leases for the Kapulena County lands, there may not be the leasing demand for the Site to justify the cost, time, and added expense to lease the Site. Exchanging is totally dependent on finding a suitable exchange site and willing owner. To meet the objective of maximizing revenues, the sales alternative is the most viable in terms of the sales proceeds and ongoing property tax revenues since the land would be privately owned. Therefore, unless an exchange becomes an option, selling the Site best meets the objectives of encouraging agricultural productivity and generating revenues.

Summary of Major Impacts and Mitigation Measures:

There are no sensitive resources on the Site (e.g., threatened or endangered species, native habitats, significant archaeological sites) that require special protection through continued government ownership or special deed restrictive covenants. Based on soil

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characteristics, topography, and rainfall, the Site is suitable for agriculture, but not as suitable in the upper portion of the Site where the topography is steeper (where the ALISH designation is Unclassified, i.e., not Prime or Other). The Site is beyond the service area of the Hāmākua Ditch, and alternative surface or groundwater sources for irrigation may not be feasible; hence, agricultural activity will need to depend on rainfall. Altering the land contours for agricultural or farm dwellings could affect the drainage onto the downstream owner, but this can be mitigated by developing conservation plans as required by the County’s grading ordinance. Should the purchaser of the Site subdivide to the maximum permitted by the existing A-40a zoning, the maximum number of lots would be approximately 20 lots (assuming 20% of the land area would be used for road improvements or other purposes). The County would likely require improvements such as all-weather access roads (for emergency vehicles) and safe connection to Māmalahoa Highway as conditions of subdivision. The lack of existing capacity in the County’s Pa‘auilo water system would mean that the subdivision would be served by water catchments and limited to six lots under the Planning Department’s water variance rules. The permitted farm dwellings would be allowed to install cesspools that meet the Department of Health’s standards since the Site is located in a non-critical wastewater disposal area where any cesspool leachate would not impact the groundwater or nearshore coastal waters. The Site is not in any special natural hazard area.

**Anticipated
Determination:**

Finding of No Significant Impact (FONSI)

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1.0 INTRODUCTION

1.1 PROPOSING AGENCY AND ACCEPTING AUTHORITY

The proposed action is the sale of County land. Any use of State or County land triggers an environmental review pursuant to Section 343-5(a)(1), *Hawai‘i Revised Statutes* (HRS), unless it is an exempt action. Since the sale of County lands is not an exempt action, the Department of Finance, as the agency that handles the disposition of County land, is the proposing agency for this environmental assessment. Whenever a county agency proposes an action, the accepting authority is the Mayor or authorized representative¹. The mailing address and primary contact person is listed below:

Ms. Nancy Crawford, Deputy Director
County of Hawai‘i
Department of Finance
25 Aupuni Street, Room 118
Hilo, Hawai‘i 96720

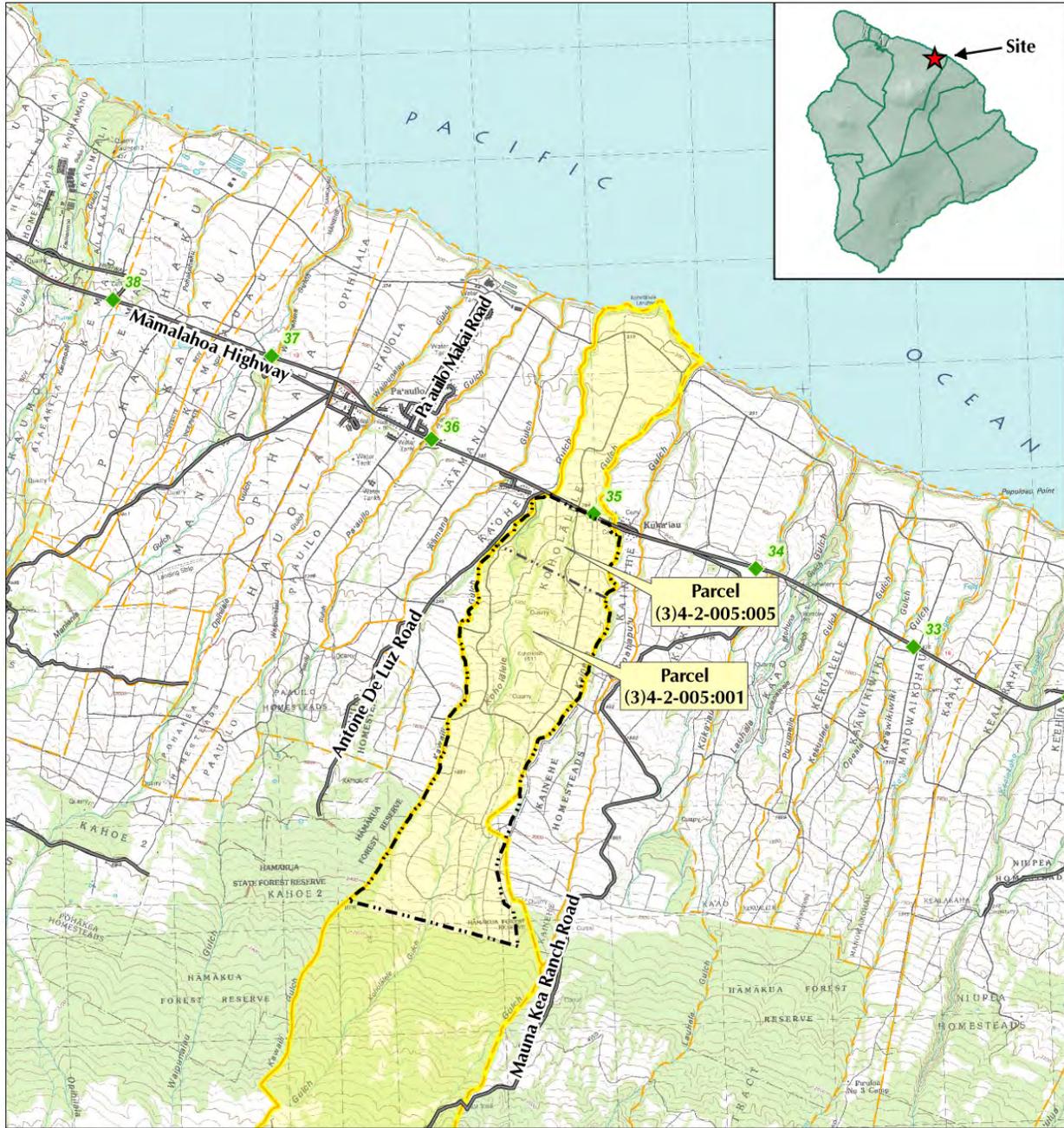
1.2 PROPERTY LOCATION

The County land proposed for sale is located in the ahupua‘a of Koholālele in the Hāmākua District, on the northeast side of the Island and County of Hawai‘i (“Site”). The Site consists of two parcels: TMK (3) 4-2-005-001 (approximately 900 acres) (“Parcel 1”) and TMK 4-2-005-005 (approximately 140 acres) (“Parcel 5”), totaling approximately 1,040 acres. The Site is located on the south (mauka) side of Māmalahoa Highway, east of Pa‘auilo, at about the 35 mile marker (Figure 1).

¹ Hawaii Revised Statutes §343-5(b)(2)(B).

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Figure 1, Regional Location Map



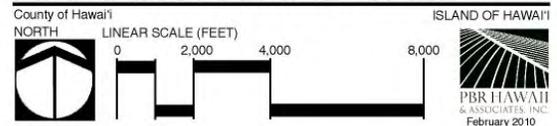
LEGEND

- Koholālele Site
- Mile Marker
- Roads
- Ahupua'a
- Koholālele Ahupua'a

Source: U.S. Geological Survey
Disclaimer: This graphic has been prepared for general planning purposes only.

Regional Location

KOHOLĀLELE HĀMĀKUA LAND SALE



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1.3 EXISTING USE

The County has cleared and fenced Parcel 5, consisting of approximately 140 acres of the Site, for a planned road maintenance baseyard. A previous environmental assessment described and assessed this proposed maintenance yard use.² However, because the County may sell this cleared area in lieu of establishing a baseyard, this parcel is included in this environmental assessment.



The remainder of the Site beyond the fenced area has not been developed or used and is overgrown with Guinea grass and ironwood.

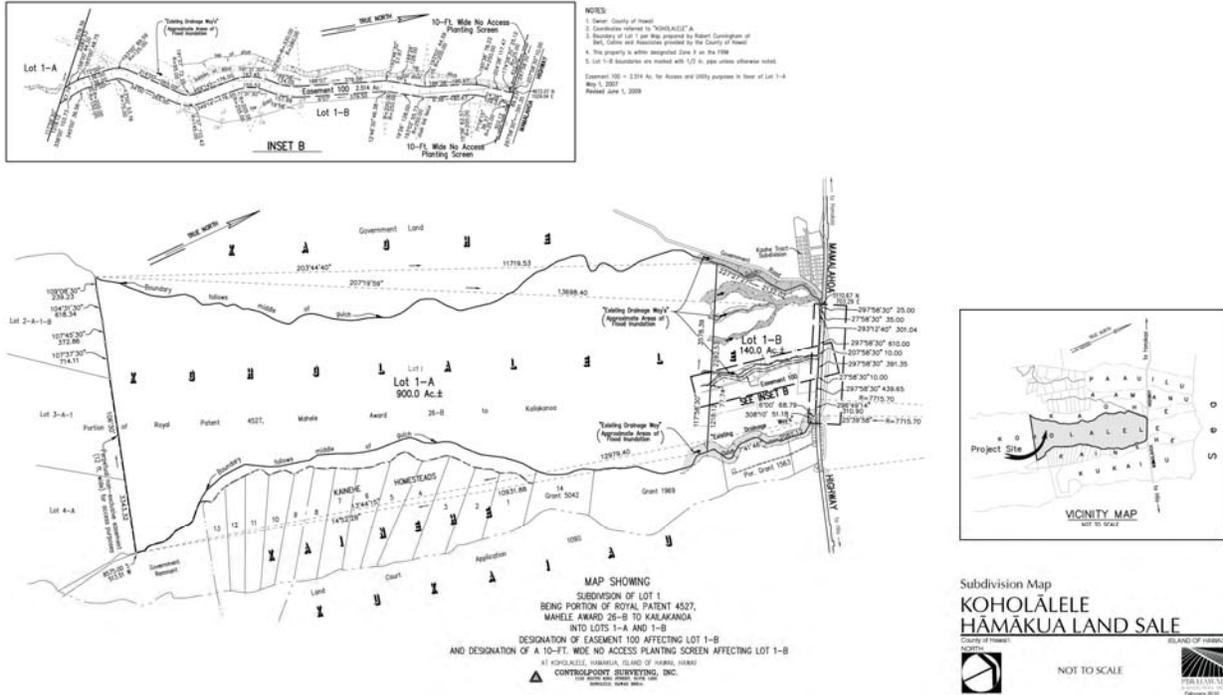


² Brian T. Nishimura Planning Consultant, October 2007. Hāmākua Road Maintenance Baseyard Draft Environmental Assessment. Prepared for County of Hawaii Department of Public Works.

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An electrical HELCO powerline traverses approximately midway through the Site in a north-south direction. A former dirt cane road traverses through the Site from Māmalahoa Highway to the mauka boundary. An easement through Parcel 5 in the vicinity of the existing cane road provides access to Parcel 1 and establishes the permitted access point to Māmalahoa Highway (see Figure 2)

Figure 2, Subdivision Map



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1.4 SURROUNDING LAND USES

The site is bound to the north (makai) by Māmalahoa Highway. Across the highway, Kamehameha Schools owns the property from the highway to the ocean and grows eucalyptus trees (see Figure 3).

To the east of the Site (towards Hilo), near the highway are a cluster of commercial buildings and single family dwellings in a town called Kūka'iau. Kainehe Gulch forms the east boundary of the Site. Mauna Kea Ranch Road provides access to the lots east of Kainehe Gulch.

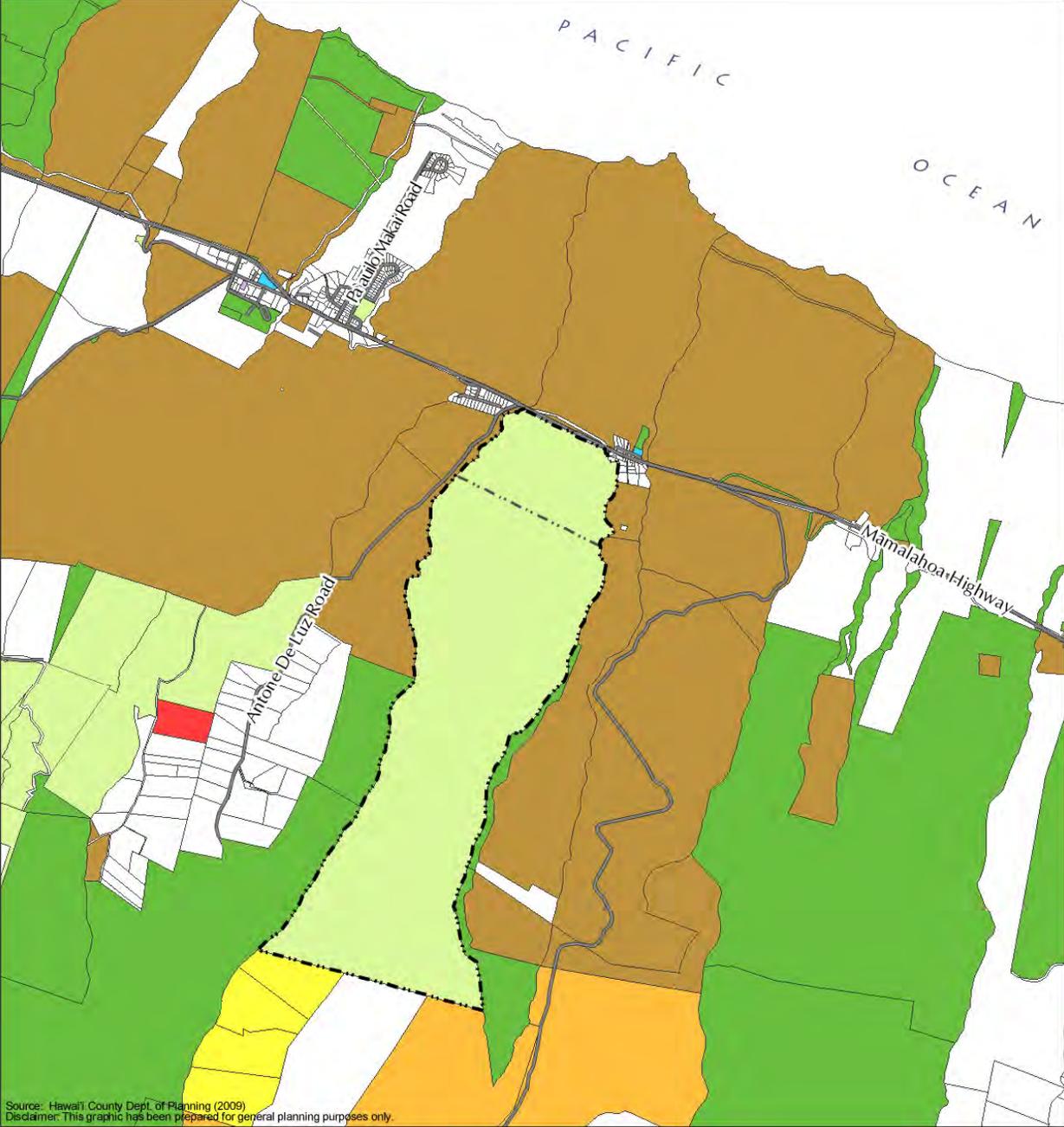
South of the Site (mauka) are large privately owned lots in the State Land Use Agricultural District, the Hāmākua Forest Reserve Pa'auilo sector bordering the southwest corner of the Site, and the Hāmākua Forest Reserve Kainehe sector bordering the southeast corner of the Site.

The Kawaii Gulch forms the west boundary of the Site (towards Honoka'a). Across this gulch, the Antone De Luz Road provides access to single family dwellings and ranches within the Pa'auilo Homesteads, as well as the lots the County plans to sell described and assessed in a previous environmental assessment,³ A cluster of single-family dwellings is located west of the Site along Māmalahoa Highway in the Ka'ohe Tract Subdivision with access from Ka'ohe Road. The town of Pa'auilo is approximately a mile to the northwest.

³ PBR HAWAII, December 2006. Pa'auilo Lands Final Environmental Assessment. Prepared for the County of Hawaii Department of Finance.

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Figure 3, Major Surrounding Landowners



LEGEND

Koholālele Site

Major Landowner

- | | |
|--------------------------|-----------------------|
| Govt. County of Hawai'i | Koholālele Ranch |
| Govt. State | Roman Catholic Church |
| Govt. State DHHL | Kūka'iau Estates |
| Kamehameha Schools | C.T. Mitchell |
| Hawai'i Conf. Foundation | Other |

Surrounding Landowners

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NORTH

LINEAR SCALE (FEET)
0 1,500 3,000 6,000

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February 2010

2.0 PROJECT DESCRIPTION

2.1 GOALS AND OBJECTIVES OF THE PROPOSED ACTION

The County acquired the Site from the bankrupt Hāmākua Sugar Company in 1994 in a settlement of taxes owed to the County of Hawai‘i. Prior to the County’s acquisition, the property had been in active sugar cane production. The County Department of Finance will be selling this property in accordance with County Council Resolution No. 161-02, adopted on January 24, 2002, authorizing the sale of the Site. Although the sales proceeds are not considered property tax revenues that are subject to the 2% allocation into the Public Access, Open Space, and Natural Resources Preservation special fund pursuant to Hawai‘i County Code §2-214(b)(5), the Mayor has proposed that the proceeds be deposited into that special fund or exchanged for any land on the Open Space priority list.⁴ The Hawai‘i County Department of Finance (DOF) proposes to initially sell or exchange Parcel 1 at public auction, and may later consider selling or exchanging Parcel 5.

2.2 NEED FOR THE PROPOSED ACTION

The County has not used, generated revenues, or otherwise derived any benefit from the Site since acquiring it in 1994 from Hāmākua Sugar Company in lieu of real property taxes owed. The County views that the sale of these lands will serve the greater public interest in that it will allow these lands to return to productive agricultural use while allowing the County to recoup previously unpaid real property taxes that it may use to fund existing or additional programs. The sale will also mean that these lands will revert to private ownership and will be subject to real property taxes that are currently not being paid under County ownership.

2.3 POTENTIAL USES

While the lands are expected to remain in agriculture, the exact use and any associated impacts will depend on the buyer. This EA, however, discusses potential impacts and mitigation measures for the possibility that the Site would be subdivided up to the maximum number of lots permitted by zoning with a farm dwelling built on each lot. The Site is zoned A-40a, allowing dwellings at a minimum lot size of 40 acres. Assuming 20% of the 1040-acre Site would be used for roadways, the Site could be further subdivided into a total of 20 lots. This hypothetical number of lots also assumes that water is or will become available.

2.4 TIMING OF ACTION

The proposed sale or exchange is tentatively planned for the later part of 2010.

⁴ Armstrong, Jason, “A flip-flop on land policy”, Hawaii Tribune Herald, January 16, 2010.

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3.0 ASSESSMENT OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter describes the existing conditions of the natural or physical environment, potential impacts of the proposed action, and mitigation measures to minimize any adverse impacts.

3.1 CLIMATE

The Site lies between the 800 and 2,400-foot elevations on the windward northeast side of Hawai'i Island. It is affected by the prevailing northeast trade winds, making the local climate cool and wet. Winds are generally northeast, with typical trade wind speeds of 10-15 miles per hour.

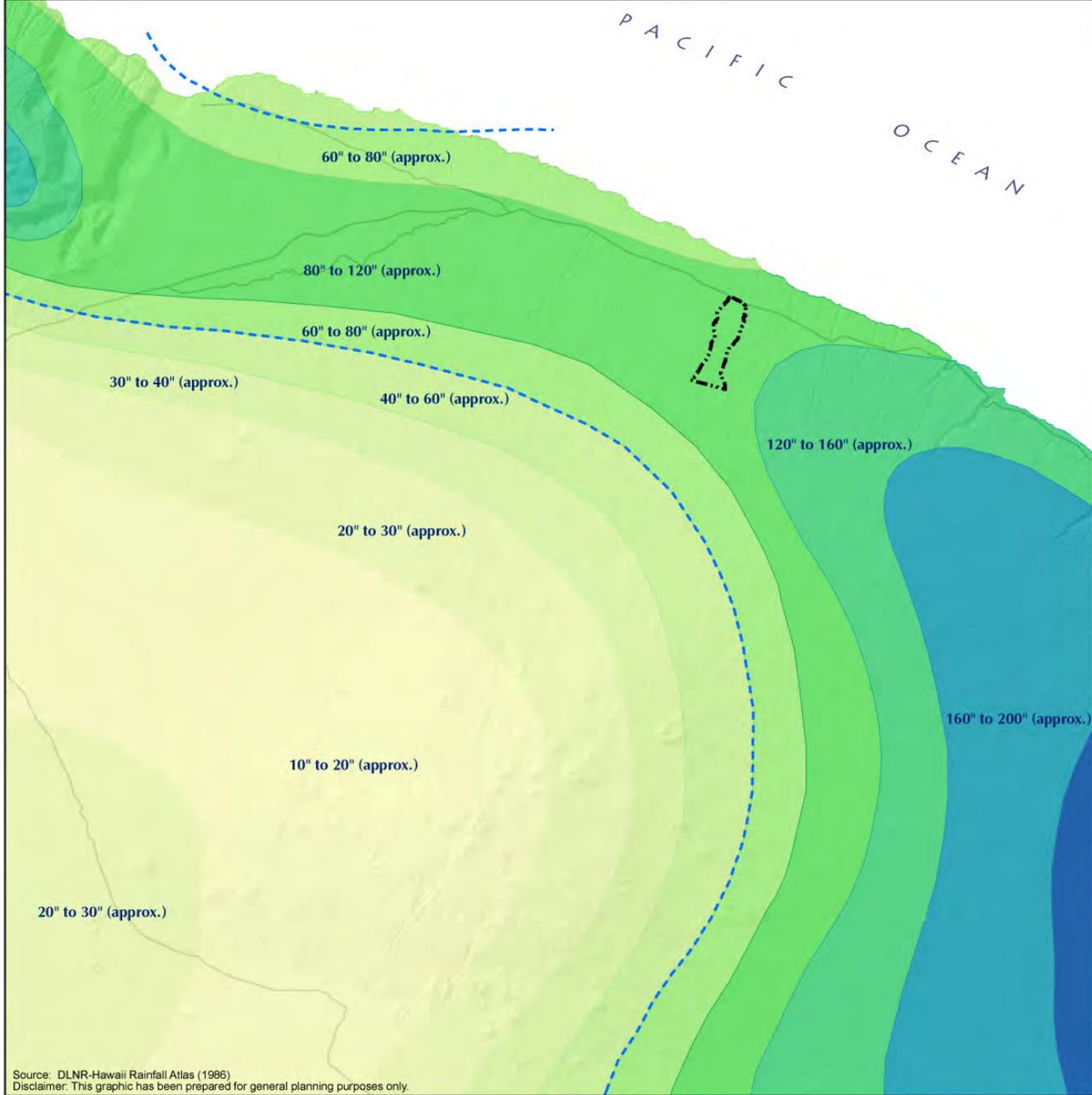
Average annual rainfall in the general vicinity of the Site is approximately 80-120" inches (see Figure 4). The average temperature for the Site is 74-76°F (DLNR 1970).

Potential Impacts and Mitigation Measures

The proposed sale and subsequent use of the Site will not affect the regional climate.

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Figure 4, Rainfall



Source: DLNR-Hawaii Rainfall Atlas (1986)
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LEGEND

Koholālele Site

Rainfall (inches)

- ~ 60 inches
- 10" to 20" (approx.)
- 20" to 30" (approx.)
- 30" to 40" (approx.)
- 40" to 60" (approx.)
- Up to 60" (approx.)
- 60" to 80" (approx.)
- 80" to 120" (approx.)
- 120" to 160" (approx.)
- 160"+ (approx.)
- 160" to 200" (approx.)
- 200" to 240" (approx.)

Median Annual Rainfall
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NORTH

ISLAND OF HAWAII

LINEAR SCALE (FEET)
0 20,000 40,000

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3.2 TOPOGRAPHY AND GEOLOGY

Located on the slopes of Mauna Kea, the Site has an average slope of 12%. Rocky gulches run from south to north, the length of the site.

Soils within the Site derive from Mauna Kea Holocene and Pleistocene era volcanic rocks (Wolfe and Morris 1996). Soils are discussed in more length in Section 3.4 of this report.

Potential Impacts and Mitigation Measures

No significant impacts to the regional geology and topography are anticipated as a result of the proposed sale or any subsequent use of the Site.

3.3 DRAINAGE & SURFACE WATER RESOURCES

The Site is bound to the east by Kainehe Gulch and to the west by Kawaili Gulch. Koholālele Gulch runs roughly down the center of the Site. Koholālele Gulch is also the name of the perennial stream that flows through that gulch with a perennial tributary that flows through Kawaili Gulch and an intermittent tributary also named Koholālele Gulch that flows through the middle of Parcel 5. The perennial stream that flows through Kainehe Gulch is a tributary to the perennial stream flowing through Kalapahapuu Gulch (see Figure 5)

The Site is designated Zone X by the Flood Insurance Rate Map, indicating that the lands beyond the gulches are not floodplains (Figure 6). The lands contain no known drainage improvements.

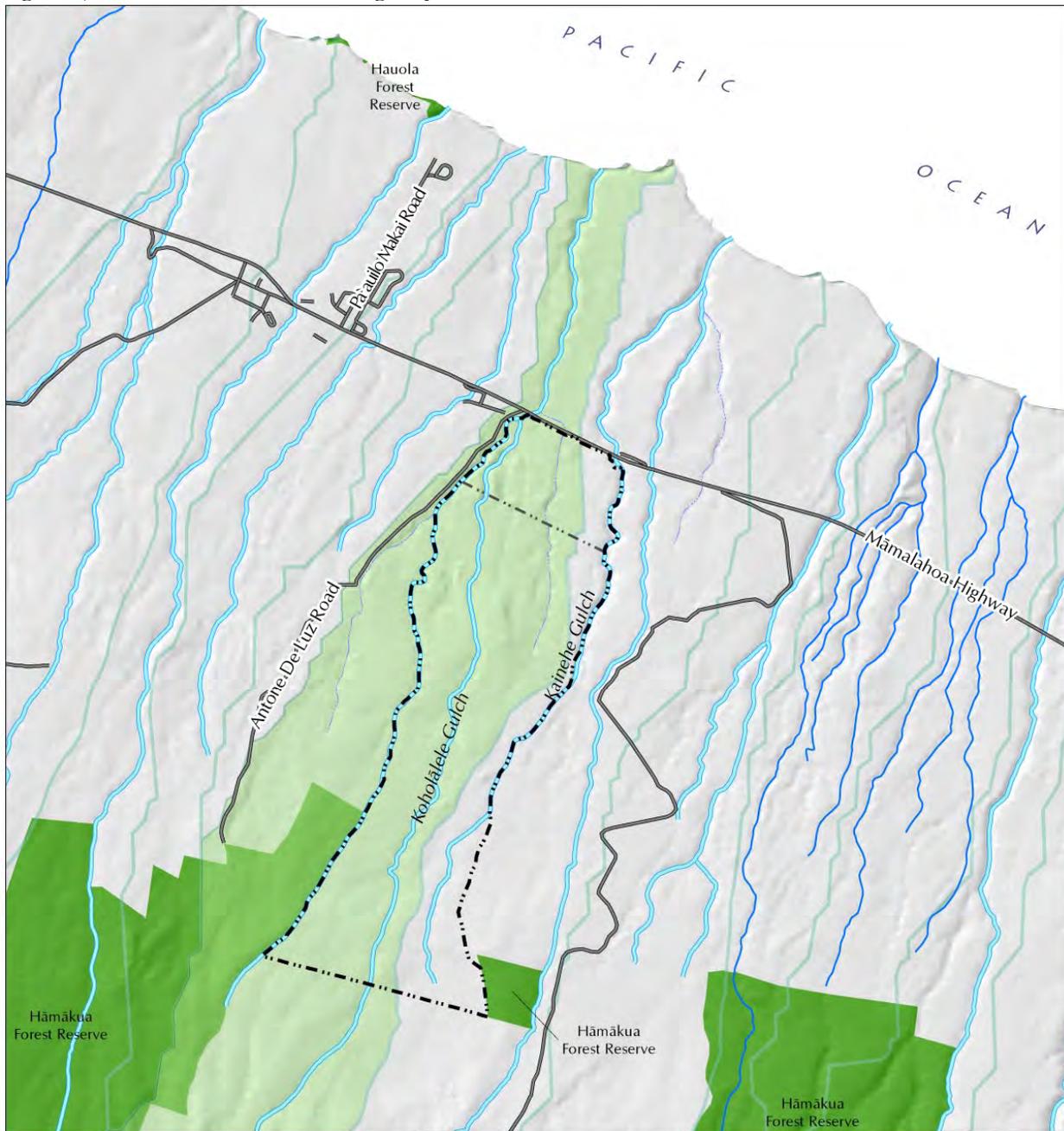
Potential Impacts and Mitigation Measures

Clearing, grubbing, and use of the land for agriculture will likely alter the drainage patterns. As the Site becomes subdivided and populated by multiple owners, the “upstream” owner could have an impact on the “downstream” owner. The mitigation of such drainage impacts could be better coordinated if each owner diligently develops a conservation program “acceptable to the applicable soil and water conservation district directors . . . providing:

- (A) Such operations do not alter the general and localized drainage patterns with respect to abutting properties.
- (B) A conservation program for the affected properties acceptable to and approved by the applicable soil and water conservation district directors is filed with the soil conservation district.
- (C) The conservation program, with appropriate modifications is reviewed and re-approved by the soil and water conservation district directors periodically but not less than once every five years.” (Hawai‘i County Code §10-3(b)(5)).

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Figure 5, Streams and Natural Drainageways



LEGEND

- | | |
|---|--|
|  Koholālele Site | Stream Type |
|  Forest Reserve |  Intermittent |
| Watershed |  Perennial |
|  Koholālele |  Non-Perennial |
|  Other |  Other Stream Types |

Source: CWIRM Stream Assessment/DLNR Division of Aquatic Resources (2004)
DLNR/DOFAW Reserves (2008)

Disclaimer: This graphic has been prepared for general planning purposes only.

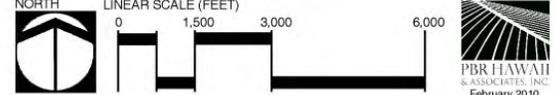
Streams & Forest Reserves

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County of Hawai'i | ISLAND OF HAWAII

NORTH | LINEAR SCALE (FEET)

0 1,500 3,000 6,000



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Figure 6, Flood Insurance Rate Map (FIRM)



LEGEND

 Koholālele Site

Flood Rating

 Floodway

 100-Year Floodplain

 500-Year Floodplain

 Outside Floodplain / Minimal Flooding

Source: Federal Emergency Management Agency (2007)
Disclaimer: This graphic has been prepared for general planning purposes only.

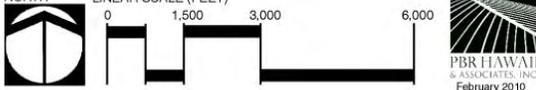
Flood Insurance Rate Map

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NORTH

LINEAR SCALE (FEET)
0 1,500 3,000 6,000



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3.4 SOILS

Three soil suitability studies have been prepared for lands in Hawai‘i. These are the U.S. Department of Agriculture *Soil Conservation Service Soil Survey* (USDA 1972), the University of Hawai‘i Land Study Bureau *Detailed Land Classification* (Baker 1965), and the State of Hawai‘i Department of Agriculture’s *Agricultural Lands of Importance to the State of Hawai‘i* (ALISH) (State of Hawai‘i 1977). The principal focus of these studies has been to describe the physical attributes of Hawai‘i’s lands and the relative productivity of different land types for agricultural production purposes.

3.4.1 Soil Conservation Service Soil Survey

The *Soil Survey of the Island of Hawai‘i, State of Hawai‘i* (USDA 1972) identifies eight soil types on the Site (Figure 7).

- Honoka‘a Silty Clay Loam, Low Elevation, HsC (0–10% slopes)
- Honoka‘a Silty Clay Loam, Low Elevation, HsD (10-20% slopes)
- Honoka‘a Silty Clay Loam, Low Elevation, HsE (20–35% slopes)
- Honoka‘a Silty Clay Loam, HTD (10-20% slopes)
- Kūka‘iau Silty Clay Loam, KuC (6-20% slopes)
- Kūka‘iau Silty Clay Loam, KuD (12-20% slopes)
- Kūka‘iau Silty Clay Loam, KuE (20-35% slopes)
- Rough Broken Land, RB

The USDA classifies the agricultural suitability of these soil types from I to VIII, with Capability Class I being the best suited for agriculture and Class VIII being the least suited. The soils on the Site are comprised of soils in Classes IV, VI, and VII:

- Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.
- Class VII soils have very severe limitations that make them generally unsuited to cultivation and restrict their use largely to pasture or range, woodland, or wildlife.

Capability subclasses, which are designated by adding a letter after the Roman numeral, indicate the main limitation risk. For example, Kūka‘iau Silty Clay Loam is classed as IVE, VIe, indicating that the main limitation risk is from erosion, unless close growing vegetative cover is maintained. The predominant soil type on the Site, the Honoka‘a silty clay loam comprising over half the Site, is in Class IV and has only slight erosion hazard.

More detailed descriptions of the eight soil types on the Site are as follows:

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Honoka‘a Silty Clay Loam, 10–25% slopes (HTD) constitutes approximately 261 acres or roughly 26 percent of the Site, and is located at the site’s highest elevations. The USDA describes this soil as being located on the windward side of Mauna Kea. In a representative profile, the surface layer is dark brown silty clay loam, approximately 6 inches thick. The subsoil is also silty clay loam. It is dark brown, very dark brown, and very dark grayish brown and is approximately 59 inches thick. This soil is medium acid to slightly acid throughout the profile. It dehydrates irreversibly into fine gravel-size aggregates. Permeability is rapid, runoff is slow, and the erosion hazard is slight. Roots can penetrate to a depth of 5 feet or more. This soil is used mostly for pasture and woodland. At the time of the survey, a small acreage at the lowest elevation was used for sugarcane. These soils are in capability Class IV.

Honoka‘a Silty Clay Loam, Low Elevation, 0-10% slopes (HsC) constitutes approximately 70 acres or roughly 7 percent of the Koholālele site. This soil is similar to Honoka‘a silty clay loam 10 to 25 percent slopes (HTD), except that it occurs at a lower elevation where the soil temperature is warmer. This soil historically has been used principally for sugarcane.

Honoka‘a Silty Clay Loam, Low Elevation, 10–20% slopes (HsD) constitutes approximately 343 acres or roughly 33 percent of the Site. This soil is similar to Honoka‘a silty clay loam 10 to 25 percent slopes (HTD), except that it occurs at a lower elevation where the soil temperature is warmer. This soil is used historically for sugarcane. Small areas are used for pasture and macadamia nuts. These soils are in Capability Class IV.

Honoka‘a Silty Clay Loam, Low Elevation, 20–35% slopes (HsE) constitutes approximately 96 acres or 9 percent of the Site. A band of this soil type runs the length of the site between the 1600 foot and 1700 ground elevation level. This soil is similar to Honoka‘a silty clay loam 10 to 20 percent slopes, except that it is steep and occurs at a lower elevation where the soil temperature is warmer. Runoff is medium, and the erosion hazard is moderate. This soil has been used mostly for sugarcane. Small areas are used for pasture and macadamia nuts. These soils are in Capability Class VI.

Kūka‘iau Silty Clay Loam, 6-12% slopes (KuC) constitutes approximately 37 acres or 4 percent of the Site. At the site, it is found in the lowest elevations, near Māmalahoa Highway. The USDA describes this soil series as consisting of well-drained silty clay loams that formed in volcanic ash. These soils are gently sloping to steep. They are on uplands at an elevation ranging from 500 to 1,500 feet and receive from 70 to 100 inches of rainfall annually. Their mean annual soil temperature is between 67° and 69° F. The natural vegetation consists of hilograss, kaimi clover, guava, and ‘ōhi‘a. These soils and Honoka‘a, ‘O‘ōkala, and Pā‘auhau soils are in the same general area. Historically, Kūka‘iau soils are used mostly for sugarcane. Small areas are used for truck crops, macadamia nuts, and pasture.

Kūka‘iau Silty Clay Loam, 12-20% slopes (KuD) constitutes approximately 37 acres or 4 percent of the Site. This soil is low on the windward side of Mauna Kea. It is dissected by many, deep, narrow gulches. In a representative profile the surface layer is very dark grayish-brown silty clay loam about 10 inches thick. The subsoil is dark-brown silty clay loam about 40 inches thick. It is underlain by basalt. The surface layer is extremely acid, and the subsoil is medium to slightly acid. This soil dehydrates irreversibly into aggregates the size of fine sand.

This soil is similar to Kūka‘iau silty clay loam, 6 to 12 percent slopes, except for the steeper slopes. Runoff is medium and the erosion hazard is moderate.

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This soil historically was used mainly for sugarcane. Small areas are used for macadamia nuts and pasture. (Capability subclass IVe, nonirrigated; sugarcane group 3; pasture group 7; woodland group 5)

Kūka‘iau Silty Clay Loam, 20-35% slopes (KuE) constitutes approximately 32 acres or 3 percent of the Site. This soil is similar to Kūka‘iau silty clay loam, 6 to 12 percent slopes, except for the steeper slopes. Runoff is rapid, and the erosion hazard is severe. Included in mapping are small areas in drainageways that have very steep slopes. This soil is used mostly for sugarcane. Small areas are used for pasture. (Capability subclass VIe, nonirrigated; sugarcane group 3; pasture group 7; woodland group 5).

Rough broken land, (RB) constitutes approximately 141 acres or roughly 14 percent of the Site and is found along most of the site’s gulches. Rough broken land is a miscellaneous land type that consists of very steep, precipitous land broken by many intermittent drainage channels. It occurs primarily in gulches, and the slope is dominantly 35 to 70 percent. The soil material ranges from very shallow to deep. Stones and rock outcrops are common in some areas. Elevation ranges from near sea level to 3,000 feet, and the annual rainfall ranges from 50 inches to more than 150 inches. Vegetation varies with rainfall. Kukui trees are typically common in the gulches. There are a few, scattered waterfalls. Rough broken land is used for pasture, woodland, wildlife habitat, and recreation areas. Adapted pasture plants and yields are similar to those for soils associated with this land type. These soils are in Capability Class VII.

3.4.2 Land Study Bureau Soil Rating

The *Detailed Land Classification, Island of Hawai‘i* (Baker et al. 1965) classifies non-urban areas based on a five-class rating system for agricultural productivity using the letters A, B, C, D, and E. Under this system, A represents the highest class of productivity and E the lowest.

The Site is comprised of lands classified as “C” or “D” with the gulches unclassified. The portion of the site classified as “C” extends from Māmalahoa Highway to approximately the 1800 foot ground elevation contour. The portion of the site classified as “D” is the higher elevation portion of the site and is primarily comprised of Honoka‘a Silty Clay Loam 10-25% slopes (HTD) (see Figure 8).

3.4.3 Agricultural Lands of Importance

The ALISH system classifies three types of land suitable for agriculture: Prime Lands, Unique Lands, and Other Lands (unsuitable lands are designated Unclassified) (State of Hawai‘i 1977):

- Prime Agricultural Land is land best suited for the production of food, feed, forage, and fiber crops. When treated and managed, including water management, and according to modern farming methods, the land has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops.
- Unique Agricultural Land is land other than Prime Agricultural Land and is used for the production of specific high-value food crops. The land has the special combination of soil quality, growing season, temperature, humidity, sunlight, air drainage, elevation, aspect, moisture supply, or other conditions, such as nearness to market, that favor the production of a specific crop of high quality and/or high yield when the land is treated

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and managed according to modern farming methods. In Hawai‘i, some examples of such crops are coffee, taro, rice, watercress and non-irrigated pineapple. Land that qualifies as Prime Agricultural Land and is used for a specific high-value crop is classified as Prime rather than as Unique.

- Other Agriculture Land is land other than Prime or Unique Agricultural Land that is also of statewide or local importance for the production of food, feed, fiber, and forage crops. The lands in this classification are important to agriculture in Hawai‘i yet exhibit properties, such as seasonal wetness, erosion, limited rooting zone, slope, flooding, or drought, which exclude the lands from the Prime or Unique Agricultural Land classifications. By applying greater inputs of fertilizer and other soil amendments, providing drainage improvements, implementing erosion control practices, and providing flood protection, these lands can be farmed satisfactorily and produce fair to good crop yields .

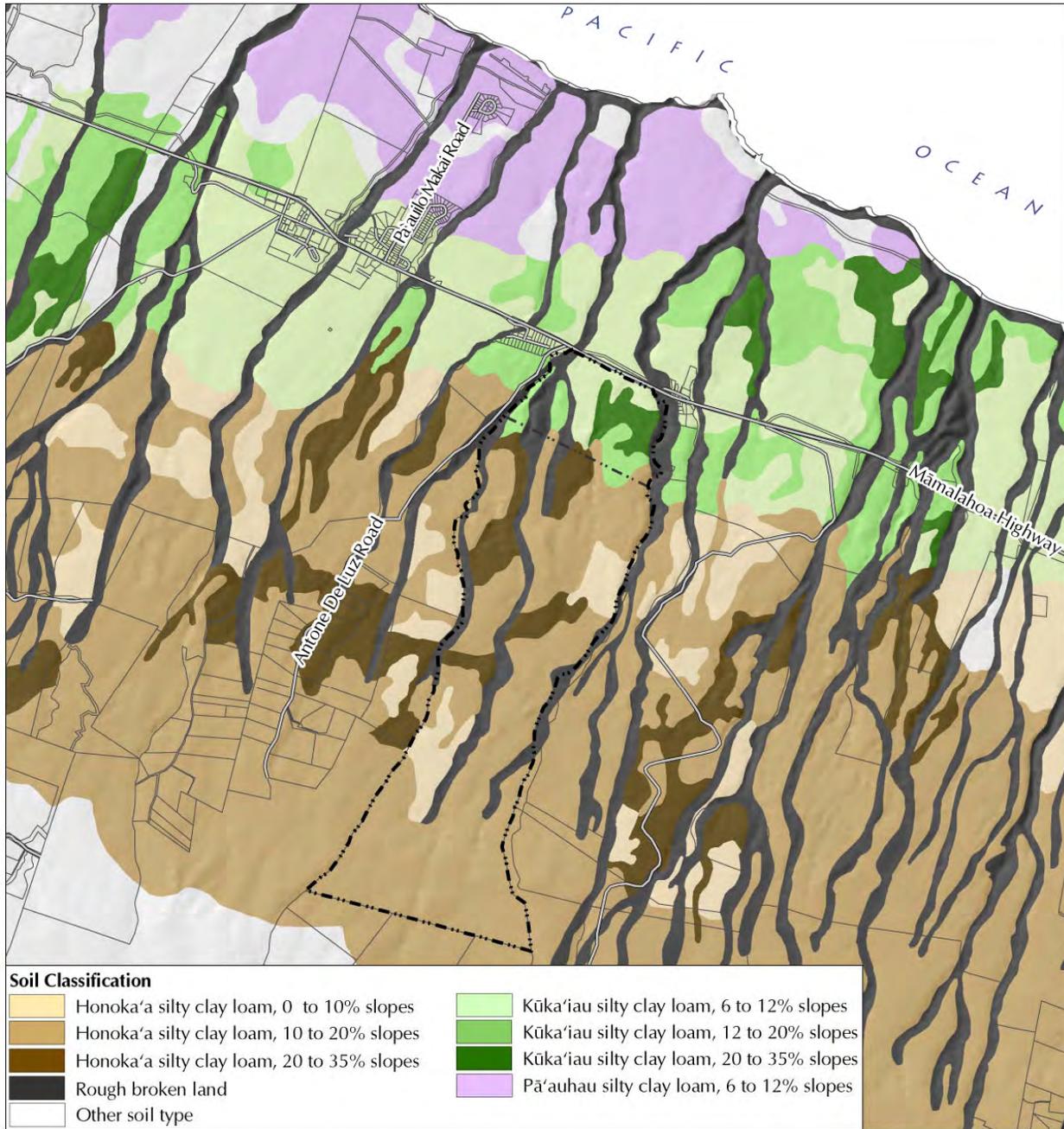
The majority of the Site is identified as Prime Lands. A small area at the Site’s lower elevation is classified as “Other”. This land is associated with the soil type Kukiau Silty Clay Loam 20-35% slope. Lands at the higher elevations that roughly correspond with the Honoka‘a Silty Clay Loam 10-25% Slopes (HTD) are unclassified. The site’s gulches are also unclassified. See Figure 9.

Potential Impacts and Mitigation Measures

The proposed sale of the Site is expected to beneficially impact agriculture by enabling private agricultural endeavors. If the Site was classified as LSB A or B, the State Land Use Law would have required that any further subdivision of the Site be subject to a covenant restricting the uses to be “primarily in pursuit of agricultural activity.” (Hawai‘i Revised Statutes §205-4.5(b). However, this covenant requirement does apply to the Site since no part of the Site is classified as LSB A or B.

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Figure 7, NRCS Soils

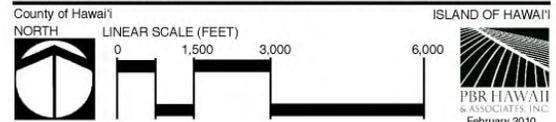


LEGEND

Koholālele Site

Natural Resources Conservation Service
Soil Classification

KOHOLĀLELE HĀMĀKUA LAND SALE



Source: Natural Resources Conservation Service
Disclaimer: This graphic has been prepared for general planning purposes only.

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

Figure 8, LSB



LEGEND

Koholālele Site

Classification

- | | |
|--------------|--------------|
| A: Excellent | D: Poor |
| B: Good | E: Very Poor |
| C: Fair | Unclassified |

Source: Land Study Bureau (1965)
Disclaimer: This graphic has been prepared for general planning purposes only.

Detailed Land Use Classification

KOHOLĀLELE HĀMĀKUA LAND SALE

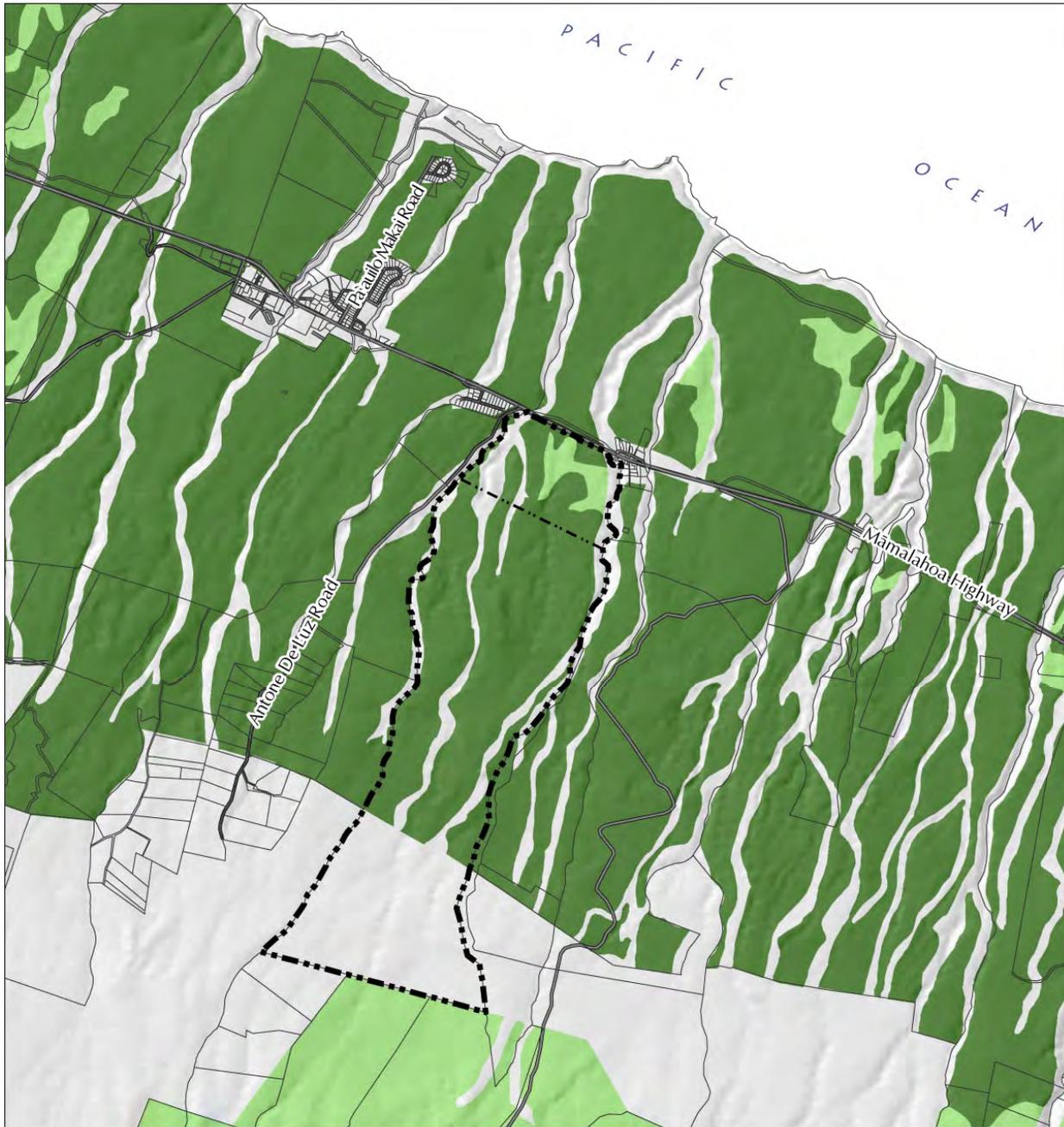
County of Hawai'i NORTH ISLAND OF HAWAII

LINEAR SCALE (FEET)
0 1,500 3,000 6,000

PBR HAWAII & ASSOCIATES, INC.
February 2010

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

Figure 9, ALISH



LEGEND

-  Koholālele Site
- District**
-  Prime ALISH Lands
-  Other ALISH Lands
-  Unclassified Lands

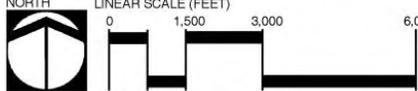
Source: State of Hawai'i Dept of Agriculture (1977)
Disclaimer: This graphic has been prepared for general planning purposes only.

Agricultural Lands of Importance
to the State of Hawai'i

KOHOLĀLELE HĀMĀKUA LAND SALE

County of Hawai'i ISLAND OF HAWAII

NORTH LINEAR SCALE (FEET)



PBR HAWAII
& ASSOCIATES, INC.
February 2010

3.5 GROUNDWATER RESOURCES AND HYDROLOGY

The Site is located within the Pa‘auilo aquifer system, which is a component of the East Mauna Kea Aquifer Sector (see Figure 11, Aquifers). The Pa‘auilo aquifer system has a sustainable yield of approximately 60 million gallons per day (mgd). Other aquifer systems within the East Mauna Kea Aquifer Sector include the Honoka‘a, Hakalau, and Onomea systems. The total sustainable yield of the East Mauna Kea Sector is 388 mgd. Existing water use within the East Mauna Kea Sector is 12.4 mgd, of which agriculture is the largest user at 9.56 mgd (77%). Of the agricultural use, the average flow of the Lower Hāmākua Ditch is estimated at 6.5 mgd in 2003. The ditch system consists of five scattered reservoirs and 14 miles of ditch generally parallel to Māmalahoa Highway from the Kukuihaele Weir to the Pa‘auilo Reservoir north of the Site. The potential groundwater withdrawal from the Pa‘auilo aquifer system from existing wells based on installed pump capacities is 6.77 mgd, or 11% of the sustainable yield (Fukunaga & Associates, Inc. December 2006).

Potential Impacts and Mitigation Measures

Since the Site is not within the Hāmākua Ditch service area or near known springs, future agricultural use would need to rely on rainfall. Private wells or stream diversions are not likely to be feasible. The availability of potable water for farm dwellings is discussed in Section 5.2 on water infrastructure.

3.6 NATURAL HAZARDS

Lava Flow. The U.S. Geological Survey (USGS) has developed lava-flow hazard zones with a numerical rating of 1 to 9, with 1 having the greatest risk. The Site is within Lava-Flow Hazard Zone 8, which indicates that only a few percent of this area has been covered by lava in the past 10,000 years (USGS, 1992).

Hurricane. The State of Hawai‘i has been affected twice in the past two decades by devastating hurricanes – Hurricane ‘Iwa, in 1982, and Hurricane ‘Iniki in 1992. Honoka‘a High School, located approximately 5 miles east of the project site, is a designated hurricane-proof Emergency Evacuation Center for the area (State Civil Defense, 2007).

Earthquake. The most recent series of earthquakes, with magnitudes of 6.7 and 6.0, occurred at Kīholo Bay on October 15, 2006. The soils within the Site are not particularly susceptible to liquefaction that would require special structural measures to mitigate earthquake damage.

Flooding. According to the Flood Insurance Rate Map (FIRM), the project site is designated as Zone X, outside of the 500-year floodplain (Figure 6).

Tsunami and Hurricane Surge. Hawai‘i Island has been affected by tsunami. Most notably, Hilo Bay and the Hāmākua Coast suffered extensive damage from the tsunami of 1946. The Koholālele site is located approximately a mile from the shoreline at a ground elevation of 800+ feet, thus it is outside of the tsunami evacuation area.

Potential Impacts and Mitigation Measures

The Site is not exceptionally vulnerable to natural hazards. Compliance with building code requirements should ensure any new construction should meet earthquake and hurricane standards, especially since the County is in the process of updating the building code to modernize these hazard-resistance standards.

3.7 FLORA

A botanical survey of the Site was conducted between October 20-22, 2009 with the objectives to document plant species on the property; document the status and abundance of each species; determine the presence or likely occurrence of any native flora, particularly any that are Federally listed as Threatened or Endangered; and, determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora in this part of the island. The Botanical Survey Report was a component of a larger Flora and Fauna Study Assessment and is attached as Appendix A.

Most of the Site (approximately 80% of the land area) is dominated by two plant species, Guinea grass (*Panicum maximum*) and common ironwood (*Casuarina equisetifolia*). These plants have rapidly colonized the former cane fields since they went out of agricultural production 15 years ago. Three other plants were reported to be “common” on the site; ‘ōhi‘a lehua, (*Metrosideros polymorpha*), loquat (*Eriobotrya japonica*) and rough maidenhair fern (*Adiantum hispidulum*). The ‘ōhi‘a was found in the Site’s gulches and scattered ridge tops, the loquat was found primarily in gulches and the maidenhair fern were found both in the gulches and in the ironwood forests. In total, 122 plant species were recorded, of these, 18 were native species including nine that are endemic to Hawai‘i. None of the native species are rare and none are federally listed or protected. A complete list of recorded plants is included with the Flora and Fauna Assessment (Appendix A). Of the non-native plant species found on site, none are of special conservation interest or concern.

The Botanical Survey Report findings indicated that the entire site showed signs of pig rooting. The Report found that, “*this was especially true in the gulches where every square foot appeared to be heavily rooted. This rooting had the twin effects of severely limiting the diversity of the more delicate native understory species, while at the same time aiding the spread of aggressive, shade-tolerant weeds such as the strawberry guava.*”

Potential Impacts and Mitigation Measures

No plant species listed or proposed as threatened or endangered by the U.S. Fish and Wildlife Service or the Hawai‘i State Department of Land and Natural Resources were found. The property has been heavily altered by sugar cane cultivation, and in the last 15 years has been degraded by invasive plant species and feral pigs.

Due to the condition of the land, there are no reasons from a botanical standpoint to preserve and keep the Site in public ownership. The best examples of remnant strips of native forest are found in the Site’s gulches, which are the areas least likely to be disturbed by any future agricultural use.

3.8 FAUNA

A Fauna Survey was conducted in conjunction with the Botanical Survey. The Fauna Survey is found in Appendix A, Flora and Fauna Survey and Assessment. Nine site visits were conducted, including four during the evening to detect occurrence of the Hawaiian hoary bat (‘ōpe‘ape‘a, *Lasiurus cinereus semotus*).

‘Ōpe‘ape‘a were detected at high elevation (2,400 ft.), mid-elevation (1,800 ft.) and lowest elevation (800 ft.) portions of the Site. The Fauna Survey presents the observation that the bats appeared to be drawn to the open, mowed base yard located at the Site’s lowest elevation adjacent to Māmalahoa Highway. The report describes that evidence of feral pig (*Sus Scrofa*) was everywhere on the property, and particularly most prevalent in the gulches. Additionally, a few mongoose were sighted. The report indicates that while not sighted, feral cats (*felis catus*), rats (*Rattus spp.*) and mice (*Mus domesticus*), are also likely present on site.

In general, the report finds that due to the overwhelming colonization of Guinea grass and ironwood trees, bird life was relatively sparse in both diversity and number. Although native and endemic birds such as the Hawaiian Hawk (‘io, *Buteo solitarius*) and Hawaiian owl (pueo, *Asio flammeus sandwichensis*) were specifically looked for, none were sighted. While not sighted, the ‘io and pueo are known to be found in the Hāmākua district and could be expected to occasionally use this site. Additionally, no native seabirds such as the threatened Newell’s shearwater (*Puffinus auricularis newellii*) or the Endangered petrel (*Pterodronma sandwichensis*) were found, nor were any shearwater burrows found. A complete list of the ten, non-native bird species that were sighted is included with the Flora and Fauna Survey (Appendix A).

The Fauna Survey also looked for insects which have been listed as Federally Endangered such as Blackburn’s sphinx moth (*Manduca blackburni*) and three endemic picture-wing flies (*Drosophila heteroneura*), (*D. mulli*) and *D. ochrobasis*). None of these insects or their larvae were observed, nor were any of the host plant species normally associated with these insects found on site.

The Fauna Survey concludes that due to the low quality of habitat characterized by the dominance of Guinea grass and common ironwood, there is little to attract a diversity of mammal and bird species. The only species that is common throughout the property is the feral pig and the dense vegetation makes it difficult for hunters to be effective at controlling the population.

Potential Impacts and Mitigation Measures

Due to the degraded habitat, there are no reasons from a faunal standpoint to preserve and keep the Site in public ownership. The Fauna Survey Report does not recommend any special measures be taken with the proposed sale.

HĀMĀKUA LAND SALE: KOHOLĀLELE
DRAFT ENVIRONMENTAL ASSESSMENT

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4.0 ASSESSMENT OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter provides background information on the existing human environment of the proposed project area. Subject areas addressed include archaeology, historic resources, culture, noise, air quality, visual environment, population and housing, community character, and economic environment. This chapter also addresses the potential impacts of the proposed sale and identifies appropriate mitigation measures to minimize the identified short-term and long-term impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

An Archaeological Inventory Survey (AIS) of the Site was conducted in November and December 2009 to, “identify and evaluate historical properties pursuant to state cultural resources management regulations” (SCS, 2010). Four archaeological sites were documented in the project area (Site 27870, 27871, 27872, and 27873) (Figure 10). All of the sites are Historic-era rock clearing mounds associated with sugarcane agriculture. All of the rock mounds are located along the slopes of gulches, on the outer boundaries of sugarcane fields. No pre-Contact Hawaiian archaeological features or cultural remains were identified on the project area. This is not unexpected as the project area is along a sparsely populated portion of the Hāmākua Coast. Since the information recorded in the AIS has adequately ascertained the timing and function of all features at all four sites, the AIS recommended no further work.

The field component of the survey consisted of a pedestrian survey, site mapping and hand excavations. The archival component of the survey included database, library and report research into the history of the area as well as searches for archaeological studies of the site and immediately surrounding area.

Information that would help illustrate the prehistoric conditions of the site and surrounding area are limited due to the site’s remote location and inconvenient access to marine areas. In published mo‘olelo, Koholālele, translated as, “leaping whale” is mentioned in the Heart Stirring Story of Ka-Miki. This story was published between 1914 and 1917 although the story is set in the 1300’s. No other mention of Koholālele was found in published mo‘olelo.

Early historic accounts of the Hāmākua District including the travels of William Ellis and Isabella Bird do not specifically mention the ahupua‘a of Koholālele, but do provide a glimpse into the physical and cultural landscape of the time. Bird’s 1872 journals of a trip on horseback from Onomea to the Waipi‘o Valley describes a series of sparsely populated and densely vegetated gulches that were highly challenging for horses to traverse. Bird also describes the sugar plantation of Kaiwiki (Onomea Plantation), which is east of Koholālele. She notes the beauty of the sugarcane fields; describes the sugar making process; and observes the transport of cane to the mill via streams and the hauling of the product by mule down to the sea.

Between 1869 and 1880, seven sugar companies were established along the Hāmākua Coast. The project site was most recently owned by Hāmākua Sugar, formerly the Davies Sugar Company which was a merger of the Laupahoehoe Sugar Company and Honoka‘a Sugar Company. The Hāmākua Sugar Company was originally known as the Hāmākua Mill Company. The site itself was in sugar production for over 100 years prior to 1994.

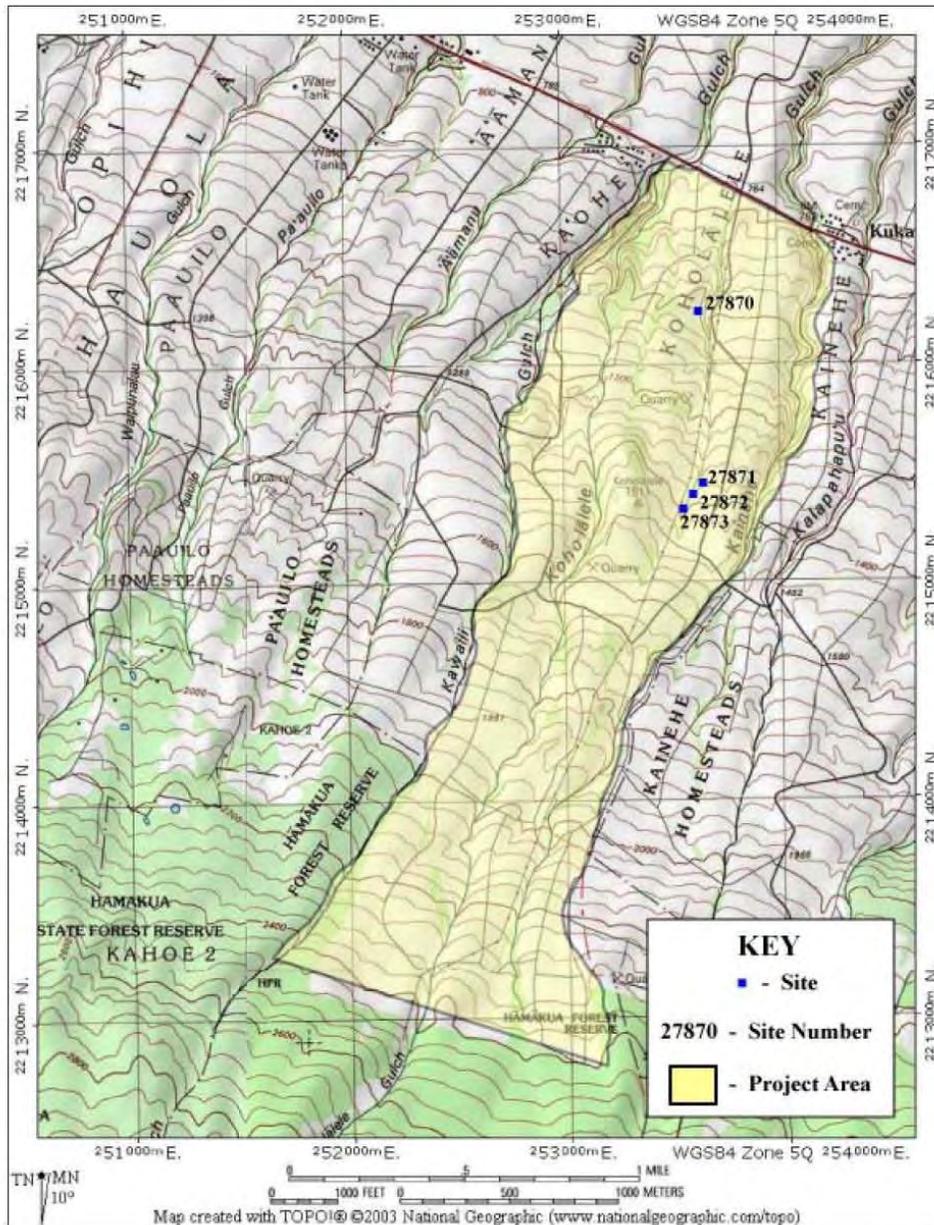
HĀMĀKUA LAND SALE: KOHOLĀLELE
DRAFT ENVIRONMENTAL ASSESSMENT

Due to the site's long history of field clearing, sugar growing and harvest, there is a lack of archaeological sites, features and artifacts. The archaeological inventory resulted in locating four archaeological sites consisting of eight rock mounds, all a result of rock clearing for field preparation. The four sites are all located on the north half of the site within an unnamed tributary gulch to Koholālele Gulch. The rock mounds are all loosely constructed piles of angular and subangular large cobbles and small boulders. None of the mounds showed evidence of stacking or facing and bulldozer push could be found at some of features.

Excavations at the features confirmed that there are no subsurface features below the mounds. The AIS concludes that the eight mounds were formed for field preparation and no further testing is recommended.

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

Figure 10, Archaeological Features



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Potential Impacts and Mitigation Measures

The proposed sale does not involve any ground disturbing activities, therefore it will not impact these archaeological features. If the site is subsequently used for agricultural purposes, it is not expected that crop production will take place within the gulches. Thus, it is likely that the rock mounds will remain undisturbed should agricultural uses commence.

The AIS conducted for this assessment concludes that each of the features have been fully documented and thus, recommends no further archaeological work be conducted for the sites.

In the future, land owners should be aware that in the event that archaeological discoveries are made during earth disturbing activities or construction, work should cease and further coordination with the State Historic Preservation Division should ensue. Should human remains be found, Rules of Practice and Procedure Relating to Burial Sites and Human Remains (HAR Title 13, Subtitle 13, Chapter 300) should be followed.

4.2 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) in compliance with Act 50 of the State of Hawai'i (2000) was conducted in order to identify and address effects of the proposed land sale on Hawai'i's culture as well as traditional and customary rights. Preparation of the CIA followed the guidelines provided by the Office of Environmental Quality in 1997. This included documenting methods for selection of informants and agencies interviewed; following ethnographic interview procedures; reviewing historical materials; and, an analysis of the potential effects of the proposal on cultural resources.

The CIA found that the project site was awarded to Kailakanoa (LCA 26-B, R.P. 4527) as part of a single large Land Commission Award.

As described in the previous section of this report, there is very limited pre-historic information about the site and surrounding lands. The CIA reports that the Koholālele ahupua'a and surrounding lands were thought to be sparsely populated due to poor access to marine resources and distance from population centers such as Hilo, Waimea and Waipi'o.

In published mo'olelo, Koholālele, translated as, "leaping whale" is mentioned in the Heart Stirring Story of Ka-Miki. This story was published between 1914 and 1917 although the story is set in the 1300's. No other mention of Koholālele was found in published mo'olelo.

More information is available regarding the sugar industry which affected plantation lands such as the site and surrounding area. The site was in sugarcane production for approximately 100 years until 1994 when Hamakua Sugar closed its doors. The CIA provides a history of sugar in Hawai'i, citing references to some of the earliest mentions of sugar production in the early 1800's. Large-scale sugar production on the Island of Hawai'i was in operation by 1839. At that time, growing, harvesting and processing of sugar was rudimentary, relying on Hawaiian labor and the power of water, oxen, mule and horse. The industry grew through the 1800's as a result of increased demand from the U.S., a reduction in import duties, introduction of new cane varieties and importation of labor.

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

The Hāmākua Mill Company, which eventually evolves to be the Hāmākua Sugar Company was founded in 1877 by Theo Davies and Charles Notley, Sr. By 1910, the company had 4,800 acres planted in sugarcane; employed more than 600 people; and, had a warehouse and landing below the cliff at Koholālele. Five individuals who either worked for the Hamakua Sugar Company or live in the area and have knowledge of the site were contacted for interviews. None of the cultural informants had knowledge of past or ongoing cultural practices on the project site. Additionally, letters of inquiry were sent to organizations whose expertise would include the project area. Apart from a letter acknowledging receipt of the letter of inquiry, no organizations responded with information concerning the potential for cultural resources to occur in the project area or suggestions for further contacts. Public notices were also published in Ka Wai Ola, The Honolulu Advertiser and the Hawaii Tribune Herald.

The CIA concludes, “Based on organizational response as well as archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. Because there were no cultural activities identified within the project area, there are no adverse effects.”

Potential Impacts and Mitigation Measures

Based on the conclusion of the CIA, no impacts to cultural resources are expected if the land is sold. Similarly, if the land is subdivided into agricultural lots and developed for agricultural uses, no impacts to cultural resources are expected. No mitigation measures are proposed.

4.3 NOISE

Currently, the project site is undeveloped land. No significant noise is generated on site, and ambient noise in the area emanates from wind, wildlife, and traffic along Māmalahoa Highway. It is anticipated that land uses after the sale of the site will be consistent with current zoning and, therefore, consistent with current uses on adjacent properties.

Potential Impacts and Mitigation Measures

Before the sale of the lands, traffic on various access roads in the project vicinity will likely increase slightly as potential property purchasers inspect the site. This will cause minimal, short-term, intermittent increases in noise levels. The sale itself will have no long-term noise impacts on the project vicinity.

Future land uses and activities, particularly construction, would have to comply with Chapter 11-46, HAR, regarding Community Noise Control.

4.4 AIR QUALITY

Air quality in Hawai‘i is among the best in the nation, and criteria pollutant levels remain well below state and federal ambient air quality standards. The State Department of Health, Clean Air Branch monitors the ambient air in Hawai‘i and has established a statewide system of monitoring stations whose primary purpose is ensuring that air quality standards are met. Hawai‘i Island is regularly affected by VOG from Mount Kilauea. Due to the prevailing northeast winds, the site is less likely to be affected by VOG than sites on the south or Kona coasts. However, Kona winds can circulate VOG up the Hāmākua Coast in the site’s vicinity.

Generally, air quality is affected by regional and local climate together with the amount and type of human activity in any given location. Federal and state ambient air quality standards have been established to regulate six parameters: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead. No state or county air-quality monitoring stations exist in the vicinity of the site.

Air quality in the vicinity of the site may be affected by pollutants from widely dispersed agricultural sources, such as concentrations of cattle and fugitive mists from infrequent spraying for agricultural pests. Other sources are emissions from occasional vehicular traffic on area roads and from farm machinery.

Potential Impacts and Mitigation Measures

There are no large, stationary sources of air pollutants and no major industries that would contribute to air pollution within, or in the vicinity of, the project area. The sale of the site involves no development or land alteration, and thus, will not affect air quality in the vicinity.

Potential agricultural uses, such as pesticide spraying, would need to be undertaken in accordance with applicable state and federal regulations.

4.5 VISUAL RESOURCES AND OPEN SPACE

The natural beauty of Hawai‘i is universally recognized and considered to be a significant and valuable asset. Various portions of the site offer views of the ocean. Since the last sugar harvest, ironwood trees have come to dominate the site’s landscape and obscure views. Greater opportunities for views of the ocean, the upper slopes and summit of Mauna Kea, and the richly vegetated, broad lower slopes descending to the coast may be possible from the site if thinning or clearing took place. In some mauka areas, near boundaries with private land and the Hāmākua Forest Reserve, there are views of native forest containing koa and ‘ōhi‘a trees.

The Koholālele property is not listed in the *General Plan* as a site of natural beauty.

Potential Impacts and Mitigation Measures

The sale of the site involves no development or land alteration, and thus, will not affect visual resources in the vicinity. Should future land owners choose to construct farm dwellings or agricultural structures, the heights for a residential structure within the agricultural district are

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

limited to 35-feet and 45-feet for all other structures. The height limit ensures that visual resources will not be greatly affected should future land owners decide to construct farm dwellings and related agricultural structures.

4.6 SOCIO-ECONOMIC CHARACTERISTICS

4.6.1 Community Profile

At the time of the 2000 U.S. census, Hawai'i County's population was 148,677, having grown from 120,317 in 1990. At same time, 571 people lived in the nearest Census Designated Place (CDP), Pa'auilo down from 587 in 1990 (DBEDT 2006).

In general, the Pa'auilo CDP is slightly younger than Hawai'i County as a whole, and has a racial mix that is significantly less Caucasian and significantly more Asian. Households in the CDP roughly correspond with household types, except that households are slightly larger and more likely to include individuals 18 and younger and 65 and older. In 2000, the CDP also had a higher instance of occupied housing units than Hawai'i County as a whole. Median household income was also slightly lower than the County as a whole.

HĀMĀKUA LAND SALE: KOHOLĀLELE
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Table 1 Demographic Characteristics: 2000

Subject	Pa‘auilo CDP		Hawai‘i County	
	Number	Percent	Number	Percent
Total Population	2,233	100	148,677	100.0
AGE				
Under 5 years	31	5.4	9,130	6.1
5 – 19 years	148	26	33,690	22.7
20 – 64 years	298	52.3	85,738	57.6
65 years and over	94	16.4	20,119	13.5
Median Age (years)	37.4	—	38.6	—
RACE (alone or in combination with one or more)				
White	207	36.3	77,477	52.1
Black or African American	4	.7	1,789	1.2
American Indian and Alaska Native	21	3.7	4,847	3.3
Asian	408	71.5	70,921	47.7
Native Hawaiian and other Pacific Islander	170	29.8	46,111	31.0
Other	38	6.7	7,271	4.9
HOUSEHOLD (by type)				
Total Households	191	100.0	52,985	100.0
Family Households (families)	142	74.3	36,903	69.6
With own children under 18 years	60	31.4	17,072	32.2
Married-couple family	102	53.4	26,828	50.6
With own children under 18 years	48	25.1	11,302	21.3
Female householder, no husband present	27	14.1	7,000	13.2
With own children under 18 years	7	3.7	4,095	7.7
Non-families	49	25.7	16,082	30.4
Living alone	40	20.9	12,240	23.1
65 years and over	20	10.5	4,214	8.0
Average persons per household	2.99	—	2.75	—
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	198	100.0	62,674	100.0
Occupied units	191	96.5	52,985	84.5
By owner	162	84.8	34,175	64.5
By renter	29	15.2	18,810	35.5
Vacant units	7	3.5	9,689	15.5
INCOME IN 1999				
Median household income	\$34,695	—	\$39,805	—

Source: DBEDT 2006.

Potential Impacts and Mitigation Measures

The proposed sale of the site will not directly introduce new residents to the project area. Although the sale of the lands will not directly affect population, there are potential impacts to

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

population based on possible future uses of the lands, as allowed by existing zoning designations for the lands. Based on the most intense development scenario under current zoning, 20 farm dwellings could potentially be built on the site after the sale. The Site is zoned A-40a, allowing dwellings at a minimum lot size of 40 acres. Assuming 20% of the 1040-acre Site would be used for roadways, the Site could be further subdivided into a total of 20 lots. This hypothetical number of lots also assumes that water is or will become available.

Using the average household size of 2.99 for the Pa‘auilo CDP, approximately 60 persons could potentially be added to the population of Pa‘auilo after the site is sold if the site is subdivided and a dwelling is constructed on each parcel. However, it is not expected that 20 dwellings would be constructed because there are no plans to provide water upgrades to the parcels.

4.6.2 Housing

There are currently no homes on the site. The homes that exist near the project site are rural lots, accessed from Antone De Luz Road. A more dense concentration of housing (Kūka‘iau) exists east of the site along Māmalahoa Highway.

The proposed sale of the site itself will not directly affect the existing housing inventory in the area. However, purchasers of the lands could construct farm dwellings on some of the properties. Based on the most intense development scenario under current A-40a zoning, the number of potential farm dwellings that could be built is 20.

Potential Impacts and Mitigation Measures

Sale of the site will not directly affect the housing inventory in the Koholālele area. Although an increase in agricultural activity would be beneficial, the lack of water and infrastructure will probably limit the intensity of such agricultural uses and it is assumed that any need for housing will be reasonably accommodated within the specific parcel or by existing housing in the area. Therefore, no adverse impacts to housing are expected, and no mitigation measures are planned with the sale of this site.

4.6.3 The Economy and Employment

The Hawai‘i County General Plan (County of Hawai‘i 2005a) discusses the economy of the Hāmākua District, of which the Koholālele property is a part. Despite the closing of Hāmākua Sugar in 1994, the population of the Hāmākua region has grown moderately, primarily due to the development of major resorts in the neighboring district of Kōhala. The economy has come to depend on cattle, macadamia nuts, and diversified agriculture. There are numerous cattle ranches in Hāmākua and several varieties of crops are grown in addition to macadamia nuts. Investments in the timber industry have also been made in Hāmākua, including a large eucalyptus plantation and a community-based forestry initiative at O‘ōkala.

Specialty crops grown in mauka Pa‘auilo near the site include vanilla (Hawaiian Vanilla Company) and ‘awapuhi (John Paul Mitchell Systems). Other crops grown in the Hāmākua area are taro, watermelon, tomatoes, ginger, kava, coffee, and other vegetables. Also important to the recovering economy of Hāmākua is the work of the CTAHR Hāmākua Research Station located in the area of the site that tests and develops crops and livestock to succeed in the mauka Hāmākua environment.

HĀMĀKUA LAND SALE: KOHOLĀLELE
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Manufacturing in the area is limited to processing agricultural crops, although a number of entities have been pursuing development of co-generation power plant on the Hāmākua Coast (Pacific Business News, January 2, 2009).

The Hāmākua District also encompasses the astronomy facilities at Mauna Kea. According to the Hawai‘i General Plan, astronomy has contributed over \$619,000,000 to the State’s economy and employs 270 permanent positions. These numbers are expected to increase should the Thirty-Meter Telescope (TMT) proposed by a consortium of universities, receive entitlements and be constructed (Hawaii Tribune Herald, 2009).

Table 2 Employment Status

Subject	Pa‘auilo CDP		Hawai‘i County	
	Number	Percent	Number	Percent
Population 16 years and older	444	100	114,647	100.0
In labor force	250	56.3	70,791	61.7
Employed Civilian Population	223	100	64,797	100
Service Occupations	64	28.7	14,403	22.2
Management and Professional Occupations	36	16.1	19,607	30.2
Sales and Office Occupations	59	26.5	16,309	25.1
Farming, Fishing and Forestry Occupations	13	5.8	2,449	3.8
Construction, Extraction and Maintenance Occupations	23	10.3	6,454	9.9
Production, Transportation and Material Moving Occupations	28	12.6	5,757	8.9
Median household income	\$34,659	—	\$39,805	—

Of the residents aged 16 years or older recorded for Pa‘auilo CDP in the 2000 census, approximately 56 percent were in the labor force (DBEDT 2005). Of the employed civilian population over the age of 16, 28.7 percent worked in service occupations, 16.1 percent in management and professional occupations and 26.5 percent in sales and office occupations. Smaller numbers worked in production, transportation, and materials moving (12.6 percent); construction (10.3 percent); and in farming, fishing and forestry (5.8 percent).

Median household income in the year 2000 was \$34,659 for the Pa‘auilo CDP. This compares with a median income of \$39,805 for Hawai‘i County and \$49,820 for the state (DBEDT 2005).

For the year 2009, the Hawai‘i County unemployment rate was reported to be 9.6 percent in December, with a statewide unemployment rate of 6.2 percent for the same month. Thus, the employment status of those in Pa‘auilo and surrounding areas may have been affected by the recent economic downturn.

Potential Impacts and Mitigation Measures

Sale of the site itself will not significantly affect economic conditions in the community. However, the future potential agricultural use of the lands can only enhance the agricultural economic base of the Hāmākua area. The potential increase in agricultural activity would likely create long term agricultural related jobs together with short-term, construction-related jobs resulting from the potential construction of farm dwellings. Should any of the purchasers decide

HĀMĀKUA LAND SALE: KOHOLĀLELE
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to construct farm dwellings, local businesses would also benefit from an increase in the demand for goods and services due to a slight increase in population.

In light of the economic impact of the closing of Hāmākua Sugar, returning the site to agricultural use consistent with its agricultural zoning would benefit the local economy.

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5.0 ASSESSMENT OF THE EXISTING INFRASTRUCTURE AND PUBLIC SERVICES, AND POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter discusses the existing infrastructure of the project area and the proposed infrastructure improvements. Mitigation measures have also been identified to address potential impacts.

5.1 TRANSPORTATION FACILITIES

Existing Roadways. The site is accessed by private roads from Māmalahoa Highway (Route 19). Māmalahoa Highway is a two-lane State Highway with a paved shoulder. It is the major transportation route between communities on the Hāmākua Coast south to Hilo and northwest to Waimea and beyond to Kona.

There is a network of unnamed, private roads on site. Formerly used for access to the sugar plantation's fields, these roads have now become densely overgrown with Guinea grass. One access road continues to be used for maintenance associated with the power line that runs through the site. There are no existing County or homestead roads on the Site.

Potential Impacts and Mitigation Measures

Traffic at the Site's access point to Māmalahoa may increase somewhat, depending on future land uses such as agricultural uses and construction of new farm dwellings. Impacts are not, however, expected to be significant.

Legal access to Parcel 1 is by a private road easement. Any further subdivision of Parcel 1 or 5 would require additional road improvements, including any necessary upgrades to the intersection with Māmalahoa.

5.2 WATER SUPPLY FACILITIES

The Site is within the service area of the County's Pa'auilo Water System. A single well and two storage tanks serve the system; however, a one-way, normally closed connection is available to receive supply from the Haina Water System if necessary. A 2.5 inch County of Hawai'i Department of Water Supply (DWS) water line is located in Māmalahoa Highway. One service to the Site exists, which the County plans to allocate to Parcel 5. The DWS has stated that they will not allow additional services from its existing water line until extensive water system improvements such as a back-up well are made. Should water become available, future service to Parcel 5 or subsequent subdivision will require an Elevation Agreement since the lots would be at an elevation where DWS cannot ensure adequate pressure.

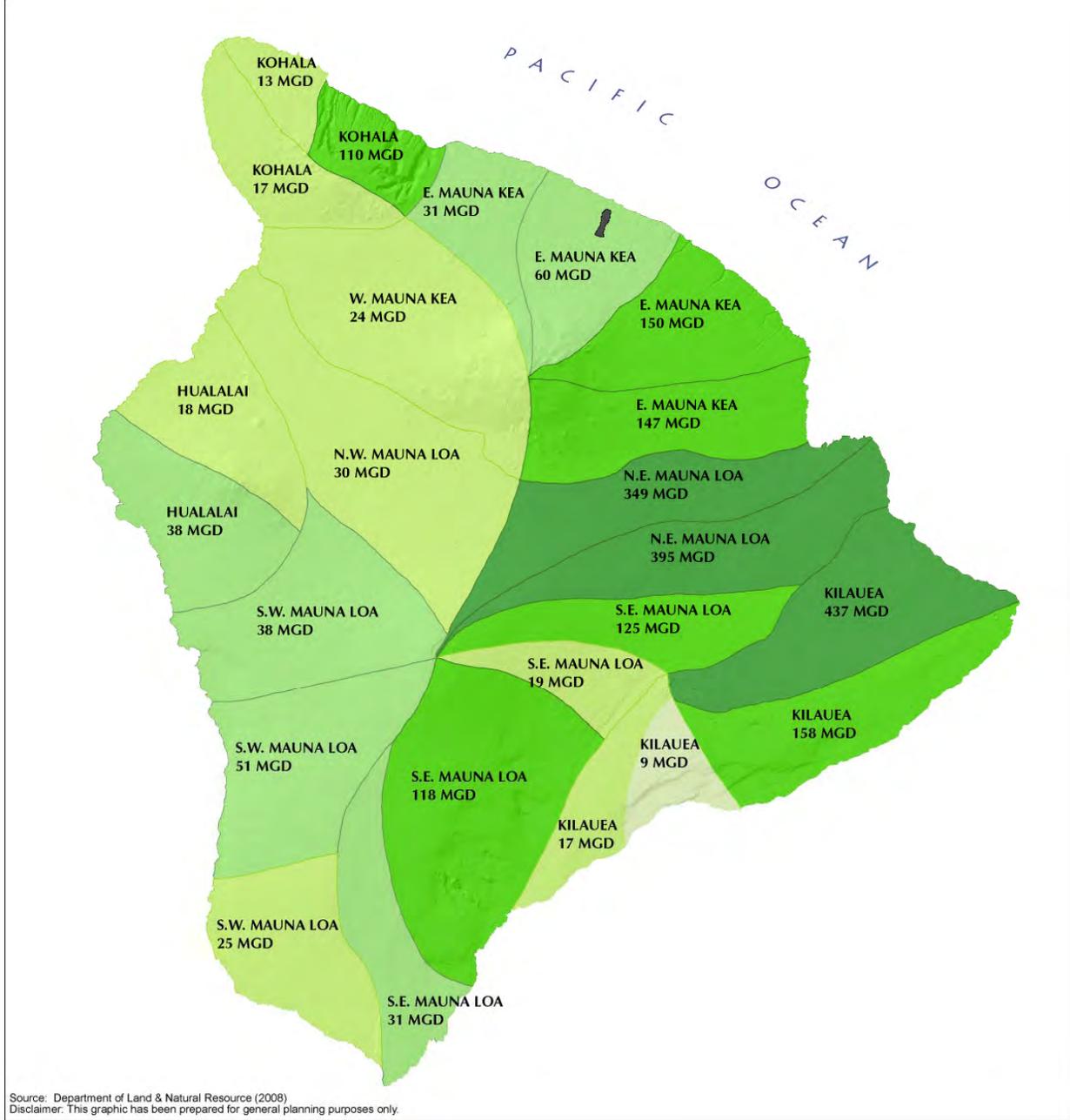
HĀMĀKUA LAND SALE: KOHOLĀLELE
DRAFT ENVIRONMENTAL ASSESSMENT

Potential Impacts and Mitigation Measures

The existing water situation not allowing additional hookups to the Pa‘auilo Water System means that any further subdivision would have to be approved through a water variance pursuant to Planning Department Rule 22. The purpose of Rule 22 is “to provide criteria for the granting or denial of variances from sec. 23-84 of the Subdivision Code, which requires a water system meeting with the requirements of the Department of Water Supply (DWS). It applies to requests for subdivisions that propose to rely on rain catchment for their water supply, on agriculturally-zoned property” (Planning Department Rules, §22-1). To be granted a variance under this rule, the site must receive a minimum average annual rainfall of 60”, and a maximum of 6 lots may be approved. Therefore, until DWS allows additional hookups, further subdivision relying on water catchments would be limited to six lots, meaning the maximum number of lots on the Site would be seven (Parcel 5 that has the existing water allocation, plus the 6 lots created by water variance that would rely on water catchments).

HĀMĀKUA LAND SALE: KOHOLĀLELE DRAFT ENVIRONMENTAL ASSESSMENT

Figure 11, Aquifers



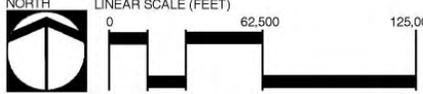
LEGEND

-  Koholālele Site
- Sustainable Yield**
-  1 MGD - 10 MGD
-  10 MGD - 30 MGD
-  31 MGD - 100 MGD
-  101 MGD - 200 MGD
-  201 MGD - 450 MGD

Aquifers
**KOHOLĀLELE
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NORTH | LINEAR SCALE (FEET) | 0 | 62,500 | 125,000



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5.3 WASTEWATER FACILITIES

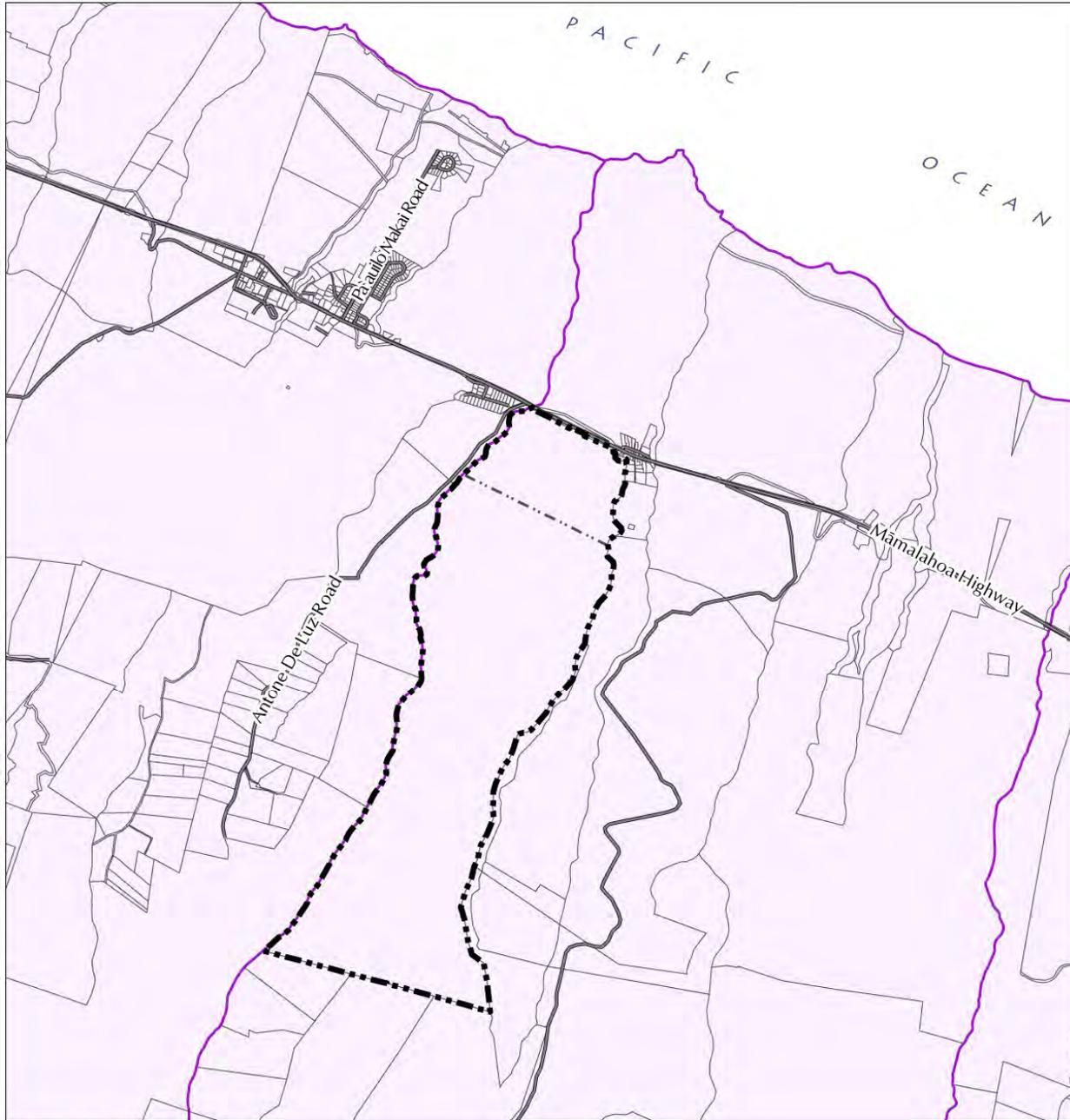
There are no wastewater treatment facilities in the vicinity of the Site; hence, any future building permits would require an approved onsite individual wastewater disposal system. The Department of Health's (DOH) Critical Wastewater Disposal Area (CWDA) map determines whether a cesspool would be an acceptable individual wastewater system. The Site is located within a non-critical area that allows cesspools (see Figure 11). In a non-critical area, cesspool leachate would not pose any threat to groundwater aquifers or nearshore coastal water quality. The design and construction of the cesspool would need to meet DOH's standards.

Potential Impacts and Mitigation Measures

Because the Site is in a non-critical area miles away from the coastline, the maximum hypothetical density of 20 additional farm dwellings allowed under existing zoning would not significantly impact the groundwater quality or nearshore water quality. Building permits could be issued using cesspools, which are substantially more affordable than septic systems. In short, wastewater disposal is not a constraint to additional development on the Site and no mitigation measures would be necessary for purposes of wastewater impacts, provided that any cesspools are constructed in conformance with the Department of Health's standards.

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Figure 12, Critical Wastewater Disposal Area



LEGEND

Koholālele Site

Class

- CWDA
- Cesspool_1
- Cesspool_5
- NON-CWDA

Source: State of Hawai'i Department of Health
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Critical Wastewater Disposal Area
**KOHOLĀLELE
HĀMĀKUA LAND SALE**

County of Hawai'i ISLAND OF HAWAII

NORTH

LINEAR SCALE (FEET)
0 1,500 3,000 6,000

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5.4 DRAINAGE FACILITIES

There are no stormwater drainage facilities (e.g., injection wells or sumps) on the Site. Precipitation is absorbed by vegetation, infiltrates into the soils or surface flows to the three gulches that traverse the Site.

Potential Impacts and Mitigation Measures

Drainage is not a concern or constraint that requires special attention in the sale (e.g., covenant or disclosure). Any further subdivision would require meeting the County's Storm Drainage Standards that would mitigate impacts to neighbors and avoid non-point source pollution pursuant to §23-92 of the Subdivision Code.

5.5 SOLID WASTE DISPOSAL FACILITIES

According to the document, *Update to the Integrated Solid Waste Management Plan for the County of Hawai'i*, in the year 2002, the total amount of solid waste managed by the county system was approximately 160,000 tons (Harding ESE, 2002). The two landfills on the island are the South Hilo Landfill and the Pu'uānāhulu Landfill. The estimated lifespan of the Pu'uānāhulu Landfill, with a 15 percent diversion rate and receiving only West Hawai'i waste, is until the year 2049. If the Pu'uānāhulu Landfill receives all of the county's waste, and if planned recycling and resource recovery efforts progress (potentially increasing the diversion rate to 45 percent), then the Pu'uānāhulu Landfill has capacity until the year 2045. Additionally, the proposed waste reduction technology in East Hawai'i could potentially expand the Pu'uānāhulu Landfill beyond the year 2049 (County of Hawai'i, 2004).

The nearest transfer station is at Pa'āuilo. The station accommodates household waste and offers recycling facilities. From the transfer station, solid waste is hauled to the County landfill at Pu'uānāhulu. Green waste facilities are located at the Hilo and Kealahāke/Kailua Transfer stations.

Potential Impacts and Mitigation Measures

The proposed sale of the site will have no direct affect on county solid waste disposal facilities.

Future use of the lands could add slightly (less than 1 percent) to the county's solid-waste stream. The overall daily per capita municipal solid waste generation for Hawai'i County is 6.2 pounds (Harding ESE, 2002). Using the average household size of 2.99 persons for the Pa'āuilo CDP, approximately 60 persons could potentially be added to the population after the lands are sold, should each new land owner choose to construct a farm dwelling. If the average amount of solid waste generated per person, per day is 6.2 pounds, then one can assume that approximately 67.66 tons of solid waste will be generated per year from this project site, should each new land owner choose to construct a farm dwelling in the future and each home is occupied by approximately 2.99 persons. Demand on the Honoka'a transfer station could increase somewhat, but demand on the Pu'uānāhulu Landfill would not significantly increase. However, it should be noted that the waste generation could be substantially less if future purchasers decide not to establish dwellings on their agricultural properties.

5.6 ELECTRICAL FACILITIES

Currently, HELCO has a 69KV Transmission line and a Distribution line running along Mamālahoa Highway within the right-of-way. A Distribution line also runs mauka through the site. According to HELCO planning staff, the Distribution line running through the site is not within an easement. HELCO’s survey department is in the process of preparing documentation for a proposed 50-foot wide easement along the pole line (25-feet on either side of the centerline).

Potential Impacts and Mitigation Measures

The proposed sale of the site will have no direct affect on the demand for electrical services. Future land uses may require electricity service. Initial conversations with HELCO planning staff indicate that connections to the mauka Distribution line could be made, however, it will require a facility upgrade to the pole lines and likely the overhead conductors as well. Other options would be the use of off-the-grid alternatives such as generators and photovoltaic devices.

5.7 EDUCATIONAL FACILITIES

Public Schools. The site is located in the Honoka‘a Complex. The nearest elementary school is Pa‘auilo Elementary & Intermediate School. The site is served by Honoka‘a Intermediate and High School. Official enrollment count for the 2008-2009 school year was 270 total students at Pa‘auilo Elementary and 790 total students at Honoka‘a Intermediate and High School.

Potential Impacts and Mitigation Measures

The proposed sale of the site itself will not directly affect the existing population or introduce school-aged children to the area.

Should the site be subdivided into 20 lots, each with dwellings constructed on the Site, an estimated 8 public school students could be anticipated. This estimate is based on the student generation rate used for calculating the nearby West Hawai‘i School Impact Fee District (DOE Planning Staff, 2009) and illustrated in the following table.

Table 3 Potential DOE Students

	DOE multiplier for single family dwellings	Number of Students
Elementary	.17	3.4
Intermediate	.08	1.6
High School	.10	2
TOTAL	-	7

For the 2008-2009 school year, capacity at the Pa‘auilo Elementary and Intermediate School was 355 students. Enrollment for the 2009-2010 school year was 276 students and the projection for the 2014-2015 school year is 308 students. For Honoka‘a Intermediate and High School, the 2008-2009 capacity was 931 students, with 764 enrolled in the 2009-2010 year and 917

HĀMĀKUA LAND SALE: KOHOLĀLELE
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projected out to the 2014-2015 school year. Were the site be developed at a density of 20 single family dwellings, the number of students generated would not exceed local school capacity.

5.8 POLICE PROTECTION

The Koholālele area is served by the Honoka‘a District Police Station, which is located approximately five miles from the site at 45-3400 Māmane Street, in Honoka‘a. The Honoka‘a police station has a staff of 13 Patrol Officers, one Community Police Officer, two Sergeants, one Police Operations Clerk and the District Captain.

Potential Impacts and Mitigation Measures

The proposed sale of the site will not directly introduce new residents to the project area and is not anticipated to increase demand for police services.

If purchasers of the lands construct farm dwellings on each of the lots of record, the population is estimated to increase by 60 persons. Relative to the total population served by the Honoka‘a police station, the potential increase that would be attributable to the sale of the site is small and not expected to significantly increase the demand for police services.

5.9 FIRE PROTECTION

Fire protective service and rescue services for the Hawai‘i County are provided by the Hawai‘i County Fire Department, which operates 20 regular fire stations and 22 volunteer fire stations. One fire station (at Pōhakuloa) is federally operated. The 20 regular fire stations and three of the volunteer stations (Laupāhoehoe, Pāhala, and Nā‘ālehu) provide 24-hour fire protection and emergency medical services. Emergency medical ambulance services are contracted by the State Department of Health. Fire Department personnel provide basic and advanced life support. Emergency medical services account for 75 percent of all Fire Department incidences. All fire personnel who provide advanced and basic life support possess appropriate certification and licenses (Hawai‘i County 2005). The nearest station to the site is located at 45-3388 Māmane Street, in Honoka‘a, approximately 7.5 miles from the project lands.

The site is within the County of Hawai‘i response area. Forest Reserve lands mauka of the site are within a cooperative response area between the County and the State of Hawai‘i, DLNR, Division of Forestry and Wildlife (DOFAW).

Potential Impacts and Mitigation Measures

The proposed sale of the site will not directly increase the need for fire and emergency services in the vicinity.

If purchasers of the lands construct farm dwellings on each of the lots of record, the population is estimated to increase by 60 persons. The potential increase that would be attributable to the sale of the site is small and not expected to significantly increase the demand for fire and emergency services. Further subdivision would require all-weather roads to enable access by emergency vehicles.

5.10 HOSPITALS AND HEALTH CARE FACILITIES

Hale Ho‘ōla Hāmākua long-term care facility (formerly Honoka‘a Hospital), at 45-547 Plumaria, Honoka‘a is the primary healthcare facility serving the Hāmākua District. Located approximately 8 miles from the site, Hale Ho‘ōla Hāmākua is an acute and long-term care hospital with 50 beds (4 acute and long-term care and 46 skilled nursing and intermediate care), and 24-hour emergency room services.

North Hawai‘i Community Hospital also serves the area. Located in Waimea, at 67-1125 Māmalahoa Highway, approximately 21 miles from the project area, North Hawai‘i Community Hospital has 39 acute-care beds and offers 24-hour emergency service (NHCW 2009).

Potential Impacts and Mitigation Measures

The proposed sale of the site will not directly increase the need for healthcare in the vicinity.

If purchasers of the lands construct farm dwellings on each of the lots of record, the population is estimated to increase by 60 persons. The potential increase that would be attributable to the sale of the site is small and not expected to significantly increase the demand for healthcare facilities in the area.

5.11 RECREATIONAL FACILITIES

The following recreational facilities are located in the vicinity of the site:

- Kukuihaele Park
- Kukuihaele Landing
- Haina Park in Honoka‘a
- Honoka‘a Landing
- Honoka‘a Park
- Honoka‘a Rodeo Arena
- Pa‘auhau Landing
- Kalōpā State Recreation Area
- Pa‘auilo Gym/Park
- Koholālele Landing

The site is also adjacent to Hāmākua Forest Reserves land.

Potential Impacts and Mitigation Measures

The proposed sale of the site itself will not directly affect the population in the project vicinity, access to Hāmākua Forest Reserves land, nor will it dramatically increase the demand for community services recreational or public facilities.

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6.0 RELATIONSHIP TO POLICIES, PLANS AND CONTROLS

This section describes the State of Hawai‘i and County of Hawai‘i land use plans, policies, and ordinances relevant to the proposed sale of the site.

6.1 STATE OF HAWAII

6.1.1 Chapter 205, Hawai‘i Revised Statutes – State Land Use Law

The State Land Use Law establishes the Land Use Commission (LUC) and gives this body the authority to designate all lands in the state into one of four districts: Urban, Rural, Agricultural, or Conservation. The Site’s district designation is Agriculture and is adjacent to lands designated Agriculture, Conservation, and at Māmalahoa Highway, Urban (Figure 13, State Land Use Districts). No change to the State Land Use Designation for the Site is proposed.

6.1.2 Section 205A, Hawai‘i Revised Statutes – Coastal Zone Management Program

The Coastal Zone Management Area as defined in Chapter 205A, Hawai‘i Revised Statutes (HRS), includes all the lands of the state. The objectives of the Hawai‘i Coastal Zone Management (CZM) Program, as set forth in Chapter 205A, include the protection and maintenance of the State’s coastal resources. As the Coastal Zone is defined in Chapter 205A, the site is within the Coastal Zone Management Area; however, the lands are located a mile from the shoreline, and its lowest elevation is approximately 800 feet above mean sea level. The following paragraphs discuss the project’s relationship to the objectives and policies of the Coastal Zone Management Program.

The proposed project site is approximately one mile from the shore and is not expected to have any adverse impacts on Coastal Recreational Resources (205A-2(1)), Coastal Ecosystems (205A-2(4)), or Beach Protection (205A-2(9)). For the same reason, the site will not be subject to potential impacts from Coastal Hazards (205A-2(6)).

The proposed sale of the lands will not adversely impact the area’s Historic Resources (205A-2(2)). Scientific Consultant Services, Inc. (2009) conducted an archaeological inventory survey of the project area. Four feature sites consisting of eight rock mounds were inventoried, evaluated and determined to be associated with Historic-era sugarcane field clearing. No impacts to these features are expected with sale of the land.

The proposed action will not significantly affect the Scenic and Open Space (205A-2(2)) quality of the project area. The site is currently uncultivated open space and forest. After the sale, the lands are expected to return to agricultural use, and some farm dwellings or farm structures may be built on them.

Sale of the site is expected to have a beneficial effect on Economic Use (205A-2(5)). The site is located in an area that has long been an agricultural community. The sale will make it possible to put these non-coastal lands back into agricultural use after having been fallow for more than a

HĀMĀKUA LAND SALE: KOHOLĀLELE
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decade. The land sale will provide opportunities for residents who wish to be in agriculture to obtain land for that purpose and enable the production of valuable agricultural commodities.

Regarding the Hawai'i CZM Program's goals to promote Public Participation in coastal management (205A-2(8)), this EA reports and publishes the potential short- and long-term impacts of the proposed sale of the site. Prior to, and throughout the development of this EA, various agencies (or agency documents) were consulted (see consultation list in Section 9.0). Additionally, several members of the community were interviewed for the Cultural Resources Impact Assessment.

Managing Development is appropriately the role of those State and County agencies assigned the responsibility of implementing the provisions of Chapter 205A, HRS, and the Coastal Zone Management Program. A major component of the Hawai'i Coastal Zone Management Program is the designation of Special Management Areas (SMA). The Counties determine the extent of the Special Management Areas within their jurisdictions and must approve and issue a permit for any development within the SMA. The site is not located within Hawai'i County SMA, and no permit will be required.

HĀMĀKUA LAND SALE: KOHOLĀLELE
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Figure 13, State Land Use Districts



LEGEND

Koholālele Site

District

Agriculture

Conservation

Urban

State Land Use Districts
**KOHOLĀLELE
HĀMĀKUA LAND SALE**

County of Hawai'i

NORTH

ISLAND OF HAWAII

LINEAR SCALE (FEET)

0 1,500 3,000 6,000

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Source: State Land Use Commission (2009)
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HĀMĀKUA LAND SALE: KOHOLĀLELE
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Figure 14, Special Management Area



LEGEND

-  Koholālele Site
-  Special Management Area

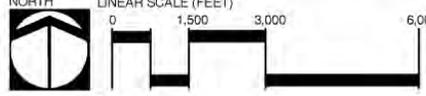
Special Management Area
**KOHOLĀLELE
HĀMĀKUA LAND SALES**

County of Hawai'i ISLAND OF HAWAII

NORTH

LINEAR SCALE (FEET)

0 1,500 3,000 6,000



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February 2010

Source: Hawai'i County Dept of Planning (2008)
Disclaimer: This graphic has been prepared for general planning purposes only.

6.2 COUNTY OF HAWAII

County-specific land use plans and ordinances pertaining to the site include the *County of Hawai'i General Plan* and the Hawai'i County Zoning Code. The following subsections present relevant elements of these land use plans and ordinances, accompanied with a description of how each will be addressed during the course of the proposed project.

6.2.1 General Plan

The *County of Hawai'i General Plan* (General Plan) was adopted in February 2005 and is a policy document for the long-range comprehensive development of the Island of Hawai'i. The plan provides direction for the future growth of the County and offers policy statements that embody the expressed goals for present and future generations. The General Plan provides the legal basis for all subdivision, zoning, and related ordinances and for the initiation and authorization of all public improvements and projects.

Specific goals and policies applicable to the proposed sale of the site are discussed below.

Natural Beauty

Goals:

- (a) *Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.*
- (b) *Protect scenic vistas and view planes from becoming obstructed.*

Discussion: The Koholālele property is not listed in the General Plan as a site exhibiting exceptional natural beauty. Nonetheless, the site offers views of the ocean, and from higher elevations, potentially Mauna Kea. However, the density of ironwood trees on the site obscures most views. As previously discussed, the sale and subsequent use of the lands (assumed to be agricultural) is expected to preserve and potentially enhance scenic places and vistas in the area. County building height limitations will maintain maximum dwelling heights at 35 feet, with farm buildings limited to 45 feet, and selective clearing of the ironwood trees which have grown to dominate the landscape would serve to open up the site.

Environmental Quality

Goals

- (b) *Maintain and, if feasible, improve the existing environmental quality of the island.*

Policies

- (a) *Take positive action to further maintain the quality of the environment.*

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Discussion: Sale of the site involves no construction or development activity. The lands are expected to retain their current Agriculture zoning after the sale, and no significant environmental impacts are expected from this action.

Natural Resources

Goals

- (a) *Protect and conserve the natural resources from undue exploitation, encroachment and damage.*
- (c) *Protect and promote the prudent use of Hawai‘i’s unique, fragile, and significant environmental and natural resources.*

Policies

- (g) *Promote sound management and development of Hawai‘i’s land and marine resources for potential economic benefit.*

Discussion: Among the natural resources of Hawai‘i are its soil, water, and air. The site is in the state land use Agricultural District, is zoned by the County for Agriculture, and contain land rated as Prime Agricultural Lands. The sale of the lands itself will not negatively impact these natural resources. Sale and subsequent use of the site is expected to put the land in agricultural use. Negative impacts to marine resources, air quality, water quality and to soils are not expected.

Economic

Goals

- (a) *Provide residents with opportunities to improve their quality of life through economic development that enhances the County’s natural and social environments.*
- (b) *Economic development and improvement shall be in balance with the physical, social, and cultural environments of the island of Hawai‘i.*
- (d) *Provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County’s cultural, natural and social environment.*

Policies

- (a) *Assist in the expansion of the agricultural industry through the protection of important agricultural lands, development of marketing plans and programs, capital improvements and continued cooperation with appropriate State and Federal agencies.*

Discussion: Agricultural activities ceased at this site with the default of Hāmākua Sugar and subsequent ownership of the land by the County. Sale of the site will make it possible to put the lands back into agricultural use, by making it available for residents who wish to be in

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agriculture to obtain land for that purpose. Putting the lands back into agriculture is consistent with the physical, social, and cultural environment of Hawai‘i County and the Hāmākua District.

Land Use – Agriculture

Goals

(a) *Identify, protect and maintain important agriculture lands on the island of Hawai‘i.*

Policies

(j) *Ensure that development of important agricultural land be primarily for agricultural use.*

Discussion: The site is former sugar cane land that has lain fallow since 1994. It is anticipated that after their sale, agricultural activities will resume.

On the county’s Land Use Pattern Allocation Guide (LUPAG) map, found in the Hawai‘i County General Plan (Hawai‘i County 2005), the site is designated Important Agricultural Lands (Figure 13). Because the site is expected to return to agricultural use, the proposed sale of the site is consistent with the Important Agricultural Lands designation.

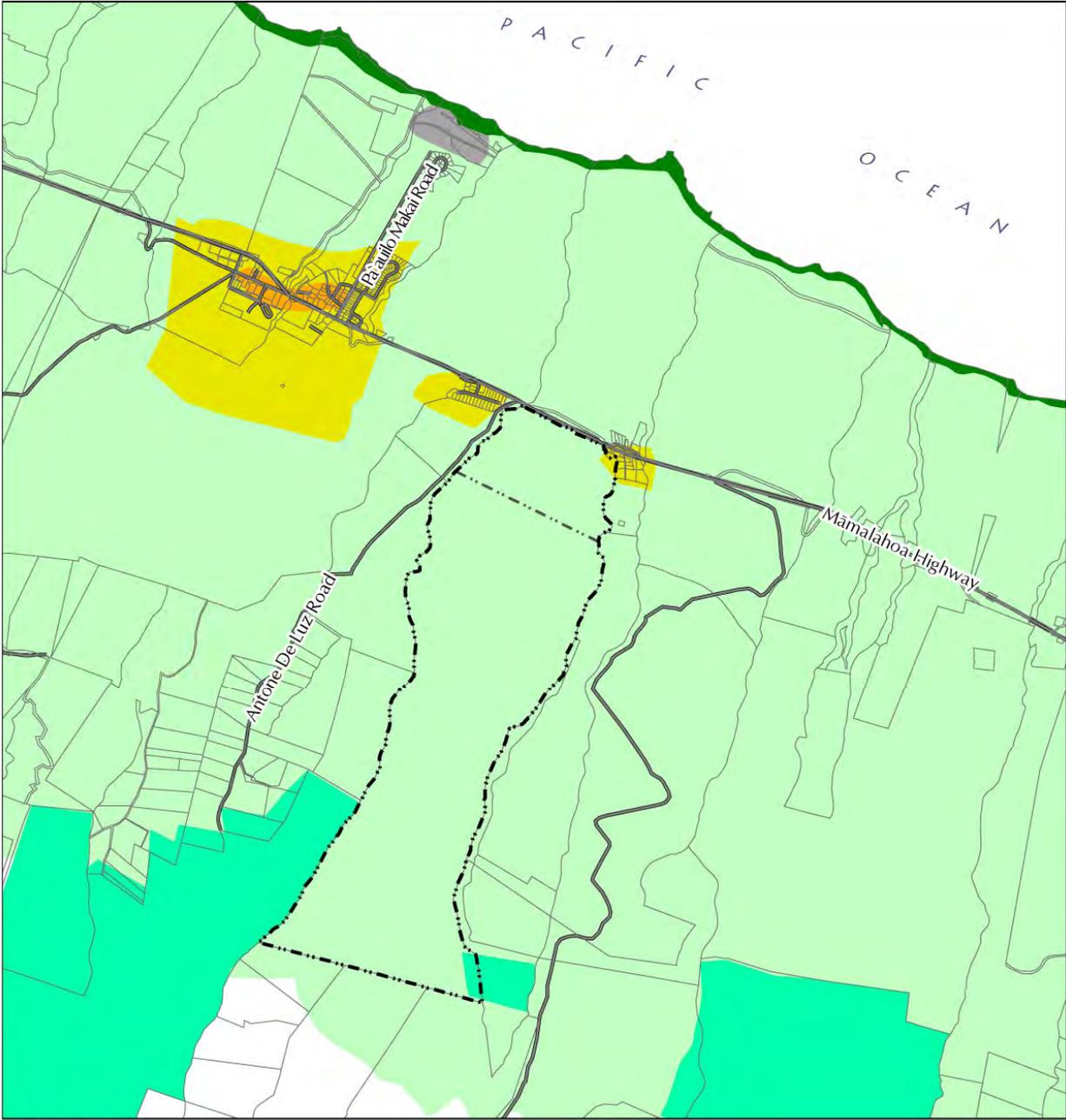
6.2.2 Hawai‘i County Zoning

Chapter 25 of the Hawai‘i County Code is the County’s Zoning Code. The Zoning Code specifies permitted uses as well as site development parameters, such as density and building setbacks. The site is zoned A-40a by the County of Hawai‘i (Figure 14). Agricultural districts provide for agricultural and very low-density agriculturally-based residential use. Density in the A-40a District is limited to a minimum building site area of 40 acres.

Discussion: The sale of the site is consistent with the Agricultural district. It is anticipated that the site will continue to be designated Agriculture and that agricultural uses can once again resume at the site after the land is sold.

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Figure 15, Land Use Pattern Allocation (General Plan)



LEGEND

Koholālele Site

LUPAG Land Classification

- | | |
|------------------------------|-----------------------|
| Industrial | Open Area |
| Low Density Urban | Conservation |
| Medium Density Urban | Extensive Agriculture |
| Important Agricultural Lands | |

Source: Hawai'i County Dept. of Planning (2005)
Disclaimer: This graphic has been prepared for general planning purposes only.

Land Use Plan Allocation Guide

**KOHOLĀLELE
HĀMĀKUA LAND SALE**

County of Hawai'i ISLAND OF HAWAII

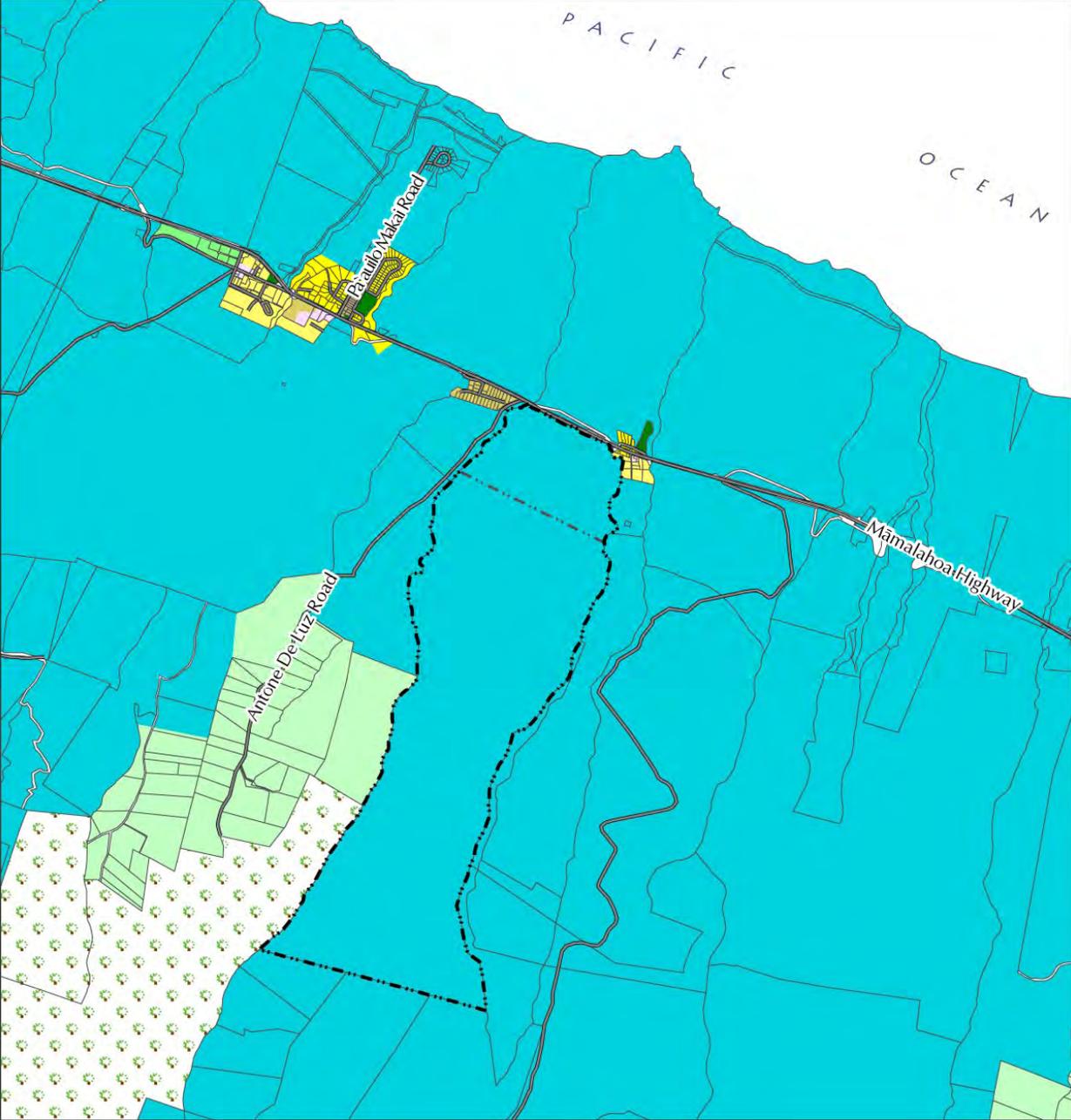
NORTH

LINEAR SCALE (FEET)
0 1,500 3,000 6,000

PBR HAWAII
ASSOCIATES, INC.
February 2010

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Figure 16, Zoning



LEGEND

Koholālele Site

Zoning

(road)	CN-7.5	RS-10
A-40a	CV-10	RS-15
A-5a	FR	RS-7.5
A-1a	OPEN	V-25
		RS-3.75

Source: Hawai'i County Dept of Planning (2008)
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County of Hawai'i Zoning
KOHOLĀLELE
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County of Hawai'i ISLAND OF HAWAII

NORTH LINEAR SCALE (FEET) 0 1,500 3,000 6,000

PBR HAWAII & ASSOCIATES, INC. February 2010

6.3 MAJOR APPROVALS REQUIRED

As there is no development or construction proposed at this time, no approvals other than the acceptance of this document and a Finding of No Significant Impact (FONSI) are required.

7.0 ALTERNATIVES TO THE PROPOSED ACTION

Under Section 11-200-10(6), HAR, Environmental Impact Statement Rules, the alternatives to the proposed action considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. The feasible alternatives must also address the project's economic characteristics while responding to the surrounding land uses that will be impacted by the project. In conformance with applicable regulations, the following alternatives, including alternative sites and uses of the property, have been identified and investigated.

7.1 NO-ACTION ALTERNATIVE (STATUS QUO)

Under the no-action alternative the County would retain ownership of the Site. The County would continue to pay expenses associated with owning the lands and not realize the revenue benefits of selling the lands. Under this alternative, the lands would continue to be property-tax exempt and the County will not realize any income from taxes. In addition, the lands would not pass to new owners and would not be put to their best use.

7.2 THE ALTERNATIVE OF EXECUTING A LAND EXCHANGE

Over the last few years, the County has explored land exchange options with large landowners in the vicinity. The County continues to be open to any opportunities to exchange the Stie, particularly with any land listed on the Open Space priority list.

7.3 THE ALTERNATIVE OF LEASING THE LANDS

The County explored the option of leasing the land to individuals or businesses that would put the land to productive use. Under the leasing alternative, the County would bear the costs associated with owning the land and administering the leases and forego the immediate larger financial benefits of selling the lands. Under this alternative, no real property tax revenues would be realized.

This alternative would achieve one project goal which is to allow these lands to be put back into productive agricultural use. However, the County recently decided to offer other surplus lands located in Kapulena for affordable agricultural leases. The extent of the proposed Kapulena lease lands (approximately 1700 acres) would likely exceed the prevailing demand for diversified agriculture in the Hāmākua area.

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8.0 ANTICIPATED DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

8.1 ANTICIPATED DETERMINATION

This EA has evaluated the potential primary, secondary, and cumulative environmental impacts, both short-term and long-term, that could result from the proposed action. Based on this assessment, the anticipated determination is a Finding of No Significant Impact (FONSI).

8.2 FINDINGS AND REASONS

To determine whether a proposed action will have significant impacts on the environment, Hawai‘i Administrative Rules Section 11-200-12 sets forth 13 significance criteria. Based on an evaluation of all phases and expected consequences of the proposed action, the findings supporting an anticipated determination of no significant impact are as follows:

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

Neither the sale of the site nor its anticipated subsequent use is expected to negatively impact natural resources in the lands or in the vicinity. While the lands are expected to remain in agriculture, the exact use and any associated impacts are unknown at this time. Purchasers of the Lands would have to comply with County, State, and Federal regulations with regard to the protection of natural resources.

An archaeological inventory survey has been conducted by Scientific Consultant Services, Inc., for the project area. The survey documented four sites consisting of eight rock mounds. The features were fully investigated and determined to be associated with Historic sugarcane field clearing. As the sale of this site does not involve any earth disturbing activities, no impacts are expected. The archaeological inventory survey concludes that no additional archaeological work be done for the feature sites. Section 4.1 discusses the inventory survey in more detail.

A Cultural Impact Analysis was also conducted by Scientific Consultant Services, Inc., and concluded that pursuant to Act 50 the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. Because there were no cultural activities identified within the project area, there are no adverse effects.

An inventory of flora and fauna was conducted by Robert Hobdy in 2009. No plant species listed or proposed as threatened or endangered were identified within the project area. Faunal survey recorded the endangered Hawaiian hoary bat within the project area. The faunal survey report concluded that the proposed sale and subsequent use of the site is not expected to have any significant adverse impact on this species.

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

The site is currently undeveloped and unused land designated by the State and County for agricultural uses. While the lands have laid fallow, non-native plant species have come to dominate the plant communities. By selling the property, the County will free itself from ongoing expenses associated with owning the lands and will benefit from the proceeds of the sale. The sale is expected to make the property available for productive agricultural use.

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

The proposed sale is consistent with the environmental policies, goals, and guidelines established in Chapter 344, HRS, State Environmental Policy. This EA has addressed such issues as natural resources conservation, soils, drainage, visual environment, flora and fauna, open space, air and water quality, wastewater, and energy consumption.

(4) Substantially affects the economic welfare, social welfare, or cultural practices of the community or state

This EA has addressed questions of population, housing, educational facilities, economic development, quality of life, noise, and transportation. The proposed sale of the site will positively affect the economic and social welfare of the Hāmākua community by providing the opportunity to place the property in the hands of owners who are likely to put the land back into productive agricultural use.

(5) Substantially affects public health

The sale of the site will not substantially affect public health in the immediate area or island wide. The lands are expected to retain their current zoning after the sale. Should farm dwellings be constructed, they will be required to comply with all water and wastewater health and safety standards. Similarly, any future agricultural uses will be required to comply with State adopted standards for sanitation and waste disposal.

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

Based on the potential to develop 26 farm dwellings as discussed previously in this document, the demand for energy and water, as well as the generation solid waste and wastewater, will not increase significantly, either regionally or island wide.

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(7) Involves a substantial degradation of environmental quality

The sale of the site itself does not entail development or construction of any kind and will not degrade environmental quality. After the sale, it is expected that zoning of the lands will remain the same and that the lands will be likely be used for agricultural purposes.

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

Because the sale of the site does not entail development of any kind, and the land will remain in its existing condition, it will not affect the environment or involve a commitment for larger actions. Subsequent agricultural use of the lands is not expected to result in cumulative effects on the environment or involve a commitment for larger actions.

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

The endangered Hawaiian hoary bat was recorded within the project area during faunal survey. Because this species is common in the Hāmākua region, and their habitat is abundant, the sale of the site and anticipated agricultural use are not expected to result in adverse impacts to this species.

(10) Detrimentially affects air or water quality or ambient noise levels

The sale of the lands will not significantly affect noise and air quality levels. During the period preceding the sale, traffic and associated noise and pollution levels will increase slightly as potential buyers examine the properties. After the sale, although traffic on area roads is expected to increase somewhat as they will be used by the purchasers of the property, substantial detrimental impacts to air quality are not expected, as any air pollutants would be rapidly dispersed by the prevailing winds. Periodic vehicular traffic associated with use of the lands may periodically contribute to ambient noise levels in the immediate vicinity of area roads.

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

The site is not located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters. As such, the sale and subsequent use of the lands would have no adverse impacts upon these types of sensitive lands, and the lands and any improvements to them would not be likely to suffer damage from hazards associated with such areas.

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(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies

The project vicinity includes a diverse range of scenic vistas and open expanses that typify the upper Hāmākua coast. The site is located at higher elevations and offer views of the ocean. Opportunities for greater expanses of views of the ocean and Mauna Kea might be possible with selective removal of the ironwood trees that have come to dominate the site. Existing views of the coastline from within the lands would be unaffected by the land sale.

In lands zoned for agriculture, any agricultural and residential structures built after the sale would be limited by zoning to 45 and 35 feet, respectively and are not expected to significantly affect views of the coast or to degrade views of the slopes of Mauna Kea from makai areas.

(13) Requires substantial energy consumption.

The proposed sale will not directly increase energy consumption. After their sale, the lands are expected to be put to agricultural use, with the possibility that farm dwellings may be constructed. Because no utility upgrades are planned, purchasers constructing dwellings or undertaking agricultural uses that require electric power will need to explore off-the-grid alternatives such as generators and photovoltaic devices.

9.0 CONSULTED PARTIES AND PARTICIPANTS

9.1 PRE-ASSESSMENT CONSULTATION PERIOD

Pre-consultation letters, along with a location map, were distributed to the agencies and organizations listed in the following table prior to development of this Environmental Assessment. Agency comment letters and responses are included in Appendix D

Table 4 Pre-Consultation Contacts

AGENCY		Letter Date	Provided Comments (yes/no)
County			
1	Department of Environmental Management	08/07/2009	yes
2	Planning Department	08/07/2009	no
3	Department of Public Works	08/07/2009	no
4	Department of Research and Development	08/07/2009	no
5	Department of Water Supply	08/07/2009	no
6	Fire Department	08/07/2009	yes
7	Police Department	08/07/2009	yes
8	J. Yoshimoto, Chair, County Council	08/07/2009	no
9	Dominic Yagong, Councilmember	08/07/2009	no
10	Office of the Mayor	08/07/2009	
State			
11	Department of Business, Economic Development and Tourism (DBEDT)	08/07/2009	no
12	DBEDT Land Use Commission	08/07/2009	no
13	DBEDT Office of Planning	08/07/2009	yes
14	DBEDT Strategic Industries Division	08/07/2009	yes
15	Department of Health – Environmental Planning Office	08/07/2009	no
16	Department of Land and Natural Resources (DLNR)	08/07/2009	yes
17	DLNR State Historic Preservation Division	08/07/2009	yes
18	Office of Environmental Quality Control	08/07/2009	yes
19	Office of Hawaiian Affairs	08/07/2009	yes
20	Office of Hawaiian Affairs – Kona Office	08/07/2009	no
21	U.H. Mānoa College of Tropical Agriculture and Human Resources	08/07/2009	no
Federal			
22	US Army Corps of Engineers, Honolulu District – Regulatory Branch	08/07/2009	no
23	US Fish and Wildlife Service – Pacific Islands Contact Office	08/07/2009	no
Other Organizations			
24	Kamehameha Schools – Land Assets Division	08/07/2009	no

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Appendix

A

{ Flora and Fauna Study and Assessment }

**FLORA AND FAUNA SURVEY AND ASSESSMENT
KOHOLALELE ALLOTMENT, HAMAKUA, HAWAII COUNTY**

INTRODUCTION

The Koholālele Allotment consists of a single parcel of land (TMK (3) 4-2-05:01 (por.) totaling approximately 900 acres of old sugar cane land that is presently abandoned and overgrown (see Figure 1). It lies on in the Hamakua District on the northwest flank of Maunakea above the Māmālohō Highway about ¼ mile east of Pa‘aūlo Town. The property is flanked on the east and west by commercial eucalyptus timber plantations, and on its south uphill side by sparsely forested pasture lands. This study was initiated by the County of Hawaii in support of a proposed land sale, in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

The entire project area consists of moderately sloping lands with broad ridges and a few shallow gulches in the ahupua‘a of Koholālele between the elevations of 800 ft. and 2,500 ft. Its eastern boundary is Kainehe Gulch and its western boundary is Kawaiī Gulch, with Koholālele Gulch running down its center. The vegetation consists alternately of expanses of dense grasses and forests of fast-growing young trees on the old cane lands and of larger trees in the gulches. Soils are characterized as Maunakea Ash, deep well-drained soils from some of Maunakea’s most recent eruptions 4,000 to 14,000 years ago (Wolfe & Morris, 1996). Annual rainfall averages 75-80 inches with the bulk falling during the winter and early spring (Armstrong, 1983).

BIOLOGICAL HISTORY

These windward slopes of Hamakua District at this elevation were once clothed with a dense forest of ‘ōhi‘a (*Metrosideros polymorpha*), kopiko‘ula (*Psychotria havaiensis*), kōlea lau nui (*Myrsine lessertiana*) and neneleu (*Rhus sandwicensis*), and an equally dense understory of shrubs such as manono (*Kadua affinis*) and ferns such as uluhe (*Dicranopteris linearis*), palapalai (*Microlepia strigosa*) and three species of hapu‘u (*Cibotium* spp.). A great variety of less common species of trees, shrubs, vines, herbs and ferns would have made for a diverse and rich forest.

The Hawaiians lived mostly at lower elevations where they farmed the larger, well-watered valley bottoms and gently sloping ridge tops or fished along the coast. They made forays into the higher forests for timber, medicines, fiber plants and bird feathers. Their activities had moderate effect on the lower elevation environment but the mauka forests would have been little changed.

In the 1800s grazing animals were introduced to this area and in the latter part of the century thousands of acres of forests were cleared for sugar cane agriculture and were plowed, burned and farmed for over a century. Sugar growing ended abruptly in the 1990s and these lands have been used for cattle grazing or stand idle. The majority of this area today is overgrown with either dense stands of 6 to 8 foot tall Guinea grass (*Panicum maximum*) or forests of common ironwood (*Casuarina equisetifolia*) that together occupy about 80% of the project area.

FLORA AND FAUNA SURVEY AND ASSESSMENT

for the

KOHOLALELE ALLOTMENT

HAMAKUA, HAWAII ISLAND

by

ROBERT W. HOBBY
ENVIRONMENTAL CONSULTANT
Kokomo, Maui
October 2009

Prepared for:
PBR Hawaii

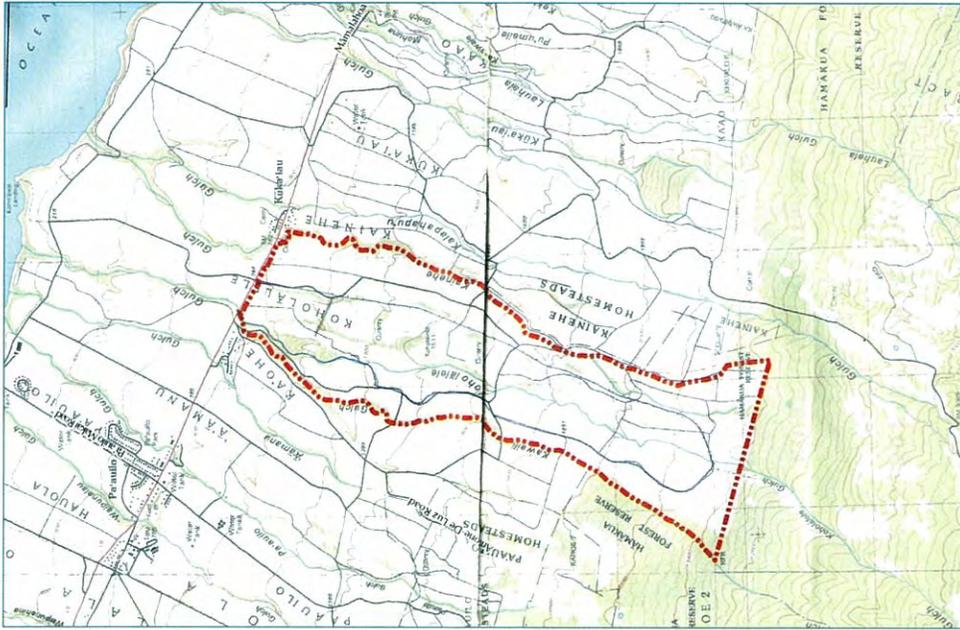


FIGURE 1 – Project Area

The gulches that dissect the property retain a few of the hardier native species that remain, but there is little of the former rich diversity of plants, mammals, birds, insects and snails that once occupied this area.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the County of Hawaii, Koholāle Ailomment lands which was conducted between October 20 and 22, 2009. The objectives of the survey were to:

1. Document what plant, bird and mammal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used following routes to ensure that all parts of this large property were covered. Areas most likely to harbor native or rare plants such as the numerous gulches that dissect the property were more intensively examined. These included Kawaiī, Koholālele and Kainehe Gulches. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation on the property is dominated by species that have grown-in on the abandoned sugar cane lands in the past 15 years. Two species in particular, Guinea grass and common ironwood, grow to the exclusion of almost everything else on about 80% of the property. Three additional species were rated as common: 'ōhi'a, loquat (*Eriobotrya japonica*) and rough maidenhair fern (*Adiantum hispidulum*). The 'ōhi'a is found mostly in the gulches and scattered on the ridge tops in the upper part of the property. The loquat is almost exclusively in the gulches but is becoming very common there. The rough maidenhair fern grows thickly under the ironwood forests and in the gulches.

A total of 122 plant species were recorded across the entire property during five site visits. Of these 18 were native species including 9 that are endemic to Hawaii: hapu'u pulu (*Cibotium glaucum*), 'iwa'iwa lau nui (*Tectaria douglasii*), ni'ani'au (*Nephrolepis exaltata* subsp. *hawaitensis*), neneleau, koa (*Acacia koa*), kolea lau nui, 'ohi'a, pilo (*Coprosma* sp.) and kopiko'ula, and 9 species that are indigenous in Hawaii as well as elsewhere in the Pacific including: palapalai (*Microlepia strigosae*), uluhe fern (*Dicranopteris linearis*), (*Gonocormus minutus*) no common name, pala'a (*Splenomeres chinensis*), pākāhākāha (*Lepisorus thunbergianus*), moa (*Psilotum nudum*), (*Cyperus polystachnos*) no common name, 'ie'ie (*Freyinetia arborea*) and huehue (*Coccinula orbiculata*). None of these native species are rare and none of them are federally listed or protected. Four species were Polynesian plant introductions including: ki or ti leaf (*Cordyline fruticosa*), 'awapuhi (*Zingiber zerumbet*), kukui (*Aleurites moluccana*) and 'hi or yellow wood sorrel (*Oxalis corniculata*). The remaining 100 plant species are all non-native and of no particular conservation interest or concern.

The whole property showed signs of pig rooting. This was especially true in the gulches where every square foot of soil appeared to be heavily rooted. This rooting had the twin effects of severely limiting the diversity of the more delicate native understory species, while at the same time aiding the spread of aggressive, shade-tolerant weeds such as strawberry guava.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area consists primarily of non-native species. The property has been heavily altered by historic land uses and continues to be degraded by invasive alien plant species and feral pigs. The gulches dissecting the property harbor the great majority of the 18 remaining species of native plants, but most of these are older, mature plants. Reproduction of all but a few native species is almost non-existent. All 18 native plant species are widespread and common.

No federally listed Threatened or Endangered plant species (USFWS, 2009) were found on the property nor were any found that are candidates for such status. No special habitats were found on the property either.

Because of the above existing conditions and because the proposed action does not involve any land use changes, there is little of botanical concern regarding this property. The proposed action is not expected to have a significant negative impact on the botanical resources in this part of the Big Island.

It is recommended that any future land uses in this area consider the protection and enhancement of the best examples of remnant strips of native forest in the gulches running through the property.



Figure 2 Lower area with dense regrowth of ironwood forest.



Figure 3 Middle area with Guinea grass in foreground, large kukui trees in gulch and ironwood forest in background.



Figure 4 Upper area with koa and 'ohi'a regrowth

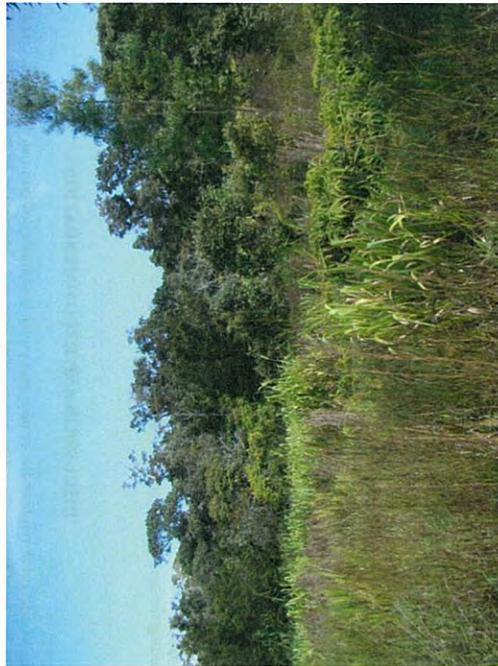


Figure 5 Upper area with large 'ohi'a trees in gulch

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within three groups: Ferns, Monocots and Dicots. Taxonomy and nomenclature of the Ferns follow Palmer (2003), while the Monocots and Dicots follow Wagner et al. (1999) and Staples and Herbst (2005).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:
 - endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.
 - indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
 - Polynesian = those plants brought to the islands by the Polynesians in the course of their migrations.
 - non-native = all those plants brought to the islands intentionally or accidentally after western contact.
4. Abundance of each species within the project area:
 - abundant = forming a major part of the vegetation within the project area.
 - common = widely scattered throughout the area or locally abundant within a portion of it.
 - uncommon = scattered sparsely throughout the area or occurring in a few small patches.
 - rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
FERNS			
ATHYRIACEAE (Lady Fern Family)			
<i>Deparia petersenii</i> (Kunze) Kato	-----	non-native	rare
BLECHNACEAE (Chain Fern Family)			
<i>Blechnum appendiculatum</i> Willd.	-----	non-native	uncommon
DENNSTAEDTIACEAE (Bracken Family)			
<i>Microlopia strigosa</i> (Thunb.) C. Presl	<i>palapalai</i>	indigenous	uncommon
DICKSONIACEAE (Dicksonia Fern Family)			
<i>Cibotium glaucum</i> (Sm.) Hook. & Arnott	<i>hapu'u pahu</i>	endemic	rare
DRYOPTERIDACEAE (Wood Fern Family)			
<i>Tectaria gaudichaudii</i> (Mett.) Maxon	<i>'iwa'iwa lau ni'i</i>	endemic	rare
GLEICHENIACEAE (False Staghorn Fern Family)			
<i>Dicranopteris linearis</i> (Burm.f.) Underw.	<i>tititae</i>	indigenous	uncommon
HYMENOPHYLLACEAE (Filmy Fern Family)			
<i>Gonocormus minutus</i> (Blume) Bosch	-----	indigenous	rare
LINDSAEACEAE (Lindsaea Fern Family)			
<i>Sphenomeris chinensis</i> (L.) Maxon	<i>pala'ā</i>	indigenous	rare
NEPHROLEPIDACEAE (Sword Fern Family)			
<i>Nephrolepis brownii</i> (Desv.) Hovenkamp & Miyam. <i>Nephrolepis exaltata</i> (L.) Schott <i>subsp. hawaiiensis</i> W.H. Wagner	Asian sword fern <i>ni'ani'au</i>	non-native endemic	uncommon rare
POLYPODIACEAE (Polypody Fern Family)			
<i>Lepisorus thunbergianus</i> (Kaulf.) Ching <i>Phlebodium aureum</i> (L.) J. Sm.	<i>pākahakaha</i> rabbit's-foot fern	indigenous non-native	rare rare
PSILOTACEAE (Whisk Fern Family)			

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SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Psilotum nidium</i> (L.) P. Beauv.	<i>moa</i>	indigenous	rare
PTERIDACEAE (Brake Fern Family)			
<i>Adiantum hispidulum</i> Sw.	rough maidenhair fern	non-native	common
<i>Adiantum raddianum</i> C. Presl	maidenhair fern	non-native	rare
<i>Pityrogramma austroamericana</i> Domin	gold fern	non-native	rare
SELAGINELLACEAE (Spike Moss Family)			
<i>Selaginella kraussiana</i> (Kunze) A. Braun	spreading selaginella	non-native	rare
THELYPTERIDACEAE (Marsh Fern Family)			
<i>Christella dentata</i> (Forsk.) Brownsey & Jermy	-----	non-native	rare
<i>Christella parasitica</i> (L.) H. Lev.	-----	non-native	uncommon
MONOCOTS			
ARACEAE (Aroid Family)			
<i>Xanthosoma robustum</i> Schott	<i>'ape</i>	non-native	rare
ASPARAGACEAE (Asparagus Family)			
<i>Cordyline fruticosa</i> (L.) A. Chev.	<i>ki, ti leaf</i>	Polynesian	rare
COMMELINACEAE (Spiderwort Family)			
<i>Commelina diffusa</i> N.L. Burm.	<i>honohono</i>	non-native	rare
CYPERACEAE (Sedge Family)			
<i>Cyperus polystachyos</i> Rottb.	-----	indigenous	uncommon
<i>Cyperus rotundus</i> L.	nut sedge	non-native	rare
<i>Kyllingia brevifolia</i> Rottb.	<i>ki'i'o'opu</i>	non-native	rare
IRIDACEAE (Iris Family)			
<i>Aristea gerrardii</i> Weim.	-----	non-native	rare
ORCHIDACEAE (Orchid Family)			
<i>Arundina graminifolia</i> (D.Don) Hochreutiner	bamboo orchid	non-native	uncommon

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SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Cymbidium</i> sp.	-----	non-native	rare
PANDANACEAE (Screwpine Family)			
<i>Freyinetia arborea</i> Gaud.	'ie'ie	indigenous	rare
POACEAE (Grass Family)			
<i>Andropogon virginicus</i> L.	broomsedge narrow-leaved carpetgrass	non-native	uncommon
<i>Axonopus fissifolius</i> (Raddi) Kuhlth.	Henry's crabgrass	non-native	rare
<i>Digitaria ciliaris</i> (Retz.) Koeler	wiregrass	non-native	rare
<i>Elyusine indica</i> (L.) Gaertn.	Carolina lovegrass	non-native	rare
<i>Eragrostis pectinacea</i> (Michx.) Nees	molasses grass	non-native	uncommon
<i>Melinis minutiflora</i> P. Beauv.	basketgrass	non-native	rare
<i>Oplismenus hirtellus</i> (L.) P. Beauv.	Guinea grass	non-native	abundant
<i>Panicum maximum</i> Jacq.	-----	non-native	rare
<i>Panicum</i> sp.	Hilo grass	non-native	rare
<i>Paspalum conjugatum</i> Bergius	Vasey grass	non-native	rare
<i>Paspalum urvillei</i> Steud.	Napier grass	non-native	uncommon
<i>Pennisetum purpureum</i> Schumacher.	-----	non-native	uncommon
<i>Schizachyrium condensatum</i> (Kunth) Nees	Palm grass	non-native	rare
<i>Setaria palmifolia</i> (J. König) Stapf	yellow foxtail	non-native	rare
<i>Setaria parviflora</i> (Poir.) Kerguelen	smutgrass	non-native	rare
<i>Sporobolus africanus</i> (Poir.) Robyns & Toumay	California grass	non-native	rare
<i>Urochloa mutica</i> (Forssk.) T.Q. Nguyen	yellow ginger	non-native	rare
ZINGIBERACEAE (Ginger Family)			
<i>Hedychium flavescens</i> N. Carey ex Roscoe	kahili ginger	non-native	rare
<i>Hedychium gardnerianum</i> Shepherd ex Ker-Gawl.			

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Zingiber zerumbet</i> (L.) Sm.	'awapuhi	Polynesian	rare
DICOTS			
ANACARDIACEAE (Mango Family)			
<i>Rhus sandwicensis</i> A. Gray	<i>neneleau</i>	endemic	rare
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	non-native	rare
ASTERACEAE (Sunflower Family)			
<i>Ageratum conyzoides</i> L.	<i>maile hohono</i>	non-native	rare
<i>Bidens pilosa</i> L.	Spanish needle	non-native	rare
<i>Conyza bonariensis</i> (L.) Cronq.	hairy horseweed	non-native	rare
<i>Conyza canadensis</i> (L.) Cronq.	horseweed	non-native	rare
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	redflower ragleaf	non-native	rare
<i>Elephantopus mollis</i> Kunth	-----	non-native	rare
<i>Emilia sonchifolia</i> (L.) DC.	violet pualele	non-native	rare
<i>Gnaphalium purpurea</i> (L.) Cabrera	purple cudweed	non-native	rare
<i>Hypochoeris radicata</i> L.	gosmore	non-native	rare
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush small yellow crown- beard	non-native	rare
<i>Sigesbeckia orientalis</i> L.	fireweed	non-native	rare
<i>Senecio madagascariensis</i> Poir.	pualele	non-native	rare
<i>Sonchus oleraceus</i> L.	wedelia	non-native	rare
<i>Sphagneticola trilobata</i> (L.) Pruski	-----	non-native	rare
BEGONIACEAE (Begonia Family)			
<i>Begonia hirtella</i> Link	-----	non-native	rare
CASUARINACEAE (She-oak Family)			
<i>Casuarina equisetifolia</i> L.	common ironwood	non-native	abundant
CONVOLVULACEAE (Morning Glory Family)			

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Ipomoea indica</i> (J. Burm.) Merr.	koali awahia	indigenous	rare
CRASSULACEAE (Stonecrop Family)			
<i>Bryophyllum pinnatum</i> (Lam.) Oken	air plant	non-native	rare
EUPHORBACEAE (Spurge Family)			
<i>Aleurites moluccana</i> (L.) Willd.	kukui	Polynesian	uncommon
<i>Chaetochyva hirta</i> (L.) Millsp.	hairy spurge	non-native	rare
<i>Euphorbia heterophylla</i> L.	kaliko	non-native	rare
<i>Ricinus communis</i> L.	Castor bean	non-native	rare
FABACEAE (Pea Family)			
<i>Acacia koa</i> A. Gray	koali awahia	endemic	uncommon
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	non-native	rare
<i>Crotalaria incana</i> L.	fuzzy rattlepod	non-native	rare
<i>Crotalaria micans</i> Link	rattlepod	non-native	uncommon
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	non-native	rare
<i>Desmodium incanum</i> DC	ka'imni clover	non-native	rare
<i>Desmodium intortum</i> (Mill.) Urb.	three-flowered beggarweed	non-native	rare
<i>Desmodium triflorum</i> (L.) DC	inikō	non-native	rare
<i>Indigofera suffruticosa</i> Mill.	-----	non-native	rare
<i>Lottus subbiflorus</i> Lag.	-----	non-native	rare
<i>Mimosa pudica</i> L.	hilihila	non-native	uncommon
<i>Senna septemtrionalis</i> (Viv.) H. Irwin & Barneby	kolomona	non-native	rare
LAMIACEAE (Mint Family)			
<i>Hyptis pectinata</i> (L.) Poit.	comb hyptis	non-native	rare
LAURACEAE (Laurel Family)			

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Persea americana</i> Mill.	avocado	non-native	rare
LYTHRACEAE (Loosestrife Family)			
<i>Cuphea carthagenensis</i> (Jacq.) Macbr.	tarweed	non-native	rare
MALVACEAE (Mallow Family)			
<i>Sida acuta</i> N.L. Burm.	-----	non-native	rare
<i>Sida rhombifolia</i> L.	Cuban jute	non-native	rare
MELASTOMATACEAE (Melastoma Family)			
<i>Tibouchina herbacea</i> (DC.) Cogn.	cane tibouchina	non-native	rare
MENISPERMACEAE (Moonseed Family)			
<i>Coccoltus orbiculatus</i> (L.) DC.	huehue	indigenous	rare
MORACEAE (Mulberry Family)			
<i>Ficus microcarpa</i> L. fil.	Chinese banyan	non-native	rare
<i>Ficus platypoda</i> (Miguel) Miguel	rock fig	non-native	rare
MYRICACEAE (Bayberry Family)			
<i>Morella faya</i> (Aiton) Wilbur	firetree	non-native	rare
MYRSINACEAE (Myrsine Family)			
Myrsine lessertiana A. DC.	ko'lea lan mi	endemic	rare
MYRTACEAE (Myrtle Family)			
<i>Eucalyptus botryoides</i> Sm.	bangalay	non-native	rare
<i>Eucalyptus microcorys</i> F.v.Mueller	tallow-wood	non-native	rare
<i>Eucalyptus robusta</i> Sm.	swamp mahogany	non-native	uncommon
<i>Melaleuca quinquevneria</i> (Cav.) S.T. Blake	paper bark	non-native	rare
<i>Metrosideros polymorpha</i> Gaud.	'ōhi'a	endemic	common
<i>Psidium cattleianum</i> Sabine	strawberry guava	non-native	uncommon
<i>Psidium guajava</i> L.	guava	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Syzygium jambos</i> (L.) Alston	rose apple	non-native	rare
ONAGRACEAE (Evening Primrose Family)			
<i>Ludwigia palustris</i> (L.) Elliot	marsh purslane	non-native	rare
OXALIDACEAE (Wood Sorrel Family)			
<i>Oxalis corniculata</i> L.	'ihī'ai, yellow wood sorrel	Polynesian	rare
<i>Oxalis debilis</i> Kunth	pink wood sorrel	non-native	rare
PASSIFLORACEAE (Passion Flower Family)			
<i>Passiflora edulis</i> Sims	passion fruit	non-native	rare
POLYGALACEAE (Milkwort Family)			
<i>Polygala paniculata</i> L.	milkwort	non-native	rare
POLYGONACEAE (Buckwheat Family)			
<i>Persicaria glabra</i> (Willd.) M. Gomez	kāmole	non-native	rare
PROTEACEAE (Protea Family)			
<i>Grevillea robusta</i> A. Cunn. ex R. Br.	silk oak	non-native	uncommon
ROSACEAE (Rose Family)			
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	loquat	non-native	common
<i>Rubus niveus</i> Thunb.	Mysore raspberry	non-native	rare
<i>Rubus rosifolius</i> Sm.	thimbleberry	non-native	rare
RUBIACEAE (Coffee Family)			
<i>Coffea arabica</i> L.	Arabian coffee	non-native	rare
<i>Coprosma</i> sp.	pilo	endemic	rare
<i>Psychotria hawaiiensis</i> (A. Gray) Fosb.	kōpiko 'ula	endemic	rare
<i>Richardia brasiliensis</i> Gomes	-----	non-native	rare
<i>Spermatocoe</i> sp.	-----	non-native	rare
SOLANACEAE (Nightshade Family)			

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Cestrum diurnum</i> L.	day cestrum	non-native	rare
<i>Solanum capsicoides</i> All.	kikania lei	non-native	rare
VERBENACEAE (Verbena Family)			
<i>Stachytarpheta australis</i> Moldenke	ōwi	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area including all habitat types were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition three evening visits were made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiorus cinereus semotis*) in the area.

RESULTS

MAMMALS

Only sign of three mammal species were observed during five site visits to the property. Taxonomy and nomenclature follow Tomich (1986).

Feral pig (*Sus scrofa*) – Pig sign was everywhere on the property, but was especially prevalent in the gulches.

Mongoose (*Herpestes auropunctatus*) – A few mongoose were seen in the margins of the forest openings where they hunt for rodents and birds.

Hawaiian hoary bat, 'ōpe'ape'a (*Lasiorus cinereus semotis*) – Bats were detected at all three survey locations, at the top of the property at 2,400 feet, in the middle at 1,800 feet and at the bottom of the property at 800 feet.

While not seen during the survey rats (*Rattus spp.*) and mice (*Mus domesticus*) would be common in this type of area where they would feed on seeds, fruits and herbaceous vegetation. Feral cats (*Felis catus*) would also be expected here. They would hunt for the rodents and birds.

A special effort was made to look for any occurrence of the native Hawaiian hoary bat by making three evening surveys on the property. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. In addition a bat detection device (Batbox IIID) was employed set to the frequency of 27,000 to 28,000 hertz which is typical for this bat species. One bat was seen in the early evening at the top of the property but was too far away to detect with the Batbox. A few bats were detected with the Batbox in the middle of the property at dusk. Numerous bats were detected at the bottom of the property with the Batbox after dark.

BIRDS

Birdlife was fairly sparse in both diversity and numbers due to extensive Guinea grass and ironwood forest habitat. Only eight species of birds were seen during five site visits. Taxonomy and nomenclature follow American Ornithologists' Union (2005).

Japanese white-eye (*Zosterops japonicus*) – Small groups of these small green birds were seen and heard twittering in trees throughout the property.

Zebra dove (*Geopelia striata*) – These small doves were seen throughout the property feeding in small flocks in clearings and flying between trees.

Nutmeg mannikin (*Lonchura punctulata*) – Small flocks of these mannikins were seen feeding on grass seeds in the open areas.

Hwamei (*Garrulax canorus*) – A few of these beautiful singers were heard warbling in gulch forests near the top of the property.

Northern cardinal (*Cardinalis cardinalis*) – A few cardinals were seen and heard calling from trees during both the day and evening surveys.

House finch (*Carpodacus mexicanus*) – Small groups of these finches were found on this property where they associate with and feed on the seeds of common ironwood.

Red-billed leiothrix (*Leiothrix lutea*) – A few of these small colorful birds were seen and heard calling in forest trees mostly in the gulches.

House sparrow (*Passer domesticus*) – A small group of these sparrows was seen in a tree in the upper part of the property.

Had the survey been extended, no doubt other non-native birds would have been seen but the habitat is not suitable for Hawaii's native forest birds which occupy forested uplands beyond the elevational range of mosquitoes and the avian diseases they carry.

Two native birds, the endemic, Endangered 'io or Hawaiian hawk (*Buteo solitarius*) and the endemic puao or Hawaiian owl (*Asto flammeus sandwicensis*), are known to frequent wet windward forests where they prey on rodents and small birds. These two birds were looked for but were not seen during the survey.

No native seabirds, most particularly the Endangered petrel (*Pterodroma sandwicensis*) or the Threatened Newell's shearwater (*Puffinus auricularis newellii*) were found on the property nor were any burrows seen.

No Endangered nene or Hawaiian goose (*Branta sandwicensis*) were seen on the property. The habitat of dense forests and deep grasses is not suitable for these birds. They prefer lush green grass such as is found in irrigated lawns and golf courses or open lava shrublands.

INSECTS

While insects in general were not tallied, a good diversity of types were seen that no doubt helped fuel the diversity of birdlife seen. One native Springtail moth, Blackburn's sphinx moth (*Manduca blackburni*) has been put on the Federal Endangered species list and this designation requires special focus (USFWS 2000). Blackburn's sphinx moth is known to occur in parts of West Hawaii and its feeding requirements are very specialized. It requires host plants in the nightshade family that are toxic, such as native species of "aiea (*Nolthoestrum spp.*) and such non-native alternative hosts as tobacco (*Nicotiana tabacum*) and tree tobacco (*Nicotiana glauca*). None of these host species were found on the subject property and no Blackburn's sphinx moths or their larvae were seen.

Three Big Island endemic picture-wing flies have been listed as Endangered, (*Drosophila heteroneura*), (*D. mullii*) and (*D. ochrobasis*). These are known from various locations on the island between elevations of 3,000 and 5,500 feet. None of their host plants occur within the project area and none of these species were observed.

DISCUSSION AND RECOMMENDATIONS

The fauna of the property were low in both numbers and diversity due to the condition of the habitat. The dense Guinea grass and common ironwood vegetation offers little that would attract most mammal and bird species. With the exception of the Hawaiian hoary bat, all mammal and bird species were non-native, and only the feral pig appears to be common to abundant throughout.

Feral pigs are able to burrow through the dense vegetation to access all part of the property. They spend most of their time in the gulches, however, where they intensively plow up the terrain in search of edible roots and earthworms. Hunters actively pursue these pigs and many are taken but the dense vegetation makes it difficult for the hunters to be effective at controlling the population at moderate levels.

Moderate numbers of bats were seen during three evening surveys. These bats are known to be widespread on the Big Island and not uncommon in some areas. They are also highly mobile, moving up and down mountain slopes and from one district to another. These movements are no doubt linked to food source availability. On this property the bats were observed throughout the area seemed to be attracted to the open mowed, grassy area near the highway and appeared to be undisturbed by passing vehicular traffic only a hundred yards away. While consideration for these endangered bats and their habitat is required, the proposed action associated with this property involves no changes in land use and there will be no impacts on the habitat. No recommendations regarding the Hawaiian hoary bat are suggested.

The Hawaiian hawk and the pueo were not detected during the survey but are known from this part of the Big Island. The hawk in particular is Endangered and carries this status and associated federal protections with it wherever it goes. It would be expected to occasionally visit this property and should be watched for. No impacts on this species, however, are expected to result from this project action.

In conclusion there is little that is unique about the degraded habitat on this property that would make it more special or important for native animal or bird species. Moreover, no immediate changes in land uses will result from this transaction. The proposed sale of 900 acres of former sugar cane lands in the Koholalele Allotment is not expected to have a significant negative impact on the fauna resources in this part of Hämākua District.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within two groups: Mammals and Birds. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:
 - endemic = native only to Hawaii; not naturally occurring anywhere else in the world.
 - indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
 - non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.
 - migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.
4. Abundance of each species within the project area:
 - abundant = many flocks or individuals seen throughout the area at all times of day.
 - common = a few flocks or well scattered individuals throughout the area.
 - uncommon = only one flock or several individuals seen within the project area.
 - rare = only one or two seen within the project area.

COMMON NAME	SCIENTIFIC NAME	STATUS	ABUNDANCE
MAMMALS			
Pig	<i>Sus scrofa</i>	non-native	common
Mongoose	<i>Herpestes auropunctatus</i>	non-native	uncommon
'ōpe'ape'a, Hawaiian bat	<i>Lasionycteris cinereus semotus</i>	endemic, Endangered	uncommon
BIRDS			
Japanese white-eye	<i>Zosterops japonicus</i>	non-native	uncommon
Zebra dove	<i>Geopelia striata</i>	non-native	uncommon
Nutmeg mannikin	<i>Lonchura punctulata</i>	non-native	uncommon
Hwamei	<i>Garrulax canorus</i>	non-native	uncommon
Northern cardinal	<i>Cardinalis cardinalis</i>	non-native	uncommon
House finch	<i>Carpodacus mexicanus</i>	non-native	rare
Red-billed leiothrix	<i>Leiothrix lutea</i>	non-native	rare
House sparrow	<i>Passer domesticus</i>	non-native	rare

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Appendix *B*

{ Archaeological Impact Assessment }

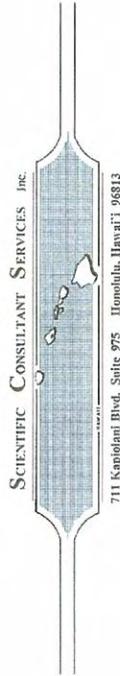
**AN ARCHAEOLOGY INVENTORY SURVEY
ON 1,040 ACRES IN KOHOLÁLELE AHUPUA'A, PA'AUULO,
HĀMAKUA DISTRICT, ISLAND OF HAWAII**
[TMK: (3) 4-2-05:01]

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ABSTRACT

At the request of PBR Hawaii and Associates, (SCS) conducted an archaeological inventory survey on a 1,040-acre parcel [TMK: (3) 4-2-05:01] at Pa'auilo, in the *ahupua'a* of Koholālele in Hāmākua District, Hawai'i Island. The property is bounded by Route 19 (Hawaii Belt Road) to the north, by Pa'auilo Homestead lands to the west, by Kaimehe Homestead lands to the east, and by undeveloped woodlands to the south. The parcel extends from 800ft (244m) to 2,450ft (747m) above mean sea level (amsl).

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of the property to identify and evaluate historical properties pursuant to state cultural resource management regulations (HAR § 275 and 276). Four archaeological sites (Site 27870, 27871, 27872, and 27873) comprised of eight rock mounds were documented in the project area.

A 0.5m by 0.5m test-unit was excavated at Site 27870, and a 1.0m by 0.5m stratigraphic trench was excavated at Site 27871. All of the sites were loosely constructed piles of rock resulting from sugarcane field clearing. All of the sites were assessed as significant under criterion D as outlined in Hawai'i Administrative Rules §13-275-6. Documentation obtained during the present study was sufficient to determine the temporal association and function of all four sites and no further work is recommended for any of the sites within the project area parcel.

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INTRODUCTION

At the request of PBR Hawaii and Associates, Scientific Consulting Services (SCS) conducted an archaeological inventory survey on a 1,040-acre parcel [TMK: (3) 4-2-05:01] at Pa'auilo, in the *āhupuaʻa* of Koholālele, Hāmākua District, Hawaiʻi Island (Figure 1, 2, and 3). The property is bounded by Route 19 (Hawaii Belt Road) to the north, by Pa'auilo Homestead lands to the west, by Kainehe Homestead lands to the east, and by undeveloped woodlands to the south. The parcel extends from 800ft (244m) to 2,450ft (747m) above mean sea level (amsl).

The project area was used for over one hundred years to grow sugarcane. The parcel was last owned by the Hamakua Sugar Company and is presently owned by Hawaiʻi County.

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of the property to identify and evaluate historical properties pursuant to state cultural resource management regulations (HAR § 275 and 276). Four archaeological sites (Site 27870, 27871, 27872, and 27873) comprised of eight rock mounds were documented in the project area. All of the sites were loosely constructed piles of rock resulting from sugarcane field clearing.

PHYSICAL SETTING

The project is approximately 730ft (223m) to 2,450ft (747m) above mean sea level (amsl). The substrate is Mauna Kea lava flows that are more than 10,000 years old (Wolfe and Morris 1996). The three soil types identified in the project area (Figure 4) are Honokaa series silty clay loam (HsC, HsD, HsE, and HTD) with 0% to 30% slopes, Kukaian series silty clay loam (KuD and KuE) with 12% to 20% slopes, and rough broken land (RB) along the steep narrow gulches (Sato *et al.* 1973). Annual rainfall is from 80 to 120 inches. The project area slopes primarily to the north and slightly to the east.

Vegetation on the project area consists primarily of introduced grasses and trees, including guinea grass (*Urochloa maxima*), ironwood (*Casuarina equisetifolia*), and guava trees (*Psidium* sp.). The project area has been used as sugarcane fields since the early post-Contact times. Aerial photographs from 1990 show that the entire property was bulldozed and used for sugarcane agriculture (Figure 5). Non-native species of grass, brush, and trees are presently growing in the fallow sugarcane fields.

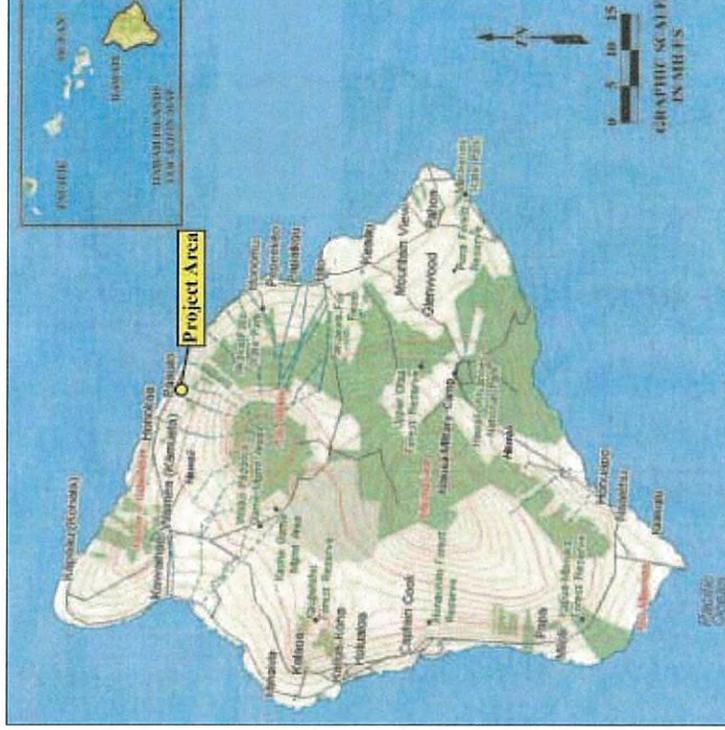


Figure 1: Hawaiʻi Island Map Showing Project Area Location.

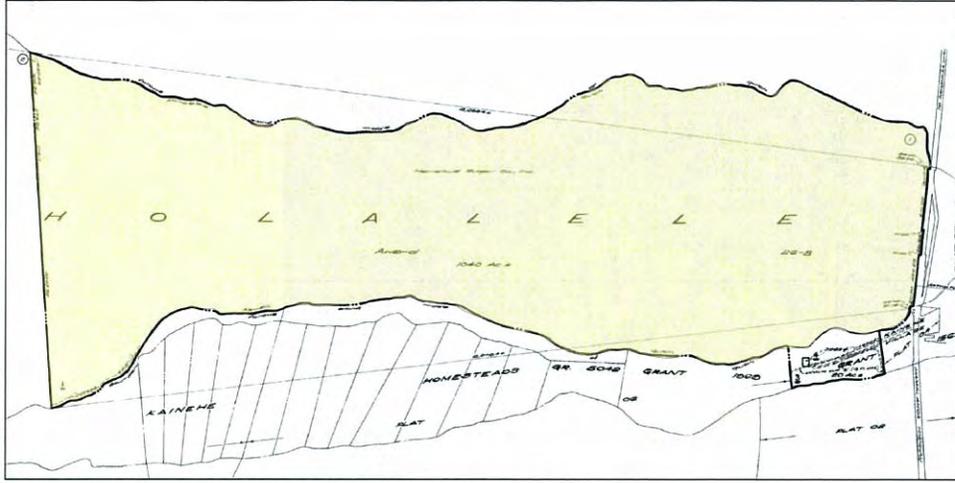


Figure 3: Map of TMK: (3) 4-2-05:01 Study Parcel (Shaded Yellow).

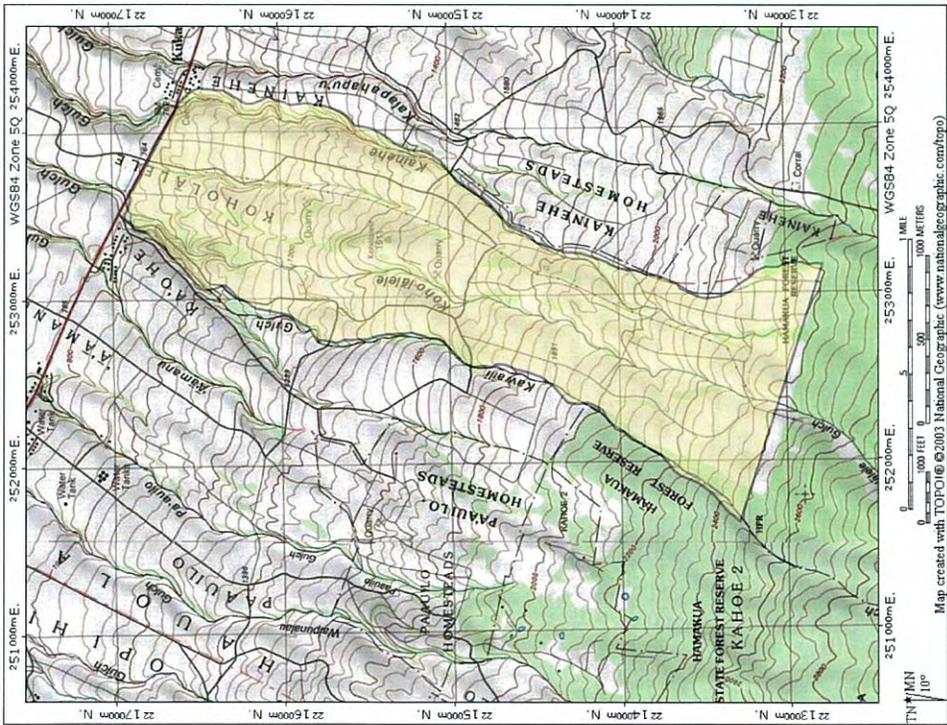


Figure 2: USGS TOPO Map Showing Project Area Location (Shaded Yellow).

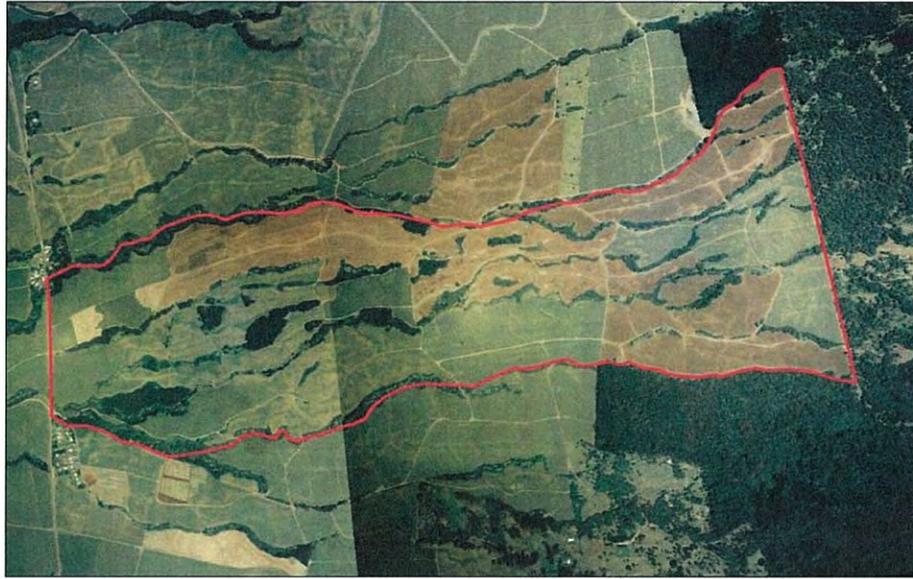


Figure 5: Aerial Photograph of Project Area Showing Sugarcane Fields.

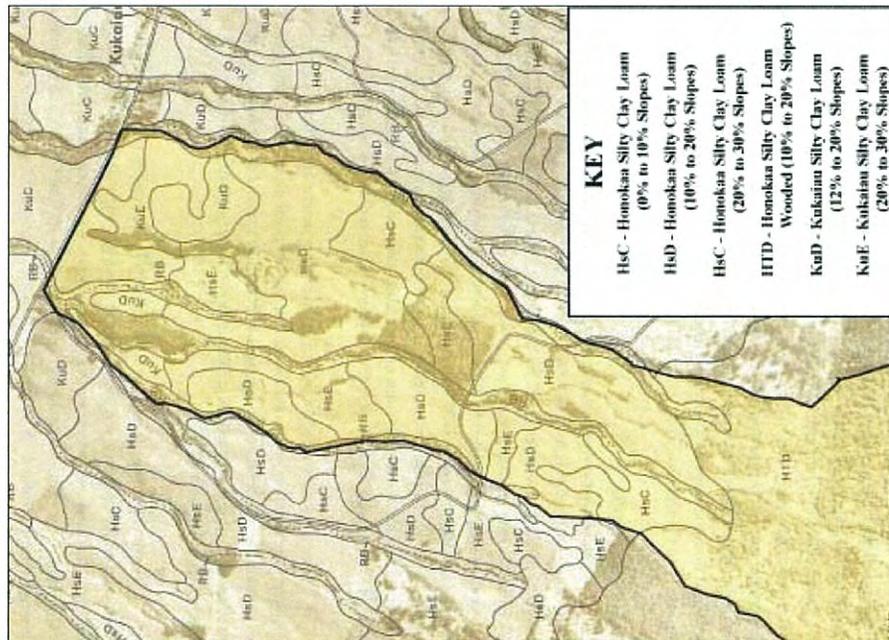


Figure 4: Soil Survey Map of Project Area (Shaded Yellow).

METHODOLOGY

ARCHIVAL METHODS

In addition to referencing available resources at SCS, archival research was conducted in the State Historic Preservation Division (SHPD) report database and library facility (Hilo, HI), the Hawaii County land records office, the *Waihoia 'Aina Mahele* database website, the Hawaiian collections holdings at the University of Hawaii'i-Hilo Library, and the Hawaii State Library system. Archival work consisted of general research on the history and archaeology of the project area, as well as specific searches of previous archaeological studies in and around the subject parcel. Historic land use data, land ownership, maps, and narrative information were obtained from the Hawaii County land records office, the *Waihoia 'Aina Mahele* database website, and the University of Hawaii'i, Hilo, Special Collections.

FIELD METHODS

Inventory Survey work was conducted in November and December, 2009 (140 man-hours total) by Tomasi Patolo, B.A. and Glenn Esscott, M.A (Project Director). Robert Spear, PhD was the Principle Investigator for the project. There were four main field components to Inventory Survey process: pedestrian survey of the entire project area; plotting located sites on a project area map with Global Position System (GPS) Universal Transverse Mercator (UTM) units (Zone 5 North) using WGS84 datum for all four sites; individual site mapping and recording; and hand excavations. Survey was conducted along east/west traverse lines. Observed surface midden, features, or anomalies were assigned temporary feature numbers. The site UTM was recorded at the site datum, which is marked with a metal tag.

Some sites were selected for test excavation to determine several site characteristics including site function, construction method, and temporal placement. Two types of hand excavation were utilized depending on the size of features and desired percentage to be excavated, desired percentage of screening, and overall goals of excavation: Test Units (TU) and, Stratigraphic Trenches (ST).

Test-units were excavated as 0.5 x 0.5 meter units, dug in natural centimeter levels. These were used on features that were thought to have a high potential for yielding occupational or temporal data, and used where vertical control would contribute to this data. This type of excavation was screened for cultural material through 1/8th inch mesh, and all units were stratigraphically profiled. A single 1.0 x 0.5 meter stratigraphic trench was excavated to examine soil stratigraphy and feature construction.

All excavated matrices were screened through both quarter inch and eighth-inch mesh. Cultural material was recorded by type on standard SCS excavation forms and collected. Soil colors were recorded using Munsell color charts, soil composition was recorded with the aid of the U.S. Department of Agriculture Soil Survey Manual on standard soil stratigraphy forms, and profiles were drawn. Overview photographs were taken of individual site features, sites, excavations, and the project area. Color photographs were taken with a 3.2 mega-pixel digital camera using a 20 cm long north arrow scale divided into 10 cm black and white increments.

LABORATORY METHODS

Inventory of midden and artifacts collected from the text excavations were analyzed and weighed. All field notes, maps, cultural material, and photographs pertaining to this project are currently being curated at the SCS facilities on the Island of Hawaii'i.

CULTURAL AND HISTORICAL BACKGROUND

HAWAIIAN LAND DIVISIONS AND SETTLEMENT

Initial settlement of the high Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

There is a paucity of prehistoric information pertaining to the lands of the project area and surrounding lands (Cordy 2000:216-217). Koholālele Ahupua'a is located in a traditionally sparsely populated area along the high cliffs of the Hamākua coast. It has poor access to marine resources and is far from the sociopolitical population centers of Hilo to the east, and the Waipi'o Valley and Waimea to the west. Though a coastal trail was used to travel along the Hamākua, much of the travel between Hilo and Waipi'o was done by sailing canoe. Koholālele is not at the nexus of a trail system, and much of the cross-island travel was conducted on trails that crossed the saddle between Mauna Kea, Maun Loa, and Hualālai (Figure 6).

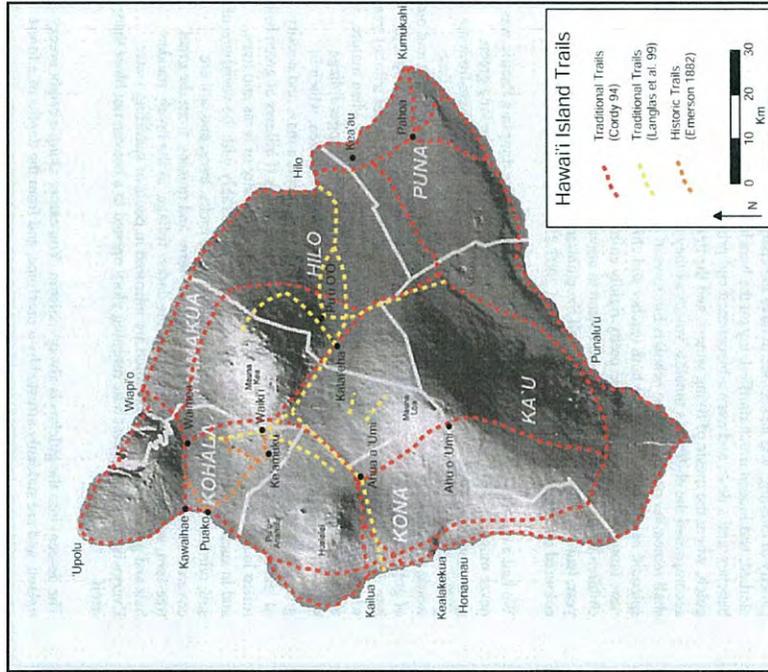


Figure 6: Hawaii Island Trail Systems.

WAHI PANA (LEGENDARY PLACES)

Koholālele Ahupua'a is a traditional Hawaiian land division situated between the 200 foot high cliffs of the Hāmākua coast and an elevation of roughly 2,450ft amsl. Koholālele is translated as Leaping whale (Pukui *et al.* 1974). Koholālele is bounded on the west by the Kawaihi gulch and on the east by Kainehe Gulch.

The earliest mention of Koholālele is in the Heart Stirring Story of Ka-Miki (*Ka'ao Ho'oniua Pu'uwai mo Ka-Maiki*) recorded and published between 1914 and 1917 in the weekly Hawaiian Newspaper *Ko Hōkū o Hawai'i* and translated by Maly (excerpts cited in Maly 1992). The story tells of Ka-Miki and his brother Maka-i-ole who travel around the Island of Hawai'i competing in traditional Hawaiian riddling and combat (*ōlohe*). The *mo'olelo* is set in the 1300s, though it is an early 20th Century collection of narratives about local traditions, tales, and family histories. The tales do have some time depth as they have been handed down through generations. They contain a mixture of "ancient" and 20th Century descriptions of the areas through which Ka-Miki and his brother Maka-i-ole traveled.

The Heart Stirring Story of Ka-Miki notes that Hāmākua District was known as a land of steep trails and steep cliffs (Maly 1992: 4-5). Pa'auilo was named for a well known club fighting expert (*koa mokomoko 'ōka'a lā'au*) named Pa'au-ilo (Maly 1992: 24). Koholālele is also mentioned by name and is translated as leaping whale (Maly 1992:14-15). No mention of Koholālele is made in other published accounts of *mo'olelo*.

PREHISTORIC AND HISTORIC ACCOUNTS OF KOHOLĀLELE

No published prehistoric accounts of Koholālele or Pa'auilo are recorded by Kamakau, I'i, Kalakaua, or Fourmunder. Cordy, using leaders of O'ahu and their exploits at Waipi'o, suggests that there was a ruling polity at Waipi'o that likely controlled lands of the Hāmākua (Cordy 2000: 141-142). Kamakau (1992) records that Kamehameha camped at Laupāhoehoe during his battles to conquer the Island of Hawai'i.

As for early historic accounts, William Ellis (2004) traveled by canoe from Hilo to Laupāhoehoe, just east of Pa'auilo, where he disembarked and continued on foot to Humu'ula along the tree line at the northern foot of Mauna Kea. Ellis states that the cliffs between Hilo and Laupāhoehoe were dotted with plantations. No mention is made of Koholālele Ahupua'a though he did not travel through it on the way to Humu'ula.

In 1872, Isabella Bird traveled by horseback along the Hāmākua from Onomea to the Waipi'o Valley and described the landscape she travelled through. The journey was over very rough and steep trails, and took five days. Bird noted "this is the most severe road on horses on Hawaii, and it takes a really good animal to come to Waipi'o and go back to Hilo (Bird 2007:85). The description that follows underscores the sparsely populated Hāmākua area:

From Onomea to the place where we expected to find the guide, we kept going up and down the steep sides of ravines, and scrambling through torrents till we reached a deep and most picturesque gulch [Kawainui], with a primitive school-house at the bottom, and some grass-houses clustering under palms and papayas, a valley scene of endless ease and perpetual afternoon. Here we found that D.'s uncle, who was to have been our guide, could not go, because his horse was not strong enough, but her cousin volunteered his escort, and went away to catch his horse, while we tethered ours and went into the school-house.

This reminded me somewhat of the very poorest schools connected with the Edinburgh Ladies' Highland School Association, but the teacher had a remarkable paucity of clothing, and he seemed to have the charge of his baby, which, much clothed, and indeed much muffled, lay on the bench beside him. For there were benches, and a desk, and even a blackboard and primers down in the deep wild gulch, where the music of living waters, and the thunderous roll of the Pacific, accompanied the children's tuneless voices as they sang an Hawaiian hymn. I shall remember nothing of the scholars but rows of gleaming white teeth, and splendid brown eyes. I thought both teacher and children very apathetic. There were lamentably few, though the pretty rigidly enforced law, which compels all children between the ages of six and fifteen to attend school for forty weeks of the year, had probably gathered together all the children of the district. They all wore coloured chemises and leis of flowers (Bird 2007:85).

We had a perfect day until the middle of the afternoon. The dimpling Pacific was never more than a mile from us as we kept the narrow track in the long green grass; and on our left the blunt snow-patched peaks of Mauna Kea rose from the girdle of forest, looking so delusively near that I fancied a two-hours' climb would take us to his lofty summit. The track for twenty-six miles is just in and out of gulches, from 100 to 800 feet in depth, all opening on the sea, which sweeps into them in three booming rollers. The candle-nut or kukui (aleurites triloba) tree, which on the whole predominates, has leaves of a rich deep green when mature, which contrast beautifully with the flaky silvery look of the younger foliage. Some of the shallower gulches are filled exclusively with this tree, which in growing up to the light to within 100 feet of the top, presents a mass and density of leafage quite unique, giving the gulch the appearance as if billows of green had rolled in and solidified there. Each gulch has some speciality of ferns and trees, and in such a distance as sixty miles they vary considerably with the variations of soil, climate, and temperature. But everywhere the rocks, trees, and soil are covered and crowded with the most exquisite ferns and mosses, from the great tree-fern, whose bright fronds light up the darker foliage, to the lovely maiden-hair and graceful selagellas which are mirrored in pools of sparkling water. Everywhere, too, the great blue morning glory opened to a heaven not bluer than itself.

The descent into the gulches is always solemn. You canter along a bright breezy upland, and are suddenly arrested by a precipice, and from the depths of a forest

abyss a low plash or murmur rises, or a deep bass sound, significant of water which must be crossed, and one reluctantly leaves the upper air to plunge into heavy shadow, and each experience increases one's apprehensions concerning the next. Though in some gulches the kukui preponderates, in others the lauhala whose aerial roots support it in otherwise impossible positions, and in others the sombre ohia, yet there were some grand clefts in which nature has mingled her treasures impartially, and out of cool depths of ferns rose the feathery coco-palm, the glorious breadfruit, with its green melon-like fruit, the large ohia, ideal in its beauty—the most gorgeous flowering tree I have ever seen, with spikes of rose-crimson blossoms borne on the old wood, blazing among its shining many-tinted leafage,—the tall papaya with its fantastic crown, the profuse gigantic plantain, and innumerable other trees, shrubs, and lianas, in the beauty and bounteousness of an endless spring. Imagine my surprise on seeing at the bottom of one gulch, a grove of good-sized, dark-leaved, very handsome trees, with an abundance of smooth round green fruit upon them, and on reaching them finding that they were orange trees, their great size, far exceeding that of the largest at Valencia, having prevented me from recognizing them earlier! In another, some large shrubs with oval, shining, dark leaves, much crimped at the edges, bright green berries along the stalks, and masses of pure white flowers lying flat, like snow on evergreens, turned out to be coffee! The guava with its obtuse smooth leaves, sweet white blossoms on solitary axillary stalks, and yellow fruit was universal. The novelty of the fruit, foliage, and vegetation is an intense delight to me. I should like to see how the rigid aspect of a coniferous tree, of which there is not one indigenous to the islands, would look by contrast. We passed through a long thicket of sumach, an exotic from North America, which still retains its old habit of shedding its leaves, and its grey, wintry, desolate-looking branches reminded me that there are less-favoured parts of the world, and that you are among mist, cold, murk, slush, gales, leaflessness, and all the dismal concomitants of an English winter.

It is wonderful that people should have thought of crossing these gulches on anything with four legs. Formerly, that is, within the last thirty years, the precipices could only be ascended by climbing with the utmost care, and descended by being lowered with ropes from crag to crag, and from tree to tree, when hanging on by the hands became impracticable to even the most experienced mountaineer. In this last fashion Mr. Coan and Mr. Lyons were let down to preach the gospel to the people of the then populous valleys. But within recent years, narrow tracks, allowing one horse to pass another, have been cut along the sides of these precipices, without any windings to make them easier, and only deviating enough from the perpendicular to allow of their descent by the sure-footed native-born animals. Most of them are worn by water and animals' feet, broken, rugged, jagged, with steps of rock sometimes three feet high, produced by breakage here and there. Up and down these the animals slip, jump, and scramble, some of them standing still until severely spurred, or driven by some one from behind. Then there are softer descents, slippery with damp, and perilous in heavy rains, down which they slide dexterously, gathering all their legs under them. On a few of these tracks a false step means death, but the vegetation

which clothes the pali below, blinds one to the risk. I don't think anything would induce me to go up a swinging zigzag—up a terrible pali opposite to me as I write, the sides of which are quite undraped.

All the gulches for the first twenty-four miles contain running water. The great Hakalan gulch we crossed early yesterday, has a river with a smooth bed as wide as the Thames at Eton. Some have only small quiet streams, which pass gently through ferny grottoes. Others have fierce strong torrents dashing between abrupt walls of rock, among immense boulders into deep abysses, and cast themselves over precipice after precipice into the ocean. Probably, many of these are the courses of fire torrents, whose jagged masses of a-a have since been worn smooth, and channelled into holes by the action of water. A few are crossed on narrow bridges, but the majority are forded, if that quiet conventional term can be applied to the violent floundering by which the horses bring one through. The transparency deceives them, and however deep the water is, they always try to lift their fore feet out of it, which gives them a disagreeable rolling motion. (Mr. Brigham in his valuable monograph on the Hawaiian volcanoes quoted below, appears as much impressed with these gulches as I am.)

We lunched in one glorious valley, and Kaluna made drinking cups which held fully a pint, out of the beautiful leaves of the *Arum esculentum*. Towards afternoon turbid-looking clouds towered over the sea, and by the time we reached the worst pali of all, the south side of Laupahoehoe, they burst on us in torrents of rain accompanied by strong wind. This terrible precipice takes one entirely by surprise. Kaluna, who rode first, disappeared so suddenly that I thought he had gone over. It is merely a dangerous broken ledge, and besides that it looks as if there were only foothold for a goat, one is dizzied by the sight of the foaming ocean immediately below, and, when we actually reached the bottom, there was only a narrow strip of shingle between the stupendous cliff and the resounding surges, which came up as if bent on destruction. The path by which we descended looked a mere thread on the side of the precipice. I don't know what the word befitting means, but if it means anything bad, I will certainly apply it to that pali.

A number of disastrous-looking native houses are clustered under some very tall palms in the open part of the gulch, but it is a most wretched situation; the roar of the surf is deafening, the scanty supply of water is brackish, there are rumours that leprosy is rife, and the people are said to be the poorest on Hawaii (Bird 2007:87-91).

We moved on in single file at a jog-trot wherever the road admitted of it, meeting mounted natives now and then, which led to a delay for the exchange of nuhous; and twice we had to turn into the thicket to avoid what here seems to be considered a danger. There are many large herds of semi-wild bullocks on the mountains, branded cattle, as distinguished from the wild or unbranded, and when they are wanted for food, a number of experienced vaccheros on strong shod horses go up, and drive forty or fifty of them down. We met such a drove bound

for Hilo, with one or two men in front and others at the sides and behind, uttering loud shouts. The bullocks are nearly mad with being hunted and driven, and at times rush like a living tornado, tearing up the earth with their horns. As soon as the galloping riders are seen and the crooked-horned beasts, you retire behind a screen. There must be some tradition of some one having been knocked down and hurt, for reckless as the natives are said to be, they are careful about this, and we were warned several times by travellers whom we met, that there were "bullocks ahead." The law provides that the vaccheros shall station one of their number at the head of a gulch to give notice when cattle are to pass through.

We jogged on again till we met a native who told us that we were quite close to our destination; but there were no signs of it, for we were still on the lofty uplands, and the only prominent objects were huge headlands confronting the sea. I got off to walk, as my mule seemed footsore, but had not gone many yards when we came suddenly to the verge of a pali, about 1,000 feet deep [Waipio], with a narrow fertile valley below, with a yet higher pali on the other side, both abutting perpendicularly on the sea. I should think the valley is not more than three miles long, and it is walled in by high inaccessible mountains. It is in fact, a gulch on a vastly enlarged scale. The prospect below us was very charming, a fertile region and bright with fishponds, meadow lands, kalo patches, orange and coffee groves, figs, breadfruit, and palms. There were a number of grass-houses, and a native church with a spire, and another up the valley testified to the energy and aggressiveness of Rome (Bird 2007:94-95).

Bird also described the sugar plantation at Kaiwiki, east of Koholalele. It was one of the first sugar mills established on the Island of Hawai'i. The Hamakua Mill Company and the Kūkai'au Mill Company had not yet been established at the time of her journey. Those two companies were established in 1877 and 1887, respectively. The Kūkai'au Mill Company was just west of the Kaiwiki Mill Company, and the Hamakua Mill Company was just west of the Kūkai'au Mill Company. Her description of the Kaiwiki Mill follows:

Then there is the sugar plantation of Kaiwiki, with its patches of bright green cane, its flumes crossing the track above our heads, bringing the cane down from the upland cane-fields to the crushing-mill, and the shifting, busy scenes of the sugar-boiling season.

Then the track goes down with a great dip, along which we slip and slide in the mud to a deep broad stream. This is a most picturesque spot, the junction of two clear bright rivers, and a few native houses and a Chinaman's store are grouped close by under some palms, with the customary loungers on horseback, asking and receiving nuhous, or news, at the doors. Our accustomed horses leaped into a ferry-scow provided by Government, worked by a bearded female of hideous aspect, and leaped out on the other side to climb a track cut on the side of a precipice, which would be steep to mount on one's own feet. There we met

parties of natives, all flower-wreathed, talking and singing, coming gaily down on their sure-footed horses, saluting us with the invariable "Aloha." Every now and then we passed native churches, with spires painted white, or a native schoolhouse, or a group of scholars all ferns and flowers. The greenness of the vegetation merits the term "dazzling." We think England green, but its colour is poor and pale as compared with that of tropical Hawaii. Palms, candelabras, ohias, hibiscus, were it not for their exceeding beauty, would almost pall upon one from their abundance, and each gulch has its glorious entanglement of breadfruit, the large-leaved ohia, or native apple, a species of Eugenia (Eugenia Malaccensis), and the pandanus, with its aerial roots, all looped together by large sky-blue convolvuli and the running fern, and is marvellous with parasitic growths.

The unique beauty of this coast is what are called gulches—narrow deep ravines or gorges, from 100 to 2,000 feet in depth, each with a series of cascades from 10 to 1,800 feet in height. I dislike reducing their glories to the baldness of figures, but the depth of these clefts (originally, probably, the seams caused by fire torrents), cut and worn by the fierce streams fed by the snows of Mauna Kea, and the rains of the forest belt, cannot otherwise be expressed. The cascades are most truly beautiful, gleaming white among the dark depths of foliage far away, and falling into deep limpid basins, festooned and overhung with the richest and greenest vegetation of this prolific climate, from the huge-leaved banana and shining breadfruit to the most feathery of ferns and lycopodiums. Each gulch opens on a velvet lawn close to the sea, and most of them have space for a few grass houses, with cocoanut trees, bananas, and kalo patches. There are sixty-nine of these extraordinary chasms within a distance of thirty miles!

I think we came through eleven, fording the streams in all but two. The descent into some of them is quite alarming. You go down almost standing in your stirrups, at a right angle with the horse's head, and up, grasping his mane to prevent the saddle slipping. He goes down like a goat, with his bare feet, looking cautiously at each step, sometimes putting out a foot and withdrawing it again in favour of better footing, and sometimes gathering his four feet under him and sliding or jumping. The Mexican saddle has great advantages on these tracks, which are nothing better than ledges cut on the sides of precipices, for one goes up and down not only in perfect security but without fatigue. I am beginning to hope that I am not too old, as I feared I was, to learn a new mode of riding, for my companions rode at full speed over places where I should have picked my way carefully at a foot's pace; and my horse followed them, galloping and stopping short at their pleasure, and I successfully kept my seat, though not without occasional fears of an ignominious downfall. I even wish that you could see me in my Rob Roy riding dress, with leather belt and pouch, a lei of the orange seeds of the pandanus round my throat, jingling Mexican spurs, blue saddle blanket, and Rob Roy blanket strapped on behind the saddle!

This place is grandly situated 600 feet above a deep cove, into which two beautiful gulches of great size run, with heavy cascades, finer than Foyers at its

best, and a native village is picturesquely situated between the two. The great white rollers, whiter by contrast with the dark deep water, come into the gulch just where we forded the river, and from the ford a passable road made for hauling sugar ascends to the house. The air is something absolutely delicious; and the murmur of the rollers and the deep boom of the cascades are very soothing. There is little rise or fall in the cadence of the surf anywhere on the windward coast, but one even sound, loud or soft, like that made by a train in a tunnel.

We were kindly welcomed, and were at once "made at home." Delicious phrase! the full meaning of which I am learning on Hawaii, where, though everything has the fascination of novelty, I have ceased to feel myself a stranger. This is a roomy, rambling frame-house, with a verandah, and the door, as is usual here, opens directly into the sitting-room. The stair by which I go to my room suggests possibilities, for it has been removed three inches from the wall by an earthquake, which also brought down the tall chimney of the boiling-house. Close by there are small pretty frame-houses for the overseer, bookkeeper, sugar boiler, and machinist; a store, the factory, a pretty native church near the edge of the cliff, and quite a large native village below. It looks green and bright, and the atmosphere is perfect, with the cool air coming down from the mountains, and a soft breeze coming up from the blue dreamy ocean. Behind the house the uplands slope away to the colossal Mauna Kea. The actual, dense, impenetrable forest does not begin for a mile and a half from the coast, and its broad dark belt, extending to a height of 4,000 feet, and beautifully broken, throws out into greater brightness the upward glades of grass and the fields of sugar-cane.

This is a very busy season, and as this is a large plantation there is an appearance of great animation. There are five or six saddled horses usually tethered below the house; and with overseers, white and coloured, and natives riding at full gallop, and people coming on all sorts of errands, the hum of the crushing-mill, the rush of water in the flumes, and the grind of the waggons carrying cane, there is no end of stir.

The plantations in the Hilo district enjoy special advantages, for by turning some of the innumerable mountain streams into flumes the owners can bring a great part of their cane and all their wood for fuel down to the mills without other expense than the original cost of the woodwork. Mr. A. has 100 mules, but the greater part of their work is ploughing and hauling the kegs of sugar down to the cove, where in favourable weather they are put on board of a schooner for Honolulu. This plantation employs 183 hands, native and Chinese, and turns out 600 tons of sugar a year. The natives are much liked as labourers, being docile and on the whole willing; but native labour is hard to get, as the natives do not like to work for a term unless obliged, and a pernicious system of "advances" is practised. The labourers hire themselves to the planters, in the case of natives usually for a year, by a contract which has to be signed before a notary public. The wages are about eight dollars a month with food, or eleven dollars without food, and the planters supply houses and medical attendance. The Chinese are

imported as coolies, and usually contract to work for five years. As a matter of policy no less than of humanity the "hands" are well treated; for if a single instance of injustice were perpetrated on a plantation the factory might stand still the next year, for hardly a native would contract to serve again.

The Chinese are quiet and industrious, but smoke opium, and are much addicted to gaming. Many of them save money, and, when their turn of service is over, set up stores, or grow vegetables for money. Each man employed has his horse, and on Saturday the hands form quite a cavalcade. Great tact, firmness, and knowledge of human nature are required in the manager of a plantation. The natives are at times disposed to shirk work without sufficient cause; the native lunas, or overseers, are not always reasonable, the Chinamen and natives do not always agree, and quarrels and entanglements arise, and everything is referred to the decision of the manager, who, besides all things else, must know the exact amount of work which ought to be performed, both in the fields and factory, and see that it is done. Mr. A. is a keen, shrewd man of business, kind without being weak, and with an eye on every detail of his plantations. The requirements are endless. It reminds me very much of plantation life in Georgia in the old days of slavery. I never elsewhere heard of so many headaches, sore hands, and other trifling ailments. It is very amusing to see the attempts which the would-be invalids make to lengthen their brief smiling faces into lugubriousness, and the sudden relaxation into naturalness when they are allowed a holiday. Mr. A. comes into the house constantly to consult his wife regarding the treatment of different ailments.

I have made a second tour through the factory, and am rather disgusted with sugar making. "All's well that ends well," however, and the delicate crystalline result makes one forget the initial stages of the manufacture. The cane, stripped of its leaves, passes from the flumes under the rollers of the crushing-mill, where it is subjected to a pressure of five or six tons. One hundred pounds of cane under this process yield up from sixty-five to seventy-five pounds of juice. This juice passes, as a pale green cataract, into a trough, which conducts it into a vat, where it is dosed with quicklime to neutralize its acid, and is then run off into large heated metal vessels. At this stage the smell is abominable, and the turbid fluid, with a thick scum upon it, is simply disgusting. After a preliminary heating and skimming it is passed off into iron pans, several in a row, and boiled and skimmed, and ladled from one to the other till it reaches the last, which is nearest to the fire, and there it boils with the greatest violence, seething and foaming, bringing all the remaining scum to the surface. After the concentration has proceeded far enough, the action of the heat is suspended, and the reddish-brown, oily-looking liquid is drawn into the vacuum-pan till it is about a third full; the concentration is completed by boiling the juice in vacuo at a temperature of 150 degrees, and even lower. As the boiling proceeds, the sugar boiler tests the contents of the pan by withdrawing a few drops, and holding them up to the light on his finger; and by certain minute changes in their condition, he judges when it is time to add an additional quantity. When the pan is full, the contents have

thickened into the consistency of thick gruel by the formation of minute crystals, and are then allowed to descend into an heater, where they are kept warm till they can be run into "forms" or tanks, where they are allowed to granulate. The liquid, or molasses, which remains after the first crystallization is returned to the vacuum pan and reboiled, and this reboiling of the drainings is repeated two or three times, with a gradually decreasing result in the quality and quantity of the sugar. The last process, which is used for getting rid of the treacle, is a most beautiful one. The mass of sugar and treacle is put into what are called "centrifugal pans," which are drums about three feet in diameter and two feet high, which make about 1,000 revolutions a minute. These have false interiors of wire gauze, and the mass is forced violently against their sides by centrifugal action, and they let the treacle whirl through, and retain the sugar crystals, which lie in a dry heap in the centre.

The cane is being flumed in with great rapidity, and the factory is working till late at night. The cane from which the juice has been expressed, called "trash," is dried and used as fuel for the furnace which supplies the steam power. The sugar is packed in kegs, and a cooper and carpenter, as well as other mechanics, are employed.

Sugar is now the great interest of the islands. Christian missions and whaling have had their day, and now people talk sugar. Hawaii thrills to the news of a cent up or a cent down in the American market. All the interests of the kingdom are threatened by this one, which, because it is grievously depressed and staggers under a heavy import duty in the American market, is now clamorous in some quarters for "annexation," and in others for a "reciprocity treaty," which last means the cession of the Pearl River lagoon on Oahu, with its adjacent shores, to America, for a Pacific naval station. There are 200,000 acres of productive soil on the islands, of which only a fifteenth is under cultivation, and of this large area 150,000 is said to be specially adapted for sugar culture. Herein is a prospective Utopia, and people are always dreaming of the sugar-growing capacities of the belt of rich disintegrated lava which slopes upwards from the sea to the bases of the mountains. Hitherto, sugar growing has been a very disastrous speculation, and few of the planters at present do more than keep their heads above water.

Were labour plentiful and the duties removed, fortunes might be made: for the soil yields on an average about three times as much as that of the State of Louisiana. Two and a half tons to the acre is a common yield, five tons, a frequent one, and instances are known of the slowly matured cane of a high altitude yielding as much as seven tons! The magnificent climate makes it a very easy crop to grow. There is no brief harvest time with its rush, hurry, and frantic demand for labour, nor frost to render necessary the hasty cutting of an immature crop. The same number of hands is kept on all the year round. The planters can plant pretty much when they please, or not plant at all, for two or three years, the only difference in the latter case being that the rattoons which spring up after the cutting of the former crop are smaller in bulk. They can cut when they please,

whether the cane be tasselled or not, and they can plant, cut, and grind at one time!

It is a beautiful crop in any stage of growth, especially in the tasselled stage. Every part of it is useful—the cane pre-eminently—the leaves as food for horses and mules, and the tassels for making hats. Here and elsewhere there is a plate of cut cane always within reach, and the children chew it incessantly. I fear you will be tired of sugar, but I find it more interesting than the wool and mutton of Victoria and New Zealand, and it is a most important item of the wealth of this toy kingdom, which last year exported 16,995,402 lbs. of sugar and 192,105 gallons of molasses. [Footnote: In 1875 the export of sugar reached a total of 25,080,182 lbs.] With regard to molasses, the Government prohibits the manufacture of rum, so the planters are deprived of a fruitful source of profit. It is really difficult to tear myself from the subject of sugar, for I see the cane waving in the sun while I write, and hear the busy hum of the crushing-mill [Bird 2007:72-78].

Bird was staying at the Onomea Plantation as a guest at the time. The Onomea Plantation was owned by her host Judge S.L. Austin who started the plantation in 1863 (Campbell and Ogburn 2008). A description of the Onomea Plantation works by Campbell and Ogburn (2008) is quoted below.

During the early days, Onomea's crushing plant was water driven. A metal water wheel and boiler had been shipped from Glasgow, Scotland in 1862. Water from the flumes provided the power to turn the wheel, which in turn moved the sugar cane crusher. The water-driven crushing plant was much larger and heavier than those of other mills. The mill was situated just below Papaikou at the foot of a gulch, which opened out to the ocean. It was the first nine-roller mill erected on the island. The mill was connected by rail to one of the best landings and loading devices on the coast. The sugar cars were hauled to the landing by a cable and sugar could be sent over the main cable to the hold of a ship without rehandling. By means of this device about 1,600 bags of sugar could be loaded in an hour.

A distinctive feature of Onomea was its system of flumes, which spanned gorges and carried cane down the slopes to the mill. Fifty-five miles of stationary and portable flumes were constructed. The trestle, which carried the main flume across Hanawainui Gulch, was the largest wooden bridge in the territory and the one spanning Kawaimui Gulch was the highest, 176 feet. Onomea's location in a heavy rainfall belt made it difficult to mechanize cane harvesting and transportation easily. Onomea was one of the last plantations to stop hand cutting cane. However, progress was made and the extensive road building program begun in 1903 was finally completed in 1956.

The heavy rainfall also tended to wash topsoil away and leach it out. Onomea was the first Hawaiian sugar plantation to use commercial fertilizer on its fields. In 1879 (1897?), bone meal fertilizer was used to improve the soil. Later on

Manager John T. Moir's protective efforts towards Onomea's topsoils resulted in the invention of a plow which was adapted to the peculiar topography of the county and the nature of the soil. The shallow, clay-like soils were subject to washing unless properly cultivated. It is Moir's credit that no field was washed out to sea during his 20 years of management. He was also considered one of the leaders in the conservation of waste products and the use of them to build up the land.

The descriptions of the Kaiwiki and Onomea plantations are good period descriptions of sugar plantations and operations in the area of the Hamakua Sugar Plantation that was soon to be operated within the project area.

NATIVE TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Mahele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). A single Land Commission Award was made within the project area. The project area parcel was awarded to Kailakanoa (LCA 26-B, R.P. 4527). Eight small awards were made makai of the project area parcel, near the coast.

THE HISTORY OF SUGAR IN HAWAII

Captain Cook found sugarcane (*Saccharum officinarum*) growing in Hawaii at the time of his arrival in 1778 (Beaglehole 1967:479). He noted that the cane was of large size and good quality. According to Hawaiians, sugarcane (*kō*) grew wild and quite well in the valleys and lowlands. It was not refined but was eaten as a food crop and was used as an offering, especially to the shark god *Mano* (Rolph 1917:166). Captain James King also noted that upon his arrival at Maui in 1778, Hawaiians came along ship carrying sugarcane as well as fruits and vegetables (Beaglehole 1967:497). Several sugarcane varieties, either indigenous or brought by early Polynesians, were known to the Hawaiians, including *Ualalehu*, *Ualalehu maoli* (native), *Honuaula*, *Laukena* (*Laukono*), *Kea* (*Kokea*), *Papa*, and *Ohua* (Wilfong 1883).

The earliest instances of sugar and molasses production in Hawaii remain uncertain, but were likely small-scale sugar extraction operations. A number of important chiefs set aside land for several of these early endeavors (Kelly et al. 1981:81). Rolph (1917:166-167) documents the inception of organized sugar production as follows:

L. L. Torbert, one the early planters, in a paper read before the Royal Agricultural Society in January, 1852, claims the earliest sugar factory was put up on the island of Lanai in 1802 by a Chinaman who came to the islands in one of the vessels trading for sandalwood. He brought with him a stone mill and boilers, and

after grinding one small crop and making it into sugar, went away the next year taking his apparatus with him.

Anderson [Anderson, Rufus, *The Hawaiian Islands*, Boston, 1864] makes a statement that 257 tons of sugar were exported from the islands in 1814, but cites no authority upon which to base his assertion.

According to Jarves [Jarves, James Jackson, *History of the Sandwich Islands*, Honolulu, 1872] the first instance of the manufacture of sugar goes back to beyond 1820, but the name of the pioneer planter is unknown. It is certain that at first molasses was manufactured and then sugar some time before 1820.

Don Francisco de Paula made sugar in Honolulu in 1819, the year before the arrival of the first missionaries. Lavinia, an Italian, did the same thing in 1823. His method was to pound the cane with stone pestles on huge wooden trays (poi boards) by native labor, collecting the juice and boiling it in a small copper kettle.

Accounts from various sources agree that the making of sugar and molasses was general in 1823-24. This undoubtedly had direct connection with the manufacture of rum, which was extensively carried on at the time.

In 1828 a considerable amount of cane was raised in the Niuanu valley and Waikapu, Maui. A pioneer cane grower, Antonio Silva by name, lived at the latter place, and some Chinamen had a sugar mill near Hilo. In those days mills were made of wood, very crudely put together and worked by oxen.

Ladd & Company established the first large-scale sugar production in Hawai'i on Kauai, while David Malo operated a mill on Maui between 1840 and 1850, and Governor Kuakini directed the planting of one hundred acres of sugar cane in 1839 in Kohala, on the island of Hawai'i (Rolph 1917:169). Missionaries at Hilo in the early 1800s produced sugar and molasses for their own use (Kelly *et al.* 1981:81). In 1841, a mill on the Wailuku River in Hilo on Governor Kuakini's land, and likely operated by Chinese, produced about 30 tons of sugar.

Sugarcane growing and milling operations were still simple. Cane fields were neither irrigated nor fertilized and sugar yields were roughly one ton per acre. Planting, by 'o'o (digging sticks), and harvesting was done by Hawaiian contract workers (Thrum 1874:36). Laborers were paid in kind, often in cloth. Once at the milling facilities, cane was fed one stalk at a time into iron band reinforced wooden rollers powered by water, oxen, mule, and horse. The juice extracted by the rollers was collected in trough and was boiled in whaling ship iron try pots (Figure 7). Less than 50% of the sugar was extracted from the cane using these methods. Additionally, production was low because indigenous sugarcanes were susceptible to introduced disease and were soft and therefore unsuitable for milling (Mangelsdorf 1956).

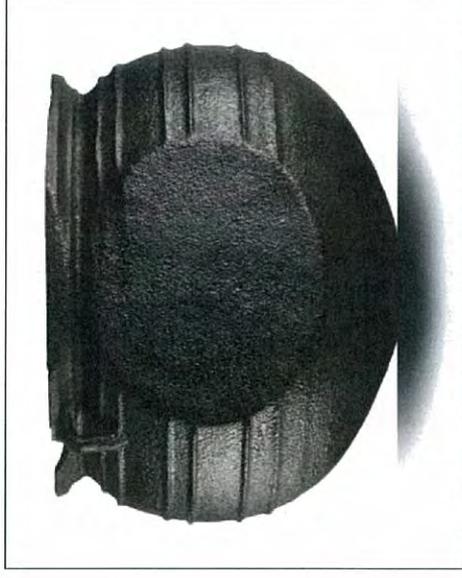


Figure 7: A Whaling Trypot Typical of Those Used For Making Raw Sugar.

Lahaina sugarcane, a variety indigenous to the Marquesas, was introduced to Hawai'i in 1854, and by 1870 had displaced all indigenous varieties for sugar production (Wilfong 1883). Hawaiian sugar production remained low despite the introduction of steam power in 1858-1859 to the milling process. The island of Hawai'i had a single mill operating at Hilo until the outbreak of the American Civil War (1861-1865). The disruption of sugar production in the American south caused a price increase and a concomitant rise in Hawaiian sugar production and export, from 2,600 tons in 1863 to 8,869 tons in 1866 (Rolph 1917:171). The rapid growth of the sugar industry created a labor shortage that necessitated hiring contract laborers from other Polynesian islands.

Hawaiian sugar production was still somewhat hindered by U.S. import duties, until a reciprocity treaty negotiated between the Kingdom of Hawai'i and the U.S. in 1876 reduced import duties levied on Hawaiian sugar, increasing the profitability of sugar production and further spurring the growth of the sugar industry. From 1877 to 1888, sugar production increased almost 500% and doubled in the following ten years (Kelly *et al.* 1981:81). American consumers purchased nearly 99% of all Hawaiian export products, much of it sugar.

In 1880 Rose Bamboo sugar cane was introduced from Australia and was grown at higher elevations on Hawai'i. Rose Bamboo cane did especially well on the relatively high table lands along the Hāmākuā coast. Lahaina and Rose Bamboo varieties were susceptible to insects and disease and subsequently yields decreased annually until both varieties were completely replaced around the turn of the century by Yellow Caledonia cane (also called White Tanna cane), a variety named for New Caledonia and Tanna, an island of present day Vanuatu (Rolph 1917:170). Yellow Caledonia had been imported to Hawai'i in 1881 and was first grown with great success in Ka'u (Tew 1987). The variety was resistant to disease and grew well in cooler climates with moderately high rainfall, and consequently was cultivated with great success along the Hāmākuā until its replacement in 1925 with hybrid varieties of sugarcane (James 2004:5).

The Hawaiian sugar industry continued to grow and additional contract laborers were hired from as far away as China and Japan (after 1890), and later from Korea, the Philippines, Puerto Rico, and Portugal. Sugar plantations began offering free medical care and rent-free housing to attract laborers. The annexation of Hawai'i by the U.S. in 1898 ensured the continued American consumer demand for Hawaiian sugar. Additionally, incorporation provided new funding for needed public works to improve the transportation and shipping facilities that made the sugar trade more profitable. The development of port facilities and the extensive railroad system that ran from Kalapana in South Puna to Pa'auiilo along the Hāmākuā coast were a direct result of the sugar industry.

THE HISTORY OF SUGAR AT KOHOLA

Seven sugar companies were established along the Hāmākuā coast between 1869 and 1880, excepting Onomea Plantation in the Hilo area (Bouvet 2001:9). Geographically, from the Hilo to Kohala sides of the Hāmākuā, they were the Laupahoehoe Sugar Company (est. 1880), the O'okala Sugar Plantation Company (est. 1869), the Kūkaiau Sugar Company (est. 1887), the Hamakua Sugar Company (est. 1877), the Paauhau Sugar Company (est. 1878), the Honokaa Sugar Company (est. 1878), and the Pacific Mill Company (est. 1879).

HAMAKUA MILL COMPANY (1877-1917)

The Hamakua Mill Company (1869-1909) was first established in 1877 by Theo Davies and his partner Charles Nottley, Sr. (Saito and Campbell 2008). In 1878, the first sugarcane was planted at the plantation and Hilo Iron Works was hired to build a mill. The plantation was located at Pa'auiilo and by 1890 the company had twenty-nine employees. By 1910 it had 4,800 acres planted in sugarcane and employed more than 600 people. The company ran three

locomotives on nine miles of light gauge rail. There was a warehouse and landing below the cliff at Koholālele where ships were loaded by crane. In 1914, the Kūkaiau Mill Company became a part of the Hamakua Mill Company. In 1917 the Kūkaiau Mill Company mill was sold and moved to Formosa (Taiwan) (Bouvet *et al.* 2001:11).

HAMAKUA SUGAR COMPANY (1917-1974) AND THE LAUPAHOEHOE SUGAR COMPANY (1974-1978)

In 1917, the Hamakua Mill Company was renamed the Hamakua Sugar Company. The Kaiwiki Sugar Company (1869-1957) was merged with the Theo H. Davies Company owned Laupahoehoe Sugar Company (1880-1978) on May 1, 1956 and operations were merged with the latter beginning January 3, 1957. In 1978, the Hamakua Sugar Company and the Laupahoehoe Sugar Company were merged to form the Davies Hamakua Sugar Company.

DAVIES HAMAKUA SUGAR COMPANY (1978-1984) AND HAMAKUA SUGAR COMPANY (1984-1994)

The Laupahoehoe Sugar Company merged with the Honokaa Sugar Company in 1978 to form the Davies Hamakua Sugar Company (1978-1984). In 1984 the Davies Hamakua Sugar Company was bought by Francis Morgan and renamed the Hamakua Sugar Company (1984-1994). The Hamakua Sugar Company operated until October of 1994, and its closing marked the end of the sugar industry on the Island of Hawai'i.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

No archaeological studies have been conducted at Koholālele. There are two archaeological projects conducted west of the current project area, at Pa'auiilo (Figure 8). PHRI conducted an archaeological inventory survey on a 174 acre parcel [TMK: (3) 4-3-003:13 and 18; and (3) 4-3-04-03] west of Pa'auiilo (Head and Rosendahl 1992). Three Historic-era sites, including a roadbed, a bridge, and a bridge complex were recorded. Cultural Surveys Hawaii, Inc. conducted archaeological monitoring at the Pa'auiilo Elementary and Intermediate School [TMK: (3) 4-3-03:24 and 32] (Wilkinson *et al.* 2009). No surface or subsurface features were recorded during the monitoring.

The lack of archaeological sites, features, and artifacts in the Pa'auiilo area is likely due to long-term sugarcane agriculture carried out in the area. Sugarcane agriculture pursuits include rock clearing and bulldozing during field preparation and harvesting. Large, mechanical equipment has likely removed any pre-Contact era archaeological remains.

EXPECTED ARCHAEOLOGICAL RESOURCES

It is expected that historic era sugar plantation features will be identified within the current project area. Pre-contact, traditional Hawaiian features are not expected due to the sparse population recorded in the area during the early historic era, and due to the long-term and constant building and land-use associated with the sugar plantation.

ARCHAEOLOGICAL INVENTORY SURVEY RESULTS

There are four archaeological sites (27870, 27871, 27872, and 27873) located in the project area (Table 1 and Figure 9). The sites consist of eight rock mounds. All of the sites are loosely constructed piles of rock resulting from sugarcane field clearing.

Table 1: Inventory of Sites in Project Area.

Site #	Form	Function	Shape	L x W x H (meters)	Age	Integrity
27870	2 Rock Mounds	Agriculture Rock Clearing	Rectangular	22 x 19 x 1	Historic	Good
27871	Rock Mound	Agriculture Rock Clearing	Circular	1.8 dia. X 0.65	Historic	Good
27872	3 Rock Mounds	Agriculture Rock Clearing	Rectangular	20 x 7 x 0.65	Historic	Good
27873	2 Rock Mounds	Agriculture Rock Clearing	Rectangular	19 x 8.5 x 0.92	Historic	Good

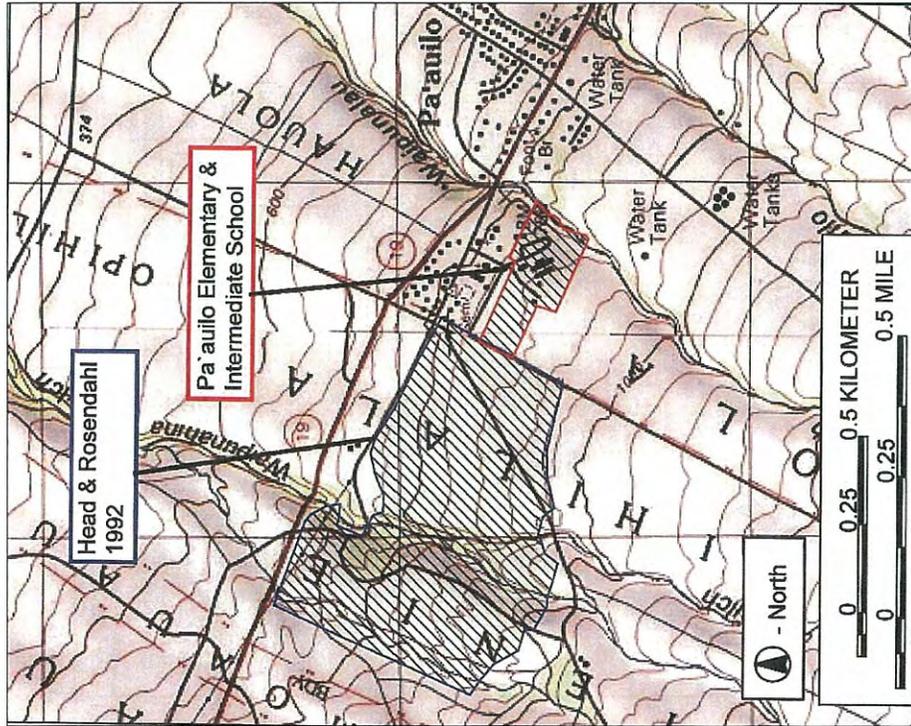


Figure 8: Previous Archaeological Studies Located on Honokaa (1995) and Kukaiau (1993) Topo Quads.

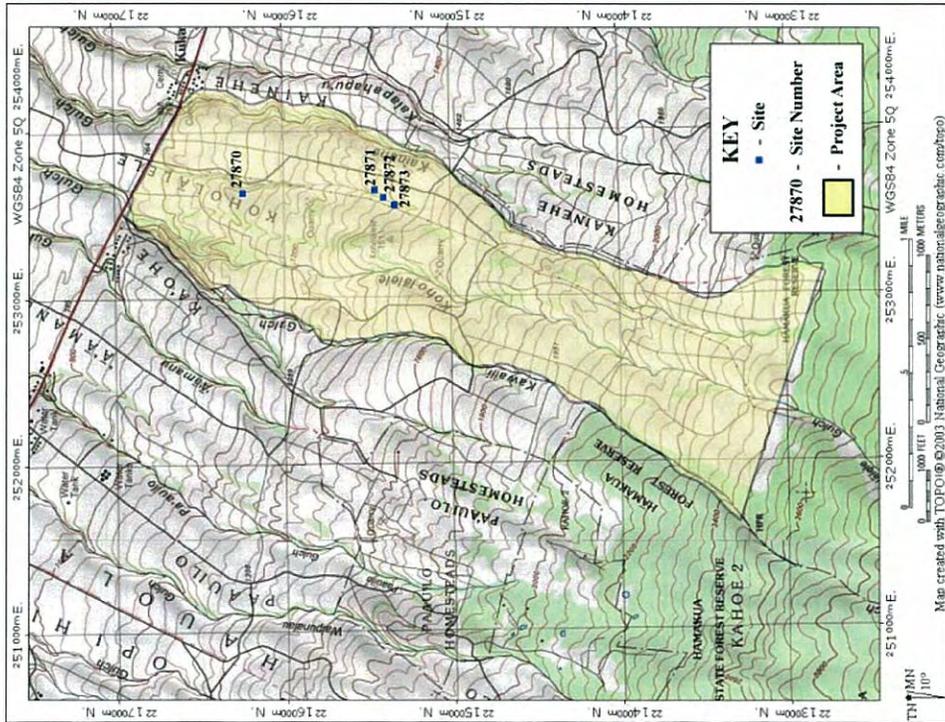


Figure 9: Location of Sites on USGS TOPO Map.

SITE 27870 (TS-1)

FORM Rock Mounds (two rock mounds)
FUNCTION: Agricultural Rock Clearing
AGE: Historic-Era
DIMENSIONS: Length: 22.0m (E/W); Width: 19.0m
CONDITION: Good
SURFACE ARTIFACTS: None
EXCAVATION: None

SITE 27870

Site 27870 is located along an unnamed gulch in the north portion of the project area at an elevation of 1,000ft (305m) amsl (see Figure 9). Vegetation in the area is *kukui*, *guava*, *pua kenikeni*, thimble berry, grass, and various ferns. The site consists of two rock mounds (Fe. 1 and Fe. 2) constructed on the east and west banks of the gulch (Figure 10).

Feature 1

Feature 1 is a rectangular rock mound located on the west bank of the gulch. Feature 1 is 5.5m long (E/W) by 4.8m wide and is 0.66m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the eastern edge of an unused sugarcane field. There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the gulch bank. The rock mound was created by clearing rocks from the surrounding sugarcane fields. It is possible that the rocks were pushed with a bulldozer. There is bulldozer push on the south and west sides of the rock mound. The rock concentration appears to be unaltered and is in good condition. A test-unit was excavated in the center of Feature 1 to determine construction and function.

Test-Unit 1 (TU-1)

A 0.5 by 0.5m test-unit (TU-1) was excavated in the center of Feature 1. TU-1 contained an architectural layer, three stratigraphic layers, and terminated on a layer of culturally sterile sediment 1.0m below the surface of Feature 1 (Figure 11).

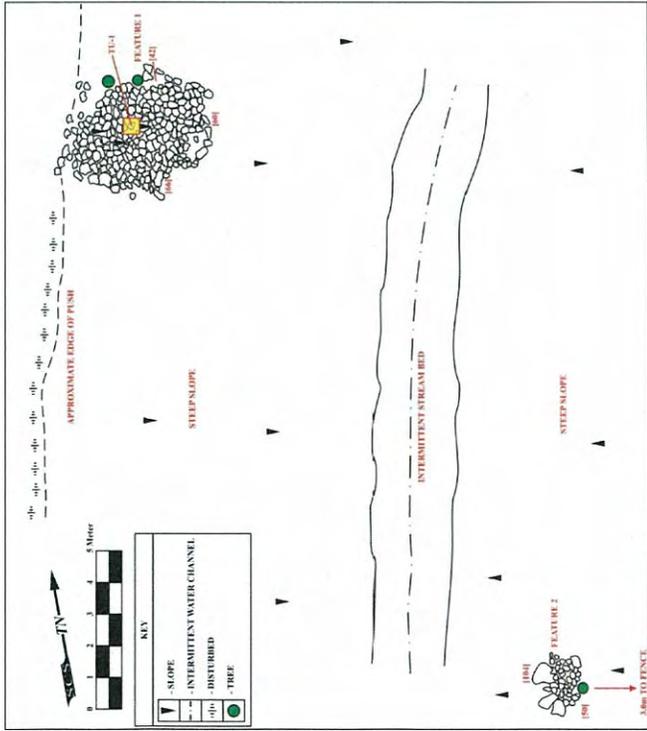


Figure 10: Site 27870 Plan View.

Architectural Layer (53-0cm above ground surface) consisted of loosely piled angular and subangular basalt large *pahoehoe* cobbles to small boulders mixed with decaying organic detritus. A short length of metal fence wire (not collected) was recorded on the surface of the rock mound in TU-1. No other cultural remains were recovered from the architectural layer. The architecture terminated at roughly 6-10cms in Layer I.

Layer II (11-40cms) was dark brown (10YR3/4) soft, fine to coarse silt loam with 1% angular and subangular basalt cobbles (in top 5cm of layer). The matrix also contained 2% fine roots. Layer II did not contain artifacts. The base of Layer II was wavy and clear, and terminated on the top surface of Layer III sediment.

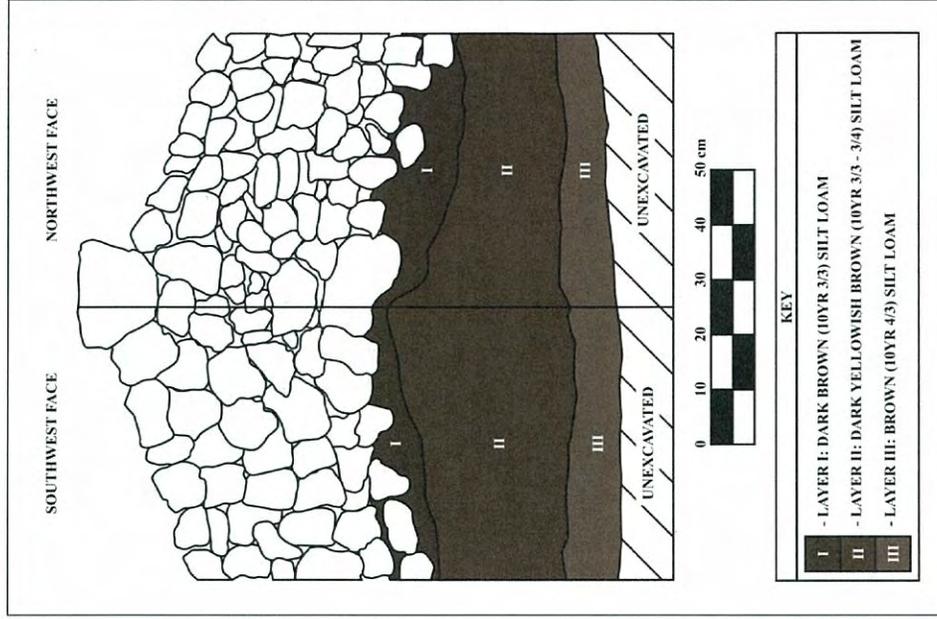


Figure 11: Site 27870, Feature 1, Test-Unit 1 Profiles.

Layer III (40-50cms) was brown (10YR4/3) firm, fine to very fine silt loam with less than 1% angular and subangular basalt cobbles and pebbles. The matrix also contained less than 1% fine roots. Layer III did not contain artifacts. The base of Layer III was wavy and clear, and terminated on the top surface of dark yellowish brown (10YR4/4) Layer IV sediment.

Feature 2

Feature 2 is a circular rock mound located on the east bank of the gulch (Figure 12). Feature 2 is approximately 2.0m in diameter and is 1.04m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the western edge of a fallow sugarcane field. There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the gulch bank. The rock mound was created by clearing rocks from the surrounding sugarcane fields. The rock concentration appears to be unaltered and is in good condition.



Figure 12: Photograph of Site 27870, Feature 2 Rock Mound Facing Northeast.

Site 27870 Summary

Site 27870 is the remains of rock clearing at Historic-era sugarcane fields. The rock mounds have very informal construction attributes: they are constructed of rock loosely piled along the slope of a gulch, just outside of the sugarcane field boundary. Excavation at Feature 1 confirmed that the features are loosely constructed and do not contain subsurface artifacts. Site 27870 has been fully documented and no further work is recommended.

SITE 27871 (TS-2)

FORM: Rock Mound
FUNCTION: Agricultural Rock Clearing
AGE: Historic-Era
DIMENSIONS: Length: 1.8m (dia.); Height: 0.65m
CONDITION: Good
SURFACE ARTIFACTS: None
EXCAVATION: None

SITE 27871

Site 27871 is located approximately 750 meters south of Site 27870 at an elevation of 1,340ft (408m) amsl (see Figure 9). Vegetation in the area is *kukui*, guava, ti, grass, and various ferns. The site is a circular rock mound located on the east bank of an unnamed gulch (Figure 13 and 14). The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the western edge of an unused sugarcane field. There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the gulch bank. The rock mound was created by clearing rocks from the surrounding sugarcane fields. The rock concentration appears to be unaltered and is in good condition. A stratigraphic trench was excavated in the center of the rock mound to determine construction and function.

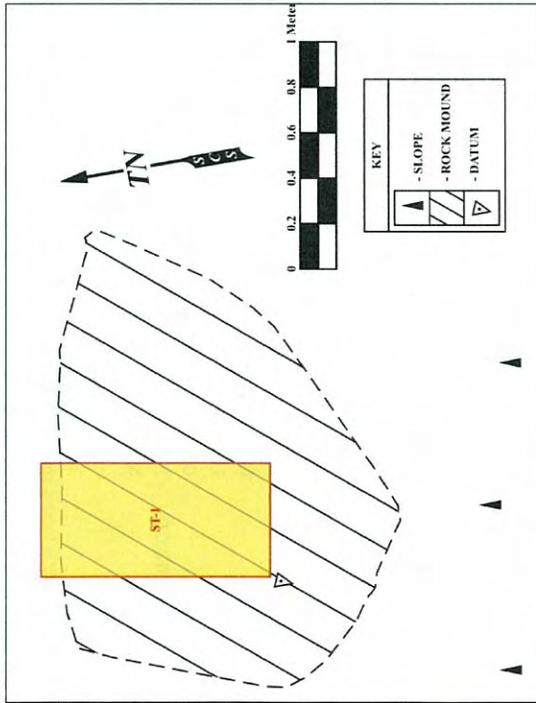


Figure 13: Site 27871 Plan View.



Figure 14: Photograph of Site 27871 Facing Northeast.

Stratigraphic Trench 1 (ST-1)

A 1.0m by 0.5m stratigraphic trench (ST-1) was excavated in the center of the rock mound. ST-1 contained an architectural layer, two stratigraphic layers, and terminated on a layer of culturally sterile sediment 1.0m below the top surface of the rock mound (Figure 15).

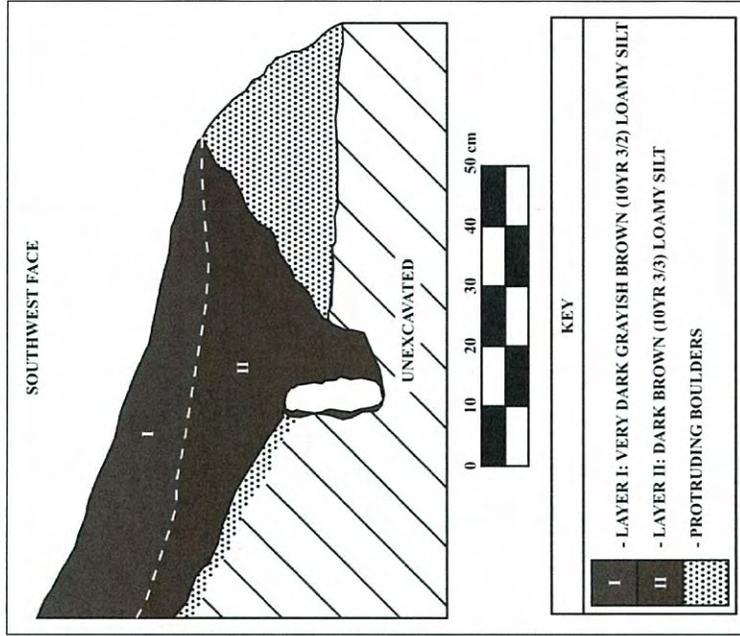


Figure 15: Site 27871, ST-1 Southwest Profile.

Architectural Layer (50-0cm above ground surface) consisted of loosely piled angular and subangular basalt large *pāhoehoe* cobbles to small boulders mixed with decaying organic detritus. No cultural remains were recovered from the architectural layer. The architecture terminated at roughly 5cmbs in Layer I.

Layer I (0-12cmbs) was very dark grayish brown (10YR3/2) soft, very fine to fine silt loam with 8% angular and subangular basalt large cobbles to small boulders (Architectural Layer rock). The matrix also contained approximately 2% small roots. Layer I did not contain artifacts. The base of Layer I was wavy and indistinct, and terminated on the top surface of Layer II material.

Layer II (12-50cmbs) was dark brown (10YR3/3) soft, fine to coarse silt loam with 1% angular and subangular basalt cobbles. The matrix also contained 5% fine roots. Layer II did not contain artifacts. The base of Layer II was wavy and clear, and terminated on the top surface of dark yellowish brown (10YR4/4) Layer III sediment.

Site 27871 Summary

Site 27871 is the remains of rock clearing of Historic-era sugarcane fields. The rock mound has very informal construction attributes. It is constructed of rock loosely piled along the slope of a gulch, just outside of the sugarcane field boundary. Excavation at Site 27871 confirmed that the rock mound is loosely constructed and does not contain subsurface artifacts. Site 27871 has been fully documented and no further work is recommended.

SITE 27872 (TS-3)

FORM Rock Mounds (three rock mounds)
FUNCTION: Agricultural Rock Clearing
AGE: Historic-Era
DIMENSIONS: Length: 20.0m (N/S); Width: 7.0m
CONDITION: Good
SURFACE ARTIFACTS: None
EXCAVATION: None

SITE 27872

Site 27872 is located approximately sixty meters southwest of Site 27871 at an elevation of 1,355ft (413m) amsl (see Figure 9). Vegetation in the area is *kukui*, guava,

ti, grass, and various ferns. The site consists of three rock mounds (Fe. 1, Fe. 2, and Fe. 3) constructed along the east bank of an unnamed gulch (Figure 16).

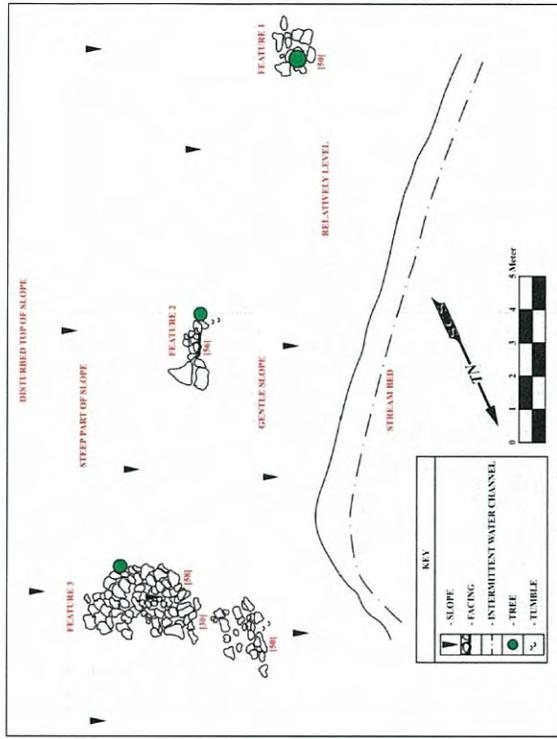


Figure 16: Site 27872 Plan View.

Feature 1

Feature 1 is a circular rock mound located at the south end of the site. Feature 1 is 1.4m in diameter and is 0.5m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the western edge of an unused sugarcane field (Figure 17). There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the gulch bank. The rock mound was created by clearing rocks from the surrounding sugarcane fields. It is possible that the rocks were pushed with a bulldozer. There is bulldozer push to the east of the rock mound. The rock concentration appears to be unaltered and is in good condition.



Figure 17: Photograph of Site 27872, Feature 1 Facing South.

Feature 2

Feature 2 is a linear rock mound located at the center of the site. Feature 2 is approximately 2.0m long (N.S) by 0.5m wide, and is 0.56m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled and stacked two to three courses high on the ground surface at the western edge of an unused sugarcane field (Figure 18). Feature 2 is roughly faced on its west side. The rock mound was created by clearing rocks from the surrounding sugarcane fields. The rock concentration appears to be unaltered and is in good condition.

Feature 3

Feature 3 is a rectangular rock mound located on the north end of the site. Feature 3 is approximately 6.0m long (E/W) by 2.0m wide, and is 0.58m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the western edge of an unused sugarcane field (Figure 19). There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the gulch bank. The rock mound was created by clearing rocks from the surrounding sugarcane fields. It is possible that the rocks were pushed with a bulldozer. There is bulldozer push to the east of the rock mound. The rock concentration appears to be unaltered and is in good condition.



Figure 18: Photograph of Site 27872, Feature 2 Facing East.



Figure 19: Photograph of Site 27872, Feature 3 Facing East.

Site 27872 Summary

Site 27872 is the remains of rock clearing of Historic-era sugarcane fields. The rock mounds are loosely constructed and are similar to those documented and excavated at the other sites on the project area. Site 27872 has been fully documented and no further work is recommended.

SITE 27873 (TS-4)

FORM: Rock Mounds (two rock mounds)
FUNCTION: Agricultural Rock Clearing
AGE: Historic-Era
DIMENSIONS: Length: 19.0m (N/S); Width: 8.5m
CONDITION: Good
SURFACE ARTIFACTS: Bottle
EXCAVATION: None

SITE 27873

Site 27873 is located 70 meters southwest of Site 27872 at an elevation of 1,400ft (427m) amsl (see Figure 9). Vegetation in the area is banyan, eucalyptus, guava, ironwood, *fi*, thimble berry, grass, and various ferns. The site consists of two rock mounds (Fe. 1 and Fe. 2) constructed on a northerly slope (Figure 20).

Feature 1

Feature 1 is a rectangular rock mound located on the north end of the site. Feature 1 is 6.0m long (E/W) by 4.0m wide and is 0.92m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the northern edge of an unused sugarcane field (Figure 21). There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of the slope. The rock mound was created by clearing rocks from the surrounding sugarcane fields. A bottle was collected from the top of Feature 1. The rock mound appears to be unaltered and is in good condition.

Feature 2

Feature 2 is a rectangular rock mound located on the south end of the site. Feature 2 is approximately 6.0m long (NW/SE) by 3.5m wide, and is 0.5m in maximum height. The rock mound is constructed of angular and subangular large cobbles and small boulders piled on the ground surface at the northern edge of an unused sugarcane field

(Figure 22). There is no stacking or facing evident in the feature construction. The rock mound is not level and follows the contour of ground surface. The rock mound was created by clearing rocks from the surrounding sugarcane fields. The rock mound appears to be unaltered and is in good condition. A modern bottle was located in the top of Feature 1.

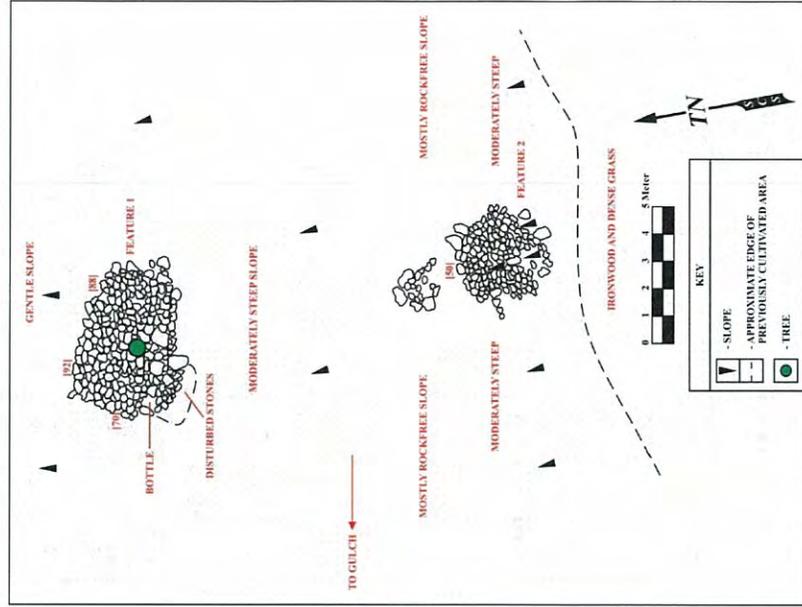


Figure 20: Site 27873 Plan View.



Figure 21: Photograph of Site 27873, Feature 1 Facing East.



Figure 22: Photograph of Site 27873, Feature 2 Facing South.

Site 27873 Summary

Site 27873 is the remains of rock clearing of Historic-era sugarcane fields. The rock mounds are loosely constructed and are similar to those documented and excavated at the other sites on the project area. Site 27873 has been fully documented and no further work is recommended.

CONCLUSION

DISCUSSION

Four archaeological sites were documented in the project area (Site 27870, 27871, 27872, and 27873) (Table 2). All of the sites are Historic-era rock clearing mounds associated with sugarcane agriculture. All of the rock mounds are located along the slopes of gulches, on the outer boundaries of sugarcane fields. No pre-Contact Hawaiian archaeological features or cultural remains were identified on the project area. This is not unexpected as the project area is along a sparsely populated portion of the Hāmākua Coast.

SIGNIFICANCE ASSESSMENTS

Sites identified during this project were assessed for their significance as outlined in Hawai'i Administrative Rules §13-275-6. To be assessed as significant a site must be characterized by one or more of the following five criteria:

- (A) It must be associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property.
- (B) It must be associated with the lives of persons significant in the past.
- (C) It must embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction.
- (D) It must have yielded or may be likely to yield, information important in prehistory or history.
- (E) Have important value to native Hawaiian people or other ethnicities in the state, due

to associations with cultural practices and traditional beliefs that were, or still are, carried out.

All of the sites documented in this report were evaluated for their significance regarding prehistory (Table 2).

Table 2: Site Significance and Recommended Treatments.

Site	Form	Age	Function	Criteria of Significance	Recommended Treatment
27870	Rock Mound	Historic	Agricultural Clearing	D	No Further Work
27871	Rock Mound	Historic	Agricultural Clearing	D	No Further Work
27872	Rock Mound	Historic	Agricultural Clearing	D	No Further Work
27873	Rock Mound	Historic	Agricultural Clearing	D	No Further Work

RECOMMENDATIONS

The four sites addressed in the Archaeological Inventory Survey report are Historic era features. Information recorded during the current study has adequately ascertained the timing and function of all features at all four sites. The sites are associated with Historic sugarcane field clearing. Full documentation of the sites and their features are contained in this report and include historical information, maps, figures, and descriptions. No further work is recommended at all four sites documented within the project area.

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Appendix *C*

{ Cultural Impact Assessment }



**A CULTURAL IMPACT ASSESSMENT OF
1,040 ACRES IN KOHOLALELE AHUPUA'A, PA'AUULO,
HĀMĀKUA DISTRICT, ISLAND OF HAWAII**
[TMK: (3) 4-2-05:01]

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Draft Report
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INTRODUCTION

At the request of PBR Hawaii and Associates, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment, of a 1,040-acre parcel [TMK: (3) 4-2-05:01] at Pa'aulo, in the *āhupua'a* of Koholālele in Hāmākua District, Hawai'i Island (Figures 1, 2, 3, and 4). The property is bounded by Route 19 (Hawaii Belt Road) to the north, by Pa'aulo Homestead lands to the west, by Kainehe Homestead lands to the east, and by undeveloped woodlands to the south. The parcel extends from 800ft (244m) to 2,450ft (747m) above mean sea level (ams). The parcel is being considered for sale by the County of Hawai'i.

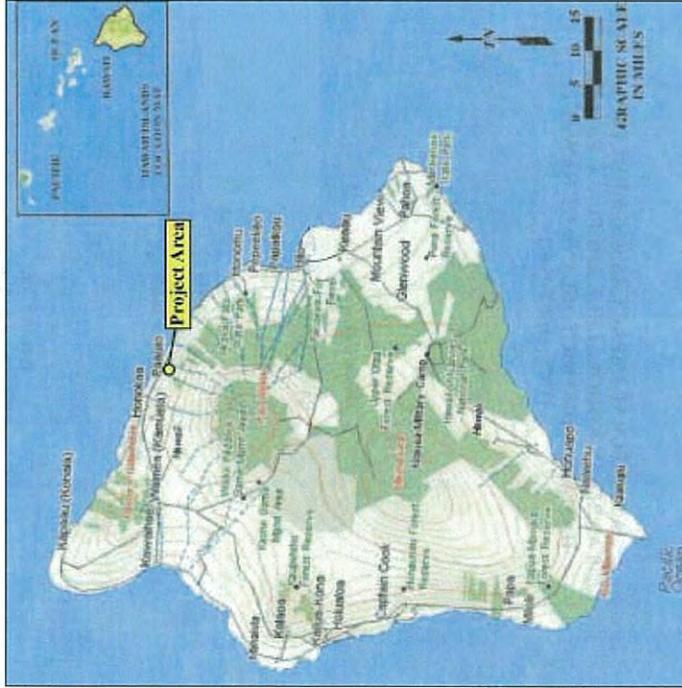


Figure 1: Hawai'i Island Map Showing Project Area Location.

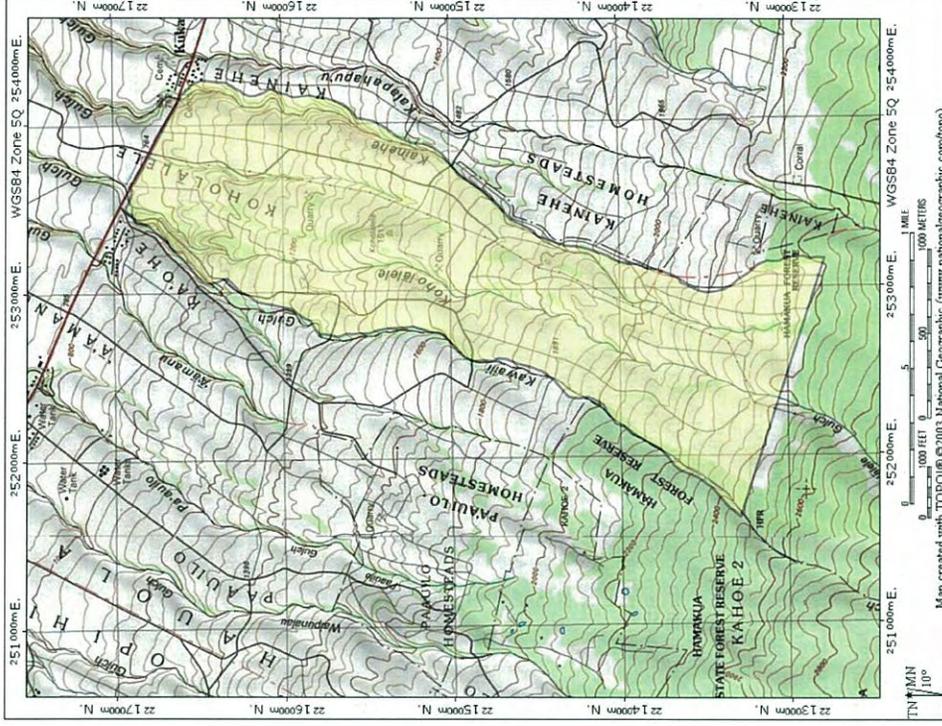


Figure 2: USGS TOPO Map Showing Project Area Location (Shaded Yellow).



Figure 4: Aerial Photograph of Project Area Showing Sugarcane Fields.

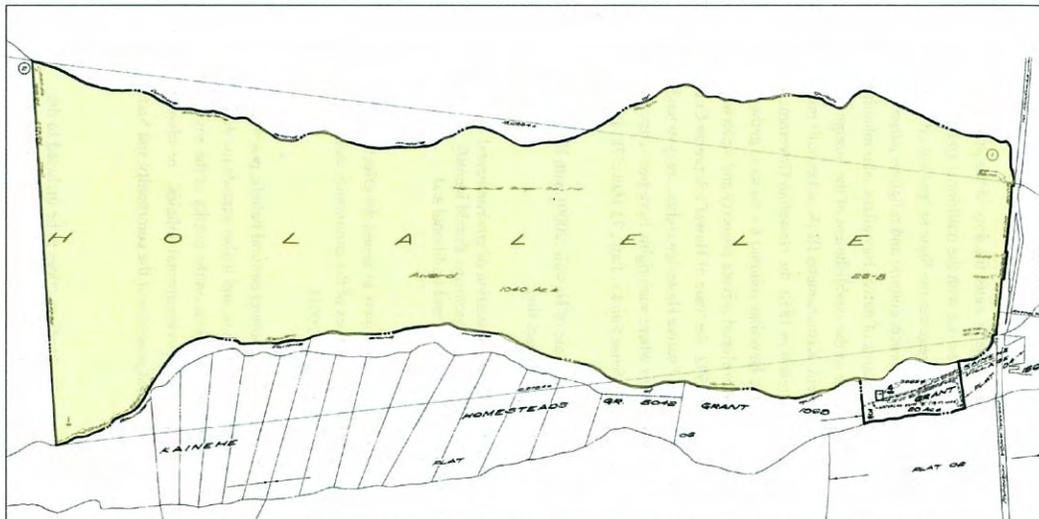


Figure 3: Map of TMK: (3) 4-2-05:01 Study Parcel (Shaded Yellow).

The Constitution of the State of Hawai'i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua'a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikaouli) preserved the people's traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua'a* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai'i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights...may extend beyond the *ahupua'a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawai'i (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 environmental review process (2001).

Its purpose has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of 'significant effect' to be re-defined as "the sum of effects on the quality of the environment including actions that are... contrary to the State's environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State" (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into

consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or *ahupua'a*" (OEQC 1997). It was decided that the process should identify 'anthropological' cultural practices, rather than 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997): The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity cultural values and rights within the project area and its vicinity (H.B. 2895, Act 50, 2000):

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC state: "...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

- (1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and

features associated with the project area, including any constraints of limitations with which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;

- (2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;
- (3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;
- (4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;
- (5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;
- (6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;
- (7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;
- (8) an explanation of confidential information that has been withheld from public disclosure in the assessment;
- (9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;
- (10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;
- (11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on

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cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *athupua*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

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In this case, letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Ruby McDonald, Coordinator of the Hawai'i branch of the Office of Hawaiian Affairs; the Waimea Hawaiian Civic Club; Ku Kahakalau (Hawai'i Island Burial Council); Leningrad Elarianoff (Hawai'i Island Burial Council); Dr. Billy Bergin; Keawe Vredenburg; Clement Junior Kanuha; and Reggie Lee. If cultural resources are identified based on the information received from these organizations and/or additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed. Public Notices were placed in the Ka Wai Ola OHA Newspaper, the Tribune Herald, and the Advertiser.

PROJECT AREA AND VICINITY

The project area is a 1,040-acre parcel [TMK: (3) 4-2-05:01] located at upland Pa'auilo, in the *ahupua'a* of Koholālele in Hāmākua District, Hawai'i Island (see Figures 1, 2, 3, and 4). The area was wooded during the pre-Contact era. More recently, the area was under sugarcane cultivation. The majority of the parcel has been altered by sugarcane agriculture.

CULTURAL HISTORICAL CONTEXT

HAWAIIAN LAND DIVISIONS AND SETTLEMENT

Initial settlement of the high Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia. This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

There is a paucity of prehistoric information pertaining to the lands of the project area and surrounding lands (Cordy 2000:216-217). Koholālele Ahupua'a is located in a traditionally sparsely populated area along the high cliffs of the Hāmākua coast. It has poor access to marine resources and is far from the sociopolitical population centers of Hilo to the east, and the

Waipi'o Valley and Waimea to the west. Though a coastal trail was used to travel along the Hāmākua, much of the travel between Hilo and Waipi'o was done by sailing canoe. Koholālele is not at the nexus of a trail system, and much of the cross-island travel was conducted on trails that crossed the saddle between Mauna Kea, Maun Loa, and Huālalai (Figure 5).

WAHI PANA (LEGENDARY PLACES)

Koholālele Ahupua'a is a traditional Hawaiian land division situated between the 200 foot high cliffs of the Hāmākua coast and an elevation of roughly 2,450ft amsl. Koholālele is translated as Leaping whale (Pukui *et al.* 1974). Koholālele is bounded on the west by the Kawaili gulch and on the east by Kainehe Gulch.

The earliest mention of Koholālele is in the Heart Stirring Story of Ka-Miki (*Kā'ao Ho'oniua Pu'uwai no Ka-Maikī*) recorded and published between 1914 and 1917 in the weekly Hawaiian Newspaper *Ko Hōkū o Hawai'i* and translated by Maly (excerpts cited in Maly 1992). The story tells of Ka-Miki and his brother Maka-i-ole who travel around the Island of Hawai'i competing in traditional Hawaiian riddling and combat (*ōlohe*). The *mo'olelo* is set in the 1300s, though it is an early 20th Century collection of narratives about local traditions, tales, and family histories. The tales do have some time depth as they have been handed down through generations. They contain a mixture of "ancient" and 20th Century descriptions of the areas through which Ka-Miki and his brother Maka-i-ole traveled.

The Heart Stirring Story of Ka-Miki notes that Hāmākua District was known as a land of steep trails and steep cliffs (Maly 1992: 4-5). Pa'auilo was named for a well known club fighting expert (*koa mokomoko ōka'a lā'au*) named Pa'au-a-Io (Maly 1992: 24). Koholālele is also mentioned by name and is translated as leaping whale (Maly 1992:14-15). No mention of Koholālele is made in other published accounts of *mo'olelo*.

PREHISTORIC AND HISTORIC ACCOUNTS OF KOHOLĀLELE

No published prehistoric accounts of Koholālele or Pa'auilo are recorded by Kamakau (1992), I'i (1993), Kalakaua (1990), or Fourmader (1996). Cordy, using leaders of O'ahu and their exploits at Waipi'o, suggests that there was a ruling polity at Waipi'o that likely controlled lands of the Hāmākua (Cordy 2000: 141-142). Kamakau (1992) records that Kamehameha camped at Laupāhoehoe during his battles to conquer the Island of Hawai'i.

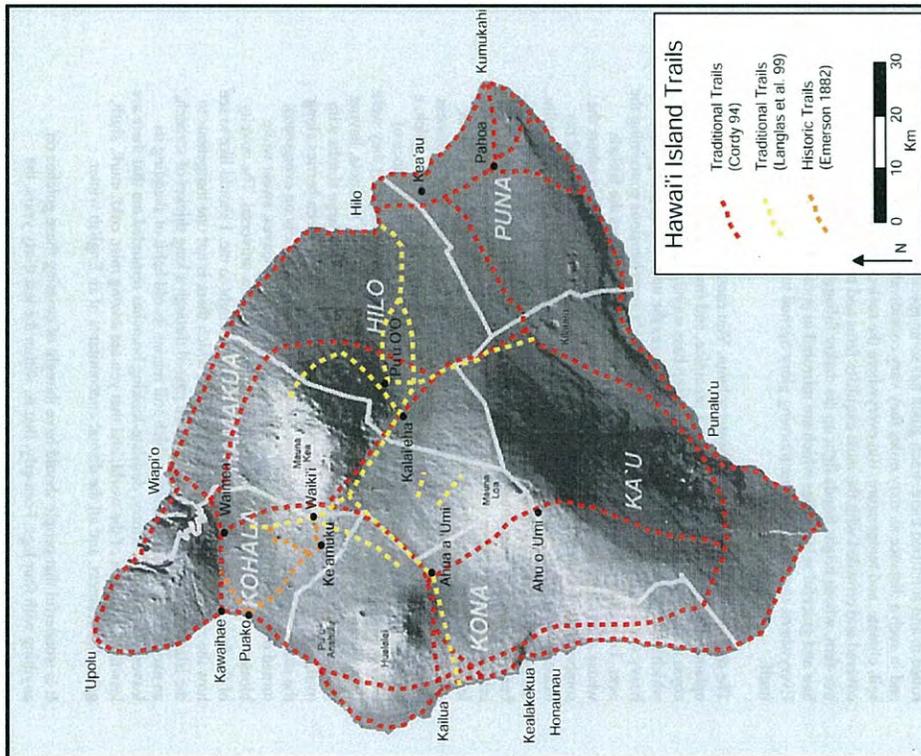


Figure 5: Hawaii's Island Trail Systems.

As for early historic accounts, William Ellis (2004) traveled by canoe from Hilo to Laupāhoehoe, just east of Pa'auilo, where he disembarked and continued on foot to Humu'ula along the tree line at the northern foot of Mauna Kea. Ellis states that the cliffs between Hilo and Laupāhoehoe were dotted with plantations. No mention is made of Koholālele Ahupua'a though he did not travel through it on the way to Humu'ula.

In 1872, Isabella Bird traveled by horseback along the Hāmākua from Onomea to the Waipi'o Valley and described the landscape she travelled through. The journey was over very rough and steep trails, and took five days. Bird noted "this is the most severe road on horses on Hawaii, and it takes a really good animal to come to Waipi'o and go back to Hilo (Bird 2007:85). The description that follows underscores the sparsely populated Hāmākua area:

From Onomea to the place where we expected to find the guide, we kept going up and down the steep sides of ravines, and scrambling through torrents till we reached a deep and most picturesque gulch [Kawaimū], with a primitive school-house at the bottom, and some grass-houses clustering under palms and papayas, a valley scene of endless ease and perpetual afternoon. Here we found that D.'s uncle, who was to have been our guide, could not go, because his horse was not strong enough, but her cousin volunteered his escort, and went away to catch his horse, while we tethered ours and went into the school-house.

This reminded me somewhat of the very poorest schools connected with the Edinburgh Ladies' Highland School Association, but the teacher had a remarkable paucity of clothing, and he seemed to have the charge of his baby, which, much clothed, and indeed much muffled, lay on the bench beside him. For there were benches, and a desk, and even a blackboard and primers down in the deep wild gulch, where the music of living waters, and the thunderous roll of the Pacific, accompanied the children's tuneless voices as they sang an Hawaiian hymn. I shall remember nothing of the scholars but rows of gleaming white teeth, and splendid brown eyes. I thought both teacher and children very apathetic. There were lamentably few, though the pretty rigidly enforced law, which compels all children between the ages of six and fifteen to attend school for forty weeks of the year, had probably gathered together all the children of the district. They all wore coloured chemises and leis of flowers (Bird 2007:85).

We had a perfect day until the middle of the afternoon. The dimpling Pacific was never more than a mile from us as we kept the narrow track in the long green grass; and on our left the blunt snow-patched peaks of Mauna Kea rose from the grade of forest, looking so delusively near that I fancied a two-hours' climb would take us to his lofty summit. The track for twenty-six miles is just in and out of gulches, from 100 to 800 feet in depth, all opening on the sea, which sweeps into them in three booming rollers. The candle-nut or kukui (Aleurites triloba) tree, which on the whole predominates, has leaves of a rich deep green when mature,

which contrast beautifully with the flaky silvery look of the younger foliage. Some of the shallower gulches are filled exclusively with this tree, which in growing up to the light to within 100 feet of the top, presents a mass and density of leafage quite unique, giving the gulch the appearance as if billows of green had rolled in and solidified there. Each gulch has some speciality of ferns and trees, and in such a distance as sixty miles they vary considerably with the variations of soil, climate, and temperature. But everywhere the rocks, trees, and soil are covered and crowded with the most exquisite ferns and mosses, from the great tree-fern, whose bright fronds light up the darker foliage, to the lovely maiden-hair and graceful *selaginellas* which are mirrored in pools of sparkling water. Everywhere, too, the great blue morning glory opened to a heaven not bluer than itself.

The descent into the gulches is always solemn. You canter along a bright breezy upland, and are suddenly arrested by a precipice, and from the depths of a forest abyss a low plash or murmur rises, or a deep bass sound, significant of water which must be crossed, and one reluctantly leaves the upper air to plunge into heavy shadow, and each experience increases one's apprehensions concerning the next. Though in some gulches the kukui preponderates, in others the lauhala whose aerial roots support it in otherwise impossible positions, and in others the sombre ohia, yet there were some grand clefts in which nature has mingled her treasures impartially, and out of cool depths of ferns rose the feathery coco-palm, the glorious breadfruit, with its green melon-like fruit, the large ohia, ideal in its beauty,—the most gorgeous flowering tree I have ever seen, with spikes of rose-crimson blossoms borne on the old wood, blazing among its shining many-tined leafage,—the tall papaya with its fantastic crown, the profuse gigantic plantain, and innumerable other trees, shrubs, and lianas, in the beauty and bounteousness of an endless spring. Imagine my surprise on seeing at the bottom of one gulch, a grove of good-sized, dark-leaved, very handsome trees, with an abundance of smooth round green fruit upon them, and on reaching them finding that they were orange trees, their great size, far exceeding that of the largest at Valencia, having prevented me from recognizing them earlier! In another, some large shrubs with oval, shining, dark leaves, much crimped at the edges, bright green berries along the stalks, and masses of pure white flowers lying flat, like snow on evergreens, turned out to be coffee! The guava with its obtuse smooth leaves, sweet white blossoms on solitary axillary stalks, and yellow fruit was universal. The novelty of the fruit, foliage, and vegetation is an intense delight to me. I should like to see how the rigid aspect of a coniferous tree, of which there is not one indigenous to the islands, would look by contrast. We passed through a long thicket of sumach, an exotic from North America, which still retains its old habit of shedding its leaves, and its grey, wintry, desolate-looking branches reminded me that there are less-favoured parts of the world, and that you are among mist, cold, murr, slush, gales, leaflessness, and all the dismal concomitants of an English winter.

It is wonderful that people should have thought of crossing these gulches on anything with four legs. Formerly, that is, within the last thirty years, the

precipices could only be ascended by climbing with the utmost care, and descended by being lowered with ropes from crag to crag, and from tree to tree, when hanging on by the hands became impracticable to even the most experienced mountaineer. In this last fashion Mr. Coan and Mr. Lyons were let down to reach the gospel to the people of the then populous valleys. But within recent years, narrow tracks, allowing one horse to pass another, have been cut along the sides of these precipices, without any windings to make them easier, and only deviating enough from the perpendicular to allow of their descent by the sure-footed native-born animals. Most of them are worn by water and animals' feet, broken, rugged, jagged, with steps of rock sometimes three feet high, produced by breakage here and there. Up and down these the animals slip, jump, and scramble, some of them standing still until severely spurred, or driven by some one from behind. Then there are softer descents, slippery with damp, and perilous in heavy rains, down which they slide dexterously, gathering all their legs under them. On a few of these tracks a false step means death, but the vegetation which clothes the pali below, blinds one to the risk. I don't think anything would induce me to go up a swinging zigzag—a terrible pali opposite to me as I write, the sides of which are quite undraped.

All the gulches for the first twenty-four miles contain running water. The great Hakalau gulch we crossed early yesterday, has a river with a smooth bed as wide as the Thames at Eton. Some have only small quiet streams, which pass gently through ferny grottoes. Others have fierce strong torrents dashing between abrupt walls of rock, among immense boulders into deep abysses, and cast themselves over precipice after precipice into the ocean. Probably, many of these are the courses of fire torrents, whose jagged masses of a-a have since been worn smooth, and channelled into holes by the action of water. A few are crossed on narrow bridges, but the majority are forded, if that quiet conventional term can be applied to the violent founderings by which the horses bring one through. The transparency deceives them, and however deep the water is, they always try to lift their fore feet out of it, which gives them a disagreeable rolling motion. (Mr. Brigham in his valuable monograph on the Hawaiian volcanoes quoted below, appears as much impressed with these gulches as I am.)

We lunched in one glorious valley, and Kaluna made drinking cups which held fully a pint, out of the beautiful leaves of the *Arum esculentum*. Towards afternoon turbid-looking clouds lowered over the sea, and by the time we reached the worst pali of all, the south side of Laupahoehoe, they burst on us in torrents of rain accompanied by strong wind. This terrible precipice takes one entirely by surprise. Kaluna, who rode first, disappeared so suddenly that I thought he had gone over. It is merely a dangerous broken ledge, and besides that it looks as if there were only foothold for a goat, one is dizzied by the sight of the foaming ocean immediately below, and, when we actually reached the bottom, there was only a narrow strip of shingle between the stupendous cliff and the resounding surges, which came up as if bent on destruction. The path by which we descended

looked a mere thread on the side of the precipice. I don't know what the word beetling means, but if it means anything bad, I will certainly apply it to that pali.

A number of disastrous-looking native houses are clustered under some very tall palms in the open part of the gulch, but it is a most wretched situation; the roar of the surf is deafening, the scanty supply of water is brackish, there are rumours that leprosy is rife, and the people are said to be the poorest on Hawaii (Bird 2007:87-91).

We moved on in single file at a jog-trot wherever the road admitted of it, meeting mounted natives now and then, which led to a delay for the exchange of nuhous; and twice we had to turn into the thicket to avoid what here seems to be considered a danger. There are many large herds of semi-wild bullocks on the mountains, branded cattle, as distinguished from the wild or unbranded, and when they are wanted for food, a number of experienced vaccheros on strong shod horses go up, and drive forty or fifty of them down. We met such a drove bound for Hilo, with one or two men in front and others at the sides and behind, uttering loud shouts. The bullocks are nearly mad with being hunted and driven, and at times rush like a living tornado, tearing up the earth with their horns. As soon as the galloping riders are seen and the crooked-horned beasts, you retire behind a screen. There must be some tradition of some one having been knocked down and hurt, for reckless as the natives are said to be, they are careful about this, and we were warned several times by travellers whom we met, that there were "bullocks ahead." The law provides that the vaccheros shall station one of their number at the head of a gulch to give notice when cattle are to pass through.

We jogged on again till we met a native who told us that we were quite close to our destination; but there were no signs of it, for we were still on the lofty uplands, and the only prominent objects were huge headlands confronting the sea. I got off to walk, as my mule seemed footsore, but had not gone many yards when we came suddenly to the verge of a pali, about 1,000 feet deep [Waipio], with a narrow fertile valley below, with a yet higher pali on the other side, both abutting perpendicularly on the sea. I should think the valley is not more than three miles long, and it is walled in by high inaccessible mountains. It is in fact, a gulch on a vastly enlarged scale. The prospect below us was very charming, a fertile region perfectly level, protected from the sea by sandhills, watered by a winding stream, and bright with fishponds, meadow lands, kalo patches, orange and coffee groves, figs, breadfruit, and palms. There were a number of grass-houses, and a native church with a spire, and another up the valley testified to the energy and aggressiveness of Rome (Bird 2007:94-95).

Bird also described the sugar plantation at Kaiwiki, east of Koholalele. It was one of the first sugar mills established on the Island of Hawai'i. The Hamakua Mill Company and the Kūka'i au Mill Company had not yet been established at the time of her journey. Those two companies were established in 1877 and 1887, respectively. The Kūka'i au Mill Company was

just west of the Kaiwiki Mill Company, and the Hamakua Mill Company was just west of the Kūka'i au Mill Company. Her description of the Kaiwiki Mill follows:

Then there is the sugar plantation of Kaiwiki, with its patches of bright green cane, its flumes crossing the track above our heads, bringing the cane down from the upland cane-fields to the crushing-mill, and the shifting, busy scenes of the sugar-boiling season.

Then the track goes down with a great dip, along which we slip and slide in the mud to a deep broad stream. This is a most picturesque spot, the junction of two clear bright rivers, and a few native houses and a Chinaman's store are grouped close by under some palms, with the customary loungers on horseback, asking and receiving nuhous, or news, at the doors. Our accustomed horses leaped into a ferry-scow provided by Government, worked by a bearded female of hideous aspect, and leaped out on the other side to climb a track cut on the side of a precipice, which would be steep to mount on one's own feet. There we met parties of natives, all flower-wreathed, talking and singing, coming gaily down on their sure-footed horses, saluting us with the invariable "Aloha." Every now and then we passed native churches, with spires painted white, or a native schoolhouse, or a group of scholars all ferns and flowers. The greenness of the vegetation merits the term "dazzling." We think England green, but its colour is poor and pale as compared with that of tropical Hawaii. Palms, candlenuts, ohias, hibiscus, were it not for their exceeding beauty, would almost pall upon one from their abundance, and each gulch has its glorious entanglement of breadfruit, the large-leaved ohia, or native apple, a species of Eugenia (*Eugenia Malaccensis*), and the pandanus, with its aerial roots, all looped together by large sky-blue convolvuli and the running fern, and is marvellous with parasitic growths.

The unique beauty of this coast is what are called gulches—narrow deep ravines or gorges, from 100 to 2,000 feet in depth, each with a series of cascades from 10 to 1,800 feet in height. I dislike reducing their glories to the baldness of figures, but the depth of these clefts (originally, probably, the seams caused by fire torrents), cut and worn by the fierce streams fed by the snows of Mauna Kea, and the rains of the forest belt, cannot otherwise be expressed. The cascades are most truly beautiful, gleaming white among the dark depths of foliage far away, and falling into deep limpid basins, festooned and overhung with the richest and greenest vegetation of this prolific climate, from the huge-leaved banana and shining breadfruit to the most feathery of ferns and lycopodiums. Each gulch opens on a velvet lawn close to the sea, and most of them have space for a few grass houses, with coconut trees, bananas, and kalo patches. There are sixty-nine of these extraordinary chasms within a distance of thirty miles!

I think we came through eleven, fording the streams in all but two. The descent into some of them is quite alarming. You go down almost standing in your stirrups, at a right angle with the horse's head, and up, grasping his mane to prevent the saddle slipping. He goes down like a goat, with his bare feet, looking

favourably at each step, sometimes putting out a foot and withdrawing it again in fading or jumping. The Mexican saddle has great advantages on these tracks, which are nothing better than ledges cut on the sides of precipices, for one goes up and down not only in perfect security but without fatigue. I am beginning to hope that I am not too old, as I feared I was, to learn a new mode of riding, for my companions rode at full speed over places where I should have picked my way carefully at a foot's pace; and my horse followed them, galloping and stopping short at their pleasure, and I successfully kept my seat, though not without occasional fears of an ignominious downfall. I even wish that you could see me in my Rob Roy riding dress, with leather belt and pouch, a lei of the orange seeds of the pandanus round my throat, jingling Mexican spurs, blue saddle blanket, and Rob Roy blanket strapped on behind the saddle!

This place is grandly situated 600 feet above a deep cove, into which two beautiful gulches of great size run, with heavy cascades, finer than Foyers at its best, and a native village is picturesquely situated between the two. The great white rollers, whiter by contrast with the dark deep water, come into the gulch just where we forded the river, and from the ford a passable road made for hauling sugar ascends to the house. The air is something absolutely delicious; and the murmur of the rollers and the deep boom of the cascades are very soothing. There is little rise or fall in the cadence of the surf anywhere on the windward coast, but one even sound, loud or soft, like that made by a train in a tunnel.

We were kindly welcomed, and were at once "made at home." Delicious phrase! the full meaning of which I am learning on Hawaii, where, though everything has the fascination of novelty, I have ceased to feel myself a stranger. This is a roomy, rambling frame-house, with a verandah, and the door, as is usual here, opens directly into the sitting-room. The stair by which I go to my room suggests possibilities, for it has been removed three inches from the wall by an earthquake, which also brought down the tall chimney of the boiling-house. Close by there are small pretty frame-houses for the overseer, bookkeeper, sugar boiler, and machinist; a store, the factory, a pretty native church near the edge of the cliff, and quite a large native village below. It looks green and bright, and the atmosphere is perfect, with the cool air coming down from the mountains, and a soft breeze coming up from the blue dreamy ocean. Behind the house the uplands slope away to the colossal Mauna Kea. The actual, dense, impenetrable forest does not begin for a mile and a half from the coast, and its broad dark belt, extending to a height of 4,000 feet, and beautifully broken, throws out into greater brightness the upward glades of grass and the fields of sugar-cane.

This is a very busy season, and as this is a large plantation there is an appearance of great animation. There are five or six saddled horses usually tethered below the house; and with overseers, white and coloured, and natives riding at full gallop, and people coming on all sorts of errands, the hum of the

crushing-mill, the rush of water in the flumes, and the grind of the waggons carrying cane, there is no end of stir.

The plantations in the Hilo district enjoy special advantages, for by turning some of the innumerable mountain streams into flumes the owners can bring a great part of their cane and all their wood for fuel down to the mills without other expense than the original cost of the woodwork. Mr. A. has 100 mules, but the greater part of their work is ploughing and hauling the kegs of sugar down to the cove, where in favourable weather they are put on board of a schooner for Honolulu. This plantation employs 185 hands, native and Chinese, and turns out 600 tons of sugar a year. The natives are much liked as labourers, being docile and on the whole willing; but native labour is hard to get, as the natives do not like to work for a term unless obliged, and a pernicious system of "advances" is practised. The labourers hire themselves to the planters, in the case of natives usually for a year, by a contract which has to be signed before a notary public. The wages are about eight dollars a month with food, or eleven dollars without food, and the planters supply houses and medical attendance. The Chinese are imported as coolies, and usually contract to work for five years. As a matter of policy no less than of humanity the "hands" are well treated; for if a single instance of injustice were perpetrated on a plantation the factory might stand still the next year, for hardly a native would contract to serve again.

The Chinese are quiet and industrious, but smoke opium, and are much addicted to gaming. Many of them save money, and, when their turn of service is over, set up stores, or grow vegetables for money. Each man employed has his horse, and on Saturday the hands form quite a cavalcade. Great tact, firmness, and knowledge of human nature are required in the manager of a plantation. The natives are at times disposed to shirk work without sufficient cause; the native lunas, or overseers, are not always reasonable, the Chinamen and natives do not always agree, and quarrels and entanglements arise, and everything is referred to the decision of the manager, who, besides all things else, must know the exact amount of work which ought to be performed, both in the fields and factory, and see that it is done. Mr. A. is a keen, shrewd man of business, kind without being weak, and with an eye on every detail of his plantations. The requirements are endless. It reminds me very much of plantation life in Georgia in the old days of slavery. I never elsewhere heard of so many headaches, sore hands, and other trifling ailments. It is very amusing to see the attempts which the would-be invalids make to lengthen their brief smiling faces into lugubriousness, and the sudden relaxation into naturalness when they are allowed a holiday. Mr. A. comes into the house constantly to consult his wife regarding the treatment of different ailments.

I have made a second tour through the factory, and am rather disgusted with sugar making. "All's well that ends well," however, and the delicate crystalline result makes one forget the initial stages of the manufacture. The cane, stripped of its leaves, passes from the flumes under the rollers of the crushing-

mill, where it is subjected to a pressure of five or six tons. One hundred pounds of cane under this process yield up from sixty-five to seventy-five pounds of juice. This juice passes, as a pale green cataract, into a trough, which conducts it into a vat, where it is dosed with quicklime to neutralize its acid, and is then run off into large heated metal vessels. At this stage the smell is abominable, and the turbid fluid, with a thick scum upon it, is simply disgusting. After a preliminary heating and skimming it is passed off into iron pans, several in a row, and boiled and skimmed, and ladled from one to the other till it reaches the last, which is nearest to the fire, and there it boils with the greatest violence, seething and foaming, bringing all the remaining scum to the surface. After the concentration has proceeded far enough, the action of the heat is suspended, and the reddish-brown, oily-looking liquid is drawn into the vacuum-pan till it is about a third full; the concentration is completed by boiling the juice in vacuo at a temperature of 150 degrees, and even lower. As the boiling proceeds, the sugar boiler tests the contents of the pan by withdrawing a few drops, and holding them up to the light on his finger; and, by certain minute changes in their condition, he judges when it is time to add an additional quantity. When the pan is full, the contents have thickened into the consistency of thick gruel by the formation of minute crystals, and are then allowed to descend into an heater, where they are kept warm till they can be run into "forms" or tanks, where they are allowed to granulate. The liquid, or molasses, which remains after the first crystallization is returned to the vacuum pan and reboiled, and this reboiling of the drainings is repeated two or three times, with a gradually decreasing result in the quality and quantity of the sugar. The last process, which is used for getting rid of the treacle, is a most beautiful one. The mass of sugar and treacle is put into what are called "centrifugal pans," which are drums about three feet in diameter and two feet high, which make about 1,000 revolutions a minute. These have false interiors of wire gauze, and the mass is forced violently against their sides by centrifugal action, and they let the treacle whirl through, and retain the sugar crystals, which lie in a dry heap in the centre.

The cane is being flumed in with great rapidity, and the factory is working till late at night. The cane from which the juice has been expressed, called "trash," is dried and used as fuel for the furnace which supplies the steam power. The sugar is packed in kegs, and a cooper and carpenter, as well as other mechanics, are employed.

Sugar is now the great interest of the islands. Christian missions and whaling have had their day, and now people talk sugar. Hawaii thrills to the news of a cent up or a cent down in the American market. All the interests of the kingdom are threatened by this one, which, because it is grievously depressed and staggers under a heavy import duty in the American market, is now clamorous in some quarters for "annexation," and in others for a "reciprocity treaty," which last means the cession of the Pearl River lagoon on Oahu, with its adjacent shores, to America, for a Pacific naval station. There are 200,000 acres of productive soil on the islands, of which only a fifteenth is under cultivation, and of this large area 150,000 is said to be specially adapted for sugar culture. Herein is a prospective

Utopia, and people are always dreaming of the sugar-growing capacities of the belt of rich disintegrated lava which slopes upwards from the sea to the bases of the mountains. Hitherto, sugar growing has been a very disastrous speculation, and few of the planters at present do more than keep their heads above water.

Were labour plentiful and the duties removed, fortunes might be made; for the soil yields on an average about three times as much as that of the State of Louisiana. Two and a half tons to the acre is a common yield, five tons, a frequent one, and instances are known of the slowly matured cane of a high altitude yielding as much as seven tons! The magnificent climate makes it a very easy crop to grow. There is no brief harvest time with its rush, hurry, and frantic demand for labour, nor frost to render necessary the hasty cutting of an immature crop. The same number of hands is kept on all the year round. The planters can plant pretty much when they please, or not plant at all, for two or three years, the only difference in the latter case being that the ratoon which springs up after the cutting of the former crop are smaller in bulk. They can cut when they please, whether the cane be tasselled or not, and they can plant, cut, and grind at one time!

It is a beautiful crop in any stage of growth, especially in the tasselled stage. Every part of it is useful—the cane pre-eminently—the leaves as food for horses and mules, and the tassels for making hats. Here and elsewhere there is a plate of cut cane always within reach, and the children chew it incessantly. I fear you will be tired of sugar, but I find it more interesting than the wool and mutton of Victoria and New Zealand, and it is a most important item of the wealth of this toy kingdom, which last year exported 16,995,402 lbs. of sugar and 192,105 gallons of molasses. [Footnote: In 1875 the export of sugar reached a total of 25,080,182 lbs.] With regard to molasses, the Government prohibits the manufacture of rum, so the planters are deprived of a fruitful source of profit. It is really difficult to tear myself from the subject of sugar, for I see the cane waving in the sun while I write, and hear the busy hum of the crushing-mill [Bird 2007:72-78].

Bird was staying at the Onomea Plantation as a guest at the time. The Onomea Plantation was owned by her host Judge S.L. Austin who started the plantation in 1863 (Campbell and Ogburn 2008). A description of the Onomea Plantation works by Campbell and Ogburn (2008) is quoted below.

During the early days, Onomea's crushing plant was water driven. A metal water wheel and boiler had been shipped from Glasgow, Scotland in 1862. Water from the flumes provided the power to turn the wheel, which in turn moved the sugar cane crusher. The water-driven crushing plant was much larger and heavier than those of other mills. The mill was situated just below Papaikou at the

foot of a gulch, which opened out to the ocean. It was the first nine-roller mill erected on the island. The mill was connected by rail to one of the best landings and loading devices on the coast. The sugar cars were hauled to the landing by a cable and sugar could be sent over the main cable to the hold of a ship without rehandling. By means of this device about 1,600 bags of sugar could be loaded in an hour.

A distinctive feature of Onomea was its system of flumes, which spanned gorges and carried cane down the slopes to the mill. Fifty-five miles of stationary and portable flumes were constructed. The trestle, which carried the main flume across Hanawaimui Gulch, was the largest wooden bridge in the territory and the one spanning Kawainui Gulch was the highest, 176 feet. Onomea's location in a heavy rainfall belt made it difficult to mechanize cane harvesting and transportation easily. Onomea was one of the last plantations to stop hand cutting cane. However, progress was made and the extensive road building program begun in 1903 was finally completed in 1956.

The heavy rainfall also tended to wash topsoil away and leach it out. Onomea was the first Hawaiian sugar plantation to use commercial fertilizer on its fields. In 1879 (1897?), bone meal fertilizer was used to improve the soil. Later on Manager John T. Moir's protective efforts towards Onomea's topsoils resulted in the invention of a plow which was adapted to the peculiar topography of the county and the nature of the soil. The shallow, clay-like soils were subject to washing unless properly cultivated. It is to Moir's credit that no field was washed out to sea during his 20 years of management. He was also considered one of the leaders in the conservation of waste products and the use of them to build up the land.

The descriptions of the Kaiwiki and Onomea plantations are good period descriptions of sugar plantations and operations in the area of the Hamakua Sugar Plantation that was soon to be operated within the project area.

NATIVE TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Mahele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). A single Land Commission Award was made within the project area. The project area parcel was awarded to Kailakanoa (LCA 26-B, R.P. 4527). Eight small awards were made *makai* of the project area parcel, near the coast.

THE HISTORY OF SUGAR IN HAWAII

Captain Cook found sugarcane (*Saccharum officinarum*) growing in Hawaii at the time of his arrival in 1778 (Beaglehole 1967:479). He noted that the cane was of large size and good quality. According to Hawaiians, sugarcane (*kō*) grew wild and quite well in the valleys and lowlands. It was not refined but was eaten as a food crop and was used as an offering, especially to the shark god *Mano* (Rolph 1917:166). Captain James King also noted that upon his arrival at Maui in 1778, Hawaiians came along ship carrying sugarcane as well as fruits and vegetables (Beaglehole 1967:497). Several sugarcane varieties, either indigenous or brought by early Polynesians, were known to the Hawaiians, including *Ualalehu*, *Ualalehu maoli* (native), *Honuaula*, *Lanakena* (*Laukono*), *Kea* (*Kokea*), *Papa*, and *Ohua* (Wilfong 1883).

The earliest instances of sugar and molasses production in Hawaii remain uncertain, but were likely small-scale sugar extraction operations. A number of important chiefs set aside land for several of these early endeavors (Kelly *et al.* 1981:81). Rolph (1917:166-167) documents the inception of organized sugar production as follows:

L. L. Torbert, one of the early planters, in a paper read before the Royal Agricultural Society in January, 1852, claims the earliest sugar factory was put up on the island of Lanai in 1802 by a Chinaman who came to the islands in one of the vessels trading for sandalwood. He brought with him a stone mill and boilers, and after grinding one small crop and making it into sugar, went away the next year taking his apparatus with him.

Anderson [Anderson, Rufus, *The Hawaiian Islands*, Boston, 1864] makes a statement that 257 tons of sugar were exported from the islands in 1814, but cites no authority upon which to base his assertion.

According to Jarves [Jarves, James Jackson, *History of the Sandwich Islands*, Honolulu, 1872] the first instance of the manufacture of sugar goes back to beyond 1820, but the name of the pioneer planter is unknown. It is certain that at first molasses was manufactured and then sugar some time before 1820.

Don Francisco de Paula made sugar in Honolulu in 1819, the year before the arrival of the first missionaries. Lavinia, an Italian, did the same thing in 1823. His method was to pound the cane with stone pestles on huge wooden trays (poi boards) by native labor, collecting the juice and boiling it in a small copper kettle.

Accounts from various sources agree that the making of sugar and molasses was general in 1823-24. This undoubtedly had direct connection with the manufacture of rum, which was extensively carried on at the time.

In 1828 a considerable amount of cane was raised in the Niuuanu valley and Waikapu, Maui. A pioneer cane grower, Antonio Silva by name, lived at the latter place, and some Chinamen had a sugar mill near Hilo. In those days mills were made of wood, very crudely put together and worked by oxen.

Ladd & Company established the first large-scale sugar production in Hawai'i on Kauai, while David Malo operated a mill on Maui between 1840 and 1850, and Governor Kuakini directed the planting of one hundred acres of sugar cane in 1839 in Kohala, on the Island of Hawai'i (Rolph 1917:169). Missionaries at Hilo in the early 1800s produced sugar and molasses for their own use (Kelly *et al.* 1981:81). In 1841, a mill on the Wailuku River in Hilo on Governor Kuakini's land, and likely operated by Chinese, produced about 30 tons of sugar.

Sugarcane growing and milling operations were still simple. Cane fields were neither irrigated nor fertilized and sugar yields were roughly one ton per acre. Planting, by *o'o* (digging stick), and harvesting was done by Hawaiian contract workers (Thrum 1874:36). Laborers were paid in kind, often in cloth. Once at the milling facilities, cane was fed one stalk at a time into iron band reinforced wooden rollers powered by water, oxen, mule, and horse. The juice extracted by the rollers was collected in a trough and was boiled in whaling ship iron trypots (Figure 6). Less than 50% of the sugar was extracted from the cane using these methods. Additionally, production was low because indigenous sugarcanes were susceptible to introduced disease and were soft and therefore unsuitable for milling (Mangelsdorf 1956).

Lahaina sugarcane, a variety indigenous to the Marquesas, was introduced to Hawai'i in 1854, and by 1870 had displaced all indigenous varieties for sugar production (Wilfong 1883). Hawaiian sugar production remained low despite the introduction of steam power in 1858-1859 to the milling process. The Island of Hawai'i had a single mill operating at Hilo until the outbreak of the American Civil War (1861-1865). The disruption of sugar production in the American south caused a price increase and a concomitant rise in Hawaiian sugar production and export, from 2,600 tons in 1863 to 8,869 tons in 1866 (Rolph 1917:171). The rapid growth of the sugar industry created a labor shortage that necessitated hiring contract laborers from other Polynesian islands.

Hawaiian sugar production was still somewhat hindered by U.S. import duties, until a reciprocity treaty negotiated between the Kingdom of Hawai'i and the U.S. in 1876 reduced import duties levied on Hawaiian sugar, increasing the profitability of sugar production and further spurring the growth of the sugar industry. From 1877 to 1888, sugar production

increased almost 500% and doubled in the following ten years (Kelly *et al.* 1981:81). American consumers purchased nearly 99% of all Hawaiian export products, much of it sugar.



Figure 6: A Whaling Trypot Typical of Those Used For Making Raw Sugar.

In 1880 Rose Bamboos sugar cane was introduced from Australia and was grown at higher elevations on Hawai'i. Rose Bamboos cane did especially well on the relatively high table lands along the Hāmākua coast. Lahaina and Rose Bamboos varieties were susceptible to insects and disease and subsequently yields decreased annually until both varieties were completely replaced around the turn of the century by Yellow Caledonia cane (also called White Tanna cane), a variety named for New Caledonia and Tanna, an island of present day Vanuatu (Rolph 1917:170). Yellow Caledonia had been imported to Hawai'i in 1881 and was first grown with

great success in Ka'u (Tew 1987). The variety was resistant to disease and grew well in cooler climates with moderately high rainfall, and consequently was cultivated with great success along the Hāmākua until its replacement in 1925 with hybrid varieties of sugarcane (James 2004:5).

The Hawaiian sugar industry continued to grow and additional contract laborers were hired from as far away as China and Japan (after 1890), and later from Korea, the Philippines, Puerto Rico, and Portugal. Sugar plantations began offering free medical care and rent-free housing to attract laborers. The annexation of Hawai'i by the U.S. in 1898 ensured the continued American consumer demand for Hawaiian sugar. Additionally, incorporation provided new funding for needed public works to improve the transportation and shipping facilities that made the sugar trade more profitable. The development of port facilities and the extensive railroad system that ran from Kalapana in South Puna to Pa'auiilo along the Hāmākua coast were a direct result of the sugar industry.

THE HISTORY OF SUGAR AT KOHOLĀLELE

Seven sugar companies were established along the Hāmākua coast between 1869 and 1880, excepting Onomea Plantation in the Hilo area (Bouvet 2001:9). Geographically, from the Hilo to Kohala sides of the Hāmākua, they were the Laupahoehoe Sugar Company (est. 1880), the O'okala Sugar Plantation Company (est. 1869), the Kukaiau Sugar Company (est. 1887), the Hamakua Sugar Company (est. 1877), the Paauhau Sugar Company (est. 1878), the Honokaa Sugar Company (est. 1878), and the Pacific Mill Company (est. 1879).

HAMAKUA MILL COMPANY (1877-1917)

The Hamakua Mill Company (1869-1909) was first established in 1877 by Theo Davies and his partner Charles Noley, Sr. (Saito and Campbell 2008). In 1878, the first sugarcane was planted at the plantation and Hilo Iron Works was hired to build a mill. The plantation was located at Pa'auiilo and by 1890 the company had twenty-nine employees. By 1910 it had 4,800 acres planted in sugarcane and employed more than 600 people. The company ran three locomotives on nine miles of light gauge rail. There was a warehouse and landing below the cliff at Koholālele where ships were loaded by crane. In 1914, the Kūkai'au Mill Company became a part of the Hamakua Mill Company. In 1917 the Kūkai'au Mill Company mill was sold and moved to Formosa (Taiwan) (Bouvet *et al.* 2001:11).

HAMAKUA SUGAR COMPANY (1917-1974) AND THE LAUPAHOEHOE SUGAR COMPANY (1974-1978)

In 1917, the Hamakua Mill Company was renamed the Hamakua Sugar Company. The Kaiwiki Sugar Company (1869-1957) was merged with the Theo H. Davies Company owned Laupahoehoe Sugar Company (1880-1978) on May 1, 1956 and operations were merged with the latter beginning January 3, 1957. In 1978, the Hamakua Sugar Company and the Laupahoehoe Sugar Company were merged to form the Davies Hamakua Sugar Company.

DAVIES HAMAKUA SUGAR COMPANY (1978-1984) AND HAMAKUA SUGAR COMPANY (1984-1994)

The Laupahoehoe Sugar Company merged with the Honokaa Sugar Company in 1978 to form the Davies Hamakua Sugar Company (1978-1984). In 1984 the Davies Hamakua Sugar Company was bought by Francis Morgan and renamed the Hamakua Sugar Company (1984-1994). The Hamakua Sugar Company operated until October of 1994, and its closing marked the end of the sugar industry on the Island of Hawai'i.

CULTURAL INFORMANT INTERVIEWS

SCS, Inc contacted five individuals who either worked for the Hamakua Sugar Company, or live in Hāmākua District and have knowledge of the lands of Koholālele (Table 1). Four of the individuals were reached by phone. None of the informants had knowledge of past or ongoing cultural practices on the project area property.

Table 1: Individuals Responding to CIA.

Name	Affiliation	Responded ?	Has Knowledge?
Terry Knabusch	Hamakua Sugar Office	Yes	No
Faye Homma	Hamakua Sugar Office	Yes	No
Jim Thropp	Hamakua Sugar Agriculturalist	Yes	Yes
Gary Aganus	Hamakua Sugar Field Superintendent	Yes	No
Rick Toledo	Hamakua Sugar Field Superintendent	No	Unknown

JIM THROPP INTERVIEW (PA'AUIILO, HAWAII)

Jim was born in Honolulu and grew up in Kāne'ohe. He was 75 years old at the time of this interview. He studied general agriculture at California Polytechnic State University where he was awarded a degree in general crops production. He worked at a sugar plantation on Kaua'i before being hired by the Hamakua Sugar Company. Jim was in charge of crop logging, tissue

testing, and fertilizer application. He remembers that the soil on the study parcel are weak in calcium, nitrogen, and phosphorus. Jim did not remember any traditional Hawaiian features on the site. He said that by the time he was there, the company was using machinery to work the fields and harvest the crops. That meant that all rock was removed from the fields and pushed into the gulches to prevent the rock from fouling or damaging the machinery. He remembers that there were some large *ulu* trees in the some of the gulches. Jim did not know of any cultural practices that might have been conducted during his time working for the plantation company.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a "good faith effort". However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Ruby McDonald, Coordinator of the Hawai'i branch of the Office of Hawaiian Affairs; the Waimea Hawaiian Civic Club; Ku Kahakalau; Keawe Vresdenburg; Dr. Billy Bergin; Clement Junior Kanuha; and Reggie Lee. Public notices were published in Ka Wai Ola, The Honolulu Advertiser, and the Hawaii Tribune Herald.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I'i, Kamakau, Chinen, Kame'eleihewa, Fomander, Kuykendall, Kelly, Handy and Handy, Puku'i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai'i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waiohona 'Aina 2007 Data Base.

CIA INQUIRY RESPONSE

As suggested in the "Guidelines for Assessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought from the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; the Hawai'i branch of the Office of Hawaiian Affairs; the Kuakini Civic Club; and the Kona Hawaiian Civic Club. Except for OHA acknowledging the receipt of our letter, none of the organizations responded with information concerning the potential for cultural resources to occur in the project area, or with additional suggestions for further contacts.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within recent times. Based on historical research and no response from the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs. The visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and coast would appear to be minimal.

CULTURAL ASSESSMENT

Based on organizational response as well as archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. Because there were no cultural activities identified within the project area, there are no adverse effects.

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Appendix *D*

{ Pre-Consultation Comments and Responses }



**DEPARTMENT OF BUSINESS,
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AUG 23 2009

PBR HAWAII

August 27, 2009

Ms. Cate Fernandez
Planner
PBR Hawaii and Associates, Inc.
1001 Bishop St
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Re: Pre-Assessment Consultation to Prepare Environmental Assessments for the sale of
Hawaii County Hamakua Lands (Koholalele & Kapulea)-Preconsultation

In response to your August 7, 2009, notice, thank you for the opportunity to provide
comments in the consultation phase of the Environmental Assessments for the sale of Hawaii
County Hamakua Lands (Koholalele & Kapulea).

Our website provides detailed information on guidelines, directives and statutes, as
well as studies and reports on aspects of energy and resource efficiency at:
(<http://www.hawaii.gov/dbedt/info/energy/efficiency/state>). Please also do not hesitate to
contact Carilyn Shon, Energy Efficiency Branch Manager, at telephone number
808-587-3810, for additional information on energy efficiency and renewable energy
resources.

We look forward to reviewing the Draft Environmental Assessment.

Sincerely,

Theodore A. Peck
Administrator

c: OEQC
County of Hawaii, Department of Finance



**PBR HAWAII
& ASSOCIATES, INC.**

April 13, 2010

Theodore A. Peck, Administrator
State of Hawaii, DBEDT
Strategic Industries Division
PO Box 2359
Honolulu, HI 96804

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Vice-President
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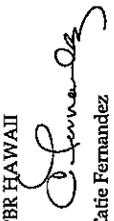
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**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HĀMĀKUA LAND (KOHOLALELE)
TMK: (3) 4-2-005-901, APPROXIMATELY 1,040 ACRES**

Dear Mr. Peck,

Thank you for your letter dated August 27, 2009 regarding preparation of
the above referenced Draft Environmental Assessment. As the planning
consultant for the applicant, County of Hawaii's, Department of Finance
we acknowledge your website offering detailed information on
guidelines, directives and statutes as well as studies and reports on aspects
of energy and resource efficiency.

Thank you for contributing to the development of this document. Your
comments will be included in the Draft Environmental Assessment.

Sincerely,

Cate Fernandez
Planner

c: Kenneth Van Bergen, County of Hawaii

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Response.doc



PBR HAWAII & ASSOCIATES, INC.

April 13, 2010
Lono A. Tyson
County of Hawai'i
Department of Environmental Management
15 Aupuni Street
Hilo, HI 96720

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF HAWAII COUNTY HAMAKUA LAND (KOHOLALELE) TMK: (3) 4-2-005-001, APPROXIMATELY 1,040 ACRES

Dear Mr. Tyson,

Thank you for your letter dated August 24, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance we acknowledge that the Department of Environmental Management has no comments at this time.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Cattie Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawai'i

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KEVIN E. NISHIKAWA, ASLA
Associate
KIMIKAWA YUKI, LEED AP
Associate

SCOTT ALMA, BRIGGS, LEED AP
Associate
SCOTT BARNHAM, LEED AP
Associate

DACHENG DONG, LEED AP
Associate

HONOLULU OFFICE
101 Ala Moana Center
Kapiolani Building, Suite 313
Honolulu, HI 96813-3181
Tel: (808) 521-5531
Fax: (808) 521-1102
E-mail: tyson@pbrhawaii.com

KAPOLEI OFFICE
101 Ala Moana Center
Kapiolani Building, Suite 313
Kapolei, Hawaii 96707-2875
Tel: (808) 521-5531
Fax: (808) 521-3161

01-Job065-2596-19 Hawaii County-Hamakuu Lands EA/EAU/Pre-Consultation/Responses to Comments/DEM Response.doc

PLANNING • LANDSCAPE ARCHITECTURE • ENVIRONMENTAL STUDIES • ENTITLEMENTS • PERMITTING • GRAPHIC DESIGN

Lono A. Tyson
Director
Ivan M. Torjose
Deputy Director



County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street • Hilo, Hawaii 96720
(808) 961-6883 • Fax (808) 961-6886
<http://enr.hawaii.gov/departmentofenvironmentalmanagement>

RECEIVED
AUG 27 2009
PBR HAWAII

William P. Kenol
Mayor

August 24, 2009

PBR HAWAII & ASSOCIATES, INC.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813-3484

Attention: Cattie Fernandez
Planner

RE: Environmental Assessments for the sale of Hawai'i County Hamakua Lands (Koholaalele & Kapulea) - Preconsultation

Dear Ms. Fernandez,

We have no comments to offer on the subject sale.

Thank you for allowing us to review and comment on this project.

With Regards and Aloha,

Lono A. Tyson
DIRECTOR

County of Hawai'i is an Equal Opportunity Provider and Employer.

2-010-1

LEONA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 521
HONOLULU, HAWAII 96809



LEONA LINGLE
GOVERNOR OF HAWAII

RECEIVED
SEP 02 2009
HAWAII

September 1, 2009

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813-3484

Attention: Ms. Cattie Fernandez, Planner

Ladies and Gentlemen:

Subject: Pre-Consultation for Environmental Assessments for the Sale of Hawaii County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Commission on Water Resource Management, Land Division-Hawaii District, Division of Aquatic Resources, Division of Boating & Ocean Recreation, Engineering Division, Division of State Parks, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
for Morris M. Atta
Administrator

LEONA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
MAILING ADDRESS: POST OFFICE BOX 521
HONOLULU, HAWAII 96809



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LAND DIVISION

2009 AUG 13 1 A 11: 35

RECEIVED
LAND DIVISION
PBR O. HAWAII

August 12, 2009

MEMORANDUM

TO:

- DLNR Agencies:
 - Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division -Hawaii District
 - Historic Preservation

RECEIVED
SEP 02 2009
PBR HAWAII

FROM: Morris M. Atta
SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: *Morris M. Atta*
Date: 8.14.09



DEPARTMENT OF LAND AND NATURAL RESOURCES
 RESOURCE MANAGEMENT
 2009 AUG 12 PM 1:45



STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 LAND DIVISION
 POST OFFICE BOX 621
 HONOLULU, HAWAII 96809
 August 12, 2009

MEMORANDUM

- TO: *FR*
- DLNR Agencies:
- Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division - Hawaii District
 - Historic Preservation

FROM: *J Morris M. Atia*
 SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands
 LOCATION: Island of Hawaii
 APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

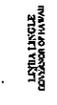
Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: *J Morris M. Atia*
 Date: 8/13/09



STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 LAND DIVISION
 POST OFFICE BOX 621
 HONOLULU, HAWAII 96809
 August 12, 2009

MEMORANDUM

- TO: *FR*
- DLNR Agencies:
- Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division - Hawaii District
 - Historic Preservation

FROM: *J Morris M. Atia*
 SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands
 LOCATION: Island of Hawaii
 APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: *J Morris M. Atia*
 Date: 8/12/09

2009 JUL -8 PM 12:58
 DIV OF AQUATIC RESOURCES
 HONOLULU, HAWAII

RECEIVED

LAUREN THIELSEN
 CHIEF OF BUREAU
 COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
 LAND DIVISION
 2009 AUG 19 A

AQUATIC RESOURCES	2009/8/19
DIRECTOR	
ADM. FISH.	
AD RESERV.	
AD REC.	
PLANNER	
STATE SVCS.	
RECRUIT	
STATISTICS	
REGISTRATION	
INSURANCE	
EDUCATION	
SECRETARY	
OFFICE SVCS.	
TECH. ASST.	
TRAINING	
INT. COMM.	
EXT. COMM.	
FILE	

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LAND DIVISION

2009 AUG 25 3:21



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

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SEP 02 2009
PBR HAWAII

August 12, 2009

MEMORANDUM

- TO: DLNR Agencies:
- Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division - Hawaii District
 - Historic Preservation

FROM: Morris M. Alta

SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

- Attachments
- We have no objections.
 - We have no comments. Comments are attached.

Signed: *[Signature]*
Date: 8/25/09



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

RECEIVED
SEP 05 2009
PBR HAWAII

September 5, 2009

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813-3484

Attention: Ms. Cattie Fernandez, Planner
Ladies and Gentlemen:

Subject: Pre-Consultation for Environmental Assessments for the Sale of Hawaii County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to Division of Forestry & Wildlife for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,
Charlene E. Abdo
Morris M. Alta
Administrator

LAURA L. THIELKE
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCES MANAGEMENT



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LAND DIVISION

2009 SEP -3 P 2:41

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 681
HONOLULU, HAWAII 96809



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SEP 03 2009

POST HAWAII

MEMORANDUM

TO: DLNR Agencies:
 Div. of Aquatic Resources
 Div. of Boating & Ocean Recreation
 Engineering Division
 Div. of Forestry & Wildlife
 Div. of State Parks
 Commission on Water Resource Management
 Office of Conservation & Coastal Lands
 Land Division -Hawaii District
 Historic Preservation

FROM: *J. Morris M. Atta*
SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands
LOCATION: Island of Hawaii
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections.
 We have no comments.
 Comments are attached.

Signed: *Paul J. Conry*
Date: SEP -2-2009

PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

LAURA L. THIELKE
BOARD OF LAND AND NATURAL RESOURCES
COMMISSIONER OF WATER RESOURCES MANAGEMENT



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LAND DIVISION

2009 AUG 25 A 8:43

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 681
HONOLULU, HAWAII 96809



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SEP 02 2009

PBR HAWAII

09 AUG 12 PM 09:45 ENGINEERING

MEMORANDUM

TO: DLNR Agencies:
 Div. of Aquatic Resources
 Div. of Boating & Ocean Recreation
 Engineering Division
 Div. of Forestry & Wildlife
 Div. of State Parks
 Commission on Water Resource Management
 Office of Conservation & Coastal Lands
 Land Division -Hawaii District
 Historic Preservation

FROM: *J. Morris M. Atta*
SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands
LOCATION: Island of Hawaii
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections.
 We have no comments.
 Comments are attached.

Signed: *Paul J. Conry*
Date: *SEP 02 2009*

5337D

LAND AND NATURAL RESOURCES
DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

RECEIVED
STATE PARKS DIV

'09 AUG 12 NO 24



2007 AUG 18 P 3:28

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 211111
HONOLULU, HAWAII 96899

August 12, 2009

DEPT OF LAND &
NATURAL RESOURCES

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SEP 0 2 2009

PBR HAWAII

LAND AND NATURAL RESOURCES
DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES



MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water, Resource Management
- Office of Conservation & Coastal Lands
- Land Division - Hawaii District
- Historic Preservation

FROM:

Joy Morris M. Aiala

SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Date: 8/17/09

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorrisAiala
Ref: Pre-Consultation Sale of Hamakua Lands
Honolulu 441

COMMENTS

- We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone _____.
- Please take note that according to the maps that you provided, it appears that the project sites, according to the Flood Insurance Rate Map (FIRM), are located in Minimal Tsunami Inundation areas and Zone X. The National Flood Insurance Program does not have any regulations for developments within the Minimal Tsunami Inundation areas and Zone X. Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is _____.
- Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol 'Iyau-Baam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.
- Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinance, please contact the applicable County NFIP Coordinators below:
 - Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
 - Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Enler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
 - Mr. Francis Corizo at (808) 270-7771 of the County of Maui, Department of Planning.
 - Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
- The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
- Additional Comments: We do not have any objections for the proposed sale of County of Hawaii lands in Koholele and Kaputenui, Hamakua District, Hawaii.
- Other: _____

Should you have any questions, please call Ms. Joyce S. Aigaman of the Planning Branch at 587-0258.

Signed:

Eric T. Hirano

ERIC T. HIRANO, CHIEF ENGINEER

Date:

8/21/09



April 13, 2010

Morris M. Atta
DLNR Land Division
PO Box 621
Honolulu, HI 96809

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HAMAKUA LAND (KOHOLALELE)
TMK: (3) 4-2-005-001, APPROXIMATELY 1,040 ACRES**

Dear Mr. Atta,

Thank you for your letter dated August 12, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawaii, Department of Finance we acknowledge that the Land Division, Division of Boating and Ocean Recreation, Division of Forestry and Wildlife, Division of State Parks, Division of Aquatic Resources and the Commission on Water Resource Management have no comments at this time. We also acknowledge that the Engineering Division finds that the site is mapped on the Flood Insurance Rate Map (FIRM) as being in the Minimal Tsunami Inundation areas and Zone X and that the National Flood Insurance Program does not have any regulations for development within these zones.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Cattie Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawaii

- BERGDALES**
THOMAS WITTER, ASLA
President
- ILYAN DUCAN, ASLA
Executive Vice-President
- RUSSELL CHUNG, ASLA, LEED AP
Executive Vice-President
- VINCENT SHERIDAN
Vice-President
- GRANT MURASANI, ASLA, LEED AP
Principal
- W. FRANK BRANDT, ASLA
Chairman Emeritus

- ASSOCIATES**
YONSCINELL, AICP
Senior Associate
- RAYMOND THIGAL, ASLA
Senior Associate
- KENNETH MURKIN, ASLA
Associate
- NIMLIHAKI YUEN, LEED AP
Associate
- SCOTT ALKAMIRGO, LEED AP
Associate
- SCOTT MURASANI, ASLA, LEED AP
Associate
- DACHENG DONG, LEED AP
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 600
Honolulu, Hawaii 96813-5818
Tel: (808) 521-5031
Fax: (808) 522-1102
E-mail: yodan@pbrhawaii.com

KAPOLE OFFICE
1001 Kalia Road, Suite 413
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5031
Fax: (808) 525-5116

PLANNING • LANDSCAPE ARCHITECTURE • ENVIRONMENTAL STUDIES • ENTITLEMENTS • PERMITTING • GRAPHIC DESIGN

O:\jpb25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Comments\DLNR - Land_CWIRM_DBOOK_Part6_DOFAPW_DAR.doc



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

September 16, 2009

RECEIVED
SEP 17 2009
PBR HAWAII

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813-3484

Attention: Ms. Cattie Fernandez, Planner
Ladies and Gentlemen:

Subject: Pre-Consultation for Environmental Assessments for the Sale of Hawaii
County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to State Historic Preservation Division for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator



April 13, 2010

Nancy McMahon, Deputy SHPO
State of Hawai'i
DLNR - State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, HI 96707

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HAMAKUA LAND (KOHOLALELE)
TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES**

Dear Ms. McMahon,

Thank you for your letter dated September 10, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance we acknowledge the comments from SHPD, indicating that the lands were previously part of sugar plantations and may include water features and historic-era plantation features. An Archaeological Inventory Survey for this property has been conducted and four historic-era features (eight rock mounds associated with field preparation) were identified, evaluated and inventoried. The Archaeological Inventory Survey will be included with the Draft Environmental Assessment and a copy of the DEA will be provided to your office for review.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

KAYO LULLOYCE
1001 Kamehaha Boulevard
Honolulu, Hawaii 96813-3484
Tel: (808) 531-5631
Cell: (808) 531-5631
Email: kayo@pbrhawaii.com

Catie Fernandez
Planner

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 318
Kapolei, Hawaii 96707-2005
Tel: (808) 536-3155
Fax: (808) 536-3155

cc Kenneth Van Bergen, County of Hawai'i

O:\j0925\2506\19 Hawaii County-Hamakuu Lands EA\EA\Pre-Consultation\Response to Comments\DLNR - SHPD Response.doc

LISA K. TRISLER
DIRECTOR
STATE HISTORIC PRESERVATION DIVISION
COMMISSION ON HISTORIC PRESERVATION
1875 PUNAHOU DRIVE
HONOLULU, HAWAII 96822
STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707
PHONE: (808) 536-3155
FAX: (808) 536-3155
WWW.DLNR.HAWAII.GOV



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

RECEIVED

SEP 17 2009

PBR HAWAII

TO: Morris M. Aita
DLNR Land Division

September 10, 2009

LOG NO: 2009.3286
DOC NO: 0909MD09
Archaeology

FROM: Nancy McMahon, Deputy SHPO/State Archaeologist and Historic Preservation Manager
State Historic Preservation Division

SUBJECT: Chapter 6E-3 Historic Preservation Review -
Request for Pre-Consultation on Environmental Assessments for the Sale of Hawaii
County Hamakua Lands (Total Acreage 2,779.807)
Koholaale & Kapuana Aliupua'a, Hamakua District, Island of Hawai'i
TMK: (3) 4-2-005:001; 4-7-005:001; 095-007.010.018 & 020

Thank you for the opportunity to comment on the aforementioned project, which we received on August 13, 2009. We regret that we were unable to meet your requested response date of September 1, 2009.

Much of these lands were previously part of the Honokaa Sugar Company plantation, and include documented water features and undocumented historic-era plantation features. We have no records of the land use prior to the historic sugar plantations, nor have any archaeological inventory survey-level reviews been completed for these areas.

We would like to recommend that a literature review and reconnaissance-level survey be conducted of these lands as part of the environmental assessment. In other areas of Hamakua we have also found that the consistent use over time of water ditch systems over time seems to have resulted in unique ecosystems not found elsewhere in the region.

If you have questions about this letter, please contact Morgan Davis at (808) 933-7650.

RECEIVED
LAND DIVISION
2009 SEP 15 A 10:31
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII



County of Hawaii
HAWAII FIRE DEPARTMENT
 25 Aupuni Street • Suite 103 • Hilo, Hawaii 96720
 (808) 981-4394 • Fax: (808) 981-2037

William P. Kenoi
 Mayor

Darryl J. Oliveira
 Fire Chief
 Glen P. I. Honda
 Deputy Fire Chief

RECEIVED

AUG 17 7 00 PM

PBR HAWAII

August 13, 2009

Attention: Caitie Fernandez
 PBR Hawaii & Associates, Inc.
 1001 Bishop Street
 ASB Tower, Suite 650
 Honolulu, Hawaii 96813-3484

Dear Ms. Fernandez,

**SUBJECT: PRE-CONSULTATION ENVIRONMENTAL ASSESSMENT
 HAWAII COUNTY HAMAKUA LANDS (KOHOLALELE & KAPULENA)**

The Hawaii Fire Department does not have any comments to offer at this time regarding the above-referenced pre-consultation Environmental Assessment.

Thank you for the opportunity to comment.

Sincerely,

DARRYL OLIVEIRA
 Fire Chief

RP:lc

Hawaii County is an Equal Opportunity Provider and Employer.



PBR HAWAII
 & ASSOCIATES, INC.

April 13, 2010

Darryl Oliveira, Chief
 Hawaii Fire Department
 25 Aupuni Street, Suite 103
 Hilo, HI 96720

PRINCIPALS
 THOMAS WITEN, ASLA
 President

R. STAN DUNCAN, ASLA
 Executive Vice-President

RUSSELL CHUNG FASA, LEED AP
 Executive Vice-President

VINCENT SHIGEKUNI
 Vice-President

GRANTY MURAKAMI, LEED AP
 Principal

W. FRANK BRANDT, FASLA
 Chairman Emeritus

ASSOCIATES
 TON SOINELL, AICP
 Senior Associate

RAYMOND ZIUGA, ASLA
 Senior Associate

KEVIN N. NISHIKAWA, ASLA
 Associate

KIMHIKARI TUN, LEED AP
 Associate

SCOTT ALIHA AMIGO, LEED AP
 Associate

SCOTT TAKAKAWA, LEED AP
 Associate

DACHENG DONG, LEED AP
 Associate

HONOLULU OFFICE
 1001 Bishop Street, Suite 650
 Honolulu, Hawaii 96813-3484
 Tel: (808) 571-5501
 Fax: (808) 522-1402
 E-mail: info@pbrhawaii.com

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PLANNING • LANDSCAPE ARCHITECTURE • ENVIRONMENTAL STUDIES • ENTITLEMENTS • PERMITTING • GRAPHIC DESIGN

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
 HAWAII COUNTY HAMAKUA LAND (KOHOLALELE)
 TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES**

Dear Chief Oliveira,

Thank you for your letter dated August 13, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawaii, Department of Finance we acknowledge that the Hawaii Fire Department has no comments at this time.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Caitie Fernandez
 Planner

cc: Kenneth Van Bergen, County of Hawaii

William P. Kenoi
Mayor



County of Hawaii
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-5998
(808) 932-3311 • Fax (808) 961-8805

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AUG 11 2009

PBR HAWAII

August 12, 2009

Ms. Cattie Fernandez, Planner
PBR Hawaii & Associates
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813-3184

Dear Ms. Fernandez:

SUBJECT: ENVIRONMENTAL ASSESSMENTS FOR THE SALE OF HAWAII COUNTY HAMAKUA LANDS (KOHOLALELE & KAPULENA) - PRECONSULTATION

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Randy Apele, Commander of the Hamakua District, at 775-7533.

Sincerely,

DEREK D. PACHECO
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

RA:lll

"Hawaii County is an Equal Opportunity Provider and Employer."



PBR HAWAII
& ASSOCIATES, INC.

April 13, 2010

Derek D. Pacheco, Assistant Police Chief
County of Hawaii's Police Department
349 Kapiolani Street
Hilo, HI 96720-5998

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Chairman Emeritus

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF HAWAII COUNTY HAMAKUA LAND (KOHOLALELE) TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES

Dear Assistant Chief Pacheco,

Thank you for your letter dated August 12, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawaii's, Department of Finance we acknowledge that the Police Department does not anticipate any significant impact to traffic or any public safety concerns.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Cattie Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawaii's

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LINDA LINGLE
Governor of Hawaii

Telephone (808) 696-4185
Facsimile (808) 696-4186
Electronic Mail: oeq@p.hawaii.gov



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Department of Health
235 South Beretania Street
Leleopapa A, Hahaione, Suite 702
Honolulu, Hawaii 96813

KATHERINE PUANA KEALOHA
Director

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PBR HAWAII

August 25, 2009

Catie Fernandez
PBR Hawaii'i & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii'i 96813-3484

Subject: Environmental Assessment for the sale of Hawai'i County Hāmākua
Lands (Koholālele & Kapulea) – Preconsultation

Dear Ms. Fernandez,

Thank you for the opportunity to provide comments regarding the proposed subject action. Your letter of August 7, 2009, does not contain information about activities that will occur on the lands once the sale is final. Therefore, the Office of Environmental Quality Control does not have adequate information to provide comments at this stage.

However, we recommend that you address the primary and secondary impacts of projected activities that will be conducted on the lands after the sale.

Sincerely,


Katherine Puana Kealoha
Director



April 13, 2010

Katherine Puana Kealoha, Director
State of Hawai'i, Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, HI 96813

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Fax: (808) 335-5183

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HĀMĀKUA LAND (KOHOLĀLELE)
TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES

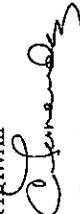
Dear Ms. Kealoha,

Thank you for your letter dated August 25, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance we acknowledge the comments from OEQC recommending evaluation of the impacts of projected activities that will be conducted on the site after the sale. Potential impacts associated with subdivision for agricultural uses will be discussed in the Draft Environmental Assessment.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII



Catie Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawai'i

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PHONE (808) 594-1888

FAX (808) 594-1865



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD09/4607

PBR HAWAII

September 1, 2009

SEP 03 2009

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Catie Fernandez
PBR Hawaii & Associates Inc.
Honolulu Office
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, HI 96813-3484

RE: Pre-consultation for the Environmental Assessments for the sale of Hawai'i County lands in Hämākua (Koholalele & Kapuleena). TMK: (3) 4-2-005: 001, (3) 4-7-005: 001, 002 and 003; (3) 4-7-006: 001, 005, 006, 007, 010, 018 and 020.

Aloha e Catie Fernandez,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter requesting comments on the above-mentioned project. The County of Hawai'i is considering selling some 2,780 acres of land in Koholalele and Kapuleena, Hämākua, Hawai'i Island. OHA has reviewed the project and offers the following comments.

The Draft Environmental Assessment (DEA) must include some sort of cultural impact assessment (CIA), in accordance with Act 50, Session Laws of Hawai'i, 2000. The Hawai'i State Legislature, through Act 50, stated that "the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture." At the very least, interviews with cultural practitioners in the area should be conducted for the CIA. Our community resource coordinators on Hawai'i Island can assist you with locating suitable interviewees. They can be reached at 920-6418 (Hilo Office) and 377-9525 (Kona Office).

OHA requests clarification whether an archaeological inventory survey for the project will be submitted to the State Historic Preservation Division for review and approval. If so, OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey.

Catie Fernandez
September 1, 2009
Page 2

Furthermore, OHA has questions about the Ceded Lands status of the parcels the county is proposing to sell. Ceded Lands hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public.

The Ceded Lands status of parcels are often obscured over time as parcels are consolidated or subdivided. OHA requests assurances that none of the parcels the county proposes to sell are Ceded Lands. To this end, we ask that the DEA contain detailed histories of each parcel, and whether at any point they have been consolidated or subdivided.

If any of these parcels are in fact Ceded Lands, the proposed sale of such lands must comply with Act 176, Session Laws of Hawai'i 2009. OHA has strong concerns about any transaction that would result in the depletion of the Ceded Lands corpus, as Native Hawaiians still have unrelinquished claims to those lands.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'ōia'i'o,

Clyde W. Nāmū'o
Administrator

C: OHA Hilo and Kona CRC Office



PBR HAWAII & ASSOCIATES, INC.

April 13, 2010

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Clyde W. Nāmū'ō, Administrator
State of Hawai'i, Office of Hawaiian Affairs
711 Kapi'olani Blvd., Suite 500
Honolulu, HI 96813

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HĀMĀKUA LAND (KOHOLALELE)
TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES**

Dear Mr. Nāmū'ō,

Thank you for your letter dated September 1, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the financing consultant for the applicant, County of Hawai'i, Department of Finance we acknowledge the comments from OHA, requesting that a Cultural Impact Assessment, an Archaeological Inventory Survey and research into the status of each parcel be performed. The Draft Environmental Assessment will include a Cultural Impact Assessment, an Archaeological Inventory Survey and research into the status of the parcel.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Cate Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawai'i

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DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

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Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96904

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MARK K. AN
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING
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Fax: (808) 587-2624

Ref. No. P-12751

September 8, 2009

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PBR HAWAII

Ms. Cate Fernandez
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Fernandez:

**Subject: Sale of Hawaii County Hamakuu Lands (Koholaalele & Kapulena)
Pre-consultation for Environmental Assessments
TMK(s): 4-2-005: 1, 2, 3, 4-7-006: 1, 5, 6, 7, 10, 18, 20
Koholaalele & Kapulena, Hamakuu, Island of Hawaii**

Thank you for sending the Office of Planning (OP) a pre-consultation request regarding Environmental Assessments (EA) for the above referenced proposed sale of land on the Hamakuu Coast of the island of Hawaii. The lots are zoned A-40a by the County of Hawaii, and are within the Agricultural or Conservation State land use districts. We note that your letter indicates that no State land use reclassification is proposed, nor is any development planned other than what is permitted according to the current zoning and State Land Use Districts. Therefore, OP has no comments at this time. In so stating, the Office offers no judgment of either the adequacy of the document itself or the merits of the proposed sale.

If you have any questions, please contact Lorene Maki of our Land Use Division at 587-2888.

Sincerely,

Abbey Seth Mayer
Director



April 13, 2010

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Fax: (808) 255-3103

Abbey Seth Mayer, Director
State of Hawaii
DEBEDI, Office of Planning
PO Box 2359
Honolulu, HI 96804

**SUBJECT: ENVIRONMENTAL ASSESSMENT FOR THE SALE OF
HAWAII COUNTY HĀMAKUA LAND (KOHOLALELE)
TMK: (3) 4-2-005:001, APPROXIMATELY 1,040 ACRES**

Dear Mr. Mayer,

Thank you for your letter dated September 8, 2009 regarding preparation of the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawaii, Department of Finance we acknowledge the comments from the Office of Planning confirming that the site is zoned A-40a and within the Agricultural State Land Use District.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Katie Fernandez
Planner

cc: Kenneth Van Bergen, County of Hawaii

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