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Kalaupapa Settlement Boundary Study Along North Shore to Halawa Valley, Molokai

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SUMMARY

The study area takes in the most scenic parts of the island of Molokai -- the spectacular north shore cliffs from Kalaupapa to the Halawa Valley. Within the study area are the pristine stream valleys of Pelekunu and Wailau and their watersheds, along with the upper watershed of the Halawa Stream, altogether encompassing about 24,000 acres. The entire study area is within the boundary of the North Shore Cliffs National Natural Landmark.

The geological resources of the study area, determined to be of national significance as attested by their designation as the North Shore Cliffs National Natural Landmark, are the major extension of those found within Kalaupapa National Historical Park. This study report finds that these geological resources meet the same standard of significance as would be applied to evaluating an area as a new unit of the national park system. Adding these lands to Kalaupapa would place this entire nationally significant geologic feature within the national park system.

This report also finds that study area biotic and cultural resources are appropriate additions to Kalaupapa National Historical Park and that the Hawaiian archeological resources of the Pelekunu and Wailau valleys are very likely to be of major significance. Moreover, the geological, archeological and biotic resources of the study area would enhance rather than duplicate similar resources found within Kalaupapa National Historical Park.

The study area has been found to be largely feasible as an addition to Kalaupapa National Historical Park. Its configuration along ridgelines encompasses watersheds, lending itself to management for resource protection. Opportunities for visitor use, however, would be only moderate because of the limited access. Based on an examination of public property tax records, potential costs to acquire the privately-owned lands adjacent to Kalaupapa National Historical Park are judged to be feasible. The 1999 assessed valuation for the approximately 15,220 acres of privately-owned land within the study area totalled $183,100.

The principal owners of the privately-owned lands within the study area are The Nature Conservancy and the Puu O Hoku Ranch. The Conservancy has indicated that they are not interested in continuing

to manage their Pelekunu Preserve and would be willing to relinquish these lands to the National Park Service. The owner of the Puu O Hoku Ranch appears to be interested in turning over ranch lands to a land managing entity such as the National Park Service to ensure the long-term protection of resource values. Kalaupapa National Historical Park has the legislative authority to acquire private lands by donation, exchange or purchase.

The remaining privately-owned lands, encompassing about five percent of the study area, are subdivided into smaller parcels. Many of the landowners here are absentee, some parcels are likely to have unresolved title problems and a few owners may oppose the establishment of a national park. These concerns, however, are judged not to affect the overall feasibility of adding study area lands to Kalaupapa National Historical Park.

The State of Hawaii is the other major landowner within the study area. The Department of Land and Natural Resources is the administering agency. State lands within the study area have the potential to be administered as a national park on the basis of a cooperative agreement. Kalaupapa National Historical Park has the legislative authority to enter into cooperative agreements with the State of Hawaii. Agreements have been in place at Kalaupapa with the Hawaii Departments of Land and Natural Resources, Health and Transportation for nearly two decades.

Alternatives for managing and protecting study area resources have been evaluated. These alternatives were found to be less adequate in terms of providing long-term protection to study area resources than including them within Kalaupapa. Adding these lands to Kalaupapa National Historical Park is judged to be the best way to ensure the long-term protection of these resources.

BACKGROUND

Study Purpose

To study and analyze lands adjacent to the existing eastern boundary of Kalaupapa National Historical Park eastward to the Halawa Valley along Molokai's north shore to determine if these lands contain resources integral to the protection and preservation of the natural, cultural, historic, scenic and recreational values of that unit of the national park system, and whether legislation to allow these lands to be added as a major boundary expansion is feasible.

Kalaupapa National Historical Park

Kalaupapa National Historical Park (NHP) was established in 1980 by Public Law 96-565 "to provide for the preservation of the unique nationally and internationally significant cultural, historic, educational, and scenic resources of the Kalaupapa settlement on the island of Molokai..." The park is located midway along the north coast of the island of Molokai.

The State of Hawaii owns nearly all of the lands within the authorized boundary of Kalaupapa NHP and all of the offshore waters within the boundary. About 70 acres within the park remain in private ownership and a single 23-acre parcel is owned by the National Park Service (NPS).

Kalaupapa is administered as a unit of the national park system on the basis of cooperative agreements with the following agencies of the State of Hawaii: the Department of Health, the Department of Transportation and the Department of Land and Natural Resources. The Department of Hawaiian Home Lands, another agency of the State of Hawaii, holds more than 1,000 acres within the park in trust for native Hawaiians. NPS administers and manages Hawaiian Home Lands within the park on the basis of a lease agreement. It is on leased Hawaiian Home Lands that Kalaupapa's patient community resides. NPS also has cooperative agreements with the Roman Catholic Church in the State of Hawaii and the Hawaii Conference Foundation. These two entities are the owners of churches located within the park. These cooperative agreements and the lease allow

for shared responsibilities in the protection, maintenance and interpretation of the Kalaupapa's natural and cultural resources.

Public Law 96-565 provides NPS with the following authorities with regard to acquiring park lands at Kalaupapa:

- lands owned by the State of Hawaii may be acquired by donation or exchange, provided that these lands are voluntarily offered;

- lands held in trust for native Hawaiians may be acquired by exchange for lands outside of the park, providing these lands are of the same "class and degree" as those that encumber the park. Lands outside the park exchanged for Hawaiian Home Lands in the park may be acquired by donation, exchange, or purchase, but not through condemnation; and

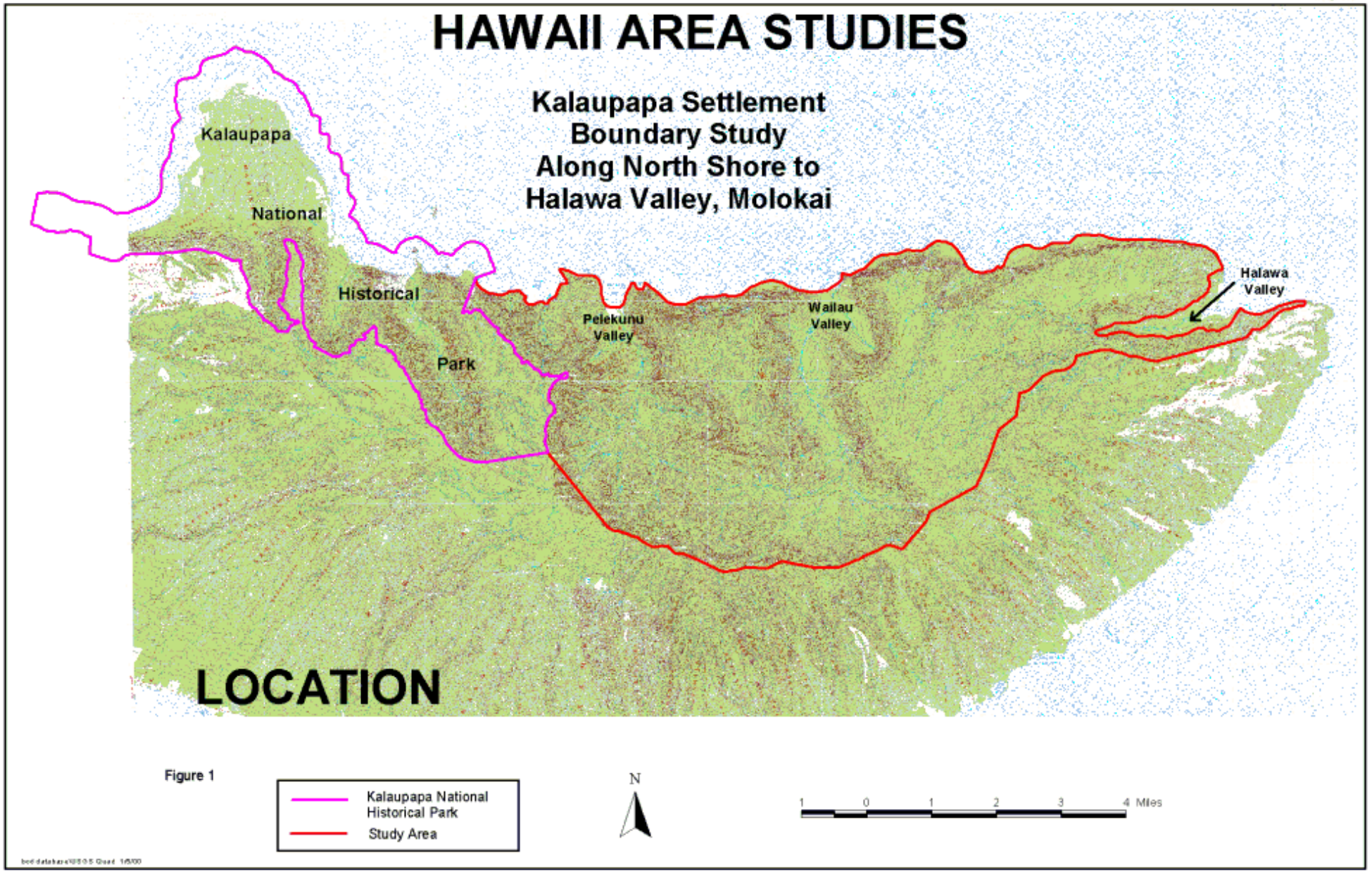
- lands privately owned may be acquired by donation, exchange, or purchase.

Public Law 96-565 was amended in 1985 to permit NPS to lease those portions of the park administered by the Department of Hawaiian Home Lands. The previous year, the Department of the Interior Inspector General and the State Attorney General had determined that the Hawaiian Homes Commission could not allow their lands to be used by other entities without compensation since they were held in trust by the State of Hawaii for the benefit of native Hawaiians. At the same time, Departmental Solicitors had determined that the leasing of State lands for national park purposes was illegal.

Lands within Kalaupapa NHP consist of the relatively flat Makanalua peninsula, three interior valleys and the rim of the adjacent cliffs or pali. The volcanic eruption that created the peninsula was a more recent geological event than the formation of the island of Molokai. The small shield volcano, Pu'u 'Uao, gave birth to the peninsula by forming the Kalaupapa shield. This feature is the most recent evidence of volcanism on Molokai, occurring in the late Pleistocene.

The rest of the park, more than half, is part of the main shield volcano of the island of Molokai and geologically distinct from the peninsula. It is comprised of the Wai'alie'a, Waihanau and

Figure 1. Location: North Shore Cliffs


HAWAII AREA STUDIES
Kalaupapa Settlement
Boundary Study
Along North Shore to
Halawa Valley, Molokai
Kalaupapa
National
Historical
Park
Pelekunu
Valley
Wailau
Valley
Halawa
Valley
LOCATION
Figure 1
Kalaupapa National
Historical Park
Study Area
N
1 0 1 2 3 4 Miles

Waikolu valleys and the spectacular pali rising more than 2,000 feet above the peninsula. Kalaupapa's pali is the westward extension of Molokai's north shore cliffs which extend all the way to the island's eastern end. The sea cliffs of the north shore of Molokai, because of their geological significance, have been designated a national natural landmark.

The North Shore Cliffs viewed from the Kalawao scenic overlook in Kalaupapa National Historical Park.

Waikolu, the largest and easternmost of the three valleys within Kalaupapa, is similar in its geological, biological, ecological and archeological resources to the other windward valleys to the east--Pelekunu, Wailau, and Halawa. However, due to the long-term effects of transbasin diversions of its flow, the biological and ecological values of the Waikolu Stream have been compromised. These diversions were begun in 1961 and studies conducted since then estimate that they remove approximately 20 percent of the annual water yield from the Waikolu watershed.

Although the primary resource management emphasis at Kalaupapa is preservation of the historic settlement structures, resource

management objectives also recognize the park's inherent scenic, geologic, biotic and archeologic resources. Natural resource management goals at Kalaupapa include conducting and encouraging natural history research to (1) further define and gain insight into the park's native island ecosystem, (2) develop life history and ecologic understanding of plant and animal species facing extinction, and (3) develop management strategies for preserving endemic island ecosystems.

Within the park, the Kalaupapa peninsula and the adjoining valleys of Waihanau, Wai'ale'ia and Waikolu have been divided into habitat zones based on the existing vegetation patterns. These patterns reflect local differences in geological substrate, rainfall, wind patterns, and temperature. The zones are montane rainforest, lowland forest, lowland mesic forest, coastal shrubland, coastal dry mixed shrubland, coastal grassland and sea cliffs.

Areas within the park containing valuable natural resources have been designated Special Ecological Areas (SEAs). These SEAs have been determined to be the most intact, diverse, unique and manageable sites within the park. The State of Hawaii's Pu'u Ali'i Natural Area Reserve (NAR), the Waikolu Valley and the pali cliffs are among the sites within Kalaupapa recognized as distinct SEAs. The Pu'u Ali'i NAR supports one of best examples of 'ohi'a (*Metrosideros polymorpha*) rain forest in Hawaii and is an essential habitat for rare and endangered native forest birds including the Molokai thrush (*Myadestes lanaiensis rutha*).

The Waikolu Valley contains the park's sole perennial stream. Native gobie fish in the Waikolu Stream include the 'o'opu alamo'o (*Lentipes concolor*), a candidate species for listing under the Endangered Species Act, the 'o'opu nakea (*Awaous guamensis*) and the 'o'opu nopili (*Sicyopterus stimpsoni*). The stream also contains other native diadromous fish and mollusks. The Waikolu Stream is notable for supporting a large population of the relatively uncommon native Hawaiian stream snail, hihiwai (*Neritina granosa*). Carter's panicgrass, *Pancium fauriei* var *carteri*, *Cyanea procera* and *Melicope reflexa*, all federally endangered plants, are found in the Waikolu Valley.

Among the projects identified in Kalaupapa's Resource Management Plan is a study to compare hydrologic and biologic attributes of the Waikolu Stream watershed with hydrologic and biologic attributes of

the nearby Pelekunu Stream watershed. As noted, portions of the Waikolu Stream flow have been diverted. These diversions have caused adverse effects on riparian and biotic resources. The Pelekunu Stream and its watershed, on the other hand, remain pristine.

The pali cliffs separate the peninsula from the rest of Molokai. Due to their steepness, these cliffs are inaccessible to feral pigs (*Sus scrofa*) and axis deer (*Axis axis*). There are three endangered plant species growing on the cliffs--'awikiwiki (*Canavalia molokaiensis*), *Schiedea lydgatei* and makou (*Peucedanum sandwicense*)--and they provide likely nesting sites for native and endangered birds.

There are Hawaiian archeological sites throughout the national park. Human occupation at Kalaupapa extends from as early as 1000 A.D., when a sizable native population occupied much of what is now the park. The number and types of archeological resources and their excellent state of preservation make Kalaupapa one the most valuable archeological preserves in Hawaii.

The Waikolu Valley offers the greatest potential for the presence of archeological resources within the park. No intensive archeological survey of this valley has as yet been undertaken. However, plans are underway for the establishment of an archeological field station at Kalaupapa. The field station will be led by noted Hawaiian archeologist Patrick Kirch of the University of California at Berkeley.

Alien animals represent a major threat to Kalaupapa's natural and cultural resources. Feral pigs and goats and axis deer are damaging the native forests in the Wai'ale'ia, Waihanau, and Waikolu valleys. Feral pigs cause damage to archeological sites by rooting at the base of structures damaging foundations and breaking down walls to make trails.

Invasive alien plants are also a significant threat to both natural and cultural resources at Kalaupapa. The park's examples of Hawaii's cloud forest and other pockets of native vegetation are threatened by the continuous and increasing presence of alien plants. Alien plants already cover archeological sites and many more are at risk.

Kalaupapa NHP is a member of the recently formed East Molokai Watershed Partnership. This coalition is composed of a group of

landowners, government agencies and non-government organizations whose purpose is to cooperate in the management of natural ecosystems to preserve native ecosystems and conserve watersheds. Private landowners within the area being studied as a potential addition to Kalaupapa are members of the coalition.

DESCRIPTION OF THE STUDY AREA

Location, Size and Ownership

The most beautiful parts of the island of Molokai are the parts most difficult to reach. Most visitors to Molokai see only the less scenic west end and the central portion of the south shoreline. The most scenic part of the island, the north coast from the Kalaupapa Peninsula to the Halawa Valley, is accessible only to the hardiest of hikers via a cross-island trail or by small boat or kayak, usually coming from Halawa Valley at the east end of the island and then only during summer months.

The boundary of the study area coincides with the North Shore Cliffs National Natural Landmark boundary outside of Kalaupapa NHP. Study area lands consist of the ahupua'a[1] of Kalawao, Waikolu, Pelekunu, Wailau and Halawa, as well as the upper portion of the ahupua'a of Kawela. Except for a few hardy individuals residing near the coast at Haupu Bay and in the Wailau Valley, study area lands are unpopulated.

The terrain is mostly mountainous, forested lands bound on the north by about 15 miles of rugged coastline characterized by spectacular sea cliffs exceeding 3,000 feet in elevation. Within the study area, these sea cliffs are breached by two major stream valleys -- Pelekunu and Wailau -- and the smaller Papalaua Valley containing the Kawainui Stream.

The study area's southern limits follow the national natural landmark boundary along the summit ridge of the Papaaia Pali. This area encompasses the watersheds of the Pelekunu and Wailau valleys plus the upper watershed of the Halawa Stream. Kamakou at 4,970 feet is the high point on the summit ridge and is the highest elevation on the island.

The study area encompasses nearly 24,000 acres. Within, the State of Hawaii owns 8,680 acres, The Nature Conservancy (TNC) 5,722 acres, and the Puu O Hoku Ranch about 8,122 acres. The remainder,

[1] Hawaiian land division usually extending from the uplands to the sea.

about 1,376 acres comprising about six percent of the total study area, has been subdivided into about 75 smaller, privately-owned parcels. Many of the owners of these parcels are absentee. Some of the parcels are likely kuleana[2] lands. Several of these parcels have multiple claims of ownership and some claims are only for the water rights appurtenant to the land.

Lands owned by the State of Hawaii take in the entire watershed of the Wailau Stream plus the adjacent uplands that comprise the Olokui NAR. State lands consist of a 8,540-acre parcel, a 125-acre parcel, plus another 22 smaller parcels ranging in size from .02 acre to 7.2 acres.

All of the watershed of the Pelekunu Stream is contained within TNC's lands. TNC's ownership consists of a 5,254-acre parcel, a 461-acre parcel, plus 13 other parcels ranging in size from .03 acre to 7.17 acres. Other owners have partial interests in nearly all of TNC's lands.

The Puu O Hoku Ranch's lands within the study area are all located on a single parcel. This parcel contains the entire upper watershed of the Halawa Stream plus the watershed of the smaller Kawainui Stream. The Halawa Valley, containing the lower portion of the Halawa Stream, is outside of the study area.

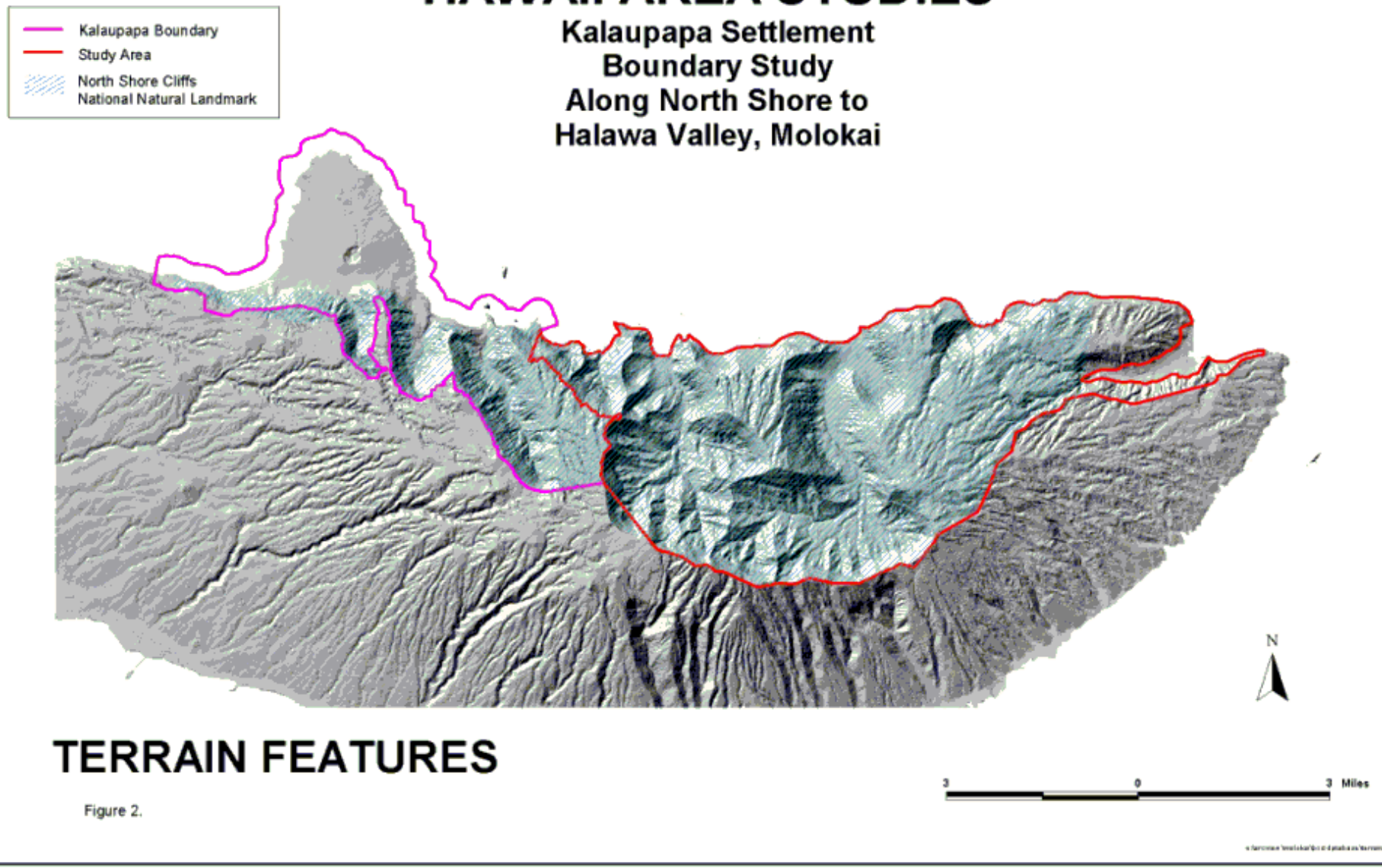
Land Uses. Study area land uses consist primarily of watershed conservation, resource protection and public hunting. All of the lands in the study area are within the Conservation District. Uses of lands classified Conservation by the State of Hawaii include open space, scenic and historic areas, wilderness and plant and wildlife habitat. Land uses in the Conservation District are governed by the Hawaii Department of Land and Natural Resources (DLNR).

A 1,620-acre portion of the State-owned lands within the study area is managed by DLNR as the Olokui Natural Area Reserve (NAR). NARs are areas designated by DLNR "to preserve a system of representative native ecosystems, geological features and endangered species for scientific, educational and natural heritage

[2] Lands given to native Hawaiians as Land Grants by the Hawaiian monarch about the year 1850.

HAWAII AREA STUDIES

Kalaupapa Settlement Boundary Study Along North Shore to Halawa Valley, Molokai

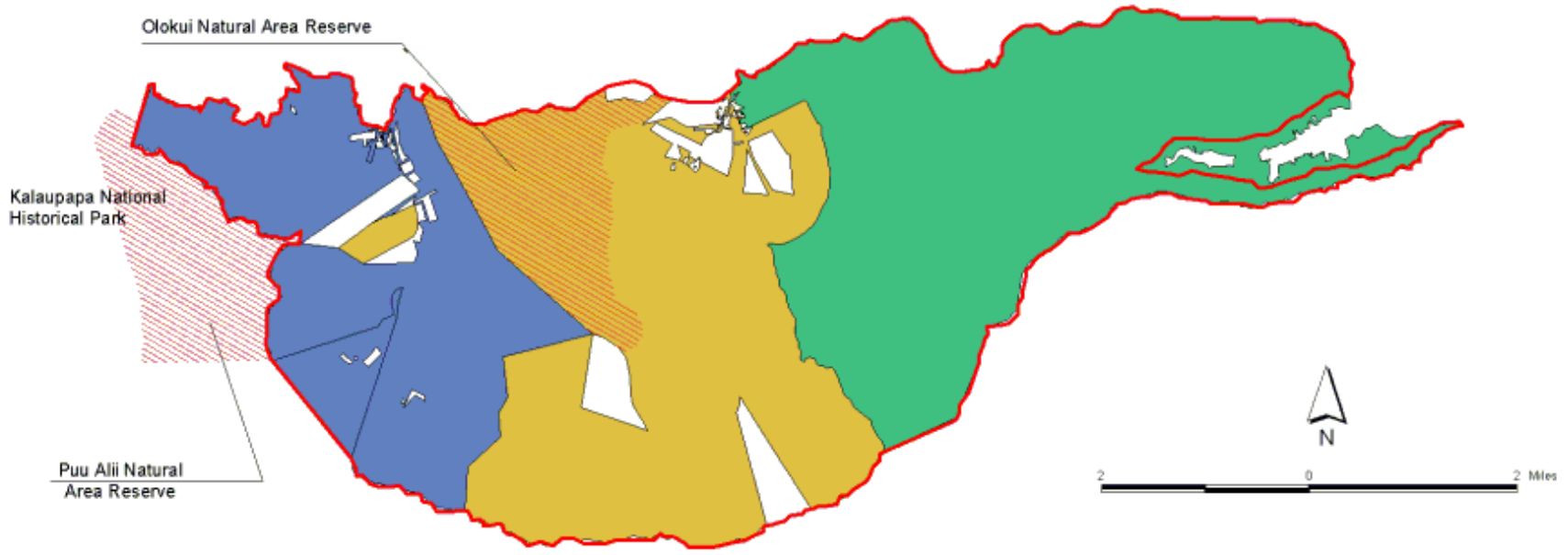


TERRAIN FEATURES

Figure 2.

HAWAII AREA STUDIES

Kalaupapa Settlement Boundary Study Along North Shore to Halawa Valley, Molokai



Major Landowners North Shore Cliffs

State of Hawaii
Puu o Hoku Ranch
The Nature Conservancy
Study Area

Figure 3.

e:\arcview\emi99\LandOwner

appreciation purposes."[3] The NAR System provides the State's highest level of resource protection. Outside of the NAR, the State-owned lands are open to public hunting.

TNC lands within the study area are being managed by the Conservancy as the Pelekunu Preserve for the protection of plants, animals and natural communities. Included within the preserve is the Pelekunu Stream, one of Hawaii's last remaining free-flowing streams and providing aquatic habitat to at least seven native species. Puu O Hoku Ranch lands within the study area are undeveloped, unused and presently not being managed for resource protection.

The entire study area is roadless. The closest vehicular access is via the unpaved extension of Maunahui Road. This 4-wheel drive road ends more than a mile from the western end of the study area. Maunahui Road is a private road and access is by permission of the landowners only. There is public access to the Wailau Valley by small boat or kayak, but as mentioned this occurs only during the summer due to rough seas along the north coast during winter months.

There are a few modest residential structures within the study area--two cabins in the Wailau Valley and a single cabin on the coast near the Pekekunu Valley. These are the homes of the only residents of the study area. Other non-permanent residential structures (tents and shelters) regularly appear along the coastal portions of the study area. These are usually occupied for only short periods of time and are removed when the occupants leave.

Within the study area on the state-owned lands open to public hunting, three species the state considers to be game animals--feral pig (*Sus scrofa*), feral goat (*Capra hircus*) and axis deer (*Axis axis*)--have open seasons. Ten wild bird species--lace-necked dove (*Streptopelia chinensis*), barred dove (*Geopelia striata*), wild turkey (*Meleagris gallopavo intermedia*), pheasant (*Phasianus* spp.), California valley quail (*Lophortyx californica*) and Japanese quail (*Coturnix coturnix japonica*)--have been designated by the state as game birds. Difficulties of access limit the amount of hunting which takes place within the study area.

[3] Chapter 105, Hawaii Revised Statutes.

The U. S. Natural Resources Conservation Service (NRSC) and the Hawaii Department of Agriculture have categorized about 100 acres of lands in the study area as Other Important Agricultural Land. Other Important Agricultural Land is defined by NRCS as lands other than Prime or Unique Agricultural Land that is also of statewide or local importance for agricultural use. The 100 acres are located in the forested uplands north of the Halawa Valley. No other agricultural lands have been identified in the study area.

Regional Context

Cattle grazing and agriculture are the main economic activities on the island of Molokai. These economic activities presently exist on a limited scale, mostly on lands in the western and central parts of the island. Once, pineapple fields covered much of this part of Molokai. Now, as on the other major Hawaiian islands, pineapple is gone. On Molokai, no major agricultural crop has replaced it. On portions of these lands, crops such as coffee beans, papaya and macadamia nuts are now being grown, along with small scattered patches of vegetables and melons. Cattle are grazed on these lands and on Puu O Hoko Ranch lands in the southeastern portion of the island.

The island of Molokai presents a high contrast in the distribution of its water resources. Eastern Molokai with its more mountainous terrain has substantial water resources; whereas, western Molokai, with its lower elevation and relatively flat terrain, has a paucity of water resources. This imbalance, coupled with low soil fertility and high evaporation from the persistent northeast tradewinds, led to the construction of a transbasin water diversion system in 1961 to bring water from eastern to western Molokai. Studies calling for additional diversions have been completed.

Molokai is part of Maui County. Maui County also encompasses the islands of Maui, Lanai and Kahoolawe. Molokai covers an area of about 260 square miles. The 1990 census population for Molokai was 4,319 (Kanaukakai, 2,658 and Kualapu'u, 1,661). The present population is estimated to be about 7,000 and is predominantly rural. Kaunakakai, located about midway along Molokai's south coast, is the island's major population and commercial center. Small communities and rural Hawaiian Homestead settlements are located in the central part of the island. The more mountainous eastern half of the island remains unpopulated, except for scattered residences and a few commercial establishments along the southern coast.

Molokai residents continue to be faced with high unemployment and limited employment opportunities.

Molokai's principal airport, located at Hoolehua, is serviced by the two major Hawaii interisland carriers with scheduled daily flights to and from Honolulu and to the other major islands. Interisland barge service operates to and from the Kaunakakai Harbor.

On the western part of the island, the Molokai Ranch, a working cattle ranch, operates a wildlife park on a portion of their lands and also provides low-key accommodations for eco-tourists and a small lodge at the entrance to Maunaloa town. The ranch is owned by a Singapore-based company, the largest landowner on the island with about 56,000 acres. Over 18,000 acres of Molokai are Hawaiian Home Lands open to native Hawaiians for homesteading. The State of Hawaii and the Puu O Hoku Ranch are also major landowners on the island.

The Kaluakoi Resort and Golf Club at the western end of the island and the Hotel Molokai near Kaunakakai, are the major providers of hotel accommodations on Molokai. Rental condominiums and bed and breakfasts are also available, but facilities for tourists remain limited on Molokai.

Resource Type

Two NPS publications, Natural History in the National Park System and History and Prehistory in the National Park System, are utilized to evaluate study areas for the significance of their natural or cultural resources. The natural history report lists and describes 33 different natural history themes, categorized as either geological or ecological, and groups them by landform type, geological history, land ecosystems or aquatic ecosystems. The report also describes how well each of the themes is represented in the national park system and in the national registry of natural landmarks. The history and prehistory report describes in outline form a thematic framework comprised of major themes, subthemes, topical facets, and facets which classify the historic resources of the nation. The report also lists how completely each of these themes are represented in the national park system and in the national historic landmarks program.

The study area contains examples of the following resource types, as defined by the Natural History and History and Prehistory thematic frameworks.

Natural history themes: Works of Volcanism, Tropical Ecosystems (montane rainforest), Seashores and Streams

History or Prehistory themes: Cultural Development:
Indigenous American Populations
- Subtheme: the Earliest Inhabitants
  - Facet: the Early Peopling of the Pacific
- Subtheme: Post Archaic and Pre-Contact Developments
  - Facet: Late Prehistoric Adaptions in the Western, Central and Eastern Pacific
- Subtheme: Prehistoric Archeology
  - Facets: Prehistoric Architecture/Shelter/Housing, Prehistoric Technology, Prehistoric Settlements and Settlement Patterns, Prehistoric Agriculture, and Prehistoric Cultural Change
- Subtheme: Ethnohistory of Indigenous American Populations
  - Facet: Native Cultural Adaptations at Contact: Native Adaptations to Polynesian Environments

Recreational Resources: The study area and its adjacent offshore waters have limited potential for the development of recreational opportunities for outdoor activities such as hiking, nature study and photography, primitive camping, kayaking and fishing. Camping and fishing opportunities would be subject to the ecological carrying capacity of the natural resources. Camping opportunities would be limited to areas where cultural resources would not be affected.

RESOURCE SIGNIFICANCE

Natural Resources

Geology. East Molokai is the remnant of a great shield volcano shaped in map view like the bottom half of an ellipse split along its major axis. The bottom half or southern flank slopes gently to the sea in the typical manner of shield volcanoes. However, the northern flank of the ellipse has been truncated by great cliffs rising up to 3,000 feet above sea level.

The sea cliffs of Molokai's north shore were formed when the northern third of the East Molokai Volcano suddenly collapsed and slid off into the sea. This was a geological event of cataclysmic proportions--involving about 600 cubic miles of island falling along a 25-mile long landslide that tumbled out as far as 120 miles offshore. The landslide was so fast and powerful that the last 80 miles of its 120-mile run was uphill, climbing 900 feet up from the Hawaiian Deep, the great depression caused by the weight of the islands. Displacement of this much material generated a 2,000-foot high tsunami that inundated the rest of Molokai and the nearby island of Lanai. Scientists date this geologic event at about 1,400,000 years ago.

Early interpretations of the East Molokai Volcano by geologists had held that the cliffs of Molokai's north shore were remnants of a much larger shield volcano whose northern flank had subsided along faults and disappeared beneath the sea. This largely correct view was disputed and for decades the cliff faces were judged to be erosional features carved by trade wind driven seas. Just recently, the earlier interpretation has been revived.

Recent investigations by the U.S. Geological Survey of the U.S. Exclusive Economic Zone, which takes in the entire Hawaiian archipelago, were the scientific basis for going back to the earlier interpretation. These investigations revealed 37 major undersea landslides. The astonishingly massive size of the area covered by these submarine mass-movement deposits was largely unknown prior to these investigations. The sidescreen - sonar system GLORIA (Geological LOng-Range Inclined Asdic) was utilized for the surveys which covered the 870-mile long reach of the Hawaiian

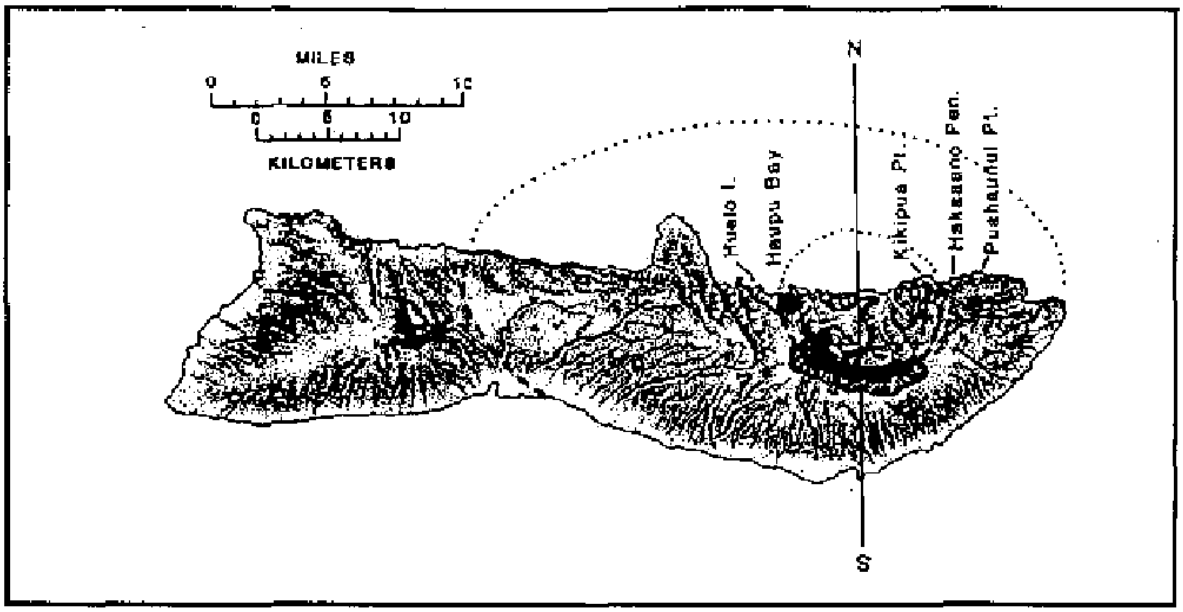


Figure 4. Physiographic Map of East Molokai: The inner dotted line and black areas mark the edge of the caldera. The outer dotted line depicts the shoreline of East Molokai Volcano before the great Wailau Landslide. From *The Caldera of East Molokai Volcano, Hawaiian Islands*. Holcomb and Compton. 1985.

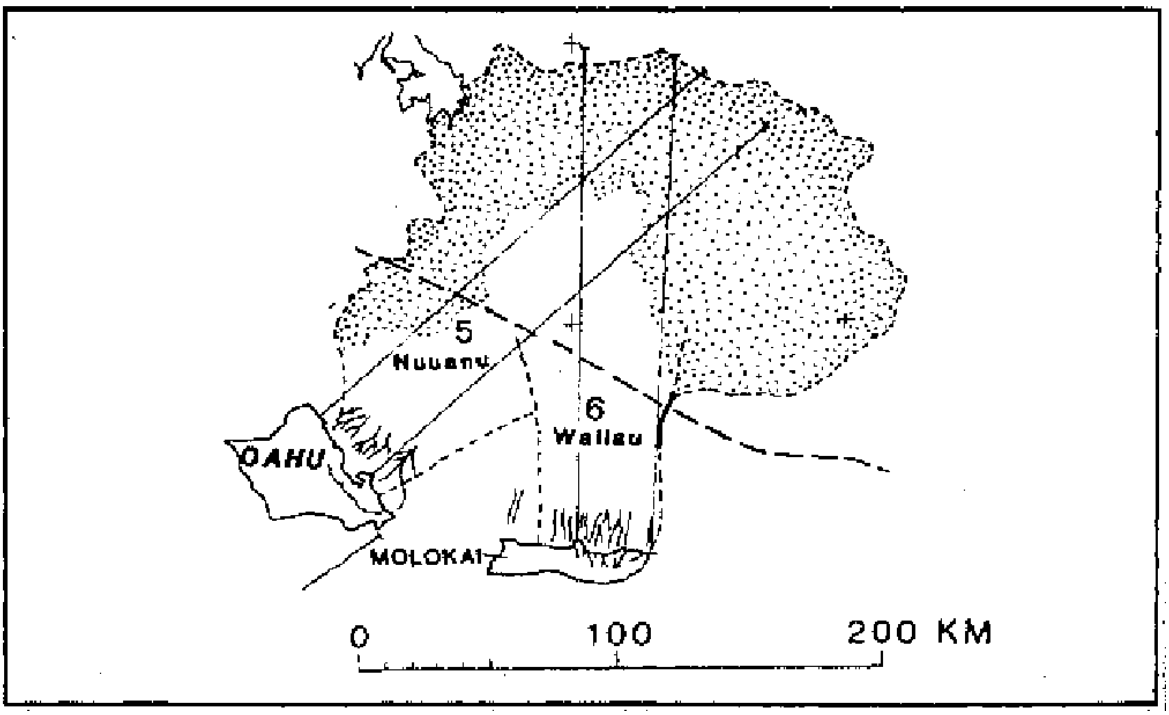


Figure 5. Extent of the Wailau and Nuuanu Submarine Landslides. From *Prodigious Submarine Landslides on the Hawaiian Ridge*. J.D. Moore, et al. 1989.

Ridge from the Gardner Pinnacles to the island of Hawaii. These surveys revealed that well-exposed, mass-movement deposits had occurred along roughly one-half of the flanks of the ridge. These deposits cover more than 38,000 square miles of the ridge and the adjacent sea floor from Kauai to Hawaii, an area more than five times the combined land area of all the major islands. Within the past decade, analyses of the GLORIA images show that giant submarine landslides are a major and ubiquitous geologic feature of island chains of volcanic origin such as the Hawaiian archipelago.

In Hawaii, two general types of slope failures have been identified: slumps and debris avalanches. Slumps are slow moving, up to 25 miles wide and over six miles thick, with transverse ridges and steep toes. Hilina Pali in Hawaii Volcanoes National Park is an example of a slump in progress. Debris avalanches are fast moving, long (more than 140 miles) rather than wide and much thinner (.3 mile to 1.25 miles). They commonly have well-defined amphitheaters at their head and hummocky terrain in their lower part. Each debris avalanche is thought to represent a single episode of catastrophic slope failure. The great sea cliffs of the north shore of Molokai are the remnants of a colossal debris avalanche called the Wailau slide.

Though not on a grand scale, the sea cliffs along Molokai's north shore continue to move. In May of 1999, a major landslide occurred just east of the Pelekunu Valley. Originating near the top of 2,500-foot high cliffs, the avalanche carried enough rock and soil debris to spill out into the ocean and create about six acres of new land.

Vegetation. The native lowland forests along the north shore of Molokai from Kalaupapa to Halawa were severely modified during ancient Hawaiian times and the native vegetation at higher elevations has since been drastically impacted by alien feral goats and pigs, and more recently by axis deer. Feral pigs and goats are ubiquitous in both Pelekunu and Wailau valleys and axis deer are now invading in these places.

The Hawaii Heritage database shows that most ecosystems within the study area are now composed of alien plant communities. Native ecosystems do remain, but only as relict representations of the Montane Wet Forest and Shrubland, Wet Cliff, Lowland

Pelekunu Bay.

Native Ohia-fern forest lies at the Puu Alii Ridge above Pelekunu Valley

This mist-shrouded bog with native vegetation lies at the Puu Alii summit ridge.

An "easy on the land" boardwalk trail ends at a scenic point overlooking The Nature Conservancy's Pelekunu Preserve.

Forest and Shrubland and Lowland Mesic Forest and Shrubland. Rich relict native plants, however, hang on at steep slopes and ridges or rocky cliffs out of reach of alien ungulates.

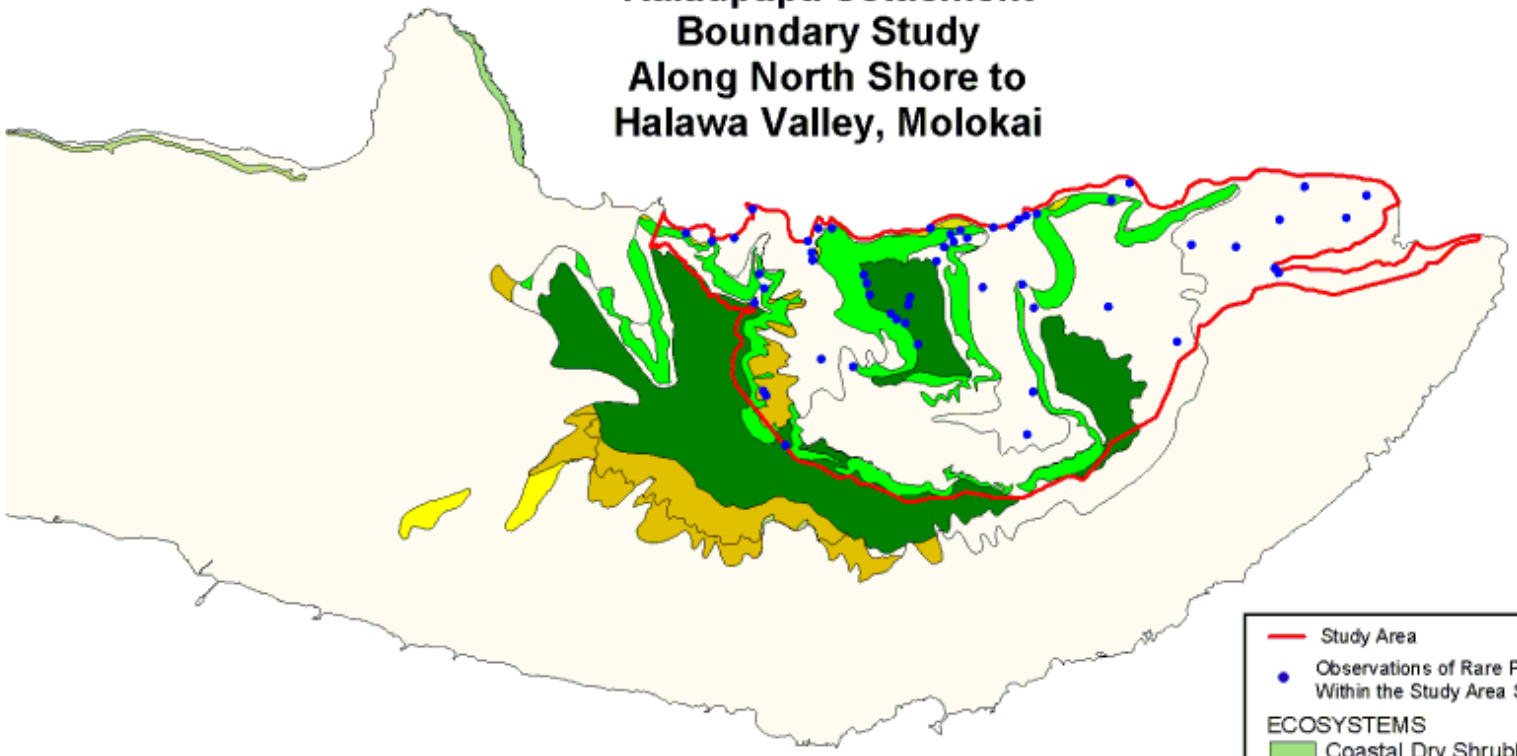
Near the Pelekunu Valley in May 1999, a major landslide occurred along the North Shore Cliff. Air Survey Hawaii

The Hawaii Heritage database shows 32 plant species occurring within the study area, mostly at isolated and inaccessible sites. The U.S. Fish and Wildlife Service lists 13 of these plant species as endangered, one as threatened and 18 others rare enough to be considered a species of concern.

The Olokui NAR is a rugged, isolated plateau where the native Hawaiian biota remains relatively pristine. Vegetation within the Olokui NAR has been divided into four natural communities: Kawelu Coastal Dry Grassland, Mixed Fern / Mixed Shrub

HAWAII AREA STUDIES

Kalaupapa Settlement Boundary Study Along North Shore to Halawa Valley, Molokai



NORTH SHORE CLIFFS ECOSYSTEMS

Native Ecosystems are green tones. All others are Non-native Ecosystems

Based upon Hawaii Natural Heritage Database

Figure 6.

Montane Wet Cliffs, 'Ohi'a Montane Wet Forest, and 'Ohi'a/Uluhe Lowland Wet Forest. Though none of the communities are considered rare, they are arguably the most pristine in the State of Hawaii.

The Kawelu Coastal Dry Grassland is a sparse to dense grassland dominated by kawelu (*Eragrostis* spp) and occurs on the driest and steepest portions of the sea cliff portion of the NAR. This community includes the Hawaiian Mixed Shrub Coastal Dry Cliffs which was observed in the vicinity of Kaholaiki Bay. Common cliff face vegetation here included hinahina kupali (*Artemisia australis*) and 'akoko (*Chamaesyce celastroides*).

The Mixed Fern/Mixed Shrub Montane Wet Cliffs occurs on the steep slopes that surround the plateau region of the NAR. Dominant plants include 'ama'u (*Sadleria* sp), uluhe (*Dicranopteris linearis* and *Diplopterygium pinnatum*), 'ohi'a (*Metrosideros polymorphus*), 'uku (*Machaerina augustifolia*), and pilo (*Coprosma* sp). All are native species.

Within the NAR, the 'Ohi'a/Mixed Shrub Forest occupies a portion of the plateau section which is remarkably pristine and probably never has been affected by feral ungulates. Canopy species included kawa'u (*Ilex anomala*) and 'ohi'a ha (*Syzygium sandwicensis*). Lower layer species included ferns and shrubs such as hapu'u (*Cibotium* spp), *Elaphoglossem* spp, pa'iniu (*Astelia menziesiana*), pu'ahanui (*Broussaisia arguta*), 'ohelo kau la'au (*Vaccinium calycinum*) and *Clermontia* spp. These are all native species.

The 'Ohi'a/Uluhe Lowland Wet Forest occurs on the moderate to steep slopes of the NAR, both on the plateau and on the walls of the mountain. The canopy is dominated by 'ohi'a, but also included several other common wet forest tree species such as 'olapa (*Cheirodendron trigynum*), kawa'u and 'ohi'a ha. The understory is dominated by uluhe and other native shrubs and ferns such as 'ohelo kau la'au, pu'uahanui or na'ena'e (*Dubautia plantaginea* ssp. *plantaginea*). Native ferns were present, generally as epiphytes, including wahine noha mauna (*Adenophorus tamariscinus*), *Elaphoglossum* spp. and *Grammitus tenella*.

A fifth community, Lama/'Ohi'a Lowland Mesic Forest, exists in the NAR on the south edge of the northeastern extension facing the Wailau Valley. This community is much smaller in area.

Relict clumps of *Brighamia rockii* survive on sea cliffs inaccessible to goats. (National Geographic Society).

Most of the above communities are threatened by the disturbances of ungulates (feral goats and axis deer). Such disturbance is usually accompanied by displacement of native plants by non-natives.

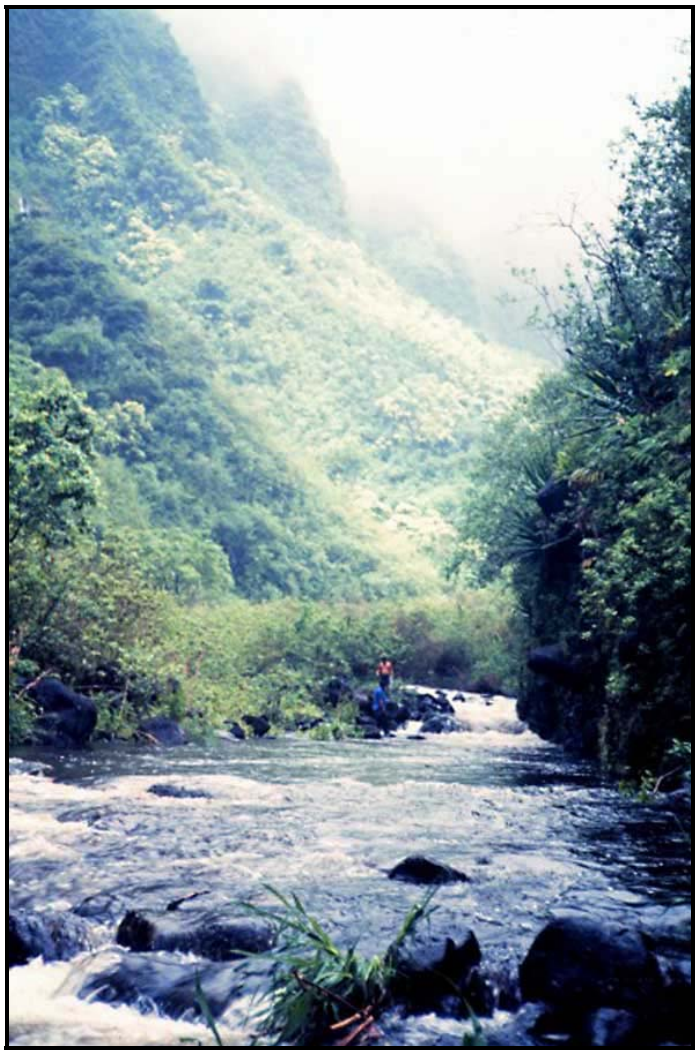
Freshwater Fauna. Hawaii's extreme isolation has resulted in freshwater fauna that is low in diversity, but very high in endemism. The only stream within the study area that has been extensively studied is Pelekunu. Study results reflect this biotic character for Pelekunu: while Pelekunu once would have been considered typical of Hawaiian streams, now it is one of the very few which remains relatively unaltered by humans. Its total length, including tributaries, is more than ten miles and it drains an area of nearly seven square miles. Pelekunu is one of the last free-flowing streams remaining in the state, and is as near a pristine condition as any.

Pelekunu's native vertebrate is intact and consists of three endemic gobies: 'o'opu alamo'o (*Lentipes concolor*), 'o'opu nopili (*Sicyopterus stimsoni*) and 'o'pu naniha (*Stenogobius hawaiiensis*); an indigenous goby, 'o'opu nakea (*Awaous guamenis*); and an endemic eleotrid, 'o'opu akupa (*Eleotris sandwicensis*). Native crustaceans include the

mountain shrimp, 'opae kuahiwi (*Atyoida bisulcata*) and an estuarine species 'opae'oheha'a (*Mactobrachium grandimanus*). The waters of Pelekunu contain an introduced Tahitian prawn, *Macrobrachium lar*, first introduced in Hawaii in 1956.

On this rat-free sea stack along Molokai's north shore a relict *Prichardia* palm forest still survives.

Two streams within the study area, Pelekunu and Wailau, were evaluated in the draft Stream Assessment study, a cooperative project of the State of Hawaii, Department of Land and Natural Resources Commission on Water Resource Management and the National Park Service, Cooperative Parks Study Unit, University of Hawaii at Manoa, Department of Botany. Pelekunu Stream was listed as Outstanding in all four measured categories, and was one of only five in the state ranked that high. The Wailau Stream was listed as Outstanding in three of the four measured categories. Pelekunu and Wailau streams were all listed as "Candidate Streams for Protection" in the study.



Pelekunu Stream. Photo by Anne Brasher, USGS

Cultural Resources

Pelekunu and Wailau valleys. The prehistoric Hawaiian population was concentrated on the southeastern part of Molokai which is well-watered with perennial streams. Here, the fertile soil of alluvial lowlands in combination with an adequate supply of water allowed the cultivation of wetland taro agriculture.

A second concentration of prehistoric Hawaiian population was found in the wet, windward valleys of Waikolu, Pelekunu, Wailau and Halawa in the northeastern part of Molokai. These were all large, cultivatable valleys. Hitchcock (1836) gave estimates of population estimates of 100 for Wailau and 150 for Pelekunu during Hawaiian times.

'O'opu nopili, *Sicyopterus Stimpsoni*. (Photo by Eric Nishibiyashi, TNC).

'O'opu naniha, *Stenogobius hawaiiensis.* (Photo by Eric Nishibiyashi, TNC).

The native damselfly is a candidate endangered species.

Scholars have stated that every possible part of these valleys was likely utilized for growing taro as evidence of cultivation goes nearly to the beach and even up the small ravines which cut the sides of the valleys. In these valleys, *heiau* (Hawaiian temples) were located away from the cultivatable bottom lands. Houses were placed along the beach and up in the valleys, close to the slopes so as to leave the land in the bottom open for cultivation. Today, the undergrowth has hidden the remains of taro cultivation in these valleys.

Phelps, in his 1937 " A Regional Study of Molokai" provides the following description of the valleys of Halawa, Wailau, Pelekunu and Waikolu:

> The material remains connected with plantings, the taro patch walls, show that these valleys were well populated in the old days. Every possible square yard was utilized for growing taro as the patches go nearly to the beach and even up the small ravines which cut the sides of the valleys. Since this region, with the exception of Halawa, has been uninhabited for some years, the undergrowth has hidden many remains; yet

> it is known through old accounts and by traditions that it was once populous. In the matter of food, the
>
> emphasis which has been placed upon taro should not obscure the importance of fish whether from deep water or from other places and of fruits and other plant products. The depth of the sea off this region prohibited the development of fish-ponds...but fishing with hook and line or with nets found rich opportunities. In addition, mollusks were found near the beaches and fresh-water fish in the streams.

Emory (1916) describes Pelekunu Valley as the "most densely populated area of the ahupua'a....where we found miles and miles of huge stone terraces, witnesses of a once thriving population that must have run into the thousands." Taro was grown on the flat land and in the steep ravines of the valley. According to Phelps (1937), the "narrowness of the gulches and their steep slopes result in the patches being no more than 12 feet on a side and the down-slope retaining wall may have to be seven feet high. The stream flows on one side of the gulch and is tapped at the highest placed patch, the water running successively into the lower ones."

Phelps (1937) furnished the following description of the plants growing in the Pelekunu Valley:

> Awa (giant pepper) grew in the wet places near the uplands; breadfruit (ulu), sugar cane (ko), arrow-root (pia), and bananas (maia) were raised on the borders of taro patches and on the interior slopes. Gourds for use as containers grew in warm and damp spots near the sea. In the uplands the shrub, olona, which provided fibers for lines and nets, and the paper mulberry (wauke) were found. Yams (whi or pia) grew in the lower forest zone.

While he was at Pelekunu and Wailau, Stokes (1911), in addition to seeing many taro patches, identified and described several heiau, a fortification (which he was told was a pu'uhonua or place of refuge), a koa or fishing shrine, a sacred cave, and a house site. A major heiau located on the coast near Kikipua Point was described with a "forbidding looking wall averaging 12 feet in height and continuing for a length of 65 feet." Near the heiau, Stokes described a

"collection of small pavements, pens and terraces..." Three heiau and a pu'uhonua were described in the valley of the Wailau Stream.

As with Pelekunu, the most inhabited part of the ahupua'a of Wailau was the stream valley. Handy, in his 1940 "Hawaiian Planter, Volume I: His Plants, Methods, and Areas of Cultivation," wrote:

> . . . Wailau, with its two streams, has extensive terraces in the seaward lowlands and back in the lower valleys of Kahawaiiki and Wailau Streams...at Wailau there is said to be high terracing of valley sides comparable to that on the Napali coast of Kauai.

Hitchcock (1836) described the soil of the Wailau Valley as "good, growing all kinds of food the wauke." At Wailau, it is estimated that approximately 80 acres were planted in taro.

The three large windward valleys--Pelekunu, Wailau and Halawa--and Papalaua, along with all of Kalaupapa comprise the old Hawaiian Ko'olau District of Molokai. These valleys were occupied continuously until the early 1800's. Though the studies cited above were fleeting and superficial, Halawa Valley has been studied more recently and in greater detail by Kirch and others. Kirch's studies show that the Halawa Valley was settled very early and that it and Pelekunu and Wailau were populated by Hawaiians adept at wetland taro agriculture.

Consequently, it is reasonable to infer that Pelekunu and Wailau valleys have Hawaiian archeology similar to that found at Halawa and that it remains intact. The following detailed descriptions by Kirch (1975) of the archeology of the Halawa Valley provide clues as to what can be expected at both Pelekunu and Wailau:

> Halawa was settled early, about A.D. 650. By the thirteenth century, the valley's population had expanded inland, and small irrigation systems were developed along side streams. The settlement pattern described here is essentially that which existed in the century or two immediately prior to European contact, after the large irrigation systems were in place and the valley's population was at its height.
>
> The extensive taro irrigation systems dominated Halawa's settlement pattern.... Thus the lower valley

alluvial floodplains were entirely covered in large rectangular fields watered by long irrigation ditches,

while the narrow alluvial flats farther inland were similarly terraced with stone-faced fields, all for taro production. Small irrigated terraces were found far inland, extending to the bases of the large waterfalls that cascade down from the valley rim. Ringing this V-shaped core of irrigated fields (wide at the valley mouth and paralleling the stream inland), on the gently sloping colluvium and exposed ridges to either side, was the zone of residential sites, dryland gardens, and temples.... The larger of these two inland study areas, Kapana...., is representative of the settlement landscape throughout much of the Halawa Valley. The Kapana settlement pattern....is dominated by agricultural features and by permanent residential sites, with several temples and shrines also present.

Irrigated pond fields are present in the western part of Kapana, with one set of large fields.... irrigated by a ditch from the main Halawa Stream, and a set of smaller, steeply terraced fields.... watered from the narrow Makaeleele Stream, one of the valley's tributaries. East of Makaeleele Stream the gentle colluvium is "corrugated" with low swales and intervening stony ridges. These swales were terraced for cultivation but were not permanently irrigated. The ridges, on the other hand, were the main focus of permanent residential sites, interspersed among smaller agricultural clearings. Thus the entire colluvial slope was a zone of intensive dryland cultivation, with house sites dispersed among the plantings.

In Kapana, as through much of Halawa Valley, residential sites are commonly stone-faced, earth-filled terraces of platforms..... Also of note are several pens and animal enclosures, reflecting the role of animal husbandry in Halawa's taro economy.

The Kapana area has three medium-sized temples; all are stepped terraces, not unlike those studied by Ladd in Makaha. Presumably, these were agricultural

temples, and they may also have functioned as men's houses . . .

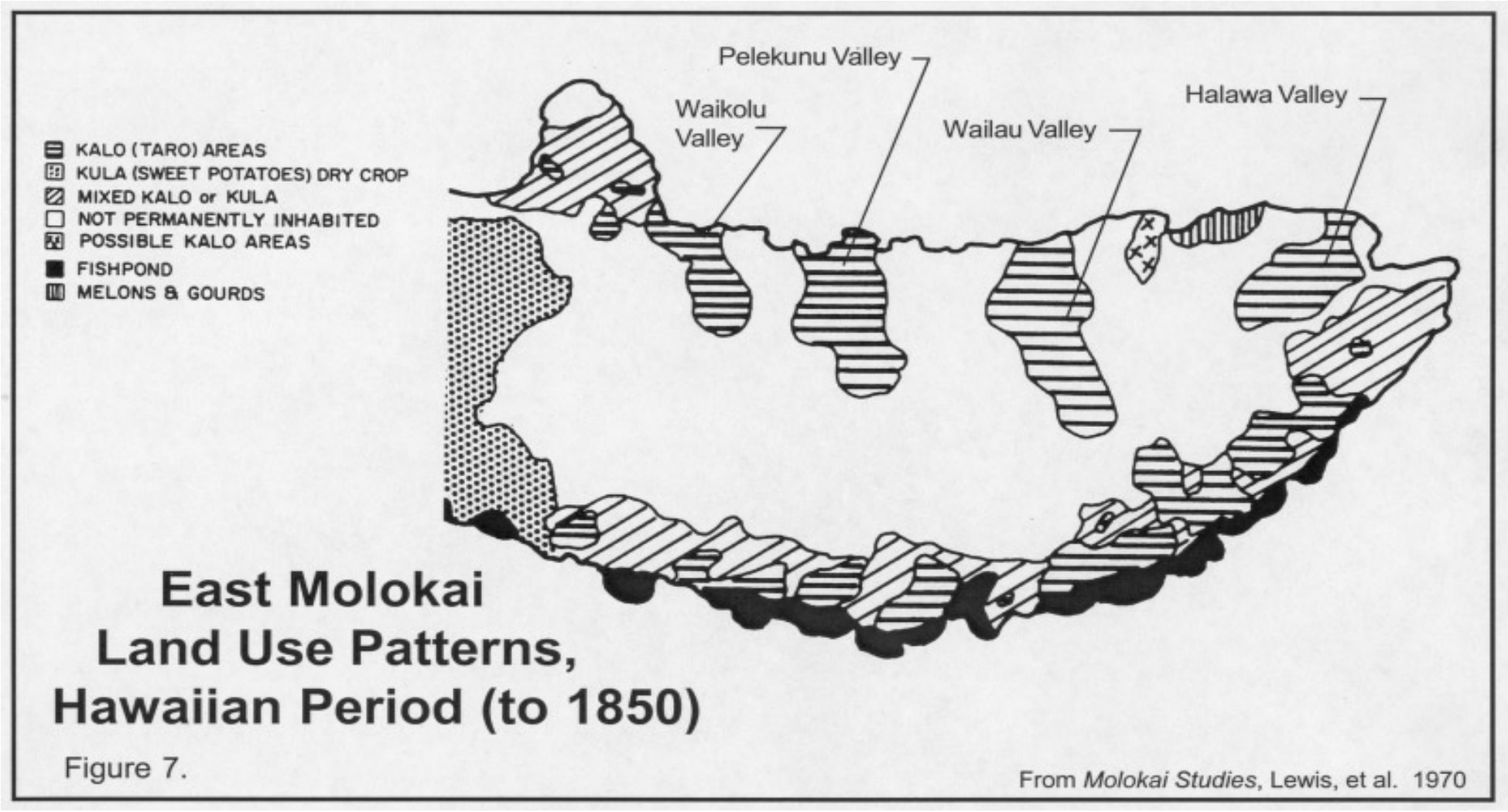


Figure 7. East Molokai Land Use Patterns, Hawaiian Period (to 1850). From Molokai Studies, H. T. Lewis, et al. 1970.

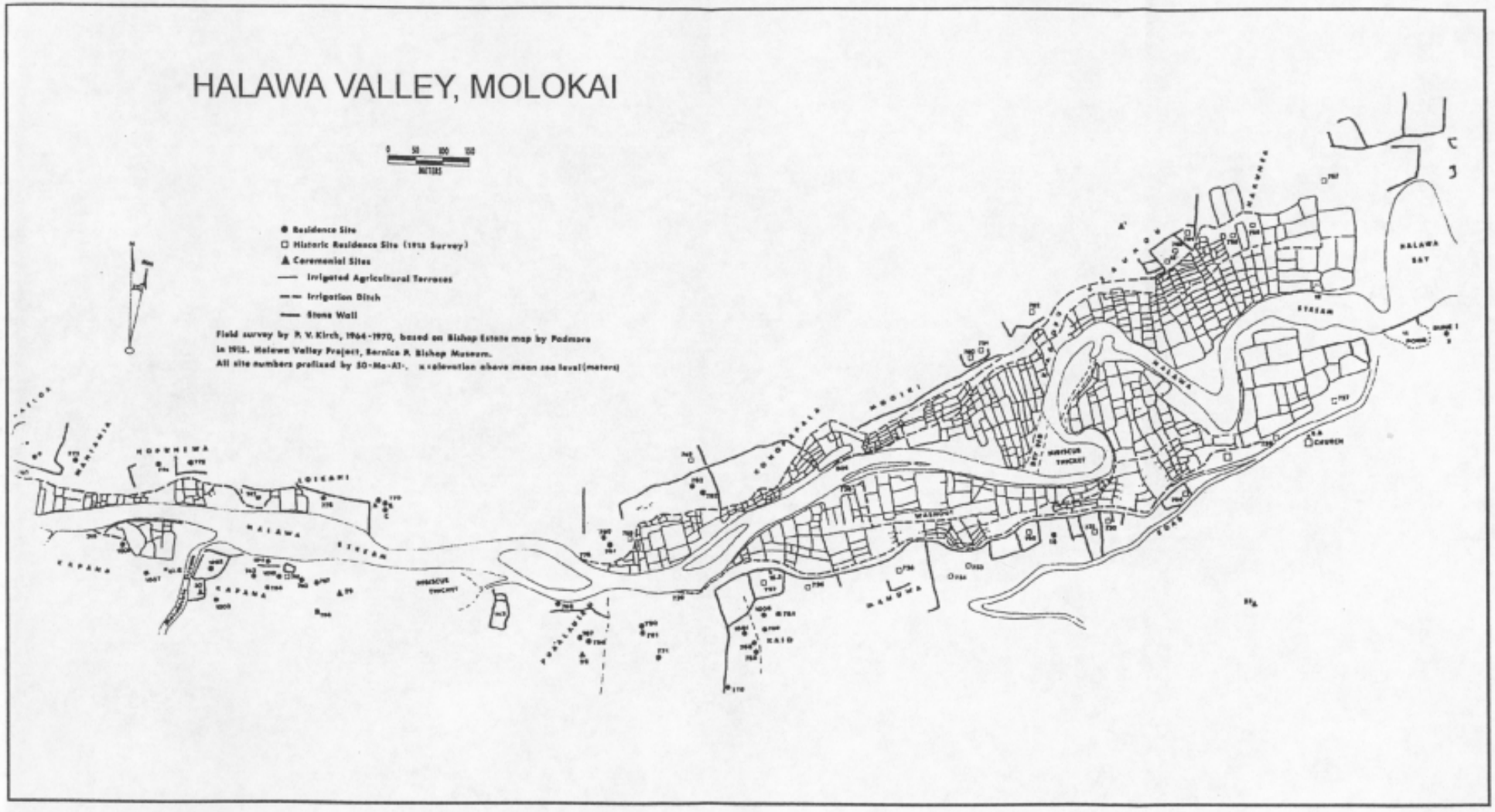


Figure 8. Halawa Valley Prehistoric Settlement Patterns. Location of pond field complexes. From *Prehistory and Ecology in a Windward Hawaiian Valley: Halawa Valley, Molokai*. Kirch, et al. 1975.

> Reconnaissance survey of other portions of Halawa Valley suggested that the patterns exhibited in Kapana are representative. Stokes (1909) recorded thirteen medium-sized heiau, fairly evenly distributed along the valley slopes and generally following the stepped-terrace plan. While these temples were probably the domain of local household groups occupying particular 'ili or sections of the valley, Halawa also contains two large luakini heiau, reflective of the island-wide polity. These are Mana Heiau, a complex structure with several platforms, terraces, and enclosing walls situated in Halawa Iki Gulch. According to traditions collected by Stokes (1909), Mana Heiau was built for (or perhaps rededicated) by island chief Alapa'inui following his conquest of Molokai. Like Kane'aki in Makaha, Mana and Papa heiau are situated on the higher slopes, with panoramic views over productive taro fields and out to sea. The choice of such settings for major luakini temples was clearly symbolic of the power and status of the paramount chief who alone had the authority to construct and dedicate such monuments.

From the early 1800's there began a continuous population decline on Molokai--caused primarily by introduced European diseases and the sandlewood trade forcing people to leave their fields to gather the valuable wood. Many windward folk simply emigrated to "topside" Molokai or Honolulu or Lahaina to be close to trading and whaling employment opportunities. By 1900, the three
windward valleys of Pelekunu, Wailau and Halawa were left very lightly inhabited. Their exceptionally rich ruins of pre-historic times, however, remained intact.

Evaluation of Resource Significance

The geological resources of the entire study area have already been determined to be of national significance. The geographic area included within this boundary expansion study was designated as the North Shore Cliffs National Natural Landmark (NNL) in 1972.

The area designated as a NNL encompasses about 27,000 acres and extends along the boundaries of Kalaupapa NHP east some 15 miles along Molokai's north shore and inland to the drainage divide, taking in the deep ampitheater valleys of Pelekunu and Wailau.

NNL designation in 1972 was based on the geological significance of the sea cliffs. As noted, at that time the North Shore Cliffs were described by geologists as the finest exposures of the ancient volcanic rocks that created the island of Molokai and were considered to be of prime importance in piecing together the story of how the Hawaiian Islands were formed.

Since NNL designation, additional evidence has been discovered beneath ocean waters which gives even greater credence to the geological significance connected with the North Shore Cliffs. Here and in the adjacent ocean waters, evidence of a landslide of massive proportions has been discovered--the result of the collapse of the entire north side of the island of Molokai into the ocean. This landslide is made up of broken rocks, some with dimensions measured in miles. Next to the actual formation of the islands, the Wailau slide, the name given this phenomenon, and the Nuuanu slide on Oahu are the most significant geologic events associated with the Hawaiian archipelago.

It is very likely that within the study area there are cultural resources of national significance. One of the reasons that the nearby Halawa Valley was selected for investigation by archeologists such as Kirch and others was their belief that this valley was representative of other windward valleys throughout Hawaii in terms of prehistoric settlement patterns. The windward valleys of Waikolu, Pelekunu, and Wailau were, like Halawa, centers of wet taro cultivation and of dense populations. Archeologists and other scientists involved in the investigation of the Halawa Valley believe that their findings and conclusions regarding the prehistory and human ecology of that area could also be applied to the Waikolu, Pelekunu and Wailau valleys.

Consequently, although yet to be thoroughly and intensively surveyed by archeologists, it is very likely that the significant archeological sites and features of the Halawa Valley would be replicated at Waikolu, Pelekunu and Wailau. Halawa's cultural resources comprise all of the components of an ancient Hawaiian community and are a complete representation of the facets of the

prehistoric Hawaiian culture. Waikolu is presently located within the boundaries of Kalaupapa NHP.

Based solely on the vegetation now present, the area from Kalaupapa to Halawa would not be regarded as nationally significant. However, if placed under NPS protection as a part of Kalaupapa NHP, the restoration of the relict native ecosystems found there would become a high priority, long-term resource management goal for park managers.

EVALUATION OF FEASIBILITY

Feasibility for Addition to the National Park System

The study area and North Shore Cliffs National Natural Landmark boundaries both follow ridgelines and include watersheds. Consequently, the configuration of the study area would lend itself to effective management for resource protection. The study area also follows land ownership and ahupua'a boundary lines.

Opportunities for increased public enjoyment of the study area would be limited. Existing access is restricted to hikers entering via a primitive cross-island hiking trail from the south and to kayakers and other boaters entering from the north. The cross-island trail begins near Puko'o on State Route 450. From the trailhead, it climbs up to the crest of the pali, descends into the upper watershed of the Wailau Stream near Pu'u Lua and follows along the east side of the stream ending at the north coast. The trail is not being maintained and is in poor condition. During the summer months, kayaks and other small boats are able to land at places like Wailau and Pelekunu on the north shore. Rough water conditions prevail along the north shore during winter months preventing access by small boat.

The State of Hawaii's position regarding their lands within the study area appears to be consistent with the position taken in the late 1970's during the NPS feasibility study for the establishment of Kalaupapa as a unit of the national park system. Presently, as then, the State of Hawaii does not wish to donate any lands to NPS for purposes of a national park. They are, however, willing to consider NPS management of State of Hawaii lands within the study area on the basis of cooperative agreements.

Kalaupapa NHP's enabling legislation allows NPS to enter into cooperative agreements with owners of property within the park to protect and interpret resources. It also authorizes acquisition of State of Hawaii lands, but only by donation or exchange and only with the consent of the owner.

TNC has indicated they would be willing to relinquish the lands of the Pelekunu Preserve to NPS. The Conservancy recognizes that

they do not have the long-term resources, which NPS would be able to provide, to manage and protect the biota, geological features, archeological sites and cultural aspects of the preserve.

The present owner of the Puu O Hoku Ranch acquired study area lands based on an interest in and a commitment to seeing that natural and cultural resource values were preserved. To ensure the long-term protection of these resources, the owner has expressed an interest in having Puu O Hoku Ranch lands within the study area included in the national park system.

Kalaupapa NHP's enabling legislation authorizes NPS to acquire privately-owned lands by donation, exchange or purchase.

In Hawaii, lands acquired by NPS for the purposes of a national park would be subject to the State of Hawaii reserving the right to any and all minerals and all surface and ground waters.

The presence of contaminated or hazardous wastes in the study area is unlikely since the entire area remains roadless and undeveloped, except for a few modest residential structures.

The remaining five to six percent of the study area is in private ownership. Most of these parcels have absentee owners and some have multiple claimants to ownership. Some of these claimants have filed only for the water rights appurtenant to the land. A few of the parcels have unknown owners. The position of these landowners with regard to the establishment of a unit of the national park system is largely unknown. Some may favor national park designation and others may oppose it.

Potential costs to acquire the privately-owned lands within the study area were found to be feasible. This finding is based on an examination of the property tax records for all lands within the study area. As a means of determining current land ownership and the feasibility of potential land acquisition costs, public property tax records for lands within the study area were examined. According to tax records, the 1999 total assessed valuation for the entire 23,900-acre study area was $523,500. This assessed valuation included the 8,680 acres of land owned by the State of Hawaii. State of Hawaii lands were assessed at $340,400. The assessed valuation for the 15,200 acres of privately owned lands within the study area was $183,100. The major owners of private lands within the study area

are the Puu O Hoku Ranch with about 8,122 acres and TNC with about 5,722 acres. The prorated assessed valuation for the Puu O Hoku Ranch lands was $55,000. The assessed valuation for TNC lands was $46,300. Other private owners within the study area comprise about 1,376 acres. The combined assessed valuation for these 75 parcels was about $81,800. (See APPENDIX -- Study Area - Tax Map Key Parcel, Ownership, Acreage and Assessed Valuation, 1999).

The study area remains a roadless, undeveloped area and all lands fall within the Conservation District. Generally, in Hawaii, Conservation District lands are assessed at well below market value to encourage property owners to keep their lands in open space. Consequently, although useful to help in determining feasibility, the assessed valuation of study area lands does not and should not be regarded as representing fair market value. In Hawaii, the correlation between assessed value and market value on undeveloped lands is considered to be extremely low.

Adding the approximately 24,000 acres to Kalaupapa NHP would nearly quadruple the size of that park. Consequently, the current park staff and facilities at Kalaupapa would be inadequate to effectively manage and operate all of the additional lands contained in the study area. Additional personnel and base funding would be needed.

Initial costs to operate and develop the more than 20,000-acre addition to Kalaupapa National Historical Park are considered feasible. An estimated $750,000 would be needed for annual operations ($500,000 for natural and cultural resource management, $150,000 for maintenance and $100,000 for interpretation). Facility development would be minimal and low-key, consisting of hiking trails and two small visitor contact stations. Development costs are estimated to be approximately $100,000. Estimates are based on the existing operating costs at Kalaupapa.

Position of the Local Community

Since access to the study area is limited and, except for a few structures and residents living in Wailau and near Pelekunu, it remains undeveloped and unpopulated, adding these lands to Kalaupapa NHP would have little effect on the East Molokai community. However, the prevailing view among Molokai residents appears to favor local community management of island lands, and

among some Molokai residents there appears to be an uneasiness over any management or control from the outside.

As part of the update of the Maui County General Plan, a Molokai Community Plan was prepared in 1984. Extensive public participation by Molokai residents was key in the preparation of that plan. Recommendations of the Molokai Community Plan included the following: any expansion of the visitor industry should not infringe upon the traditional social, economic and environmental qualities of the island; promotion of traditional use of the valleys along Molokai's north shore; and regulation of land use in a manner which reaffirms and respects customary and traditional rights of native Hawaiians. As part of the Molokai Community Plan, residents of the east end of the island developed their own separate set of policy statements. One of the statements called for adding a zoning category called "traditional" to the existing designations.

The recommendations and policy statements in the Molokai Community Plan still appear to be valid. Any legislation to add study area lands to Kalaupapa NHP would have to address the above concerns. Key among these would be accommodating the traditional land uses and rights of native Hawaiians and assurances that NPS would only seek to acquire lands from willing sellers.

ALTERNATIVES FOR MANAGEMENT AND RESOURCE PROTECTION

In conducting studies of potential boundary adjustments, other alternatives need to be considered in terms of their adequacy for managing and protecting study area resources before any recommendations can be made for boundary revisions to existing units of the national park system. Alternatives considered for the study area lands include the following.

Alternative 1. Establishment of a National Heritage Area

National heritage areas have been defined by NPS as "a place designated by Congress where natural, cultural, historic and scenic resources combine to form a cohesive, nationally distinctive landscape arising from patterns of human activity shaped by geography." National heritage areas are places containing special landscapes where the people who live and work there have all chosen to come together to conserve their own heritage. Critical to establishing a national heritage area is a prior demonstration of widespread public support by the residents of a potential heritage area for the designation. In heritage areas it is the responsibility of the people living there to ensure that resources are protected, preserved and interpreted.

National heritage areas are usually composed of private property, although they may include public parks or preserves. Within national heritage areas, the federal government does not acquire lands nor is there any federal regulation imposed on private property. Rather, lands and resources are protected, maintained and interpreted for public use primarily through the voluntary actions of the people who live within the designated national heritage area.

Typically, within national heritage areas partnerships are formed between private nonprofit organizations and federal, state and local governments. Federal agencies such as NPS play a limited role in these partnerships, usually acting as a catalyst by providing technical assistance in the preparation of studies and plans.

As part of the designation process, Congress authorizes the establishment of a management entity to coordinate the actions of the partners and the development of a heritage area management plan for resource conservation. The management entity may be a local government agency, a nonprofit organization or an independent federal commission. To date, Congress has established more than a dozen national heritage areas, with enabling legislation tailored to fit conditions existing in each particular area.

If, following the completion of a suitability/feasibility study for the establishment of a national heritage area, the study area was established as a national heritage area, there would be an increased potential for cohesive management of the study area's natural and cultural resources, thereby increasing the potential for their long-term protection. Resource protection would be the responsibility of the landowners, guided by the management entity through the implementation of a heritage management plan.

The long-term protection of resources would be dependent on study area landowners sustaining their commitment. National heritage area designation would have no effect on private ownership of land within the study area. Study area lands in private ownership would remain so.

Although enabling legislation for national heritage areas has differed, usually tailored to a specific landscape, study area issues do not appear to fit this particular kind of approach for landscape conservation. First, the study area is not a settled place where people live and work--the 24,000 acres remain roadless and uninhabited, except for a few individuals residing in the coastal portions; and, second, there does not appear to be any widespread public support present for establishing a heritage area--the impetus for national heritage area designation typically comes from residents who join together for the purpose of conserving a particular landscape.

Also, national heritage area designation does not appear to be consistent with the expressed long-term goals of the two major owners of private lands within the study area. The owner of the Puu O Ranch has indicated a desire to turn over ranch lands to a land managing entity such as NPS to ensure the long-term protection of their resource values. TNC has indicated they cannot continue to provide the resources necessary for the long-term management and protection of their Pelekunu Preserve and further indicated they

would be willing to relinquish their lands to NPS. National heritage area designation would have little if any effect on study area resources owned by the State of Hawaii and it is unknown if any of the remaining landowners, most of them absentee, would favor national heritage area designation.

Alternative 2. National Historic Landmark Designation

To be designated a national historic landmark, a professional study would have to be undertaken to formally survey and evaluate archeologic and historic resources within the study area to determine if they possess exceptional value to the Nation--that is, are of national significance. The thematic framework described earlier in this study report would be utilized to help in making that determination.

When completed, and if archeologic and historic resources were determined to be of national significance, the landmark study would be reviewed by the Secretary of the Interior's Advisory Board. Following their review, the advisory board would submit its recommendations to the secretary who has the final responsibility for declaring properties eligible for designation as national historic landmarks.

Designation as a national historic landmark would provide formal recognition to the Hawaiian archeological resources within the study area, if these were determined to be of national significance. National historic landmark designation would not change land ownership in the study area. Landmark designation by the Secretary of the Interior could occur only with the consent of the landowners and protection of resources would be the responsibility of the landowners. Historic landmark designation is not legally binding and by itself would not assure the long-term protection of archeological resources. Landmark designation would not provide any level of protection for study area biotic resources.

National historic landmark designation would increase the potential for the cohesive management of study area archeologic and historic resources. However, landmark boundaries would likely cover only those portions of the study area where significant archeologic and historic resources are found.

Alternative 3. Continuation of Existing Conditions (No Action)

Under this alternative, study area lands would not be managed cohesively. The three major landowners would continue to independently pursue their own management goals. There would be little or no efforts study area-wide directed toward developing or implementing a systematic and long-term management strategy for the care and protection of biotic and cultural resources.

There would little change in land use. Due to its remoteness and lack of road access, there is little likelihood any of the study area would be threatened by major development. Lands would continue to be in open space. Under this alternative, however, there would be no long-term guarantee that about one-third of the study area would remain in the hands of the present owner of the Puu O Hoku Ranch. The present owner of the Puu O Hoku has shown considerable interest in being a good land steward, but does not wish to be the long-term caretaker of these lands. If the present owner were to sell, the next owner may not be as interested in resource protection. Under this alternative, there would be a risk of major changes in land use occurring on what are now Puu O Hoku Ranch lands. These changes would have the potential to affect other lands within the study area.

Biotic and cultural resources would continue to be managed and protected to some degreee by DLNR on their lands. State lands within the Olokui NAR would continue to receive a high level of protection. TNC's Pelekunu Preserve resources would receive protection, but the Conservancy has indicated they do not have the capability to continue as land managers in the long term.

Except for lands within the NAR, there would be no long-term resource management efforts aimed at controlling the spread of invasive alien plant species or feral ungulates and other destructive alien animals. The vegetation of the study area would be increasingly dominated by alien plants. Native vegetation and habitat for native forest birds, including several listed species, would continue to decrease. There would be no long-term resource management efforts to restore the biotic resources of the study area to their earlier condition during Hawaiian times.

Geological resources would be largely unaffected under this alternative. The North Shore Cliffs NNL designation would continue

to give recognition to the national significance of the study area. However, the landmark designation is only a formal way of recognizing the national significance of geological resources. It is not legally binding on landowners nor does it provide any level of protection to study area archeologic or biotic resources.

This alternative would do little in the way of identifying, protecting or stabilizing Hawaiian archeological sites and features found in the study area. Archeological sites and features would continue to be covered by vegetation, damaged by the roots of alien plants and soil aggregation would continue to cover and bury them. The rooting activities of feral pigs would also continue to damage archeological sites.

Under this alternative, public use of the study area would remain largely unstructured. This unstructured use by visitors brings with it the potential for additional invasive alien plants being introduced into the study area, as well as inadvertent damage to and possibly removal of Hawaiian archeological sites and features.

FINDINGS

This report finds that lands within the study area contain significant natural and cultural resources and offer limited opportunities for public enjoyment of those resources. The geologic resources of the study area independently meet criteria for national significance--that is, these resources meet the same standard of significance that would be applied in evaluating an area for the establishment of a new unit of the national park system.

This report also finds that the geologic, biotic, ecological and cultural resources of the study area have a strong relationship to the resources within Kalaupapa NHP--that is, all of the Natural and Prehistory and History themes present in the study area are represented at Kalaupapa NHP--and that the natural and cultural resources found within the study area would enhance the resources of Kalaupapa NHP rather than merely duplicate them. For example, major portions of the North Shore Cliffs Natural National Landmark are within the study area, but presently outside of Kalaupapa; and the archeological resources of the Pelekunu and Wailau valleys would enhance those presently found within Kalaupapa at Waikolu.

This report also finds that the cultural resources of the study area are very likely to be of major significance. This finding is based on the strong likelihood that the Hawaiian archeological resources in the nearby Halawa Valley, described in detail and evaluated by archeologists and determined to be of major importance, would be replicated in the study area's Pelekunu and Wailau valleys.

With regard to feasibility, this report finds that the study area lands meet nearly all the tests of feasibility as an addition to Kalaupapa NHP. The small, scattered portions of the study area where many of landowners are absentee and where title problems are likely to exist are judged not to be a major obstacle to adding the other study area lands to Kalaupapa NHP. These lands encompass only a small portion of the study area and would be regarded as private inholdings within the boundaries of Kalaupapa NHP.

Alternatives for the management and protection of study area resources were evaluated. These alternatives were found to be less adequate for the long-term for management and protection of

resources than adding study area lands to Kalaupapa NHP. Direct management by NPS is judged to be the clearly superior alternative.

Study area lands could be legislatively added to Kalaupapa NHP with the following language: The Secretary of the Interior is authorized to accept donation of, or to purchase from willing sellers, lands within the North Shore Cliffs National Natural Landmark (restricted to the Pelekunu, Wailau and the upper Halawa watersheds). Lands thus acquired would become part of and be administered by Kalaupapa NHP.

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Study Area - Tax Map Key Parcel, Ownership, Acreage and Assessed Valuation, 1999

TMK PARCEL	OWNER	ACREAGE	VALUE
5-4-03-020	Kuahulu, David K., et al.	6.00	$21,000
5-4-03-021	Burkett, Clarissa L., et al.	.02	$700
5-4-03-022	Burkett, Clarissa L., et al.	1.68	$5,900
5-4-03-032	The Nature Conservancy	460.82	$16,100
5-9-03-011	Mansfield, L.A., Foundation*	12.28	$98,200
5-9-05-001	Liljestrand, Robert H.	.06	$100
5-9-05-002	State of Hawaii	.19	
5-9-05-003	Liljestrand, Robert H.	.91	$100
5-9-05-004	Mowrey, William F. & Martha A.	.28	$100
5-9-05-005	Staub, Kila Gail Sheldon	1.93	$200
5-9-05-006	Meyer, Dennis W. Sr., et al.	.25	$100
5-9-05-007	Dunn, Linda	.58	$100
5-9-05-008	State of Hawaii	.27	$100
5-9-05-009	Brown, Francis H.I. Tr., et al.	.49	$100
5-9-05-010	Mowrey, William F. & Martha A.	.64	$100
5-9-05-011	State of Hawaii	.84	$100
5-9-05-012	Mowrey, William F. & Martha A.	1.56	$200
5-9-05-013	State of Hawaii	.26	$100
5-9-05-014	Brown, Francis H.I. Tr., et al.	2.00	$300
5-9-05-015	State of Hawaii	.18	$100
5-9-05-016	Sykes, Sarah L.E.	1.71	$200
5-9-05-018	Brown, Francis H.I. Tr., et al.	3.00	$400
5-9-05-019	Brown, Francis H.I. Tr., et al.	.70	$100
5-9-05-020	Chow, Christopher K., et al.	1.70	$200
5-9-05-021	Napapa, Joseph H., estate	1.10	$100
5-9-05-022	Brown, Francis H.I. Tr., et al.	66.67	$200
5-9-05-023	Dunn, Linda	1.12	$100
5-9-05-024	Kawaa, Violet Kalaau	.55	$100
5-9-05-026	Westcoatt, Wren W. Sr., et al.	.27	$100

* approximately 4 acres of this parcel are located within the study area. Assessed valuation for the 4 acres has been prorated to be $33,000.

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TMK PARCEL	OWNER	ACREAGE	VALUE
5-9-05-027	Magoon, John H. Sr. Tr. Estate	.33	$100
5-9-05-028	Simpson, James, et al.	.40	$100
5-9-05-029	Nahoopili, Pauline N., et al.	.32	$100
5-9-05-030	Bailey, Fred & Bren	.06	$100
5-9-05-031	Walker-Moody Construction Co.	1.39	$200
5-9-05-034	Hawaii Maritime Center, et al.	2.59	$300
5-9-05-035	State of Hawaii	.18	$100
5-9-05-036	Arakaki, Walter Yutaka Tr.	.54	$100
5-9-05-037	McCary, Robert A. & Zelie K.D.	.58	$100
5-9-05-038	State of Hawaii	.04	$100
5-9-05-039	State of Hawaii	.04	$100
5-9-05-040	Lester, George P. Family Tr.	.51	$100
5-9-05-041	State of Hawaii	.02	$100
5-9-05-042	Sproat, Clyde Halemaumau, et al.	.78	$100
5-9-05-043	Kahoohuli, George P., et al.	.31	$100
5-9-05-044	Hind, Robert L. Jr. Tr., et al.	2.50	$300
5-9-05-045	Ulu, Keawe, Estate, et al.	.12	$100
5-9-05-046	Brown, Francis H.I.E., et al.	.62	$100
5-9-05-047	Ulu, Keawe, Estate	.57	$100
5-9-05-048	State of Hawaii	.12	$100
5-9-05-049	Brown, Francis H.I. Tr., et al.	.72	$100
5-9-05-050	Caparida, Eustaquio & Judy	.09	$100
5-9-05-052	State of Hawaii	.21	$100
5-9-05-053	Brown, Francis H.I. Tr., et al.	.73	$100
5-9-05-054	State of Hawaii	.76	$100
5-9-05-055	Ulu, Keawe, Estate	.63	$100
5-9-05-056	State of Hawaii	.02	$100
5-9-05-057	State of Hawaii	.12	$100
5-9-05-058	Barrett, Danny Dean, et al.	.21	$100
5-9-05-059	Sutcliffe, Claude Robert, et al.	.21	$100
5-9-05-060	State of Hawaii	.16	$100
5-9-05-061	Henderson, James, et al.	1.01	$100
5-9-05-062	Simpson, James, et al.	.43	$100
5-9-05-063	State of Hawaii	.22	$100
5-9-05-064	Hawaii Maritime Center, et al.	4.00	$500
5-9-05-065	Hawaii Maritime Center, et al.	.83	$100
5-9-05-066	Hawaii Maritime Center, et al.	.30	$100
5-9-05-067	State of Hawaii	7.20	$288,000
5-9-05-068	Legrande, Douglas J. Tr., et al.	.47	$100
5-9-05-069	Legrande, Douglas J. Tr., et al.	.75	$100
5-9-05-071	Hulu Estate	.12	$100
5-9-05-072	Hulu Estate	.16	$100

TMK PARCEL	OWNER	ACREAGE	VALUE
5-9-05-073	Scott, Ellen O., et al.	11.07	$1,400
5-9-05-074	Legrande, Douglas J. Tr., et al.	1.50	$200
5-9-05-075	Brown, Francis H.I. Tr., et al.	.01	$100
5-9-05-076	Ulu, Keawe Estate, et al.	.01	$100
5-9-05-077	Ulu, Keawe Estate, et al.	.57	$100
5-9-05-078	Brown, Francis H.I. Tr., et al.	.44	$100
5-9-05-079	Ulu, Keawe Estate, et al.	.02	$100
5-9-05-080	Mowrey, William F. & Martha A.	.02	$100
5-9-05-081	Dunn, Linda	.01	$100
5-9-05-082	Simpson, James, et al.	.24	$100
5-9-05-083	State of Hawaii	2.53	$300
5-9-05-085	State of Hawaii1	.82	$200
5-9-05-086	State of Hawaii	.55	$100
5-9-05-087	Brown, Francis H.I. Tr., et al.	.02	$100
5-9-05-088	Brown, Francis H.I. Tr., et al.	.02	$100
5-9-05-089	Brown, Francis H.I. Tr., et al.	.01	$600
5-9-06-001	Puu O Hoku Ranch Ltd.**	8,422.62	$59,600
5-9-06-002	State of Hawaii	8,540.00	$38,400
5-9-06-003	Brown, George, et al.	304.00	$1,300
5-9-06-004	Brown, George, et al.	177.00	$1,000
5-9-06-005	Sykes, Sarah Louise Ebert Tr.	55.00	$500
5-9-06-006	First Hawaiian Bank Trustee	34.00	$300
5-9-06-007	Brown, Francis H.I Tr., et al.	32.00	$300
5-9-06-008	Wright, Harold S. Tr.	38.99	$300
5-9-06-009	Brown, Francis H. Tr., et al.	78.00	$500
5-9-06-010	Millard, H. Ray Jr.	41.20	$3,200
5-9-06-011	The Nature Conservancy, et al.	5,254.00	$27,400
5-9-06-013	State of Hawaii	.36	$100
5-9-07-001	The Nature Conservancy, et al.	3.70	$1,100
5-9-07-003	Kuahulu, David K., et al.	1.68	$500
5-9-07-004	The Nature Conservancy, et al.	.28	$100
5-9-07-005	State of Hawaii (School Grant)	.18	$100
5-9-07-006	Mahial, Levi, deceased, et al.	1.09	$300
5-9-07-007	Mahial, Levi, deceased, et al.	.99	$300
5-9-07-009	Paahao, Luka, et al.	1.18	$400
5-9-07-010	Brown, H.I. Trust, et al.	.49	$200
5-9-07-011	The Nature Conservancy, et al.	2.92	$900

** approximately 8,122 acres of this parcel are located within the study area. Assessed valuation for the 8,122 acres has been prorated to be $55,000.

TMK PARCEL	OWNER	ACREAGE	VALUE
5-9-07-013	State of Hawaii (School Grant)	1.00	$300
5-9-07-014	The Nature Conservancy, et al.	.03	$100
5-9-07-015	Kuahulu, David K., et al.	.10	$100
5-9-07-016	The Nature Conservancy, et al.	.04	$100
5-9-07-017	The Nature Conservancy, et al.	.13	$100
5-9-07-018	Mahial, Levi, deceased	.08	$100
5-9-07-019	Mahial, Levi, deceased	.13	$100
5-9-07-020	Kualoa Land Corporation	.06	$100
5-9-07-021	The Nature Conservancy, et al.	.17	$100
5-9-07-022	Mahial, Levi, deceased	2.91	$400
5-9-07-023	Paahao, Luka	.37	$100
5-9-07-024	The Nature Conservancy, et al.	.89	$100
5-9-07-025	Miller, Raymond C., et al.	.33	$100
5-9-07-026	Whaco	.96	$100
5-9-07-027	Magoon, John H. Sr. Tr., Estate	.36	$100
5-9-07-028	Kuahulu, David K., et al.	1.43	$200
5-9-07-029	Kuahulu, David K., et al.	.19	$100
5-9-07-030	The Nature Conservancy, et al.	.04	$100
5-9-07-031	The Nature Conservancy, et al.	.18	$100
5-9-07-032	The Nature Conservancy, et al.	.06	$100
5-9-08-002	Evans, Archie Leroy	9.50	$2,900
5-9-08-003	Loomis, James C., et al.	4.26	$1,300
5-9-08-004	Hanchett, Michael P., et al.	5.34	$1,600
5-9-08-005	Brown, Zadoc W., et al.	7.17	$2,200
5-9-08-006	Brown, Zadoc W., et al.	4.70	$100
5-9-08-007	Brown, Zadoc W., et al.	13.24	$300
5-9-08-009	Magoon Brothers, et al.	5.56	$100
5-9-08-010	Brown, Zadoc W., et al.	5.00	$100
5-9-08-011	State of Hawaii	125.00	1,500
5-9-08-012	Mowrey, William F. & Martha A.	4.98	$100
5-9-08-013	Daniel J. Fairbanks III, Tr.	41.30	$300
5-9-08-014	Unknown	1.70	$100
5-9-08-015	Unknown	.68	$200
5-9-08-016	Kuahulu, David K., et al.	5.14	$100
5-9-08-017	Hitchcock, Dorcas L., et al.	160.40	$1,000

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In addition to the above references, this boundary study was based on the following CD-ROM GIS databases:

Hawaii Outer Islands Tax Map Key (TMK) Database. 1997.

Hawaii National Parks GIS Database. 1999.

Digital Elevation Model (DEM), B/W Hillshade U7M/Z4, Digital Raster Graphic (DRG) 10m digital images of USGS 7 1/2' quad maps. U.S. Geological Survey, Department of the Interior. 1999.

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Site Investigation Trip Report

On February 8, 2000, Bryan Harry, Superintendent, Pacific Islands Support Office; Gary Barbano, Park Planner, Pacific Islands Support Office, and Rick Potts, Resource Management Specialist, Kalaupapa National Historical Park viewed the western portions of the study area from along the Papaala Pali. Access is via an unpaved road that terminates at the beginnings of a narrow boardwalk trail (the Pepeopae Bog Trail) constructed by TNC. From the boardwalk trail, views of TNC's Pelekunu Preserve can be seen. The boardwalk terminates at the Pelekunu Preserve Overlook.

Gary Barbano spent a week camping and hiking in Wailau Valley in July 1977. At that time, there were no residential structures and no permanent residents in the valley, although several coastal campsites were occupied. Since that time, there has been a major increase in impacts to the valley's native biota from the browsing and rooting activities of feral ungulates. Also, there has been a significant decrease in the number of hihiwai, a native freashwater limpit found in the Wailau Stream.

More recently, Haleakala National Park Resource Manager, Ron Nagata, hiked into Wailau Valley from the south side and also viewed portions of the coast from helicopters. Photographs taken during the flights revealed the presence of large numbers of axis deer. The presence of axis deer foretells the eventual replacement of native vegetation with alien species.

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