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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 9, 2013

Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Director:

With this letter, the Department of Land and Natural Resources hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Kahakapao Recreational Area situated at TMK: (2) 2-4-016-0000, in the Makawao District on the island of Maui for the publication in the next available edition of the Environmental Notice.

Enclosed is the completed OEQC Publication Form, two copies of the DEA-AFONSI, and Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Torrie Nohara at (808) 873-3508.

Sincerely,

WILLIAM J. AILA, JR.
Chairperson

Enclosures

MAY 23 2013

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AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)

Project Name: Kahakapao Recreational Area
Island: Maui
District: Makawao
TMK: (2) 2-4-016:002
Permits: BLNR Approval
Proposing/Determination Agency: DLNR
(*Address, Contact Person, Telephone*)
Accepting Authority:
(*for EIS submittals only*)
Consultant:
(*Address, Contact Person, Telephone*)
Status (check one only):

_**X**_DEA-AFNSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
__FEA-FONSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__FEA-EISPN	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
__Act 172-12 EISPN	Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
__DEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
__FEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__ Section 11-200-23 Determination	The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.
__Section 11-200-27 Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.
__Withdrawal (explain)	

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page)**:**

Responding to the increased interest and direct inquires from the public, Na Ala Hele seeks to expand the trail system in the Makawao State Forest Reserve to include the new Kahakapao Recreational Area. The area is intended to provide hiking, equestrian, and bicycling opportunities for the novice to experienced enthuiast, including the very young and old by establishing a gravity/flow trail, a bicycle pump track, two skills practice areas, a youth practice area with track, and extending the multi-use trails. An additional parking area with accessible port-a-pots, kiosks, and picnic tables will be established near the trail head area. These additions are aimed at providing the public with an additional recreational opportunity. This need is demonstrated by the increased appearance of illegally built trails and tracks.

DRAFT ENVIRONMENTAL ASSESSMENT

for

CONSTRUCTION AND PUBLIC USE

of the

KAHAKAPAO RECREATIONAL AREA

MAKAWAO STATE FOREST RESERVE, MAUI

Division of Forestry and Wildlife
Na Ala Hele Trails & Access Program
Maui District Office

May 2013

Introduction

The Na Ala Hele Trails & Access Program was established in 1988 through Chapter 198D of the Hawai'i Revised Statutes. At that time, the State Legislature assigned to the Department of Land and Natural Resources the responsibility of the planning, developing, acquiring land or rights for public use of land, construction , and engaging in coordination activities to implement a statewide trail and access system. The Division of Forestry and Wildlife was designated as the parent agency responsible for supporting the Program.

The Program is concerned with creating a trail system within private and state-owned lands; it is responsible for the maintenance and development of trail systems within State Forest Reserves. On the island of Maui, these Forest Reserve areas include the West Maui, Koolau, Hana, Kipahulu, Makawao, Waihou, and Kula Forest Reserves.

Responding to increased interest and direct inquiries from the public, Na Ala Hele seeks to expand the trail system in the Makawao State Forest Reserve to include the new Kahakapao Recreational Area. The Area is intended to provide hiking, equestrian and bicycling opportunities for novice to experienced riders, including the very young and old.

Summary

Project Name	Kahakapao Recreational Area
Proposing Agency	Na Ala Hele, Trails and Access Program Division of Forestry and Wildlife Department of Land and Natural Resources State of Hawai'i
Approving Agency	Department of Land and Natural Resources State of Hawai'i
Location	Makawao State Forest Reserve TMK (2)-2-4-016:002

Property Owner	State of Hawaii	
Land Use	Conservation District, Resource Subzone	
Agencies Consulted	State:	Department of Health Office of Environmental Quality Control Department of Land and Natural Resources Historic Preservation Division Aquatic Resources Division Land Management Division Conservation and Resources - Enforcement Division State Parks Division Department of Transportation Department of Agriculture
	County:	Planning Department Department of Parks and Recreation Department of Public Works
	Federal:	National Park Service U.S. Fish and Wildlife Service
	Other:	Sierra Club, Maui Chapter Native Hawaiian Plant Society Friends of Haleakala National Park Haleakala Ranch, Ltd. Na Ala Hele, Maui Advisory Council Maui Hunters' Association Maui Mountain Bike Coalition

A list of those commenting on the Draft Environmental Assessment and copies of comment letters and responses will be included in Appendix D of the Final Environmental Assessment.

Background

The Makawao State Forest Reserve is comprised of 2,093 acres on the west-facing slope of Haleakala Volcano. The Reserve ranges in elevation from about 2,040 to 4,920 feet elevation and contains a network of over 13 miles of bulldozed management roads. The Reserve was established in 1908 to protect the important water shed. Until 1997, when the Kahakapao Road was opened to the Piiholo Water Treatment Facility, there was no legal public access to the Reserve. In 2003 the Kahakapao Loop Trail was constructed. This trail was constructed to provide a relatively level pathway for use by beginning to intermediate level recreational users, including hikers, bicyclists and equestrian users, while at the same time providing increased security to the County Water Treatment Facility. The trail is intended for day use only and measures approximately 5.75 miles. Since the Kahakapao Loop Trail was opened in 2003, there have been several illegal bicycle trails constructed within the Makawao State Forest Reserve. Two (2) of these trails are being incorporated into the Kahakapao Recreational Area. Individually, these trails were examined to see if they met or exceeded Na Ala Hele Trails standards for bicycle trails. Those trails that did not meet Na Ala Hele standards will be rehabilitated and removed from the State Forest Reserve.

Traditional Hawaiian gathering has occurred in the Makawao State Forest Reserve area for generations and predates the establishment of the Reserve itself. Hunters have also utilized the area, searching for wild pig. During the 1960's, the State Division of Forestry began a tree-planting program in the Makawao area to replace the declining remnant forest. Planting was done between 1960 and 1971 and consisted largely of eucalyptus, various pines and tropical ash. The ridgelines were scraped with bulldozers creating four-wheel drive roads, many of which still exist. These roads were named after the equipment operators who created them. Today, this forest provides excellent soil and water protection as well as outstanding recreational opportunities.

The goal of the proposed action is to provide an extended hiking and equestrian experience, while establishing a practice bicycle area for youth and beginner riders, provide a gravity/flow trail experience for beginning to experienced riders, a pump track experience for all interested riders, and two (2) skills practice areas for riders to increase their riding abilities. The Area is intended for day use only; and continues Na

Ala Hele's commitment to fulfill a recreational need for Maui District. Creation of the Kahakapao Recreational Area is not expected to create any significant environmental impacts. Therefore, a Finding of No Significant Impact (FONSI) is expected.

General Description of the Technical Actions and Socio-Economic Characteristics

Technical Actions

The planned Kahakapao Recreational Area covers approximately 452.6 acres, and will add nearly a mile of multi-use trail, include a gravity/flow trail, keiki practice area, pump track and two (2) skills areas. Access to the complex is off Kahakapao Road, located approximately 1.5 miles up Piiholo Road from Makawao Avenue. The planned recreational area starts near the Kahakapao Loop Trail parking area. To accommodate the predicted increase in visitor activity, another parking area is being planned. The new parking area will be approximately 150' X 100' and will accommodate approximately thirty (30) vehicles and four (4) horse trailers. Several picnic tables will be set up near the new parking area. The recreational area will be constructed within the Eucalyptus plantation with a predominantly non-native understory. A map illustrating the planned complex is included in Appendix A.

The Kahakapao Recreational Area will consist of 4 main phases of development. These phases have been strategically aligned with the State of Hawaii's, Department of Land and Natural Resources goals for managing recreation in Makawao State Forest Reserve. Each phase will be completed as funding and volunteer turn-out allows.

Project Phases 1-4

Phase 1- Design, build and install interpretive, informational and educational signs on a gravity/flow trail on the east side of the existing trail network.

Phase 1.5- Decommission unsanctioned trails throughout the forest that do not meet Na Ala Hele standards.

Phase 2- Design, build and install signs on the Keiki Track and Beginner Skills Area.

Phase 3- Design, build and install signs on the Pump Track.

Phase 4- Design, build and install signs on the Advanced Skills Area and other skills areas

Project overview and description of features

Phase 1- will focus on professionally designing and building a gravity/flow trail on the east side of the existing Kahakapao Loop Trail network. This trail will be built to the Na Ala Hele trail standards outlined in the NAH Program Plan, pages V-7 through V-9 (Appendix B) and will follow the International Mountain Bicycling Association's (IMBA) guidelines with regard to trail design (Appendix C). This trail will include features and design consistent with a gravity/flow riding experience which will include insloped turns, jumps and technical trail features. This trail will offer an intermediate to advanced riding experience while helping to dissuade rouge trail building by offering the type of experience that some have attempted to create in other areas of the forest. Phase 1.5 will focus on decommissioning and reclaiming predetermined unsanctioned trails with every effort to return them to their natural state and close access to these trails.

Phase 2- will focus on designing, building and installing signs on the Keiki Track and Beginner Skills Area. The Keiki Track will be built to Na Ala Hele trail standards and will follow IMBA guidelines. The Keiki Track and Beginner Skills Area will offer a much needed opportunity for up and coming mountain bikers to hone their skills in a risk managed environment. The more opportunities that are available for skill building throughout a trail system, the less likelihood there will be for accidents as these areas offer skill progression and a chance to learn how to handle a bike in an area designed for that purpose rather than out on the trail.

Phase 3- will be focused on designing, building and installing signs on the Pump Track. A pump track is a small loop trail (usually taking up less than a quarter of an acre and as small as 75' X 75'. The pump track will consist of a series of rollers and berms that allow riders of a variety of abilities to improve mountain bike skills such as cornering and taking advantage of terrain. The pump track will be designed based on IMBA and other industry designs.

Phase 4- will consist of designing and building additional advanced skills areas in an effort to create a risk managed opportunity for intermediate and advanced mountain bikers to build their skills. These advanced skills areas (and any other skills areas) will be focused on creating opportunities for progression thus improving the risk management plan for the trail system.

Trail Building and Design - Phase 1 will be executed with assistance from Na Ala Hele's staff, volunteers, and IMBA's Trail Solutions Program. IMBA Trail Solutions is the International leader in developing mountain bicycling facilities with experience in over 250 projects in North America, Europe, and Asia. IMBA's Trail Solutions staff excels in planning, designing and constructing bike parks and trails that provide high-quality experiences for visitors while simultaneously minimizing risk, liability and environmental impact. By utilizing their expertise, Na Ala Hele will substantially lower the cost of production, increase efficiency, and lower the long term liability to the project.

The success of a trail is dependent on its social, environmental and economic sustainability. A well designed trail should cause minimal impact and require little maintenance; it should also provide the trail user the experience they are seeking. Melding these design parameters is a great challenge, and with IMBA's assistance, Na Ala Hele will strike this balance.

The first phase of the project will be completed in five (5) stages. The first stage involves an initial biological reconnaissance survey (already performed) of the projected area, identification of sensitive elements, and flagging of the potential course. The flagging will be removed after construction.

The second stage includes creating an American's with Disability Act (ADA) acceptable parking area and access to an ADA acceptable port-a-pot. Several picnic tables will be set up near the new parking area. At least one of these tables will be accessible. Creation of the parking area will occur concurrently of the other development until work is completed.

The third stage includes preliminary removal of vegetation and debris (brushing) from the planned trail course. Trees of 15' height will not be cut to avoid any impacts to native bat pups during the bat's reproductive season (June 1 until September 15). This action of preliminary brushing will reveal and define the extent and condition of the trail bed and uncover any existing sensitive plants or historical materials. In the event that any Federally listed threatened or endangered species, archaeological sites or artifacts are encountered, trail work will halt and efforts to re-route the trail course to avoid these elements will be made.

The fourth stage will involve construction of the trail bed and careful removal of fallen trees and hazardous tree-snags from portions of the trail. Trail construction will involve the use of materials taken from the surrounding landscape when possible and complementary materials when surrounding materials are not available. Where possible, the trail will be cut to a grade ranging between 5 and 10 percent in keeping with established NAH specifications and the IMBA Guidelines . The width of the trail will vary from approximately three to four feet, and will be constructed with bicycle use in mind. Removal of woody roots and stumps will be done only where necessary and where doing so will not de-stabilize the trail.

The final stage of phase one (1) will be to place several interpretive, informational and educational signs at strategic locations along the trail requiring users to observe certain rules of conduct and warning of possible hazards. Periodic brushing of vegetation, clearing of debris, removal of trash, spot-restoration of trail structures, and maintenance of trail signs will be routinely conducted. Light use of herbicides including Roundup (Isopropyl amine salt of Glyphosate) and Garlon 3A (Tricipyr) may be employed at this point and from time to time as part of a regular maintenance plan to prevent the regeneration of non-native vegetation in the trail bed. Because the trail is being constructed with the use of volunteer labor, construction may take as long as one year, depending on volunteer turnout.

Kahakapao Road ends at a gate on the Makawao State Forest Reserve Boundary. The gate is generally opened at 7:00 AM and closed at 7:00 PM daily. Parking for this facility will be in the Kahakapao Loop Trail parking area. This large gravel area was built to accommodate the turning radius of vehicles pulling horse trailers. To provide parking for the predicted increase in traffic to the area, a new parking area is being constructed.

This area will park approximately thirty (30) vehicles and four (4) horse trailers. The existing parking and expanded parking areas will include a parking space and port-a-pot that meets the ADA (Americans with Disability Act) standards. Another existing parking area near the Borge Ridge Road Gate has been improved. This improvement has been done prior to and independently of the creation of the Kahakapao Recreational Area. Parking in the Borge Ridge Road area was increased from the current 3 parking spots to approximately 8 spots. This area will be signed as active unloading area for hunting dogs. This is being done in an effort to separate the hunting dogs from pets, at the hunting community's request.

Socio-economic Characteristics

No direct economic effects are expected to result from the establishment of the Kahakapao Recreational Area. Although Na Ala Hele allows commercial activities to occur by permit on certain trails, the Kahakapao Recreational Area is not intended for that use. The Area will add approximately 13,500 feet of trail to the statewide Na Ala Hele trail system as an additional recreational resource for all ages interested in hiking, nature study, photography, hunting, bicycling, and horseback riding and 9.5 acres of pump track, keiki and skills areas. Na Ala Hele's goal is to create a family-oriented wild land recreational experience by increasing the multi-use trail, building a gravity/flow trail, keiki practice area, pump track, and skills areas.

Costs relative to completing the project and maintaining the trail will be borne by the State of Hawai'i and its volunteer participants under the Na Ala Hele Trails and Access Program and will not involve the use of private funds. The estimated development costs for labor, materials, planning, necessary documentation, and all phases of the project (not including long term maintenance) should not exceed $100,000.00

The significant aesthetic value inherent in the area's mixed-native and historic forest plantation character includes the quiet forested isolation characteristics of the Makawao State Forest Reserve and offers a special outdoor experience for the community.

Historically, Na Ala Hele has relied on the efforts of volunteers for construction, brushing and light maintenance of its trails. The Kahakapao Recreational Area will also

involve engaging individual and group volunteers who will invariable gain a feeling of accomplishment and other benefits derived from multiple service project excursions during the trail building period.

Summary Description of the Affected Environment

The work project site is located entirely within the Makawao State Forest Reserve. The area is located on the western slopes of Haleakala Volcano, in the District of Makawao, Tax Map Key (2)-2-4-16:002. The weather is usually clear in the morning hours until the clouds build up and envelop the lower portions of the State Forest Reserve in the afternoon. Mist or light and persistent rain is common although in recent years, drought conditions have prevailed. Storms usually occur during the fall and winter months, with heavy winds and rain contributing 60 to 120 inches of rainfall annually. Nights are generally cool at any time of the year. Winds originate predominately from the East-northeast for most of the year and may occasionally flow from the South-southwest during "Kona" conditions. Winds and cloud conditions are often variable due to and atmospheric vortex that is created by the mountain topography of the area and prevailing trade winds.

Public Utilities

There are no public utilities (electrical, water, sewer, or other) within three miles of any part of the trail. There is a port-a-pot located in the existing parking area that services the Kahakapao Loop Trail. This port-a-pot will continue to be in place and another port-a-pot will be added to the new parking area upon construction. Both port-a-pots will be fully accessible once the construction phase of the new parking area is completed. The nearest public utilities are located in Makawao Town. There is, however, electricity provided to the water works pumps at the County facility.

Public Access

The planned Kahakapao Recreational Area is accessible year-round by following the Kahakapao Road off of Piiholo Road from Makawao Town. The public will have access

to the large gravel parking area located within the State Forest Reserve between the hours of 7:00 AM and 7:00 PM.

Flora

The Kahakapao Recreational Area passes though a plantation forest of varied introduced species on the ridge tops and remnant native species in the gulches. No threatened or endangered species were encountered during the botanical survey along the flagged portion of the features. Occurring within the Forest Reserve, but not along the trail or road corridors are the candidate species Holei (*Ochrosia haleakalae*) and the Federally listed endangered species Mahoe (*Alectryon macrococcus*). Plant species observed and surveyed along the entire trail and courses are listed below.

Non-native:
Ashes (Fraxinus spp.)
Monterey Cypress (Cupressus macrocarpa)
Eucalyptus (Eucalyptus spp.)
Monterey Pine (Pinus radiata)
Black Wattle (Acacia decurrens)
Silky Oak (Grevillea robusta)
Australian Red Cedar (Toona ciliate)
Guava (Psidium guajava)
Quinine (Cinchona pubescens)
Christmas Berry (Schinus terebinthifolius)
Senna (Senna septemtrionalis)
Ti (Cordyline fruticosa)
Passion Fruit (Passiflora edulis)
Love-in-a-mist (Passiflora foetida)
Morning Glory (Ipomoea indica)
Five-finger Maidenhair (Adianturn hispidulum)
Lady Fern (Athyriopsis japonicum)
Velvet Grass (Holcus lanatus)
Wild Cane (Saccharum spontaneum)
Molasses Grass (Melinis minutiflora)
Broom sedge (Andropogon virginicus)

Hilo Grass (Paspalum conjugatum)
Palm grass (Setaria palmifolia)
Rattail Grass (Sporobolus africanus)
Yellow Foxtail (Setaria glauca)
Carpet grass (Axonopus fissifolius)
Asiatic Pennywort (Centella asiatica)
Hairy Cats-Ear (Hypochoeris radicata)
Heal all (Prunella vulgaris)
Plantain (Plantago lanceolata)
Asiatic Hawks beard (Youngia japonica)
Fireweed (Erechtites valerianifolia)
Kahili Ginger (Hedychium gardnerianum)
Maui Pamakani (Ageratina adenophora)
Gorse (Ulex europaeus)
Poha (Physalis peruviana)
Hairy Horseweed (Erigeron bonariensis)
Tar Weed (Cuphea carthagenensis)
Pukamole (Lythrum maritimurn)
Blackberry (Rubis argutus)

Native:
Ohia (Metrosideros polymorhpa)
Koa (Acacia koa)
Kolea Lau nui (Myrsine lessertiana)
Papala (Charpentiera obovata)
Hapuu pulu (Cibotium glaucum)
Olopua (Nestegis sandwicensis)
Halapepe (Pleomele auwahiensis)
Kopiko (Psychotria hawallensis)
Naupaka kuahiwi (Scaevola gaudichaudii)
Pilo (Coprasma foliosa)
Pukiawe (Styphelia tamelameiae)
Kanawao keokeo (Cyrtandra grayi)
Hoi Kuahiwi (Smilax melastomifolia)

Hue hue (Cocculus trilobus)
Manono (Hedyotis hillebrandii)
Manono (Hedyotis terminalis)
Maile (Alyxia oliviformis)
le le (Freycinetia arborea)
Carex (Carex spp.)
Uluhe (Dicranopteris linearis)
Kupukupu (Nephrolepis exaltata)
Moa (Psilotum nudum)
Dryopteris wallichiana
Iwa Iwa (Asplenium adiantum-nigrum)
Iwa Iwa (Adiantum cuneatum)
Peahi (Microsorum spectrum)
Okupukupu lauii (Doodia kunthiana)
Palaa (Odontosoria chinensis)
Loulu (Coniogramme pilosa)
Palapalal (Microlepia strigosa)
Hoio kula (Pneumatopteris sandwicensis)
Ala ala wai nui (Peperornia spp.)
Bryophyte spp.

Fauna
A variety of avifauna and mammals occur throughout Makawao State Forest Reserve. Several native bird species are known to inhabit the project area. They include:

Alauahio (Paroreomyza montana)
Amakihi (Hemignathus vixens)
Apapane (Himatione sanguinea)
liwi (Vestiaria coccinea)
Kolea (Pulvialis fulva)

The majority of bird species in the area are represented by exotic or introduced game bird species. They include:

Barred Dove (Geopelia striata)

Common Myna (Acridotheres tristis)
House Finch (Carpodacus mexicanus) Japanese Bush Warbler (Cettia diphone)
Japanese White-eye (Zosterops japonicus)
Nutmeg Mannikin (Lonchura punctulata)
Northern Cardinal (Cardinalis cardinalis)
Northern Mockingbird (Mimus polyglottus)
Melodious Laughing Thrush (Garrulax canorus)
Spotted Dove (Streptopelia chinensis)
Mourning Dove (Zenaida macroura)

Mammals and reptiles observed or otherwise known to inhabit in the project area include:

Feral Cat (Felis catus)
Feral Dog (Canis familiaris)
Feral Pig (Sus scrufo)
House Mouse (Mus musculus)
Mongoose (Herpestes auropunctatus)
Rat (Rattus spp.)
Skink (Scincidae sp.)

Lasirus cinereus semotus, the Hawaiian Hoary Bat, is known to occur in the project area. No adverse impacts are expected as a result of the trail and road construction, and in fact, the project may allow for greater surveys of the species. Trees of 15' height will not be cut during the bat's reproductive season (June 1 until September 15) to avoid any impacts to pups.

Historical/Archaeological and Cultural Sites

A cultural impact assessment was conducted for the proposed Kahakapao Loop Trail in the ahupua`a of Hamakuapoko and the full report is included as Appendix D. Historic research of the project area was carried out to identify any cultural resources or traditional practices associated with the areas encompassing the proposed trail corridors and surrounding vicinities. An attempt was made to contact present and former residents of Makawao who may have used the areas for cultural practices, as

well as various organizations regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the Kahakapao project area.

Formal interviews were conducted with Mr. Sam Ka'ai, an informant long familiar with the Makawao State Forest Reserve area. Mr. Sam Ka'ai was born in Hana and currently lives in Pukalani. He has extensive cultural knowledge of the general Makawao areas and is considered one of Hawai'i's living cultural treasures. The second informant was born and raised in Makawao and was a regular pig hunter in the Makawao State Forest Reserve area.

Historic background research of the Hamakuapoko area indicated areas makai of the project area, near the gulches, would have been rich in resources and well populated in traditional times. However, the project area and surrounding vicinities would have been covered in native forest including koa (Acacia koa), ohi'a lehua (Metrosideros polymorpha), ti (Cordyline fruticosa), and kukui (Aleurites moluccana), and unsuitable for long term habitation. Two centuries of deforestation for industrial purposes destroyed the majority of the native forest, and by the early to mid 1900s, the neighboring Waihou Spring State Forest Reserve area was open pastoral land. Also introduced in the early 1900s was the competitive gorse weed Scotsman (Ulex europaeus) that was used as hedging material. The gorse had spread uncontrollably by the 1950s and destroyed majority of the native plants that remained. In 1953, the Olinda prison facility was opened with the primary purpose of having inmates clear the overgrown gorse areas. In response to the decline in forest areas and the overgrown gorse problem, the State Department of Forestry began a tree-planting program in the 1960s. Today the project area consists primarily of introduced species including eucalyptus, various pine and tropical ash.

The only ongoing cultural practice identified in the vicinity of the project area was pig hunting. Pig hunting was historically a major cultural activity in the upland areas of Makawao, although discussions with local residents and testimonies by informants indicated pig hunting has declined over the last fifty years as a result of increased residential developments and lack of public access. Several pig hunting trails are located adjacent to the existing Kahakapao Loop Trail, however informant testimonies have

indicated that access to pig hunting trails would not be restricted by the development of the Kahakapao Recreational Area.

Gathering for plant resources in traditional times would have occurred in the project area. Procurement of forest resources such as sandalwood and koa, bird feathers, medicinal plants, and possibly alternate food source during times of famine would leave little or no evidence of such activities. In addition, the proposed project area was once a sandalwood and koa forest for which Hawaiians would gather koa stumps for canoe making [personal communication Sam Ka'ai, January 13, 2003]. Logs were cut and soaked in Maliko Gulch in preparation for transportation downstream to the oceanfront where the shaping would occur. However, over two centuries of mass deforestation the landscape has changed dramatically, and the majority of the native plants resources that were once gathered no longer exist. Limited maile (Alyxia olivaeformis) and `ohi`a lehua (Metrosideros polymorpha) picking are known to occur within the Makawao State Forest Reserve, however there was no indication during the assessment of any ongoing plant gathering activities and none of the informants interviewed indicated any knowledge of ongoing plant gathering in the project area.

A field inspection of the area, as well as consultation with Makawao residents, State archaeologists, and a review of historic maps failed to find any archaeological sites or cultural properties in the vicinity of the project area. Based on a field inspection conducted by Dr. Melissa Kirkendall, State Historic Preservation Division Maui/Lanai Island Archaeologist in September 2001, the State Historic Preservation Division determined it unlikely that significant historic properties would be impacted by the trail's construction and concluded that no historic properties would be affected by the planned construction of the Kahakapao Recreational Area. The State Historic Preservation Division was asked to make further comment on this Kahakapao Recreational Area DRAFT EA and that letter and the corresponding response is included in Appendix E.

Adjacent Natural Resources

The Kahakapao Recreational Area lies entirely within the Makawao State Forest Reserve; hunters, equestrians, bicyclist and hikers have used the area over the years.

The Kahakapao Recreational Area will be developed within a predominantly Eucalyptus plantation. There are several gulches within the area, with the existing trail crossing an unnamed gulch filled with a mix of native and nonnative plants, and continuing through the plantation until reaching the Paahao Ridge Road at approximately the 2880 feet elevation. From there the trail travels up the ridge road to approximately 3680 feet elevation where it contours back to the Fong Ridge Road, crossing through the top of the same gulch. The gulch is not a perennial stream but may experience occasional freshets. The area was planted with exotics for wood production as a goal, and as a consequence large/small scale harvesting and replanting may occur. If so, it may affect recreational opportunities and will require some type of mitigation. Fong Ridge also serves as a popular site for DLNR's minor harvesting activities that includes vehicular access only when the Piiholo Water Treatment Plant has their gates open.

The new roads created by DLNR turn off the blacktopped road below the water treatment facility, pass through the non-native tree plantations circumventing the water treatment facility, and reconnect with the appropriate ridge road. The Borge Ridge Road has been gated at the bottom to restrict access to non-vehicular traffic. The existing parking in front of the Borge Ridge Road Gate has been improved to increase available parking from 3 spaces to approximately 8 spaces.

Sensitive Habitats

The native plant species of the area are fairly common to mesic areas on Maui and in the State. A survey of the construction areas revealed no specimens classified as threatened or endangered. Though not directly within the planned construction areas, three threatened or endangered species are also located within the Forest Reserve. Their location within the Forest Reserve exposes them to random accidental damage, vandalism, or removal by anyone who may choose to wander off the established trails.

During the summer months, the area is exposed to drought and near-drought conditions where grasses and other bushy shrub species become a highly combustible fuel source. This period can present a significant fire hazard and in 1996 and again in 2012 the Reserve experienced fires occurring due to a downed utility power line along Fong Ridge Road.

Identification, Summary of Major Impacts and Alternatives Considered

Major Impacts - Positive

The Kahakapao Recreational Area will provide excellent opportunities for expanding the recreational use of the Makawao State Forest Reserve, matching a growing demand for family-oriented trail use activities, nature study, and photography. The trail will enhance environmental and ecosystem awareness by the public and also detection of native flora and fauna and incipient alien species. The series of techniques for reconstruction, maintenance and management described in the action's technical characteristics in the final work phase have been quite effective in mitigating a variety of consequences from public use along other Na Ala Hele trails.

The positive benefits of an aggressive management program incorporating a strong interpretive element should successfully offset the negative impacts expected to be caused by occasional acts of vandalism, littering, unauthorized fires and other degrading uses of the trail. The trail will provide firefighter access across gulches that are otherwise difficult to traverse without an established trail and will act as a firebreak for ground moving grass fires. The gate at the top of Fong Ridge has a history of vandalism. With the increased presence of recreational users, vandalism may be discouraged. An active volunteer program administered by Na Ala Hele will provide for additional maintenance of the trail while providing an interpretive context and an appreciation of the environment for trail users and volunteers alike. Learned trail maintenance and management techniques by volunteers would be transferable to other locations on Maui and across the State where similar environmental conditions exist.

Major Impacts - Negative

Construction of the Kahakapao Recreational Area will briefly expose roots and other subsurface biomass to feral pigs. Pigs (and possibly deer) continue to represent the most significant source of negative impacts to the landscape. Long term rooting and browsing of the native vegetation by pigs and compaction of soils and spread of nonnative grasses throughout the area has helped establish aggressive non-native weed

species. Rooting and grazing have also reduced the capacity for reestablishing less-aggressive native plant species. Plant defoliation caused primarily by grazing of deer may also promote soil erosion through the loss of protective leaf cover.

It is possible that large numbers of trail users would represent an additional source of impacts to the area. Hikers, hunters, equestrians and mountain bikers wandering of the trail or traversing switchbacks in large groups could significantly damage vegetation, possibly accelerating soil erosion and helping to de-stabilize the trail bed. Horses may loosen the trail foundation, accelerating erosion and ditching if not controlled or watched closely. Horses may also browse on native plants. Unfortunately, vandalism, fires, and littering, can be expected to occur, though not with significant frequency.

Motorcycles are occasionally observed to be using trails within the State Forest Reserve. Forest Reserve Rules and Regulations ban motorcycles from going off of established roads while using Forest Reserve lands. Na Ala Hele will install appropriate informational signs at the trailhead, and if necessary, construct physical barriers such as trailhead bollards or other motorcycle use deterrents. Signs will identify users and right of ways to reduce conflicts.

Various user impacts will be monitored for their effect on the long-term preservation of the existing native plants and animals in the area. The Maui Na Ala Hele Trails Program may adapted a monitoring (Photopoint Management) system involving the use of photography, trail bed transect measurements, weed inventories, and field counters to compare use with impacts if this management practice is indicated. Na Ala Hele is empowered to restrict access or close trail areas should the impacts prove too severe for continued public use without program intervention.

Based on the historic background research, as well as informant testimonies, the Kahakapao Recreational Area is anticipated to have no adverse impact upon native Hawaiian cultural resources, beliefs and practices. The only ongoing cultural practice identified during the course of the assessment was pig hunting; however, the construction of the Kahakapao Recreational Area will not affect the legal hunting availability of the area. While the combination of hunting and other recreational activities could be cause for serious accidents, the Makawao State Forest Reserve is a designated multi-use area. The area will continue to be open to hunting on weekends

and holidays, and hunters are welcome to use the trail to access the area and to ease the retrieval of meat.

Alternatives Considered

A no-build scenario was considered as an alternative to the proposed project. If the Kahakapao Recreational Area project is deferred, a significant opportunity to provide recreation for the largest portion of the recreational community will be deferred. Also, an important link to forming a significant firebreak within the plantation forest will not be built. Deprivation of public enjoyment of the various experiences offered by trail use for novice users and families would not be realized and a significant public recreational resource would be wasted. It is also believed that the illegal construction of bicycle trails will resume within the Makawao State Forest Reserve if additional bicycle opportunities are not created.

Proposed Mitigation Measures

Impacts to the trail area will result from regular public use over time. Effective management strategies for regulating use will be a primary strategy for trail management. Existing monitoring and management efforts are proving to be effective.

The Program will strive to convey important information to the public regarding trail use etiquette. The Na Ala Hele Trail System Rules and Regulations provide a clear definition of appropriate use activities and will be combined with a trailhead information program. Na Ala Hele will place information about the new area in the existing public informational website located at www.hawaiitrails.org which contains trail maps, user etiquette, information on the spread of non-native plants and interpretive descriptions that are available free of charge.

No strategies or techniques for reducing impacts to the trail area can be considered totally effective. However, constructing the trail to avoid sensitive native elements, remaining within trail grade specifications, constructing adequate trail slope and drainage structures will satisfactorily protect against impacts. The sensitive nature of the local natural environment is explained to all users through the series of methods

described above. Trail management techniques require routine monitoring to determine their effectiveness as will the use of informational and educational signs.

In order to mitigate impacts to endangered species, DLNR intends to provide fencing around any endangered species found within 50 feet of any recreational feature. At this time, there are no known rare species within that range. Volunteers will be informed of any threatened or endangered plant species within the recreational area. Should any endangered plants be found, they will be protected from grazing by horses by exclosure fencing or other appropriate mitigation measures.

In order to mitigate the spread of invasive species, interpretive and educational materials will be made available through the Wailuku DLNR office and the Na Ala Hele website. Na Ala Hele will maintain the trail corridor to keep it relatively free of noxious weeds.

All State historic preservation laws will be considered and integrated, when appropriate, in the development and management of the area in accordance with Chapter 6E, Hawai'i Revised Statutes. In the event that any historical sites, artifacts or other structures are encountered within the area, the State Historic Preservation Division will be notified immediately, construction will halt, and the process pertaining to establishing management, mitigation, and if appropriate, interpretive measures will be initiated.

Should they become necessary due to human impact on the surrounding environment, several public use impact mitigation measures could individually or collectively be installed. They include: passive barriers, (e.g., visitor channeling for sensitive site avoidance), interpretive signs, and increased frequency of regular maintenance of the area by DOFAW staff and trained volunteers. Seasonal closures may be necessary. As mentioned above, motorized vehicles use of the area will be prohibited.

Finally, to mitigate the potential conflict between recreational users and hunters, signs warning of the presence of hunters will be posted.

Determination

With the implementation of the management strategies recommended in this DRAFT Environmental Assessment, it is not expected that this project will have a significant detriment to the surrounding environment, and a Finding of No Significant Impact (FONSI) is anticipated.

Findings and Reasons Supporting Determination

No Federally listed threatened or endangered plant or animal species have been found to occur within the construction area. No impacts to historical sites or cultural practices are expected to occur resulting from the construction or use of the trails, features, or roads. These elements, combined with implementing a suitable management plan and an active volunteer program should be effective in mitigating the bulk of user-related impacts.

The anticipated Finding of No Significant Impact is based on the evaluation of the project in relation to the following criteria identified in the Hawaii Administrative Rules § 11-200-12.

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

The proposed Kahakapao Recreational Area will not impact the visual character of the area. The area is compatible with the surrounding land use plans and programs being implemented for the region. The area is located within the Makawao State Forest Reserve, which is public land, and will increase general accessibility to the area for the public.

Some common plants may be damaged during construction, but not to any significant degree. No archaeological or historical sites are known to exist within the area. Should any archaeologically or culturally significant artifacts, bones, or other indicators of previous onsite activity be uncovered during the construction phases of development, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources, State Historic Preservation Division.

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

The area will expand the range of beneficial uses within the environment by increasing recreational opportunities in the Makawao State Forest Reserve. Appropriate public access to and use of the area will be increased. The proposed project is compatible with the range of uses for a forest reserve.

3. Conflicts with the state's long term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes.

The proposed development is consistent with the Environmental policies established in Chapter 344, H RS, and the National Environmental Policy Act.

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

The proposed project is not expected to affect the economic or social welfare of the community or State. The proposed project is designed to support surrounding land use patterns, will not negatively or significantly alter existing residential areas, and will not stimulate unplanned population growth or distribution. Funds for implementation are coming from normal government operational budgets and volunteer labor. Social impacts are expected to be positive, as the project's development is in response to public requests for increased hiking, equestrian and biking opportunities. Community members will benefit from the creation of additional recreational opportunities.

5. Substantially affects public health.

The proposed project will provide a significant contribution to Maui's future population by providing residents with the opportunity to improve their general health and well-being by exercising and enjoying the natural beauty of the Makawao State Forest Reserve. The activities associated with hiking, bicycling, and equestrian trails work to dramatically increase one's health.

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

The proposed project in itself will not generate new population growth, but will provide needed recreational values to the area's present and future population. No public facilities will be impacted.

7. Involves a substantial degradation of environmental quality.

The proposed project will utilize existing undeveloped forest reserve lands. The overall design of the project will complement the general use of the area. The project itself will have a small footprint and is not expected to result in a substantial degradation of environmental quality. Endangered species found in the project area will be protected from harm during and after construction.

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

Construction and use of the planned area is not anticipated to have a cumulative impact on the environment, nor is it a commitment for larger actions. Increasing the number of recreational opportunities and improving the Na Ala Hele trails system is compatible with the long-term goals of the State.

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

There are no rare, threatened or endangered species within the project area. The project is not anticipated to substantially affect rare, threatened or endangered species or their habitat.

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

Due the location of the proposed project in the Makawao State Forest Reserve, there is not anticipated to be any impact to near-shore ecosystems resulting from surface runoff. Some noise will be generated during construction; however, this activity will take place only during daylight hours, far from any residential area, and is anticipated to be minimal. Impacts will be significantly positive in terms of public health and enjoyment as compared to the "no action" alternative.

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

Development of the project is compatible with the above criteria since the project area is not in a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal waters. Moreover, development of the project is not likely to harm environmentally sensitive areas, because much of the forest reserve was previously disturbed by planting of the tree plantations, and no longer reflects a "natural environment."

12. Substantially affects scenic vistas or view planes identified in county or state plans or studies.

Due to the topographical characteristics of the forest reserve, views along the project area are generally not significant. The majority of the project will not be visible, except from higher elevations along the trail by persons traveling along the trail. Finally, no views will be obstructed or be visually incompatible with the surrounding area

13. Requires substantial energy consumption.

Construction of the proposed project will not require substantial energy construction. The general public is anticipated to provide the majority of the manual labor. After completion of construction, there will be minimal demand for energy use, limited to periodic maintenance efforts.

List of Permits Required

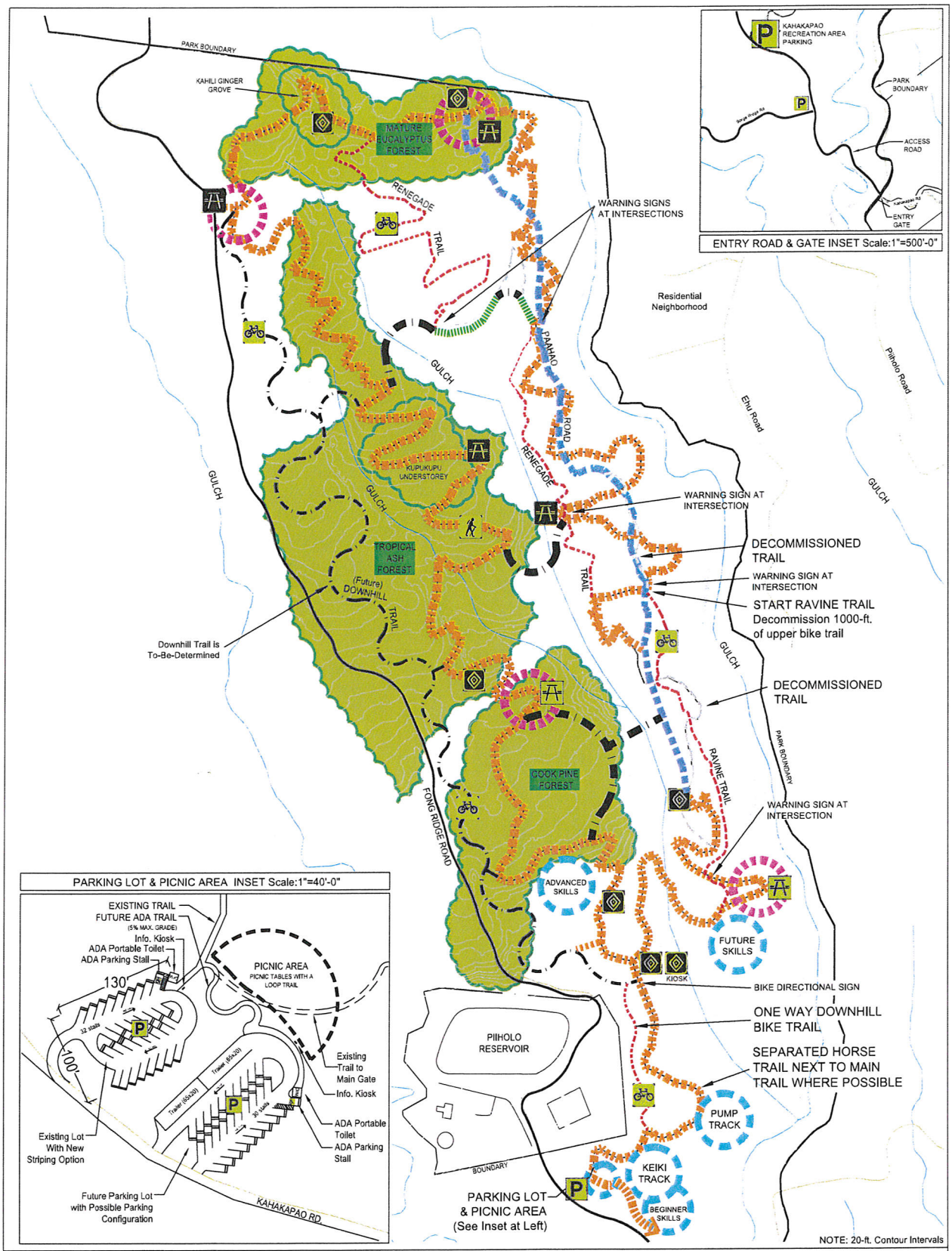
Construction of the project requires approval by the Board of Land and Natural Resources. No other permits are anticipated.

Environmental Assessment Preparation

This Environmental Assessment was prepared by staff of the Na Ala Hele Trails & Access Program, Maui District, Division of Forestry & Wildlife, Department of Land & Natural Resources, State of Hawaii.

Appendix A

MAP OF PLANNED AREA



LEGEND

- EXISTING MULTI-USE TRAIL
  (MULTI-USE TRAILS ARE BIKING, PEDESTRIAN AND EQUESTRIAN)
- NEW MULTI-USE TRAIL
- EQUESTRIAN-PREFERRED TRAIL (ALL USERS ALLOWED)
- RE-DESIGNATED AS MULTI-USE TRAIL
- NEW BIKE TRAIL
- EXISTING BIKE TRAIL
- DECOMMISSIONED TRAILS
- EXISTING INTERPRETIVE SIGN
- EXISTING PICNIC TABLE
- NEW PICNIC TABLE OR BENCH
- REST AREA WITH MAP KIOSK &/OR PICNIC TABLE
- NEW IMPROVEMENT AREA

MAKAWAO FOREST RESERVE - MASTER PLAN

Kahakapao Recreation Area

MAKAWAO, MAUI, HAWAII

CHRIS HART & PARTNERS

0 ft. 100' 300' 600' 900' 1200'

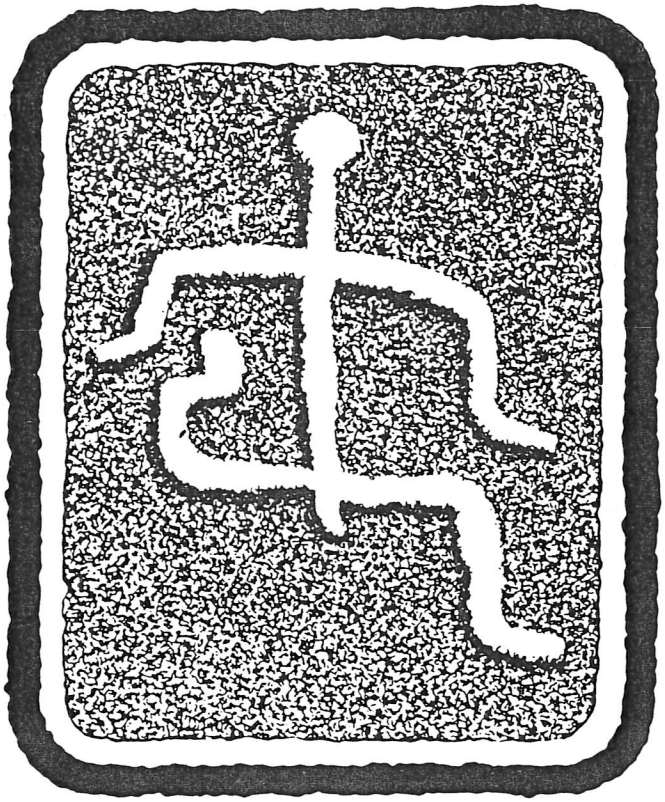
SCALE: 1"=300'-0"

Appendix A-1

PROJECT: 12-127
DATE: 5/2/ 2013

Appendix B

NAH TRAIL SPECIFICATIONS



NA ALA HELE
Hawai'i Trail & Access System

PROGRAM PLAN

Prepared By
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

May 1991

Management actions are also more likely to be accepted if the public is consulted and informed when various actions are being considered. Trail and access users have a stake in many management decisions. Involving the public (via the Na Ala Hele advisory councils) is recommended whenever feasible. The councils can help managers by outlining their preferences with respect to management actions and by facilitating communication between user groups and managers. The advisory councils and user groups can also be instrumental in public information or education programs which constitute an indispensable aspect of ongoing management.

D. TRAIL AND ACCESS DEVELOPMENT, DESIGN, AND MAINTENANCE

1. GENERAL TRAIL AND ACCESS DEVELOPMENT GUIDELINES

Na Ala Hele's trail and access development guidelines apply differently depending on the trail type. Existing or historic trails, roads, and other access ways will often not conform to recommended guidelines. Na Ala Hele does not intend to redesign or reconstruct these trails unless absolutely necessary. Na Ala Hele consults with the Historic Preservation Division in historic trail restoration and maintenance concerns which are discussed later in this section.

"High quality trail design is primarily a balance between beauty and function. Natural features and scenery exist ideally in creative juxtaposition with the continuity, efficiency, and durability of a proposed route." (From Trail Building and Maintenance, 2nd ed. Proudman and Rajala, 1981)

V-11-A

The following information is applicable to the construction of new Na Ala Hele trails and accesses or to existing, non-historic trails/accesses in need of reconstruction. Specific design guidelines for various trail types and modes of transport are presented in Figures V-4. through V-6.

- Initial Construction and Ongoing Maintenance - Routes should be designed to require minimal future maintenance. The need for vegetation removal, grading, and other modifications should be minimized. Trails should be located where the soil is stable and well-drained.

- Erosion - Routes should conform to the natural terrain. Long, straight sections, sudden, abrupt changes in direction, and steep grades should be avoided. Switchbacks, waterbars, and steps should be used to promote erosion control.

- Safety - Stream and road crossings should be planned to minimize the potential for accidents. Bridges may be necessary. Warning signs may be needed.

- Trail Experience - The trail experience can be more interesting with the incorporation of a diversity of biological, climatic, scenic, and topographic features along the route. Trails should include areas where the public can safely access scenic views.

Additional general information on trail development, including design, layout, and construction, is contained in the many source materials in the Na Ala Hele library. Especially valuable materials are listed in Figure V-3.

Figure V-3. Recommended Sources on Trail Building and Maintenance

Proudman, Robert, and Rajala, Reuben, Trail Building and Maintenance, 2nd Edition. Appalachian Mountain Club in association with the National Park Service, National Trails Program, Boston: 1981. **This is easily the best single volume source on trail construction and repair and is strongly recommended as a handbook for groups actively involved in trail work.** Each DOFAW District Office has a copy. Handbooks can be purchased by writing to:

Appalachian Mountain Club Books
5 Joy Street
Boston, MA 02108

Hooper, Lennon. NPS Trails Management Handbook. United States Department of the Interior, National Park Service. 1983.

State of Indiana, Department of Natural Resources. Indiana Trails Construction and Maintenance Manual.

State of New Mexico, Natural Resources Department. Adopt-a-Trail Handbook. Volunteers for the Outdoors. 1984.

Ashbaugh, Byron. Trail Planning and Layout. National Audubon Society. New York: 1965.

2. SPECIFIC TRAIL AND ACCESS DEVELOPMENT GUIDELINES

Refer to Figures V-4. through V-6. for details on trail and access design, layout, and construction.

3. ACCESSIBILITY FOR PERSONS WITH DISABILITIES

a. What the Law Requires

Chapters 502 and 504 of the Rehabilitation Act of 1973 require that programs, services, buildings, and facilities that are supported by Federal monies be accessible to persons with disabilities. Section 103-50, HRS, requires that all public buildings and facilities constructed by the State and Counties conform to the "American Standards Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped."

The "Uniform Federal Accessibility Standards" are used by the Federal Departments of Interior, General Services Administration, Defense, Housing, and Urban Development, and the U.S. Postal Service.

Even though the Na Ala Hele program has not applied for or received Federal funding, the program must comply with Federal accessibility requirements because Na Ala Hele is part of DOFAW and DLNR, both of which receive Federal monies for a variety of programs.

b. Accessibility

The previously mentioned "American and Uniform Standards" work to prevent architectural barriers so that disabled persons can enjoy access to governmental services that should be equally accessible to all people. Accessibility is not limited to structures and facilities. Federal law also requires programs to be equally accessible. This includes making information available to visually and hearing impaired persons on the availability and location of services, programs, and facilities.

There are no established standards for trails, camping grounds, and picnic shelters. The State of Hawaii's Commission on Persons with Disabilities (Department of Health) is available to review program and structural plans and advise on ways to provide equal access to the maximum extent feasible. In the absence of established standards, it is important to voluntarily determine what can be done to facilitate access to outdoor areas. A balance needs to be maintained between accessibility needs, safety, and environmental and historic preservation concerns.

A wheelchair accessible path requires sufficient width, gentle slopes, and a firm, slip-resistant surface. To construct and maintain to safety standards, such a trail in historic, wildland, or sensitive trail environments may result in unacceptable levels of impacts on the trails and their surroundings. Wherever accessible trails/accesses are located, parking, restrooms, water, and other facilities must be built to standards that enable use by disabled persons, particularly if such facilities are present for the non-disabled.

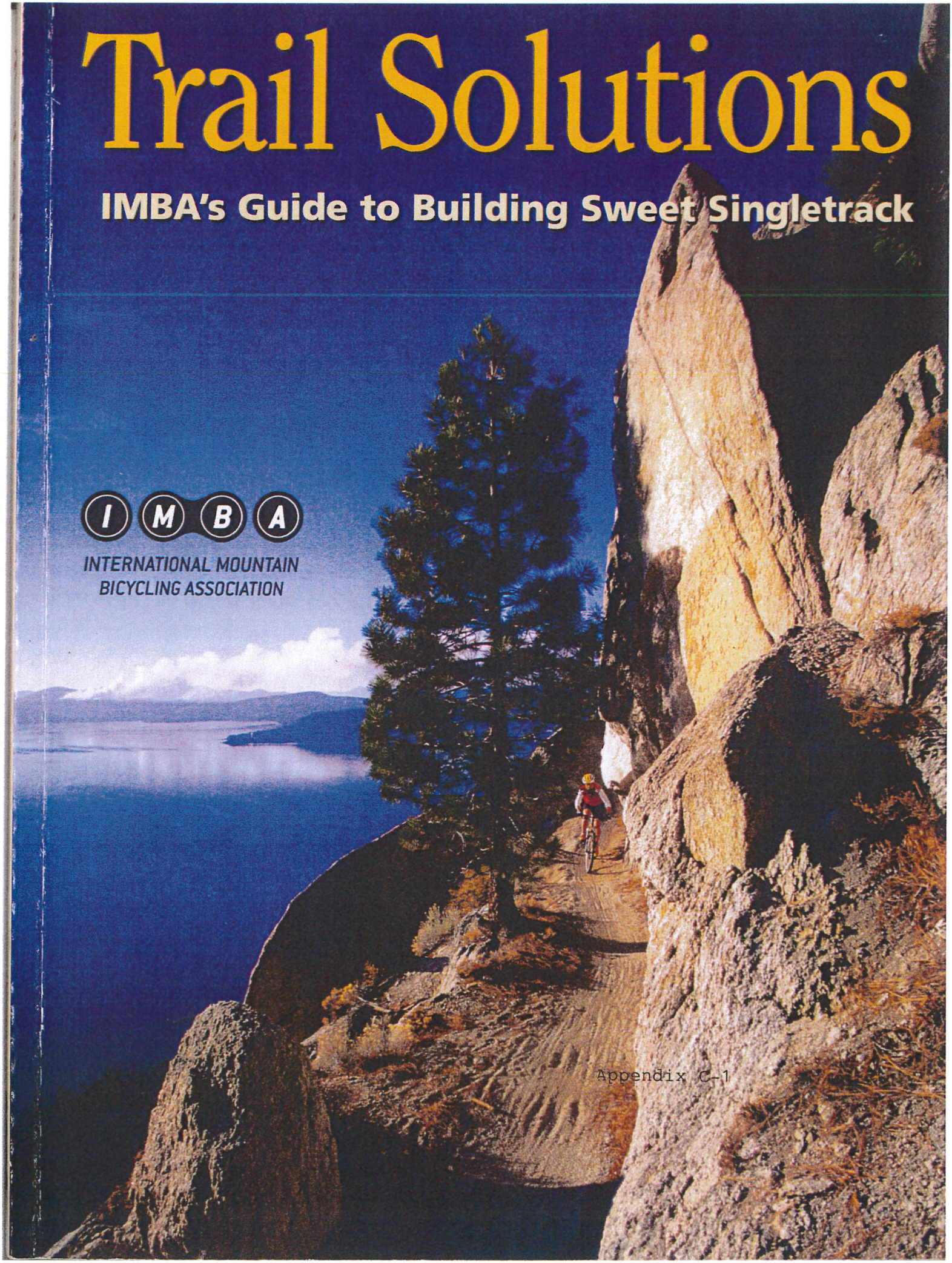
Kanaha Pond, a major wetland habitat for waterbirds on Maui, has wheelchair accessible trails and viewpoints. Keanae Arboretum, a DOFAW project on Maui, is in the process of developing trails that will be wheelchair accessible. However, at this time neither area has any restroom facilities.

Appendix C

IMBA TRAIL GUIDELINES

Trail Solutions

IMBA's Guide to Building Sweet Singletrack



IMBA

INTERNATIONAL MOUNTAIN BICYCLING ASSOCIATION

Appendix C-1

The Five Essential Elements of Sustainable Trails

1. The Half Rule
2. The Ten Percent Average Guideline
3. Maximum Sustainable Grade
4. Grade Reversals
5. Outslope

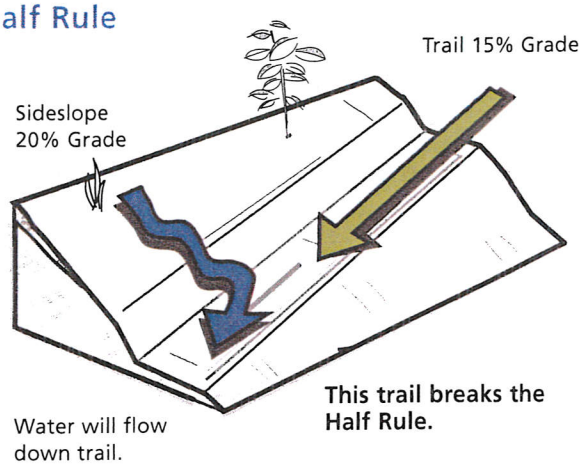
1 The Half Rule

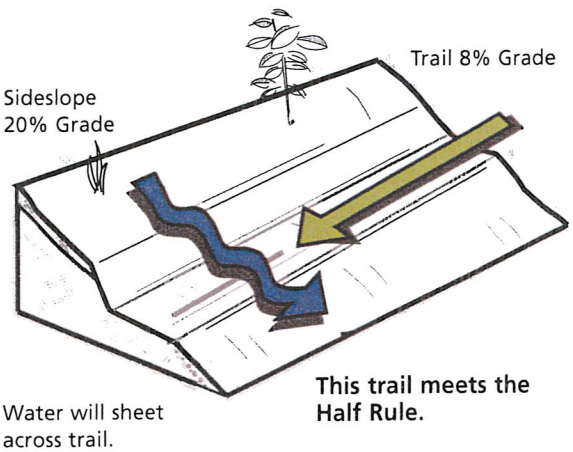
A trail's grade shouldn't exceed half the grade of the hillside or sideslope that the trail traverses. If the grade *does* exceed half the sideslope, it's considered a fall-line trail. Water will flow down a fall-line trail rather than run across it.

Measure the sideslope with a clinometer (we'll discuss how to do this shortly), then be sure to keep the tread grade below half of that figure in order to ensure good drainage. For example, if you're building across a hillside with a sideslope of 20 percent, the trail-tread grade should not exceed 10 percent.

The half rule is especially important in gently sloping areas. A common mistake occurs when trails are routed down gradual slopes, based on the assumption that erosion won't be a concern in nearly flat areas. Yet, water will funnel down trails and ruin them even on gentle slopes. A trail passing through an area with a mere 6 percent sideslope must have a trail tread grade less than half of that figure—only 3 percent—in order to escape the fall line.

Half Rule





C–2

There is an upper limit to this half rule: You must also apply knowledge about maximum sustainable grades. Very steep trails will erode even if their grade meets the half rule. For example, a trail with a grade of 24 percent that traverses a steep, 50-percent sideslope may be unsustainable even though it complies with the half rule.

2 The Ten Percent Average Guideline

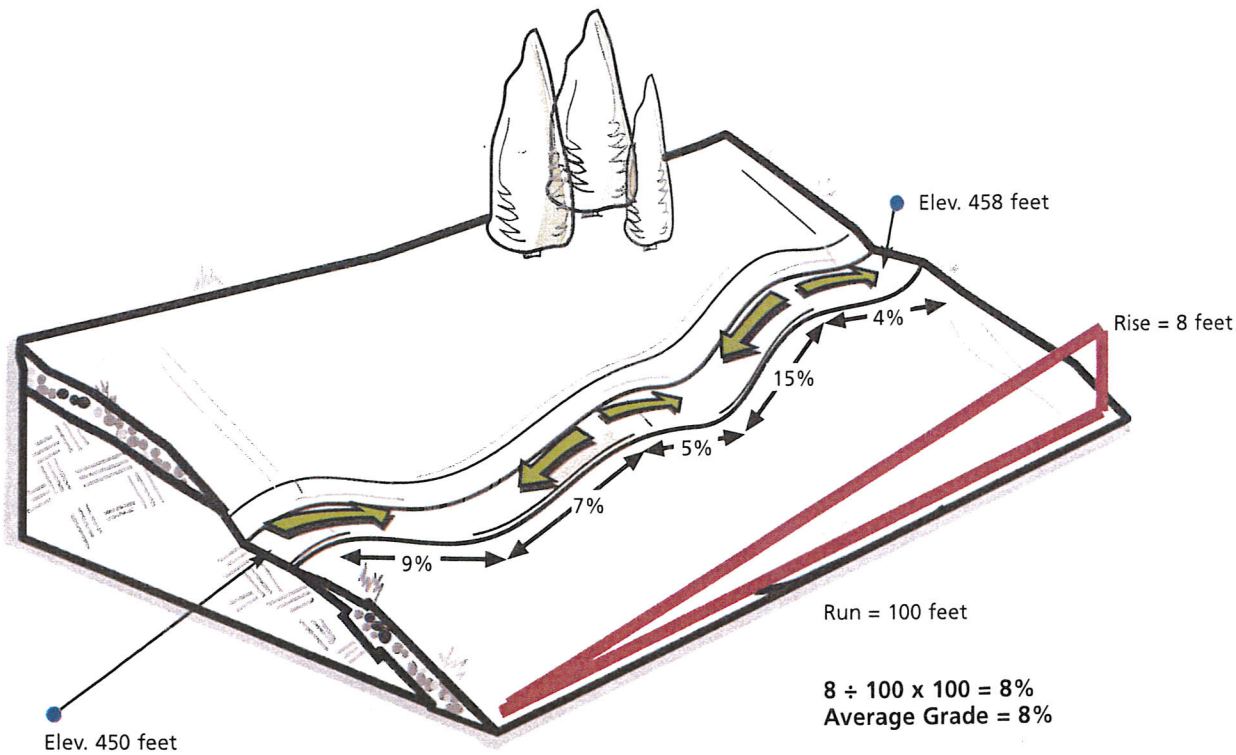
Generally, an *average* trail grade of 10 percent or less is most sustainable. Also called *overall trail grade,* average trail grade is the slope of the trail from one end to the other.

This does not mean that *all* trail grades must be kept under 10 percent. Many trails will have short sections steeper than 10 percent, and some unique situations will allow average trail grades of more than 10 percent.

A trail's average grade is calculated by dividing total elevation gain by total length, multiplied by 100 to convert to percent. For example, a trail that gains 1,000 feet of elevation and is 2 miles long would have an average grade of 9.4 percent. (1,000 ft. /10,560 ft. x 100 = 9.4%)

For trails that undulate rather than climb or descend consistently, **average trail-segment grade** can be calculated for certain sections. For example, a trail that is relatively flat with only one small climb may have an average trail grade of only 2 or 3 percent. In this case, it would be more helpful to evaluate the average trail-segment grade in a critical climbing section only.

Average Trail Segment Grade



C–3

Why 10 Percent?

Aids Planning

The 10 percent average figure provides a framework for sustainable design and can be very helpful when conceptualizing a trail. You'll be able to calculate the approximate length of trail needed to reach the top of a given hill at a sustainable grade, and you'll be able to plot possible trail corridors with sustainable grades on a topo map.

Applies to Most Soil Types

There are many types of soil and each has different qualities of cohesion and drainage. Some soils support steeper trail grades than others. By employing a 10-percent average, you won't need to rely on your soil-identification skills. A 10-percent average grade is a trustworthy guideline for sustainable trails in all but the most unique soil conditions. (See page 84 for a more thorough discussion on soil.)

Minimizes User-Caused Erosion

Average grades of 10 percent or less help minimize erosion caused by users. Sustained grades of more than 10 percent can increase the amount of soil loosened by visitors who must work harder to travel up or down the slope. This loosened material is more easily carried off by water and gravity, resulting in a damaged trail.

Allows Design Flexibility

A trail that climbs at conservative grades allows flexibility in case there is an obstacle in the path. By staying at or below a 10 percent average, you can adjust the route without necessarily starting at the beginning or routing the trail too steeply to reach your targeted destination.

Helps Future Reroutes

Future reroutes are much easier if the average grade is roughly 10 percent. For example, if a trail with an average grade of 20 percent develops an erosion problem, a reroute around the problem area may require very steep grades or a switchback to reach the destination. When average grades are closer to 10 percent, there is greater flexibility for the trail's future.

Accommodates Undulations

Average grades of 10 percent allow the trail to rise and fall without resulting in overly steep sections. Visualize a trail climbing to a targeted destination at an average grade of 20 percent. The trail dips slightly to cross a drainage and then resumes climbing. Following the dip, the trail must now climb at 25 percent—an unsustainable grade—in order to reach the destination. A better design would have the trail climb at an average of 8 to 10 percent, with short sections of 15 percent when needed (as long as the sideslope grade is greater than 30 percent, to ensure the trail meets the half rule).

Bright Idea

Begin flagging the trail with conservative grades below 8 or 10 percent. This allows flexibility in case you run into something like a water seep or major tree and need to route the trail around the object. By using shallow grades as you move along, you can steepen the route periodically without necessarily reconfiguring the whole trail.

3 Maximum Sustainable Trail Grades

The 10 Percent Average Guideline advises that, generally, an *average* trail grade of 10 percent or less is most sustainable. But what about *maximum grade?*

Maximum grade is the steepest section of trail that is more than about 10 feet in length. When designing a trail, it is essential to determine early in the process the precise maximum trail grades the trail will be able to sustain in your local conditions. This target figure will help guide your layout and ensure sustainability. Although maximum sustainable trail grade is typically about 15 to 20 percent, it is site-specific and fluctuates based on several factors. The variables to be considered when setting your target maximum trail grade include:

- **Half Rule** A trail's grade shouldn't exceed half the grade of the sideslope. If the trail grade is steeper than half the grade of the sideslope, it is considered a fall-line trail.

  Note: the maximum sustainable grade on a gentle hillside will be half the grade of the sideslope.

- **Soil Type** There are many types of soil and each has different qualities of cohesion and drainage. Some soils will support steeper trail grades than others. See page 84 for a more thorough discussion of soil types.

- **Rock** Trail grades can be steeper on solid rock. However, steep earthen sections between rocks may need to be fortified or armored to prevent soil loosening and erosion.

- **Annual Rainfall Amount** Trails in regions with either very high or very low annual rainfall may need to be designed with gentler trail grades. Lots of rain can lead to water-caused erosion. Low rain levels can lead to very dry and loose tread surfaces.

- **Grade Reversals** A grade reversal is a short dip followed by a rise, forcing water to drain off the trail. It is an essential technique for preventing water from channeling down the trail. Frequent grade reversals will allow for slightly steeper trail grades. We'll describe grade reversals more thoroughly in a moment.

- **Type of Users** Trails restricted to relatively low-impact visitors such as hikers and mountain bikers can sustain maximum grades as high as 15 to 25 percent for short distances depending on soil and rainfall. Trails open to visitors with higher impact, such as horses or motorized users, should have more gentle maximum grades.

- **Number of Users** Trails with high anticipated use may need shallower maximum trail grades.

- **Difficulty Level** Trails with a higher level of technical challenge may incorporate steeper grades, but construction techniques such as frequent grade reversals and armoring may be necessary to ensure sustainability.

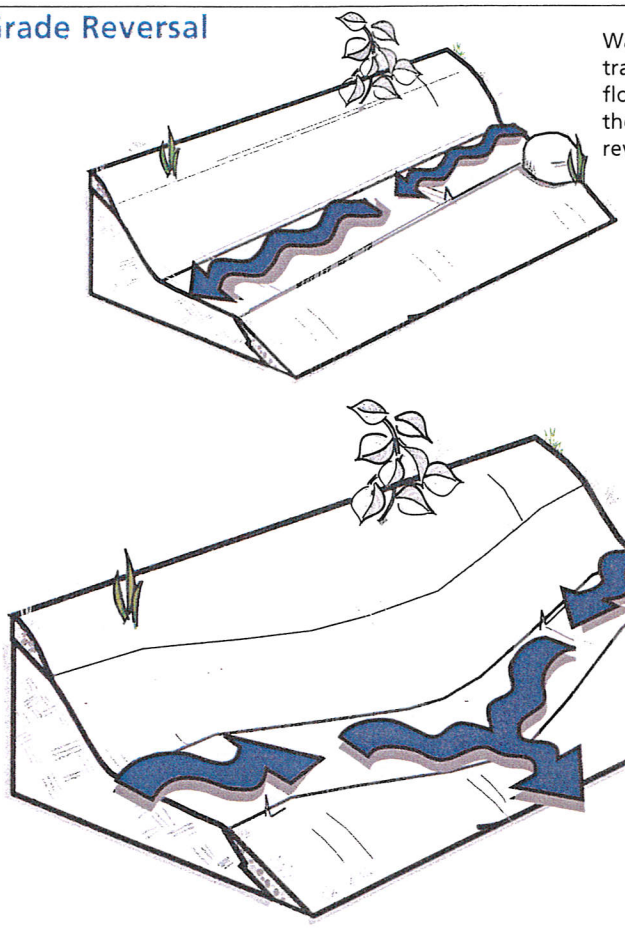
Calculating the maximum sustainable trail grade is a complicated process that requires a high level of trail-building knowledge and experience. When in doubt, design trails with conservative grades until you have had the opportunity to observe the effect of a variety of trail grades in your local conditions.

4 Grade Reversals

A **grade reversal** is just what it sounds like—a spot at which a climbing trail levels out and then changes direction, dropping subtly for 10 to 50 linear feet before rising again. This change in grade forces water to exit the trail at the low point of the grade reversal, before it can gain more volume, momentum, and erosive power. Grade reversals are known by several different terms, including grade dip, grade brake, drainage dip, and rolling dip.

Frequent grade reversals are a critical—and often overlooked—element of sustainable trail design. Most trails will benefit from grade reversals every 20 to 50 feet, depending on soil type and rainfall. Bear this in mind: *It's much easier to build a trail with grade reversals in it than to come back a year later and try to retrofit them into a poorly designed trail. For best results, incorporate them in your design from the start!*

Grade Reversal



Water may become trapped on trail and flow long distances if there are no grade reversals.

A grade reversal forces water to drain off the trail.

Grade reversals can help trails endure, even with minimal maintenance. Older trails often have a deeply compacted, concave trail tread that collects water. With regular grade reversals, this water will only be trapped on the trail for a short distance before it can drain. Grade reversals effectively divide the trail into short, individual watersheds, so the drainage characteristics of one section of trail won't affect any other section.

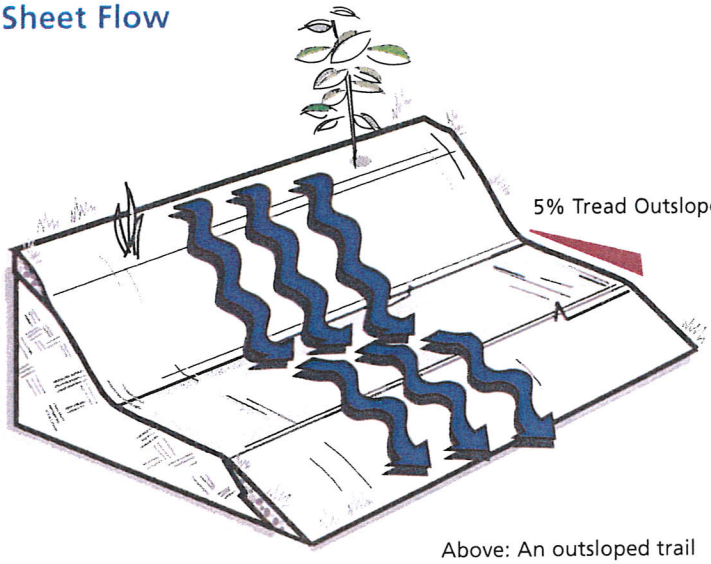
Grade reversals also make a trail more enjoyable. For mountain bikers, long runs of constant grade encourage excessive speed on a downhill and they're boring on an uphill. Short climbing interludes on a downhill provide variety, challenge, and let cyclists get off their brakes for a bit. Brief descents mixed into long climbs help all users regain their momentum and catch their breath.

5 Outslope

As the trail contours across a hillside, the downhill or outer edge of the tread should tilt slightly down and away from the high side. This tilt is called **outslope**, and it encourages water to sheet across and off the trail instead of funneling down its center. Outslope is one reason why contour trails last for years and years. IMBA recommends that all trail treads be built with a 5-percent outslope.

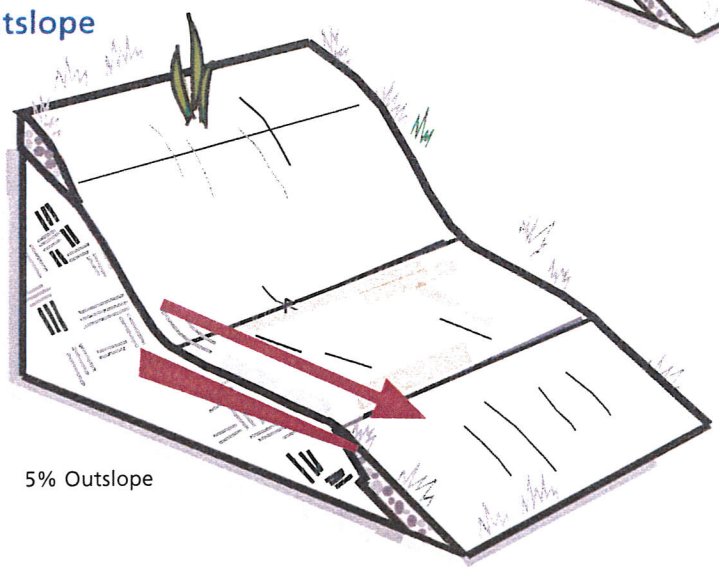
Outslope can be difficult to maintain in loose soils. Tires, feet, and hooves constantly compact the center of the trail and push loose soil to the sides, creating a concave tread. Frequent grade reversals are essential in order for water to drain in this situation.

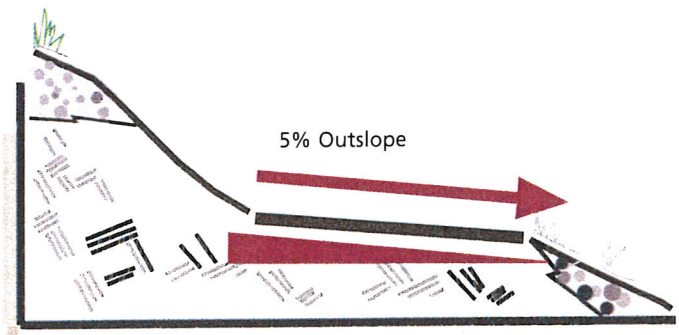
Sheet Flow



Above: An outsloped trail tread allows water to drain in a gentle, non-erosive manner called "sheet flow."

Outslope





C–7

APPENDIX D

CULTURAL IMPACT ASSESSMENT

CULTURAL IMPACT ASSESSMENT FOR THE PROPOSED KAHAKAPAO LOOP AND WAIHOU SPRINGS TRAILS HĀMĀKUAPOKO *AHUPUA`A*, MAKAWAO DISTRICT, MAUI ISLAND, HAWAI`I (TMK: 2-4-16: 2, 2-4-15: 2, 3, 4, 6, 12)

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Prepared for
Na Ala Hele Trails and Access Program

Cultural Surveys Hawai`i, Inc.
February 2003

ACKNOWLEDGMENTS

Cultural Surveys Hawai`i, Inc. would like to thank all the informants who participated in this cultural impact assessment. We are most grateful for their time and kind words of wisdom. We also wish to acknowledge Bob Hobdy of the Department of Land and Natural Resources and Sam Ka`ai for their *mana`o*.

ABSTRACT

At the request of Na Ala Hele, Cultural Surveys Hawai`i, Inc. conducted a cultural impact assessment for the proposed Kahakapao Loop Trail (TMK: 2-4-16: 2) and the Waihou Springs Trails (2-4-15: 2, 3, 4, 6, 12) in the *ahupua`a* of Hāmākuapoko, District of Makawao, Maui.

An attempt was made to contact present and former residents of Makawao, as well as various organizations regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the Kahakapao Loop and Waihou Springs trail project areas. Two knowledgeable informants were identified and interviewed.

Historic background research indicated that in ancient times, the project areas would have been covered in native forest including *koa*, *`ohi`a lehua*, *ti*, and *kukui*. Areas *makai* would have been well populated and suitable for successful cultivation of a variety of resources. However, areas *mauka* (including the project areas) would have been unsuitable for long periods of habitation. Mass deforestation and cattle grazing in the mid 1800s through the early 1900s had eliminated majority of what had existed of the native forest, and in response to the declining remnant forest, the State Division of Forestry began a tree-planting program in the 1960s.

This study failed to find any archeological sites within the trail corridors or immediate vicinities. Two archaeological studies have been conducted south of the Waihou Springs trails project area, however both studies reported no significant archaeological findings.

The only ongoing cultural practice identified during the course of the cultural impact assessment was pig hunting within the Makawao Forest Reserve. Pig hunting was historically a major cultural activity in the upland areas of Makawao, although pig hunting has declined over the last fifty years as a result of increased residential developments and lack of public access. Several pig hunting trails are located adjacent to the proposed Kahakapao Loop trail, however informant testimonies have indicated that access to pig hunting trails would not be restricted by the development of the trail corridors.

Although no specific cultural concerns were identified during the course of the cultural impact assessment, Cultural Surveys Hawai`i, Inc. recommends the following in the event that inadvertent historic properties, including human burials, are encountered during construction for the Kahakapao Loop and Waihou Springs trail corridors. State law (Chapter 6E, Hawai`i Revised Statutes) requires the following:

1. Stop all disturbing activity in the immediate area.
2. Leave all remains in place.
3. Immediately notify the State Department of Land and Natural Resources-Historic Preservation Division (DLNR/SHPD) and the county police department.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

A. Project Area Background

At the request of the Department of Land and Natural Resources Division of Forestry and Wildlife, Na Ala Hele Trail and Access Program, Cultural Surveys Hawai`i, Inc. conducted a cultural impact assessment for the proposed Kahakapao Loop (TMK 2-4-16: 2) and Waihou Springs trails (TMK 2-4-15: 2, 3, 4, 6, 12), Hāmākuapoko *Ahupua`a*, Makawao District, Island of Maui (Figures 1). The proposed Kahakapao Loop trail will be located within the Makawao Forest Reserve (Figure 2), and the Waihou Springs trails will be situated within the Waihou Springs Forest Reserve in Olinda (Figure 3).

The purpose of the cultural impact assessment is to consider the effects that the proposed trails may have on native Hawaiians as it pertains to their culture and right to practice traditional customs. The Hawai`i State Constitution, Article XII, Section 7 protects "all rights" of native Hawaiians that are "customarily and traditionally exercised for subsistence, cultural and religious purposes." Act 50 (SLH 2000) was passed as an attempt to balance the scale between traditional lifestyles and development and economic growth. Act 50 provides that environmental impact statements: (1) Include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amends the definition of "significant effect" to include adverse effects on cultural practices.

The Scope of Work (SOW) was designed to meet the Guidelines For Assessing Cultural Impacts as adopted by the Office of Environmental and Quality Control (OEQC) (1997), as well as, the requirement of any other State and County agencies involved in the review process for the proposed project. The "Guidelines for Assessing Cultural Impacts" issued by the Office of Environmental and Quality Control (OEQC) discuss the types of cultural resources, practices and beliefs that might be assessed. The Guidelines state:

> The type 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 man-made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

Preliminary archaeological and botanical surveys were conducted in December of 2001. The archaeological assessment resulted in a finding that "no historic properties will be affected by this undertaking" (SHPD/DLNR LOG. 28907 DOC. 0112CD32). Additionally, the botanical assessment indicated that no threatened or endangered native or endemic species were within the trail corridor itself, although a few exist within the Forest Reserve. The current cultural impact assessment is a complimentary component to the archaeological and botanical studies, and provides critical information regarding those traditional and cultural practices that may be affected by the development of the Kahakapao Loop and Waihou Springs Trails.

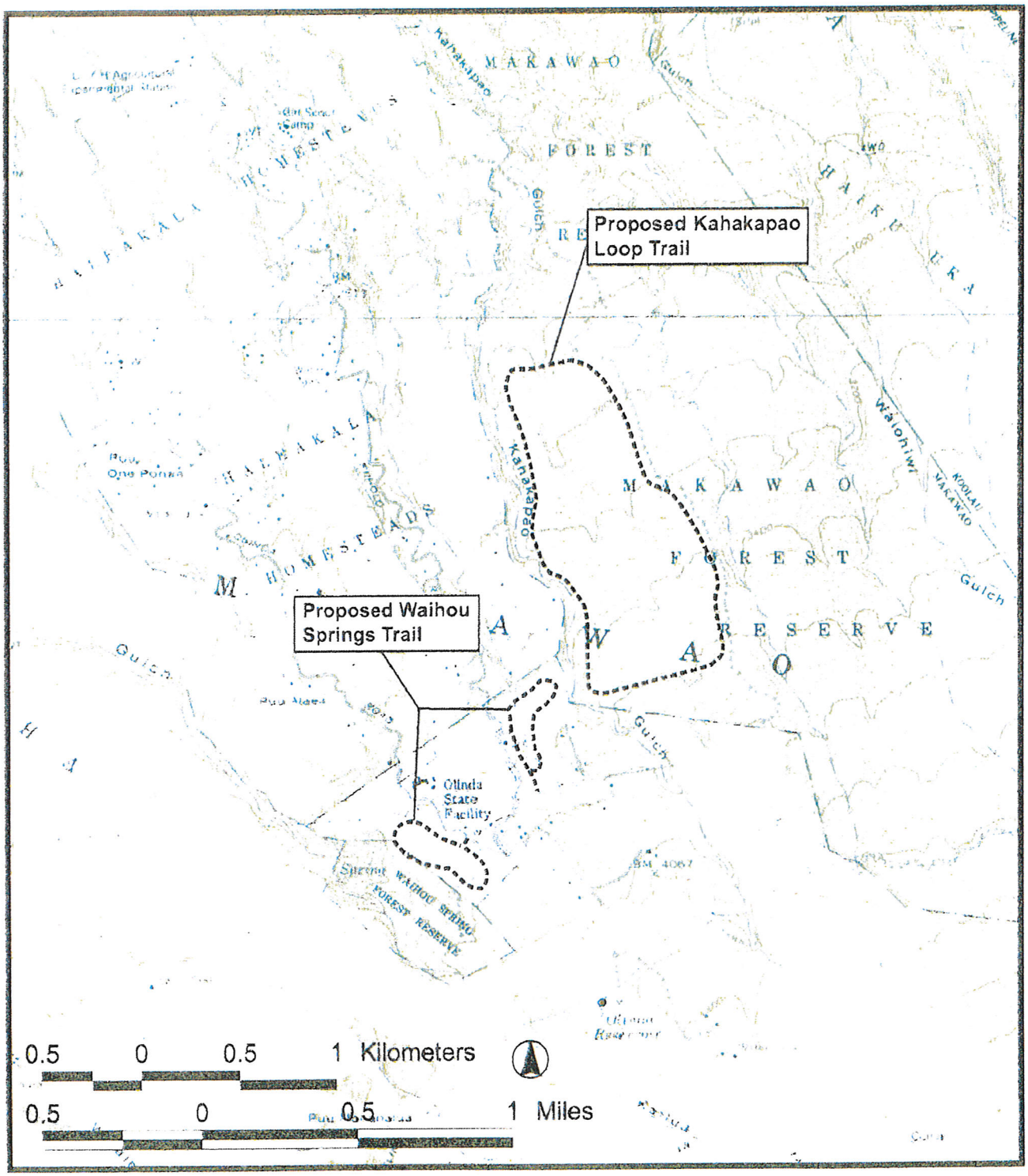

Figure 1 Portion of USGS 7.5 Minute Series Topographic Map. Kilohana and Haiku Quadrangles. Showing Kahakapao and Waihou Springs Trail project areas.

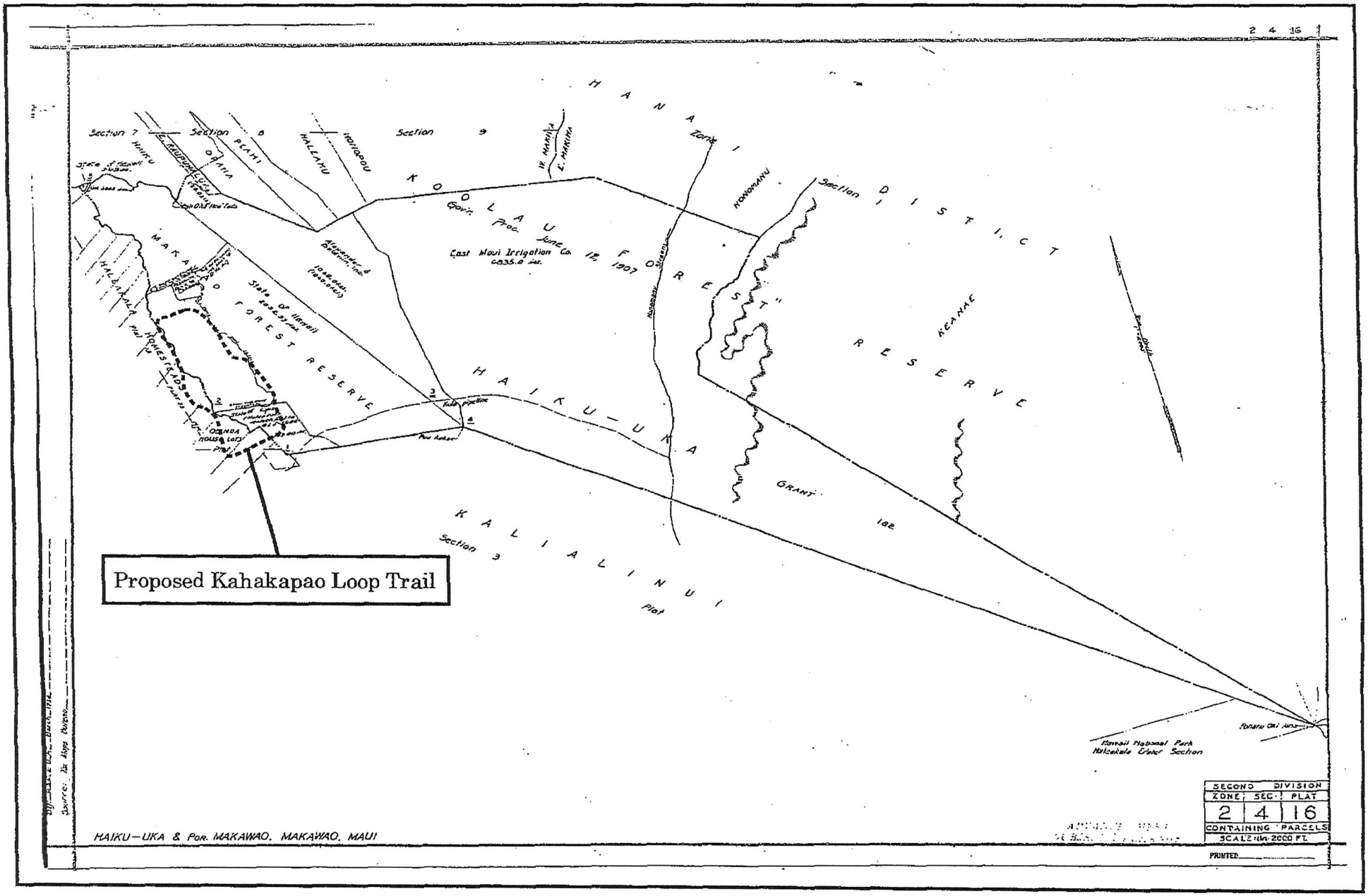

Figure 2 Tax Map Key 2-4-16 Showing Kahakpao Loop Trail.

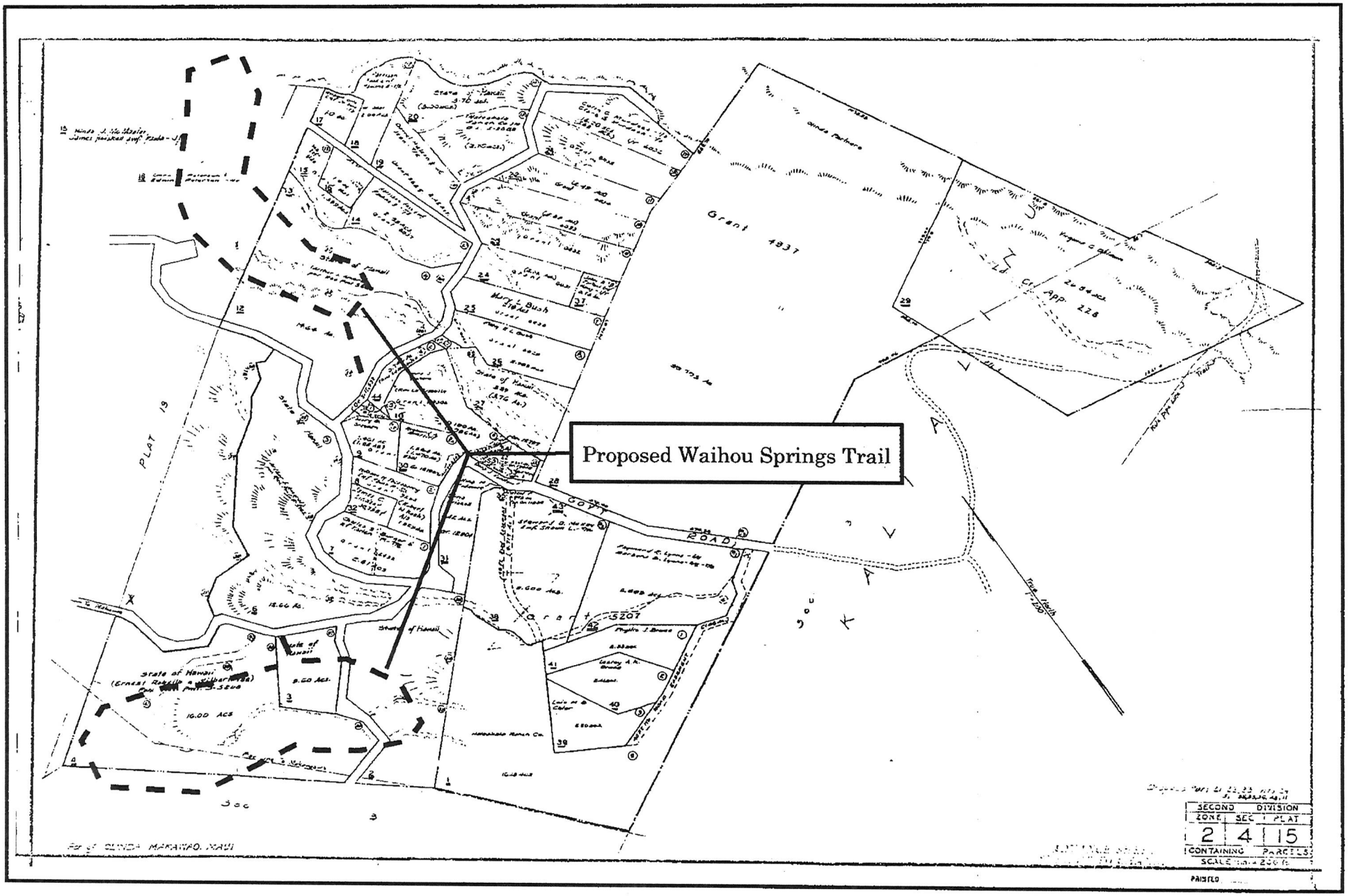

Figure 3 Tax Map Key 2-4-15 Showing Waihou Springs Trails.

B. Scope of Work

In compliance with the Office of Environmental and Quality Control (OEQC) and Act 50, the following Scope of Work (SOW) was designed to satisfy the requirements of a cultural impact assessment as it relates to the identification of traditional Hawaiian customs and rights within the project areas.

1) Examine historic documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities. Such activities would include the gathering of plant, animal and other resources, in addition to agricultural pursuits, as may be indicated in the historic record.

2) Review existing archaeological information pertaining to site distribution, as this may enable us to reconstruct traditional land use activities, as well as identify and describe past and/or present cultural resources, practices, and beliefs associated with the trail.

3) Conduct limited oral interviews with persons knowledgeable about the historic and traditional practices in the project area(s).

4) Preparation of a report on the above items summarizing gathered information as related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and any features identified.

C. Methodology

1. Historic Research

Historic documents, maps and photographs were researched at: the Hawai`i State Archives; Hawai`i State Survey Office; Bernice Pauahi Bishop Museum archives and library; the State Historic Preservation Division (SHPD) Library; and the Cultural Surveys Hawai`i Library.

2. Identification of Knowledgeable Informants

Hawaiian organizations, government agencies, community members and cultural and lineal descendants with ties to the Makawao area were contacted to (1) identify potential knowledgeable individuals with cultural expertise and knowledge of the Kahakapao and Waihou Springs project areas and surrounding vicinities, and (2) to identify cultural concerns and potential impacts relative to the Kahakapao and Waihou Springs project areas. An effort was made to locate informants who either grew up in Makawao or who, in the past, used the Kahakapao and/or Waihou Springs project areas for traditional and cultural purposes. In addition, informal talk-story with community members familiar with the project areas was ongoing throughout the consultation period. The organizations and agencies consulted

included: the State Historic Preservation Division; West Maui Cultural Council; Maui/Lana`i Island Burial Council; Office of Hawaiian Affairs; Alu Like, Inc.; Maui Hawaiian Civic Club; Department of Hawaiian Homelands; Maui Community College; Sierra Club; Nature Conservancy; Native Hawaiian Plant Society; and individual departments of the County office.

The following table shows the results of the community consultations which were conducted.

Table 1: Results of Community Consultations

Key:

Y=Yes
N=No
A=Attempted (at least 3 attempts were made to contact individual, with no response)
S=Some knowledge of project area
D=Declined to comment
U=Unable to contact, i.e., no phone or forwarding address, phone number unknown

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
Aiu, Pua	Office of Hawaiian Affairs	Y	N	No comment. Made referrals.
Allen, Janet	West Maui Cultural Council	A		
Armstrong, Thomas	Makawao Resident	Y	Y	Resident of Makawao. Comment that proposed Kahakapao Trail will not affect hunting access.
Craddick, David R.	Department of Water Supply–Maui County	A		
Chun, Philip		A		
Derego, Jeffery C.	Kahakapao resident	Y	Y	Resident of Makawao. Hunts pig and deer in the area. Expressed concern about conflicts between hikers and hunters.

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
Dukelo, Kahele	Maui Community College, Po`okela Program	Y	N	No comment and no referrals given.
Duey, Rose Maire	Alu Like, Inc.	Y	Y	Made referrals.
Evenson, Mary		Y	S	No comment.
Fujishiro, Paul	La`au lapa`au expert	A		
Hall, Dana N.	Maui/Lanai Island Burial Council	Y	Y	Made referrals.
Haan, Bram Den	Valley Isle Road Runners Association	U		
Hau, Skippy	DLNR Division of Aquatic - Resources Maui	Y	Y	Gave comment regarding trail management and potential forest fires. Made referral.
Hobdy, Bob	Department of Forestry and Wildlife	Y	Y	Gave extensive historic background about Olinda and the Makawao Forest Reserve. First hand knowledge about the trail area–completed botanical survey for the environmental assessment.
Hokoana, Lui	Maui Community College, Hui Lei Ola	Y	N	No comment.
Ino, James J.	Natural Resources Conservation Service	A		
Ka`ai, Sam	Resident of Pukalani	Y	Y	Has extensive knowledge of the culture and history of the general Makawao area. Interviewed on January 14, 2003.
Kafka, Peter R.	Sierra Club	U		

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
Kapeliela, Kana`i	DLNR, State Historic Preservation Division	A		
Kirkendall, Dr. Melisa	DLNR, State Historic Preservation Division	Y	Y	No known archaeological sites in either areas. Commented on springs in Olinda that were once tapped into for supplying water to Kula residents.
Ke`au, Charles		A		No known telephone number.
Koga, Jason	DLNR, Land Division	Y	N	Made no comment.
Lindsey, Ed		Y	N	Made referrals.
Matsui, Patrick	Department of Parks and Recreation	Y	N	Made referrals.
Maui Historical Society		Y	N	Made referrals.
Mauri, Carla	Makawao Public Library	Y	N	Made no comment. Made referrals.
Maxwell, Charles K.	Maui/Lanai Island Burial Council	Y	D	Declined to comment.
McEldowney, Dr. Holly	DLNR, State Historic Preservation Division	Y		Commented that both the Kahakapao and Waihou Springs area appear to be already substantially developed.
Medeiros, Anthony	Former resident of Olinda.	Y	Y	Grandparents and Parents lived in Olinda in the '30s, '40s and '50s. Used to pick blackberry to make jam and hunt pig as youngsters.
Medeiros, Vanessa	Department of Hawaiian Homelands	Y	N	Made referrals.

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
Merle, Jeff	Olinda resident.	Y	Y	Commented on *maile* picking within the Makawao Forest Reserve and Olinda areas. Also mentioned the abundance of pig hunting within both areas.
Naeole, Iokepa	The Nature Conservancy	Y	N	Made referrals.
Nelson, Linda	Native Hawaiian Plant Society.	U		
Pelekikena, Clara DeStefano	Central Maui Hawaiian Civic Club	U		
Pu, Eddie		U		
Shattenberg-Raymond, Lisa	Maui Nui Botanical Gardens	Y	S	Made referrals.
Shimaoka, Thelma	Office of Hawaiian Affairs	Y	S	Made several referrals.
Wendt, Ed		A		

3. The Interview Process

A substantial effort was made to locate 3-4 knowledgeable informants for the cultural impact assessment for the Kahakapao Loop Trail and Waihou Springs Trail. Two individuals with extensive knowledge of the Makawao area were identified and formally interviewed. The first interview was conducted on January 14, 2003 with Mr. Sam Ka`ai, and the second interview was carried out on January 16, 2003 with an informant long familiar with Makawao Forest area. The second interviewee wishes to remain anonymous, and will be referred to as the Informant throughout this report. Each interview lasted an hour to two hours, and both interviews were taped and transcribed. Both participants were then given the opportunity to review the transcriptions and provide any necessary corrections and/or editing remarks to approve the final transcription. An "Authorization for Release" form giving permission for the interviews to be used as part of this assessment was then signed by each informant. Excerpts from the interviews were used throughout the report, wherever applicable. The full transcription for both interviews is appended to this report.

4. Biographical Sketch of the Informant

Sam Ka`ai

Mr. Sam Ka`ai was born to Edward and Kathryn Marciel on April 17, 1938 in Hāna, Maui. At birth, Mr. Ka`ai was *hanai* by his father's eldest sister, Maile Marciel and her husband, Sam Kaha`i Ka`ai, who raised him. His father was a craftsmen and canoe maker, who passed his knowledge of the material Hawaiian culture on to Mr. Ka`ai at a very young age. During the war of the 1940s, Mr. Ka`ai's family moved from Hāna to Kaupō, and then to Moloka`i and Waihe`e. Mr. Ka`ai is one of six siblings and holds the title of *hiapo* (first born). Today, Mr. Ka`ai resides in Pukalani where he continues to perpetuate the Hawaiian culture through a variety of cultural activities. Mr. Ka`ai is considered one of Hawai`i's living cultural treasures, who is often called upon to conduct cultural ceremonies, lectures and blessings.

II. PROJECT AREA DESCRIPTION AND NATURAL SETTING

A. Project Area Description

The proposed Kahakapao Loop Trail is planned to be located within the Makawao Forest Reserve (Figure 4). The proposed trail corridor will located on the western slope of Haleakalā Volcano within the Makawao Forest Reserve. Looping from the bottom of Fong Ridge the trail connects to the bottom of Pa`ahao Ridge. From there, it continues up Pa`ahao Ridge then cuts through the gulch and reconnects to the top of Fong Ridge. The trail is approximately three miles long. The elevation of the proposed trail ranges from 2800 feet above sea level in the gulches to 3600 feet above sea level on the ridge. The Makawao Forest Reserve was established in 1908 for watershed protection, and includes an area of approximately 2,093 acres. In the 1960s, a state forestry program of tree-planting was undertaken, with ridges and level areas bulldozed and a road system established for planting and harvesting.

The Waihou Springs Trail is proposed for the Waihou Springs Forest Reserve in Olinda (Figure 5). The proposed trail will be in two sections–one to the west of the Olinda Bird Sanctuary and one to the east. The western loop ranges in elevations from 3600 to 3800 ft above sea level and the eastern loop at 3400 to 3700 feet above sea level. The name "Olinda" refers to the name of Samuel T. Alexanders' home, which was later sold to Harry Baldwin (Pukui *et al.* 1974: 169). Olinda was also the location of a territorial and state prison camp from 1956 to 1973. The former prison camp facility was then converted into the Olinda Bird Sanctuary in 1986.

B. Natural Setting

Weather conditions within the project areas are usually clear during the morning hours, with a few afternoon clouds, which envelope the lower portions of the Forest Reserve. Mist and/or light and persistent rain is common, however, in recent years drought conditions have prevailed. Storms usually occur during the Fall and Winter months with heavy winds and rain contributing 60 to 120 inches of rainfall annually. Nights are usually cold all year round. Winds originate mainly from the east-northeast for most of the year, but may occasionally blow from the south-southwest during "Kona" conditions. Winds and cloud conditions usually vary due to the mountain topography and the prevailing trade winds. The topography is extremely varied due to the trails transition from the bottom of the gulches to the top of the ridges. The areas within the gulches consist of well-drained soils developed in volcanic ash (Olinda loam, 12 to 20 percent slopes) and rock land encompassing the trail areas up on the ridges (Foote *et al.* 1972).

Figure 4 General Picture of the Proposed Kahakapao Trail area,

Figure 5 General Picture of the Proposed Waihou Springs Trails area.

III. CULTURAL SETTING

A. Makawao District

The proposed Waihou Springs and Kahakapao Loop trails reside in the modern judicial district of Makawao in the *ahupua`a* of Hāmākuapoko. In ancient times, the *ahupua`a* of Hāmākuapoko would have been considered an independent *moku* or district, with a number of *ahupua`a* within.

Under the reign of Kaka`alaneo, Maui was divided into twelve *moku* or districts (Coulter 1935: 216-217). These *moku* included Kā`anapali, Lāhainā, Hāmākuapoko, Hāmākualoa, Ko`olau, Hāna, Kīpahulu, Kaupō, Kahikinui, Honua`ula, Wailuku, and Kula. The twelve ancient districts of Maui were later reduced to four under the Civil Code of 1985, which consolidated all East Maui districts into one. Later the Session Laws of 1909 regained two districts, which established a total of six districts. Under the Session Laws of 1909, Hāmākualoa and Hāmākuapoko were joined to make the modern district of Makawao.

The Makawao District, as presently defined, consists of four traditional Hawaiian political districts. These include Honua`ula to the south, along the leeward slopes of Haleakalā; Kula, which overlooks the Wailuku District and the Isthmus lands; and Hāmākuapoko and Hāmākualoa along the windward slopes of Haleakalā (In Sterling 1998: 4).

The literal translation of Makawao is "forest beginning" (Pukui *et al.* 1984: 142), although several interpretations have transpired. Makawao may also translate to mean the "eye of the inland forest"–maka, meaning 'eye' (Pukui 1986: 224) and wao meaning 'inland region or forest' (Pukui 1986: 382).

The two rains associated with Makawao are the *`ualena* and *`uki`ukiau* rains. The *`uki`ukiu* rain is also referred to as *`ukiu* rain and is described as "a fine rain with wind that blows down from the mountains" (In Sterling 1998: 9). Although very little literature has been written about the *`ualena* and *`uki`ukiu* rains, Mr. Sam Ka`ai suggested the following:

SK: *`Ulalena, `Ula* mans reddish-yellow, and *`Ualena* is the yellow rains–which I have a feeling, I cannot confirm, but I have a feeling it was used for [inaudible]. But let's say it was called `Ulalena rains, the reddish-yellow rains, which is, the rain is falling and the light comes through from the dawn, and that is the water spirit, and would be one of the lower manifestations of the kūohu, the cloud of Kāne's involvement when the rains fall–you see it's Kāne, it's the rains of Kāne falling on the forest of Haumea, now *hau* means to serve up and *mea* means serving up all things, so Haumea makes the forest grow. So it's also the mist that comes out of the ground, so we associated Haumea, okay–and the earth is called *papahonua, wāhine papahonua,* but the child spirit, the forest spirit is *wāhine haumea*, she receives the rain and for that she offers all these things up. Now `Ualena rains have this kind of

mist–*kuakuokalena* is the mist that comes across the area and has that certain quality of dawn, `ula`ulalena–it's the equivalent to the thing you see in the ocean called *`ehu`ehukai*–when the waves come in and the wind blows the sea back and makes that spray and you see the rainbows inside that, that is *`ehu`ehukai*. So some people are named `Ehu from *`ehu`ehukai*, the blowing back of the wave, sometimes it's called the red-headed surfer and other times it's called the rooster of the wave, get all kind different kind names–it depends on whose interpreting. So this `Ulalena get that golden reddish rain, which comes in that mist, that's because the cloud banks are rising and the rains that fall from that–if the light pictures through, get that color–now that's the physical description. For the Hawaiian, it's coming the enriched breadth of this woman, breathing on the forest–and the other name is very supportive, it's a name of a fern. What's the name overthere?

CSH: `Ukiukiu.

SK: Get *`uki`uki* grass–know *`uki`uki* grass, now try remember Hāmākua coast get *`uki`uki*. *`Uki`uki* is one dryland grass? Where you find that kind grass? Mostly in Kona, yeah? So I think `Ukiukiau is more, that's just the rain that comes over, because in the old days also had *`uki`uki* fern–it's one prickly fern. Or it's a fern that we call by a different name, but when come dry the thing all shock, and that's what they call *`uki`uki*. Here in Hawai`i we call the fish *ulua*, you go down to the Tuamutu's, the full size fish is called the *ulua*, we call *pāpi`o* the younger one, yeah–down there get five different names and *ulua* is only [inaudible]. It's all according to the sizes–*purau* for how, because *puahau* is the flower only. Then they have *purau* is the wood, we call it *lā`au*, them they get–you look at the tree it's one name, you look at the stem it's another name, you look at the fruit it's another name–they don't have that so called catch–in other words, with our culture we pick one name, we say *puahau*, the flower of the *hau*, then we say *la`auhau* for the wood–get multiplicities, so it's hard, they say what kind of wood is it, they say *hau*, it's –so same thing up there, it's *`uki`uki* might be the poky-poky grass, but when ferns in summer, when getting to that dry stage, one of the descriptions is poky-poky grass–you know that tangled, you know the one we east, it's the home for pigs. That fern, when it's in its dry state–so it might be, and try remember dry fern has that yellowish color, if you talking about the yellowish rain, you know where the formal is coming out–I don't know if you want to use that kind of stuff, because you're not going to find literature, you're going to say Sam Ka`ai said–.

Several legends mention the *`ukiu* and *`ulalena* rains, including the legend about Kihapi`ilani and his sweet potato patch. After escaping from his brother Lono, Kihapi`ilani came to reside among the commoners of Hāmākuapoko. There, he planted a large sweet potato patch. As Kihapi`ilani worked, the rain and wind of Makawao penetrated his body. "The sunshine beat down on this back, the `uki`ukiu breeze blew in front of him, the `Ulalena rain added its share, and intense heat reflected from the *`ulei* vines" (Kamakau 1961: 24). It was the double rainbow that followed the *`Ulalena* rain that eventually

revealed Kihapi`ilani's royal identity, as Kamakau explains:

> One old man remarked to the other, "there must be a chief near by for this is the first time that a rainbow is spread before the trees." As they were speaking a man came from below with a huge load on his back, and they called to him to come into the house. He shifted his load, saw the old men, Kau-lani and his companion, let down his burden, and entered...They asked him, "Where are you going?' He answered, "I am returning to the boundary of Kula and Makawao." "Are you a native of the place?" they inquired? "Yes," he replied. They said, "There is not a native from Kula to Hamakua with whom we are not acquainted. You are a stranger." "Yes, I am a stranger." They said, "The gods have revealed your identity. You are a chief, Kiha-a-Pi`ilani." He answered, "I am he. Conceal your knowledge of me and tell no one." (Kamakau 1961: 24)

Clearing of the forest trees for sugarcane by Europeans in the mid to late 1800s had altered the environment. The negative effects included in less rainfall in the Makawao area as Mr. Sam Ka`ai had suggested:

SK: So today we affirm the Pā`ia Bypass, the this that. Just like Ho`okipa. Had forest going all the way from the top of Hāli`imaile, where the *maile* lied down like carpets–big forest over there. From there down to Ho`okipa had *`ohia* trees all the way to the shore. And the minute they saw had rain there, Europeans said let's cut all those trees down and plant sugar. So they moved the wet line by. In fact they made it the town zone. The mist rains of *`ulalena* came that far down. Now all that push away. Because you scrape the ground, you take the trees–you know how it when it rains, it steams, it causes clouds, it holds the mist–all of that was taken away. They burned all that wood off for sugar. They brought in Portuguese with ox–that's how most Portuguese came here, to pull the stumps of the *koa* trees out. And the *haole* who didn't want to pay money said okay you clean my land I will give you an acre there. And finally you attract work for cleaning of land. And then the gulch, I can't think of the name, that's where the old dump was, they burned for fifteen years. When you throw logs over that still dirt in the roots they continue to smoke for fifteen years. The Hawaiians say the *puoho* is coming back–the ancient mist.

B. General Overview of Hāmākuapoko Ahupua`a

The *ahupua`a* Hāmākuapoko is located on the north side of east Maui, abutting Kula and Wailuku on the west and Hāmākualoa to the east. One translation of Hāmākuapoko is 'short Hāmākua' (Pukui *et al.* 1974: 39). A review of the literature indicated no interpretation of the name, however geographically, it is the same north/northeastern position as the Hāmākua Coast on the island of Hawai`i. This may suggest a correlation between the name and its geographic position on an island (Bushnell *et al.* 2001: 13).

Few historic documentation associate upcountry Maui with residential areas of ruling chiefs, sacrificial *heiau* or places of refuge. Instead, the upland areas have been noted as a productive area renowned for the growing of dry taro, sweet potatoes and raising of pigs (Watanabe 1996:53). Historical documentation by E.F. Craighill Handy and Elizabeth Handy (1972) outline likely general patters in the number of traditional *ahupua`a* of Hāmākuapoko:

> Hāmākua Poko (Short Hāmākua) and Hāmākua Loa (Long Hāmākua) are two coastal regions where gently sloping *kula* lands intersected by small gulches come down to the sea along the northern coast line of East Maui...Stream taro was probably planted along the watercourse well up into the higher *kula* land and forest taro throughout the lower forest zone. The number of narrow *ahupua`a* thus utilized along the whole of the Hāmākua coast indicates that there must have been a very considerable population. This would be despite the fact that it is an area of only moderate precipitation because of being too low to draw rain out of trade winds flowing down the coast from the rugged and wet northeast Ko`olau area that lies beyond. It was probably a favorable region for breadfruit, banana, sugar cane, arrowroot; and for yams and *`awa* in the interior. The slopes between the gulches were covered with good soil, excellent for sweet-potato planting (Handy and Handy 1972: 498).

More specifically, Handy (1986) describes the cultivation of Hāmākuapoko at Maliko Stream as follows:

> The deep gulch of Maliko Stream widens at its seaward end into a flat-bottom valley which, in pre-sugar days when the stream had constant flow, harbored a number of terraces. The gradually rising land of Hamakuapoko in earlier times would have been suitable for dry taro not for wet. It was probably well populated and cultivated, for the *kula* land east of Maliko was a small patchwork of *ahupua`a*. (Handy 1986:109)

According to Handy's descriptions, Hāmākuapoko would have been well populated by Hawaiians along the *makai* sections of the gulches and streams, which provided adequate soil conditions for cultivation of a variety of plant resources. Successful cultivation and the continued flow of the water resources would have sustained a substantial population. However, the landscape *mauka* would have been covered in native forest vegetation and unsuitable for long periods of habitation.

C. Legends Associated with Hāmākuapoko

Only a few legends were found with direct link to Hāmākuapoko. The first legend is of Kihapi`ilani and his sweet potato patch. The legend of Kihapi`ilani and his sweet potato patch has been written at extent by both Fornander (1917) and Kamakau (1961), although there are noted differences in the stories location.

Kihapi`ilani came to rule Maui by killing his older brother who was first born successor. Kihapi`ilani is often remembered on Maui for his stupendous leap from great heights into a pool of water (*lelekawa*), and for building a paved road around the island of Maui (Beckwith, 1970). Because Kihapi`ilani was an actual figure, much of the legend is said to be based on historic events. Fleeing from the ill treatment of his older brother, Pi`ilani, Kihapi`ilani runs to Makawao where he takes up residence with a woman and her family, all the while keeping his identity secret. He lives peacefully for a time in a place called Kalaniwai. When his wife's family begins to complain of his laziness, Kihapi`ilani travels to the lowlands of Ha`ikū, he learns how he can take revenge on his older brother. He takes the sweet potato stalks back to Kalaniwai and plants his famous sweet potato patch, after which he continues on to Wailuku to pursue his brother (Forrader 1917: 236-242).

In Kamakau's version, Kihapi`ilani is represented more as a supernatural figure with legendary strength who runs to a place on the boundary of Kula and Makawao. It is here where he plants his great patch of sweet potatoes:

> There was a famine in Kula and Makawao, and the people subsisted on *lulele, pualele, popolo,* and other weeds. One night Kiha-a-Pi`ilani went to clear a patch of ferns to plant sweet potatoes, and on the same night he made a large one that would naturally require the labor of eight men to clear. When morning came, the hedge patch was noticed, an immense one indeed. The people said skeptically of this great undertaking, 'Where will he find enough sweet potato slips to cover the patch?' Next day Kiha-a-Pi`ilani went to Hāmākuapoko and Hali`imaile to ask for potato slips. The natives gave him whole patches of them wherever he went; [they said]. He went to clean a number of morning glory-veins and returned. Two owners who gave him the contents of their patches had gone home. He pulled up the vines and whatever potatoes adhered to them, and allowed them to wilt in the sun. After they had wilted he laid vines on the, and tied them. He went on doing this until he had enough load for ten men to carry. Then he made a carrier (*`awe`awe*) of morning-glory vines, placed the bundles of slips in it, and lifted it with great strength onto his back. The sunshine beat down on his back, and the *`uki`ukiu* breeze blew in front of him, the `Ulalena rain added its share, and intense heat reflected from the *`ulei* vines (Kamakau 1961:24).

Kamakau places Kihapi`ilani's sweet potato patch and the events of the story within Hāmākuapoko, although Forrader's account places the figures more within the boundaries between Makawao and Ha`ikū, on the border of the two Hāmākua districts. The legend is significant in that it illustrates the importance of sweet potato in Makawao, which continued to play a critical role in Makawao throughout the historic period (Sterling 1998: 99).

The two Hāmākua districts are further mentioned in a chant written by Ke-a-ula-moku. Ke-a-ula-moku, son of Ka-ua-kahi-akua-niu and Naohaku, was an acclaimed composer of chants and a celebrate man of Kalani`opu`u's day. While traveling back to Hawai`i island with Kalani`opu`u, Kā-a-ula-moku was homesick for the two Hāmākua

districts of Maui, where he had lived with Kamehameha-nui and Kahekili. His love for Hāmākuapoko and Hāmākualoa was further expressed in lines from the following chant:

Alo—ha, alo—ha—	Affectionate longing, affectionate longing,
Aloha wale o`u maka—a la—e o`u	Affection for my (foster) parents, my parents,
Aloha wale o`u makua	Affection for my parents
Mai na `aina Hamakua,	Who belongs to Hamakua,
He mau `aina Hamakua elua,	The two districts of Hamakua,
No`u mua kaikua`ana i noho ai,	Where my elder brothers live.
He ala pali na`u he mau ali`i ia,	My hillside trails are theirs to rule,
O ka hanai ana komo kā aloha,	They nurtured me until I loved them;
Lele hewa au i he mau kaikua`ana—e	I find myself with other elder brothers
`A`ole—he mau mea `e wale no o laua.	Who are not the same to me.
...(Kamakau 1961: 112).	

Kamakau (1961) also referenced Hāmākuapoko as one place where chiefs would send their men to gather people for shark bait:

> Some of the chiefs under Kamehameha, such as Alapa`i-malo-iki and Ka-uhi-wawae-ono, were murdering chiefs who did not keep the law against killing men, but went out with their men to catch people for shark bait. If they found a man or even a woman out at night they would kill him and keep the body until it decayed and used it for shark bait...At Keala and Kalahiki in South Kona, at Hāmākuapoko on Maui, and at Pu`uloa on O`ahu, people were killed by them for shark bait (Kamakau 1961: 232).

It is also in Hāmākuapoko that residents were most aware of possible shark attacks. As such, Kamakau (1964) also indicated the tremendous respect for sharks, given by Maui residents. As he explains:

> This is the main reason why the people of Maui worshiped sharks–in order to be saved from being eaten by a shark when they went fishing. At Kaupo, Kipahulu, Hana, Ko`olau, Hāmākuapoko, Ka`anapali, Lahaina, and Honua`ula a fisherman was in danger of being devoured by a shark when he was out fishing with a dip net (*`upena `aki`iki`i),* or setting out fishnets (*lawai`a `upena ho`auau),* or whichever kind of fishing a man would be doing alone. (Kamakau1964: 78)

It is further mentioned that Maui residents would not eat shark meat out of respect. Those who would indulge in a taste for shark meat were considered, *malahini* or foreigners (Kamakau 1964: 78).

D. Early Historic Period

The Māhele

The *Māhele* records of the 1840s and 1850s indicate that Kekauonohi (great granddaughter of Kekaulike, former King of Maui) received the *ahupua`a* of Hali`imaile (LCA 11216), which included some 4,260 acres at "Hāmākuapoko" (Indices 1929). At the

same time the east half of Hāmākuapoko became government lands with the western half awarded to W.P. Leileiohoku (Indices 1929). Leileiohoku's portion of Hāmākuapoko was later "surrendered in leiu of commutation" (Indices 1929) for other lands, which made virtually the entire Hāmākuapoko District/*ahupua`a* government lands. Thus, no Land Commission claims are recorded because it was all government-claimed land (Masterson *et al.* 1997: 5). Majority of the *kuleana* LCA were awarded north of the proposed trail areas, within the present Makawao Town. Settlement in the areas of the proposed project areas would have been difficult as a rest of the high forest density [personal communication with Bob Hobdy, December 18, 2002].

Traditional Land Use Patters

The project areas was undoubtedly native Hawaiian forest. During traditional Hawaiian times, the area was probably sparingly utilized for forest resources. Typical trees and vegetation in the area included *koa*, sandalwood, *`ohi`a lehua, kukui and ti.* Procurement of forest resources such as sandalwood and *koa*, bird feathers, medicinal plants, and possibly alternate food source during times of famine would leave little or no evidence of such activities. However, clearing of the forest for pasture or other uses is quite evident. The proposed trail corridor was once a sandalwood and *koa* forest [personal communication Sam Ka`ai, January 13, 2003] for which Hawaiians would gather *koa* stumps for canoe making. Logs were cut and soaked in Maliko Gulch in preparation for transportation downstream to the oceanfront where the shaping would occur. During Mr. Sam Ka`ai's translation of Makawao, he mentioned the culture of canoe making in the Makawao forest:

SK: There are many *wao*–when you look up land names, like Owaomulimuli, usually get one high mountain like this and then get a break, like a break in the wood, that is called the muddy place. *Mulimuli* is mud–*owao*–Hawaiians talk about that, usually no can plant–place where you can plant stuff is where get mud, above that the soil is too one kind, too mineralized rather than–top soil is mixed right, with organic material, not organic material, but the basics. So Makawao usually means to perceive the inner forest. Place where you can see in the inlands. Okay the area above where the school is had *koa* trees and they were cut by the Hawaiians and pulled to where we call Makawao, and thrown in the river, or rather thrown into the mud banks of the river, so that it [the stumps] wouldn't dry.

CSH: So they were throwing the–

SK: You adze the tree, you drag–from up there, you drag down here, and then you rest it in a cool place, no wind blowing on top, cover `em with mud or in the trench, and you fill `em up with water, for one year.

CSH: To retain the moisture?

SK: So that thing no crack. And then that became a major station for roughing and shaping. You did more roughing and shaping, to bring down, there and that's where you rested. In case you were rained out–Makawao can be rainy–instead of going all the way down to the lowlands, for drying out, you would cross the mountain–you know the gulches–and come towards once a place called Pukalani. It had a hole in the heavens so the rains did not fall as

much–and here you could dry up. So here *mauka* is a place where they gathered the *māmane, ulupua* and *kauwila*–those hardwoods. But cattle came in so quick that all these trees were gathered up as firewood for the plantation, and finally those trees take so long for grow, they disappeared from the scene. Now above a certain line, above four thousand feet, all of those trees–there were no trees, it was just grassland, so it was called Kula–it is usually found in the arid, leeward side of an island.

By 1873, the *koa* of the lower forest of Haleakalā was severely depleted. Deforestation would have created an environment suitable for cattle ranching, where cattle were not quite so sensitive to temperature, rainfall or soil conditions. Native plants were quickly overtaken by introduced species or suffocated out of existence. Mr. Sam Ka`ai elaborated on the subject of the deforestation of native plants and indicated that many of the trees that replaced the *koa* and *`ohi`a lehua* were resources that could provide for industries:

CSH: You were talking earlier about the *koa* trees in Makawao forest and it being there for canoe makings.

SK: Most of it was *`ohia*. I know on the back part of the road–Omaopio used to be another reason for call *melemele* is because you had pua melemele, the yellow *`ohia* used to grow up there. Now it's all guava and *waiawī* and–remember the cattlemen brought in ninety different kinds of grass. You see this man who died here, he brought in some of the best grasses–[kukuiū?], which is from Africa and Buffalo Grass, which held the soil together. He came and saw a solution–some of the grasses they made and was killing off the Hawaiian grasses, like *`uki`uki* that goes straight up. *Pili* grass, go straight up. The cattle knock `em over–easy for knock over and then they become furrows of dirt. So these grasses took over to save the flooding off, because the cattle, the weight was smashing the ground and making it all loose. Von Tempsky moved up here and ran cattle, and then he brought in the Wattle tree because of the bark–it was good for tanning leather. To create a local industry. But then they didn't use it and it became a weed up here. Hāna, Hāna Plantation–you know they took out all the trees and so all the trees come back up, now African Tulips. It was brought in because it was the [inaudible] that made up life jackets. When Hawai`i was more marine orientated, when the Sandelwood mountains they grew that, and then the second row they developed Kepa from India–the cotton tree they call that, to make up life jackets. Now that is a weed growing all over Hāna. It is reforesting the areas. The forest that is growing in Hāna is not the native forest. It is not the *`ohia* that was there and the *lauhala* that was solid along the coast like Nāhiku.

CSH: Did they eventually clear all those *koa* trees or–

SK: *Koa* was a sellable wood, so you cut every sellable wood to make money. Then they tried to replant and it didn't come back fast enough. Hawaiian roots take too long. So then they did research and in the 1880s they–by 1900s it's heavy already–it's *kalipa* or Eucalyptus. Fast growing hardwood. Of course, it's very combustible. Very burnable. But we don't have that problem because they plant `em in very wet areas. But upper Kula no trees grew–no trees at all. So then they put in the black forest. The Scotch came in and then they put in

Gorse.

The decline in native forest in the vicinity of the Waihou Springs area is further demonstrated on a 1872 map of Makawao (Figure 6). By the 1870s, the Waihou Springs project area was probably cleared pasture land, with little to no native vegetation. The only tree indicated in the vicinity of Waihou is a 'lone *koa* tree', located *makai*. The area in the vicinity of the proposed Kahakapao trail, however, still appears to be planted in *koa* and *`ohia* (Figure 7). Also indicated on the 1873 survey map is the old Haleakalā trail, which was historically the primary route from Makawao to Haleakalā.

E. Hāmākuapoko 1900s to Present

Ranching was to eventually dominate all land use within the project area and the upland slopes of Haleakalā. Clear cutting and burning of sandalwood continued well into the mid 1800s, which greatly impacted the landscaping of the area. Numerous Portuguese worked as woodcutters in the area, cutting wood for Pā`ia Mill:

Informant: My grandfather was a woodsmen. He cut wood for the plantation because the mill used to run with wood–with steam. So had plenty Portuguese in those days was all wood cutters. My grandfather used to own all this over here. He was a farmer. But my other grandfather, on my father's side, he was a wood cutter for the mill.

CSH: What mill was that?

Informant: Pā`ia Mill.

The continued clearing of the forest trees over a century had taken its toll, and in response to remedy the situation, the Makawao Forest Reserve was established in 1908. The forest reserve was sanctioned off for watershed protection and included approximately 2,093 acres.

Also during the early 1900s, gorse was introduced in the upland forest of Hāmākuapoko. Gorse (*Ulex europaeus*) is a spiny, evergreen exotic shrub which can grow up to 15-feet tall and 30-feet in diameter. In a single gorse plant, there can be hundreds of pods which eventually burst and expel thousands of gorse seeds. The roots are very extensive and can live underground for over thirty years. Gorse branches end in a spine and are covered with green, scale-like prickly leaves (King County 2003). It is here say that the individual who introduced the gorse was identified during a confrontation at a local bar, as Mr. Sam Ka`ai had indicated in the following transcription:

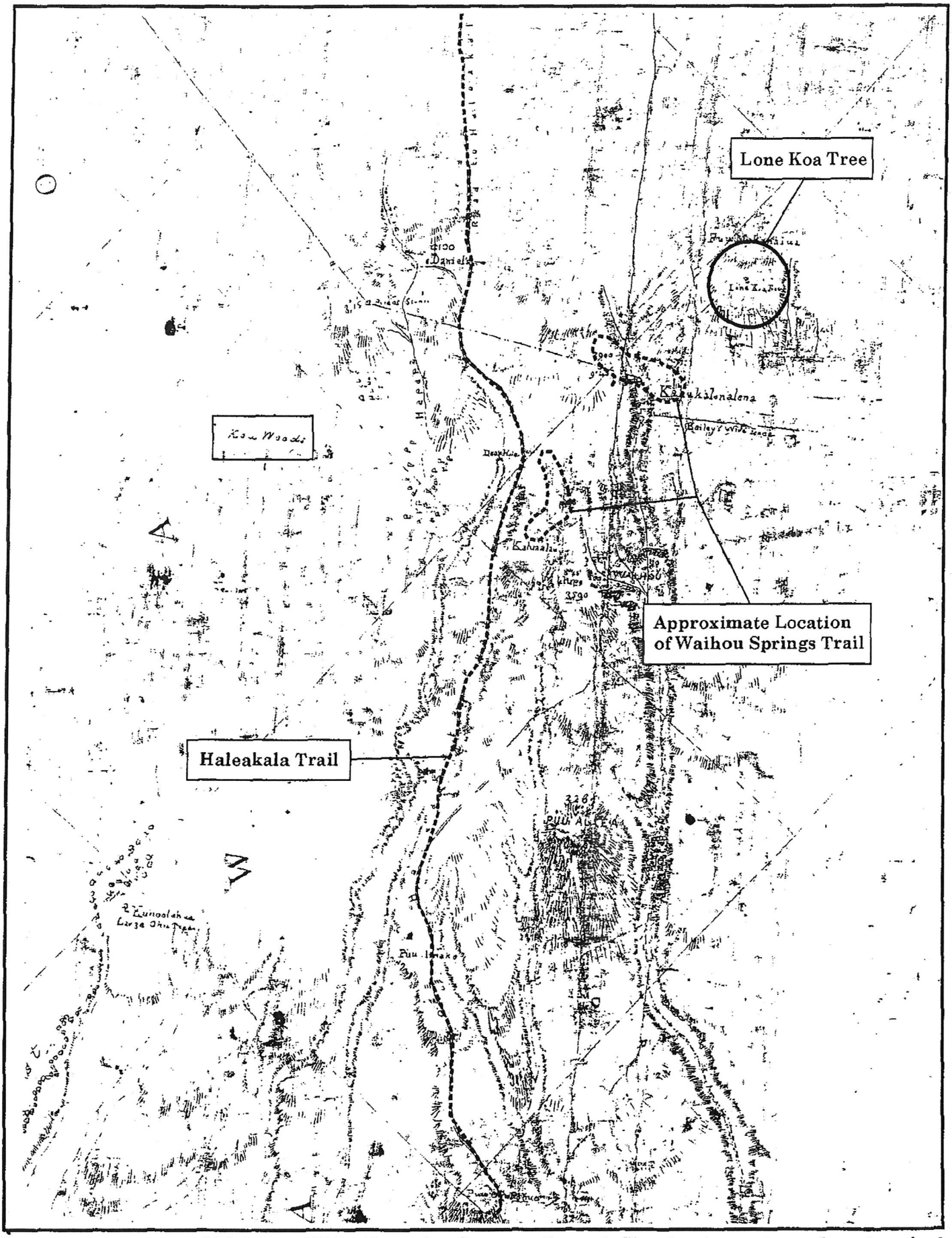

Figure 6 1872 map of Makawao, W.D. Alexander, Surveyor-General, Showing Approximate Location of Kahakapao Lobp Trail and Forested Areas.

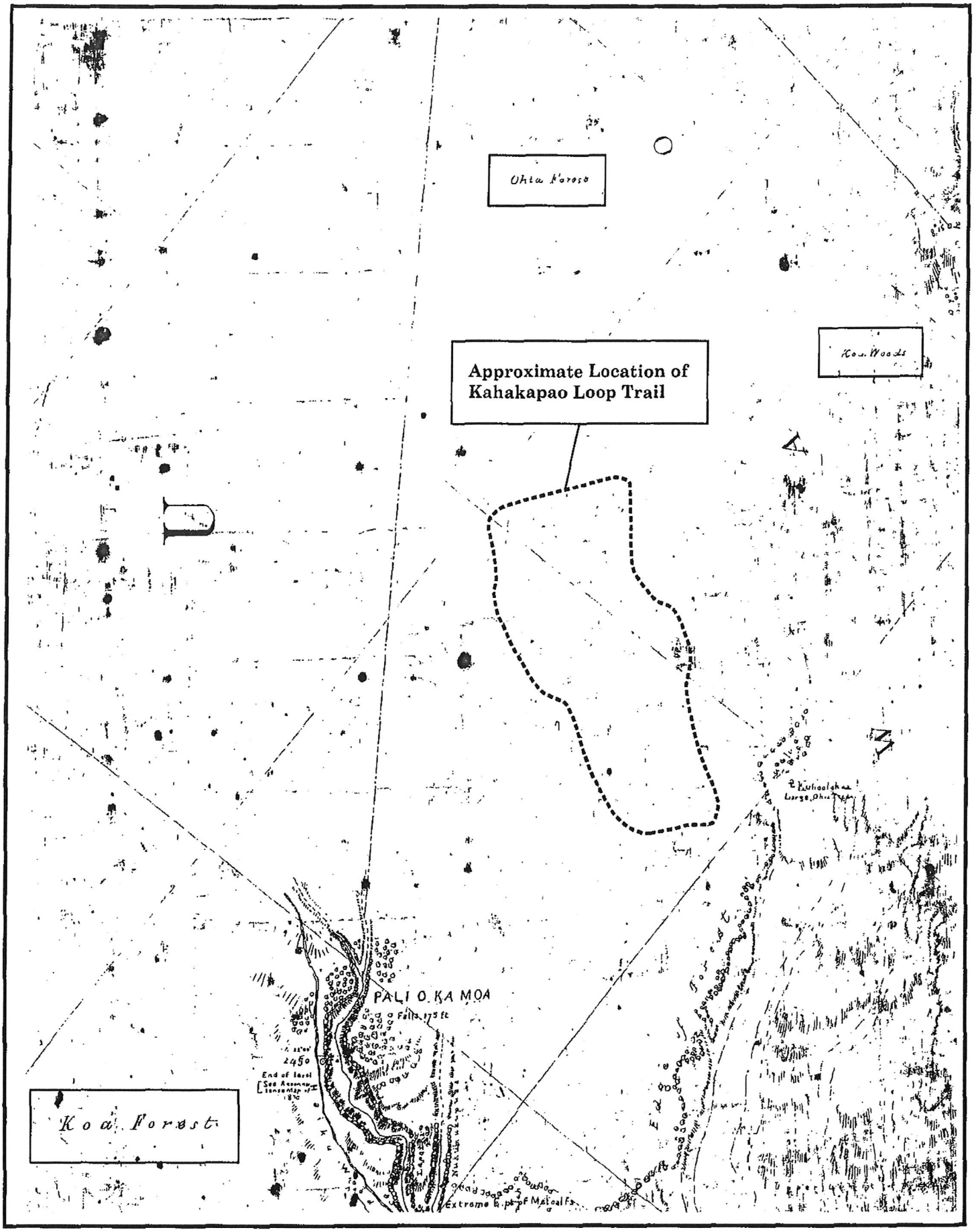

Figure 7 1872 Map of Makawao, W.D. Alexander, Surveyor-General, Showing Approximate Location of Waihou Springs trails area, Haleakalā Trail, and areas impacted by deforestation.

CSH: What was that Gorse for?

SK: Well, I have tried to find, somebody had one–it was kind of in Hawaiian and then there is supposed to be an English copy about a fist fight between two Scotchman in the Wailuku Hotel. There were two old men. One went after the other with a stick and the other one [inaudible] him for it. And they were senior gentlemen in their sixties and seventies when it happened. There is a Hawaiian person who got a hold of the records–I don't want to mention his name because I don't want to pick on the family. And the fight was, the guy said he had brought in the Gorse.

CSH: Who brought in the Gorse?

SK: One of the Scotchman. And the other one said, "you damn fool who brought the scourge of Scotland here." And then they just went after each other–the two old guys. The two old guys, who were senior gentlemen. But the description about who brought the Gorse–.

Gorse is native to western and central Europe, where it is has been cultivated for centuries as hedgerows and livestock forage. Mr. Sam Ka`ai suggested that gorse was also introduced to Maui for similar reasons:

SK: The Gorse in Scotland was a wide bush–you trim it and you make hedges out of it. And they are the original *pānini,* the pen of prickles. It's all over New Zealand. It takes over all kind of pasture. You cannot clear it, the Scotch brought it! You cannot clear it with a bulldozer. The shoots will stay in the ground fifteen to twenty years. So now in the areas around Lake Kaupō that thing was really really bad. And in the re-cleaning, they brought in spruce. California Spruce. And they grow those trees, and today New Zealand is the largest artificial forest in the world. Now why? Because Gorse took over and by growing spruce the tree grows faster, cuts the light off and the gorse dies. So up here they grow Japanese Blackpine to cut off the gorse. But gorse was a hedge rows in Scotland and you trim it and the sheep couldn't go through. That's how the paddocks were measured, by gorse fencing. And when you get free labor to go out and cut the gorse–it's all needles, terrible job, the minute you abandon the land, the gorse grows outward. You see, it's one of these clever things.

CSH: They brought the gorse here for the same reason?

SK: Deliberate! That man said, "I brought the gorse here." And the other Scotsman got up and told him he was a damn fool. For the same reason, to make hedges in the upland. This is the cleverness of the European mind introducing the change of industry!

By the 1930s, the gorse had spread uncontrollably. The second informant interviewed also commented on the nuisance nature of the weed:

CSH: Oh so they used to grow the gorse to make bushes.

Informant: Yeah, but this thing get seeds and the seeds–and on a hot day the seeds can fly twenty to thirty feet away, and that things just keeps spreading and spreading. So when Tam got real old and he felt it was his last days on earth, then he hired somebody and started cleaning this all up and raising cattle. So you hardly see the gorse now.

Majority of the forest area was set aside as homestead programs in the 1950s, including the Haleakalā Homesteads and the Olinda Houselots. A 1907 map by Walter E. Wall shows the homestead area of Haleakalā and Olinda. Also indicated on the historic map is the old Haleakalā horse trail, located southeast of the proposed Waihou Springs Trails (Figure 8).

In an effort to eliminate the gorse, a state territorial prison camp was also established in 1953 [personal communication with Bob Hobdy December 18, 2003] located near the present Olinda Homesteads, and adjacent to the proposed Waihou Springs Trails. Low-security prisoners were brought to Maui from overcrowded O`ahu prisons, with the primary purpose of clearing the overgrown gorse areas. The Olinda prison facility was located on 114 acres of Haleakalā land (Figure 9) and initially housed approximately 30 prisoners. A portion of the western segment, where the existing trail is accessed from Olinda Road, was the location of a large recreational ball field for the prison camp, which is now covered by the existing pine forest. In addition to clearing the gorse, prisoners grew vegetables for shipment to Honolulu (Maui News 1942: 1). In the early 1950s, Olinda prisoners had also undertaken the job of linking the road to Kahakuloa with the highway that extends beyond Lahaina, making it possible to circle clear around the West Maui block of mountains (The Honolulu Advertiser 1955: A4). By the mid 1950s, majority of the gorse had been eliminated. Issues pertaining to the sanitation of the facility, the increase number of escaping convicts, and the lack of budget for maintaining buildings eventually forced Olinda prison camp to close in 1973.

In response to the declining remnant forest, the State Division of Forestry began a tree-planting program in the Makawao area in the 1960s. Tree planting consisted primarily of eucalyptus, various pine and tropical ash. As a secondary measure, the tree planting also served to keep the gorse weed down by shading it out of existence. The second informant interviewed had participated in the reforestation in the early 1960s and mentioned the following:

Informant: And then inside here, I going show you, had one big garden, the State had, I work for them little while. They raise trees. Ninety-percent of the trees they raise was–Taeda pine, Sugi pine, and some other kind. This is one ancient tree right here–[laughing].

CSH: One telephone pole [laughing]!

Informant: And eh–we used to raise them there, in the building, as seedlings, and then when they come about one foot tall we take them outside–and then from there, when come about two three feet high, we take `em in the trucks and we go Waipoli, above Kula.

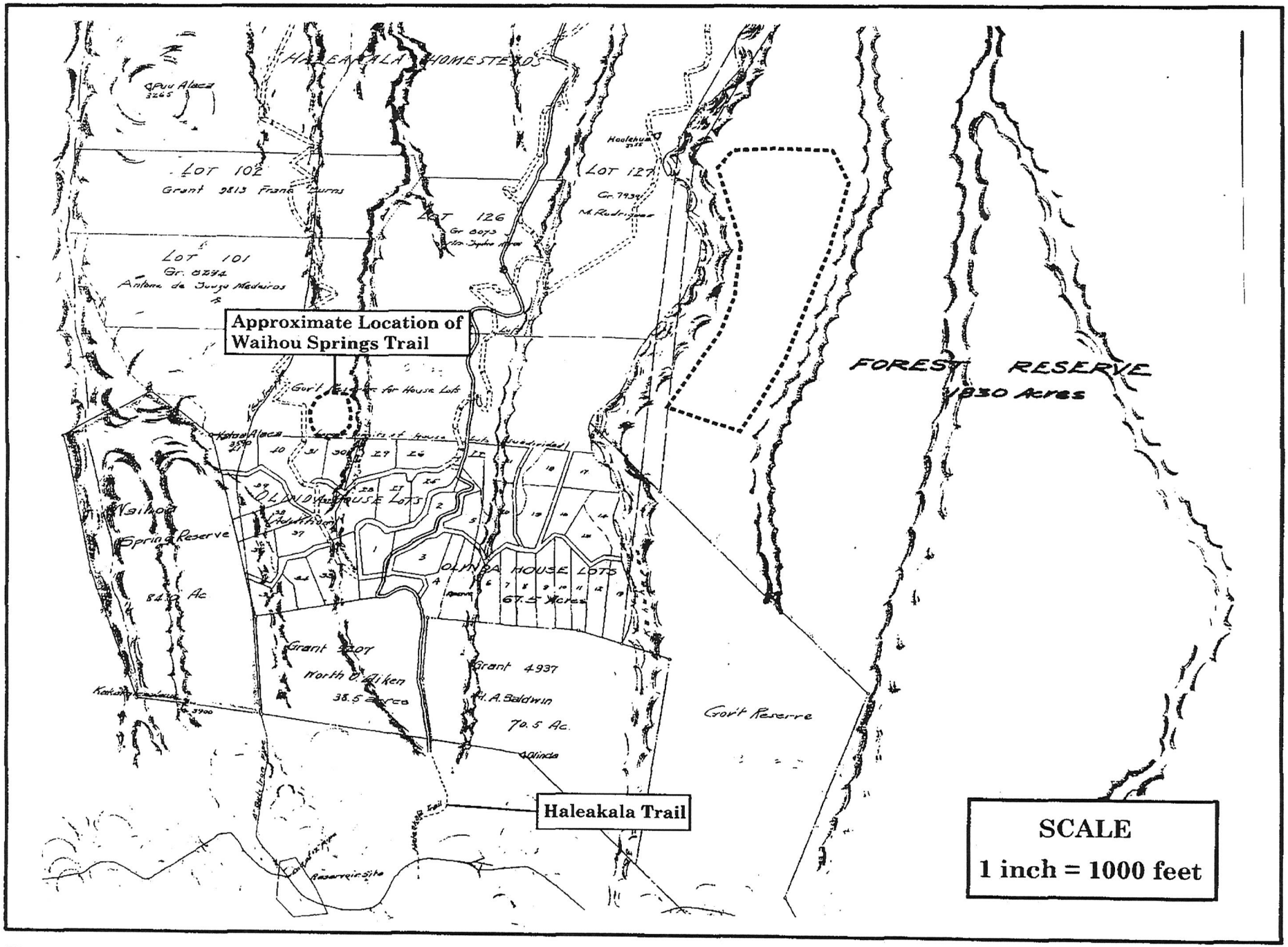

Figure 8 1907 Map of Makawao, Walter E. Wall, Surveyor, Showing Approximate Location of Kahakapao and Waihou Springs project areas.

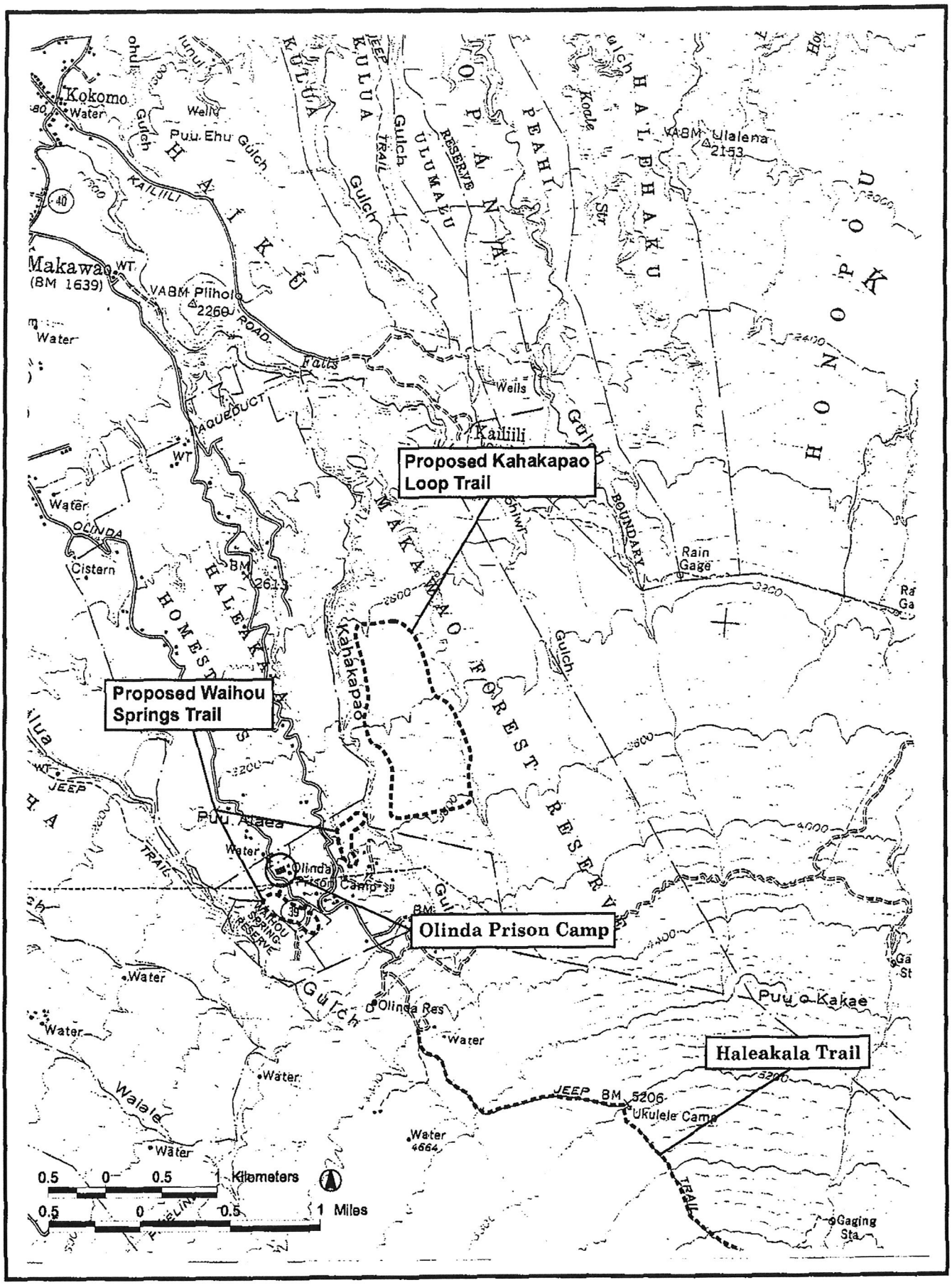

Figure 9 1957 USGS Topo Map, showing locations of Olinda Prison Camp and Haleakalā Trail.

D-33

We take `em up there we plant, no more even trees up there, that place was all open and dry area. So, they figure they going plant trees there and going attract the clouds, they going hold the clouds for rain, for moist.

CSH: Oh for the moisture.

Informant: Yeah–only thing, they went plant the wrong kind trees [laughing]. Pine trees–pine trees no attract the moist. Like they did in the Makawao Forest Reserve–they destroyed everything that was natural and go plant eucalyptus. You can tell this was planted because the kind of in rows, yeah. And then when you go up Polipoli, by the cabin, by what they call hunters cabin, from there you walk down the trail, you going come to one redwood forest–we used to go there every six months for trim the trees, for trim the branches. This is *poha*, you know what is *poha*?

The house in which they raised the seedlings would have been adjacent to the existing Waihou Springs Trail. The house is no longer in use, but remnants of its existence still remain. In addition to planting pine, the State had also attempted to raise insects in the same garden house in hopes that it too could help eliminate the gorse:

Informant: Not yet. This road was made, when they decided to make this a nursery–this land was given by–I forget who went give this land to the State, and then they decided to make one nursery and then they made this road, they made the nursery in there. And then one guy, one caretaker, he used to live up there, get one house up there–then caretaker and the warden from the prison afterwards, they used to live over there. After that, when I was working for the State, we used that to raise bugs, you know. They wanted something to kill the gorse, so they raised one kind of moth that they said would kill the gorse, that they would put a web all around the gorse–never work out!

CSH: Oh the moth–?

Informant: Never work out. They let the moth go and you never see `em no more. And then couple other bugs were raised up there–just like we no more enough bugs around here. Okay, from here on that was the nursery. Used to be one gate here. Right inside there is where we used to plant all the trees, after came out of the seeding room. This is part of the trail you are talking about.

In 1986, the Olinda prison facility was converted into a state-of-the-art captive bird propagation facility. The Olinda Bird Sanctuary is home to a flock of endangered *`alala* and nene, as well as other bird species in danger of becoming extinct.

Today the major agricultural activities in upcountry Maui and areas in the vicinity of the project area are livestock grazing, truck farming, flower production, and orchard crops. The forest reserve has been used in recent time for recreation and hunting. Pig hunting is still popular within the forest reserve, although the number of pigs have declined in recent years as a result of residential developments. Additionally, changes in weather conditions over the last fifty years have affected the flow of water in the area and majority of the gulches and natural springs are dry.

IV. PREVIOUS ARCHAEOLOGICAL RESEARCH

The earliest documented archaeological study in the Hāmākuapoko was conducted by Winslow M. Walker (1930) in the early 1930s during his Maui island archaeological inventory survey. Walker identified and described over 200 *heiau* on the island of Maui, many of which were previously destroyed. In Hāmākuapoko, Walker recorded one *heiau* located "near Kailua Gulch half a mile west of the Paia Road" (Walker 1931: 152). Walker identified the *heiau* as Site 58 and described it as "a platform 50-80 feet and probably destroyed in cane" (Walker 1931: 152).

Recent archaeological investigation in upcountry Hāmākuapoko are rare, however two archaeological studies most relevant to the present project areas were identified. In 1988, an archaeological inventory survey was carried out for the proposed 36-inch waterline starting at the Olinda Water Treatment Plant, northeast to the Waikamoi Reservoirs. The water main is located one half of a mile south of the proposed Waihou Springs trail and two miles south of the proposed Kahakapao Loop trail. The archaeological investigation indicated no evidence of historic sites (Estioko-Griffin 1998). A second study was carried out for the proposed Kahakapao Reservoirs located approximately one and one-half mile west of the proposed Waihou Springs trails and two and a half miles south of the proposed Kahakapao Loop trail. The reconnaissance survey identified no archaeological sites within the project area (Borthwick 1990).

The remainder of the archaeological studies conducted in Hāmākuapoko are situated *makai* or north of the present Kahakapao Loop and Waihou Springs trails project areas. Two documented burial sites located well to the northeast of the current project areas were identified during the archaeological background research. The closest documented burial site is located more than 15-miles northeast of the current project areas. State Site 50-50-06-2922 is a cluster of grave monuments and an isolated grave (Donham 1992). Additionally, a burial pit (State Site 50-50-05-4502) was also documented during monitoring for the Ku`au Beach Subdivision, located over 25 miles northeast of the current project areas (Masterson 1997).

No archaeological studies have been conducted directly within the Kahakapao Loop and Waihou Springs trails project areas, or immediate vicinity. Table 2, however, provides an account of previous archaeological studies in the vicinity, and indicates the source, the State Site Numbers (if applicable), the location of the study, the type of study conducted, and a brief summary of the author's findings.

Table 2. Previous Archaeological Studies Conducted in the Vicinity of the Kahakapao Loop and Waihou Springs trails project areas

Source	State Site #	Location	Nature of Study	Results
Walker 1930	Site 58	Near Kailua Gulch half a mile west of the Pā`ia Road	Inventory Survey	Said to have been a platform 50-80 feet. Probably destroyed in cane.
Asdic-Griffin 1988		Waikamoi Reservoir to Olinda Water Treatment Plant	Inventory Survey	No evidence of historic sites were found.
Borthwick 1990		Kahakapao Reservoirs	Reconnaissance Survey	No evidence of historic sites were identified.
Donham 1990a	50-50-10-1709 through 1711 and 50-50-10-2512 through 2524	Pi`ilani Residential Community	Inventory Survey	Sixteen sites with 30 component features were identified at the end of the survey. Three of the sites had been previously identified. Findings included nine terraces, seven enclosures, four C-shapes, four rock piles, two platforms, two midden scatters, an alignment, and a modified outcrop. Limited subsurface testing was conducted at five sites.
Donham 1990b	50-50-10-2475	Pi`ilani Residential Community	Data Recovery Program	Initial inventory survey conducted in May of 1989 indicated two possible human burials. Data recovery conducted a year later found no human remains present . A revised interpretation of the site was made and the authors indicated a possible terrace complex associated with dryland agriculture.
Donham 1990c		Upcountry Maui High School Sites	Inventory Survey	Five potential Upcountry Maui High School sites were investigated. No archaeological sites were identified.
Donham 1992	50-50-06-2922	Upland ridge separating Honopou and Ho`olawa drainage system	Burial Documentation	A cluster of grave monuments and an isolated grave was identified and described.

Source	State Site #	Location	Nature of Study	Results
Masterson *et al.* 1997	50-50-05-4502	Ku`au Beach Subdivision	Monitoring Report	One burial pit (50-50-05-4502) was identified and recorded. No burial was exposed and the new road embankment was constructed as a raised berm of imported soil to secure the area from erosion and further disturbances.
Kawachi 1997		Northwest slopes of Haleakalā	Archaeological Site Recording	Initial investigations identified three post-contact Chinese agricultural sites (Watanabe 1996). The current study reports on the recordation and limited excavation of the three sites. Four previously unidentified sites (three terraces and a modern road) were also documented.
Fredericksen 2000		Hanawana Valley	Inventory Survey	A previously identified agricultural complex with possible habitation features were investigated. One charcoal sample was extracted from a large terraced area. Radiometric analysis yielded a date range of AD 1425 to 1665. Additional archaeological study was recommended.
Shideler *et al.* 2000		Ulumalu-Peahi Water System	Inventory Survey	No evidence of significant cultural resources identified.
Bushnell *et al.* 2001		Kahui Pono L.L.C. Roadway Access Easement	Traditional Practices Assessment	No ongoing cultural activities or historic sites were identified.

V. CULTURAL RESOURCES/TRADITIONAL PRACTICES

A. Native Gathering Practices for Plant Resources

In traditional times, the project areas would have been covered in native forest including *koa (Acacia koa)*, *`ohi`a lehua (Metrosideros polymorpha)*, *ti (Cordyline fruticosa)*, and *kukui (Aleurites moluccana)*. Over the last two century, however, deforestation for industrial purposes had dramatically altered the appearance of the forest. Logging in the mid to late 1800s resulted in the elimination of majority of the forest trees, which was later followed by cattle grazing in the early to mid 1900s. The introduction of gorse (*Ulex europaeus*) as hedging material in the early 1900s further added to the rapidly declining native forest. By the mid 1950s, the gorse had spread uncontrollably, killing majority of the remaining native plants. In response to the problems of deforestation, the State began a tree-planting program in the early 1960s, at which time eucalyptus, various pines and tropical ash were planted. As a result of the continued abuse of the forest area, many of the native plant species that may have occupied the project areas no longer exist.

No threatened or endangered species were encountered in the trail corridor areas during the environmental assessment. However, *mahoe (Alectryon macrococcus)* is a Federally listed endangered species and is known to exist within the Makawao Forest Reserve area. Mr. Bob Hobdy of the Department of Forestry and Wildlife mentioned that *maile (Alyxia olivaeformis)* and *`ohi`a lehua (Metrosideros polymorpha)* also exist within the forest reserve areas, and further indicated that limited flower picking are known to occur in areas *mauka* of the proposed Kahakapao Loop trail [personal communication with Bob Hobdy December 18, 2002]. Non of the informants interviewed indicated any knowledge of ongoing plant gathering in the project areas.

Based on the botanical survey, as well as informant testimonies, it is believed that there is no ongoing gathering of plant resources within the proposed trail corridor or immediate vicinity.

B. Native Hunting Practices

In historic times, hunting would have been an essential component of everyday life for residents of Makawao. The second informant interviewed was born and raised in Makawao, and is a third generation pig hunter in the Makawao forest area. He had indicated that his father made very little wages and hunting was a necessity to his families survival. He further mentioned that pig hunting continued to be an important activity for him, even when he was raising his own family. However, the convenience of local supermarkets quickly replaced hunting, and today his children know very little about hunting practices. Below, he discusses his recent retirement from pig hunting:

Informant: No–I getting too old already. You know like my doctor says, "someday they going find you dead in the woods." I said, "so what? I gotta die someplace." And no more as much pigs as used to get. I tried many times to quit hunting–because my kids all grow up, and they marry other kind people. Two of my daughters married *haole*–you bring one pig home they say, "eh what is that dad?" They rather go to the supermarket go buy–so, I catch a pig, I bring `em home, I clean `em, I make smoke meat. I tell them, "You guys, get some

meat come get!" They tell me, "Eh–no need, we get from the last time, yet!" I bring `em home I make *laulau*, "you guys like *laulau*?" "Yeah okay we like." "Okay, how much you like?" "Give me three `nough." I made eighty, what the heck am I going to do with eighty? So afterwards, I catch one pig, I come through Makawao town, I look for one Filipino, I tell `em, "you like this pig?" "Oh yeah." I go give `em to him. Afterwards I think–what am I doing this for? Shoot–it's not a must anymore. Like I raised my family almost the way my father did–although I became an ocean man afterwards–fish, pig, goat–that's how I helped raise my family.

CSH: Times have really changed, now, yeah?

In addition to pigs, the informant also mentioned the abundance of pheasants in the Makawao forest area:

CSH: And had pheasants up here you said?

Informant: Oh, choke with pheasants. In fact till today some guys shoot in the fields around here. I get one guy, he one pheasant hunter right now, one of my friends, he brought me about twenty birds already. About twenty five–but I no can eat `em all. I take bout five or ten and then the rest I go give to my Filipino neighbors–they eat `em all, just like chicken.

Pig hunting in the Makawao forest area would have been abundant in historic times, however discussions with local residents and testimonies by informants indicated that pig hunting has declined in recent years due to restrictions in public access and the decline of wild pigs that roam the areas, due to the increasing number of residential developments. Based on informant testimonies and talk-talk story sessions with local pig hunters, it appears that there will be no adverse affects to pig hunting by the development of the Kahakapao and Waihou Springs trail corridors.

C. Trails

The old Haleakalā trail is the only historic trail identified in the vicinity of the project areas. The Haleakalā trail is indicated on a series of historic survey map (see Figure 6 through 8), as early as 1873. The trail is located immediately south of the Waihou Springs trails project area and extends from Olinda, south-southeast to Haleakalā Crater. Prior to the construction of paved roads in the mid 1950s, the Haleakalā trail would have been one of the primary access route between Makawao and Haleakalā. Portions of the Healakalā trail now traverses through private properties and the trail itself is no longer regularly utilized.

In addition to the historic Haleakalā trail, several pig hunting trails were noted in areas adjacent to the Kahakapao Loop trail project area. However, no pig hunting trails are known to traverse either the Kahakapao Loop or Waihou Springs trail corridors.

D. Burials

There is no direct evidence or documentation of burials in the trail corridors or immediate vicinity. Background archaeological research did indicated two burial grounds approximately 15-miles northeast (*makai*) of the proposed project areas (Donham 1992 and Masterson 1997).

E. Cultural Properties

No cultural properties have been noted in the vicinity of either the Kahakapao or Waihou Springs trails project areas. A filed inspection of the area, as well as consultation with Makawao residents, State archaeologists, and a review of historic maps indicated no archaeological sites or cultural properties in the vicinity of the project areas. However, two structures associated with the Olinda prison facility are known to exist adjacent to the proposed Waihou Springs trails project area. The baseball field and garden house are known to have been associated with the Olinda prison facility, which opened in the 1950s and closed in the mid 1970s. Neither the baseball field nor the garden house will be affected by the development of the Waihou Springs trail corridor.

VI. SUMMARY AND RECOMMENDATIONS

A. Summary

A cultural impact assessment was conducted for the proposed Kahakapao and Waihou Springs trails in the *ahupua`a* of Hāmākuapoko. Historic research of the project area was carried out to identify any cultural resources or traditional practices associated with the areas encompassing the proposed trail corridors and surrounding vicinities. An attempt was made to contact present and former residents of Makawao who may have used the areas for cultural practices, as well as various organizations regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the Kahakapao and Waihou Springs project areas.

Formal interviews were conducted with Mr. Sam Ka`ai and an informant long familiar with the Makawao Forest area. Mr. Sam Ka`ai was born in Hāna and currently lives in Pukalani. He has extensive cultural knowledge of the general Makawao areas and is considered one of Hawai`i's living cultural treasures. The second informant was born and raised in Makawao and was a regular pig hunter in the Makawao Forest area.

Historic background research of the Hāmākuapoko area indicated areas *makai* of the project areas, near the gulches, would have been rich in resources and well populated in traditional times. However, the project area and surrounding vicinities would have been covered in native forest including *koa, `ohi`a lehua, ti,* and *kukui,* and unsuitable for long term habitation. Two centuries of deforestation for industrial purposes destroyed majority of the native forest, and by the early to mid 1900s, the project areas was open pastoral land. Also introduced in the early 1900s was the competitive gorse weed Scotsman that was used as hedging material. The gorse had spread uncontrollably by the 1950s, destroyed majority of the native plants that remained. In 1953, the Olinda prison facility was opened with the primary purpose of having inmates clear the overgrown gorse areas. In response to the decline in forest areas and the overgrown gorse problem, the State Department of Forestry began a tree-planting program in the 1960s. Today the project areas consists primarily of introduced species including eucalyptus, various pine and tropical ash.

This study failed to find any archaeological sites within the trail corridors or immediate vicinities. Two archaeological studies have been conducted south of the Waihou Springs project area, however both studies reported no significant archaeological findings.

The only ongoing cultural practice identified in the vicinity of the project area was pig hunting. Pig hunters still access nearby trails to hunt wild pig within the Makawao forest reserve areas, however none of the hunting trails are known to traverse the proposed trail corridors. Mr. Bob Hobdy [personal communication December 18, 2003] further mentioned that pig hunting has declined in recent years due to the lack of public access and the decline of wild pigs that roam the area due to residential developments over the last thirty years.

Gathering for plant resources in traditional times would have been abundant in the project area. However, over two centuries of mass deforestation had changed the landscape dramatically, and majority of the native plants resources that were once gathered no longer exist. *Maile* and *`ohi`a* picking are known to occur within the Makawao forest reserve, however there was no indication during the assessment of any ongoing plant gathering activities.

Based on the historic background research, as well as informant testimonies, the Kahakapao and Waihou Springs trails will have no adverse impact upon native Hawaiian cultural resources, beliefs and practices. The only ongoing cultural practice identified during the course of the assessment was pig hunting, however public access for hunting activities will not be affected by the development of the trail corridors.

B. Recommendations

Although no specific cultural concerns were identified during the course of the cultural impact assessment, the following recommendation is made in the event that inadvertent historic properties, including burials, are encountered during construction of the Kahakapao Loop and Waihou Springs trail corridors. State law (Chapter 6E, Hawai`i Revised Statutes) requires the following:

A. Stop all disturbing activity in the immediate area.
B. Leave all remains in place.
C. Immediately notify the State Department of Land and Natural Resources-Historic Preservation Division (DLNR/SHPD) and the county police department.

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Appendix: Interviews

SK: Okay, let me get orientated–Haleakalā Homestead, which is, extended by where? Makawao. I'm trying to find out where the mountain is. Olinda–.

CSH: You know where the old State prison was?

SK: Where the State what used to be?

CSH: –Ah the State Prison.

SK: Yeah I know where that–so this is above that?

CSH: Yes, above that.

SK: Okay now I am orientated. Olinda Reserve. Water Tank. Kailua–that's the stream. Makawao Forest Reserve. Okay, this all up on top Haleakalā. Ha`ikū `uka.

CSH: I think they two fall in two different *ahupua`a*. The Olinda one falls in–

SK: No, no but the thing about it is that I am trying to find some prominent things around it. Girls School and campus. Where is that?

CSH: I think I have a better map.

SK: That no make sense. I don't know what this is. What is Pu`u `alaea? Unless I have this upside down. I'm looking for some prominent orientation–where the sea, where the mountain, where the north, where the south. Does this mean north?

CSH: Yes, this is north.

SK: Okay, this is the way I'm supposed to be looking at it. So Haleakalā is up here. So this is the *mauka* part behind–. This the place where they get for go look the birds?

CSH: Yes. The bird sanctuary.

SK: Where is that over here?

CSH: It's right over here.

SK: Okay now I know where I'm talking about. This is where the Baldwins are–so this Pi`iholo Ranch area is just below. Okay, perhaps I am not the best person for this area because I am still trying to figure out the name of this road over here.

CSH: Waiohiwi Gulch–that's one of them.

SK: So this is lands above EMI [East Maui Irrigation] ditch?

CSH: Yes.

SK: So this is inside the Forest Reserve?

CSH: Yes!

SK: And what are you trying to know about those things?

CSH: I just want to gain some insight into past cultural activities that were going on in the area and if there still are cultural activities that continue today in the area.

SK: Peter Baldwin and his son run those activities up there, but he owns Kumupio Ranch and that would give him access to knowledge, and he rides through there, and because he takes a ride up there he has bothered himself by talking to all the cowboys, people who knew–all the Portugese who used to go up there. They used to take *koa* trees from the area, and guys hunt into this area. There are some penetrations, which I think it's what you talking about here. Hawaiian homesteads–and there are some people who have bought lands up there. Do you know if these houses still exist?

CSH: I believe so.

SK: Because it looks like there are a lot of houses in there, and I can't even recognize those things.

CSH: When I talked to you earlier, you had mentioned–

SK: I'm still trying to figure out where this road is–you know people along the road over there, but you don't know the–. Where the heck is that Girls School. Okay, I grew up in Kaupō and on the leeward side of Hāna, and I am familiar with the Lahaina and Waihe`e area where I grew up. This needs that special orientations by the horsemen who go up into the trails. Now what are these–are these being preserved?

CSH: No, they want to develop pedestrian trails–not really develop, but they want to clear areas for pedestrian trails.

SK: Okay, access for nature trails. So this is part of developing–so the Makawao Forest Reserve belongs to Haleakalā?

CSH: I'm not sure.

SK: So in other words, the Nature Conservancy has bought this?

CSH: No Nā Ala Hele, who is part of the Department of Land and Natural Resources has received money to make nature trails.

SK: I think there is some pressure to make public access. I believe the older cowboys (like Ikua Purdy)–you know the old *kānaka*, we grew up with them, see, and because of his family he is like a historical person–I know people don't go to him because he is not Hawaiian, but Haleakalā has been there longer, and the people who have worked for them have been around there longer than–they would have more information about

hunting–my brother hunted up there. But to say that they know the names specifically–. What do you have for the meaning of Makawao?

CSH: You tell me, uncle.

SK: There are many *owao*–when you look up land names, like Owaomulimuli, usually get one high mountain like this and then get a break, like a break in the wood, that is called the muddy place. *Mulimuli* is mud–*owao*–Hawaiians talk about that, usually no can plant–place where you can plant stuff is where get mud, above that the soil is too one kine, too mineralized rather than–top soil is mixed right, with organic material, not organic material, but the basics. So Makawao usually means to perceive the inner forest. Place where you can see in the inlands. Okay, the area above where the school is had *koa* trees, and they were cut by the Hawaiians and pulled to where we call Makawao, and thrown in the river, or rather thrown into the mud banks of the river, so that it [the stumps] wouldn't dry.

CSH: So they were throwing the–

SK: You adze the tree, you drag–from up there, you drag down here, and then you rest it in a cool place, no wind blowing on top, cover `em with mud or in the trench, and you fill `em up with water, for one year.

CSH: To retain the moisture?

SK: So that thing no crack. And then that became a major station for roughing and shaping. You did more roughing and shaping, to bring down, there and that's where you rested. In case you were rained out–Makawao can be rainy–instead of going all the way down to the lowlands, for drying out, you would cross the mountain–you know the gulches–and come towards once a place called Pukalani. It had a hole in the heavens so the rains did not fall as much–and here you could dry up. So here *mauka* is a place where they gathered the *māmane, ulupua* and *kauwila*–those hardwoods. But cattle came in so quick that all these trees were gathered up as firewood for the plantation, and finally those trees take so long for grow, they disappeared from the scene. Now above a certain line, above four thousand feet, all of those trees–there were no trees, it was just grassland, so it was called Kula–it is usually found in the arid, leeward side of an island. So Kula is named after the gold grasslands of the uplands and sweeps down and then does a lateral in the area called Kīhei is called Kula Makai, and over here is Kula Mauka. That is the place you find *keawe* trees today–that arid dry area is also called Kula. So get Kula Makai and Kula Mauka. And right next to Kula Mauka comes–on the Big Island would be like North Kona and–you know towards the overpass road–that's the kind of dryland forest of the hardwoods–the Hawaiians would use to make weapons. There was the *kauwila, māmane, ulupua*–and the place in Makawao, or next to Makawao in the land of Hāmākua Poko, *mauka* part of Hāmākua Poko is called `Awalau. See and I think your area is even–

CSH: Hāmākua Poko I think mine.

SK: Hāmākua Poko and then Hāmākua Loa. So it's called H-Poko–when you say H-Poko they understand, but nobody use the name Hāmākua. Hāmākua Poko is where you are talking about, and `Awalau is a part of it–today they call that area Haiku, but

Haiku is a line–Haiku consists of Haiku Hill, Giggle Hill, Slaughter House Hill and then cut mountain along O`opio Road. That is the dividing line of the *moku* and Māliko Gulch, that was the dividing line–everything on the southern side and west (below Hāli`imaile) belongs to Wailuku Moku and above Hāli`imaile belongs to Kula Mauka. East and north of that line is called Hāmākua Poko–so only the hill area and the village is called, but because they had a plantation there, called Haiku Plantation, all its land became known as Haiku–it's specific name, but they calling the whole area Ka Haiku, and Haiku is only the village–in fact it's only the hill, south of the village. When you come around the coast here, through what is Ho`okipa, which is in the Wailuku District, and you make that turn you see a hill they building houses, this side all pineapple, Haiku is supposed to be there–that hill is Haiku. Ka Haiku means to stand and to speak loudly or proudly–or is the bumps on your back–you know the nobs on your back, that's what those hills are.

SK: Let me show you this paper over here–now this was done by Kepā Maly. Polynesian Editation Corporation, August 1, 1846 to July 26, 1846, then November 14, 1865–now these are about trips taken around this place, describing different Plantation and the views, and back here are all the goddesses, the streams–"[reading]...developed with [inaudible] and associated with the falling rains, M*A*L*I*K*O and ascending falling rains were re-met by Mr. Castle, the chief mill operator at Haiku. Haiku, we saw the mill, the people, they were packing up to come and visit us. We saw–." The name of the rain is U*K*I*U*K*I*U–Ūkiukiu is the rain, " [reading] proudly moving across the top of Pi`iholo...and it is found in an ancient *mele*, spoken here...it says traveling in the presence of Haiku here is Awa`awapuhi Gulch forth in the visiting approach..." Anyway this paper will give you, this paper was given to Peter Baldwin, and it's my only copy. Now let's see here, Pi`iholo Sugar Plantation, it describes that and its elevation and area, how much acres. What we are trying to do is get to the Hawaiian material here–Hawaiian Traveling—1840. Back here you see inside this paper is the name I've been trying to get— it's the two water princesses of this area, you know the *kiha*. In fact, what I should do is let you read this now, turn off your tape.

[Pause]

SK: `Ulalena, `Ula means reddish-yellow, and `Ualena is the yellow rains–which I have a feeling, I cannot confirm, but I have a feeling it was used for [inaudible]. But let's say it was called `Ulalena rains, the reddish-yellow rains, which is, the rain is falling and the light comes through from the dawn, and that is the water spirit, and would be one of the lower manifestations of the kūohu, the cloud of Kāne's involvement— when the rains fall–you see it's Kāne, it's the rains of Kāne falling on the forest of Haumea. Now *hau* means to serve up and *mea* means serving up all things, so Haumea makes the forest grow. So it's also the mist that comes out of the ground, so we associatedHaumea, okay–and the earth is called *papahonua, wāhine papahonua*, but the child spirit, the forest spirit is *wāhine haumea,* she receives the rain and for that she offers all these things up. Now `Ualena rains have this kind of mist–*kuakuokalena* is the mist that comes across the area and has that certain quality of dawn, `ula`ulalena–it's the equivalent to the thing you see in the ocean called *`ehu`ehukai*–when the waves come in and the wind blows the sea back and makes that spray, and you see the rainbows inside that, that is *`ehu`ehukai.* So some people are named `Ehu from *`ehu`ehukai*, the blowing back of the wave, sometimes it's called the red-headed surfer and other times it's called the rooster on the wave, get all kind different kind names–it depends on whose interpreting. So this `Ulalena

get that golden reddish rain, which comes in that mist, that's because the cloud banks are rising, and the rains that fall from that–if the light pictures through, get that color–now that's the physical description. For the Hawaiian, it's coming the enriched breadth of this woman, breathing on the forest–and the other name is very supportive, it's a name of a fern. What's the name over there?

CSH: `Ukiukiau.

SK: Get *`uki`uki* grass–know *`uki`uki* grass, now try remember Hāmākua coast get *`uki`uki*. *`Uki`uki* is one dryland grass? Where you find that kind grass? Mostly in Kona, yeah? So I think `Ukiukiau is more, that's just the rain that comes over, because in the old days also had *`uki`uki* fern–it's one prickly fern. Or it's a fern that we call by a different name, but when come dry the thing all shock, and that's what they call *`uki`uki*. Here in Hawai`i we call the fish *ulua*, you go down to the Tuamutu's, the full size fish is called the *ulua*, we call *pāpi`o* the younger one, yeah–down there get five different names and *ulua* is only [inaudible]. It's all according to the sizes–*purau* for how, because *puahau* is the flower only. Then they have *purau* is the wood, we call it *lā`au*, them they get–you look at the tree it's one name, you look at the stem it's another name, you look at the fruit it's another name–they don't have that so called catch–in other words, with our culture we pick one name, we say *puahau*, the flower of the *hau*, then we say *la`auhau* for the wood–get multiplicities, so it's hard, they say what kind of wood is it, they say *hau*, it's –so same thing up there, it's *`uki`uki* might be the poky-poky grass, but when ferns in summer, when getting to that dry stage, one of the descriptions is poky-poky grass–you know that tangled, you know the one we eat the stems for, it's the home for pigs. That fern, when it's in its dry state–so it might be, and try remember dry fern has that yellowish color, if you talking about the yellowish rain, you know where the formal is coming out–I don't know if you want to use that kind of stuff, because you're not going to find literature, you're going to say Sam Ka`ai said–.

CSH: Do you know Bob Hobdy? I talked to him earlier, too and he talked about–

SK: And how was it?

CSH: Well, he's retiring.

SK: Try ask him about that fern.

CSH: Okay.

SK: Because it is the grass, but try ask him about the fern.

CSH: He's going to New Zealand for one whole month for his retirement.

SK: That's one good man you know!

CSH: Yeah that's what I heard. So he gave me some insight into the area.

SK: Did he ever show you the place names that he did of Maui? Did he publish that ever? He lectured, but I'm not sure if he ever published.

CSH: Now that he is retired, he said he will spend his time trying to do the place names and work on his maps.

SK: That is very important. He is the one who revealed Nāhiku–as being a sub-province or sub-*moku*. There is always a debate about whether Nāhiku belongs to the *moku* of Hāmoa or Hāna or Ko`olau. Ko`olau is what we call Ke`anae. The *moku* of Ke`anae is not a *moku*–the place is called Ko`olau. It goes from Hāmākua `Ike, Hāmākualoa, Ko`olau, and in between Ko`olau and what is known as Hāna today, would be Hāmoa, is this place called Nāhiku. Which means 'the seven'. It's a sub-province or something, like a sub-district. Everyone says, "how come Ke`anae got it's name?" On the right hand side is Okalaupapa, which is the lower peninsula–get big argument about that–get one place called the Manoa, other people call it Niumo`o. Get one fish hole, and *`ōpae* may have come out of that, but we don't know–but that's the place of *`anae*, all the baby fish. That's the same side the interisland ferry boats that used to come in and land out there on the rock. So that place is called Ke`anae. The mail came off at that place. So the area then became known as Ke`anae Mail bank. So that area became prominent. The Papali something, which is where the YMCA camp is, that is a fortress–that cliffs up there. A very famous fortress, but there is not enough literature about it. No prominent chief at the time of–connected it. The roads bring in, and make this place as prominent again. So you call that place Ke`anae, and *`anae* is the small fish. The mullet or whatever–when it is in its' infant stage, swarming. Right off that area. That was what could be seen by the landing boats, so it's called Ke`anae. So they called it–well it's the mail going to Ke`anae. But the mail is going to all of the province called Ko`olau. Because they already had a Ko`olau, O`ahu they didn't want a Ko`olau, Maui. Like they have Hāmākua on the Big Island, Hāmākua on Kaua`i–they didn't want one more Hāmākua for the mail, so they started calling it Sam's place. That's where Kamuela came out. That is a modern Bible name. The mail master was one Chinese guy named Sam–or one Scotsman named Sam, I don't know. But the name Sam, was given to Sam's bag. Kawaihae Mauka, Kamuela–same name. So the same thing here, Ke`anae changed it's name *`anae* because of the mail bags being delivered, cargo being delivered–that's a landing. But that province or *moku* is called Ko`olau. And then, the prominent places of ancient Hawai`i in that is Wailua Ike and Wailua Nui. Now the roads rides the ridge in between to the place called Kawaikāne. That is the big population areas. And then there was the population above that peninsula. So we have modified the names. Just like, we have now, Mākena. Mākena is one spring, not a district. But the area is called Honoula. And a most prominent place now down there is the bay, called Keone`ō`io–bone fish bay. Wai Lea is Honoula. And then the area we call Kīhei. Kīhei is a phenomena seen from that land, not that land. That land is called Kula Makai–*ka moku* Kula Makai. And when you are standing on Kula Makai you can see the phenomena called Kīhei. Kīhei is Haleakalā with the clouds, you know the pink up here, with the clouds going out towards Kaho`olawe, that is called Kīhei. That is the shawl of Haleakalā. You can see it. It really is over Honoula, but we call it Kīhei. But everyone says–but I tell them, "if you think you so right, then how come you can have Kama`oli`i one, Kama`oli`i two and Kama`oli`i three?" *Kama* means child. *Kama`āina*, child from here. Home team, *kama`āina*. The ones, the children who ate here first. *Malahini*, the guy from up the shore. In protocol, when you set up, the home team is the *kama`āina*, because the bones are behind them in the mountains. The *malahini* stand at the shoreline. That is one of the basic protocol. Kama`oli`i one is happy child number one, and happy child two and happy child three–that's *`ōlelo haole* in Hawaiian, backwards. Pā`ia for instance. Pā`ia is in your district. Pā`ia is

not a district. When you go and take your drivers' test for license, they tell you it's rooster town. That's the meaning of Pā`ia. But it doesn't mean that at all. Pā`ia means intrusive sound. What the rooster does in the morning. Because how you know that is, when they talk about Pā`ia Mauka–*ka hale pule a ka nui elua.* Get two churches towards the mountain from Pā`ia, is the two churches of God. And the town is called Pā`ia Makai–towards the sea from Pā`ia. Pā`ia is the mill, meaning noisy. Towards the sea from noisy is the village. From the mountain from noisy is the two churches. So when you close the mill down ,and there's no sound then. what? No more Pā`ia. But the government calls it Pā`ia District. These are the misnomers of the place. So we should go back to the *ahupua`a* and find what the name of that place. Interesting, yeah.

CSH: It's amazing how over a span of fifty years how much is lost and how things change.

SK: You go to a chief informant, which is usually a casual talk, talking to some plantation manager, who wanted to just call the field something. And so, all things change according to the convenience of who is the *luna* elevated at that time. Pu`unēnē is now a hole. Pu`ulepo is a mound of dirt that used to be where this cut-off to Lahaina is from Kahului, and the road to Kīhei–in between there is a hole in the ground. That was a large mound called Pu`ulepo. Or Lelelepo, meaning the mound of the flying earth. And they shoveled all that away with two-ton wagons and eight mules to make all Wailuku roads. And then when the steam shovels came–it was such good soil–Pu`unēnē is the same thing. It's not the mill, it's over here where the old road–you know where dump goes up, goes up to Kula–there was a mound, I believe it's where the stone cracker is. It was the mound of the geese. But now it's gone. They used that raw material. And I am told by some old timers that there were seven of these mounds, and they are all gone. They were in that little area, and they made up–they were used for the roads, at the time when you hand shoveled. So that started in the 1840s, already, when the dirt started to disappear. So you have this not much recording, and then later on we know a trucking firm–you see, when there is a company, the company keeps records, and then everything starts to shadow, and that's what Pā`ia–. When I was young, I asked an old Hawaiian man, who was my elder, and I knew the meaning, but I told him Pā`ia. And he told me, like *haupia,* Pā`ia–it meant the first stage of pounding of the tapioca, which is what *pia* is. Like *pa`i`ai.* And I asked around for years if that was a possibility. *`I`a `i`a* the way you scratch on the board, or you hit some rattling sound, that is *`i`a`i`a.* That's what the rooster does. When you are sleeping, that first sound is intrusive. You have to know how Hawaiians got people up. If your elder man walk inside, and wake you up he ways, "`oe`oe–ala!" Meaning, you, you, up! The elders would say, [singing] *`a`ala paha o`i`a anuanu mai e ka wela ke ala paha*–would you like to get up? The cold is going, and the heat is coming, would you like to get up? Then they would add the rains of so and so are singing–that's how you get up elders. So Pā`ia is the most intrusive way to *ho`o`ala.* And plantation, blow the whistle, get up, go to work! And that's what they say–wow the noisy! And then the Hawaiians start dying off, you start bringing in Chinese, Japanese –everyone speaking different languages, and everyone adjusts to the needs of the day. So the things Hawaiian were negligible–all set aside. So today we affirm the Pā`ia Bypass, the this that. Just like Ho`okipa. What is the meaning for that? Had forest going all the way from the top of Hāli`imaile, where the *maile* laid down like carpets–big forest over there. From there down to Ho`okipa had *`ohia* trees all the way to the shore. And the minute they saw had rain there, Europeans said let's cut all those trees down and plant sugar. So they

moved the wet line by. In fact they made it the town zone. The mist rains of *`ulalena* came that far down. Now all that is push away. Because you scrape the ground, you take the trees–you know how it when it rains, it steams, it causes clouds, it holds the mist–all of that was taken away. They burned all that wood off for sugar. They brought in Portuguese with oxen–that's how most Portuguese came here, to pull the stumps of the *koa* trees out. And the *haole* who didn't want to pay money said okay you clean my land I will give you an acre there. And finally you attract work for cleaning of land. They used these block detectors [attackers?]. Had twelve thick of two inch housers going nine to ten times around one block, tied to many, many oxen that would pull the tree stumps up. And then the gulch, I can't think of the name, that's where the old dump was, they burned for fifteen years. When you throw logs over that still have dirt in the roots, they continue to smoke for fifteen years. The Hawaiians say the *puoho* is coming back–the ancient mist. But it really was the smoke. So that was how that land was changed. That is what all those rock piles are. And Lahaina of course had more rock piles. They just literally changed the agronomy and pushed the wet line back, miles. It was good top soil, versus places where after you take the trees away the top soil was shallow. There was good soil. More *heiau* are destroyed along this coast, you know along Hāmākuapoko. The reason was that all the operators were non-Hawaiians–some of them were Norwegians and Germans. Germans came with the machines. So they bust all that stone up. Some of the stones were pushed into the ocean, some were pushed into making road beds along those areas, and bridge abutments.

CSH: You were talking earlier about the *koa* trees in Makawao forest, and it being there for canoe makings.

SK: Most of it was *`ohia*. I know on the back part of the road–Omaopio used to be another reason for call *melemele* is because you had pua melemele, the yellow *`ohia* used to grow up there. Now it's all guava and *waiawī* and–remember the cattlemen brought in ninety different kinds of grass. You see this man who died here, he brought in some of the best grasses–[kukuiū?], which is from Africa and Buffalo Grass, which held the soil together. He came and saw a solution–some of the grasses they made and was killing off the Hawaiian grasses, like *`uki`uki* that goes straight up. *Pili* grass, go straight up. The cattle knock `em over–easy for knock over ,and then they become furrows of dirt. So these grasses took over to save the flooding off, because the cattle, the weight was smashing the ground and making it all loose. Von Tempsky moved up here and ran cattle, and then he brought in the Wattle tree because of the bark–it was good for tanning leather. To create a local industry. But then they didn't use it, and it became a weed up here. Hāna, Hāna Plantation–you know they took out all the trees and so all the trees come back up, now African Tulips. It was brought in because it was the [inaudible] that made up life jackets. When Hawai`i was more marine-orientated, when the Sandelwood mountains they grew that, and then the second row they developed Kapok from India–the cotton tree they call that, to make up life jackets. Now that is a weed growing all over Hāna. It is reforesting the areas. The forest that is growing in Hāna is not the native forest. It is not the *`ohia* that was there, and the *lauhala* that was solid along the coast like Nāhiku.

CSH: Did they eventually clear all those *koa* trees or–

SK: *Koa* was a saleble wood, so you cut every saleable wood to make money. Then they tried to replant, and it didn't come back fast enough. Hawaiian roots take too long. So then they did research, and in the 1880s they–by 1900s it's heavy already–it's *kalipa* or Eucalyptus. Fast growing hardwood. Of course, it's very combustible. Very burnable. But we don't have that problem because they plant 'em in very wet areas. But upper Kula no trees grew–no trees at all. So then they put in the black forest. The Scotch came in, and then they put in Gorse.

CSH: What was that Gorse for?

SK: Well, I have tried to find, somebody had one–it was kind of in Hawaiian and then there is supposed to be an English copy about a fist fight between two Scotchman in the Wailuku Hotel. There were two old men. One went after the other with a stick and the other one [thumped?] him for it. And they were senior gentlemen in their sixties and seventies when it happened. There is a Hawaiian person who got a hold of the records–I don't want to mention his name because I don't want to pick on the family. And the fight was, the guy said he had brought in the Gorse.

CSH: Who brought in the Gorse?

SK: One of the Scotchman. And the other one said, "you damn fool, you brought the scourge of Scotland here." And then they just went after each other–the two old guys. The two old guys, who were senior gentlemen. But the description about who brought the Gorse. The Gorse in Scotland was a wire-bush–you trim it and you make hedges out of it. And they are the original *pānini*, the pen of prickles. It's all over New Zealand. It takes over all kind of pasture. You cannot clear it, the Scotch brought it! You cannot clear it with a bulldozer. The shoots will stay in the ground fifteen to twenty years. So now in the areas around Lake Kaupō, that thing was really, really bad. And in the re-cleaning, they brought in spruce. California Spruce. And they grow those trees, and today New Zealand is the largest artificial forest in the world. Now why? Because Gorse took over and by growing spruce the tree grows faster, cuts the light off and the gorse dies. So up here they grow Japanese Blackpine to cut off the gorse. But gorse was a hedge rows in Scotland and you trim it, and the sheep couldn't go through. That's how the paddocks were measured, by gorse fencing. And when you get free labor to go out and cut the gorse–it's all needles, terrible job, the minute you abandon the land, the gorse grows outward. You see, it's one of these clever things.

CSH: They brought the gorse here for the same reason?

SK: Deliberate! That man said, "I brought the gorse here." And the other Scotsman got up and told him he was a damn fool. For the same reason, to make hedges in the upland. This is the cleverness of the European mind introducing the change of industry! Remember all those changes were agricultural in the beginning. African Tulip, the Kapok Tree, the Gorse, the funny tree–the tanning leather, Wattle. All these things were brought in deliberately because they were going to deliver a product for the farm! Now here's my observation–all the guys showed up with store-bought hats. Some ladies had *lauhala* hats and very few of them had feather hats. And yet in the '60s, no good rider would be caught with a store-bought hat. When they came to the Maui County Fair, the races–everyone wore their *lauhala* with their *kolahala* hat or peacock bands. My grandmother made peacock bands. Mrs. Ching them up in

Kula, Ching Store, they all make *kolohala* lei bands. That reminds me, I have to have someone unload my room here. I have an airtight box with some bands I put in there, and I think it's no good. Anyway, I have all green, all blue–you see, what they call the blue band has green, blue and purple in it. And the real blue *kolohala* only comes from here–

CSH: Oh, the neck area of the peacock.

SK: It's all neck, but only two spots on the side are what they call maroon-blue, or imperial blue. I have an imperial blue, a mixed blue–.

CSH: It's in an air tight bag?

SK: Yeah, but I think you no can keep feathers in one air tight bag. And it's been there for quite a while. I was worried about bugs so I put it away, but maybe I've done myself a disservice. Anyway, all the feather making, people don't do it anymore. See, we talk about the good old days. They still have some *paniolo* saddles–that is the secondary culture, that agricultural period. This place was famous for oxen and people who could shoe oxen. Farriers of the first order. Today we call farriers, blacksmiths. My dad was an iron monger, a blacksmith, a whitesmith, a farrier, and a cutler. Certificates are issued by the Kamehameha Schools.

CSH: What is a whitesmith?

SK: Today we call them tinsmiths. But tinsmiths today only bend metal. Old tinsmiths cast those lamps out of what we call pewter. But pewter was false tin. Tin was a metal that you made those things. White metal smithing was all the thin casting of various–and bronze and brass were done by whitesmiths. Because blacksmiths forge iron, it was all tempered. Iron mongering is the shaping of big metal. They get trip hammers for mongering, but before used to get many guys with hammers. Blacksmiths makes steel out of iron. White iron is steel, and black iron is wrought iron–wrought to hammer–and then you took the cold steel, white steel, white iron, and you pound it into smaller and smaller pieces. Then you heat it up so it becomes cherry-red, orange color, and you pull it through a piece of iron, and you made wire. Then you take two bricks like this and put these rods across, between the bricks, and you heat it up in the furnace, in the blacksmith furnace. Then you pour in carbon, and the carbon fuses to the wire. Then you open that, and you pound all those iron with carbon fused to it, you pound it into a single piece–that was steel. So blacksmith, there was so much in doing that and wrought ironing, hammering and all that, that is blacksmithing. Whitesmithing was brass, bronze, tin–mostly tin–and flat sheet work that was necessary. And some lead stuff was also called whitesmithing. And then cutlery was people who took the steel and made razors and knives, and shearing, and made the steel to adhere to an ax. You make an iron ax and you put the steel edge–just a little piece of steel. My dad could do that. That was old Kamehameha School. My father sent me on one goose chase–I had to go find a clock of the two Pi`ianai`a's. I go up ask Kamehameha, they don't know what the heck I'm talking about. So they say, "okay, this is the way we going tell you the story. In the time when the head of the school shot himself in the head–." I went, what? I gotta go up there and tell them they shot him in the head. He said yeah, "tell `em they shot him in the head." He was in the office at Bishop Hall. So I said, okay! He had one instructor that was German. He was the industrial instructor–that was my father's

story now! And, he made–that man made a clock. Carved the clock out of *koa*, which was two carved dolphins. That's why he said, "ka pi`inai`a ihu hope"–the nose down. Well, apparently in Bishop Hall, there was this clock of this carved Greek dolphins. And it had the kerosene–and my dad remembers that intimately because the clock was finished about the time he was there. And that had been moved to different halls, and nobody knew about it.

CSH: Where is it now?

SK: I've never seen it, but it is at Kamehameha Schools. My daughter said it was in so and so hall. I don't know if it is working, but I know the carving is there. And that was the old clock. And that is the man that taught the industrial arts and issued your certificate–. Now you had to work all year at school, and during the summer you went down to the Navy yard and become first an iron monger, then a smith, then work with the bronze, after so many years–and then when you *pau* all that, the shipyard and your instructor signed the paper that had a certificate. I want one of those certificates. I think that would be a treasure. It's a time gone. So I had to ask my dad, okay, these guy's all blacksmiths? He said no they all farriers–they not even good. So I told him, what is one good one? What is a real farrier? For me pass the farrier test–you know about the mule shoe for climb the mountain? In the quarry? They talking about making mule shoes and having a piece of flat metal so the shoe can bite in for walking on hard stones.

CSH: Oh, like cleats?

SK: Yeah, like cleats. Nobody knows about that–nobody does it like that. Mining was done like that and you had to do that–Industrial shoeing. For Clydesdales and Belgiums and large horses, they kick themselves. They have bad footing. You have to weight the shoes so that it would make the shoes go that way, because they can hurt themselves. When you push them, and they beginning to get a bad gait–so you had to weigh the shoes, you had to put weights on it. You had to know that. That was farriering to him. And so I said, so what was your test? You had to put the weights and see the animal? He said, no! They just brought the oxen, put it outside the school, okay, shoe that! Here's the iron–they throw you a piece of iron. You had to cut that piece of iron up into four and then eight and then into sixteens. They had to build two cleats like this and two like this–crisscross and weld them together, and they make two edges like that–for cloved-foot animals. And it is more tender than horse. The nail is not as long. And so you had to hot patch it to make it fit perfect. And you had to nail smaller. And I said, when you grew up did you have to do this [inaudible], already the oxen was going. Already mostly mules and tractors already. Steam tractors and [inaudible]. But the older mills here and in that description at the [inaudible] how many oxen they had. Two hundred something oxen. In that paper [inaudible]. OK. That's what they talk about. That's a farrier, one who could shoe the oxen.

CSH: A farrier.

SK: Farrier, farrier is a horeshoe man. I didn't even know that. I grew up with a blacksmith. And they said no, farrier.

CSH: Two books [Inadudible] had this kind [inaudible] people imagination, book smart, good at school.

SK: Try to remember, I am in the point[?]. I know the guys who trained for it, but it was already passing out of their lives. I'm the ones that fall down before the computer. Remember that if in 1900 you couldn't shoe a horse and you were somebody's damn fool. Because why? Everybody rode horses. High School in the 50's, if you couldn't type, you ain't gonna get a job. 'Cause typing was a big deal

CSH: You were going in the 50's?

SK: I'm 65. 1938. So you know, 50's,. I mean that's the standard. We went, right after us, you have to use the business and homemaking, you got to use the calculating...

CSH: The ten key

SK: The ten key apua, and now who knows that. You know that. Then it was considered bad to use a calculator 'cause you couldn't figure. Now the kids who can't figure only can use a calculator. And now we get these kind of people like this. The [loma] is not like that. Pretty soon they gonna make ..., so [inaudible] talk constantly, and no pay attention hit the telephone pole. They're scolding everybody for turn off the machine in a movie. They go beep, beep, beep. They don't think they got them on. So, now if you got computer literate, no one can tell you about typing. They brought one up here for me to put my readings inside for [inaudible]. They want the records so they can be sent in. [Inaudible] computer. I could never get it to work.

CSH: The medical people set up the computer for you?

SK: Yes. I couldn't get it to work.

SK: You know what, I tell you it's funny. I get some big shields which are very unusual cups, I get all those. But the basic ones you never buy because they are plain and they were cheap, the highest was 50 bucks, somebody bought like forty, thirty, thirty-five dollars. Now, they all in the 600 dollar category. You know the perfect round ones with the stick, the toi mesas, they were common. Well, they're not common any more. There's one that is a coconut shape called *niu* [inaudible]. That's the two, the most common ones, like that. And there's some straight ones. I never got it 'cause I never thought they were elaborate. [Inaudible] without those. I have the hala, the bird-beak, the battle hammers, the gun stock.

CSH: But not the...

|SK: I have a mace, a throwing mace, they call it a throwing mace, but this is a battle mace. It has a hundred dots on it. The time of xxx, they kill a chief, and people xxx in a certain manner so they don't get attacked by his spirit. The one that is in Arts and Crafts of the Pacific, so Pacific artifact, by Terrence Berrel[?]. Do you know who Terrence Berrel is? He's a xxx Japanese xxx, something pressed [?} from Japan. He's a New Zealander, and he wrote all that stuff and he has a picture of a particular Fijian [ax?], the primo piece. .. And made the mistake of selling me that one.

CSH: And now you have it.

SK: And now I have it. And I haven't seen it for now about 18 years. It's in a box. But I have a ta`a, there you see that ta`a there, you recognize that ta`a, that was given to me for a blessing. Right next to it that is an omen collection tongue-and-tattoo someone club. Next to that is a saw-bill kauai. The black mace, I made that. The Hawaiian war club is missing. Next to that is a Samoan club. I just came back with John Lake[?] from Rapa Nui when Hokulei was there. That is what was given to me. Those are fish vertebrae. It's a hui from Rapa Nui.

CSH: Which one?

SK: There, the club sitting against the wall, with the rattle [?]. So, it looks like a [inaudible]. Right next to the picture.

CSH: Yeah, the fish vertebrae.

SK: That's fish vertebrae. And for the eye too...[inaudible]. And next to that is a Fijian war club made modern, called the Order of the Sow,

CSH: Order of the Sow.

SK: Yeah, and I was given that. But you know that, the others that I have are old stuff. 1850.

CSH: And when you found them on e-bay..

SK: No, no, my freind is getting-, people breaking up collections, see, and they offer them for sale. I got my friend buying this stuff and he got six of those story masons and I ain't too good. Right now he's broke so he's not playing with the machine.

CSH: E-bay is so dangerous.

SK: What he does is this, he gets the average places and there you are competing with the best collectors, that's who pay the big money. They like them, you no go get them, 'cause, "opening bid 100 dollars" and they say final not reached, if it says final reached, I gotta say 2000, guys creeping up, yeah, but these guys who like stuff, dealers, 2000, they just [wrassle] everybody. See, you don't pay 2000, you pay from the last bidder, but they willing to chase it 2-3000. Well, from 100 to 2000 is a big place in between. At least I'm not up there. I get a war club, I no afford that. You know what a u`u is?

CSH: Oh what?

SK: An u`u. Have you ever seen an u`u?

CSH: Is that a weapon?

SK: You ever heard of the tata-ha- i-va? Alias Marquesans. You know where Marquesa is?

CSH: Yes.

SK: French Polynesia. Marquesa. I have one of their clubs.

CSH: And these that you've collected over the years by visiting people, and they've become [inaudible]?

SK: Well, four of those have been given to me, right there, it was given in ceremony. You know [inaudible] Hokulei [inaudible] so I tell these stories and they like them, you know, ko ko, and making people do that, and once you're giving these unusual stuff you tend to chase some things for around often. Now that long tai hau, I bless the Humata collection at the Bishop, at the Academy of Arts. I give pua nunis to come and chant and I did the blessing and everything. And they gave me kalani, this is, what do you want, I also did something else, inside the collection they had a Hawaiian war daggar to Wailua, Kauai. [Inaudible] This is delightful. Larry Bishop, he's the curator. He put the collection together for presenter. She told me, what she could do for me. I'm telling you, I like to open the case, take out that piece, put down paper, I gonna trace 'em. They got so shook up, they asked me to stay here with her. The son, says yeah, lets leave them there.

CSH: Let's open that up!

SK: So, I tell you what I meant from the tracing. That's it. There not symmetry, shaped as well. Collection, that's it.

CSH: It's made of koa?

SK: You can not say, no curly koa, Hawaiians called it ka-la-au-keiki. Or they call it lau olele . Twisted or ke ke. Ke ke Means crooked , eh.

CSH: And you just traced 'em?

SK: I made that. And everybody, of course, in the copy place, Oh, wow! They opened that case, huh? [Inaudible]. So I traced the thing out, and see I can make one. I said, look, it's wonderful that the Academy has it. Just wonderful. It's sort of sad that the Hawaiian doesn't have it. How will the Hawaiian have it? Well first he must have a packet. Then you must have the will. Then you must have the lau. You must not make bracelets with it or fine European furniture or music box or hair barrettes. You must make the kalakamoi. The real thing to the Hawaiian. I said, 'So, why did you want that?' 'Cause the three in Bishop Museum were sort of crude, while this big one that big and the symmetry is not done. This is the most well-balanced in symmetry. She said, 'Well, I guess we really have a wonderful thing." I said, 'Yes, you do." So, I laid it up. Then all the boys all at once, you know come to Wailuku, you no deserve one. You gotta pay your dues. You folks need to have boboa and palaulau, don't go and make the unusual. Make the one can use. You know I may call the supper on these guys. Xxx This is the most common weapon, at the end of the Kamehameha wars. this is koloa pahoa, this hau ila, xxx

CSH: They are two different kinds because of their size?

SK: Yeah. This is the most common. And he's using this hand with a capo over here

CSH: Oh, to hide...

SK: To block stones. You know they shooting stones. Boom. How you know, catch stones, you can heat spears, catch stone in head. So, you walk forward with this thing, the

javelin, you throw, if somebody swing xxx, block away xxx, so if I do this I put them here. You can not catch them with your fingers, too far xxx . The long xxx is to go beyond the elbow, so you can't bust the elbow. After you throw your spear, then this is your fighting weapon. Ka bu is like a daggar. And then, this a palaaou, maninki

CSH: Uncle, you sawed all these by hand and you brought them empty all by hand.

SK: Okay, let's go ahead and turn the tape off and we'll go into the garage and I'll show you my work.

CSH: Okay uncle–I want to thank you for taking the time to share with me your *manao* first. So Mahalo!

_____End Interview___

CSH: And tell me a little bit about your grandfather.

Informant: My grandfather was a woodsmen. He cut wood for the plantation because the mill used to run with wood–with steam. So had plenty Portuguese in those days was all wood cutters. My grandfather used to own all this over here. He was a farmer. But my other grandfather, on my father's side, he was a wood cutter for the mill.

CSH: What mill was that?

Informant: Pā`ia Mill.

CSH: Oh Pā`ia Mill. And when did they come to Makawao?

Informant: My grandfather?

CSH: Yeah.

Informant: Wow, I don't remember. I wasn't even born yet. He worked Haleakalā Ranch. He worked part-time for the ranch, too. And eh, woodcutter and same time he living on the ranch–do some work for the ranch. Okay you turn the next right, you turn, that's Kahakapao. Which the name is wrong. The state put the name Kahakapao–this actually is Pauhinui. Kahakapao is way up, but the state come over here put up one sign says Kahakapao–wrong–but I guess we gotta go with that. Right here.

CSH: Okay.

Informant: This going up to the water treatment plant. This was all made–this road was all made–this road was all dirt. Even four-wheel-drive vehicles no can come through here when rain–so much mud. So the State decided to make this treatment plant up there in the State land. So they rebuilt all this road. Some of this road going into people's properties, some of it they got wrong. You know the State and County, they can never do anything correctly. They do mostly correctly, but some mistakes. And get all wild pigs, all in here–all through here.

CSH: This is an area where the hunters still go?

Informant: Ah–over here? Over here hardly get now. No more because plenty people bought, yeah. When they buy, no more pigs. I used to catch plenty pigs in this gulch right here.

CSH: Do you remember going pig hunting when you were small?

Informant: Oh yeah. I used to go with my parents and my older brothers.

CSH: How many siblings do you have?

Informant: Ah–I not going say like, what you call, it's siblings now, not seedlings okay [joking]. Siblings, I had nine–six brothers and four sisters–actually ten, but one died young.

CSH: And you guys all used to go pig hunting up there?

Informant: All pig hunters–from my grandfather, to my father, to us.

CSH: What was a typical day when you guys went pig hunting?

Informant: What was what?

CSH: What was a typical day?

Informant: The weekends, because during the week we gotta work or go school or something, yeah. But in here was full with *kalakala*. *Haole* call it gorse. You see this kind–every leaf is one thorn. You see this thing came in the 1800s over here. And this guys, this is one *pākē* guy, Tam, he own all this, used to own `em. Ah, that's all homestead land that the government gave away–he [Tam] took all this land but he never did take care of his land. This was full of gorse–thick with `em and the pigs used to hide under there.

CSH: Who brought the gorse in?

Informant: Some *haole* guys that says he was going use `em for fences. Used to raise sheep in the old days.

CSH: Oh so they used to grow the gorse to make bushes.

Informant: Yeah, but this thing get seeds and the seeds–and on a hot day the seeds can fly twenty to thirty feet away, and that things just keeps spreading and spreading. So when Tam got real old and he felt it was his last days on earth, then he hired somebody and started cleaning this all up and raising cattle. So you hardly see the gorse now.

CSH: And the prison was opened up initially to–for the prison inmates to clear the gorse?

Informant: Ah–not necessarily. They used to make roads, like Kahikinui Tower–get one bad section there that the prisoners made that road. And pass Kahikinui, they call that Waiopai, cut the cliffs and all. Okay, we are about to enter State land–from here on it's State land. This is called Makawao Forest Reserve. And the State call this Kahakapao.

CSH: And you said this was called–?

Informant: Pauhinui–just about ending, then going come Kahakapao. My grandfather guys used to cut wood all inside here. In fact, most of these trees were planted by them. And this gulch here is called Ginger Gulch, because this whole gulch

is full of ginger.

CSH: The red one?

Informant: No the regular ginger. A lot of pigs are caught in here. And this the bicycle trail–there it comes out right here.

CSH: Oh dirt bikes?

Informant: And this bike trail is my hunting trail. They started following me going around. Goes in the back of the treatment plant, all the way up to Waikamoi, and some guys go into Haleakalā Ranch, but it's illegal. Waikamoi is all State land and then come back down the loop, come around like this.

CSH: You know anyone who come pick flowers up here? What kind flowers get over here?

Informant: No more flowers–only get gingers. That's the only kind flower get. Get over here, but you gotta climb the trees, some trees high you know. No one like climb tree! No more flowers. This is one trail here again. Sometimes come out through the–. When we planted these trees here, this used to be one Jeep road where we take the trees inside, where we take the seedlings, right here.

CSH: Oh that road over there?

Informant: Yeah, stay on your side sometimes they come down through here real fast.

CSH: Do you know of any archaeological sites or historic sites in here?

Informant: Not in here–they all gone. The tractors knock them all down.

CSH: Before they knocked them all down had stuff in here?

Informant: Yes.

CSH: What kind stuff?

Informant: Oh like–the stone they used to use to make the canoes, you know they make `em hot and then they chip off the charcoal to make the canoe. *Poi* pounders–not too many up here, *poi* pounders. The big ax for dig, made out of stone.

CSH: And you remember seeing them when you were young?

Informant: Yeah, yeah. I used to hunt pigs down there, used to take my friend with me–he was a collector. And get plenty trails in there from my mother guys–my mother guys used to live across here. Had a big camp, they called that Kalili, and they used to come down the gulch wash their clothes–that's where they washed their clothes. So they make all these trails and today the *haole* come by they say, "that's archaeological trails made by the Hawaiians"–that made by the Portuguese!

CSH: Portuguese who going wash clothes [laughing].

Informant: This the treatment plant. Yeah, right here. This is as far as we can go without four-wheel drive. There's one more road that goes from the gate–but locked, you no can go, ah–up to Waikamoi. But anyway, this is the treatment plant. And this ridge, you see right here, this all planted. The state had planted all this.

CSH: So this was all introduced then.

Informant: Yeah, all this not native to Hawai`i. Those pine trees there, you see that one with the cones and stuff, I don't know what kind pine is that, we used to call that short leaf pine, and we planted that, right around here. And this eucalyptus, the young kind, they grow by seed, yeah–but they find out later on that the leaves all blowing inside the–that's the catchment for the water over there. Get the cement blocks where the water go and the settlement stay, and then they go to the next pool, and then from there to the treatment plant–I used to catch a lot of pigs right inside of here. Sometime they right on the road.

CSH: This area, in pre-contact times, you know anything about the history before–?

Informant: Well, according to one old Game Warden, his name was Henry Lesiong, I don't know if you look up the history and stuff–he said when Kamehameha came to conquer this island most of the Hawaiians went run up Pi`iholo and hide up here.

CSH: Oh they were hiding–

Informant: Yeah, from Kamehameha. Kamehameha had come try conquer them, no could, they were really strong up here. So he just let them go and he went. So they lived over here for many many years, the Hawaiians, until become civilization.

CSH: In this Makawao area?

Informant: Right here in Makawao, that's Pi`iholo–because that's where had the water. You need water, yeah.

CSH: Right because that's where all the resources are.

Informant: And then they used to make canoes all–ah, I can show you places. They made the canoes with these big *koa* trees and they float `em downstream–Māliko Gulch–to get `em to the ocean.

CSH: Oh yeah, that's what I heard. I heard this place is real rich in canoe resources.

Informant: I can show you the big hole–where the trees was. They go cut the trees and the stump going rotten, yeah–but we gotta walk up Pi`iholo, kind of private property, get one different owner over there, he kind of wise guy.

CSH: So this place is actually really rich in cultural history then?

Informant: And there's a lot more that I never know before my time. You know, my parents and my grandfather they wasn't interested in that, in those things, so they never even bother with that. But you know, when they was cleaning in here, had one guy, what was his name now–oh, Mau, his last name is Mau–he picked up a lot of stuff. And this guy Gibson, Steven Gibson, he was operating the tractors and stuff so when they see the stone and stuff they take `em, yeah. Take `em home before going get destroyed.

CSH: And those guys, they all passed on?

Informant: No–they still alive. Harry Gibson, he live Ha`ikū–he can tell you some of this, too–he work for the state, plant trees and all, all over the place.

CSH: And how come they cleared all this place and planted?

Informant: They never replant this–that's all pasture. But they clear `em to clean all the gorse. From here down, this all Homestand land–both sides of the road. And I don't know how, you know in those days, how the government could come here in the old days and tell–"this land is homestead and we giving it away." You see, my father was no cattlemen or horsemen, he worked for the Baldwins, but the people who was, they took a lot of land–like the Souza, they took two hundred acres, like Toni Tam, he took another two hundred acres.

CSH: And they were all working for the Baldwins?

Informant: No, they was on their own these people. They raise cattle and horses–those days horses were very valuable. The rest down here was all Baldwins–whatever you see down here, that's all Baldwin–thousands of acres, which I'm sure they never buy, they just took `em. Some property was probably homestead, unclaimed lands–they took `em all. They took thousands of acres–everywhere had water, they took `em all. This is all the people that came late, they buy little pieces from the big land owners. This guy own this section here, he live in Lahaina, and he bought this right here.

CSH: And how old are you Steven?

Informant: I'm seventy-five. No, seventy-seven.

CSH: When were you born?

Informant: Twenty-five–ah, I'm what you call one antique already [laughing].

CSH: That's okay I like antiques–I get one Model-A myself.

Informant: And you know when I like vegetables, I come right here my friend he give me free, all I like–organic vegetables. That used to be my grandfather's farm, too that. He bought six acres over there–nice guy that guy, nice guy. Oh you know the bicycle path–you know where the treatment plant is, they call that the loop, yeah–the next gulch, the gulch right next to the treatment plant,

across there get the bicycle trail. Sometime they get dropped off at Waikamoi and they come around and come out where I told you they come out–oh, we pass `em already, inside the State land.

CSH: Do you know of any old Hawaiian trails?

Informant: Well most of the trails I'm following are old Hawaiian trails and then some of them are–. No, no go this way, this is Baldwin's ranch. He own three quarters of this island. When you get down there, where we went turn left, you take a right, you go up the hill, no you take a left going up the hill, go all the way around we going go to the old prison. I saw something in the paper you went send me about the baseball field, they had a very large baseball field over there–nah, never was that big, was small, just enough for play.

CSH: Get Warabi up here, too–the fern?

Informant: No, no more you gotta go Waikamoi or inside country. Waikamoi get the big kind–you know the mountain kind. Then you go *makai* below get the smaller one. This all homestead land, two side of this road, all the way over–all was given to the people before.

CSH: How's about birds? Any native birds over here?

Informant: I get one along this mountain, one old one, *`i`iwi*, but no, I no see them no more. When I first used to come around here, yeah I used to see some, but not that many, but some.

CSH: What else kind birds had? *`I`iwi* and what else?

Informant: *`Ō`ō*, I seen couple of *`Ō`ō*–they mate and then they leave, yeah. And then, I don't know the names, but the little brown one, more small–and lately I've been hearing this bird, so I look at `em and I went take one picture of the bird, hard to see `em and they fast moving bird. I took `em to Nature Conservancy and they said, "ah, this not one endangered bird, this one Japanese warbler." But I hardly see them though, now. When had the gorse, before they cleaned the gorse, plenty of them used to be inside the gorse, and then they cleaned the gorse and then no more–I don't know why. And then the little green birds, that is endangered, with the kind of big eyes, we call them meijiro. I think today they still get the meijiro name to `em, but I think get another *haole* name. That one, used to have hundreds of them, they used to be bad birds, they used to eat all the papayas and all the figs–nobody used to like that, they used to shoot them with the BB guns, and look today it's endangered. You know what happened here–I'm going tell you what happened with all these endangered birds. HC&S [Hawaiian Commercial and Sugar] EMI [East Maui Irrigation] they started using chemicals to kill the weeds along side the ditches, get four ditches that go clear across this island, and that's where the birds were drinking their water during the summer time. And all these chemicals sitting there–at first they were using DDT, then they turned to different chemicals, now the birds going go over there, drink the water, and eat the weeds, and get the seeds–get the chemical. Either they going die, or they going come sterile, or the eggs going come soft and no can hatch–and nobody

like bring that subject up you know, because against the big fires. This go way up far [talking about the road]. Get plenty turns up here, you have to be real careful. In the old days, they try for avoid the rich guys, yeah, they no like go through the rich guys property so they go all through the poor man's property [laughing].

CSH: Do you know of any burials over here?

Informant: Pi`iholo–oh Pi`iholo had couple over there–one whole family used to live over there. Get the cave, everything. Some *haole* kid went through there, they went broke `em all, you know, in order to find the artifacts, yeah. They went bust `em all up. Even the graveyard, all the stone went up–cross the river, get one small cave, you look inside the cave, all black, where they used to cook–and we found some artifacts there and plenty, you know when they make and no work out, they throw `em down the gulch, yeah. Yeah my friend found several over there–he found one *kukuihelepō*, you know what is that?

CSH: No what is that?

Informant: The stone where they put the fire inside and she burn all night–because in the olden days you gotta get fire, you no can put out your fire, or else you gotta go get fire from your neighbor, so they keep the fire burning all night. Next morning with the *kukui*, the *kukui* nut they get the *kukui* nut, stack `em up like this, yeah, and they light the first one, she burn, she come to the second one, she come to the third one, and by the end come morning time–and then they get the fire for start cooking in the morning and from then on, it keep on burning. All State land yet, on both sides of the road–that the government went give away–all this.

CSH: But the burials, they are not anywhere near where they want to put the trails but?

Informant: No–pretty close. Where I told you where the bicycles go up, where I told you that's my trail that, when you reach on top there, about eight minutes from there you reach the site.

CSH: And so that's by the Kahakapo Loop then? This Olinda Trail–no more nothing over there eh? Get any archaeological site or burials over there?

Informant: Get one spring you was talking about. But that spring has been dead for over fifty years or more, no more water.

CSH: They used to tap into the spring over there to get water?

Informant: No way–not that I know of. That spring is dry. You know in the old days used to rain a lot, so you get water all the time.

CSH: You guys used to go swimming in there?

Informant: Who me? No. I used to go hunting and when I get too dirty or too hot I just jump into the pond–you know mountain, sometime you carrying the pig

coming back, you come to one waterfall, you throw the pig down and you jump over [laughing].

CSH: Where did you grow up? Right over there by the Makawao Forest?

Informant: No–you know where Kawamoto Store, where we was inside there, about two miles below that. Had one ranch called Grove Ranch–owned by one Baldwin. My father worked there, he was a horse trainer. So we all grew up on the ranch.

CSH: How often you folks used to come up?

Informant: Almost every day we come up mountain. Us mountain people! Beach we hardly used to go until I met my wife–my wife Hawaiian, she that kind like go beach all the time. Then we was going beach, and that's when I learned how for throw net, I learned how to dive, I learned how to hook fish, I used to catch a lot of fish, because in those days no more boats yet. No more boats inside the bay. I used to catch mullet, twenty-four inches, two-feet kind mullet I used to catch. *Manini*–I used to come home–I used to hunt pigs in Pāpa`a`ea and the trail for go down the beach right across. Only thing it's rough. I catch one pig, I come back, I take `em off the truck, I cover `em all good for the flies no bother the pig, and then I go down the beach with my dogs, and I come home with fish and pork.

CSH: And where is your wife from?

Informant: My wife is from Kailua, before you get–just pass Huelo, about one fourth way to Hāna. So I was raised around this kind area, used to be in the forest almost every day. We used to ride horses from Makawao to the crater go shoot goats and then come back.

CSH: So you guys used to hunt in this area, goat and pig?

Informant: Over here pigs, in the old days not too much pigs here, the pigs used to be way in the forest, but gradually they came out here, yeah. You see, my father worked in the ranch he make small pay and we had to get something to substitute the pay, plus we had big family–so what used to be on the table was pork, most of the time, from wild pigs we would catch in the forest, and goat–we go hunt goats and catch goats. Fish, we were not fishermen, us, we dryland kind guys. And then my father go Kaho`olawe, the guys was staying Kaho`olawe, taking care the place, sometimes he go vacation three months, then my father go over there, he take us over there, then we used to fish over there. Over there you can shoot the *uhu* with the shotgun–and then goats, and turkeys–we used to put them in salt barrels. No more ice box and no more freezer, so we put them all in salt barrels and bring them home with us when we come.

CSH: And how you guys used to prepare the pig?

Informant: Ah, some we make sausage–was real fat kind, we call them pork pig *pilau*–sour, you know that kind, no can have baby, sour–and they come real

fat. Before plenty food in the mountain–bananas all over, now the sickness, banana sickness went kill `em all, no more now. The pigs was fat, and big kind pigs, bring `em all, we make sausage. And my mother used to cook `em, roast `em and stuff with potatoes and carrots and whatever–eh, that went help raise our family.

CSH: Those days you could really live off the land.

Informant: Oh yeah! I used to come home with *pepeiao*, pork *pepeiao*, warabi–you guys call it warabi, Hawaiians call it *pohole*. Every time you go mountain you come home with something–even if you no more pig you get something you can bring home–the *lū`au* leaves, the taro leaves–nowadays you go over there everything is no good for nothing.

CSH: Never have taro patches up here?

Informant: Wild taro, used to get wild taro patches. But over here no more because this kind dry area this, yeah. One gulch over there, Māliko Gulch, run water kind of regular because get springs in that gulch–but A&B [Alexander and Baldwin] get `em because that's their place–like I said, they went take, they came here looking for gold and silver, no had so they took the next valuable thing–land and water.

CSH: Somebody was telling me you know, like you said, this whole area was known for canoe making. They used to cut the trees down and they used to soak them, so no split the wood, keep `em moist, and then take `em down to the ocean by way of Māliko Gulch.

Informant: Yeah! Eh, high waterfalls, they float `em down. Hold `em with ropes go down–they make their own ropes.

CSH: And you said still get remnants because you can tell which one–?

Informant: Yeah, yeah! Yeah you can tell because this guy I take with me, like I said, he was a collector, and he tell me "how come get *`opihi* shells up here?" I look, oh yeah that *`opihi* shells.

CSH: Wow you guys would find *`opihi* shells all the way up here?

Informant: *`Opihi* shells they can last eighty, ninety, hundred years!

CSH: That's up by the Makawao Forest?

Informant: Yeah–more inside, up Pi`iholo side–but not far from where we was. I said, "oh yeah *`opihi* shells." And then get the big holes–and then he go tell me, "you know what this is? This is one old tree that they had cut and they make canoes and then they send `em down." `Cause Māliko in the old days, rain a lot, that gulch carry a lot of water, that's why that gulch is so big. And then a lot of branches falling in, so they try for cut the trees as close as they can to the gulch, so when they finish with the canoe they just bring `em inside the gulch, and soak `em in the water, in one pond, and then they float `em

downstream, go to Māliko. They never have two thousand or ten thousand canoes, but they had a few, yeah. And those guys knew how to make canoes–not like today.

CSH: Oh the nice up here.

Informant: Nice–all land given away. Too bad my father, my grandfather no was one farmer so that he could ask for some land too around here [laughing]. Some people went take a lot you know–like that guy Tam, I don't know how he got so much land. But the rules was, you had to clean the place up and you had to live on `em. Toni Apo never did that–that was the only guy that let his land neglect, let `em go–but still yet hold on to `em–now he own `em. It's worth millions of dollars. Nice yeah up here?

CSH: Yeah nice! And this road wraps right around and comes right into Olinda?

Informant: Right–right into Olinda. And one go straight up, go to Waikamoi. Crater–you can go by horse all the way up, but this side you got to go Haleakalā Highway.

CSH: You still horseback ride up here, too?

Informant: No–now only *hāole* ladies. This start the State land again here–that's where get the Bird Sanctuary. Why the State plant these damn trees, you know why, they no can keep up with the gorse–the gorse that grow in their property, so they plant these pine trees so they can kill all the gorse, it kills itself.

CSH: Kind of like a canopy yeah?

Informant: Yeah. I planted some of these trees all in here.

CSH: For your work?

Informant: I worked for the State only for little while. This all belong to the bird sanctuary. You know this Bird Sanctuary, to me, it's nonsense–because they raising `em, they feeding `em by hand, they hand feeding them, then when they let them go, they die, they don't know how to find food–no more food for them. What they should do–they should go around and plant stuff, like wild oats, wild rice, or something that the birds can eat–they just let them go, what the heck they going eat, they no can eat pine trees! They going, going, going until they die–they no more even water. To me, that is useless.

CSH: They not helping them learn how to survive on their own.

Informant: Then they go out into the forest they find one nest and they go take the eggs or the babies away from the nest–ah, that's not right.

CSH: You know anybody who used to come up here and pluck feathers for make arts and crafts like that?

Informant: You mean catch the birds? No, no no. They used to shoot them and just leave them there, dead, shoot `em with the BB guns, and the just leave them

there–you know those kind kids.

CSH: And had pheasants up here you said?

Informant: Oh choke with pheasants. In fact till today some guys shoot in the fields around here. I get one guy, he one pheasant hunter right now, one of my friends, he brought me about twenty birds already. About twenty five–but I no can eat `em all. I take bout five or ten and then the rest I go give to my Filipino neighbors–they eat `em all, just like chicken. Over twenty, he brought about thirty already my house, but the season no *pau* yet. Okay right here you going take one right we going go back towards Makawao. This road go up to one gate, from there you go Waikamoi. Inside there I get stories for tell, but not real old–I guess stories, we made all the road and my father guys used to go over there and a couple other Portuguese–here, right here, I planted all these trees, me and one guy, Steven Gibson, we planted all these. Right here you going take one left–yeah right here you can drive inside.

CSH: When did you plant these trees?

Informant: Oh, I don't know when [laughing]. Okay, stop right here, we go talk story little while right over there. This is the baseball field–not very big you know. And then you like go walk inside little ways?

CSH: Yeah!

Informant: Okay we go. I show you where we used to plant the trees.

[Pause]

Informant: These all the pines.

CSH: Yeah, it smells nice up here.

Informant: This gate was open up here up until just lately, you used to be able to drive right in. It's cool yeah, you come up here at six in the morning and you shrink about one inch [laughing]. They no even make one place for walk through. Waihou Springs Trail right there, the loop, it's kind of far you know. Oh, we can go around–too good how they went make this, for cattle I guess. But anyway, this was the baseball field, in fact, have one building yet, right there by the field.

CSH: Oh like one dugout?

Informant: Yeah. And then the rest they raise their cattle, the prisoners–for their beef, for they eat. Oh you going be cold.

CSH: Oh nah! I'm okay.

Informant: And then inside here, I going show you, had one big garden, the State had, I work for them little while. They raise trees. Ninety-percent of the trees they raise was–Taeda pine, Sugi pine, and some other kind. This is one ancient

tree right here–[laughing].

CSH: One telephone pole [laughing]!

Informant: And eh–we used to raise them there, in the building, as seedlings, and then when they come about one foot tall we take them outside–and then from there, when come about two three feet high, we take `em in the trucks and we go Waipoli, above Kula. We take `em up there we plant, no more even trees up there, that place was all open and dry area. So, they figure they going plant trees there and going attract the clouds, they going hold the clouds for rain, for moist.

CSH: Oh for the moisture.

Informant: Yeah–only thing, they went plant the wrong kind trees [laughing]. Pine trees–pine trees no attract the moist. Yeah so, that's how screwed up the State was before, people running the State, they don't know what the heck they doing. Like they did in the Makawao Forest Reserve–they destroyed everything that was natural and go plant eucalyptus. You can tell this was planted because they kind of in rows, yeah. And then when you go up Polipoli, by the cabin, by what they call hunters cabin, from there you walk down the trail, you going come to one redwood forest–we used to go there every six months for trim the trees, for trim the branches. This is *poha*, you know what is *poha*?

CSH: The *poha* berry? Yes, it's *`ono* in ice cream!

Informant: This different kind pine, small the cones.

CSH: Yeah the tiny! Wow, if I lived up here, I would go jogging everyday.

Informant: You got to get up twelve o`clock–you sleep up here until twelve. You live up here you gotta get heater.

CSH: This is really nice up here. So this is one of the trails?

Informant: Not yet. This road was made, when they decided to make this a nursery–this land was given by–I forget who went give this land to the State, and then they decided to make one nursery and then they made this road, they made the nursery in there. And then one guy, one caretaker, he used to live up there, get one house up there–then caretaker and the warden from the prison afterwards, they used to live over there. After that, when I was working for the State, we used that to raise bugs, you know. They wanted something to kill the gorse, so they built one kind of moth that they said would kill the gorse, that they would put a web all around the gorse–never work out!

CSH: Oh the moth–?

Informant: Never work out. They let the moth go and you never see `em no more. And then couple other bugs were raised up there–just like we no more enough bugs around here. Okay, from here on that was the nursery. Used to be one gate

here. Right inside there is where we used to plant all the trees, after came out of the seeding room. This is part of the trail you are talking about.

CSH: Oh so right in here then–?

Informant: It's a loop, it goes and comes right back around. And the spring is right down here.

CSH: But the springs are all dead?

Informant: Yeah, all dead.

CSH: When was the prison opened?

Informant: I don't know–as far as I can remember. This was a lot of work in the old days. Now I hear Maui Pine using them for pick pineapple. Up here was–I don't know if I want to take you over there. Anyway, the place we used to raise the seedlings was in there. We go back over there we go walk, I no like take you over here, too rough. And you go through this road, right up there get one house. The warden's house. All these trees here were all planted–they used to call this the experiment station. Had two Nextel stations down the road, now it's no more, now somebody else get 'em.

CSH: Ah, next time I come, I going come with you and you can show me those trees.

Informant: Oh yeah, we used to plant a lot of trees up there. See the first guy for take care this place was one guy Joe Silva–old man Joe Silva. He was taking care this nursery and he planted those plum trees. Every year we used to come up here and pick up bags of plums–right there somebody went commit suicide. This young boy and one young girl, they came driving in here, I guess they were–they sure were in love, I don't know what happened, but they put all the glasses up from the car, and they went connect one hose from the tailpipe inside the car.

CSH: Oh carbon monoxide.

Informant: Yeah, they went kill themselves. No could find them for about two weeks. Finally, they came inside here–they was rotten inside the car. I used to be rescue so–help the firemen. You see, we get one club Maui [inaudible], I was part of the rescue team–they call us sometimes when [inaudible]. So all these trees here, that's all clear pasture.

CSH: Oh it was all pasture before the pine came?

Informant: Yup. And then we planted this, all in here.

CSH: So the whole Olinda area was pasture and you could see for miles–all flat land?

Informant: When the State went come over here it was nothing but trees–like I told you, we was planting eucalyptus trees all over the place like crazy, thinking for the

future, yeah. So then the guys that got the land, they have to clear their land.

CSH: So the areas in which they have proposed the trails, do you have any concerns with those areas?

Informant: I don't know, we never proposed that, was some *haole*–I guess that is his choice, I guess that is what he wanted–something for the people look, I guess. But I think if they made one trail for the people, the people who come over here, we call them *haole*–I think at least one trail should have Hawaiian trees, all this stuff is imported stuff from all over the world.

CSH: Hardly any native plants.

Informant: No more! You not going find nothing in here. Used to have pigs inside here you know. You know the loop trail, we are on it.

CSH: Oh the Waihou Springs trail?

Informant: Yeah. Get one branch you can go to the springs or you can just do one loop and go right around. Get one gulch right next to `em.

CSH: Wow this is really nice. But like you said, no more native plants.

Informant: Ah nothing in here, this is what you call, what we used to call ash trees–we planted all this, but they get one different name today. Plenty thousands of these trees all over this place.

CSH: Now who did you work for? Tony was telling me you went retire from construction. What company was that?

Informant: Hawaiian Dredging and Pacific Construction, and then they went to Grace, and then Yoshimuri–about twenty different companies. Twenty-three years I work construction.

CSH: Oh twenty-three years–oh so what, you went retire from the Labors Union?

Informant: Yeah, Labors Union. Then I went County work–rubbish truck for a while, and then run grass cutter, and then drive one truck, and then retire. Two time I went retire, not too many guys can do that.

CSH: I know– young people like myself, we just lucky if we can retire from one place–and we lucky we can stay one place for more than twenty years.

Informant: So if we went up there–you know the trail going up, we would have came out right here.

CSH: Oh, it's just a loop that comes around?

Informant: Yeah, it's just a loop that comes around. It's more like an exercise loop. You like go to the springs?

CSH: Yeah okay!

Informant: We no go down `cause it's kind of hard to go down. We just go from the top and look down.

CSH: Okay. Eh next time I come, I going give you one weeks notice and we come over here and you can show me how for pig hunt–I like go.

Informant: You know, I was talking to the guy, you know where you went park your car, the guy over there is in charge of the park–Ameral. He tell me, "you not going take her for one far walk, eh" I said, "No! Not supposed to be, only for look around." [laughing] I trying for see if I can find deer marks, but no more deer! I just see them dog markings.

CSH: The prisoners, they was growing vegetables, too?

Informant: Yeah, they had vegetables. By and by we go down, stop over there. It's where you stay park. Get the Bird Sanctuary and then I show you where get the vegetable farm and then get the buildings where they learned how make crafts–make bowls and stuff, so when they go outside, they get something for do–they know how to do something.

CSH: Right.

Informant: Run bulldozers, they teach some guys. They go make roads for the State or the County. Now you no can use prison labor–somehow some guy from the mainland came and said that's cruelty, you cannot do that to the prisoners, so everybody went stop. The spring should be right down here–we only going on top and look down, cause get on switch back trail, kind of hard for go down, I no like take you down there. Right down there by the last tree that's the trail–you go down there maybe you going see one waterfall, dry. We can probably see it from up here, no need go down.

CSH: How come it's all dry now?

Informant: Because like I told you, the weather has been changing over the last twenty years. The water has changed a lot–a lot of rain used to get. Plenty gulches all dry. The more they mess around with satellites and stuff, the worse the weather gets.

CSH: Had *`ōpae* inside?

Informant: I no remember. I never come over here for *`ōpae*, I used to go East Maui Irrigation Forest–when we go hunt pigs, you know the rivers get *`ōpae*, yeah, take the *`ōpae* net. Today they get this kind *`ōpae* net, before they had the one made with the guava stick–put `em by the stone, one stone at a time [laughing]. This trail was made by volunteers, not by the State–people come over here and volunteer make this trail over here, and the State give them permission–especially the Nature Conservancy and these preservation people–they give them thousands of acres of land and do what they want with `em–and people like us no can even buy half acre. They giving thousands of

acres away, and what they do? They just go over there and kill all the pigs, that's the first thing they do. Second thing they do is put fence, millions of dollars for fence up the area, and certain places where the pig concentration is plenty, they no make fence, so the pigs come inside the park, and then they kill them. Every damn person that come here do the same thing–eh, pigs not killing that much! You figure, pigs was here hundred years before they came. The spring right down here. We only going come to the edge right here–so not that far. Right across there is private property already–right across this gulch. Tam, that *pākē* guy, who own land all the way down to Makawao. Oh that is Haleakalā Ranch, Baldwins again. Where I told you get the gate for go Waikamoi, from there on until the crater is all Baldwins. Try listen? I thought I heard something–I thought I heard a deer.

CSH: You guys come up here and hunt deer, too?

Informant: No. Down my friends place–we past over there.

CSH: Eh deer is good meat.

Informant: I never shoot one deer in my life, I no care for eat deer. My wife go help me wash the meat like that, she break out all in hives.

CSH: Oh.

Informant: She's allergic to deer meat. I only have one deer–lives in my house, and I no like shoot `em because the bugga wash my clothes and everything [laughing]! That's my deer and I ain't going shoot `em. No I not going. The spring, just like real spring–people go over there thinking they going see water, and all dry. That's when you come back you so tired you can rest over there.

CSH: Oh, the bench.

Informant: That's the spring over there.

CSH: What is the name of this spring?

Informant: What they call this–Waihou Spring. No go near the edge, by and by I gotta go get you [laughing]. From here the gulch come real big, because no water getting into it now–get another branch. Ah right there the waterfall–no more already, *pau*. All over there, that's pasture land–civilization. So you came to the spring, how do you like it!?

CSH: Yeah, I like it–unfortunately it's dry, though.

Informant: You good walker. I thought maybe you not so good walker, but you can walk–you get good legs [laughing].

CSH: [Laughing] I can walk for days.

Informant: We call this gulch, Toni Tam's Gulch! Because all down there is his–all the way to Makawao. You see how deep the gulch? Just imagine, I up here and

my dogs are barking at the pigs down there–eh, I gotta go get `em–I gotta find one way for go down [laughing]. You like carve your name [in the tree]?

CSH: Nah. Oh this paper tree or what?

Informant: No this eucalyptus. This is the blue gum, blue gum they call this.

CSH: This one soft tree?

Informant: Yeah, get the hard one right over there–Robusta.

CSH: Oh the thing look like get some kind of infection.

Informant: This when you go get `em, the inside always red–strong wood. Wow, I never was in the woods for long time.

CSH: Do a lot of people use this trail?

Informant: Like I said, *haole*–locals no come here, though. They no like see this, locals. I'm out of condition.

CSH: Me too, don't worry.

Informant: A little huffing and puffing is okay. I stopped hunting about three years now–all together.

CSH: All together you just stopped?

Informant: Yup!

CSH: Getting to be too rough?

Informant: No–I getting too old already. You know like my doctor says, "someday they going find you dead in the woods." I said, "so what? I gotta die someplace." And no more as much pigs as used to get. I tried many times to quit hunting–because my kids all grow up, and they marry other kind people. Two of my daughters married *haole*–you bring one pig home they say, "eh what is that dad?" They rather go to the supermarket go buy–so, I catch a pig, I bring `em home, I clean `em, I make smoke meat. I tell them, "You guys, get some meat come get!" They tell me, "Eh–no need, we get from the last time, yet!" I bring `em home I make *laulau*, "you guys like *laulau*?" "Yeah okay we like." "Okay, how much you like?" "Give me three `nough." I made eighty, what the heck am I going to do with eighty? So afterwards, I catch one pig, I come through Makawao town, I look for one Filipino, I tell `em, "you like this pig?" "Oh yeah." I go give `em to him. Afterwards I think–what am I doing this for? Shoot–it's not a must anymore. Like I raised my family almost the way my father did–although I became an ocean man afterwards–fish, pig, goat–that's how I helped raise my family.

CSH: Times have really changed, now, yeah?

Informant: Oh yeah. When I first got married, I worked for seventy-five cents an hour–and then came up to two dollars an hour. My house note was thirty dollars a month, and I had hard time paying `em sometimes [laughing]–gotta squeeze for pay `em. I bought my place six thousand dollars. Come to our neighborhood, now it's two hundred thousand. Everything has come up.

CSH: You children, all of them still live here in Maui?

Informant: Oh yeah.

CSH: Right here in Makawao?

Informant: Kahului and Hawaiian Homes, and eh, Portuguese Terrace, and one in Wailuku, and one in Makawao, in Pukalani. If I ran away right now, you can get out of here?

CSH: Just gotta follow that path right up there.

Informant: Where we going left or right?

CSH: Left.

Informant: Eh you smart. Sometime I go hunting with these young guys I tell them, "where the truck stay from here?" Sometime they stay down there, and they pointing up–I tell them, "eh, you guys stay lost." So I tell `em, "you know when you guys walk, no just walk now–you gotta remember what you see, make marks in your mind."

CSH: I know, plenty people get lost hiking on O`ahu.

Informant: You know people from New York who never seen the forest before, they go take one six mile hike on one ridge–narrow–crazy people! Now we get big problem on this island with kayakers. That's another one. They go take people out, inexperienced people, they go out, get the channel from Hilo, then get the wind and the rough water, they no can come back–get the kids with the, one five year old kid–the life vest he get on, no even fit him. Big problems. They should make the guys who rent the kayaks, pay for the rescue. Next time you come, we go take the Kahakapao Loop–where I told you get the bicycle trail that's only about the worse spot right there, get one steep hill, but short, and then the land on top is flat, cross one small gulch, and then you stay in the back of the treatment plant already. Then you keep walking, you going come to the treatment plant, and then if you like go straight up–you no like go straight up, it's far and it's a climb all the way up. Twenty years ago I do that, today I no like. Then, I had hard time pig hunting, you know, every time I tell myself, I going stop–the edge is there, I going stop. Then one day I broke my smoke house down–then I no can go, no more. I used to make charsiu, smoke–and regular my way, everybody like my way! And sausage my way–you know people use the electric grinder come out like hamburger, us guys we make `em the old Portuguese way, we cut all by hand, little chunks like this–I give `em to guys they tell me, "oh I never eat this kind before, *`ono*, good!" I got to cure `em first, mix `em all up, put `em in the icebox, then night time I

come mix `em again, and then the next day I fill `em all up, and stuff `em.

CSH: What you use for the casing? The intestines?

Informant: Yeah, you can buy `em at the store, all clean and everything. In the old days, with my mother guys, we used to make our own. We kill the pig take the guts, only one certain gut, and then we go clean `em all good, salt and lemon, and then we go use that. Today, we go buy the casing.

CSH: You guys make vinha d'alhos style, too?

Informant: My wife use to make–she's one Hawaiian, but she learned from my mother. My son he like eat pork, he go buy–supermarket. Today you go market, pork butt, sixty-nine cents a pound–how cheap! You figure, you gotta buy one truck, you gotta keep four or five dogs–eh.

CSH: And then you have to invest couple hours.

Informant: Oh no, you gotta go all day. I used to leave my truck sometimes, seven in the morning, I no come back `till seven in the evening. You gotta know where you going. This used to be the pasture, where they raise their cows. This the house where we used to raise the seedlings.

CSH: In highschool we used to go Big Island once a year go plant *koa* seedlings–oh boy, that's hard work.

Informant: I no think *koa* one endangered species anymore, everybody planting *koa* nowdays.

CSH: Hard work for plant.

Informant: Polipoli we used to carry the pine trees, bags, on our backs, with one shovel–you take fifty trees, I take fifty trees–and we would be walking through gulches, we walk through bushes–

CSH: With the sack, and the shovel–! It was hard work when I went to plant seedlings.

Informant: Oh yeah–it's hard work. They talk about Haleakalā Park, used to have some Hawaiians living in there–I doubt had very much. They probably came from Kīpahulu–the other side of the mountain–but to live inside the crater, they no more the kind clothes we have today, warm clothes.

CSH: I can't imagine what it's like to live up there, already down here it's cold already.

Informant: From there up, you see the pasture, its all ranch. The ranch go around like this, all the way around up until the crater.

CSH: And you went plant all these trees?

Informant: Yeah, all the trees inside here–me and Steven Gibson. The rest, the whole gang went plant this. This came way later than this one.

CSH: And Steven Gibson was the guy who used to collect the artifacts?

Informant: No, the brother–Harry, he was the foreman. Jacob Mau was the number one foreman, but he never did care for that. Then Harry used to pick up some, not all. Eh they destroyed a lot over there. I can still show you little caves–where I told you had the burial grounds and all that. But even get *pahole* over there. Probably go walk down the beach every day–go down couple days, come back up again–take salt with them, *pa`akai* for salt the fish. Salt everything–. We lived without refrigeration, we lived with kerosene stoves and wood stoves. First, when we real young, we had wood stove, my mom wake up early make the fire, cook for my father go work–and then afterwards came to kerosene. The ranch my father work for, they used to give us kerosene for free, twenty gallons a month–because labor was so damn cheap, they no can afford to buy anything. They got free house, plantation house, big help–but they getting labor almost like free. Dig ditches all the way up, that's my wife's family guys, they dig out all those EMI [East Maui Irrigation] ditches coming out–they work there with the Chinese coolies. The bosses were mean to them. Every boss or foreman, Baldwin or whatever, carry one rifle with them on the horse to show `em, "no get stupid with me."

CSH: I guess you gotta show them control.

Informant: No get stupid with them or they go shoot you on site–and they get away with it. Right now I working for one Baldwin part-time. You know Makawao Town, part of Makawao Town belongs to one Baldwin, so my job is to keep the place clean, and no let anyone park inside the parking lot–it's private parking. Over there, get some radical people–sometimes they stay on drugs, they like fight you!

CSH: It's a nice place for relax over here.

Informant: It's beautiful. It's been nice talking to you and walking–I like it, you're a good person.

CSH: You too, uncle. I going come back and we go hiking.

Informant: Preferably on Saturday. You know where the road stay, turn inside there.

CSH: Okay.

Informant: Maybe we can go visit the Bird Sanctuary. From now on going get one steep grade so you go put `em in second gear, yeah–no go in drive.

CSH: Look that beautiful home.

Informant: That's the game warden had one–he used to live there, one guy, but the warden after he moved from up there, he moved over here–they went build him one new house over here. What the heck was his name? Al–oh, Al Souza,

he was the first game warden up here. I think he *make* already–I think he died already.

CSH: Oh, game warden?

Informant: No–warden for the prisoners! The game warden was living over there after the prison was gone, now I don't know who–someone with the forest reserve. This was all pasture–drive right in here [into the Bird Sanctuary]. We go walk around.

CSH: Open? No?

Informant: Come we go look around. That's one endangered gardenia [laughing]. Nah–not that. This *māmane*–how the heck they grow down over here? This is *pohā*, you know. The birds, where they get the birds, it's in the back. You know whose paying for this? You and I. [Inaudible]

CSH: Oh yeah, they are closed. That's okay, but they have the birds back there. Oh–

Informant: I wanted you for go see them.

CSH: You see the vegetables here, the cattle over there–you see, they hardly bought food, mostly rice and flour and stuff–the rest they raise their own.

Informant: So where do you want to go?

CSH: No, I think this is pretty good–I thank you for offering me so much information!

Informant: Thank you and you're welcome.

_____End Interview_____

APPENDIX E

COMMENT LETTERS

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 2, 2013

DLNR Attention: Torrie Nohara
Na Ala Hele, Trails and Access System
Division of Forestry and Wildlife
(Torrie.L.Nohara@hawaii.gov)

LOG NO: 2013.1662
DOC NO: 1304JP07

Aloha Ms. Nohara:

SUBJECT: **National Historic Preservation Act Section 106 Review-**
Draft Environmental Assessment for the Proposed Na Ala Hele Trails and Access System
Kahakupao Trail Loop Construction
Ha'iku Uka Ahupua'a, Makawao District, Island of Maui
TMK (2) 2-4-016:002

Thank you for the opportunity to review the Draft Environmental Assessment (EA) for the Kahakupao Trail Loop Construction. We received your inquiry for comments and appreciate the subsequent email correspondence during April, 2013. The proposed undertaking is located on State lands and Federal funds will be utilized through the Recreational Trails Program Grant. Na Ala Hele seeks to expand the trail system in the Makawao State Forest Reserve to include the new recreational area. Because the trail is being constructed with the use of volunteer labor, construction may take as long as one year, depending on volunteer turnout.

The Makawao State Forest Reserve is comprised of 2,093 acres on the west-facing slope of Haleakala. The Reserve ranges in elevation from 2;040' to 4,920' and contains a network of over 13 miles of bulldozed management roads. During the 1960's, the State Division of Forestry began a tree-planting program to replace the remnant forest. Planting efforts occurred between 1960-1971 consisting largely of eucalyptus, pines and tropical ash. The ridgelines were scraped with bulldozers creating four-wheel drive roads, many of which still exist.

In 2003 the approximate 5.75 mile loop trail was constructed to provide a pathway for use by beginning to intermediate level recreational users, including hikers, bicyclists and equestrian users, while at the same time providing increased security to the County Water Treatment Facility. Since the Trail was opened, there have been several illegal bicycle trails constructed but two of the existing trails are being incorporated into the Kahakapao Recreational Area. The Area of Potential Effect (APE) falls within the same footprint as the 2003 work. On January 3, 2002 we provided comments and indicated "no historic properties will be affected" (*Log 28907, Doc 0112CD32*).

We understand the entire APE has been impacted by bulldozing, various types of mechanical land clearing, large planting areas and active pedestrian trails. Therefore, we believe **no historic properties will be affected** by the proposed work. In the event that historic resources, including human skeletal remains, structural remains, or other types of cultural remains are identified, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and inform our division. Please contact Jenny Pickett at (808) 243-5169 or Jenny.L.Pickett@hawaii.gov for concerns about this letter.

Mahalo,

Theresa K. Donham
Deputy State Historic Preservation Officer

cc: Department of Planning (planning@mauicounty.gov)
County of Maui DSA fax: (808) 270-7972
Scott Fretz DLNR (Scott.Fretz@hawaii.gov)

Appendix E-1

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE
54 SOUTH HIGH STREET, ROOM 101
WAILUKU, HAWAII 96793

May 6, 2013

Historic Preservation Division
Attention: Theresa K. Donham
Deputy State Historic Preservation Officer
Post Office Box 621
Honolulu, HI. 96809

Aloha Ms. Donham:

SUBJECT: National Historic Preservation Act Section 106 Review-
Draft Environmental Assessment for the Proposed Na Ala Hele, Trails and Access System: Kahakapao Recreational Area
Ha'iku Uka Ahupua'a, Makawao District, Island of Maui
TMK (2) 2-4-016:002

Thank you for your written response to our request for review of the Draft Environmental Assessment (EA) for the Kahakapao Recreational Area. As outlined in your letter and detailed in the Draft EA, proper protocols will be adhered to if any historical resources are encountered. We appreciate your time.

Mahalo,

Torrie Nohara

Torrie Nohara
Na Ala Hele, Trails and Access Program

cc: Department of Planning (planning@mauicounty.gov)
County of Maui DSA fax: (808) 270-7972
Scott Fretz DLNR (Scott.Fretz@hawaii.gov)