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Technical Report 135

THE LANDS OF HINA: AN ARCHAEOLOGICAL OVERVIEW AND ASSESSMENT OF KALAUPAPA NATIONAL HISTORICAL PARK, MOLOKA'I

MARK D. McCOY
EDITED BY DAVID DUFFY

The PCSU is a cooperative program including the University of Hawai'i and the National Park Service, U.S. Department of the Interior

2005

THE LANDS OF HINA:

An Archaeological Overview and Assessment of Kalaupapa National Historical Park, Moloka'i Island, Hawai'i

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MANAGEMENT SUMMARY

This overview and assessment report focuses on previous, current, and proposed archaeological research in the Kalaupapa National Historical Park (NHP) on Moloka'i Island, Hawai'i. The park is the home of the historical Kalawao (A.D. 1866-1900) and Kalaupapa (A.D. 1900-present) settlements for people with leprosy, or Hansen's disease as its known today. The report centers on projects dealing with the substantial archaeological record preserved in the park dating to the early historic (A.D. 1866-1778) and prehistoric (A.D. 1778-1200) eras. The goal of the report is to provide park managers and others a succinct summary of previous and current archaeological research, an assessment of the results, and recommendations for additional research and management.

Kalaupapa NHP has a history of archaeology dominated by surveys. An estimated 6.4 % of the park has been intensively surveyed (690 acres/279.5 ha) with an additional 7.6 % surveyed at the reconnaissance level (820 acres/332 ha). A total of 616 sites have been recorded, some including hundreds of small features. Overall site density is high and the state of preservation of sites is excellent. There is extensive evidence of modification of the landscape for agriculture during the prehistoric and historic eras. Kaupikiawa Cave (50-60-03-312) has been of particular interest to archaeologists due to what the deposits inside may tell us about the prehistoric era. Archaeological excavations have been rare; however, current evidence suggests a continuous record of human occupation for the past 800 years. Permanent settlements may have been first established in the Waikolu Valley and somewhat later on the Kalaupapa Peninsula and other parts of the park.

The results of past archaeological projects are synthesized in the text and presented in detail in Appendix I. Most projects reviewed have been instigated and funded by the National Park Service (NPS). Other projects such as historic resource studies, archival research, and natural resources studies are also discussed since they have the potential to provide important supporting, independent lines of evidence to interpret the archaeological record. Recent academic research on the historic era at Kalaupapa is reviewed.

A total of 12 actions/projects are recommended for improved cultural resource management. The report summarizes the goals, costs, benefits, and priority of each of these actions/projects. The hiring of an archaeologist at the park is strongly recommended. Other recommendations include developing a park-specific research design, site stabilization, public information, cooperative research, an archaeological base map, database development, reconnaissance and intensive surveys, archaeology of the early historic era, paleoenvironmental research, and site monitoring. Other potential future research themes include developing the chronology of human occupation, origins and development of the Kalaupapa Field System, and the rise of the Ko'olau Polity.

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ACKNOWLEDGEMENTS

I owe a *mahalo nui loa* to the National Park Service (NPS) who has supported my research in Kalaupapa during the past year. In that time, with the help of the NPS, I have concurrently completed this report as well as valuable background research and fieldwork for my Ph.D. dissertation. From his post at the Pacific Islands Support Office (PISO) in Honolulu, Rob Hommon managed to masterfully bring together my blossoming interest in Kalaupapa and this overview and assessment project. He has lead, provoked, and inspired me to think critically about Kalaupapa archaeology as only someone of his experience could. Rob was also a welcome special guest visitor in the field.

Park superintendent Tom Workman and Jennifer Cerny (cultural resources) provided vital on-the-ground support in the park. They have both generously given up their time to create the logistical lifeline for the project and helped solve all the small challenges one faces when conducting field research in one of the most isolated places in the islands! Each of them genuinely cares about Kalaupapa and it shows. Laura Carter Schuster of the Hawai'i Volcanoes National Park acted as project director. Shirlene Iwai of the Pacific Cooperative Studies Unit of the University of Hawai'i played an important role at every stage of the project in coordinating work with PCSU. The State of Hawai'i Department of Heath generously allowed my field crew to reserve designated hunting areas for survey. To the good people at the Department of Health and the deer and boar hunters of Moloka'i-- *mahalo*!

Archival research in the collections at University of Hawai'i at Mānoa (Hamilton Library, Hawaiian Collection), archives of the Bernice Pauahi Bishop Museum, and various branches of the State of Hawai'i (State Archives, Survey Office, State Historic Preservation Division, Bureau of Conveyances) was guided by discussions with Pat Kirch, my advisor at the University of California, Berkeley. Kirch is ultimately responsible for my involvement in Kalaupapa and generously allowed me the time away from my responsibilities in the graduate program at Berkeley to write the report. He too was a welcome special guest visitor this past summer who offered valuable comments on the project. To him, I extend a special *mahalo nui loa* for his guidance and faith. I am also grateful to the Anthropology Department of Indiana University, Bloomington for sponsoring me as a research associate during the report writing phase of the project.

There are many of the NPS staff that worked to make this report come together. Credit for chasing down decades worth of documents produced by different projects goes to Rob Hommon and Jennifer Cerny who reviewed the extensive files of the National Park Service. Melia Lane-Kamahele arranged for access to maps and drawings of sites. She also managed to provide my field crew with the finest surveying equipment available, including GPS units and technical GIS support. Guy Hughes, head of natural resources in the park, also generously gave up his time and office space. He is also partially responsible for some of the photographs in this report that were taken from the uniquely privileged position of a low-flying helicopter. Earl "Buddy" Neller provided a detailed bibliography for this overview. Thanks to all those who corresponded with me about the park, including former park superintendent Dean Alexander, Doug Herman of Towson University, Roger Kelly

of the NPS Great Basin Support Office, and Charles Langlas of the University of Hawai'i, Hilo. Sarah Collins and Eric Komori at the State Historic Preservation Division generously shared site records as well as valuable information about the area. Thanks also to J. Stephen Athens for his time and granting me access to the extensive library located at International Archaeological Research Institute, Inc. (IARII) in Honolulu.

Last summer I traveled to Kalaupapa with one of the very best group of people I have ever had the privilege to work with in the field. Eddie Bailey, K. Ann Horsburgh, Elaine Howard, Kathy Kawelu, and Robin Stephenson worked hard to make the season a success. More than that, they made a real effort to embrace the spirit of the small community and enjoy the natural beauty of the place. From Barge Day to the community sing-along, the experience was one none of us would soon forget. *Mahalo nui loa* to you all, and also to our friends on the staff and in the community that made us feel welcomed last summer.

David Duffy, director of the PCSU, worked hard to have this report published as part of the PCSU technical report series. Jennifer Cerny, David Duffy, Rob Hommon, Melia Lane-Kamahele, Jadelyn Moniz-Nakamura, Laura Carter Schuster, and Tom Workman reviewed and offered valuable comments on a draft of this report. The writing process has given me a chance to develop my own thoughts on Kalaupapa and I hope the final product does the same for others who will have the privilege of working in such a special place.

MDM
Bloomington, Indiana

Chapter 1

INTRODUCTION

Kalaupapa National Historical Park Archaeological Overview and Assessment
The purpose of the Kalaupapa National Historical Park (NHP) Archaeological Overview and Assessment is to provide park managers and others a succinct summary of previous archaeological research in the park, an assessment of the results, and recommendations for additional research and management in accordance with relevant statues and regulations. The report presents material in a general manner useful for planning of park improvement projects, management, and interpretation of sites. In addition, information important to specialists (i.e., archaeologist, anthropologists, historians) regarding specific projects has been included (Appendix I). Regionally specific and technical terms used in the text are explicitly defined (Appendix II).

This overview relies primarily on records of archaeological projects--published and unpublished-- on file with the National Park Service (NPS) at archives located either at Kalaupapa NHP or at the Pacific Islands Support Office (PISO), Honolulu, Hawai'i. Additional historical sources were made available through the collections at University of Hawai'i at Mānoa (Hamilton Library, Hawaiian Collection), the archives of the Bernice Pauahi Bishop Museum, and various branches of the State of Hawai'i (State Archives, Survey Office, State Historic Preservation Division, Bureau of Conveyances). National Park staff were also instrumental in collecting the sometimes fragmented records of previous research necessary for this report.

The incarceration of people with leprosy on Moloka'i Island from A.D. 1866 to 1969 has been well studied (Daws 1973; Greene 1985; Moblo 1996; Stewart 2000). As one former park superintendent pointed out, historical resources are "open ended" in Kalaupapa since our greatest link to the past is the living patient community. However, the historical or cultural resources discussed here date to prior to the establishment of the leprosy settlement. Primarily of concern are the early historic era (A.D. 1866-1778) and prehistoric era (A.D. 1778-1200), often overlooked by historians. The Island of Moloka'i and the Kalaupapa Peninsula were not primary centers of intense protracted, culture contact like the port town of Honolulu (Figure 1-1). Thus, it is generally assumed early historic communities were primarily made up of the descendants of original inhabitants of the area called *kama'āina*.[1] Ethnohistoric documents place these communities within the four territories (*ahupua'a*): Kalaupapa, Makanalua, Kalawao, and Waikolu--the western-most

[1] Figure 1-3 appears to be a rare photograph of four *kama'āina* of Kalaupapa, Moloka'i posing in front of a house constructed of *pili* grass (Arning 1931). The woman on the left seems to be demonstrating the making of tapa (*kapa*) cloth. The two men are described in the caption as fishermen wearing the traditional "Malo-Kapa," one is holding a net. The younger woman is described as wearing a "Kapa Pau," a tapa cloth skirt (*kapa pa'u*). The immense cliffs (*pali*) of Kalaupapa can be seen in the background. The identities of the people and location of house shown are unknown. Creighton (1886) reports that only forty *kama'āina* residents remained in Kalaupapa at the time the photograph was taken. Alternatively, these folks could have been *kokua*, helpers brought to the area to help people suffering from Hansen's disease or patients without visible signs of the disease.

territories of the Ko'olau district (*moku*) (Figure 1-2). Legendary accounts of the Hawaiian past link the people of Ko'olau district through tales of conflict and contact with communities located on the leeward side on Moloka'i Island, O'ahu, Maui, and other neighboring Hawaiian Islands (see Summers 1971).

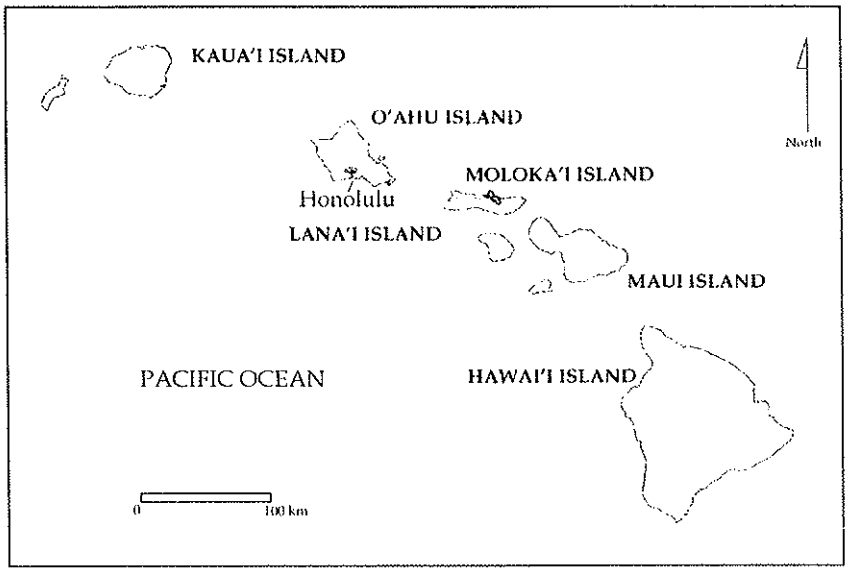

Figure 1-1 - Map of the Hawaiian Islands

The History of the Kalaupapa National Historical Park

Kalaupapa is a low, flat, triangular-shaped peninsula jutting about 3 km out from the dramatic sea cliffs of the north shore of Moloka'i Island, Hawai'i (Figure 1-2). The name Kalaupapa translated from the Hawaiian language has been taken to mean "flat leaf," "flat plain," or "much level land" (Goodwin 1994a). The geologic history of Moloka'i Island has conspired to keep the peninsula isolated from the main body of the island by a wall of cliffs (*pali*) that rise to a height of 1,600 to 3,000 ft (530 to 1,000 m) above sea level. The sea cliffs are the result of the massive Wailau landslide that drove the entire north half of the island into the sea about 1.5 million years ago in what would have been one of the world's most violent natural disasters (Macdonald *et al.* 1983:343-352). In the years after the landslide, eruptions from the centrally-located Kauhakō Crater formed the peninsula at the base of the cliffs.

When in the mid-nineteenth century the Kingdom of Hawai'i was looking for a place to build a settlement for people suffering from leprosy (Hansen's disease), the isolation of the peninsula made it a natural choice.[2] Drugs to treat the disease were developed during World War II and eventually the quarantine of Kalaupapa was lifted in 1969. The 10,779 acre Kalaupapa National Historical Park, which includes the Kalaupapa Peninsula and three adjacent valleys, was created to preserve the historic leprosy settlement

[2] The Board of Health first considered the Palolo Valley, Hawai'i Island for the location of the settlement, then rejected it in favor of the Kalaupapa Peninsula on Moloka'i Island after the president of the board visited the peninsula (Hawaii Board of Health 1886).

that was once home to some 8,000 patients including the famous Catholic missionary priest Joseph deVeuster (Father Damien). Today, those who began their life exiled to the peninsula in the years before the disease became treatable now remain there by choice. Life in the modern day community of Kalaupapa is centered on the care of these last remaining patients.

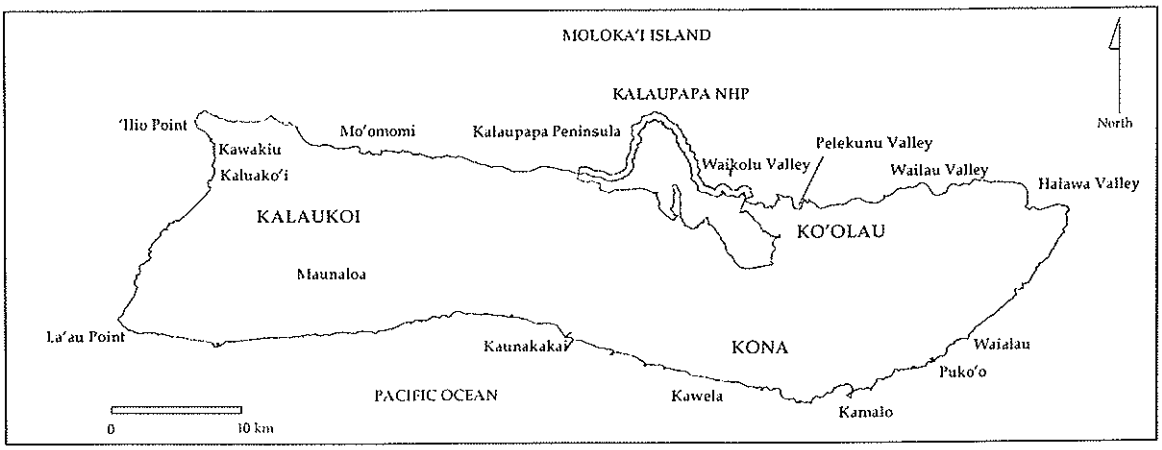

Figure 1-2 - Map of Moloka'i Island (adapted from Kirch 1985: Figure 103)

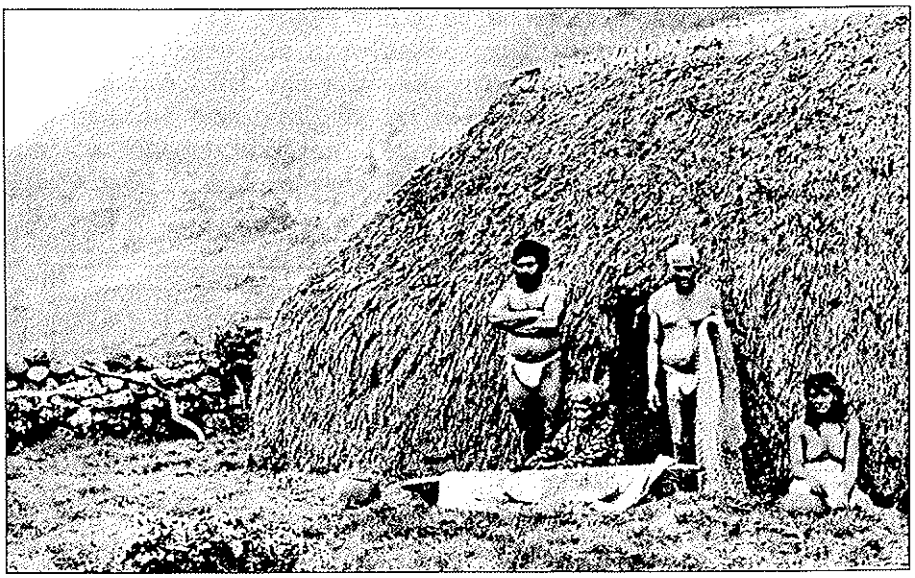

Figure 1-3 - Photograph of Four People Posing in Front of a *Pili* Grass House, Kalaupapa, Moloka'i Island (c. A.D. 1886). The identities of people are unknown. Caption (translated from German) reads, "*Kapa*-knocker in front of *pili*-grass house in Kalaupapa, Molokai. Two fisherman with *Malo-Kapa*, one girl with *Kapa Pau*" (Arning 1931). See also Footnote (1).

[3] The Board of Health first considered the Palolo Valley, Hawai'i Island for the location of the settlement, then rejected it in favor of the Kalaupapa Peninsula on Moloka'i Island after the president of the board visited the peninsula (Hawaii Board of Health 1886).

Kalaupapa NHP is one of the newest of our national parks. Dean Alexander (1996:41), a former superintendent, briefly describes the park's history, purpose, and job of the park staff:

> Kalaupapa was designated a National Historic Landmark (NHL) in 1976 due to its integrity as [a] surviving example of a leprosarium, and its extensive archaeological resources. The park was established in December 1980. By this act, the National Park Service was added to an existing partnership of state and federal agencies and private groups that are involved in managing the area. The park was established to preserve and interpret the resources for current and future generations, but it was also established to protect the lifestyle and privacy of the patients. This creates management difficulties as challenging as the preservation versus public use conflict typical of most parks.
>
> To carry out its mission, the National Park Service relies on numerous intangible resources and comparatively few tangible ones. The NPS owns 23 out of... [10,778.88 land acres within the designated park boundaries]. Most of the historic buildings are owned by the State of Hawai'i Department of Health or individual patients. The NPS occupies its offices and quarters by the permission of the on-site state administrator. So what is the NPS's role here and how does it get its job done?
>
> A short answer is that the NPS staff does research on the natural, historic, and archaeological resources of the park, operates the water system and through cooperative agreements with state agencies and churches, maintains historic buildings and grounds.

Figure 1-4 shows the boundaries of the park and Figure 1-5 depicts current land ownership. Multiple government agencies with different missions overlap in Kalaupapa. In addition to these agencies, the patient community and other local communities on the island are important stakeholders in what goes on in the park. The area has for many years enjoyed the independence of being its own county (Kalawao County) separate from the rest of the island (Maui County).

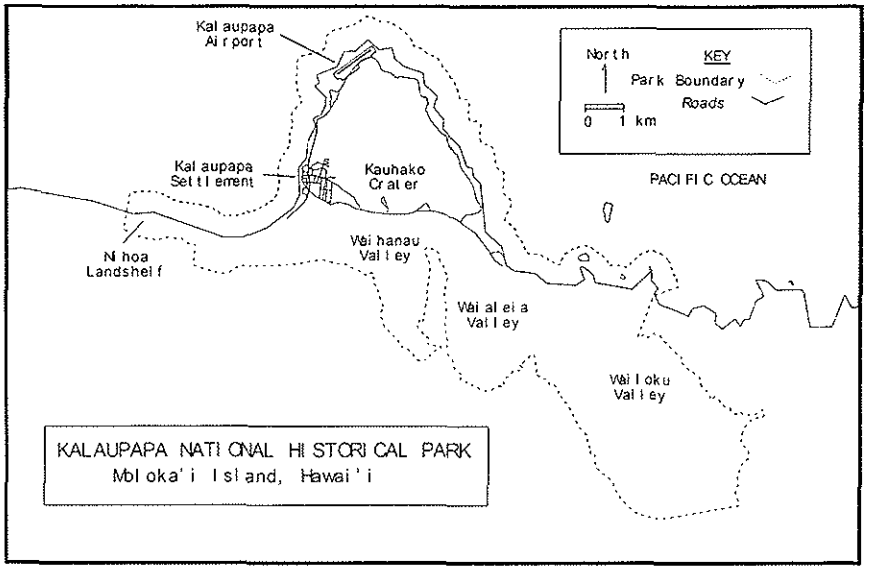

Figure 1-4 - Map of Kalaupapa National Historical Park, Moloka'i Island, Hawai'i

The Archaeological Landscape

Kalaupapa was recently described as "one of the richest collections of archaeological, historical and natural resources in the Pacific Region" by a cultural resources review of the Pacific Islands Cluster, Pacific Region Division (Wells and Hommon 2000). Archaeologists widely acknowledge the Ko'olau district as one of the best preserved in the islands. Archaeological features "cover the peninsula like a fish net" which make it difficult to speak about individual sites (Wells and Hommon 2000:20) (see Chapter 3, Summary of Surveys and Sites).

Accessibility to the park is a significant factor in life at Kalaupapa. Visitors to the park that are not the personal guests of a patient must be on a guided tour. The range of facilities and equipment for archaeological research, while steadily improving, are subject to the general space crisis felt as the growth of the park seriously outstrips the available housing. Also, restrictions developed by the Patient Representative Council are strictly enforced. For example, state and federal employees' spouses and children are not permitted to reside in Kalaupapa. No one under the age of 16 is allowed to visit the park.

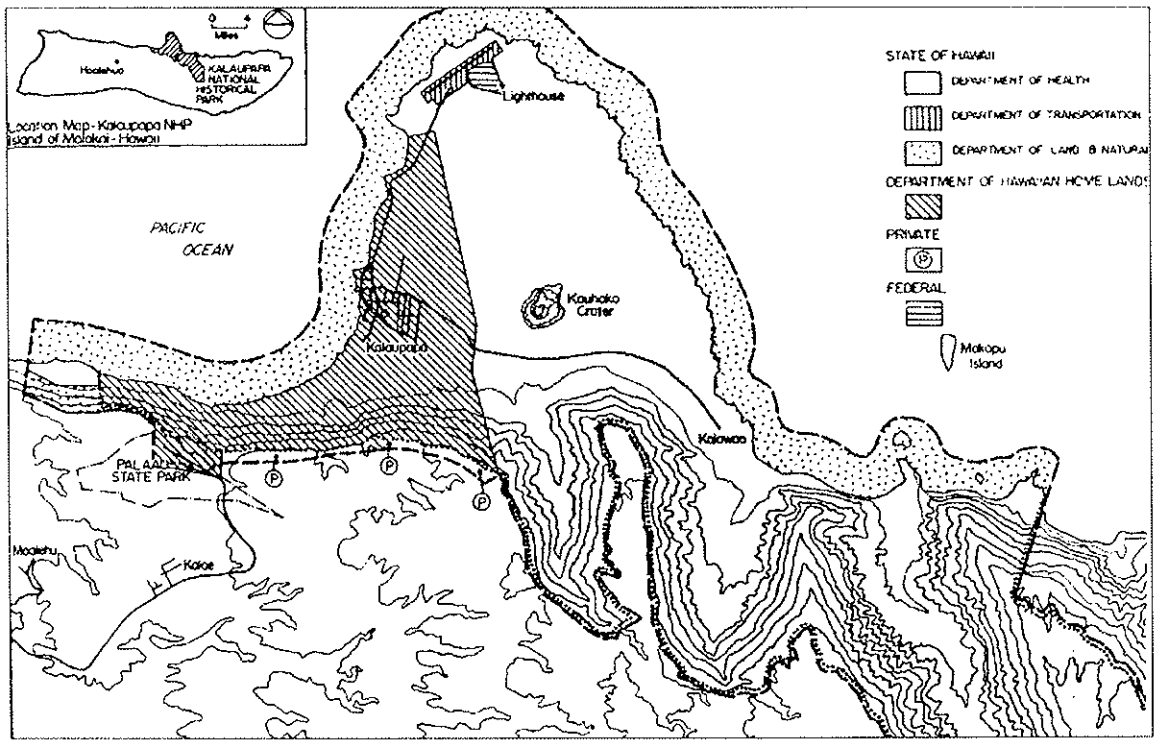

Figure 1-5 - Map of Land Ownership in Kalaupapa National Historical Park (source: KNHP Land Protection Plan (1986))

Administrative History

From 1980 to present, five people have administered the Kalaupapa NHP as superintendent: Henry Law, Peter Thompson, Dean Alexander, Doug Lentz (acting), and current superintendent Tom Workman. Cultural resource management has the benefit of support from the Pacific Islands Support Office (PISO) in Honolulu, Hawai'i and on-site park staff. In the early years,

cultural resources were overseen by two figures, both of whom were key in advocating Kalaupapa be put on the National Register of Historic Places, the legendary archaeologist Edmund Ladd and Gary Somers (Ladd and Somers ms.; Somers and Ladd 1983). In his position at the Pacific Area Office, the predecessor of the PISO, Somers headed a range of different projects in the park until 1992 (Somers 1982, 1983a, 1983b, 1983c, 1985, 1986, 1987, 1988, 1992, 1996). Rob Hommon, his successor, currently holds the equivalent position at the PISO and is also active in the management of the park. Cultural resources staff at the park in the past included archaeologist Earl "Buddy" Neller (1991-96), historian Sharon Brown (1996-99), and historian Christi Shaw (2000-01). Jennifer Cerny (2002-present) has recently been hired as the first cultural anthropologist on the cultural resources staff. Archaeological work continues to be carried out in the park through contract, temporary hire, and assistance from other parks.

Chapter 2

ENVIRONMENTAL SETTING AND CULTURE HISTORY

Physical Environment and Climate

The Hawaiian Island chain is made up of eight main islands and over one hundred smaller islands, islets, and reefs stretching in a northwest arc across the Tropic of Cancer in the North Pacific Ocean (Figure 1-1). Centrally located among the main islands, Moloka'i Island ranks fifth in size, measuring at about 38 miles (63 km) east-west and 10 miles (6 km) north-south (Figure 1-2). There are three general ecological provinces on the island: (1) the north-east coast with its deep, amphitheatre-like headed valleys and the broad, flat Kalaupapa Peninsula, (2) the south-east coast with smaller valleys and highly developed coastal reef; and (3) the western zone with its rough, arid rocklands (Kirch 1990:215).

The island consists of two coalescing volcanoes, West Moloka'i (peak elevation: 421 meters / 1,381 feet above sea level) and the younger East Molokai Volcano (peak elevation: 1,515 meters above sea level /4,970 feet above sea level) (Clague *et al.* 1982) (Figure 1-2). East Moloka'i Volcano has two vents, one submerged off the east coast of the island, and the other, Kauhakō Crater, responsible for creation of the Kalaupapa Peninsula. The oldest dated sample of Kalaupapa Basalt originated from Kauhakō Crater over one million years ago (1.24 +/- 0.16 mya) after the Wailau landslide (Clague *et al.* 1982). The youngest is dated to 0.34 to 0.57 million years ago (ibid). The main peninsula has what are called Kalaupapa Series soils that are derived from the weathering of these geologically young *pahoehoe* flows. Although these soils are described as "shallow... [with] many stones and cobblestones on the surface and few to many in the profile..." (Foote *et al.* 1972:56) *their distribution corresponds with the extensive dryland Kalaupapa* Field System.[4] Colluvial deposits derived from erosion and landslips can be found along the base of the cliffs and valley bottoms in the park. Along the Waihanau[5] Stream bed, and the mouth of the Waialeia Valley, soils associated with traditional wetland agriculture called Haleiwa Series have been noted (Fink 1991; Kirch 1977, 2002). The soil regimes of the valleys and talus slopes are probably more heterogeneous than those on the peninsula; however, fine-grained data on soils are lacking in both zones.

In the Hawaiian Islands the abundance and geographic distribution of rainfall are mainly effected by two factors: tradewinds and elevation. Island landscapes follow an orthographic pattern of positive correlation between elevation and precipitation. The northeast tradewinds carry storms to the archipelago that bring moisture to windward areas leaving the opposite side

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[4] It is important however to keep in mind that modern soil classification in Hawai'i is biased toward contemporary mechanized agriculture, not traditional Hawaiian-style agriculture. One example of this bias is the way Foote *et al.* (1972:56) charactorize the area where we find most of the dryland fields as "impractical" for cultivation. Clearly, the area was heavily cultivated in the past using traditional Hawaiian techniques.

[5] All place names in the text are as they appear on the most recent USGS 7.5 minute quad map, often missing their proper diacritical marks.

of the island in a rain shadow. Variation on any single island can usually be divided into a windward side that is wet, and a leeward side that is dry (see Kirch 1994). Figure 2-1, adapted from Wagner *et al.* (1990: Figure 9), is an example of the expected pattern of rainfall where tradewinds meet a tall, sheer cliff-face, as on the northern shore of Moloka'i Island. Local microclimates and conditions can alter the expected distribution of moisture, for example through phenomenon like fog-drip precipitation.

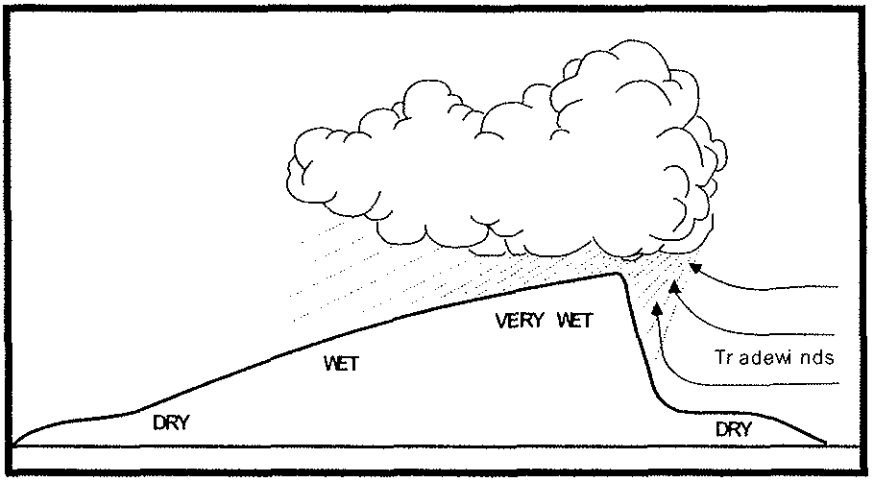


Figure 2-1 - Diagram Showing Expected Rainfall Patterns of a Shear Windward Coastline (adapted from Wagner *et al.* 1990: Figure 9)

The Kalaupapa Peninsula itself has a unique microclimate. The peninsula is dry, with the northern tip getting less than 1,000 mm (40 inches) of rainfall per year. The northeast tradewinds meet the eastern half of the peninsula at full force but a large north-south oriented lava tube crest together with the Kauhakō Crater form a natural windbreak sheltering the western half of the peninsula. In the North Kohala Field System on Hawai'i Island, Ladefoged et al. (in press) explain how wind velocity can affect the growth of crops:

> The level of moisture in the soils of Kohala necessary for growing sweet potato is highly influenced by the strong NE tradewinds. . .Berger (1972:72), in his authoritative book on plant and soil interactions, notes that "under normal field conditions most of the water removed from the soil is lost by a combination of direct evaporation from the soil itself and transpiration from the leaf surfaces." The combination of these processes is referred to as evapotranspiration, and Berger (1972:72) observes that high winds greatly increase the loss of water. Scott (2000:271) provides a detailed and quantified description of these processes, and demonstrates how the rate of evaporation is positively correlated with wind velocity (also see Caborn 1957:24-27).

As in North Kohala, stone field walls were constructed to act as artificial windbreaks across the peninsula, to aid in cultivation. There is little doubt that local conditions on the peninsula affected the form, distribution, and timing of agricultural expansion and intensification of the Kalaupapa Field System.

Ecological Communities

The natural environment of the Hawaiian Islands has been dramatically impacted by the presence of humans, especially with the human introduction of alien plants from the Americas, Europe, and Asia. Flora currently found in the islands are often categorized as either endemic, Polynesian-introduced, or alien, based on when and how it arrived. Generally, endemic and Polynesian introduced taxa can be found throughout the park, but are out competed especially in dry areas by aggressive alien taxa. Alien plant species in dry zones like Christmas berry (*Schinus terebinthifolius*) and lantana (*Lantana camara*) dominate the landscape in a dense cover, just as Java plum (*Syzgium cumini*), rose apple (*Syzgium jambos*) and strawberry guava (*Psidium cattleianum*) choke mesic environments. Nonetheless, a recent field study noted twenty different plant communities within Kalaupapa NHP (Fink 1991).

Natural resources management in the park has as a goal the control or eradication of feral animals and alien vegetation. After the eradication of cattle in the 1980's, the Axis deer (*Cervus axis*) and the feral pig (*Sus scrofa*) topped the list of pest animals. Through a cooperative effort with the State of Hawai'i Department of Health and local hunters the NPS has trapped or hunted Axis deer out of large sections of the park. A system of high, chain-link fence currently prevents the animals from repopulating areas that are virtually deer-free. The alien plants that choke the landscape, as well as the pest animals named above, are all known to destroy archaeological sites in Kalaupapa (Somers 1992).

Paleoenvironmental research focusing on reconstructing the past environment and tracking changes attributable to natural and human agency has to date been unsuccessful in Kalaupapa NHP, mainly due to a failure to find and recover pollen-bearing, intact sediments in Kauhakō Crater Lake.[6] Based on the distribution patterns of rainfall and elevation, we can get an idea of what sorts of plant communities may have been present in the park before alien plants came to dominate the area (Gangé and Cuddihy 1990). Figure 2-2 shows annual rainfall isohyets at 1000 mm (40 inches) and 2000 mm (80 inches). In Hawai'i, zones are commonly referred to as either dry (less than 1,200 mm/ 48 inches per year), mesic (1,200-2,500 mm/ 48-100 inches per year), or wet (greater than 2,500 mm/ 100 inches per year).[7] Figure 2-2 also shows elevation at 100 foot (30m) isohyets. The overlapping ranges of elevation expected for different zones (given in meters and feet above sea level) include: coastal (0-15 masl/0-49 fasl), coastal/lowland (15-300 masl/49-984 fasl), lowland (300-500 masl/984-1,640 fasl), lowland/montane (500-2,000 masl/1,640-6,562 fasl), and montane (2,000-2,700 masl/6,562-8,858 fasl). Clearly, a wide range of vegetation communities were probably found in the park from coastal to lowland dry scrublands on the peninsula and along

[6] There have been tremendous past efforts made at dredging deposits from Kauhakō Crater Lake, the largest of which was the April 1988 "Investigation of Kauhakō Crater in Kalaupapa, Molokai" a cooperative NPS project involving, United States Navy (USN), National Geographic and the US Marine Corps, with Daniel J. Lenihan as Project Director. Natural resource divers have explored the crater as recently as 2000. See NPS Submerged Resources Center: http://data2.itc.nps.gov/submerged/dispproj.cfm?alphacode=KALA.

[7] A weather station located on the peninsula has collected data for at least the past 10 years. This data set will help refine estimates of daily and seasonal variations in rainfall, humidity, wind, and temperature.

the coast, to lowland mesic forests, and up to montane wet forests along the cliffs (*pali*) and valley uplands.

Prehistoric and Early Historic Periods

Cultural History of the Hawaiian Islands
Discovery and colonization of the Hawaiian Islands can ultimately be traced back to the expansion of peoples with Lapita-styled pottery into Oceania beginning in the middle of the second millennium B.C. Given the isolated position of the Hawaiian Islands--geographically remote even by Oceanic standards--contact, secondary, and back migrations to and from the islands

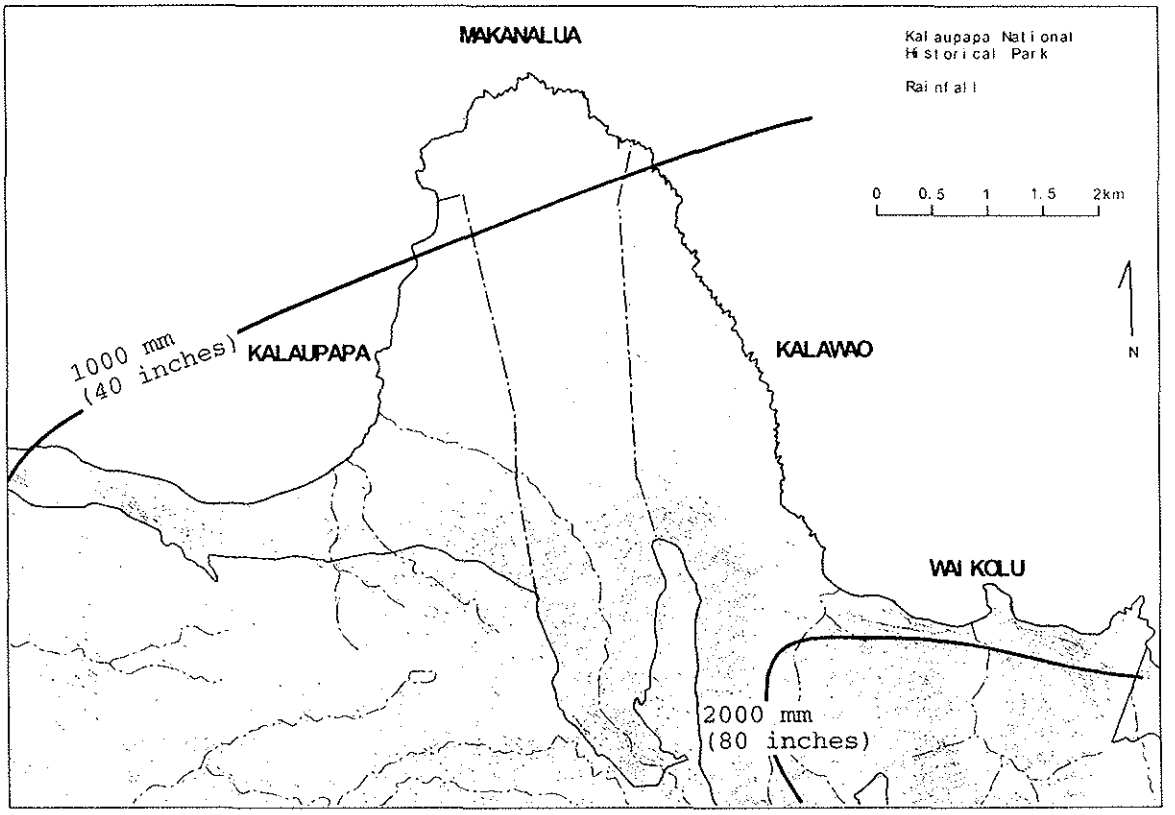


Figure 2-2 - Elevation Contour Map (100 ft/30 m interval) and Annual Rainfall (1000mm/40 inch interval) (source: DLNR, State of Hawai'i)

were probably rare. However, Hawaiian oral history tells of the coming of elite people from Tahiti who migrated and changed the social and political scene late in prehistory. Evidence from computer modeling, experimental voyaging, archaeology, and oral traditions have all been brought to bear on topic of the discovery and settlement of Remote Oceania (see Kirch 2000a).

Currently, there is a debate over when people discovered, colonized, and became well established in the Hawaiian Islands. Researchers have been divided into two camps, one favoring a long chronology and the other favoring

a short chronology (Graves and Addison 1995). Estimates of the date of Hawaiian colonization range from as early as 100 A.D. to as late as sometime after 600 A.D. (Athens and Ward 1993; Athens *et al.* 1999; Chun and Spriggs 1987; Cordy 1996; Graves and Addison 1995; Hunt and Holson 1991; Kirch 1985; Masse and Tuggle 1998; Tuggle 1979; Tuggle and Spriggs 2000).

Kirch (1985) defined five periods in Hawaiian culture history, based on a long chronology: Colonization (A.D. 300-600), Developmental (A.D. 600-1100), Expansion (A.D. 1100-1650), Proto-Historic (A.D. 1650-1795), and Historic (A.D. 1795-). In a review of radiocarbon dates from archaeological sites on the Island of Moloka'i, Weisler (1989) divided the Expansion Period into Early Expansion (A.D. 1100-1400) and Late Expansion (A.D. 1400-1650) periods. In Kalaupapa, Greene (1985) further divided the Historic Era into a number of periods including the Pioneer Kalawao Settlement Period, Kalawao Settlement Period, Pioneer Kalaupapa Settlement Period, Revitalization Period Kalaupapa Settlement, and Kalaupapa Settlement Period. Simplified, the Historic Period in Kalaupapa can be thought of as having an Early Historic Era (A.D. 1795-1866), Kalawao Settlement Era (A.D. 1866-1900), and Kalaupapa Settlement Era (A.D. 1900-present). Table 1 summarizes these various chronological schemes and the range of estimated dates of colonization.

The range in estimates of the date of the first human presence in the islands is significant to how archaeologists interpret the occupation of Kalaupapa. For example, according to the long chronology, Moloka'i Island may have remained rarely used for several hundred years after it was discovered. The oldest date from an archaeological site on the island comes from the Hālawa Valley and indicates people could have been living there possibly as early as the 6th century A.D.[8] The park in this scenario would have been passed over by people for a millennia since our best evidence of early occupation comes from the Waikolu Valley and dates to around 1200 A.D. (Kirch 2002; see Chapter 4 this volume). If the short chronology is accepted, the establishment of permanent settlements may have quickly followed the discovery of the island. However, even with a more recent estimated date of discovery, the park may not have been settled until six hundred years after the island was first occupied.

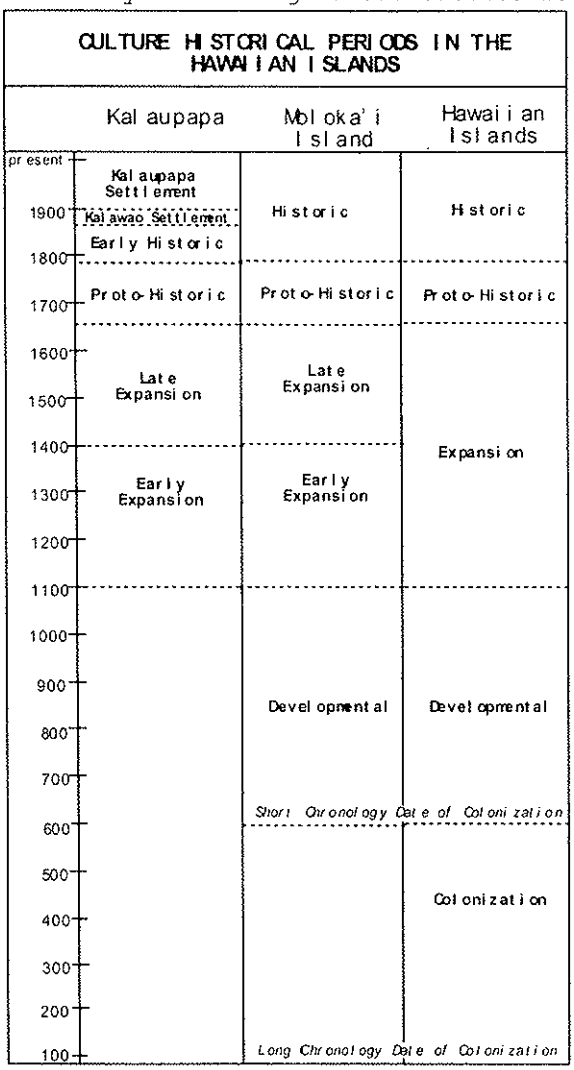
Social and Political Organization

The Hawaiian Islands once were home to a highly stratified, archaic state society. At the time of European contact, the elite dominated a feudal system of land tenure centered on the community territory known as the *ahupua'a* (Hommon 1976; Kirch 1985). Idealized *ahupua'a* are coast-to-upland (*mauka-makai*) oriented and divide islands like pie slices cross cutting resource zones. The political control of these territories was organized into four tiers, each corresponding to larger and larger geographic domains of control. Within a community territory there were several traditional sub-divisions based on use-rights (Kirch 1985). The *'ili*, the land upon which one or more households were based, is the most commonly attested to in ethnohistoric records. Other sorts of land divisions include the *mo'o*, a "[n]arrow strip of land, smaller than an *'ili*", the *lele*, "a detached part or lot belonging to one *'ili*, but located in another *'ili*," and *ko'ele*, a

[8] Gak-2743 Cal A.D. 582 (648) 759 at 68.2% probability (see Wiesler 1989:129).

"[s]mall land unit farmed by a tenant for the chief" (Pukui and Elbert 1986). Tribute in the form of corvée labor, agricultural surplus, and other materials produced by commoners, served as the power base for ongoing competition between elites to expand their power. This situation is in stark contrast to the earlier kinship and land tenure systems in Hawaiian society that reckoned land use rights though membership in a corporate linage group. The *traditional* system of land tenure shifted to a *territorial* system, so named for the overlapping levels of elite control based on the community territory (*ahupua'a*) (Kirch 1985). This type of community structure found in the Hawaiian Islands at the time of contact developed in prehistory during the Expansion Period (A.D. 1100-1650) as new communities were established, and new large agricultural field systems were constructed in marginal areas.

The history of the ruling chiefs of Moloka'i Island is a complex web of genealogies and oral history recounting famous battles for power by the



*Adapted from Graves and Addison (1995), Greene (1985), Kirch (1985, 2002), Weisler (1989).

Table 1 - Hawaiian Chronology

chiefs from other islands as well as between the island's districts (*moku*). Important high chiefs (*ali'i nui*) include Kamauaua (13th century), Kahokuohua (15th century), Kiha-a-pi'ilani (early 16th century), Lanikaula (a prophet of the 16th century), Kalanipehu (17th century), Kalaipahoa (17th century), Kane'alai (18th century), and Kapi'iohokalai (18th century).[9] In the early 19th century, Kamehameha I, a chief of Hawai'i Island, became the first to unite all the Hawaiian Islands under the rule of a single seat of power. Over the course of the campaign, the forces of Kamehameha I occupied Moloka'i Island for a full year in 1790 before setting off to attack rival forces. After the island again came under the control of chiefs from Maui Island, Kamehameha I returned and retook the island early in 1795, only again to leave to attack the Island of O'ahu (Summers 1971).

Traditional Hawaiian Communities, Settlement Patterns, and Site Types

The cumulative work of just over 50 years of professional archaeology on Moloka'i Island has given us some idea of the development of the ancient community and settlement patterns, economy, ideology, and land tenure due to a commitment to understand the form and distribution of archaeological sites on the landscape (Athens 1989; Bonk 1954; Goodwin 1994a, 1994b; Kirch and Kelly 1975; Ladefoged 1990; Somers 1985; Summers 1971; Weisler and Kirch 1985).[10] Describing Hawaiian archaeology in general, Kirch (1985:247) notes:

> A large corpus of settlement pattern data is available for study, beginning with early efforts, such as Chapman's survey of two *ahupua'a* in the Kahikinui District of Maui, and continuing with the explicit application of settlement pattern methods in the Mākaha, Hālawa, and Lapakahi projects (Green 1980; Kirch and Kelley 1975; Rosendahl 1972a), as well as... numerous contract and research projects...

When carefully studied, the distributions of sites can be linked to known ethnohistorical social patterns like the *kapu* system that proscribed men and women's activities and status differentiation between commoners (*maka'āinana*) and elites (*ali'i*). Kamakau (1976:96) notes differences in the households of elites:

> Houses might be large or small. The ruling chiefs, chiefly land holders, land agents, native sons, and prominent people had large establishments, with sheds, men's houses, sleeping sheds, heiau houses, women's eating houses, house for storage of provisions, houses for cooking, and many other houses. The establishments of people were sometimes large and sometimes small. Each man had several houses - for wife, children, parents, relatives and retainers.

Malo (1951: 29-30) has suggested the wealthy, or those who "belonged to the *alii* class... had separate houses for themselves and their wives," along with several of other buildings with special purposes. The people of "no account (lapuwale)... cared only for a little shanty; the fireplace was close to their head, and the poi dish conveniently at hand; and so, with but one house, they made shift to get along" (Malo 1951:29-30). Salvage ethnography

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[9] All dates are estimates based on oral history.

[10] A more complete list of references to archaeological reports on Moloka'i Island is available through the State Historic Preservation Division (Department of Land and Natural Resources, State of Hawai'i) online at the Experimental Database Server: http://tako.icsd.hawaii.gov/~choumoek/. Currently, 87 titles are listed for the Maui County portion of the island (TMK:2-5) and 14 for Kalawao County (Kalaupapa NHP) (TMK:2-6).

by Handy and Pukui (1958) on the Island of Hawai'i suggests within a household cluster one might find a common sleeping house, or area (*hale noa*), a men's house (*mua*), menstrual hut (*hale pe'a*), storage shed for crops and tools (*hale papa'a*), separate ovens for cooking the meals of men and women (*hale kāhumu*), and possibly a canoe shed (*hālau*). So with the aid of ethnohistorical data, we have some idea of the form of a traditional household (*kauhale*), as well as types of built agricultural infrastructure, various sites of religious practice, burial sites, refuges, and fortifications.[11] Archaeologically, large sets of seemingly associated structures are rare, perhaps supporting the notion that they pertained to chiefs only.

There are two general descriptive models of settlement patterns within a traditional community. Ethnography from the Island of Hawai'i gave us what is called the 'Ohana model in which parts of a kin group located in coastal areas would exchange marine resources with members living inland for terrestrial resources (Handy and Pukui 1958).[12] If this were the case on the Kalaupapa Peninsula, we can expect to find permanent settlement in the inland and coastal zones contemporaneously from late in prehistory perhaps into the early historic period. Alternatively, archaeological research has suggested a "shifting residence model" (Rosendahl 1972, Newman 1970). In this model, a shift in residence from large, coastal households to smaller temporary shelters in the agricultural zone typify the settlement pattern designed to meet the cyclical, periodic need for agricultural labor. Settlement pattern case studies based on large regional surveys and excavations--including those in dryland agricultural field systems--have found this type of a mobility pattern. Communities initially situated along the coast shifted their efforts inland and expanded agricultural production (Kirch and Kelley 1975; Hommon 1986; Green 1980). In this case, distinct zones of occupation should be definable based on a continuum from permanent to temporary use of domestic architecture. Naturally, determination of the frequency and duration of use of any feature is best based both on an inventory of the surface remains and on some subsurface testing.

Cultural Contact

The arrival of British Captain James Cook in December of A.D. 1778 marked the beginning of changes in the nature of the Hawaiian community observable in the archaeological record from the grossest regional scale to the household level. A catastrophic demographic crash due to introduced diseases, warfare on a scale never dreamed of, the movement of people into the burgeoning port towns of Honolulu and Lahina, and ultimately the abolishment of the *kapu* system: all are reflected in changes in the landscape (Kirch and Sahlins 1992; Kolb and Dixon 2002; Ladefoged *et al.* 1987; Weisler and Kirch 1985). New multiethnic communities were formed that included people whose ancestry could be traced to the nations of Europe, Asia, Africa, and the Americas, as well as from other parts of Oceania. The forces of the growing "world

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[11] Cachola-Abad (1996), based on careful examination of ethnographic information, has suggested our archaeological-based interpretation of sites, especially temples (*heiau*), need to take into consideration the great deal of variation that exists in the architectural form of different classes of sites. Generally, the identification of temple (*heiau*) are known from a combination of local informants and archaeology.

[12] For archaeological research relevant to the 'Ohana model, see Clark and Kirch (1983) and Allen and McAnany (1994).

system" drew together people with capitalist, religious, and other personal motivations (Wallerstein 1974). Rather than discard this era as a sad period marking the death of Native Hawaiian culture at the hands of European diseases and greed, recent studies have worked to better understand the worldwide effects of culture contact in a holistic way incorporating multiple lines of evidence including ethnographic, historic, and archaeological data (Lightfoot 1995). Table 2, adapted from Greene (1985), shows a few significant events during the early historic through modern era in Hawai'i. Culture contact research is important in that it highlights cultural change, persistence, and resistance during the historic era.

Table 2 - Significant Events During the Early Historic through Modern Era (adapted from Greene 1985).

Date	Event
1778	British ships *Discovery* and *Resolution* arrive in Hawaiian Islands
1810	Kamehameha I crowned first king of the Kingdom of Hawai'i
1819	Kamehameha II officially ends the *kapu* system
1849	Gold discovered in California, boom in demand for Hawaiian goods
1850	Board of Health organized by Kamehameha III
1851	Sharp decline in demand for Hawaiian potatoes in California
Table 2 (cont.) 1866	First people with Hansen's disease arrive in Kalawao, Moloka'i Island
1898	Hawaiian Islands annexed by the United States
1900	Territory of Hawai'i created
1920	Hawaiian Homelands Act passed
1941	Pearl Harbor attacked
1940's	Hansen's disease becomes treatable with sulfone drugs
1959	State of Hawai'i created
1969	Quarantine lifted on Kalaupapa Settlement

Early Historic Economy and Land Tenure

The early historic period in Hawai'i is often classified by the shifts in the economy as the people of the islands were pushed and pulled into a capitalist world economy. The demand for sandalwood (*'iliahi*) (*Santalum spp.*) in China put traders in a position to take advantage of competition among Hawaiian chiefs for foreign goods (Kuykendall 1968). Chiefs and others who retained rights to land and commoner labor ordered the harvesting of sandalwood on an unprecedented scale. Later, after the sandalwood trade fell off, the Hawaiian economy shifted to supplying the growing number of whaling ships visiting the islands.

In 1849, the discovery of gold in the United States' California territory precipitated the overnight immigration of thousands of people to the Pacific coast. The Hawaiian Islands experienced a boom in exports of sweet potatoes (*uala*) (*Ipomoea batata*) and Irish potatoes to supply the Gold Rush towns of California. At the time gold was discovered, Hawaiian people actually made up 10% of the population of the port town of San Francisco (Goodwin 1994a). In Kalaupapa, the productivity of the land for growing sweet potato gave the

area a reputation as a prime spot for trade. An article called "UALA UALA" by M.L. Napihelua, published in the Hawaiian newspaper *Ka Hae Hawaii* on March 4th, 1857, describes varieties and abundance of potatoes as well as offering advice to planters (cited in Handy and Handy 1972:518):

> These sweet potatoes from ancient times. Most of mine seen here in Kalaupapa are these kinds. There are nineteen varieties. Nine are dark, ten are white and fragrant. Of the dark varieties previously mentioned, only three are good, the *'apo*, the *likolehua*, and the *halonaipu*. These may be the names by which they are known on other islands or perhaps they had other names. I have heard that the *halonaipu* is called *mohihi* on Kauai. These three mentioned are also sold at Kalaupapa with the addition of some white and dark sweet potatoes. Like the *likolehua*, and *halonaipu* when ready to be sold are heaped at the seaport like bruised mountain apples on the beach, their purplish color lying against the pahoehoe lava. The eyes scan them up and down with desire for the tubers raised by the farmers.
>
> The President of the Board of Education asked us to report all undesirable sweet potatoes, that is those which were watery and speckled. All the white ones were watery and specked and because the white men did not want them they all became spoiled. According to others, we are to destroy all bad potatoes. But, we must stop a bit there. This may be a better idea, to separate all unwanted sweet potatoes for the families and the animals, because we know what hearty eaters Hawaiians are. They put in and put in till the abdomens grow large with quantities of Maiola's food. Separate the old fashioned dark sweet potatoes from those introduced from South America for trading with ships.
>
> Kalaupapa is a good land because the crops planted area successful and the gain is large. They are not eaten by caterpillars and cut worms. The number of animals from Kalaupapa to Waikolu are over a hundred, cattle, horses, donkeys, and mules. They do not swallow these things because there is much grass. The Hawaiians are mistaken in the idea that the land is growing but it is just the same. The animals are multiplying more and more. Our patches are like the places where the ropes for the riggings are kept outside of the sides of whaling ships which move on the sea. Not a thought is given if there is a hole somewhere.
>
> Many sweet potatoes are being planted now, four or five patches to each man. Most of the crops are watermelons, and some small and big beans and onions. Be on the watch, you traders, for Kalaupapa is the best in all the islands for good prices and fast work. All the California ships come to Kalaupapa. This is my thought, with my regards too.

The effect of this shift in the local economy of Kalaupapa from the traditional agriculture to production for overseas export is a major theme of the early historic era (see Goodwin 1994a).

The *territorial* system of land tenure in Hawaii became codified in a shift to a Western-style *fee-simple* ownership system during a legal process called the Great Mahele (1846-1852) (Barrère 1994; Chinen 1958). By 1848, a Board of Commissioners to Quiet Land Titles (a.k.a., the Land Commission) was created by the Hawaiian Legislature. In this initial stage, the islands were divided between Kamehameha III and 245 chiefs. Later, in 1850, the Kuleana Act allowed commoners to make claims on land and resources. In Kalaupapa, the history of this early stage of land claims not entirely straightforward. Nonetheless, Patrick Kirch (2002:16) has made an initial analysis of the records.

Kalaupapa *ahupua'a* was originally slated as government land but later claimed by Kaunuohua, a *kahu*, or attendant in the royal court and *kaukau ali'i* (an elite with middle range status). Further research is needed to track how these conflicting claims were eventually settled. Kalaupapa *ahupua'a* was the last on the peninsula to be sold to the Board of Health, reported by Greene (1985:49) not to have been bought until 1873. Makanalua *ahupua'a* was claimed and granted to Miriam Kekau'nohi, a grand-daughter of Kamehameha I, who was of the highest status, *ali'i nui*. The land was later willed to her husband and eventually sold at probate to the Board of Health. Samuel Kuluwailehua, a lower-level elite and land manager called a *konohiki*, controlled Kalawao *ahupua'a* at the time of the Mahele. The land was later traded to the government in exchange for land in Waikiki. However, it remains unknown who agreed to sell land to the Board of Health when the president of the board visited in the 1860's(see below). Unfortunately, the records of Waikolu Valley "have proven especially refractory from the point of view of chiefly control" (Kirch 2002:16). Kirch's (2002:16-17) initial findings raise many questions that require further archival research to resolve.

Historic and Modern Periods

Greene (1985), and others have done a thorough job of describing the history of the leprosy settlements at Kalawao and Kalaupapa (Bushnell 1967, 1968; Daws 1973; Moblo 1996, 1998, 1999). Below is a basic outline of the events leading up to the establishment of the settlement. It is important to keep in mind that the management of historic resources relating to the settlement composes a majority of the workload of cultural resource managers in the park.

Under pressure from advisors, Kamehameha III signed "An Act to Prevent the Spread of Leprosy" on January 3rd, 1865, enabling the Board of Health to identify and purchase lands on which to isolate people with Hansen's disease. After some debate, the board chose the Kalaupapa Peninsula as the site for the new settlement (see Footnote 2, this volume). The Board of Health (1886:21) later recorded the motivations for choosing Kalaupapa:

> The northern side of Molokai was thought to contain valleys which were by nature favorably located for the purpose, containing hundreds of acres of cultivable land, abundance of water, separated from other parts of the island by steep palis, and the landings on the sea shore difficult to approach so as to secure the seclusion desired.

Kalawao and Makanalua *ahupua'a* on the eastern and central portions of the peninsula came under the control of the Board of Health in quick succession (Board of Health 1886; Greene 1985). According to the Board of Health (1886:27-8) records dated September 20th, 1865:

> The President reported that he had, since the last meeting of the Board, again visited the island of Molokai, and had succeeded in procuring the desired track of land at Kalaupapa. There are from seven to eight hundred acres, excellent for cultivation and grazing, with extensive kalo land belonging to it; there are from 15 to 20 good house obtained with the land, the whole being obtained for about $1800 cash, together with some other Government lands given in exchange. A promise was made to the present inhabitants to remove them from there free of charge.

The first patients arrived in 1866 A.D. and lived on the eastern side of the peninsula at Kalawao. The purchasing of Kalaupapa *ahupua'a* in 1873 and the last remaining lands and property held in private hands (*kuleana*) allowed the board to finally completely restrict access to the area by A.D. 1895. By the turn of the century, the settlement shifted to its current location on the western side of the peninsula at Kalaupapa. R.J. Creighton's (1886) description of Kalawao prior to the final eviction of the original inhabitants gives us an idea of the state of the landscape and social relations, albeit a clearly biased one:

> It was evidently the seat of a dense population, the old natives speak of it as being famous for its production of sweet potatoes and hogs. Indeed, there is no doubt whatever that it could supply the entire population of these Islands to-day with these food commodities were it applied to that use. It is heavily grassed with Bermuda or manienie grass, and could easily carry 10,000 sheep. The ancient population have left traces of their occupation in numerous stone walls, stone fences and break-winds; there being certainly not less than from thirty to forty miles of such fences. Every little holding of kuleana was securely fenced off with stones gathered from the surface of the ground. Where the exposure is open to the strong trade wind, miles upon miles of low parallel stone windrows extend across the land about four feet apart, to shelter the sweet potato plants; and so dense was the population and so precious appears to have been the land, that little clearances, about a yard square, are carried along the rocky sides of the crater of Kahukoo [Kauhakō] to its very summit. Yet this busy, industrious population has disappeared. About forty of the ancient landholders remain and wage perpetual lingual war with lepers and Kokuas about metes and bounds, and that is all there is to show for them except the stone walls and windbreaks. It is a sad comment upon the past, and points a moral which intelligent readers will not fail to draw themselves.

Over the years, the Board of Health passed from the Kingdom of Hawai'i to the U.S. Territory of Hawai'i, and finally transformed into the State of Hawai'i Department of Health that today continues to oversee the daily care of the patient community.

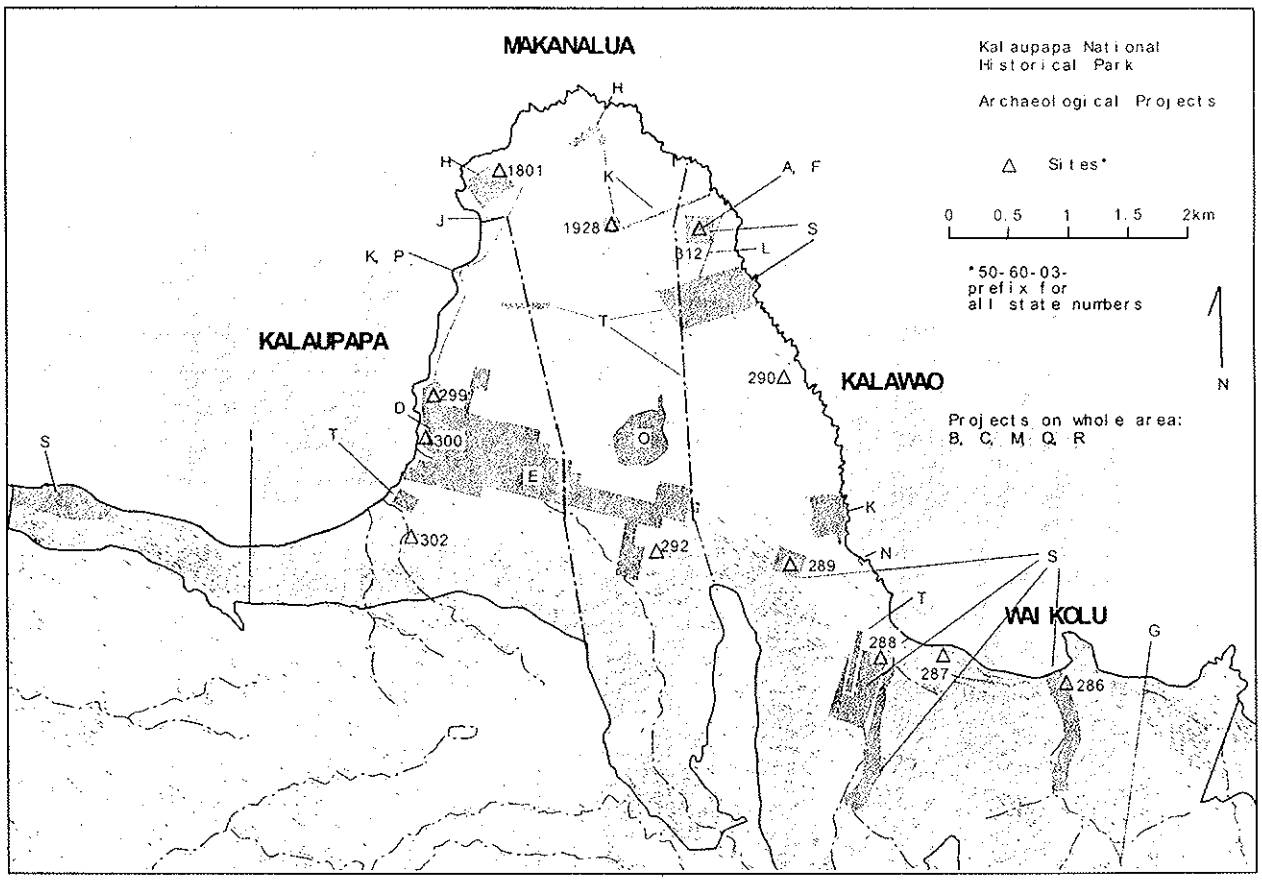
Chapter 3

OVERVIEW

Scope of Overview

The following overview covers past, current, and proposed archaeological projects within Kalaupapa National Historical Park. All work has been consolidated into project headings used as shorthand for the purpose of this review (Figure 3-1; Appendix I). The project headings - for example, Project H: The Airport Improvement Project - often refer to different archaeological projects that took place in stages and were reported in different text sources. In this chapter these projects are referred to either by their letter designation - e.g., (H) - or by a citation to some or all of the reports associated with the project - e.g., Ladefoged (1990). For a complete list of projects (A-V) see Appendix I. A detailed project summary along with information on specific methodology, personnel, dates of fieldwork, time periods of sites, number of sites, types of sites, maps and photographs, collections, absolute dates, National Register of Historic Places

Figure 3-1 - Map of Previous Archaeological Projects



significance, and a list of published and unpublished material are listed in summary form by project heading in Appendix I. The summaries were written specifically to be of the greatest benefit to readers with some background in Hawaiian archaeology, although technical terms are defined in Appendix II. Sites discussed in the text are listed in Table 3. The following is a more general summary of the history of archaeological research in the park as well as ongoing and proposed future research. In addition, a few select sources are reviewed below that provide independent and supporting lines of evidence, including early historic era documents and a selection of historical, ethnohistorical, and natural science research. This information should be valuable for anyone conducting research or cultural resource management in the park.

Table 3 - Archaeological Sites[1]

Site Name(s)	SHPD Site No.	Site Type
Project A	-	-
Kaupikiawa Cave; Cave 1; Site MO-B9-7	50-60-03-312	rockshelter
Project B	-	-
Site 307, Kuka'iwaia Point	50-60-04-307	ko'a complex
Site 286, 'Ahina Heiau	50-60-04-286	heiau
Moa'ula Heiau	N/A	heiau
Ka'aiea Heiau	N/A	heiau
Site 287, Kalaehala Heiau	50-60-04-287	heiau
Site 288, Ko'a at Waialeia	50-60-04-288	ko'a
Site 289, Kawaha'alihi Heiau; "Lang-Lang Heiau"	50-60-03-289	heiau
Site 290, Ananaluawahina Cave	50-60-03-290	rockshelter
Site 291, Ko'a at Kaupikiawa	50-60-03-291	ko'a
Heiau	N/A	heiau
Kealaakeakua Heiau	N/A	heiau
Site 292, Kapua Heiau	50-60-03-292	heiau
Site 293, Holua Slide	50-60-03-293	holua slide
Site 294, Heiau	50-60-03-294	heiau
Site 295, Heiau	50-60-03-295	heiau
Site 296, House site	50-60-03-296	house site
Site 297, Ko'a	50-60-03-297	ko'a
Site 298, Ko'a at Ka Laea (Summers 1971), Site 8a (McHenry 1954), Koa at Kahili (Connelly 1974a), Feature 10, 5a, 5b, 8 (Ladefoged 1990)	50-60-03-298 50-60-03-1803	ko'a
Site 299, Kuahu Heiau	50-60-03-299	heiau
Site 300, Ka'ahemo Heiau	50-60-03-300	heiau
Site 301, Heiau	50-60-03-301	heiau
Site 302, Kamanuolalo Heiau	50-60-03-302	heiau
Site 303, Pikoone	50-60-03-303	sacred area
Pu'ukahi Heiau	N/A	heiau

[1] Sites reported in recently published (e.g., Kirch 2002) or material in press have been omitted from this list.

Site 304, Nihoa	50-60-03-304	household and agricultural complex
Project D	-	-
N/A	50-60-03-515	N/A
Table 3 (cont.) *Project G*		
Well Construction Site #2	N/A	agricultural
Well Construction Site #3	N/A	agricultural
Project H	-	-
Feature 1, 2, and 3	50-60-03-1801	shelter; residential; boundary enclosure
Feature 4	50-60-03-1802	agricultural
Feature 6	50-60-03-1804	residential
Feature 7	50-60-03-1805	shelter
Feature 9	50-60-03-1806	cupboards
Feature 11	50-60-03-1807	shelter
Feature 37	50-60-03-1808	residential
Feature 38	50-60-03-1809	residential
Feature 16	50-60-03-1810	shelter
Feature 12	50-60-03-1811	animal enclosure
Feature 13	50-60-03-1812	possible shrine
Feature 14	50-60-03-1813	shelter
Feature 15 and 36	50-60-03-1814	shelter; boundary alignment
Feature 17	50-60-03-1815	shelter; agricultural
Feature 18	50-60-03-1816	shelter
Feature 19	50-60-03-1817	shelter; agricultural
Feature 20	50-60-03-1818	shelter
Feature 21	50-60-03-1819	agricultural
Feature 22	50-60-03-1820	shelter
Feature 23	50-60-03-1821	shelter
Feature 24	50-60-03-1822	shelter
Feature 25, 26, and 27	50-60-03-1823	shelter; agricultural
Feature 28	50-60-03-1824	residential
Feature 29	50-60-03-1825	shelter
Feature 30, 31, and 32	50-60-03-1826	shelters; agricultural
Feature 33	50-60-03-1827	shelter; boundary alignment
Feature 34	50-60-03-1828	shelter
Feature 35	50-60-03-1829	shelter
Feature 1E	50-60-03-1830	agricultural
Feature 2E	50-60-03-1831	agricultural
Feature 3E	50-60-03-1832	shelter
Feature 4E	50-60-03-1833	agricultural
Feature 5E	50-60-03-1834	shelter
Feature 6E	50-60-03-1835	shelter; agricultural
Feature 7E	50-60-03-1836	foundation
Feature 8E	50-60-03-1837	agricultural
Feature 9E	50-60-03-1838	shelter
Feature 10E	50-60-03-1839	shelter; agricultural

Feature 11E	50-60-03-1840	cupboard
Project I	-	-
Defunct Pali Trail	N/A	trail
'Ili'ili-ka'a Trail, Pali Trail	N/A	trail
Table 3 (cont.) *Project J*	-	-
N/A	N/A	fishpond(s)
Project P	-	-
N/A	50-60-09-1897	habitational, agricultural, ritual

Archaeology at Kalaupapa, Moloka'i Island

A Brief History

The documentation of archaeological sites in Kalaupapa began with several occasional visits to the area by early surveyors, pioneering archaeologists, and enthusiastic amateurs (Monsarrat 1894; Stokes 1909; Phelps 1937; McHenry 1938, 1954). In the 1960's, modern archaeological research on the Kalaupapa Peninsula began with a rock shelter excavation by a team from the University of Hawai'i at Mānoa lead by Professor Richard Pearson (Hirata and Potts 1967; Pearson *et al.* 1974). An initial radiocarbon assay from the site yielded one of the oldest dates from an archaeological site on Moloka'i Island (Weisler 1989; but see Kirch 2002). After the creation of the Kalaupapa National Historical Park in 1980, archaeology on the peninsula, as in most of the State of Hawai'i, has been aimed at cultural resource management. Large-scale projects associated with the improvement of the airstrip (Athens 1989; Ladefoged 1990; Goodwin 1994a, 1994b) and an underground water pipeline (Somers 1985) produced a number of high quality surveys and excavations. A team from the University of California Berkeley, Oceanic Archaeology Laboratory led by Professor Patrick Kirch has once again taken up academic interest in the area (Kirch 2002). Following this work, the author has begun the Kalaupapa Peninsula Archaeological Project (KPAP), a multi-year, on-going research project (McCoy 2002a). Since each project is described in detail in Appendix I, the summary below concentrates on several important overall trends in archaeology at Kalaupapa organized by the themes including: continued interest in Kaupikiawa Cave (A) (F) (L) (S); cultural resource management (C) (D) (E) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (R); the discovery of human remains from the prehistoric era (Q); recent projects (S) (T); and ongoing or proposed work in the park (U) (V).

Kaupikiawa Cave

For archaeologists, the most significant results in terms of establishing the long-term culture history of Kalaupapa have come from research focused on Kaupikiawa Cave (50-60-03-312),[14] a rockshelter site located on the northeast portion of the peninsula. After being led to the site by local resident Richard Marks, Professor Pearson and his students from the University of Hawai'i at Mānoa excavated seven test pits inside the cave over two brief trips in 1966-7. The artifacts and midden (i.e., shell, bone, etc.) found

[14] Site numbers beginning with 50-60-03- or 50-60-04- refer to their identification number on Hawaiian Register of Historic Places, administrated by the State of Hawai'i, State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources. Site numbers assigned to sites in unpublished material (e.g., Manning and Neller, in prep.) have not yet been registered and are thus subject to revision.

indicated that the cave was used as a shelter starting sometime in the prehistoric era; however, little was found that might distinguish this from many such sites throughout the islands (Hirata and Potts 1967; Pearson *et al.* 1974).

The rockshelter was one of the few sites visited by a team from the Bishop Museum sent to Kalaupapa in 1974 as part of the State Inventory of sites. Years later in 1984, Marshall Weisler of the Bishop Museum, in cooperation with Gary Somers of the NPS, sent several samples from Pearson's excavations to a laboratory for radiocarbon dating. They received back three dates, one of which indicated use of the cave around 1,000 years ago - a statistic that is often repeated in literature relating to Kalaupapa (Weisler 1989). Although this sample dated to the late Developmental Period (A.D. 600-1100), it is nonetheless one of the oldest from an archaeological site on Moloka'i Island.

In recent years, the date of the earliest occupation of the Hawaiian Islands has been the subject of increasing debate causing archaeologists to critically re-examine many known early sites (Athens and Ward 1993; Athens *et al.* 1999; Chun and Spriggs 1987; Cordy 1996; Graves and Addison 1995; Hunt and Holson 1991; Kirch 1985; Tuggle 1979; Tuggle and Spriggs 2000). Since the deposits inside the cave were not excavated to the point that they were completely destroyed, the rockshelter is a site worthy of re-investigation. Patrick Kirch and his team from the University of California, Berkeley have recently undertaken such a re-examination of the site by analyzing small sediment samples recovered (Kirch 2002). The results of the re-examination of the sites is discussed in detail below (see Chapter 4, this volume).

Cultural Resource Management

By magnitude, most of the archaeology in North America in the past twenty years has had cultural resource management explicitly as its primary goal. Kalaupapa National Historic Park is no exception to this trend. Nearly all the projects reviewed for this report were undertaken as part of the ongoing management of cultural resource by the NPS (C) (D) (E) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (R).

U.S. federal archaeology programs of cultural resource management have adopted a model promoting preservation, protection, interpretation, and scientific research on the portions of the archaeological record on public lands. This trend is a reflection of U.S. federal legislation and NPS cultural resources policy.[15] Independent private companies, called contract archaeologists, are sometimes brought under government contract to complete work required for compliance with federal cultural resource law. There are many social, political, ethical, and economic issues that come into play in the realm of cultural resource management. For example, the research goals of every archaeological project--explicit or implicit--directly affect how and what is recorded as well as final interpretations. This report, and other archaeological work conducted as cultural resource management, is not more or less objective, value free, or neutral, than other research.

[15] See Appendix III. Federal Archaeology Legislation and NPS management documents for a summary.

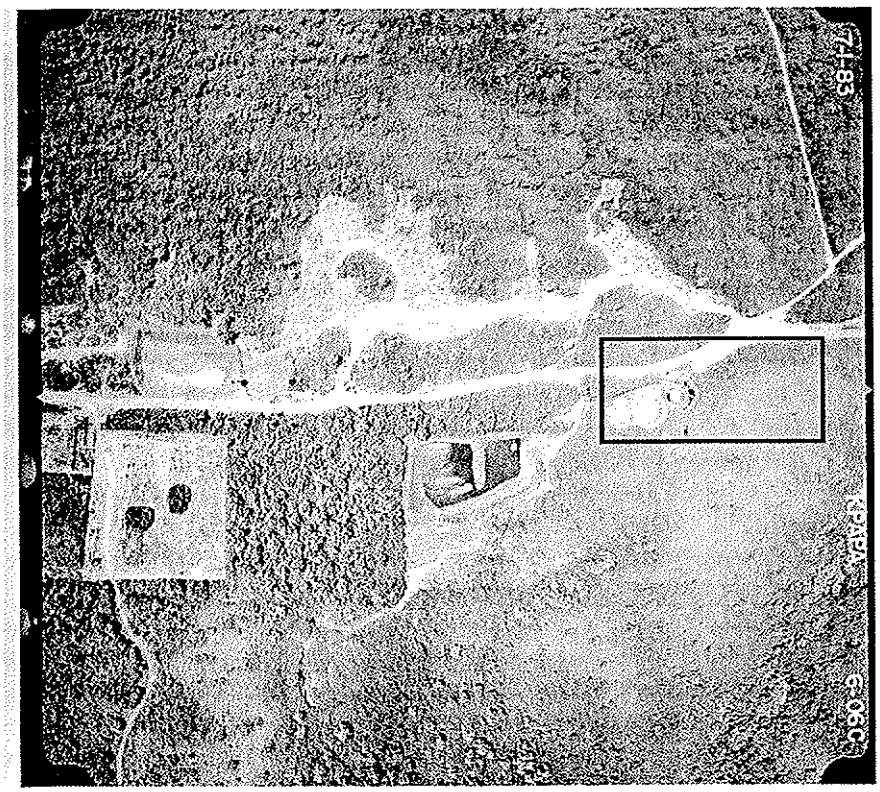
The two largest projects completed in Kalaupapa were undertaken ahead of construction of a waterline (E) and changes to the local airstrip at the Kalaupapa airport (H). Each project involved an intensive-level survey. The waterline project, directed by park archaeologists, required extensive vegetation clearing of a large swath along Damien Road from Kalaupapa settlement to Waihanau Valley. Figure 3-2 is an aerial photograph taken during the project showing an example of the scale of clearing necessary for the survey (seen in progress on the left half of the photograph) and the density of archaeological features found. The area today is again completely overgrown. A smaller area on the extreme western and eastern ends of the airstrip was surveyed for the airport project. A few of the sites discovered were later fully excavated by contract archaeologists and completely destroyed by the construction project under the supervision of a monitoring archaeologist. No such archaeological excavations were undertaken for the waterline project, but an archaeologist did monitor construction.

Several other portions of the park have been surveyed intensively in the past (K) (O). Park archaeologists have surveyed along the main road between Kalaupapa settlement and the airport, on and around the hilltop Makapulapai Burial Complex south of the lighthouse, a portion of the Kalaupapa Field System from Makapulapai east to near Kaupikiawa Cave, the land awarded in LCA No. 8589 to Kanakaokai in the Great Mahele, and the area immediately around the U.S.G.S. Kahio benchmark near the east end of the Kalaupapa Airport, as well as the area on the east coast of the peninsula used in the filming of a movie on the life of Father Damien (Manning and Neller in prep; Cerny ms.). Archaeologists contracted by the NPS have surveyed the entire interior of Kauhakō Crater as well as a portion of southern end of Kauhakō Trench (Rechtman and Henry 2001). Excavation was not undertaken as part of these projects.

Reconnaissance survey, excavations, and archeological monitoring in Kalaupapa are also part of cultural resource management at the park (D) (G) (L) (M) (P) (R). An initial survey by the NPS of the Kaupikiawa lava tube system located on the northeastern end of the peninsula recorded a number of rockshelter sites (Radewagen and Neller ms). A visit by archaeologists working for the State of Hawai'i to areas set to be impacted by well construction in the remote Waikolu Valley attested to the extensive wet land agriculture practiced there in the past (Yent 1986). Test excavations in the late 1970's by contract archaeologists ahead of hospital construction unfortunately resulted in little learned about either the historic or prehistoric era in Kalaupapa (Barrera 1978). Monitoring by a contract archaeologist of the construction of the fence on the inland side of the road between town and the airport minimized impact of the project on the archeological record as well, while recording features not previously reported (Cochrane 2000a, 2000b).

The NPS as part of its regular cultural resource management program works with historians, historical architects, and others to determine the effects, if any, of small improvement or maintenance projects in the park. Section 106 documents pertaining to forty-five of these projects are summarized in Appendix I. These documents are the best continuous record of the care of cultural resources at Kalaupapa. Most of the work centers on the occasional required maintenance or infrastructure improvements on historical properties

(i.e., buildings). Virtually all of these features date to the Kalawao or Kalaupapa Settlement Era, but the preservation and management of the prehistoric and early historic component of the archaeological record are clearly of equal concern.



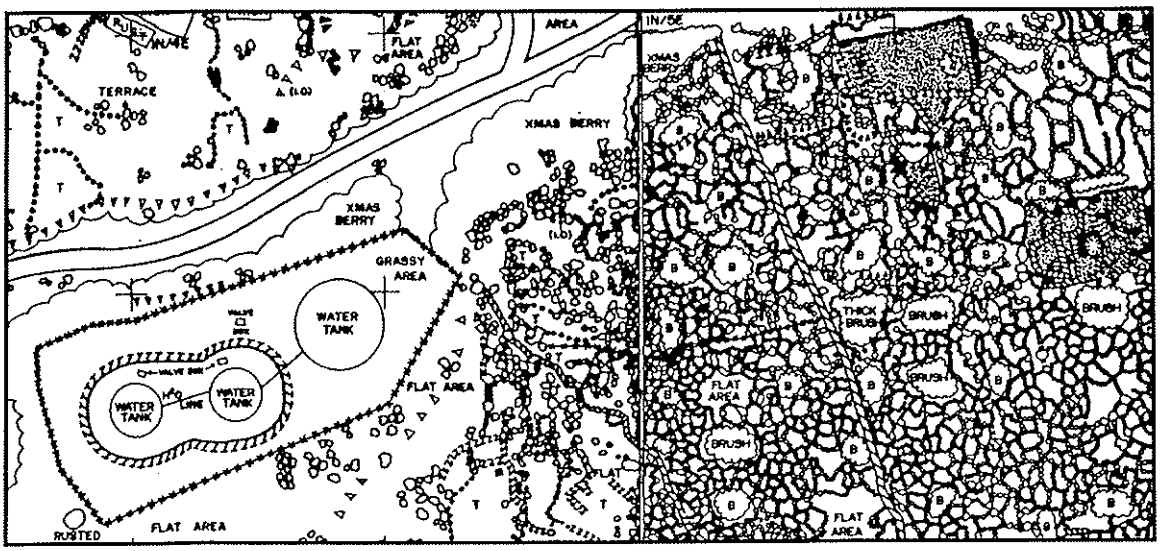


Figure 3-2 - Aerial Photograph and Map of Archaeological Features Near Waihanau Valley (site map from Somers 1985)

Human remains

The Kalaupapa Peninsula is home to thousands of graves associated with the leprosy settlement, most of which are in known locations within several large Historic-era cemeteries (Greene 1985). These graves are cared for and preserved as part of the historical resources of the Kalaupapa National Historical Park. The remains of individuals interned at Kalaupapa before 1866 A.D. are managed separately and for practical purposes are considered the domain of archaeology. Overall, relatively few remains from the prehistoric era have been discovered in Kalaupapa.[16] In all, burials tend to be found in the context of coastal sand dunes – especially on the northern tip of the peninsula (Q), the well-documented, hilltop Makapulapai Burial Complex (K), rockshelters, (Q) and isolated stone burial cairns found on surveys (Collins 2000; Manning and Neller in prep.; McCoy 2002a; Pietrusewsky 1991; Radewagen and Neller ms; Somers 1986, 1996). These are not however the only locations where remains may be discovered in the future. Also, Kalaupapa seems to be home to a relatively unique burial pattern, rarely documented in the Hawaiian Islands – the interment of individuals with an immature chicken (*moa*) (*Gallus gallus*), called in this report the *Moa 'Aumakua* Burial Pattern (Somers 1986, 1996).

Recent Research

In the summer of 2000, several surveys were conducted by a team from the University of California, Berkeley to identify variability in the distribution of archaeological sites in different physiographic zones of Kalaupapa (Kirch 2002). Survey areas chosen included: the Nihoa Landshelf, the area around Kaupikiawa Cave, a large section of the dryland field system called the Kaupikiawa Transect, the Kalawao Talus Slopes, Waialeia Valley, and Waikolu Valley. In addition, important known sites including temple (*heiau*) and fishing shrines (*ko'a*) reported by Stokes (1909) were mapped in detail with a plane table and alidade. Kaupikiawa Transect on the eastern half of the peninsula was also mapped by the same method. The open test pits in Kaupikiawa Cave originally excavated by Pearson in the 1960's were temporarily stabilized and deposits were sampled from known stratigraphic context for dating and analysis.

Most recently, the author, a Ph.D. graduate student at the University of California, Berkeley, has begun the Kalaupapa Peninsula Archaeological Project (KPAP). The first phase of the project included four intensive survey transects, site relocation, reconnaissance survey, and test excavation. Survey transects included: the Kaiaka Transect near the parking lot for the *pali* trail, the Western Kaupikiawa Transect between the west end of the Kaupikiawa Transect and the central access road on the peninsula, the Punoneino Transect across the west-central part of the peninsula, and Waialeia Valley Transect. A few small basal excavations on domestic architecture and trench excavations in agricultural plots were also completed.

[16] For a comprehensive review see Appendix I, Accidental Discoveries of Human Remains: 1980-2002.
[17] For a comprehensive review see Appendix I, Accidental Discoveries of Human Remains: 1980-2002.

Ongoing and Proposed Future Research

A partial list of ongoing and proposed cultural resource management projects are listed on an internal web database called PMIS (Project Management Information System). Previously, the park tracked proposed and funded projects at Kalaupapa in a paper Resource Management Plan (RMP) report (Lentz 1999). The document currently most relevant to cultural resource management in the park is a review of the archaeology of all the parks in the Pacific Islands Cluster, Pacific West Region completed by the NPS Systemwide Archaeological Inventory Program (SAIP) (Wells and Hommon 2000). The SAIP report gives an inclusive list of 19 project statements also found in the RMP and PMIS (See Appendix III). The priorities of these projects are ranked by seven criteria set out previously by the SAIP in 1992. According to the report, 80% of the park is reasonable goal for intensive archaeological survey coverage, given the terrain and vegetation (Wells and Hommon 2000:35).

The thirteen proposed and funded projects related to prehistoric and early historic cultural resources on the PMIS database are listed as Draft, Park approved, or Region-reviewed. Approved and funded projects include: the Damien Movie Construction Site project (N); the second phase of the Kauhakō Crater survey (O); and this Archaeological Overview and Assessment. At the time of writing, the final draft of the movie set report is in production. The final draft of the crater report has been approved by the State Historic Preservation Division (SHPD) and is in press. Only two projects, surveys in Kalaupapa *ahupua'a* and Kalawao settlement, are listed as Park approved and awaiting review. The remaining eight proposed projects--six of which are surveys, one archival, and one planning for alien plant control--are listed as Draft (see Chapter 5).

To continue its mission of promoting research, planning, and stewardship in the parks, NPS cultural resource managers have proposed projects listed in the RMP, PIMS, and SAIP that generally fall under two categories: archival and archaeological survey. Projects involving archaeological excavation, remote sensing, or laboratory analysis of existing collections will be aided by these initial inventories of resources in the park. The SAIP report includes two project statements that could specifically help form the foundation for research beyond survey: a park-specific research design (KALA-C-096) and the development the ASMIS database of sites (KALA-C-095).

Park managers have submitted two projects for funding that were spawned by the ongoing Kalaupapa Peninsula Archaeological Project (KPAP). The first proposal is aimed at re-initiating paleoenvironmental research in the park (McCoy 2002b). Past attempts at obtaining sediment cores from Kauhakō Crater Lake have failed (see Footnote 5 above). New methods and strategies are clearly needed to reconstruct the past natural environment. This kind of research will benefit both management and research in the natural and social sciences. The second proposal is for an archaeological field school that will include new surveys, excavation, and laboratory work, as well as concurrent training for undergraduate students (McCoy 2002c).

Summary of Sites and Surveys

One of the jobs of cultural resource managers is to track the number of archaeological sites recorded and estimate how much of the park has been

surveyed. The most recent estimate suggested about 475 sites had been recorded and "only about 500 acres or about 5 percent of the park systematically surveyed" (Wells and Hommon 2000:20). Table 4 is the latest estimate of area surveyed and sites recorded based on this overview and recent surveys. A total of 616 sites have been recorded, 690 acres (279.5 ha) intensively surveyed, and 820 acres (332 ha) reconnaissance-level surveyed. Overall, an estimated 6.4 % of the park has been intensively surveyed and 7.6 % reconnaissance surveyed. The density of sites in any one area will vary, as will the sorts of features. For example, in a well-preserved area relatively clear of vegetation on the east side of the peninsula, a density of non-agricultural architecture sites of about 1.5 per acre (3.6 sites per ha) has been found (Kirch 2002). In terms of agricultural features, density in this area is about 3 features per acre

Project	Area Surveyed	Survey Intensity	Number of Sites and Features
A	N/A	N/A	1 site; several features
B	N/A	N/A	25 sites or site names
C	N/A	N/A	5 sites (previously recorded)
D	N/A	N/A	1 site, 5 features
E	333 acres (135 ha)	Intensive	About 200 sites
F	N/A	N/A	1 site; several features (previously recorded)
G	4 acres (1.7 ha)	Intensive	2 sites, 6 features
H	20 acres (8.1 ha)	Intensive	40 sites
I	N/A	N/A	2 sites
J	8 acres (3.2 ha)	Intensive	1 site
K	220 acres (87.9 ha)	Intensive	127 sites
L	50 acres (20 ha)	Reconnaissance	10 sites (1 previously recorded site)
M	N/A	N/A	N/A
N	11 acres (6.5 ha)	Intensive	3 sites; 65 features
O	49.5 acres (19.8 ha)	Intensive	32 sites containing 333 features
P	60 acres (24 ha)	Reconnaissance	1 site with 19 features
Q	N/A	N/A	N/A
R	+350 acres (+140 ha)	Reconnaissance	Many historic sites, 4 pre-contact sites
S	360 acres (144.5 ha) / 27.5 acres (11 ha)	Reconnaissance / Intensive	107 sites (3 previously recorded)
T	12 acres (4.7 ha)	Intensive	56 sites, 516 features (plus 11 previously recorded sites)
Total	690 acres (279.5 ha) (6.4 %)	820 acres (332 ha) (7.6 %)	616

Table 4 - Amount of Area Surveyed and Number of Sites and Features Recorded

(7.6 features per ha). However, in the author's surveys aimed specifically to test the range of variability in agricultural features, a density of about 37 agricultural features per acre (94 features per ha) was found (McCoy 2002). The higher estimate of density is likely due to the small size of plots in the areas surveyed. Overall, based on these measures of density, there are likely thousands of unrecorded sites in undisturbed areas of the park.

History, Ethnohistory, and the Natural Sciences at Kalaupapa

Archaeologists rely on multiple lines of evidence to reconstruct or interpret the past. As such, research must incorporate data and interpretations from disciplines and subdisciplines outside of anthropology including the humanities (i.e., history, ethnohistory), natural sciences (i.e., geology, biology), and other social sciences (i.e., sociology, human geography). The following review of past historical and natural science research at Kalaupapa is meant to introduce the reader to potentially useful sources and studies, not as a comprehensive overview.

Historical and Ethnohistorical Record

There are few written records of Kalaupapa prior to the establishment of the leprosy settlement. In 1854, Jules Rémy, a French botanist who toured the Island of Moloka'I, often making remarkably detailed descriptions of plant communities. He briefly visited Kalaupapa, arriving by boat from the east and leaving via one of the *pali* trails. Rémy's (1893) comments on flora demonstrate how dramatically the natural landscape has changed. In addition, Rémy describes in detail his interactions with local people and the extensive sweet potato (*uala*) (*Ipomoea batata*) fields he observed around the villages. King Kamehameha IV who ruled the islands from A.D. 1855 to 1863, visited and also commented on the abundance of potatoes (Curtis 1966:174). As for all of the Hawaiian Islands, there are many mid-nineteenth century records relating to the shift to *fee simple* land tenure during a period called the Great Mahele. The Mahele records of pre-1866 Kalaupapa together constitute a rich, textured body of ethnohistorical data (see Kirch 2002; McCoy 2003).

After A.D. 1866, the frequency of historical documents relating to Kalaupapa clearly increases dramatically as it became the center of public attention of the kingdom and the world. The types of documentary sources on this period include letters from some of the first patients like Peter Kaeo, who often corresponded with his cousin Queen Emma; newspaper articles (Creighton 1886); records kept by doctors like Edward Arning (1931)and clergy like Joseph deVeuster (Father Damien); and later accounts from celebrity visitors like author Robert Louis Stevenson and reporter Ernie Pyle. We also see some of the first documentation of archaeological sites in the notes of M.D. Monsarrat (1894), J.F.G. Stokes (1909), T. Thurm (1909), S. Phelps (1937), and F. McHenry (1938, 1954). Catherine C. Summers (1971) in her definitive book *Molokai: a site survey*--the starting point of every archaeological study on the islands since its publication--reviews and summarizes each of what these early sources tell us in terms of the archaeological record of Kalaupapa.

Historical Resource Research and Management

The NPS has commissioned several important historical reviews as well as amassing in its own files an impressive collection of the historic era literature. The definitive book on the historic era is without a doubt Greene's (1985) *Exile in Paradise: The isolation of Hawai'i's leprosy victims and development of Kalaupapa Settlement, 1865 to present*. Although this massive volume focuses mainly on the post-1865 period, it is also a great resource for studying the early historic era. The review is organized around historic buildings; however, it is possible to extract information on a range

of topics. Also, individual historical studies commissioned by the NPS on the *pali* trails and vanished fishpond(s) of Kalaupapa add depth to our knowledge of these features (Curtis 1991; Wyban 1993). Another recommended source of historical information is Goodwin's (1994a, 1994b) two-volume report on the excavation of a sweet potato farm dating from around A.D. 1840 to 1860. Especially useful for future research is his annotated bibliography on archival sources from this era (Goodwin 1994b).

Archival sources of information on Kalaupapa prior to A.D. 1866 mainly relate to the Great Mahele land division of the mid-nineteenth century. Through an online service called Waihona 'Aina (www.waihona.com) the NPS currently has descriptions of a number of land claims made under the Kuleana Act of 1850 (Waihona 'Aina 1998).[17] Few actual awards were granted in the area with most of the lands going to elite persons directly related to the royal family (Barrère 1994).[18] In Kirch's (2002) initial analysis of the claims made, as compared to the claims awarded, he found a direct correlation between the rank of the elite who controlled an *ahupua'a* and unsuccessful commoner claims. For example, in Makanalua *ahupua'a* where Miriam Kekau'ōnohi (*ali'i nui*), a granddaughter of Kamehameha I, was awarded land, only 8 % of commoner claims were successful. In Kalawao *ahupua'a* where Samuel Kuluwailehua (*konohiki*) was in control at the time of the Great Mahele, 78 % of claims were awarded (Kirch 2002: Table 2).

Author (Year)	Type of Data
Barrère (1994)	Mahele records.
Board of Health (1886)	B.O.H. minutes of meetings.
Brocker (1998)	Photographs.
Bushnell (1967, 1968)	Archival research.
Creighton (1886)	Historic newspaper report
Curtis (1991, forthcoming)	Archival research.
Daws (1973)	Archival research.
Fortunato de Loach (1975)	Archival research.
Greene (1985)	Archival research and summary.
Goodwin (1994a, 1994b)	Archival research and annotated bibliography.
Handy and Handy (1972)	Archival research.
Herman (2001)	Archival research.
Kuykendall (1968)	Archival research.
Moblo (1996, 1998, 1999)	Archival research.
Monsarrat (1894)	Map and notebook.
Phelps (1937)	Interviews and fieldwork.
Rémy (1893)	Historic journal.
Stewart (2000)	Archival research.
Stoddard (1893)	Archival research and visit.
Summers (1971)	Archival research.
Waihona 'Aina Database (1998)	Mahele records.
Wyban (1993)	Archival research.

Table 5 – List of Selected Archival Sources of Historical Information, Maps, and Photographs

There are also a number of historic-era maps and photographs that help archaeologists and historians reconstruct the past at Kalaupapa (Table 5).

[17] The Waihona 'Aina database is continually in a process of making more kinds of records available and so should be consulted again in future research.
[18] See Chapter 2, Early Historic Economy and Land Tenure for a description of elite awards.

Unfortunately, the records of the late 19th century Boundary Commission's visit to the area to survey the *ahupua'a* boundaries have not been located. During archival research for this review, several historic surveys of *kuleana* lands have been found in the State Archives. In addition, ethnohistorical research has produced several legendary references to people and places in Kalaupapa (Summers 1971). Finally, available ethnohistoric records of Moloka'i Island have great potential to add depth to archaeological research in the park (Lee and Wills 1990).

Historic Kalaupapa Revisited

Dozens of authors have told the stories of the Kalaupapa leprosy settlement and the life of Joseph deVeuster (Father Damien) from a clearly Western colonial-missionary centric viewpoint (Brocker 1998; Daws 1973; Stewart 2000). However, in more recent scholarly work on Kalaupapa by Pennie Moblo these stories are re-cast in a critical light, giving us a more balanced view of the historical context of the settlement (Moblo 1996, 1998, 1999). An anthropologist by training, Moblo specifically addressed the history of Kalaupapa in terms of race and leadership, as well addressing the history of leprosy policy, the rise of the Reform Party, and the historic renegade community of people with the disease on Kaua'i Island who lived in self-imposed isolation. Recently joining in the revisiting of the history of Kalaupapa through a critical lens is historical geographer Douglas Herman (2001).

Natural Sciences Research and Management

The better we understand the unique, local, natural environment of Kalaupapa, the greater the chance we have of tracking the types, quality, quantity, and reliability of food and industrial plant and animal resources of the past. Ancient Hawaiians were the decedents of generations of Polynesian peoples who used cumulative experience and innovation to learn to live in some of the most isolated environments in the world. Their story of exploration, colonization, and adaptation to new islands has been the focus of scientific study for years (for a review see Kirch 2000a). Within the park, nearly all the major terrestrial and marine zones in the Hawaiian Islands are in some way represented. The diversity of zones and the long history of occupation of the area make it ideal for social scientists to study the dynamic relationship between people and the natural environment over time.

Generally, natural resource studies concentrate on areas identified as potentially home to endangered or threatened native/endemic plants or animals. The "coastal spray zone" - an area that has been closely studied - is located where the dominant northeast trade winds draw saline-rich sea spray on to a narrow strip of land along the coast (Canfield 1990). The stream, lake, and soil distributions of Kalaupapa have been inventoried in studies that take the entire archipelago as their study area. Table 6 is a list of types of environmental data these natural resource studies have produced. Geological research have been more localized, mainly concerned with the formation of the *pali* during a massive landslide event. Such research resulted in the dating of the Kalaupapa Basalt, a unique type of volcanic rock born of Kauhakō Crater, as well as mapping of the ocean floor offshore (Clague *et al.* 1982).

Author (Year)	Type of Data
Canfield (1990)	Coastal spray zone report.
Clauge *et al.* (1982)	Geology of Kalaupapa Basalt and Wailua Landslide.
Denham *et al.* (1999)	Paleoenvironmental coring.
Fink (1991)	Vegetation map.
Fletcher (1994)	Geomorphological history of coastal deposits.
Foote *et al.* (1972:56)	Soils map.
Gangé and Cuddihy (1990)	General reference on climate.
Morgenstein (1978)	Geological study on volcanic glass.
Murakami (1993)	Paleoethnobotany.
Somers 1992	Effect of alien plants on landscape.
Wagner *et al.* (1990)	General reference on vegetation.
Weisler (1990)	Geochemistry of basalt artifacts.

Table 6 - List of Selected Sources of Environmental Data

Summary

Since the park was created in 1980, archaeology conducted by NPS staff, contract archaeologists, and academic researchers has all been part of the overall cultural resource management policy of the NPS that stresses research, planning, and stewardship. Methodologically speaking, the history of archaeology at Kalaupapa is dominated by surveys. Archival resources are often integrated into these projects. Hawaiian archaeologists have shown a sustained interest in Kaupikiawa Cave (50-60-03-312) due to what the deposits inside may tell us about the prehistoric era. Recently, archaeologists from the NPS and the University of California, Berkeley have worked together to establish long-term field research program in the park. Other projects funded by the NPS such as historical resource studies, archival research, and natural resources studies show potential in providing important supporting and independent lines of evidence to interpret the past. Recent work on the historic era revisits the historic past with a more critical eye (Moblo 1996, 1998, 1999; Herman 2001).

Chapter 4

ASSESSMENT

Scope of Assessment

In the following chapter the report shifts from reviewing to synthesizing and assessing previous research. In essence, the first section asks the question: What have we learned through these projects about the past? The next section evaluates the types and quality of archaeological data collected as evidence of the past. A number of different kinds of archaeological evidence are summarized by topic and site type. This evidence is used to synthesis in greater detail the culture history of Kalaupapa. Finally, the current state of spatial, temporal, and formal data on the archaeological record in the park is summarized.

General Summary of Prehistoric Kalaupapa

Our best evidence suggests the earliest settlers in the park probably lived in the Waikolu Valley early in the Expansion Period (A.D. 1100-1650) at least 800 years ago (Kirch 2002). At this time, people had been living in the windward Hālawa Valley to the east of the park for hundreds of years. The people of the Waikolu Valley may have chosen to live in this area since the natural landscape lends itself to the wetland cultivation. Visiting the valley today one can see the pondfields (*loi*) built by the first inhabitants and later historic-era farmers to grow taro and other crops (Yent 1986). Naturally, evidence of prehistoric settlement and land use is likely to be masked by later use and modifications of the landscape.

The Kalaupapa Peninsula, however, was probably not occupied until slightly later in the Expansion Period, perhaps around 1300-1400 A.D. (Kirch 2002; Ladefoged 1990). The prehistoric inhabitants of the park probably lived in a dispersed pattern with single households spread out from one another. Much of the land was used for agriculture. On the peninsula where it is dry and there are no permanent streams, people built field walls to protect crops like sweet potato (*'uala*) from the northeast tradewinds. The remnant field walls can be seen from the air as one arrives at Kalaupapa Airport. In wetter areas near the base of the cliffs, people built garden terraces. True pondfield agriculture may have only been practiced in the Waikolu Valley or at the mouth of the Waihanau Valley (Handy and Handy 1972). The first peoples of Kalaupapa also collected marine resources along the shore, the reef, and offshore except when strong winter storms prevented it. People visited other parts of the island both by canoe and by trail over the cliffs (Curtis in press).

By late in prehistory, the landscape was divided into four community territories (*ahupua'a*): Waikolu, Kalawao, Makanalua, and Kalaupapa. These small chiefdoms formed the west end of the political district (*moku*) of Ko'olau. Oral traditions recorded in the historic era suggests Kalaupapa was the site of a battle between the chiefs of Ko'olau district and allied forces from the leeward side of Moloka'i Island and 'Oahu Island (Summers 1971).

Makapulapai, a hill in the center of the peninsula with sixty burial cairns built on it, may be a memorial to those who died in the battle sometime in the 18th century.

General Summary of Early Historic Kalaupapa

In the years just after contact with Europeans in 1778, the population of the Hawaiian Islands was decimated by disease and overwhelmed by war. As a result, the fields and homes of people living in Kalaupapa were rapidly abandoned. Moloka'i Island was captured and occupied by Kamehameha I in 1790, later taken by forces from Maui Island, and retaken in 1795 (Summers 1971). By 1810, the Kingdom of Hawai'i was established and Kamehameha I was crowned king.

As the population of Kalaupapa decreased, the settlement pattern changed and several small villages were established. By 1848, a major reworking of the land tenure system called the Great Mahele was underway. Over the course of a few years, the ownership of land was set down in maps and written deeds. Also at this time there was a jump in the amount of potatoes exported from Hawai'i. These barrels of potatoes were valuable in the Gold Rush markets of California in 1849 where population growth was outstripping the ability for local farmers to meet demand. Newspapers tell us Kalaupapa was famous as a dependable source of potatoes. Archaeological evidence supports this notion and suggests that fields that had been abandoned on the peninsula were once again farmed specifically due to the demand for potatoes (Ladefoged 1993; McCoy 2003).

Finally, from 1866 to 1895, the Board of Health resettled the original inhabitants of the area (*kama'āina*) in an effort to close the peninsula and isolate people with Hansen's disease. Historical documents indicate people were relocated to another part of Moloka'i Island outside the park. The relationship between the first patients and the last of the descendents of the original inhabitants to live in the park is a topic that has yet to be addressed through archaeological and historical research.

Settlement and Community Patterns

Since the advent of modern archaeology in Kalaupapa, American archaeology has been dominated by "settlement pattern archaeology" (Chang 1968; Flannery 1976; Green 1980; Longacre 1970; Willey 1968). Through various techniques, archaeologists have attempted to link the spatial distribution of sites with that of natural resources as well as examine the relationship between sites. These spatial analyses take place on three analytical scales of increasing size: the household, community, and region. An evaluation of the settlement pattern minimally requires three axis of information: time, space, and form (Spaulding 1960). Thus, for archaeologist the challenge is to describe the distribution of sites and resources, the variation in the form of sites, and establish a chronology.

To date, settlement pattern archaeology has been dominated by environmental archaeology. For example, few archaeologists explicitly focus on what early settlement pattern archaeologists called the "community pattern," a pattern

distinct in that it "could be attributed to efficient causes in the sphere of sociological and social psychology" (Chang 1962:28). For example, "the placement of houses in a community, the social ties among the inhabitants, their relationship in terms of political control, social behavior, and mental attitude, can be made the subject of the study of community patterns" (ibid). Overall, given the rich ethnohistoric record and excellent state of site preservation in the region, Kalaupapa is an ideal location for a more balanced approach to settlement patterns.

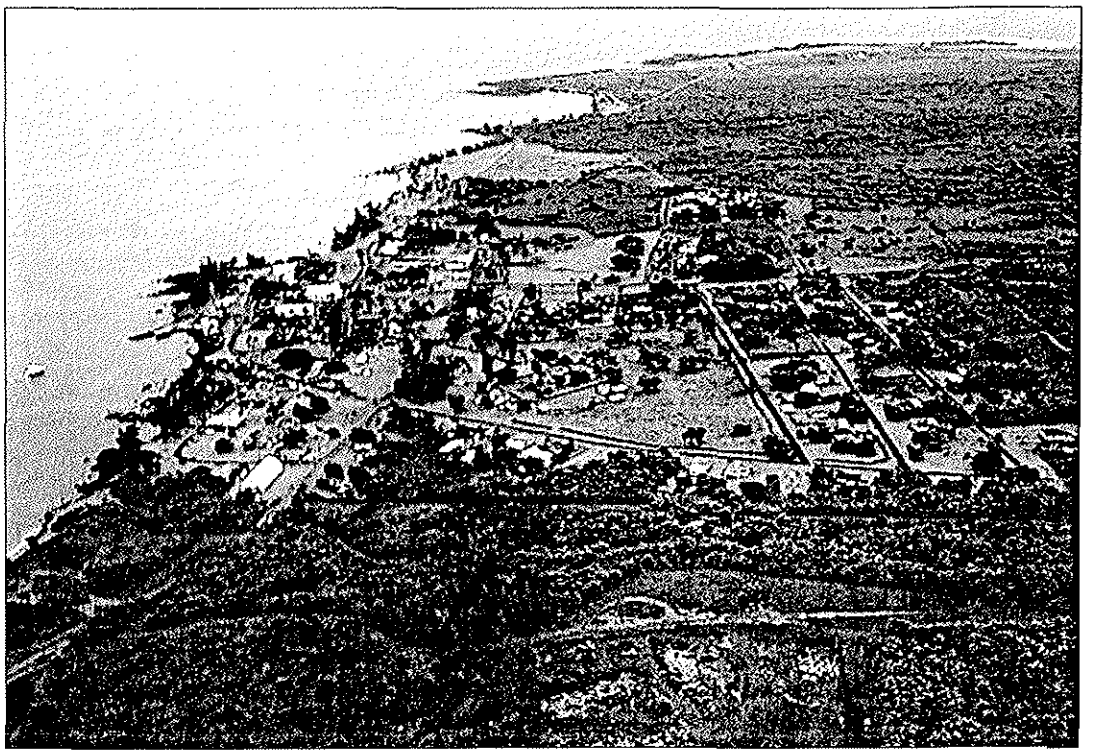


Figure 4-1 - Kalaupapa Settlement and Coastal Plain (photograph by M.D. McCoy)

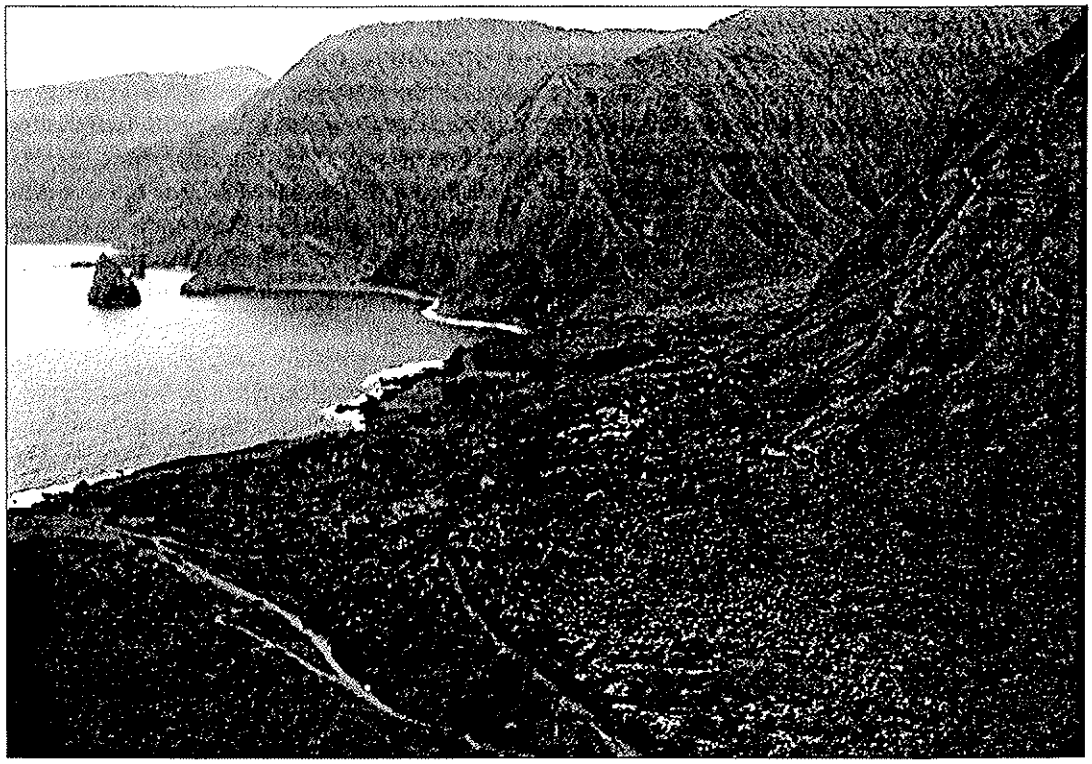


Figure 4-2 - Kalawao and Colluvial Slope Zone (photograph by M.D. McCoy)

The following discussion concentrates mainly on prehistoric settlement and community patterns. Past research on the Kalaupapa Peninsula suggests that although archaeological features are continuously distributed over the landscape, it may be useful to consider these challenges in terms of two geographic zones defined by vegetation, soil type, slope, and elevation: Coastal Plain and Colluvial Slope (Figure 4-1 and 4-2). By the historic era, the settlement pattern was dominated by villages including the coastal villages of Kalaupapa and Kalawao, but probably also one on the east coast called Iliopii, and lesser known villages in the valleys of Waialeia and Waikolu (Goodwin 1994a).

The Coastal Plain and Colluvial Slope Zones

The Coastal Plain is made up of broad, flat-to-low-sloping land formed from recent Kauhakō Crater lava flows (Figure 4-3). Many stone architectural features in this zone seem to date to the prehistoric to early historic era. A few long-term habitations are found in the area. Caves and freestanding stone shelters built to temporarily shield people from the wind are common. There is a continuous distribution of agricultural plots that make up the dryland Kalaupapa Field System. Sacred sites, such as fishing shrines (*ko'a*) found along the coast, tend to be small in size and variable in form.

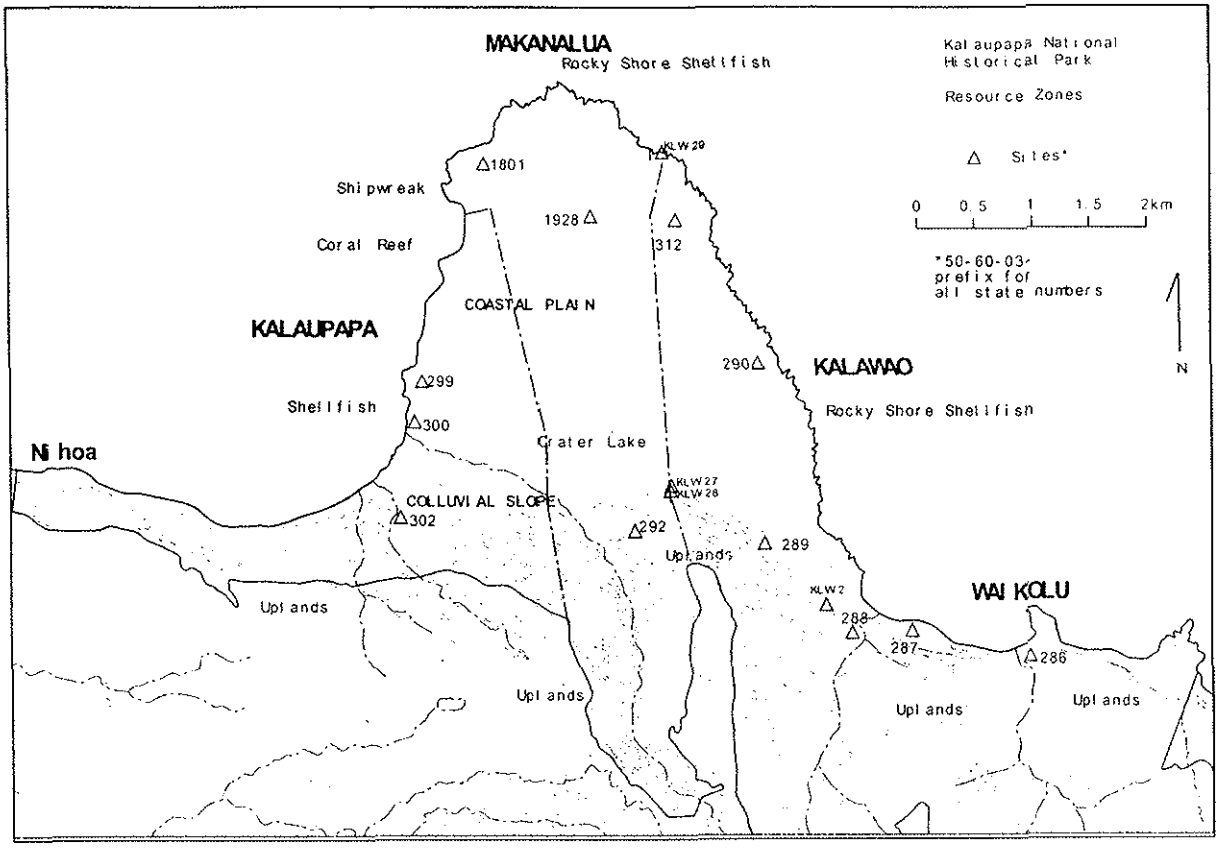


Figure 4-3 - Map of Archaeological Sites and Resource Zones

The area called the Colluvial Slope is steep land found in a west-to-east band along the base of the cliffs and valleys. The proximate origin of the Colluvial Slope is the accumulation of deposits from the constant erosion of the cliff face of the north shore. Few shelters are found in this zone. Agricultural features, mainly irregular small clearings, are continuously distributed across the landscape. Some plots may have been fed by intermittent floodwater, whereas others, especially in the valley bottoms, were probably true wetland pondfields (*lo'i*) (Handy and Handy 1972). There are a number of large *heiau* in this zone as well as a *holua* slide. Intermittent streams originating in the valleys are found exclusively in the Colluvial Slope zone. However, these zones are not homogeneous, nor are their boundaries distinct. For example, within Kauhakō Crater the landform and archaeological landscape seem to have much in common with both areas. The three community territories (*ahupua'a*) on Kalaupapa Peninsula cross-cut these zones, encompassing near equal portions of each. To the east of the Kalaupapa Peninsula is the large Waikolu Valley that was itself at one time its own community territory (*ahupua'a*). Currently, our best estimates of the settlement and community pattern in the valley are based on analogy to what was found in an extensive survey of the Hālawa Valley on the northeast coast of the island (Kirch 1975; Kirch and Kelly 1975).

Nihoa Landshelf, Points, and Offshore Islands

Within park boundaries are a number of small offshore islets, remote points, and one major landshelf that do not fit well into either major zone. Rough surf makes access to these spots difficult, especially during the winter months. However, Nihoa Landshelf on the western end of the park is known to have an archaeological landscape with a range of habitation and agricultural sites, suggesting it was used relatively regularly in the past (Kirch 2002; McHenry 1938, 1954). Off the northeastern point of the peninsula there is group of three small islets called Namoku that are probably natural low tide stands within the inshore coral reef. On the remote east end of the park, the Waikolu Bay at the mouth of the Wailoku Stream is framed to the east by Leinaopapio Point. Okala Island is just offshore from the point. Further from the coast is the larger islet of Mokapu Island. Both islands can be seen featured in many photographs of the north shore taken from the east side of the peninsula. Together, Leinaopapio Point and Kukaiwaa Point form the outline of another bay. Near the steep coast of this bay is an island called Huelo. These two bays and offshore islands would have been within the community territory of Waikolu *ahupua'a*. The archaeological landscape of this area is undescribed.[20]

The islets near Waikolu Valley, also known together as the "Rocks of Kana," are probably too small, or too steep, to expect very much stone architecture on them (Summers 1971).[21] However, recent archaeological surveys on remote landshelves on the coast of Hawai'i Island have demonstrated that in these environments archaeological sites are sometimes preserved by a layer of deposits laid down by small landslides in colluvial zones (Dawson 2001). If similar sites are found on the points along the north coast of the island, they may give us a better idea of the connection between Kalaupapa and the rest of the Ko'olau district (*moku*).

Economy and Resources

Agriculture

In terms of reconstructing agricultural development in the region, the dryland plots of the extensive Kalaupapa Field System have received the most attention from archaeologists (Kirch 2002; Ladefoged 1990, 1993; McCoy 2002a; Somers 1985). The fields probably expanded rapidly sometime in the fifteenth century, continued to expand into less desirable areas probably along with some kind of intensification of production, then were abandoned during the demographic crash following European contact, and finally re-worked during the early historic era to supply ships bound for the Gold Rush markets of California (Ladefoged 1993). Historic documents suggest that during the occupation of the Kalawao Settlement (A.D. 1866-1900) the fields were once again abandoned. Prehistorically, sweet potato (*uala*) was probably the main crop planted, but accompanying food crop plants would have included plants like yams (*uhi*) (*Dioscorea alata*) and sugar cane (*ko*) (*Saccharum officinarum*), as well as plants like bottle gourds (*ipu*) (*Lagenaria siceraria*). During the early historic era, newly introduced plants like the

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[20] Summers (1971:185-8) was only able to collect information on four sites in Waikolu, but see Kirch (2002).

[21] Elsewhere in Polynesia, offshore islands have featured prominently in religious and ritual cycles, like the famous Birdman Cult of Rapa Nui (Easter Island).

Irish potato, beans, and onions joined traditional crops. The elite, through a local land manager, probably profited from production into the historic era. Currently, the Kalaupapa Peninsula Archaeological Project (KPAP) is looking at the form, distribution, and chronology of the development of the fields. Initial investigations have demonstrated the fields to be more or less continuously spread over every undisturbed part of the peninsula (McCoy 2002a).

There are other important related issues for which we have very little information including: wetland agriculture, floodwater irrigation, soil productivity, and domestic animals. This gap in knowledge, especially regarding wetland agriculture, can be mostly attributed to the paucity of surveys within the Colluvial Slope zone and a lack of excavation in general. Two surveys in the Colluvial Slope zone this past summer revealed wetland terraces as densely distributed as the dryland fields (McCoy 2002a). In general, we cannot understand the context of dryland agricultural development without some notion of the development of wetland agriculture as well.[23]

Domestic and Wild Animals

The relative importance of domestic and wild animals in the lives of people during the prehistoric and early historic eras in Kalaupapa is virtually unknown due to the lack of archaeological excavations. However, thanks to historic records, and the relative isolation of the peninsula, the presence of certain animals can help refine the date of occupation of a site. Recent re-evaluation of deposits inside Kaupikiawa Cave (50-60-03-312) identified the remains of vertebrates including "the native Hawaiian bat (*Lasiurus cinereus*), identifiable fragments of pig (*Sus scrofa*), and the Pacific rat (*Rattus exulans*). . . [and from upper historic period levels] horse (*Equus caballus*) and the European house mouse (*Mus domesticus*)" (Kirch 2002:90-92). Excavations at an early historic era farmstead (50-60-03-1801) by Goodwin (1994a, 1994b) unearthed the remains of a number of these animals including "toad, large galliform [probably turkey], two doves, large rats, mouse, mongoose, horse, medium artiodactyl, and large land mammal" (Goodwin 1994a:181). The majority of domestic animal remains recovered were pigs, although dog (*Canis familiaris*), chicken (*Gallus gallus*), horse and probably turkey, were also discovered. Although a few examples were found, seabirds were surprisingly rare in the deposits. No other equivalent sample from a household has been excavated in Kalaupapa, making comparison over time or space difficult.

Coastal and Marine Resources

With such a large dryland field system, the role of coastal and marine resources is often overlooked at Kalaupapa. In the coastal zone there are shellfish, inshore fish and coral reef sea life in sheltered natural harbors, and deep-sea fishing grounds not far off shore (Figure 4-3).[24] The park includes a small brackish lake with no fish, but noted to be home to shellfish in the past (Phelps 1937). There are several freshwater streams in

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[23] See Kirch's (2002) discussion of dryland and wetland prehistoric agriculture in Kalaupapa.

[24] The fauna excavated by Pearson *et al.* (1971) remain unanalyzed or unreported.

[25] Summers (1971:194), citing Thurn (1907:240), writes that, "Somewhere at Kalaupapa, 'Ai'ai is said to have left a fish stone. That is the reason fish constantly gather there even to this day"

the park as well. The fishpond(s) located on the northeast point on the peninsula would have been a predictable source of fish whenever3 required (Wyban 1993). The sea was also a source of material such as coral and shell used to make tools and personal adornment.

We know very little about the relative importance of these resources due to the lack of excavation of the midden left behind after ritual, festive, or daily food preparation and consumption. Only two such deposits have been excavated thus far: Kaupikiawa Cave (50-60-03-312) and a historic era farmstead (50-60-03-1801). Pearson *et al.* (1974) in their laboratory analysis of shell from Kaupikiawa Cave identified five genera: *pipipi*, or sea snail (called *Nerita* but also known as *Neritidae*), *'opihi* or limpet (called *Heliconiscus* but also known as Patellidae *Cellana exarata*), *pupu kolea* or periwinkle (*Littorina*), *pupu awa* or drupe (*Drupa*), and *leho* or cowrie (*Cypraea*), of which the first two were selected to test changes in the average size of individuals. They found the smallest examples came from lower levels which "might be inferred to reflect a lessening of the pressure on the shell[fish] supply during the time period of the upper levels" (Pearson *et al.* 1974:48). However, it remains undetermined if the trend was "the result of human activity relating to the shellfish or to an internal dynamic within the shell[fish] population" (Pearson *et al.* 1974:49). Without a better understanding of the context in which the remains were deposited, and how they compare to other similar contemporary, previous, and later deposits, this initial midden analysis of the site tells us little. Within the samples from the site taken by Kirch's (2002) team, "some 26 different species were identified, dominated by gastropods, but also including 5 bivalve taxa, 2 sea urchin species, and a small amount of Crustacea." The taxa are consistent with what would have been available on the rocky shoreline nearby the site. In addition, 26 types of fish were found described as "generally small-to-medium sized individuals, from taxa typically inhabiting near-shore and reef environments; most frequent were Labridae (*Bodianus* sp. and *Halichoeres* sp.) and Scaridae (*Scarus* sp. and *Calotomus* sp.)" (Kirch 2002:90-92) (See Appendix I for a detailed discussion of the site).

The historic era farmstead (50-60-03-1801) fully excavated by Goodwin (1994a, 1994b) yielded a range of material evidence of coastal and marine resource exploitation such as fishing gear, shellfish remains, and fish bones. Fishing gear at this coastal site included 5 fishhooks, some made of bone and some of iron, 2 net weights, "bread loaf" and "grooved" sinkers, and 3 cowrie shell lures. The majority of the shells found at the site were worn and naturally deposited there by wave action. The remains of shellfish clearly collected and eaten at the site were found on the leeward side of the house near cooking areas. Most taxa-- *pipipi* (*Neritidae*) and *'opihi* (*Patellidae*)-- could be found in the immediate area. Some taxa not naturally available in the area were also found including "*Strombidae*, which inhabit sandy areas, and a few *Theodoxus vespertinus*, which inhabit the mouths of freshwater streams" (Goodwin 1994a:177). Goodwin (1994a:181) summarizes the analysis of over 14,000 fish bones or fragments:

> Sixteen taxa are represented. . . Most of them are small lagoon or inshore reef fish that would be taken in nets or traps while a few of the large

carnivorous varieties (labrids, cirrihitids, mullids, and carangids) could be caught on hooks. There were few offshore, deep ocean fish in the collection indicating that residents here seldom employed deep water trolling or bottom fishing as major fishing techniques.

Given the short duration of occupation of the site, the analysis concentrated on the spatial distribution of materials. It is difficult, but not impossible, to compare this sample to the one excavated from Kaupikiawa Cave (50-60-03-312), but one must take into consideration differences in sampling strategies, recovery methods, and names used to identify shellfish. One method to utilize these data on coastal and marine resources is though analysis that takes into consideration fishing techniques that bias the types of species likely to be caught.[25] For example, a possible explanation for the paucity of deep-water fish species in the collection is that rough winter seas tended to discouraged offshore fishing during a large portion of the year.

Lithic Resources

The study of flaked and ground stone is a unique branch of science developed by archaeologists to learn about the past through the only material that has beenpreserved from all stages of human history. Currently, lithic technology studies center on topics like establishing the source of the stone used, reconstructing the stages of reduction of the material from quarrying to tool making to reworking, use wear and residue analysis to try to determine the sorts of actions in which stone tools were employed, and classification of tools by type. The potential for these sorts of lithic technology studies in Kalaupapa is outstanding. An initial study by Weisler suggested the flaked basalt found by test excavation during the Airport Improvement Project could have come from a single local source (Ladefoged 1990).[26] Flakes of volcanic glass have been found in association with historic deposits by both Goodwin (1994a) and Barrera (1978), suggesting continued stone tool use well after European contact. The distribution of sources of stone in the area is currently unknown. The uplands and the *pali* are likely to have large natural deposits of basalt that could have been quarried. The past volcanic activity of Kauhakō Crater no doubt produced volcanic glass, which could be found in any number of places and forms.

Upland Resources

There is currently virtually no data on the role of upland resources in Kalaupapa (Figure 4-3). Accessible parts of the immense cliffs (*pali*) and the upper elevation of valleys held trees probably used for canoe building, birds whose feathers could have been used to make prestige items like chiefly feather cloaks, as well as countless other plants uses for crafts and medicine (Hiroa 1957; Kirch 1985). During part of the early historic period the uplands were economically important as the elite's hunger for foreign goods drew the islands into a period of heavy sandalwood (*'iliahi*) (*Santalum*

[25] See Weisler (2002) for a discussion of fishing techniques on Moloka'i Island.

[26] Ladefoged (1990:171) reports that Weisler found most of the basalt to be medium to course grained. Samples were tested with non-destructive X-ray fluorescence (XRF) methods against all eight major and three minor sources associated with Maunaloa quarry site on Moloka'i Island and Kapohaku quarry site on Lana'i Island for oxides of titanium, magnesium, iron, and trace elements (Rb, Sr, Y, Zr, and Nb).

spp.) harvesting for export to China (Kirch and Sahlins 1992).[3] Production of tapa (*kapa*) cloth and dyes also rely on plants found in the uplands. A chiefly tapa called *'ahapi'i* which was painted with fine lines made from *kukui* bark dye, and a type of tapa called *kumanomano*, are associated specifically with the Kalaupapa Peninsula (Summers 1971:188).[4] The uplands and *pali* are certainly areas in need of future archaeological research in terms of paleoethnobotany, but also as a zone where basalt for stone tool production may have been quarried.

Evidence of Lines of Transportation and Communication

Resources and information in the past have traveled to and from communities living in Kalaupapa over trails and by sea via canoe, sail, and steamer ships. Evidence of these essential parts of social life is also left behind in material remains occasionally. Archaeologists can choose to study material evidence of patterns of interaction, trade, and communication by trying to determine the location of the source of materials found (e.g., stone, shell), by looking at the few remnants of sea traffic, like shipwrecks and canoe sheds, and if we are lucky, by surveying the surviving portions of trails people used. A shipwreck visible from the northeastern shore of the peninsula is a good example why these sorts of unique sites should be investigated in their own specific historical context. The wreck is the *Kalaa,* a 1,519-ton ship that wrecked on the reef on January 3rd, 1932. According to Greene (1985), the resulting oil spill was the first major spill in which the local newspapers reported on the large amount of marine life killed.[5] It is not out of the range of possibilities this story is the first of its kind worldwide. The *Kalaa* thus may hold a place in the history of maritime disasters few would guess from the small portion visible above the waterline (Figure 4-3). The Chinese junk *Foo-po II* also sank off Kalaupapa in October 1935 but its current location is unknown. Either on land or sea, the physical evidence of interaction, transportation, and communication has yet to be addressed by archaeological research.

Household Archaeology

When carefully studied, the distributions and forms of habitation sites can be linked to known ethnohistorical social patterns like the *kapu* system that prescribed men and women's activities and underlay status differentiation between commoners (*maka'āinana*) and elites (*ali'i*). With the aid of ethnohistorical data, we currently have some idea of the form of a traditional household (*kauhale*), types of built agricultural infrastructure, various sites of religious practice, burial sites, and fortifications in Hawai'i. In addition, change in the form of houses over time has been interpreted as tracking the end of the *kapu* system in the nineteenth century (Ladefoged *et al.* 1987).

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[3] This review found no evidence of this sort of harvesting in Kalaupapa. However, this should not be taken as evidence it never occurred.

[4] Figure 1-3 is a photograph of several people wearing tapa (*kapa*) cloth garments in Kalaupapa around A.D. 1886.

[5] The *Kalaa* is listed with the "Abandoned Vessel Project" inventory of the National Oceanic and Atmospheric Administration (NOAA) (http://response.restoration.noaa.gov/dac/vessels/inventory/hi.html). The NOAA describes the wreck as "fishing boat, sunk 1996; visible wreckage reported." The author has made NOAA aware of the erroneous date for the sinking of the ship. It is also unclear how the vessel was designated as a fishing boat.

In Kalaupapa, household-level archaeology remains underdeveloped with the exception of Goodwin's (1994a, 1994b) excellent case study of an early historic farmstead.[30] For example, Manning and Neller (in prep.) present the results of extensive archival research on Kanakaokai, a man of some status who received lands in Kalawao as part of the Great Mahele. Some of the habitation sites found on the survey of Kanakaokai's land are interpreted as traditional Hawaiian households (*kauhale*) occupied at the same time he was the landowner. Other houses are interpreted simply as post-contact era houses.

Goodwin's (1994a) report on the large-scale excavation of a historic homestead (50-60-03-1801) includes many iterations of the site map showing the location and frequency of different classes of material that are used in an analysis of the functional use of space. From these we find that many of the daily activities took place on the western, lee side of the house. More importantly, these methods supply information on diet, cooking, and eating habits of the residents of the household as well as patterns of disposal of waste. The farmhouse, the largest known on the peninsula, may in fact have belonged to the land manager (*konohiki*) of the community territory (*ahupua'a*) (Goodwin 1994a:37-8). The excavation is a wonderful example of household level archaeology on remains from early historic Hawai'i and a valuable part of recent archaeological work in the islands on the often overlooked period where history and anthropology overlap (Kirch and Sahlins 1992; Mills 2002).

Communal Places and Sacred Sites

There is no systematic synthesis of the distribution and sequence of construction, dedication, or re-dedication of known sites sacred to ancient Hawaiians in Kalaupapa. The following summarizes what we currently know about sites like temples (*heiau*), shrines, burials, legendary places, and places where people would have gathered for feasting, ritual, dancing, and games. Much of what we know comes to us from elderly *kama'āina* interviewed by Stokes (1909), as well as other oral traditions, archaeology, and historic records. The relation of these sites to past socio-political changes will be discussed.

Location and Types of Temples (heiau)

In Kalaupapa, 26 *heiau*, or possible *heiau*, have been reported by archaeologists with an additional 4 *heiau* named by oral tradition but as yet unidentified (Kirch 2002; Ladefoged 1990; Manning and Neller in prep.; McCoy 2002a; Rechtman and Henry 2001; Somers 1985; Stokes 1909; Summers 1971; see Table 7). The size of *heiau* range from an example of the smallest kind in Hawai'i, the *pohaku a Kāne* type, to two examples of the largest class, the *luikini* type, with most falling into the medium-sized class. From Stokes' (1909) visit we can identify certain *heiau* as dedicated to Ku, Hina, Kamohaialii; Hoomea [Haumea] (sister of Pele) and for specific purposes such as *ho'oului'a*, offering first crops, and *hana aloha*, to aid in the union of lovers (Summers 1971). Based on their location, size, form, and cardinal orientation, archaeologists have suggested certain other *heiau* were probably dedicated to Ku, Lono, and/or Kāne (Kirch 2002). Archaeologists have also

[30] Goodwin (1994a:46-51) has reviewed the various lines of historical evidence of residential structures in Kalaupapa.

suggested some *heiau* may have been associated with the annual Makahiki festival (see below). Two nicely preserved examples of what are probably *heiau ho'o'ulu'ai* associated with fertility and agriculture were recently found incorporated in surrounding garden plots (McCoy 2002a). Still other small *heiau* were probably dedicated to family gods (*'aumakua*).

Our knowledge of these sites is uneven, however, a general spatial pattern is emerging. In the valleys and Colluvial Slope zone we find most of the medium and large sized *heiau*. The Coastal Plain has few *heiau*. some of which are associated with distinctive landforms like the Kauhakō Crater and the hilltop burial complex at Makapulapai. The *heiau* that are found tend to be small, probably family *heiau* or associated with agriculture. However, the pattern observed does not mean certain types of *heiau* are found exclusively within certain zones. There could be a few large, and certainly many more smaller and medium-sized *heiau* to be discovered in the park. It is also important for those given the task of interpreting these structures to keep in mind that *heiau* may have complex histories, sometimes with multiple stages of construction and episodes of re-dedication (Kolb 1991).

Table 7 - List of Known Sacred and Unique Sites[31]

Type	Site name	Site number	Source
heiau	Ahina Heiau	Site 286; 50-60-04-286	Summers (1971)
heiau name	Moa'ula Heiau	---	Summers (1971)
heiau name	Ka'aiea Heiau	---	Summers (1971)
heiau	Kalaehala Heiau	Site 287; 50-60-04-287	Summers (1971)
heiau	Kawaha'alihi Heiau; "Lang-Lang Heiau"	Site 289; 50-60-03-289	Summers (1971)
heiau name	---	---	Summers (1971)
heiau	Kealaakeakua Heiau	---	Summers (1971)
heiau	Kapua Heiau	Site 292; 50-60-03-292	Summers (1971)
heiau	---	Site 294; 50-60-03-294	Summers (1971)
heiau	---	Site 295; 50-60-03-295	Somers (1985)
heiau	Kuahu Heiau	Site 299; 50-60-03-299	Summers (1971)
heiau	Ka'ahemo Heiau	Site 300; 50-60-03-300	Summers (1971)
heiau	---	Site 301	Somers (1985)
heiau	Kamanuolalo Heiau	Site 302; 50-60-03-302	Summers (1971)
heiau name	Pu'ukahi Heiau	---	Summers (1971)
heiau	---	---	Kirch (2002)
heiau	---	KLW-2	McCoy (2002a)
heiau	---	KLW-24	McCoy (2002a)
heiau	---	KLW-27	Somers (1985)

[31] This list includes all sites listed in published sources and some but not all sites identified in reports that are in production.

unknown, associated with heiau	"The Pueblo"	KLW-28	Somers (1985)
heiau	---	MKL-28	McCoy (2002)
possible heiau	---	50-60-03-2416	Rechtman and Henry (2002)
possible heiau	---	---	Manning and Neller (in prep.)r
possible heiau	---	---	Manning and Neller (in prep.)
Table 7(cont.) possible heiau	---	---	Manning and Neller (in prep.)
possible heiau	---	---	Manning and Neller (in prep.)
possible heiau	---	---	Manning and Neller (in prep.)
possible heiau	---	---	Manning and Neller (in prep.)
possible heiau	---	---	Manning and Neller (in prep.)
possible heiau	---	---	Manning and Neller (in prep.)
pohaku a Kāne	---	---	Manning and Neller (in prep.)
ko'a complex	Kuka'iwaia Point	Site 307; 50-60-03-307	Summers (1971)
ko'a	Ko'a at Waialeia	Site 288; 50-60-03-288	Summers (1971)
ko'a	Ko'a at Kaupikiawa	Site 291; 50-60-03-291	Summers (1971)
ko'a	Ko'a	Site 297; 50-60-03-291	Summers (1971)
ko'a	Ko'a at Ka Laea or Koa at Kahili	Site 298; 50-60-03-298; 50-60-03-1803	Ko'a at Ka Laea (Summers 1971), Koa at Kahili (Connelly 1974a); Site 8a (McHenry 1954); Feature 10, 5a, 5b, 8 (Ladefoged 1990)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)
possible ko'a	---	---	Manning and Neller (in prep.)

ko'a	---	KLW-29	McCoy (2002)
shrine	---	---	Manning and Neller (in prep.)
shrine	---	---	Manning and Neller (in prep.)
burial complex	Makapulapai Burial Complex	50-60-03-1928	Manning and Neller (in prep.)
rockshelter site	Ananaluawahina Cave	Site 290; 50-60-03-290	Summers (1971)
birthing stone	---	---	Manning and Neller (in prep.)
sacred area	Pikoone	Site 303; 50-60-03-303	Summers (1971)
holua slide	---	Site 293; 50-60-03-293	Summers (1971); McCoy (2002a)
Table 7(cont.) konane board at house site	---	KT-27	Kirch (2002)
petroglyph	"Rock Doctor"	---	Manning and Neller (in prep.)
petroglyph	"Stone Nurse"	---	Kirch (2002)
petroglyphs in rockshelter	---	MKL-29	McCoy (2002a)
stone wall	The Great Wall	---	Manning and Neller (in prep.); McCoy (2002a); Somers (1985)
shipwreck	*Kaala*	---	Greene (1985:474)
shipwreck	*Foo-Po II*	---	Greene (1985:474)

Other Sacred Sites: Fishing Shrines (ko'a), Petroglyphs, and Legendary Places

We are indeed fortunate Stokes (1909) not only recorded information about the largest and most impressive sacred sites but also smaller sites. In Kalaupapa, there are a total of 16 *ko'a* (fishing shrines), or possible *ko'a*, known from oral tradition and archaeological survey (Table 7). Sites found thus far tend to follow the expected form found in the Hawaiian Islands. Kirch (1985:261) describes *ko'a* as places:

> . . .where fishermen made offerings to assure bountiful yields of fish and other marine creatures. *Ko'a* are found in a wide range of configurations, but usually are characterized by a small court, either a pavement or a walled enclosure (often constructed against a large natural boulder or outcrop). Frequently there is an upright waterworn stone before which offerings were placed. . . *Ko'a* are distributed along coastlines, often in promontories with good ocean views.

Nearly all of these sites in Kalaupapa are within a short distance of the shore, with the exception of one high on the slopes of Waialeia Valley (Site 288, "Ko'a at Waialeia," see Summers 1971 and Kirch 2002). *Ko'a* are generally found evenly dispersed from one another along the coast. As with *heiau*, our knowledge of these sites is uneven and there are likely more examples in the park yet to be discovered. To date, only one site interpreted as a possible shrine (50-60-03-1812) has been test excavated. Ladefoged's (1990) 50cm-by-50cm test pit excavation suggests further excavations will tell us more about the dates of use, construction, types of

offerings, and activities at these sites.[35] In addition, it is likely these sites correspond to different fishing grounds and may mark particularly abundant, preferred, or contested marine resources.

Petroglyphs, carved or pecked figures or symbols on stones, have been found in three locations on the peninsula (Table 7). In all cases the petroglyphs are of human figures and appear to have been made during the prehistoric era. One of the best-known figures is located on the hilltop Makapulapai Burial Complex. Local people have named this figure the "Rock Doctor". This figure seems to be a single human holding an implement in one hand. Below, I argue the figure might be an image of Kuali'i, an eighteenth century chief from O'ahu Island, doing battle with the aid of his *ko'i pohaku* (stone adze) named Haulanuiakea. The 60 burial platforms on and around the hill may be those of the warriors who in the story of the battle were slain by the stone adze as they twice attacked the canoes of Kuali'i "at the sandbar at Kalaupapa" (Fornander 1916-17:416-20 cited in Summers 1971:16-17). Another often visited petroglyph, is also a single human figure located on a stone near a large *heiau* (50-60-03-289). Local people have named this figure the "Stone Nurse". Unlike most petroglyphs, both of these figures have been pecked into boulders and placed within stone architecture where they are found. The most recently discovered rock art is found within a rockshelter just south of Makapulapai and includes three human figures, one twice as large as the other two (Figure 4-4). These three figures could also be interpreted as representing Kuali'i and possibly the warriors on either side of his canoe slain by his stone adze. A human tooth found on the rockshelter floor suggests there may be burials present. More petroglyphs are likely to be found in the park.

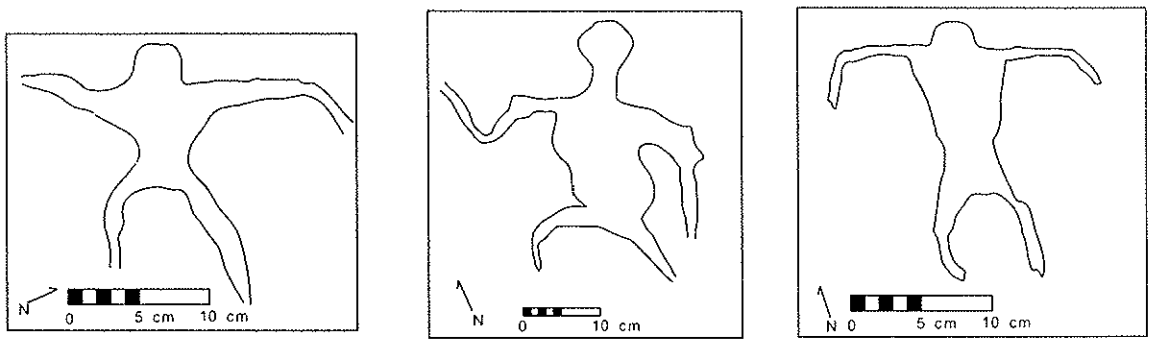

Figure 4-4 – Drawings of Petroglyphs Found at Rockshelter Site (MKL-29)

Oral traditions and archaeological survey have identified two places associated with birth in Kalaupapa. Hawaiian legends tell of a fight that occurred between husband and wife Lono and Kaikilani while playing a game of *konane* at a place called Pikoone, a sand beach on the southwest coast of the peninsula (Table 7) (Summers 1971). The place earned its name because it was

[35] Ladefoged's (1990) Feature 10 (50-60-03-1803) was probably what McHenry reported as a fishing shrine (*ko'a*). The upper layers of a test pit at the site suggest it was used as historic house. Lower layers "might represent an earlier occupation, and the possible alignment [found in excavation might be] a part of an earlier building phase" (ibid:98). Feature 13 (50-60-03-1812) was interpreted as a "possible shrine," but more investigation is needed to clarify how a large amount of immature pig bone (*Sus scrofa*), associated with historic-era animal bone, was deposited under a stone terrace. Further excavations are warranted at both sites.

a favorite place to deposit the umbilical cords (*piko*) (ibid). Elsewhere, a stone "in a shape favored as birthstones" was found during survey of the coastal plain (Manning and Neller in prep.). At the top of the *pali* trail is the site *Ka Ule o Nanahoa, (the penis of Nanahoa), the largest example of a* phallic stone in the Hawaiian Islands. The site, although not within the boundaries of the park, is unambiguously associated with fertility and should be considered when interpreting the past ideological landscape.

Ancient Feasting and Sport

We are lucky to have both archaeological evidence and oral traditions relating to ancient Hawaiian feasting and sport in Kalaupapa. The famous Makahiki festival has been described through some of the earliest historic records relating to Hawai'i Island (Handy and Handy 1972; Malo 1951; Sahlins 1995). A high-ranking elite person would have impersonated the god Lono as he and his entourage would travel from community to community around an island, collecting tribute goods in the form of food stuffs and finished goods. Based on the distribution of sites observed in Kawela on the lee side of Moloka'i Island, archaeologists have interpreted *heiau* on the boundary between communities as the likely locations at which tribute would be offered during the Makahiki season (Wiesler and Kirch 1985). Somers (1985:116) has suggested a large *heiau* and nearby multi-enclosure structure in the park "may have been associated with the god Lono and the Makahiki festival" due to their location just to the east of the boundary between Makanalua and Kalawao *ahupua'a* (Somers 1985a:116; see also McCoy 2002a). Somers (1985:53-55) notes some other similarities between these sites and ones found by Weisler and Kirch (1985) in Kawela:

> . . .the heiau may be a former hale o Loro or temple dedicated to the primary deity of agriculture. Like the structures in Kawela, the heiau is a large stone-filled terrace bordered on the east by a substantial wall. The Kawela structure was also bordered on the north by a substantial wall. This structure is bordered on the north by a retaining wall and terrace. The Kawela structure had an artificial pit to the east of the main structure. A large depression or pit is in the southeast corner of this structure. There were large quantities of branch coral adjacent to the pit at the Kawela structure. There was no branch coral associated with the pit in this heiau...
>
> . . .[there are] previously recorded heiau inside the western boundaries of Makanalua and Kalaupapa ahupua'a. . .Site 295 was recorded as just inside the west boundary of Makanalua ahupua'a and Sites 299 and 300 were recorded just inside the western boundary of Kalaupapa ahupua'a. We will never know whether or not these were hale o Lono, but their locations suggest that possibility.

Unfortunately, these *heiau* briefly described by Stokes (1909)--Sites 295, 299, and 300-- have all been destroyed (see Summers 1971; Somers 1985). The heiau described by Somers (1985) is surrounded by a landscape "literally covered with rock alignments and small clearings," again linking the site to the practice of agriculture. However, other archaeological evidence pertaining to the use of the area during the Makahiki festival has not yet been located.

As in all cultures, children and adults alike in the past enjoyed participating in sports as players and spectators. Ethnohistoric

reconstructions of games and their associated equipment by Hiroa (1957:365) gives us some idea of the variety of sports in prehistoric Hawai'i:

> The Hawaiians had a large number of ancient games (*pa'ani kahiko*); but in the years following foreign contact, they were gradually abandoned, with the exception of hula dancing and surfing. . . Many of these--such as foot racing (*kukini*), boxing (*mokomoko*), wrestling (*hakoko*), trials of strength, swimming, and diving--required no apparatus. . .Some major sports for children requiring apparatus included swinging (*lelekoali*) with a morning-glory vine for a rope; walking on stilts (*kukuluae'o*), for which the construction is not recorded; and flying kites (*ho'olele lupe*) made of *hau* covered with tapa or pandanus leaf; spinning tops and *teetotums*; and playing jack stones. . .Adult recreations included the making of string figures. . .

Hiroa (1957:365-386) goes on to describe the adult games and equipment for *no'a*, *puhenehene*, *'ume*, *kilu*, *konane*, *'ulumaika*, pitching disks, *pahe'e*, ring-and-ball game, peg-and-ball game, bow and arrow, dart game, whip stick and dart game, sledding, and surfing. In Kalaupapa a *holua* slide can be found on the southern slopes of Kauhakō Crater (Table 7).[33] Oral traditions describe the nearby Waihanau Valley as famous for the bowling game (*'ulumaika*) (Curtis forthcoming). Summers (1971:194) also describes the ethnohistoric record of surfing in Kalaupapa *ahupua'a*:

> The surf at Kalaupapa, which was called Pu'ao (Finney, 1959:347), was liked the best by the Molokai chiefs (Kamakau, 1961:54). 'The waves are fearful but the boys of Kalaupapa that were skilled surf riders enjoyed riding on them. They are not mere things to be trifled with either' (Kanepuu, 1867c).

In addition to the reference to the *konani* game in the legend of Pikoone, a physical stone slab board used in the game has been found at a house site in the coastal plains of Kalawao *ahupua'a* (Kirch 2002).

Burial Sites

Evidence of human burials from the prehistoric or early historic era have been reported in four types of places: Makapulapai Burial Complex (50-60-03-1928), the sand dunes on the northeastern tip of Kalaupapa peninsula, caves like Ananaluawahine Cave (50-60-03-290) on the coastal plain and isolated stone burial cairns found on surveys (Collins 2000; Manning and Neller in prep.; McCoy 2002a; Pietrusewsky 1991; Radewagen and Neller ms; Somers 1986, 1996). In cases where actual human remains have been found since the park was established, they were all unintentionally discovered in caves and dunes. Although sand dunes and caves are precisely the sorts of context where we expect to find traditional-styled Hawaiian burials, the remains found to date cannot be considered a representative sample. As such, it is difficult to confidently assess the areas outside of these contexts in terms of the likelihood of finding more remains. The existing data set of skeletal inventories and descriptions of bones, due to the issue of sampling, cannot be used to meaningfully assess things like status, social organization, kinship, community structure, group health, demography, or diet. However, both the large burial complex called Makapulapai and a unique burial pattern found outside of the complex deserve further elaboration (see below).

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[33] Reconnaissance survey in Kalawao *ahupua'a* suggests the possible existence of another *holua* slide in the park (L. Carter Schuster personal communication). Further archaeological survey is recommended to confirm this initial interpretation.

Phelps (1937:35) tells of other possible burial sites:

> This is on the talus slope of the mountains which form the landward end of the Peninsula. The loose rocks have been arranged in the shape of circular pits, most of them 4 to 6 feet in diameter and probably at least 7 feet deep. I have no way of verifying this interpretation (the pit may have been used for storing food) but there are similar pits at Site 41 in the Mapulehu Valley. There, the pits are made in a pile of stones rectangular in shape, about 300 feet long, 80 wide, and 10 in height. According to an old resident of the district many bodies are buried there but I had not the means of investigating. . . It may be this was a Hale Poki, or burial heiau. . . sometimes built for a deceased alii (noble) by his successors.

The landscape described by Phelps (1937) does not fit well with any site in the park described by any other source. The area seems to have some resemblance to the densely packed features uncovered in Makanalua *ahupua'a* by Somers (1985). If they are one-in-the-same, then the pits described are more likely to have been storage pits as Phelps suggests. However, the talus slope is a highly dynamic landform covered in dense vegetation. Therefore, it is equally likely the site has not been re-visited and/or it may have been buried by natural erosion of the cliffs.

Makapulapai and the Story of Kuali'i

Makapulapai (50-60-03-1928) is the name given to a prominent volcanic hill (tumulus) near the center of the northern half of the peninsula in Makanalua *ahupua'a* (Figures 4-3 and 4-5) (Manning and Neller in prep.). The area on and around the hill has been surveyed and 117 features were recorded including 60 burial platforms and terraces, 2 *heiau*, and a number of enclosed agricultural field plots (50-60-03-1928 to 50-60-03-1932). Such large burial complexes are rare in the Hawaiian Islands. Oral history suggests these burials correspond to a large, significant battle in which many were killed.

Manning and Neller (in prep.) convincingly link Makapulapai to a specific battle attested to in Hawaiian oral history between the chiefs of Ko'olau district and the chiefs of Kekaha ("the dry land that stretched from Kawela to Mo'omomi") that took place sometime during the first quarter of the eighteenth century (Summers 1971:16). Half the year, the sea was too rough for fishing off the north shore. The Ko'olau chiefs therefore waged a campaign in an attempt to take the south shore of the island to secure fishing rights there. Fornander (1916-1974:416), cited in Summers (1971:16), writes: "But the chiefs of Kekaha, knowing the value of these fishing grounds, were determined to hold on to them; so this determination on their

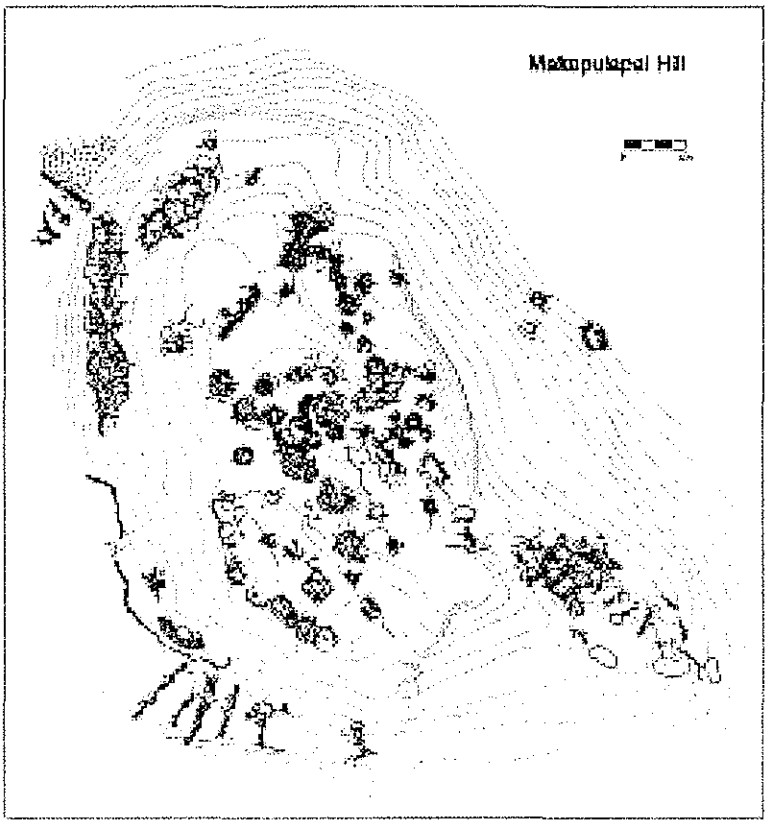

Figure 4-5 - Map of Makapulapai Burial Complex (50-60-03-1928)

part caused a general internal conflict at this time." With aid from Kuali'i, a chief from the Island of O'ahu, the Kekaha chiefs won a major victory at "the sand bar at Kalaupapa." In a final battle at Pelekunu, the Island of Moloka'i became under the control of Kekaha and the O'ahu chief. The full story retold by Fornander (1916-1917:416-420) is quoted below since it speaks to some of the motivations of the chiefs and gives a detailed account of the battle:

> When Kualii heard [from Paepae, a chief from Kekaha, that several disputes had taken place because the Ko'olau chiefs desired Kekaha]... he immediately gave his consent and the canoes were again put to sea and they set sail for Kaunakakai where they arrived in due time. A council was then held by the chiefs, at the close of which they set out. The men were embarked on the canoes, while the Molokai chiefs and Kualii went by land until they reached Maamomi [Mo'omomi], where Kualii and the chiefs took the canoes and set sail for Kalaupapa.
>
> When the chiefs of Ko'olau heard that the war was to be carried into Kalaupapa, the war canoes were put out from Halawa and from all the Koolau side to go to battle. But Kualii and his chief warriors, Maheleana and Malanaihaehae, with other warriors had already encountered the chiefs residing at Kalaupapa and had defeated these chiefs. But other chiefs of Koolau and Kona with their men arrived soon after this who were prepared to continue the battle against the chiefs of Kekaha. In this battle Paepae was very conspicuous both in strength and bravery, so much so that he and his force surpassed the chief warriors of Kaulii. When Kualii and his followers were victorious over all the chiefs of Molokai all the lands on the Koolau side came into Paepae's possession. This victory was not, however, gained

> through the use of the war clubs, but through the use of Kualii's stone axe [*ko'i pohaku*] named Haulanuiakea. Following is the story of the destruction of the enemy by Kualii with the blade of the axe.
>
> While Kualii and his followers were floating in their canoes over the sand bar at Kalaupapa, the soldiers from Koolau swam out to the canoes of Kualii with the intention of capturing them; there were some forties [sic] in number. When they got to the canoes they took hold of them and lfted [sic] them onto their shoulders. While this was being done Kualii rose with his axe in hand and swung it along one side of the canoes killing those on that side, which caused the canoes to lean toward that side as the canoes were then on the shoulders of the men. When Malanaihaehae saw that the people on one side of the canoes were slain, he rose and reached for the axe which was being held in Kualii's hand and swung it along the other side of the canoes, which slew all the people on that side; and the canoes again fell on even keel in the sea and floated as before.
>
> Not very long after this some more of the enemy came along, equal in number to those that had been slain, and again lifted up the canoes of Kualii just as the other had done, without any signs of fear, although the others were floating around dead. Again the axe was used with deadly effect and again Kualii and his followers were victorious by the use of the blade of Haulanuiakea. This was kept up until the whole army was slain.

Kuali'i had actually already left the fighting when the campaign was won in a final battle in Pelekunu to the east of the park. Paepae of Kekaha after the battle announced to the chiefs of Ko'olau in his victory speech that their warriors had been slain by Kuali'i. Before returning home, Kuali'i made a "new division of the lands" and "left Paepae and Manau his wife in charge of the island" (Fornander 1916-1917:416-420).

The petroglyph of a human figure on the summit of Makapulapai, locally known as the "Rock Doctor," might be an image of Kuali'i doing battle with the aid of his *ko'i pohaku* (stone adze) named Haulanuiakea, or alternatively Malanaihaehae, the warrior in the story who also took up the adze in the skirmish. The 60 burial platforms on the hill may be those of the warriors who in the story of the battle were slain by the stone adze as they twice attacked the canoes of Kuali'i. Of course, the single image could also have been specifically placed to distinguish the burial of a one person. The petroglyph is somewhat unusual in that it was pecked into a free basalt boulder and placed there.

Rock art that has recently been found within a rockshelter just south of Makapulapai includes three human figures, one twice as large as the other two (Figure 4-4). These three figures could also be interpreted as representing Kuali'i or Malanaihaehae and the warriors on either side of their canoe slain by the stone adze. Therefore, it may be that the burial complex may include the hill and some of the nearby collapsed lave tube valley. Overall, Makapulapai Burial Complex is clearly significant to Hawaiian prehistory although it is sometimes overlooked in overviews on Hawaiian warfare (Kolb and Dixon 2002).

Moa 'Aumakua *Burial Pattern*

NPS archaeologist Gary Somers (1986, 1996) has brought to light a unique style of interment represented in three burials discovered in Kalaupapa in

this report called the *Moa 'Aumakua* Burial Pattern.[31] First, the nearly complete remains of the two individuals were found exposed by erosion in sand dunes near Kahiu Point and later reburied. Both individuals were found in a flexed position each buried with the complete skeletal remains of an immature chicken (*Gallus gullus*). Called in the Hawaiian language *moa*, the chicken was introduced to the islands by early Polynesian settlers. Somers (1986, 1996) reviewed Hawaiian traditions regarding the *moa* and notes similar burials on the Island of O'ahu at Mōkapu (Bowen 1974).

In an attempt to explain this burial pattern Somers (1986, 1996) eliminates several possibilities. First, it is assumed the birds were not interned as food for the deceased in the afterlife since the individuals are both adult females who may have been restricted from eating chicken in life. The possibility that the birds were pets or fighting cocks was eliminated as explanations since the birds were both young. "[N]o satisfactory explanation of [the burial pattern's] occurrence" was found by Somers (1986:9), but he relates an attention-grabbing quote from Kamakau (1964:33):

> When a man died, the kahuna 'aumakua of the dead person came and performed his ritual of offering a pig (pua'a uko), or if not a pig, a chicken (moa 'aumakua), to make acceptable (ho'omaika'i) the soul of the dead person to live together with his 'aumakua, his ancestral gods.

To Somers (1986:9) the ethnohistoric documentary evidence "does not contain enough detail to explain the particular occurrence of immature chickens being buried with adult female humans." Five years later, a newborn or infant of unknown sex was discovered nearby and again with what appeared to be the bone of a chicken (*Gallus gallus*) (Pietrusewsky 1991 in Goodwin 1994b). Certainly if in the future more examples of the *Moa 'Aumakua* Burial Pattern in the park were found exposed by erosion or accident, they might yield additional information regarding this pattern.

Clearly, this review favors the interpretation that the pattern is indicative of individuals who have the *moa* as their family god (*moa 'aumakua*). Current evidence is naturally open to other interpretations. For example, the remains of the two individuals found near Kahiu Point were determined through well-developed osteological methods to be physically female. Anthropologists however commonly distinguish between the physical *sex* and the *gender* of individuals. Physical sex is determined at birth as male or female whereas gender is something that is socially constructed in life. Since gender can vary independently of physical sex, it is incorrect to assume a direct relationship between the sex of remains and the gender of that person in life, even if there are many examples of direct correlation between the two. What makes the distinction of *sex* and *gender* even more critical is the fact that the types of gender recognized in societies tends to be culturally specific. This relatively nuanced discussion is relevant to this burial pattern since it is important to keep in mind that the gender of the individuals found is in fact unknown.

[31] None of the burial discussed below were found in association with Makapulapai Burial Complex.

Landscapes in time: The Kalaupapa Chronology

Archaeological Evidence of Early Occupation

For many years the oldest accepted date from an archaeological site in Kalaupapa NHP came from Kaupikiawa Cave (50-60-03-312). In 1984, Marshall Weisler, formerly of the Anthropology Department of the B.P. Bishop Museum, collaborated with NPS archaeologist Gary F. Somers to date material collected by Richard Pearson during 1966-7 excavations at the site. The three resulting radiocarbon dates (Beta-9276, -9962, and -9275) yielded results calibrated to dates of 1031-1255 A.D., 1280-1635 A.D., and 1689-1926 A.D., respectively. In his review of 48 radiocarbon dates for Moloka'i Island, Weisler (1989:137) notes that the earliest of these dates "suggests use of Kalaupapa Peninsula during the Developmental (A.D. 600-1100) to early Expansion period (A.D. 1100-1650) for exploitation of coastal marine resources."

The results of a recent re-evaluation of Kaupikiawa Cave by Kirch (2002) in combination with new radiocarbon dates from other sites in the park suggest the culture history of the earliest stage of the occupation of Kalaupapa needs to be re-written (see Table 8). Three new dates from Kaupikiawa Cave (Beta -155366, -155365, and -155364) yielded calibrated ages of 1280-1400 A.D., <1650 A.D., and <1660 A.D., respectively. An additional new date from pondfield deposits in Waikolu Valley (Beta-153426) was found to have a calibrated true age of 1240-1280 A.D. (1 sigma), or 1200-1290 A.D. at 95% probability. Based on this data, Kirch (2002:93-95) has recently presented a new interpretation of the early occupation of Kalaupapa:

> In sum, while the Kaupikiawa Rockshelter does encapsulate a depositional sequence spanning ~500-600 years (i.e., beginning around the 14th centuries A.D.), it should no longer be claimed as proving evidence for a millennium of human occupation at Kalaupapa Peninsula. Rather than providing evidence for a possible Developmental Period settlement, as suggested by Weisler (1989), human activity in the vicinity of the rockshelter seems to have commenced during the Expansion Period, while actual occupation and deposition of shell midden dates to the Proto-Historic Period. In our view, this reinterpretation is more consistent with the environmental setting of the shelter, at the northernly, marginal extreme of the peninsula. Of course our re-dating of this site in no way negates the possibility of a longer occupation sequence for the Kalaupapa Region. Indeed, our AMS date of 1200-1290 cal A.D. on the loulu palm charcoal from Waikolu Site 1 can be taken as an indication of human presence in this large valley by at least the 13th century, or the early part of the Expansion Period. In our view, the most likely localities for early human settlement and land use in the region would have been either in the large valleys such as Waikolu, and/or along the colluvial slopes with their richer agricultural soils.

Accepting Kirch's (2002) new evidence means a shorter chronology for the prehistory of Kalaupapa. On the Kalaupapa peninsula it appears the earliest dates of occupation correspond to the Early Expansion Period during the late 13th or early 14th century. Both Kirch's (2002) earliest date from Kaupikiawa Cave, 1280-1400 A.D., and the earliest date recovered in association with a buried field wall by Ladefoged (1990), 1281-1520 A.D. (97% probability), overlap in this period. In the Waikolu Valley, new evidence points to a history of development stretching back in time to at least the Early Expansion Period and perhaps slightly longer. The date from Waikolu Valley

with a calibrated true age of 1200-1290 A.D. is now the earliest date from an archaeological site in the park, if this new analysis of Kaupikiawa Cave is accepted (Kirch 2002). Only more radiocarbon dates from early sites in the park will aid in determining the precise early settlement history of the area.

The Late Prehistoric Through Early Historic Era

After the early use of the peninsula attested to in the Kaupikiawa Cave (50-60-03-312) site, there is a gap of several hundred years until we have the next absolute date from an archaeological deposit (Table 8). Of the seven radiocarbon dates from identified wood charcoal recovered from coastal sites during excavations by Ladefoged (1990), most range from modern to the late prehistoric era, with the exception of one from under a buried field wall that dated to 1281-1520 A.D. (97% probability). From these results Ladefoged (1990:183) proposed the first chronology of the settlement of Kalaupapa:

> The results of the intensive study indicate that the study area has been used for residential and agricultural purposes over the last seven centuries. It is likely that occupation of the area has an even greater antiquity. However, the vast majority of the features in the study area appear to date to the historic era. The tendency of the features to contain a single cultural deposit suggests that they were built and used within a relatively short time frame. This does not, however, mean that all features were occupied at the same time. The chronometric and relative dating techniques suggest that the features were occupied during several different time periods within the historic era.

By combining excavation and survey evidence, Ladefoged (1990:182) comments on the form of agricultural fields:

> There are two main types of agricultural complexes in the west end of the study area. These include alignments with enclosures around them, and alignments without enclosures. . .The density of alignments is much higher within the enclosures than the areas outside. . .It is possible the agricultural enclosures are a later intensification of an earlier field system.

Several critical pieces of historical evidence helped Ladefoged (1990) to develop this general chronology for the area. First, independent sources suggest that during the Kalawao/Kalaupapa settlement periods much of the food was imported from elsewhere rather than grown locally on the peninsula. The local population (*kama'āina*) was evicted with the establishment of the leprosy settlement except for "about forty persons [who] chose to remain and formed a community that lasted about twenty-nine years" (Fortunato de Loach 1975:84, cited in Ladefoged 1990:7). Thus, the establishment of the settlement probably corresponds with the abandonment of agricultural fields built by those who were later "disposed of their birthright" (Stoddard 1893:21). Documentary evidence also shows that Kalaupapa was a prime spot for traders to buy potatoes to supply the boomtown markets of California during the Gold Rush of 1849 (see Handy and Handy 1972:518). Ladefoged (1993) later used these lines of evidence to sketch out the development of the Kalaupapa dry land field system from their first use during the prehistoric era to their abandonment shortly after European contact, their

re-intensification during the Gold Rush Era demand for potatoes, and their final abandonment after the establishment of the leprosy settlement.[55]

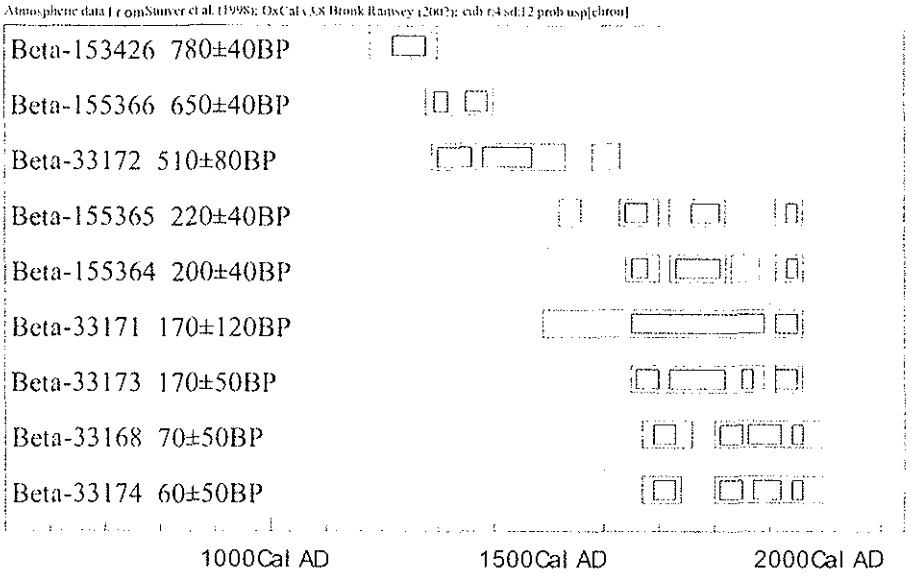

Table 8 - Calibrated Range of Radiocarbon Dates from Identified Charcoal

Major Socio-political Events in Hawaiian History

There are three major events in late prehistory and in the early historic era that we know likely had serious impacts on the political hierarchy at Kalaupapa: (a) the defeat in the eighteenth century of the Ko'olau district (*moku*) chiefs by combined forces of Kuali'i, a chief from the Island of O'ahu, and the Kekaha chiefs from leeward Moloka'i, (b) the capture and occupation of Moloka'i Island by the forces of Kamehameha I in 1790 and (c) and Kamehameha's reconquest of the island in 1795 (Summers 1971). Fornander (1916-1917:416-420) (cited in Summers 1971) notes Kuali'i before returning home made a "new division of the lands" and "left Paepae and Manau his wife in charge of the island." Makapulapai Burial Complex (50-60-03-1928) may be archaeological evidence of this battle for control of the Ko'olau district (*moku*), of which Kalaupapa is a part. A recent summary of evidence for warfare in Hawai'i suggests warfare had an increasing impact on the daily lives of commoners in the early historic era (Kolb and Dixon 2002). Indeed, the occupation of the army of Kamehameha I on other islands is noted to have impacted the settlement pattern and agricultural development of even the most remote places (see Kirch and Sahlins 1992). Currently, there is no known archaeological evidence in Kalaupapa of occupations by the forces of Kamehameha I.

As a result of this review of archaeological research and oral traditions a pattern has emerged that may allow us to link these political shifts to sites other than Makapulapai. The sites that Stokes' (1909) local informant seems to have omitted include several large sites clearly dating from the prehistoric era. These sites notably include what appears to be the largest

[55] Also as a result of Ladefoged's (1990) research we know that a massive tsunami in 1946 witnessed by the former lighthouse keeper caused the destruction of several buildings at the northern point of the peninsula.

heiau on the peninsula (KLW-2, McCoy 2002a), Makapulapai Burial Complex (50-60-03-1928), the large sized *heiau* and nearby multi-enclosure structure that "may have been associated with the god Lono and the Makahiki festival"(Somers 1985a:116),[24] as well as medium-sized sites like agricultural temple (*heiau ho'o'ulu'ai*). The tempting conclusion is that their use and the importance of the gods to which they were dedicated had been overshadowed in oral traditions by those glorifying the later reign of the Kamehameha line, who had their own favored members of the pantheon of Hawaiian gods. Alternatively, the informant interviewed may not have wanted to talk about the sites because it would revel their location. The information could also have simply been lost over time by local people or Stokes. Further archaeological investigation is required to determine if these structures were indeed built and used earlier than the ones reported by Stokes.

A Proposed History of "The Great Wall of Kalaupapa"

What is called here "The Great Wall of Kalaupapa" has recently been mapped and a possible history of its construction can now be proposed, in part thanks to this overview (Figure 4-6). Although dense vegetation now covers much of the peninsula, the wall stands out in aerial photographs and is easily accessible in many places. In the field, Trimble ProX and GeoExplorer3 Global Positioning units provided by the NPS were used by teams to record the wall as a line in relatively clear areas and as points in places where only a portion of the wall is visible (McCoy 2002a). Even so, the extreme southern end of the wall remains unrecorded due to extraordinarily thick brush.

The Great Wall is oriented north more-or-less continuously from the base of the cliffs, just to the west of a large sized *heiau* (KLW-27) and multi-

[24] Sommers (1985) interpreted these sites as associated with the Makahiki due to their location just to the east of the boundary between Makanalua and Kalawao *ahupua'a*

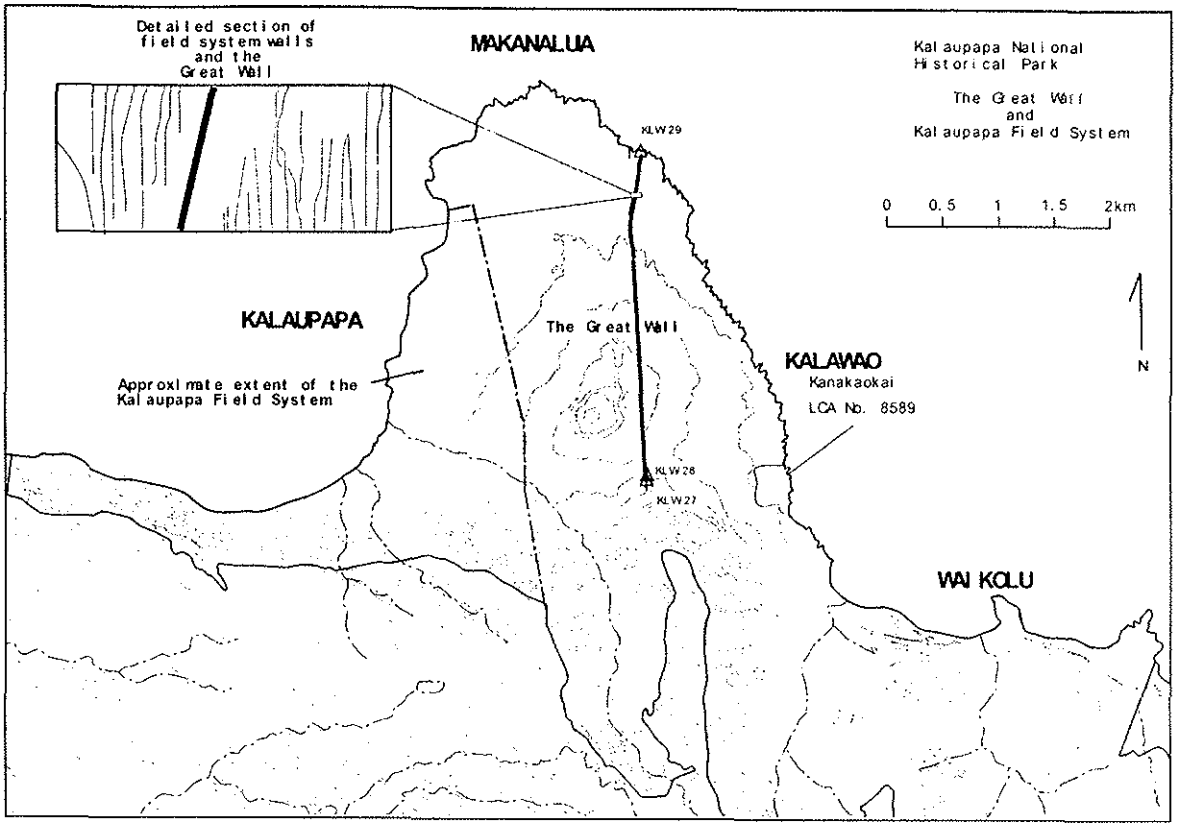

Figure 4-6 - Map of the Great Wall of Kalaupapa (adapted from Somers 1985; Manning and Neller in prep.; and McCoy 2002a)

enclosure structure (KLW-28) (Figure 4-7). From there the wall runs along the east side of Kauhakō Crater and intersects a second alignment at about two-thirds down the length of the peninsula. The second alignment extends the wall northwest along the coastal plain. This part of the wall then turns north to end at a fishing shrine (*ko'a*) (KLW-29) on the rocky north coast of the peninsula (Figure 4-8). These two sections together make up the whole of the Great Wall. On average the wall is over a meter high and 85 cm wide. The style of construction is generally core-filled with different facing patterns, perhaps due to the different types of basalt immediately available. No effort was made to record detailed architectural style.

This evidence implies the boundary between Makanalua and Kalawao *ahupua'a* may have a long and probably complex history. The temple and fishing shrine found in association with the boundary suggest it likely dates to the prehistoric era. It may have initially formed during the Late Expansion

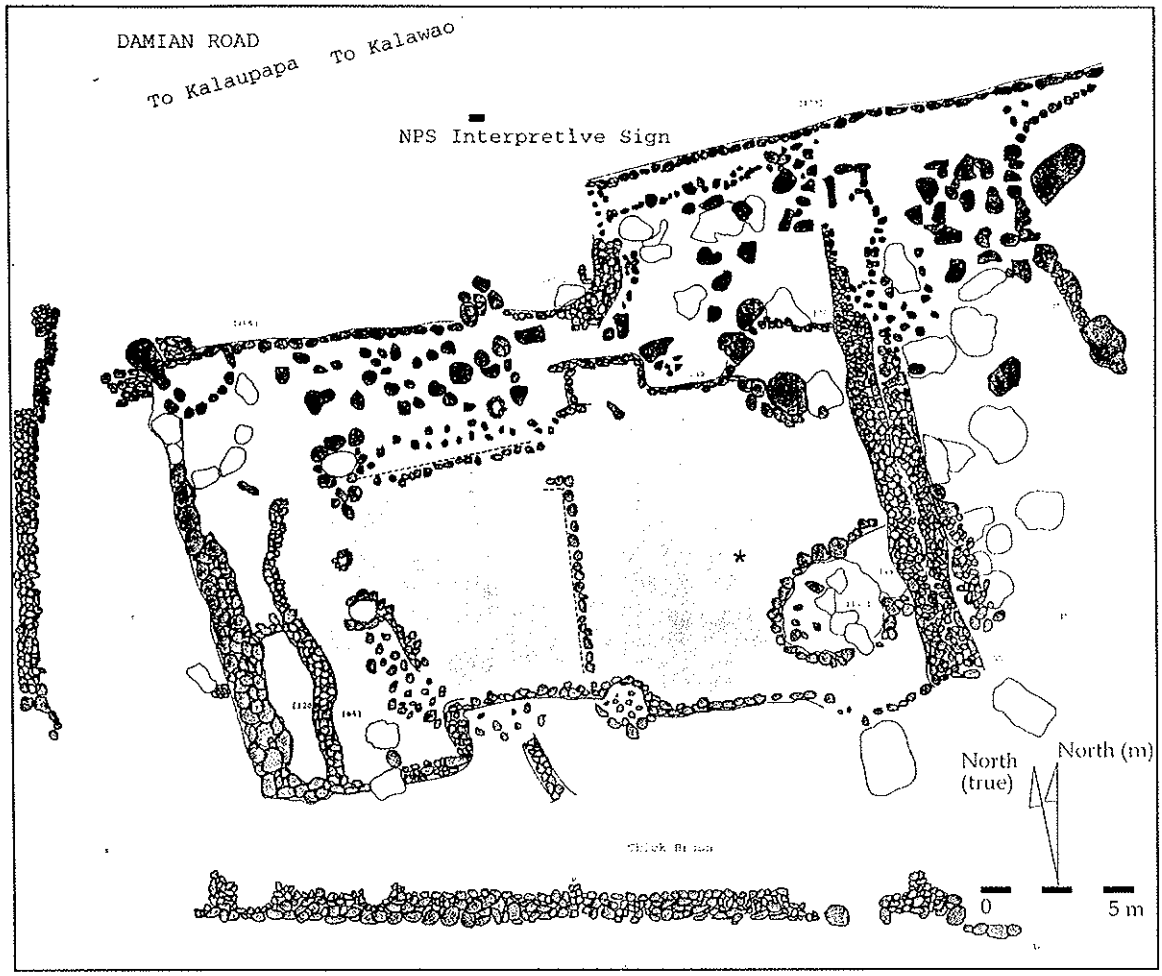

Figure 4-7 - *Heiau* (KLW-27) Near the Boundary Between Makanalua and Kalawao *Ahupua'a* (source: McCoy 2002a)

Period (A.D. 1400 - 1650) when archaeologists have argued the territorial land tenure system first arose. Under the territorial system commoners had access to land and resources in exchange for corvée labor and taxes paid by tribute to elite landholders (Kirch 1985). Chiefs used this labor force to build agricultural infrastructure, temples (*heiau*), trails, boundary markers, and to tend their gardens and fishponds. However, as demonstrated by the story of the Kuali'i, the landscape was open to re-division. It is also probable that war was not the only context in which boundaries might be redrawn or land units re-allotted.

Although the boundary between Makanalua and Kalawao *ahupua'a* is probably of great antiquity, the wall marking the boundary may have been constructed in the Early Historic Era (A.D. 1795-1866). Two pieces of evidence help to generally bracket the period when the wall was constructed. Our first historic record of the Great Wall comes a notebook kept by Monsarrat (1894) during his 1894 survey of the peninsula. In the notebook, the boundary wall was labeled as an "Old Wall." To the east within Kalawao *ahupua'a*, another wall is also described in the same way (Manning and Neller in prep.). This

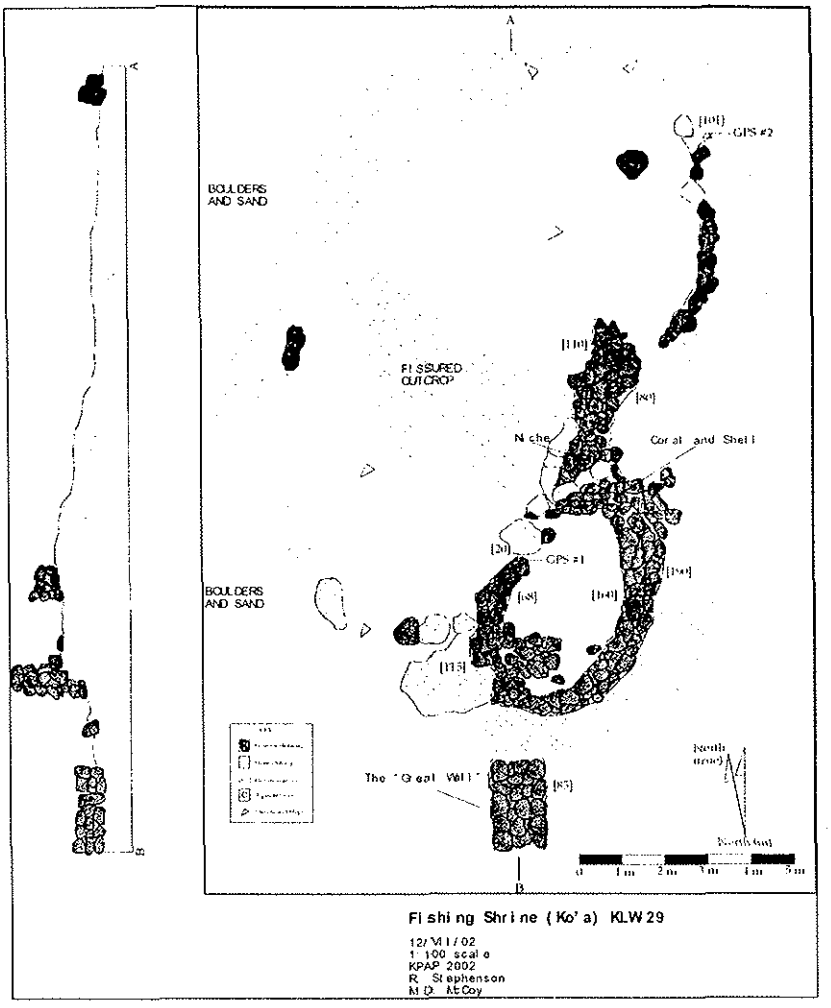

Figure 4-8 – *Ko'a* (KLW-29) on the Boundary Between Makanalua and Kalawao *Ahupua'a* (source: McCoy 2002a)

wall marks the outline of lands claimed and awarded to Kanakaokai (LCA No. 8589), a Lahinaluna-educated Protestant missionary teacher who came to live in Kalaupapa around A.D. 1839 (Manning and Neller in prep.).

Our second line of evidence comes from several archaeological surveys (Kirch 2002; Manning and Neller in prep.; McCoy 2002a) that depict sections of the two walls described in Monsarrat's (1894) notebook. Along the sides of each of these walls there is an area free of stone. Presumably, this area was cleared as stone from field walls was robbed during wall construction. On a historic household site on the northern tip of the peninsula, again stone from older field walls has clearly been robbed to create new enclosing walls (Ladefoged 1990). As described above, Ladefoged (1990) has suggested the fields were largely abandoned during the depopulation of the islands after European contact and then re-intensified as evident by enclosed gardens. If we attach a rough estimate of 1795 A.D. to the abandonment of the fields, it can be used as the a terminus post quem to bracket the construction of the

Great Wall to sometime during the Early Historic Era between 1795 and 1894 A.D. when it appeared in Monsarrat's (1894) notebook.

It is possible to further bracket the construction of the wall within the Early Historic Era. The Board of Health purchased both Kalawao and Makanalua *ahupua'a* in quick succession to build the leprosy settlement. Therefore, by 1866 A.D. the boundary marked by the wall was meaningless. Since the height of the wall would have made it a barrier to animals, it seems probable it was built after 1830 A.D. when the first cattle arrived on the peninsula. Indeed, large portions of the Island of Moloka'i were rapidly being incorporated into a single cattle ranch at this time. Over one hundred years after their introduction, McHenry (1938) does note the use of field walls at Kalaupapa by inhabitants ". . .who keep them to a certain extent in repair as drift fences for cattle." However, a closer look at the period between 1830 and 1866 reveals two important historical processes that may have come together to motivate the construction of the Great Wall: The 1849 Gold Rush and the Great Mahele Land division.

When gold was discovered in California in 1849 towns like San Francisco were swamped with new arrivals. The demand for food in the markets of these towns caused a boom in the Hawaiian Islands in potatoes for export. Historic newspapers tell us Kalaupapa was known as one of the places traders were sure to find barrels of potatoes (see Handy and Handy 1972). The booming market meant the value of the dry *kula* land laying in disuse rapidly jumped in value. Also during this period there was a remarkable slow down in the depopulation of Kalaupapa (Figure 4-9). The benefits of the new cash economy may have compelled common folks to stay and work the lands. There was also legislation that made it unlawful to leave rural areas at this time in Hawaiian history that may help explain this trend (Ladefoged 1993).

A few years prior to the Gold Rush, under the advice of Western businessmen, the Kingdom of Hawai'i began the process called The Great Mahele that would codify the land tenure system. As noted above, Kirch (2002) has found in the records of Mahele claims from Kalaupapa a direct correlation between the rank of elite and the likelihood that commoner claims were unsuccessful. Clearly, the peninsula at this time was a contested area. It may be that that elite land owners, motivated by a booming economy, sought to clearly mark uncultivated *kula* lands upon which the wall was built as their property.

In sum, all current evidence points to an early historic era date of construction of the Great Wall of Kalaupapa. The wall was probably built in

at least two stages sometime between 1795 and 1866 A.D. If we accept the Gold Rush potato boom and Great Mahele Land Division as co-occurring motivators for wall construction, this estimate can be narrowed to between 1848 and 1866 A.D.

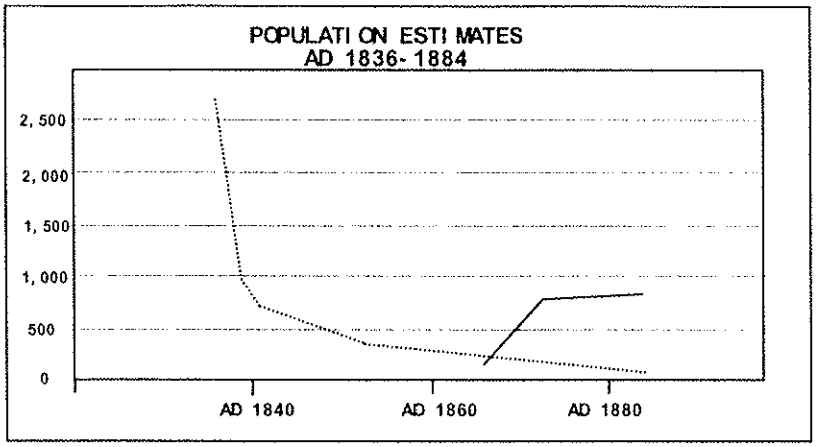

Figure 4-9 - Population Estimates of Historic Kalaupapa and Neighboring Region (sources: Creighton 1886; Fortunato de Loach 1975; Greene 1985; Hawaiian Board of Health 1886)

Social Organization and Daily Life

There are several in-depth case studies that may help understanding of developments in Kalaupapa by analogy. For example, the Waikolu Valley, of which we know so little, may have a developmental history similar to that of Hälawa Valley on the east end of the north shore (Kirch and Kelly 1975). The dryland fields, although much smaller in scale, seem to have much in common with the North Kohala and Kona field systems in West Hawai'i Island (Kirch 1985). However, these areas are certainly not the only places we should look to for comparing and contrasting what is found at Kalaupapa.

Despite the natural isolation of Kalaupapa, it is clear the former occupants of the area at any one time were interconnected through kin ties and political relationships to other communities in the islands. Unfortunately, gaps in understanding the chronology of the settlement and community patterns makes it difficult to put Kalaupapa in the context of overall changes in social organization. In addition, a dearth of fine-grained information on domestic and ritual behavior allows only a broad understanding of daily life in the past. Rather than entertain speculations at this time, social organization and daily life in prehistoric and early historic Kalaupapa are recommended as topics for future research.

Archaeological Data

Spatial Data

Global Positioning System (GPS) units and Geographic Information Systems (GIS) technology allow cultural resource managers to inventory accurately the location of large numbers of sites. The potential use of this technology goes far beyond the immediate advantages of being able to record the location

of sites in the field with a high degree of accuracy and precision. Spatial data sets in a GIS format can be used to store information about quantitative and qualitative attributes recorded on sites, features, and artifacts; used to analyze their distribution; as well as identify cultural resources likely to be impacted by future park improvement projects. GIS can also be used to bring together disparate sources of data recorded in different ways. However, to make use of GPS and GIS tools in archaeology, fine-grained, accurate data is required.

An overall, comprehensive GIS database of the archaeological landscape of Kalaupapa is currently in development. A thorough search for maps of any kind has identified the following types of site and/or location maps: (i) field maps of sites done by tape and compass; (ii) field maps of sites done by plane table and alidade; (iii) site location maps made by use of aerial photography; (iv) maps of field walls made with optical transit; (v) maps of field walls made by use of false color IR aerial photography; (vi) maps of field walls made by plane table and alidade; (vii) scale AutoCAD drawings of some of these types of maps; (vi) GPS point coordinates given for sites or features (differentially corrected and uncorrected); and (vii) GPS lines representing field walls (differentially corrected). The projects that produced these maps each decided what was the appropriate method(s) to record sites, given their research goals, equipment, and personnel.[37] Copies of these maps can be found both in the park and the PISO.

Data on Formal Variation of Sites, Features, and Artifacts

Variation in the form of standing dry-laid stone architecture and artifacts in assemblages excavated from such sites are the most widely used kinds of archaeological data recorded by archaeologists in Hawai'i. Large-scale archaeological settlement pattern studies and ethnohistoric information on traditional Hawaiian life and architecture together form a framework that allows us to interpret the uses of sites we encounter on surveys. Cachola-Abad (1996) rightly points out that our archaeological-based interpretation of sites, especially temples (*heiau*), needs to take into consideration the great deal of variation that exists in the architectural form of different classes of sites. Materials such as stone, bone, and shell preserved in trash deposits and recovered though excavation are sometimes our best clues to reconstructing the past. Variation in the frequency and form of different classes of artifacts can give us an idea of changes in the lives of people over time. Also, certain kinds of artifacts that could only have been deposited after European contact-i.e., introduced plants and animals, metal, glass, etc.-help us date by association the time period a site was occupied or used.

Temporal Data

The dating of sites is not an uncomplicated process. Archaeological science is continually re-evaluating new methods and previous findings. Table 8 above summarizes the reliable radiocarbon dates from the park and shows the calibrated range of dates that have come from secure archaeological context on wood charcoal identified by plant species. Table 9 is a list of most of the radiocarbon dates from archaeological sites and geological samples on the

[37] See Project Summaries (Appendix I) for reviews of the methodology used in specific projects.

island. Samples from within the park can be seen in italics. Reliably is rated on an ordinal scale of 1 to 3 based on the context of the find and methods of dating. The score of 3 is given to dates that have low reliability and generally not very useful. Table 10 shows a few dates obtained by volcanic glass hydration of material from an archaeological site in the park. The same reliability rating system is applied. Generally speaking, this

Table 9 - Table of Radiocarbon Dates Ranking Reliability*
(*dates from Kalaupapa NHP are in italics)

Conventional 14C Age BP (C.R.A.)	BP (calibrated, 1 sigma)	Series/ Location	Reliability 1- best 2- ave. 3- poor	Source	Lab-ID	Comment
780 +/- 40	*750-660 (2 sigma)*	*Waikolu Valley*	*1*	*Kirch (2002)*	*Beta-153426*	*WK-1*
200 +/- 40	*290-270;200-150;20-0*	*Kalaupapa Peninsula*	*1*	*Kirch (2002)*	*Beta-155364*	*Kaupikiawa Cave (50-60-03-312)*
220 +/- 40	*300-280;180-150;10-0*	*"*	*1*	*Kirch (2002)*	*Beta-155365*	*Kaupikiawa Cave (50-60-03-312)*
650 +/- 40	*670-550*	*"*	*1*	*Kirch (2002)*	*Beta-155366*	*Kaupikiawa Cave (50-60-03-312)*
880 +/- 70	*900 +/- 70*	*"*	*2*	*Weisler (1989)*	*Beta-9270*	*Kaupikiawa Cave (50-60-03-312)*
490 +/- 180	*460 +/-180*	*"*	*2*	*Weisler (1989)*	*Beta-9962*	*Kaupikiawa Cave (50-60-03-312)*
< 120	*< 120*	*"*	*2*	*Weisler (1989)*	*Beta-9275*	*Kaupikiawa Cave (50-60-03-312)*
510 +/- 80	*see table, chapter 4*	*Northwest Kalaupapa Peninsula*	*1*	*Ladefoged (1990)*	*Beta-33172*	*Feature 8*
170 +/- 120	*see table, chapter 4*	*"*	*1*	*Ladefoged (1990)*	*Beta-33171*	*Feature 12*
170 +/- 50	*see table, chapter 4*	*"*	*1*	*Ladefoged (1990)*	*Beta-33173*	*Feature 13*
100.4+/-0.6 modern	*N/A*	*"*	*1*	*Ladefoged (1990)*	*Beta-33170*	*Feature 18*
100.4+/-0.9 modern	*N/A*	*"*	*1*	*Ladefoged (1990)*	*Beta-33169*	*Feature 23*
70 +/- 50	*see table, chapter 4*	*"*	*1*	*Ladefoged (1990)*	*Beta-33168*	*Feature 28*
60 +/- 50	*see table, chapter 4*	*"*	*1*	*Ladefoged (1990)*	*Beta-33174*	*Feature 31*
300 +/- 90	*A.D. 1470-1670; 1780-1800*	*"*	*3*	*this volume, Neller (n.d.)*	*Beta-87077*	*Site 1801, Cat 167, Feature 102 (hearth), II/1*
110 +/- 90	*A.D. 1670-1740; 1800-1950*	*"*	*3*	*this volume, Neller (n.d.)*	*Beta-87078*	*Site 1801, Cat 236, Feature 105 (hearth), I/1*
90 +/- 40	*A.D. 1690-1730; 1810-1920*	*"*	*3*	*this volume, Neller (n.d.)*	*Beta-87079*	*Site 1801, Cat 239, Feature 102 (hearth), II/1*
260 +/- 40	*A.D. 1520-1570; 1630-1670;*	*"*	*3*	*this volume, Neller (n.d.)*	*Beta-87080*	*Site 1801, Cat 243, Feature 105 (hearth), II/1*

	1780-1800					
110 +/- 60	A.D. 1680-1740; 1800-1930	"	3	this volume, Neller (n.d.)	Beta-87081	Site 1801, Cat 246, Feature 105 (hearth), II/1B
100.7+/- 0.5 modern	N/A	"	3	this volume, Neller (n.d.)	Beta-87082	Site 1801, Cat 265, Feature 107 (hearth), I/1
Table 9 (cont.) 40 +/- 60	A.D. 1690-1730; 1810-1850; 1870-1920; 1940-1950	"	3	this volume, Neller (n.d.)	Beta-87083	Site 1801, Cat 292, Feature 105 (hearth), I/1
80 +/- 50	A.D. 1690-1730; 1810-1920;	"	3	this volume, Neller (n.d.)	Beta-87084	Site 1801, Cat 295, Feature 110, II/1
160 +/- 50	A.D. 1660-1710; 1720-1820; 1830-1890; 1910-1950	"	3	this volume, Neller (n.d.)	Beta-87085	Site 1801, Cat 298, Feature 107 (hearth), I/1
170 +/- 90	A.D. 1650-1710; 1720-1820; 1830-1890; 1910-1950	"	3	this volume, Neller (n.d.)	Beta-87086	Site 1801, Cat 301, Feature 108 (hearth), II/1
160 +/- 80	A.D. 1660-1710; 1720-1820; 1830-1890; 1910-1950	"	3	this volume, Neller (n.d.)	Beta-87087	Site 1801, Cat 324, Feature 102 (hearth), II
270 +/- 90	A.D. 1480-1680; 1760-1810; 1930-1950	"	3	this volume, Neller (n.d.)	Beta-87088	Site 1801, Cat 361, Feature 113 (hearth), I/2
150 +/- 70	A.D. 1660-1710; 1720-1890; 1910-1950	"	3	this volume, Neller (n.d.)	Beta-87089	Site 1801, Cat 365, Feature 101 (hearth), II/1
120 +/- 60	A.D. 1680-1740; 1800-1950	"	3	this volume, Neller (n.d.)	Beta-87090	Site 1801, Cat 370, Feature 113 (hearth), II/1
70 +/- 60	A.D. 1690-1730; 1810-1920; 1940-1950	"	3	this volume, Neller (n.d.)	Beta-87091	Site 1801, Cat 395, Feature 102 (hearth), III/1
250 +/- 50	A.D. 1520-1570; 1620-1680; 1770-1810; 1930-1950	"	3	this volume, Neller (n.d.)	Beta-87092	Site 1801, Cat 458, Feature 117, I/1
1380 +/- 90	1368 - 1491	Halawa Series	2	Weisler (1989)	Gak-2743	
820 +/- 80	818 - 673	"	2	Weisler (1989)	Gak-2741	
230 +/- 120	456 - 0	"	2	Weisler (1989)	Gak-2742	
750 +/- 90	739 - 666	"	2	Weisler (1989)	Gak-2744	
350 +/- 80	509 - 305	"	2	Weisler	Gak-2739	

				(1989)		
440 +/- 80	536 - 459	"	2	Weisler (1989)	Gak-2740	
290 +/- 60	456 - 294	Kawela Mound Series	2	Weisler (1989)	Beta-2278	
< 160	277 - 1	"	2	Weisler (1989)	Beta-2273	
300 +/- 80	474 - 291	Upland Kawela Series	2	Weisler (1989)	Beta-3364	
290 +/- 60	456 - 294	"	2	Weisler (1989)	Beta-3365	
Table 9 (cont.) < 120	261 - 24	"	2	Weisler (1989)	Beta-2274	
< 140	270 - 13	"	2	Weisler (1989)	Beta-2275	
< 140	270 - 13	"	2	Weisler (1989)	Beta-2276	
< 120	261 - 24	"	2	Weisler (1989)	Beta-3363	
150 +/- 50	285 - 0	"	2	Weisler (1989)	Beta-3366	
< 120	261 - 24	"	2	Weisler (1989)	Beta-3367	
< 180	283 - 2	"	2	Weisler (1989)	Beta-3368	
< 170	280 - 5	"	2	Weisler (1989)	Beta-3369	
< 180	283 - 2	"	2	Weisler (1989)	Beta-2277	
< 140	270 - 13	"	2	Weisler (1989)	Beta-2279	
< 120	261 - 24	"	2	Weisler (1989)	Beta-3362	
110 +/- 50	273 - 0	Coastal Kawela Series	2	Weisler (1989)	Beta-3802	
290 +/- 60	456 - 294	"	2	Weisler (1989)	Beta-7563	
710 +/- 50	688 - 665	"	2	Weisler (1989)	Beta-7564	
320 +/- 70	370 +/- 70	Upland Kaunakakai Series	2	Weisler (1989)	Beta-27390	
560 +/- 110	600 +/- 110	"	2	Weisler (1989)	Beta-27391	
160 +/- 60	30 +/- 60	"	2	Weisler (1989)	Beta-27392	
350 +/- 80	380 +/- 80	"	2	Weisler (1989)	Beta-27393	
1450 +/- 60	1000 +/- 60	Kalama'ula Series	2	Weisler (1989)	Beta-11172	
400 +/- 60	170 +/- 70	"	2	Weisler (1989)	Beta-11171	
300 +/- 60	200 +/- 60	"	2	Weisler (1989)	Beta-11168	
70 +/- 50	< 120	"	2	Weisler (1989)	Beta-11169	
< 190	< 190	"	2	Weisler	Beta-	

				(1989)	11170	
500 +/- 70	540 +/- 70	Kipu Series	2	Weisler (1989)	Beta-27115	
610 +/- 60	640 +/- 60	"	2	Weisler (1989)	Beta-27116	
1290 +/- 60	1100 +/- 60	Kaluako'i Series	2	Weisler (1989)	Beta-20906	
360 +/- 50	505 - 315	"	2	Weisler (1989)	Beta-13743	
260 +/- 50	170 +/- 50	"	2	Weisler (1989)	Beta-13744	
< 160	277 - 7	"	2	Weisler (1989)	Beta-5700	
170 +/- 60	160 +/- 60	"	2	Weisler (1989)	Beta-20881	
Table 9 (cont.) 550 +/- 300	721 - 0	"	2	Weisler (1989)	M-767	
425 +/- 150	620 - 310	"	2	Weisler (1989)	M-1183	
GEOLOGICAL SAMPLES						
3370 +/- 70	N/A	Kawela	N/A	Weisler (1989)	Beta-5122	
410 +/- 60	N/A	Puko'o	N/A	Weisler (1989)	Beta-12903	
27,000	N/A	Kalani	N/A	Weisler (1989)	GX-2672	
4870 +/- 100	*N/A*	*Northwest Kalaupapa Peninsula*	*N/A*	*Fletcher (1992)*	*Beta-55476*	
4640 +/- 70	*N/A*	"	*N/A*	*Fletcher (1992)*	*Beta-55474*	
4730 +/- 80	*N/A*	"	*N/A*	*Fletcher (1992)*	*Beta-55475*	
4060 +/- 70	*N/A*	"	*N/A*	*Fletcher (1992)*	*Beta-55473*	

method has fallen out of favor with Hawaiian archaeologists.[35] Currently, few radiocarbon samples have been securely dated to the prehistoric era. Overall, a larger sample of dates from a wider range of sites would give us a better idea of the chronology of Kalaupapa.

Age (A.D.)	**Series/Location**	**Reliability** 1- best 2- ave. 3- poor	**Source**	**Lab-ID**
1850 +/- 19	*Kalaupapa Peninsula*	*3*	*Barrera (1978)*	*4091*
1772 +/- 15	"	*3*	*Barrera (1978)*	*4093*
1755 +/- 26	"	*3*	*Barrera (1978)*	*4094*
1753 +/- 27	"	*3*	*Barrera*	*4095*

[35] See Hommon (1993) for a review of the use of volcanic glass dating by Hawaiian archaeologists. See also Barrera's (1978) Hospital Project, Project Summaries, Appendix I, this volume.

			(1978)	
1773 +/- 34	"	*3*	*Barrera (1978)*	*4096*

Table 10 - Table of Volcanic Glass Dates Ranking Reliability*
(*dates from Kalaupapa NHP are in italics)

Absolute dates are not the only method archaeologists use to date sites. Historic records and the relationship between archaeological features and deposits can give a relative date of construction, use, or abandonment (Harris 1979). For example, since agricultural field walls seem have been robbed of stone to build the Great Wall, we know the construction of this feature must have taken place later in time than the use of the field walls, relatively speaking. Historical records give us another line of evidence to relatively date the Great Wall. A sketch map of the wall made during the historic era tells us it must have been built prior to A.D. 1894 (Monsarrat 1894) (see above).

The excellent condition of the archaeological landscape in Kalaupapa and the results of past excavations hold promise for future work. To refine and improve the current temporal data set research should concentrate on: (i) the date of occupation of early sites; (ii) agricultural development, specifically the expansion and intensification of the large-scale dryland field systems during the traditional Hawaiian and early historic periods; and (iii) the historical development of settlement and community patterns. Based on current methods, the greatest improvements to the body of chronological data for Kalaupapa will come from a program of excavation of a range of types of archaeological sites. Wood charcoal identification and radiocarbon dating augmented with relative methods of dating would be ideal.

Environment and Paleoenvironmental Reconstruction
In general, data sets generated by research on natural resources can be very useful for understanding the past if the spatial and temporal scale of information is relatively fine-grained. For example, efforts to reconstruct the past environment of the Kalaupapa Peninsula and its adjacent valleys has in the past brought together people interested in better understanding natural and cultural resources in the park. So far, projects have exclusively concentrated on exploring natural deposits within the Kauhakō Crater Lake. The lake by all estimations should be an ideal location to find undisturbed layers of sediment that could be sampled by coring; however, as of now none have been discovered (see Footnote 5). Currently there is only one published paleoenviromental core from Moloka'i Island (Denham *et al.* 1999:54). The analysis of the core revealed the landscape had undergone detectable changes in plant communities due to human agents. Kalaupapa NHP is in a good location for future paleoenvironment research due to its diversity of plant communities and history of occupation and land use.

Ethnohistory and Archaeology
History, by definition, is written only by the hand of literate people in the past and reflects the biases of the author in content, precision, and accuracy. As such, the field of "ethnohistory" has developed to bring to light topics and stories relating to the historically under-represented.

Recent works by anthropologist Pennie Moblo (1996, 1998, 1999), primarily using archival sources, are excellent examples of thoughtful historical research on the leprosy settlement at Kalaupapa. Moblo (1996, 1998, 1999) has specifically addressed the history of Kalaupapa in terms of race and leadership, as well addressing the history of leprosy policy. Recently joining Moblo in revisiting the history of Kalaupapa through a critical lens is historical geographer Douglas Herman (2001). As Kirch and Sahlins (1992) have demonstrated, archaeology can provide a useful line of evidence in such ethnohistoric studies.

The worldwide attention Kalaupapa settlement has had virtually since its foundation tends to overshadow the story of the original occupants of the area (*kama'āina*). The NPS web site describing the Kalaupapa National Historical Park (www.nps.gov/kala) on the other hand is an example of presenting a balanced history including both groups:

> Two tragedies occurred on the Kalaupapa Peninsula on the north shore of the island of Moloka`i; the first was the removal of indigenous people in 1865 and 1895, the second was the forced isolation of sick people to this remote place from 1866 until 1969. The removal of Hawaiians from where they had lived for 900 years cut the cultural ties and associations of generations of people with the `aina (land). The establishment of an isolation settlement, first at Kalawao and then at Kalaupapa, tore apart Hawaiian society as the kingdom, and subsequently, the territory of Hawai'i tried to control a feared disease. The impact of broken connections with the `aina and of family members "lost" to Kalaupapa are still felt in Hawai'i today.

Through research, planning, stewardship, cultural resource managers have managed to tell the story of the lives of indigenous people of Kalaupapa while at the same time paying respect to the direct connection of the patient community and the people of Hawai'i to the historic settlement.

Chapter 5

RECOMMENDATIONS

The following recommendations are presented in terms of suggested directions for future research and improvements for cultural resource management. All proposed projects are described in terms of goals, costs, and benefits. Managerial recommendations are primarily based on challenges specific to the park. Projects that park managers are currently working on are briefly discussed.

Challenges for Cultural Resource Management

Cultural resources management in all parks has three basic components: research, planning, and stewardship (see Appendix III). These components work together in projects aimed toward preserving, maintaining, and interpreting cultural resources. Projects undertaken in Kalaupapa NHP regularly face transportation challenges due to the remoteness of the park. In addition, the range of facilities and equipment for archaeological research, while steadily improving, are subject to the general space crisis felt as the growth of the park outstrips the available housing.

Summary of Archaeology in Kalaupapa NHP

Archaeologists have intensively surveyed an estimated 6.4 % (690 acres/279.5 ha) of the park with an additional 7.6 % (820 acres/332 ha) surveyed at reconnaissance level. Most projects have taken place on the peninsula rather than the valleys or other remote points. A total of 616 sites have been recorded, some including hundreds of small features. The landscape has been extensively modified for agriculture during the prehistoric and historic eras. Overall site density is high and preservation of archaeological sites is of the highest quality. The few excavations that have been conducted suggest a continuous record of human occupation for at least the past 800 years. In addition, Kirch (2002) has recently recommended four avenues of future research in the park: developing the chronology of human occupation, origins and development of the Kalaupapa Field System, the rise of the Ko'olau Polity, and early historic transformations.

Recommendations

Below is a list of 12 recommended actions and projects to improve cultural resource management at Kalaupapa NHP. Each is ranked in terms of costs (high, medium, low), benefits (A = research, B = planning, C = stewardship), and priority (immediate, short term, long term), then described in detail. Overall, a full-time archaeologist on staff at the park is likely to be of the greatest benefit to the program.

Table 11 - Recommended Actions and Projects

Action/Project	Costs	Benefits	Priority Ranking
Hire Archaeologist	High.	A, B, and C.	Immediate.
Research Design	Medium.	B.	Short term.
Site Stabilization and Vegetation Clearing	Low.	C.	Immediate.
Table 11 (cont.) Public Information and Interpretation	Low.	C.	Short term.
Cooperative Research	Medium.	A.	Short term.
Base Map	Medium.	A, B and C.	Short term.
Database Development	Low.	A, B, and C.	Long term.
Survey (reconnaissance)	Medium.	A, B, and C.	Short term.
Survey (intensive)	High.	A, B, and C.	Long term.
Historic Archaeology	High.	A, B, and C.	Long term.
Paleoenvironmental Research	High.	A.	Long term.
Site Monitoring Program	Medium.	B, C.	Long term.

Actions and Projects

HIRE ARCHAEOLOGIST
Goal: Hire cultural resource staff archaeologist.
Small, remote parks in the Pacific Islands Cluster have benefited from increased presence of on-site archaeologists over the years. These parks have seen immediate improvements in the identification of cultural resource needs. On-site archaeologists also aid in designing, administering, and conducting projects. A park archaeologist will also benefit all parks in the cluster through joint projects. Park managers are currently in the process of making this recommendation a reality.
Costs: Salary, housing.
Benefits: Improve the ability of the staff to manage cultural resources.

RESEARCH DESIGN
Goal: Create park-specific research design.
All archaeologists agree there are no hard-and-fast rules on how to design archaeological research. Where to survey, how to survey, where to excavate, and how to excavate are all determined by a research design. Research design plays a role in virtually everything an archaeologist does from before fieldwork through analysis. A recent draft of guidelines for archaeological curation facilities for the State of Hawai'i developed by the Society for Hawaiian Archaeology (http://www.sha.hawaii.edu/guidelines.htm) defines succinctly an archaeological research design:

Research Design--A written plan that provides the rationales, goals and methods for investigations of archaeological sites including, but not limited to:

1. The scientific and anthropological reasons for pursuing the proposed investigation.

2. Hypotheses to be tested and the questions to be asked of the data; that is, what the investigator hopes to determine about past human activity, including such items as occupational sequence, settlement patterns, subsistence strategies, chronology, trade and social networks, alliances, etc.

3. The explicit manner in which data will be collected and analyzed, and how these relate to the research goals.

4. Plans for consultation with affiliated Native Hawaiians, and/or other cultural groups.

5. Inferential techniques to be used to interpret the data.

6. Schedule and work effort estimates.

The most recent SAIP report recommends, among other things, writing a park-specific research design (Wells and Hommon 2000). The proposed research design project (KALA-C-096) should be a high priority since it will give managers an explicit plan for future work. One goal of the project should be to develop detailed project statements to be proposed for internal and external sources of funding for research at Kalaupapa (i.e., AMMA, NSF). The research design should also develop a plan in regards to the nomination of sites to the Hawaiian and National Register of Historic Places.
Costs: Personnel, report production.
Benefits: The park-specific research design will outline how to proceed with future projects.

SITE STABILIZATION AND VEGETATION CLEARING
Goal: Stabilize archaeological sites.
Kaupikiawa Cave (50-60-03-312) needs to have its floor permanently stabilized by filling in excavation test pits with clean, white sand to slow erosion of unexcavated deposits. The pits have been open since 1968 and Radewagen and Neller (ms.) first noted the need to stabilize the site in 1996. Kirch (2002) and his crew temporarily stabilized the open test pits recently. A small crew could complete the work required to permanently stabilize the site in a single day. White, or light colored sand would be ideal since it will unambiguously mark which parts of the cave site have been previously excavated. Natural resource staff should be consulted in the planning stage of the project since coastal environments in Kalaupapa have suffered in the past from sand mining. Since a known archaeological site will be augmented, cultural resource management personnel are required to be present during the stabilization.

Another activity that affects site stabilization is vegetation clearing. When sites are cleared, secondary vegetation is likely to grown back and rapidly destabilize sites made of stone architecture (Somers 1992). Future projects - archaeological or otherwise - should take into consideration the long-term effect of clearing on sites. Continual maintenance of cleared sites may be the best way to ensure they will not degrade over time. The broad distribution and excellent condition of many sites in the park simply requires cultural resource managers to carefully plan and to predict the effects of vegetation clearance on individual sites.
Costs: Personnel.

Benefits: Preserve archaeological sites for future research and interpretation.

PUBLIC INFORMAION AND INTERPRETATION
Goal: Create more public awareness of the archaeology of Kalaupapa.
The park is in a position to take an active role in publishing material not just for archaeologists, but also the general public. In the future, books, magazines, and newspaper articles that focus solely on Joseph deVeuster (Father Damien) will continue to be published. The NPS has the opportunity to present Kalaupapa, to quote Gary Somers (1985), as "more than a leprosy settlement." The current NPS web site (www.nps.gov/kala) is a good example of presenting more balanced historical information for the public. One way the park may consider reaching the public is through publishing a new brochure on the archaeology of the park. Other avenues of increasing public awareness include outreach projects with local communities and additional information for people visiting the park.
Costs: Personnel, publishing costs.
Benefits: Greater pubic awareness of the early historic and prehistoric cultural resources in the park.

COOPERATIVE RESEARCH
Goal: Support joint archaeological research.
Archaeologists from outside the park should continue to be encouraged to propose and undertake research at Kalaupapa with NPS support in-kind. This trend can be traced back to Gary Somers (1985:119), formerly of the PAAR, who recommended:

> Archaeologists from other institutions, such as the Bishop Museum, should be encouraged to cooperate with the National Park Service and to conduct archaeological research at Kalaupapa to assist the National Park Service in its attempts to understand and interpret the prehistory and early history of the park.

In the recent past the author as well as Patrick Kirch of the Oceanic Archaeological Laboratory (OAL) at the University of California, Berkeley, have with NPS sponsorship both been allowed to conduct research in the park (Kirch 2002; McCoy 2002a). Joint research, often shifting the burden of research design development, personnel, laboratory facilities, and other costs onto the outside agency, should continue to be encouraged and closely monitored.
Costs: Use of facilities at the park, monitoring.
Benefits: Cooperative research can lead to greater understanding of cultural resources.

ARCHAEOLOGICAL BASE MAP
Goal: Create digital map of features visible on air photos taken between 1949 and the present.
An excellent hand-drawn base map by Melia Lane-Kamahele (PISO) has shown the method of mapping archaeological features from air photos to work well on Kalaupapa Peninsula, but not in valleys. Ultimately, this project is a major step toward giving cultural resource managers the ability to assess areas quickly, reliably, and efficiently. In addition, air photo and GPS maps have

been useful in places like North Kohala, Hawai'i Island to derive a sequence of dryland field development (Ladefoged, *et al.* in press; McCoy 2000).
Costs: Personnel, purchasing negatives, computer equipment.
Benefits: General knowledge of spatial distribution of archaeological features without vegetation clearing and survey.

DATABASE DEVELOPMENT
Goal: Create central archaeological database of sites and material.
The park has experimented with different archaeological site databases designed for management purposes like the List of Classified Structures (LCS) and the ASMIS database. These top-down models were designed for management purposes and not surprisingly do not represent the local cultural resources in Kalaupapa well in practice. In general, other than for planning and management purposes, archaeologists do not work with site databases at a very large scale since contextual meaning of sites and artifacts are easily lost as one increases scale. A digital archaeological database of spatial, temporal, and formal site data is a real possibility at Kalaupapa. The size of the park and the quality of preservation of the archaeological record make database development highly beneficial for research and management at relatively low cost. Major challenges for this project include: the definition of sites, the incorporation of existing site data, and the incorporation of new data. Software already in use by the park, like ArcView© and Access© are promising platforms to house the database.
Costs: Personnel.
Benefits: A general database combined with an archaeological base map will allow managers to meet Section 106 responsibilities quickly, reliably, and efficiently.

RECONNAISSANCE SURVEY
Goal: Reconnaissance survey in remote areas of the park.
The first step in describing the archaeological record in hard-to-reach places like Upper Waikolu Valley, Nihoa Landshelf, offshore islands, and remote points, is reconnaissance survey. These areas can have a rich, well-preserved archaeological record, as Kirch (2002) found in his surveys of Nihoa Landshelf and Waikolu Valley. Proposed expansion of the park boundaries to include large, inaccessible, windward valleys will require similar surveying. Adding archaeologists onto existing backcountry projects is recommended to keep costs down.
Costs: Personnel, field equipment, and report publication cost.
Benefits: A better knowledge of the archaeological landscape will allow managers to meet Section 106 responsibilities quickly, reliably, and efficiently.

INTENSIVE SURVEY
Goal: Intensive survey of important sites and areas at risk of being disturbed either by human or natural agents.
As a result of previous surveys, cultural resource managers have a good idea of the location of many important sites in the park. Intensive survey and mapping of sites such as temples (*heiau*) is the first step toward interpreting these sites for the public.
Costs: Vegetation clearing, survey, mapping, personnel, and report writing.

Benefits: A better knowledge of the archaeological landscape will allow managers to meet Section 106 responsibilities quickly, reliably, and efficiently.

THE ARCHAEOLOGY OF HISTORY, Patients and Kama'āina *Communities in the Early Historic Era (1866-1895)*
Goal: Improve knowledge of early historic era though archaeology and archival research.
The historic settlements of Kalawao and Kalaupapa are the main focus of historical interpretation in the park. However, during the early days of the settlements the last of the original inhabitants of the area (*kama'āina*) lived along side the first patients. A combination of archival and archaeological datasets could be used to track the relationship between the first patients and the people (*kama'āina*) displaced between 1866 and 1895. It may be useful to concentrate on archaeological domestic features like households, as well as communal places. In addition, the historic renegade community of people with the disease on Kaua'i Island, who lived in self-imposed isolation, may provide an interesting comparative body of data.
Costs: Personnel, archival research, field equipment, and report production.
Benefits: A clearer picture of the relationship between the patients, about whom so much has been written, and their neighbors.

PALEOENVIRONMENTAL RESEARCH
Goal: Identify changes in vegetation communities in the past.
Park managers have recently submitted a proposal to re-initiate paleoenvironmental research in the park. Past efforts include failed attempts at drawing sediment cores from Kauhakō Crater Lake (see Footnote 5). New methods and strategies are clearly needed to reconstruct the past natural environment.
Costs: Personnel, field equipment, laboratory analysis, and report production.
Benefits: Paleoenvironmental research can benefit both management and research in the natural and social sciences though an understanding of the long-term ecological trends.

SITE MONITORING PROGRAM
Goal: Monitor condition of known archaeological sites in the park.
This overview has demonstrated that the park has within its boundaries many well-preserved archaeological sites. Natural landslides in the colluvium slope zone have the potential to gradually cover sites. In addition, strong winds and waves may damage sites on the coast. Therefore, sites that have been recorded by previous archaeological surveys should be occasionally visited to assess their condition.
Costs: Personnel, documentation equipment (cameras, etc.).
Benefits: Improved ability to protect sites from damage due to natural processes.

Projects in Progress
All of the recommended actions and projects described above have been or are in some way currently being addressed in the park. The request for a permanent archaeologist position at the park was included in a recent proposal for an increase in the annual base funding for funding year 2007.

The SAIP originally identified the potential benefit of a park-specific research design. Site stabilization and vegetation clearing are addressed in a draft project statement that would create a plan for alien plant clearing around archaeological sites. Public information and interpretation are part of the daily practice of cultural resources staff. Gary Somers (formerly of PAAR) first advocated cooperative research at the park almost twenty years ago. Melia Lane-Kamahele (PISO) has already demonstrated the utility of aerial photographs to create a base map of archaeological sites in the park. The process of database development is an ongoing challenge addressed by park managers. Nearly all of the existing draft project statements identify an area of the park in need of survey. The Kalawao Settlement Survey project currently in review is a necessary first step to understanding the lives of people living in the area during the early historic period. Park managers are currently trying to re-initiate paleoenvironmental research in park. Site monitoring is a regular part of the stewardship of sites. Finally, an indefinite contract on future projects is currently in the planning process. The contract would help put park managers in a good position to effectively address a large number of actions and projects.

APPENDIX I. Project Summaries

Project Title: Pearson *et al.*'s (1971) Excavations at Kaupikiawa Cave

Dates of Fieldwork: 1966-67
Author(s): Richard Pearson, Jean Hirata, Loretta Potts, and F. Harby
Personnel: Richard Pearson and University of Hawai'i students.
Methods: Test excavation.

Descriptive Summary: Richard Pearson's excavation at Kaupikiawa Cave (50-60-03-312) in 1966-67 was the first profession archaeological project in Kalaupapa. After being led to the site by resident Richard Marks, Pearson and his students from the University of Hawai'i, Mānoa excavated seven test pits over two brief trips. Generally the team excavated in arbitrary 3-inch levels with some attempt to follow natural levels where visible. Both dry screening and wet screening nearby in the sea were employed; however, the screen size used is unknown. A preliminary report on the analysis of the midden excavated (Hirata and Potts 1967) and one publication summarizing the fieldwork and analysis resulted from this project (Pearson *et al.* 1971). All artifacts are reported to be in the collections of the Bishop Museum, Honolulu. This site was later placed on the Hawaiian Register of Historic Places (P.C McCoy 1974b, see below). Years later, Weisler (1989) and Kirch (2002) returned to this site for further analysis (see Chapter 4 above, ," for a discussion of these later findings).

Time period(s): Prehistoric through historic.
Number of sites and features: 1 site; several features.

Types of sites and features: 1 rockshelter habitation site.
Maps and Photographs: Figures 1 (location map) and 2 (sketch map) in Pearson *et al.* (1971); see also Hawai'i Register of Historic Places Form for detailed map; photographs, if taken, are not in NPS files.
Collections: Artifacts in collections of B.P. Bishop Museum.
Absolute dates: See Weisler (1989) and Kirch (2002)
National Register of Historic Places significance of sites: Site is not assessed for register significance by the authors, but is now on the Hawai'i Register of Historic Places.
Published and unpublished source material referenced: Kirch (2002); Hirata and Potts (1967); P.C. McCoy (1974b); Pearson *et al.* (1971); Weisler (1989)

Project Title: Summers' (1971) Overview of Sites on Moloka'i Island

Date of Publication: 1971
Author(s): Catherine C. Summers
Methods: Archival based.

Descriptive Summary: Overview of known archaeological sites, circa 1971, and oral history on Moloka'i Island. Major emphasis placed on sacred sites. For Kalaupapa, Summers' main sources of information are Stokes' (1909) reconnaissance survey and McHenry's (1954) notes and correspondence, but other sources consulted include: Monsarrat (1894), Puna (1877), Thurm (1909), Fornander (1916-17), Arning (1931), and Phelps (1937), (see Summers 1971:188-196). These archival sources can all be found in the B.P. Bishop Museum Archives, Honolulu. All archaeological studies on Moloka'i Island begin with this landmark book.

Time period(s): Prehistoric through historic era.
Number of sites and features: 25 sites, unknown number of features.
Types of sites and features: 15 *heiau* and names of *heiau*, 4 *ko'a*, 1 *ko'a* complex, 1 cave site, 1 *holua* slide, 1 house site, 1 sacred area, and 1 household and agricultural complex; unknown number of features.
Maps and Photographs: Foldout: Map of Moloka'i; 2 photographs and 1 sketch map reproduced from Stokes (1909).
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Sites are not assessed for register significance by the author, but many are now on the Hawai'i Register of Historic Places.
Published and unpublished source material referenced: Arning (1931); Fornander (1916-17); McHenry (1954); Monsarrat (1894); Phelps (1937); Puna (1877); Stokes (1909); Summers (1971); Thurm (1909)

Project Title: 1974 State Site Inventory by Bishop Museum

Dates of Fieldwork: 1974
Author(s): Robert D. Connolly, III, and Patrick C. McCoy
Personnel: Robert D. Connolly, III, Steve Clark, Patrick C. McCoy, Aki Sinoto, and possibly others.

Methods: Site relocation survey.

Descriptive Summary: In 1974 as part of the statewide archaeological site inventory several archaeologists from the B.P. Bishop Museum visited Kalaupapa to relocate and record sites listed in Summers' (1971) overview (see above). Only five sites within the Kalaupapa NHP were relocated and nominated to the Hawai'i Register of Historic Places. Very few original records of this project are on file with the NPS or in general circulation. At least one of these sites was plotted in the wrong location, a mistake that unfortunately, nearly twenty years later, helped intensify a misunderstanding about the site into a serious controversy (Goodwin 1994a:9, also see below). Even Connelly himself has characterized the quality of the information gathered by the brief survey as unreliable (Goodwin 1994a).

Time period(s): Prehistoric through historic period.
Number of sites and features: 5 sites, unknown number of features.
Types of sites and features: 1 cave site, 1 rockshelter habitation, 1 *ko'a*, 1 household and agricultural complex, and 1 *heiau*.
Maps and Photographs: Only one site form (Kaupikiawa Cave, 50-60-03-312) on file with NPS. Site locations are plotted on Summers' (1971) map of the island. Photos taken but not published.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Sites are not assessed for register by the authors, but are now on the Hawai'i Register of Historic Places. There are likely significant mistakes in the data on file with the State Historic Preservation Division (SHPD).
Published and unpublished source material referenced: Connolly (1974a, 1974b); Goodwin (1994a); P.C. McCoy (1974a, 1974b, 1974c); Summers (1971)

Project Title: Barrera's (1978) Hospital Project

Dates of Fieldwork: 1977-8
Author(s): William Barrera, Jr., Maury Morgenstein
Personnel: William Barrera, Jr. and field crew.
Methods: Test excavations.

Descriptive Summary: Prior to hospital construction in Kalaupapa, archaeologist William Barrera, Jr. was contracted by the company in charge of the project to provide cultural resource management. Initial shovel test pits (n=13) suggested *in situ* prehistoric era deposits could be present. In total, 26 one-meter-square pits were excavated to find that the deposits at site 50-60-03-515 were "almost entirely obliterated by historic earth modifications" (Barrera 1978:10). The mixed historic and prehistoric deposits at the site unfortunately tell us little about the past. However, Barrera's (1978) archaeological methodology is worthy of note. In addition to his midden analysis to try and address the past subsistence economy, he employed the expertise of geologist Maury Morgenstein (1978) to help advance the method of dating sites by basaltic glass hydration. This method has fallen out of favor with Hawaiian archaeologists due to the effects local conditions have on results compared to the relatively reliable radiocarbon

dating method. If the hydration dates are correct, or near correct, the dates of use of the site suggest the historic-era use of flaked volcanic glass (see also Hommon 1993).

Time period(s): Late prehistoric through historic.
Number of sites and features: 1 site, 4 features.
Types of sites and features: Unknown site type, features include: 1 historic cesspool, 2 possible fire pits, and 2 other pits. Report is at times unclear regarding features.
Maps and Photographs: Figures 1-3 are plan view maps of site and excavation units, Figures 4 and 5 are photographs of excavation units.
Collections: 47 pre-contact style artifacts. Location of material is unknown.
Absolute dates: 5 dates from basaltic glass hydration on material recorded from features range from A.D. 1850 +/-19 to 1753 +/-27.
National Register of Historic Places significance of sites: Site is not assessed for register by the author, but is now on the Hawai'i Register of Historic Places.
Published and unpublished source material referenced: Barrera (1978); Hommon (1993); Morgenstein (1978)

Project Title: Water Pipeline Improvement Projects

Dates of Fieldwork: 1982-84
Author(s): Gary F. Somers
Personnel: Gary F. Somers, Edmund J. Ladd, and field crew.
Methods: Intensive survey and monitoring.

Descriptive Summary: Shortly after the creation of the Kalaupapa National Historical Park, the NPS and State of Hawai'i Department of Health began to improve the existing water system. In total these improvements included constructing a new well, pump, access road, and tanks in Waihanau Valley as well as extensive reconstruction of the pipeline between the well and town, within the town, and years later, along the road from town to the airport (see "The Neller Files" below). National Park archaeologists Gary F. Somers and Edmund J. Ladd directed three intensive archaeological surveys covering 350 acres (142 hectares) ahead of construction to meet Section 106 requirements. The research design and methodology employed in this first modern, professional archaeological survey at Kalaupapa is discussed in detail by Somers (1985) in the project's final published report. The project area can be broken into two sections: (1) within the Waihanau Valley and in the "bottomlands" between the valley and town, which covered 195 acres (79 hectares) along Damien Road, and (2) within the town itself, which covered a total of 138 acres (56 hectares). Archaeological sites were unexpectedly dense and distributed continuously over the entire the landscape where it had not been bulldozed or built upon. Thus, after over eight months of fieldwork, Somers (1985:103) wrote:

> Two conclusions are obvious when one looks at the results of the survey. First, the peninsula was intensively utilized prehistorically and historically and archaeological features can be expected to be found anywhere and everywhere. Second, bulldozing and land clearing have destroyed many

archaeological features and have distorted the archaeological record in and around Kalaupapa Settlement and along the road and in the pastures on the way to Kalawao.

Rather than assigning each site and feature numbers and discussing them individually, Somers (1985:47-101) summarized the archaeological landscape by features found in each grid unit. These descriptions were further summarized in a table indicating the presence of feature types in each 1-hectare grid unit of the survey (ibid: Table 2) and a table ranking the frequency of occurrence of feature types across the 88 grid units surveyed (ibid: Table 3). Agricultural features (terrace, flat area, cleared area, circular enclosure, modified boulder field and artificial pit in boulder area) were judged by Somers (1985:116) to be the "most impressive archaeological features in terms of variety and extent." This survey allowed the first archaeologically based assessment of the nature of the ancient agriculture in Kalaupapa. However, perhaps the most significant discovery was a large unrecorded *heiau* and nearby multi-enclosure structure that "may have been associated with the god Lono and the Makahiki festival" due to their location just to the east of the boundary between Makanalua and Kalawao *ahupua'a* (Somers 1985a:116; see also McCoy 2002a). Other feature types found included: broken walls, stone alignments, stacked stone walls, stone mounds, rubble mounds, depressions, walled enclosures, core-filled walls, graves, stone platforms, stone pavements, a cemetery, circular pits, walled shelters, cupboards, multi-enclosure structures, *ahu*, and *imu*. Another significant discovery was the confirmation that a *heiau* noted by Stokes (1909) in Makanalua *ahupua'a* - "Site 295 Heiau," in Summers (1971) - had been destroyed sometime over the 76 years since it was first recorded.

In addition to the extensive archaeological survey, the final report on this project is the first to bring to light the extensive pre-settlement occupation of Kalaupapa, the fascinating transition period when the traditional Hawaiian community (*kama'āina*) still lived along side the first people sent to the settlement, as well as making recommendations for future research and cultural resource management in Kalaupapa NHP (Somers:118-9).

Time period(s): Prehistoric through historic.
Number of sites and features: Hundreds.
Types of sites and features: Many agricultural features, stone walls, a few habitational features, 1 *heiau*, and 1 multi-enclosure structure.
Maps and Photographs: Very good published plan view maps of survey area (published versions are 75% reduced from original making them about 1:2,000 scale), aerial photos, but no site photos.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Report does not address the significance of sites in terms of the register, but many likely qualify.
Published and unpublished source material referenced: Somers (1982, 1983a, 1983b, 1983c, 1984, 1985, 1987, 1988, 1992); Somers and Ladd (1983)

Project Title: Weisler's Radiocarbon Assessment of Moloka'i Island

Dates of Fieldwork: 1984
Author(s): Marshall Weisler
Personnel: Marshall Weisler and Gary F. Somers.
Methods: Laboratory with field check of site.

Descriptive Summary: Marshall Weisler's (1989) review article on radiocarbon dates of Moloka'i and the dating of material from Pearson's excavations of Kaupikiawa Cave (50-60-03-312) is discussed at length above. The results of a recent re-evaluation Kaupikiawa Cave (50-60-03-312) by Patrick Kirch (2002) suggests the claim of nearly a millennium of occupation based on the findings reported in Weisler (1989) may not be valid (see above Chapter 4, "Landscapes in time: The Kalaupapa Chronology").

Time period(s): Prehistoric through historic.
Number of sites and features: 1 site; several features.
Types of sites and features: 1 rockshelter habitation site.
Maps and Photographs: No additional site maps. No photographs or soil profiles, although locations of samples are described.
Collections: Samples taken from collections in the B.P. Bishop Museum.
Absolute dates: 3 radiocarbon dates.
National Register of Historic Places significance of sites: N/A.
Published and unpublished source material referenced: Weisler (1989); Somers (1985); Kirch (2002)

Project Title: Waikolu Valley Wells Development Project

Dates of Fieldwork: 1986-1994
Author(s): Martha Yent
Personnel: Martha Yent, Gary F. Somers, and Earl "Buddy" Neller.
Methods: Reconnaissance and intensive survey.
Descriptive Summary: In 1986 Martha Yent (Hawai'i State Parks) completed a one-day survey in the upper Waikolu Valley ahead of the construction of three new water pumps downstream of existing pumps on the Waikolu Stream on behalf of the Department of Water and Land Development (DOWALD). Yent's (1986:12) brief manuscript report - the first modern archaeological survey of the valley - describes the extensive modification of the area for agriculture at least up to 700 feet above sea level. Six intact agricultural features (five terraces and one water control feature) near the proposed well sites, as well as several previously disturbed areas, were sketch mapped and described. The report recommended only that a buffer be set around these features so they would not be disturbed by well construction. In 1988 Gary F. Somers visited the valley to inspect the area. Somers found that the construction site of one of the wells had been moved to a drastically different spot than had been previously agreed upon and surveyed by Yent (1986) (Baldwin 1988; Neller 1994). An area 40 meters by 40 meters had been disturbed without archaeological survey in a location that included "a series of agricultural terraces with nicely faced retaining walls. A portion of one of the terraces

was damaged by earth moving" (Baldwin 1988:2). At one of the other well sites the recommended buffer zone had clearly not been maintained.

Time period(s): Prehistoric through historic.
Number of sites and features: 2 sites, 6 features.
Types of sites and features: 5 agricultural terraces and 1 water control feature.
Maps and Photographs: Location and site sketch maps (Yent 1986) and areas disturbed by construction (Baldwin 1988).
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Not evaluated.
Published and unpublished source material referenced: Baldwin (1988); Neller (1994); Somers (1988); Yent (1986)

Project Title: Airport Improvement Project

Dates of Fieldwork: 1988-1994
Author(s): J. Steven Athens, Thegn N. Ladefoged, and Conrad "Mac" Goodwin.
Personnel: Same, plus field crew.
Methods: Reconnaissance survey (Part I), intensive survey, test excavations, laboratory, and radiocarbon dating (Part II), excavation and laboratory (Part III), and monitoring (Part IV)

Descriptive Summary: A project sponsored by the State of Hawai'i's Department of Transportation to improve Kalaupapa Airport and bring it in line with federal aviation safety codes set in motion some of the most scientifically significant archaeological work undertaken at Kalaupapa. The archaeological research progressed in stages from reconnaissance survey, to intensive survey and test excavations, to full excavation of sites, to monitoring of construction activities. Although work is always tailored to the project at hand, these stages are typical of cultural research management-oriented archaeological projects worldwide.

Part I:
In 1988, J. Steven Athens and Michael Kaschko of the not-for-profit contract archaeology group International Archaeological Research Institute, Inc. (IARII), in a brief reconnaissance survey, identified 33 previously unrecorded features in the area around the airport. These features on the northern tip of the peninsula were numbered, described, photographed, and had their locations indicated on an overall map of the study area (see Athens 1989: Figure 2). Comparing their initial findings to what Somers (1985) found during the pipeline project in the southern portion of the peninsula, Athens (1989:12) noted some differences in the distribution and form of features:

> For one thing, the features within the project area appear as more or less discrete entities. They do not form virtually the continuous mass of stone alignments, mounds, etc. that were recorded by Somers. Another difference appears to be in the number of shelter features. . .[which] appear to be rare in the south part of the peninsula, and relatively common in the north.

Athens (1989:12) goes on to note differences in the type and distribution of agricultural features:

> In the project area many of these [agricultural features] are in the form of parallel linear agricultural alignments (see Photos 3 & 4), which appear to be virtually absent on the south side of the peninsula.

Since Athens' (1989) survey indicated construction would certainly alter the archaeological record in the undisturbed areas around the airstrip, an inventory-level survey and test excavations were recommended for those to be impacted.

Part II:
In 1989, a four-person team of IARII archaeologists, led by Thegn N. Ladefoged, over the course of a month mapped and recorded 40 sites (49 features) and completed 23 small test excavations (11 square meters in total) in 21 features at the western and eastern ends of the Kalaupapa Airport (50-60-03-1801 to -1840). The location of these features can be seen on the report's study area map derived from aerial photographs. Features were classified by probable functions in the past including: shelter (n=27), residential (n=6), boundary enclosure (n=1), agricultural (n=12), cupboards (n=2), animal enclosure (n=1), possible shrine (n=1), boundary alignment (n=2), and foundation (n=1). Ladefoged (1990: Table 1) also lists the quantity and morphological classifications of architectural components of each feature. Although most features include only a handful of components, some agricultural and residential features include many small stone alignments for garden plots (i.e., Feature 5B: 1 enclosure, 178 alignments).

Test excavations were conducted to refine interpretations and recover material to date the features. Hand excavations used both natural layers and arbitrary levels within natural layers. Virtually all deposits were screened through nested 1/4 and 1/8 inch screens.

The most significant finding of the test excavations was the discovery of stone alignments buried up to 85 cm below the modern ground surface within two excavation units in a large enclosed dry land field (Feature 5b and Feature 8). Of the seven radiocarbon dates from identified wood charcoal recovered during excavations, most range from modern to the late prehistoric era, but one early date of 1281-1520 cal A.D. (97% probability) from one of these excavation units suggests a long chronology of agricultural development in the area. Virtually all of the locations of excavation units were indicated on feature maps in the final report. However, one out of the two units that showed evidence of buried architectural components unfortunately was left off the overall map. By combining excavation and survey evidence Ladefoged (1990:182) writes:

> There are two main types of agricultural complexes in the west end of the study area. These include alignments with enclosures around them, and alignments without enclosures. . .The density of alignments is much higher within the enclosures than the areas outside. . .It is possible the agricultural enclosures are a later intensification of an earlier field system.

In summary, Ladefoged (1990:183) writes:

> The results of the intensive study indicate that the study area has been used for residential and agricultural purposes over the last seven centuries. It is likely that occupation of the area has an even greater antiquity. However, the vast majority of the features in the study area appear to date to the historic era. The tendency of the features to contain a single cultural deposit suggests that they were built and used within a relatively short time frame. This does not, however, mean that all features were occupied at the same time. The chronometric and relative dating techniques suggest that the features were occupied during several different time periods within the historic era.

The historical evidence that helped Ladefoged (1990) develop the general chronology for the area is discussed in detail above (see Chapter 4, "The Late Prehistoric Through Early Historic Era" above). In addition, historic maps suggest the cement foundation (Feature 7E, Site 50-60-03-1836) found in the study area was probably a residence occupied for a short period from the 1930's until a massive tsunami in 1946. A former lighthouse keeper witnessed the destruction of several buildings at the northern point of the peninsula during this event (Ladefoged 1990).

Additional evidence used to date features included artifacts and animals introduced during the early historic era. The collections from excavations of fish and animal bones, shells, flaked stone, soil samples, carbon samples, and historic and prehistoric artifacts were removed from the park for analysis by a number of experts including Gail Murakami (plant identification), Christopher M. Stevenson (volcanic glass), Marshall Weisler (basalt), and Alan Zeigler (fauna). Their findings, presented in the final report (Ladefoged 1990), provide a good starting point for future archaeological research (see also Goodwin 1994a).

Part III:
In a detailed historic preservation, burial treatment, and mitigation plan, Tomonari-Tuggle and Tuggle (1991) list only 5 out of the forty sites identified by previous work (Athens 1989; Ladefoged 1990) - sites 50-60-03-1801, -1802, 1826, -1828, and -1827 - as likely to be impacted by construction activities at the Kalaupapa Airport (Tomonari-Tuggle and Tuggle 1991:Figure 3). When the project finally progressed to the point of mitigation by data recovery in 1991 (i.e., excavation at sites to be destroyed) it was determined that only three sites were to be disturbed: 50-60-03-1801 (historic household complex), -1826 (enclosed agricultural fields), and -1827 (enclosed agricultural fields). Each of the agricultural field enclosing walls encapsulated only a few architectural components (e.g., -1826, 2 stone alignments, 6 rock piles with coral, and 1 shelter). These sites were all located at the west end of the airstrip.

Conrad "Mac" Goodwin (1994a, 1994b) directed the excavation of these three sites as well as authoring the two-volume report that interpreted the sites as the remains of a single sweet potato farm occupied from around A.D. 1845 to 1865. The full-scale excavation of the farm included 81 predominately 2 meter by 2 meter sized hand-excavated units covering most of the main house

stone platform and 6 trenches in the fields (1 hand-excavated trench and 5 bulldozer trenches). Hand excavations used both natural layers and arbitrary levels within natural layers. Virtually all deposits were screened through nested 1/4 and 1/8 inch screens. The crew discovered 27 new features--mostly slab-lined hearths uncovered during excavation. Overall, given the shallow cultural deposits, excavations were aimed at identifying spatial patterning of artifacts deposited around the site. Artifacts and ecofacts recovered were, not surprisingly, the same classes of materials found by Ladefoged (1990). These materials --except for the lithics-- were analyzed by the same experts listed above for the previous stage of the project. A geologic assessment of the deposits at the site by Fletcher (1992), including radiocarbon dating three naturally deposited shell samples to between 4,000 and 5,000 BP, addresses in detail the site and soil formation processes at this portion of the peninsula. Interestingly, Murakami (1993) again found no alien historically-introduced plant species and concluded that at least 70% of the firewood by weight at the site came from local, coastal taxa, and with the remainder possibly coming from the crater or *pali*. Also, we see a greater range of historic era artifacts in this collection, notably personal items like buttons and beads of many kinds and a silver coin minted in Spain in 1769 (Goodwin 1994a:131).

Goodwin (1994a) includes many iterations of the Site -1801 map showing the location and frequency of different classes of material that are used in an analysis of the functional use of space. Much of the daily activities took place on the western, lee side of the house. Goodwin (1994a) also commented on diet, cooking, and eating habits of the residents of the household as well as patterns of disposal of waste. No buried architecture was found during excavations of the agricultural fields. It should be noted that these sites are not the same fields in which Ladefoged (1990) discovered buried stone alignments and prehistoric-era wood charcoal.

Overall, Goodwin's (1994a, 1994b) reports are the result of thorough research, including a partially annotated bibliography that is a great resource for anyone doing work on Kalaupapa, and a wonderful example of household level archaeology on remains from early historic Hawai'i. Recent archaeological work in the islands shows an increased interest in this often overlooked period where history and anthropology overlap (Kirch and Sahlins 1992; Mills 2002).

Goodwin (1994a) makes some interesting speculations regarding the site and the peninsula. Goodwin (1994a:37-8) suggests the farmhouse, the largest known on the peninsula,, may have belonged to the land manager (*konohiki*) of the land division (*ahupua'a*). He further speculates the prehistoric peak population of Kalaupapa to have been 10,000 to 5,000 persons, an unusually high estimate for such a small region. However, issues like agricultural development, demographic change, lithic technology in the historic era, gender, identity, and early capitalism in Hawai'i were not directly addressed in relation to the wealth of evidence presented. In part, further work in this vein was pre-empted by the time and energy spent addressing a controversy surrounding the interpretation of site -1801 as a house or *heiau* (see below). It should be noted that in an uncommon crossover between the cultural resource management and academic sides of archaeology that speaks

well of both, Goodwin's (1994a, 1994b) work received a favorable review in the peer-reviewed academic journal of the Society for Historical Archaeology (Weber 1995).

In this stage of the project several independent factors led to a substantial misunderstanding, mistrust, and controversy. In the final report Goodwin (1994a) documents in a detailed and thoughtful manner the clearly trying process of demonstrating to the NPS, the local community, the broader Native Hawaiian community, and the State of Hawai'i that the site was a historic house site and not an ancient Hawaiian *heiau*. The course of these events is outlined below.

To put the controversy in context, Goodwin (1994a:195-6) goes into great detail about the history of the project from the very start when "a number of alternative plans were drafted, each having tradeoffs between the needs of the [patient] community, runway safety, the preservation of archaeological sites, the wishes of the National Park Service, and environmental preservation." The final "compromise" plan proposed by Park Superintendent Thompson "involved numerous and often complex consultations with the Kalaupapa patients and resident workers, the DOH, and the NPS" (Kalaupapa Airport Master Plan 1990:10-1, cited in Goodwin 1994a:195) which included a general community vote.

Site -1801 had been evaluated in the previous surveys and labeled as a residential site (Athens 1989; Ladefoged 1990). When then park superintendent Peter Thompson visited Goodwin's crew in the early stages of excavation, a comment was made that the site was more complex than had been originally indicated in previous work. As such, the archaeologists were considering several alternative interpretations of the surface architecture exposed, including the possibility that it might have been a small *heiau*. The fact that more details about the form of the site were being exposed and that multiple working hypothesis were being entertained by the archaeologists excavating the site is not only more common than not at this stage of work, but signs that the crew was doing a competent job (see Chamberlin 1965). Thompson (1991), however, wrote a letter to the SHPD accusing all the parties in the project of knowing destruction of an "extraordinarily important religious site" (see Goodwin 1994a:194). Apparently, the superintendent was led to believe this was the case based on a recent architectural overview that reported rumors of a *heiau* in the area, which he in turn referred to as oral history from the patient community. Goodwin (1994a) speculates that when the Kingdom of Hawai'i displaced the original inhabitants (*kama'āina*), the local heirs to the oral history of Kalaupapa passed on little to the new community (for evidence to the contrary see below, Wyban 1993).

The controversy was further fueled by the fact that the 1974 State Survey crew from the Bishop Museum (Connolly 1974a) clearly misreported the name and location of a fishing shrine (*ko'a*) in the area originally poorly recorded in McHenry's notes (1954) (Site 8a) and listed in Summer's (1971) inventory of sites on the island (Site 298). Goodwin (1994) reports that Ladefoged (1990) found this site in good condition on the northwest end of the peninsula and labeled it Feature 10 (50-60-03-1803). To further confuse the issue the site was initially interpreted based on archaeological evidence as a historic

residential site; however, it was noted that "the feature is currently used as a shrine, indicated by the offerings wrapped in ti leaves that are located on various parts of the platform" (Ladefoged 1990:31). The results of a small test pit at the site showed evidence of historic rubbish in the upper layers but Ladefoged (1990:98) notes a lower layer "might represent an earlier occupation, and the possible alignment of an earlier building phase. Further excavation is needed for clarification."

To mediate concerns over the quality of archaeological work at the site in 1991 the NPS hired Terry Hunt of the University of Hawai'i to act as an independent consultant. By the start of 1992 Hunt (1992) had completed a review of the project, including several site visits, that confirmed the misidentification of the site by the 1974 Bishop Museum crew and that site -1801 was occupied in the post-contact era. Hunt (1992) further reported that IARII "did an admirable job." Nonetheless, "two individuals (Neller 1992[b]; [M.B.] Trask 1992) before the Senate Committee on Historic Preservation, July 13-15, 1992, stated that 'Kahili Koa' was destroyed at Kalaupapa. This is unfortunate and untrue since there is no record from any source that 'Kahili Koa' ever existed except as a name first promulgated in 1974" (Goodwin 1994a:209). It is perhaps not insignificant that Hawaiian archaeologists in general, and Hunt specifically, were to soon be the target of serious social critique by University of Hawai'i Professor Haunani-Kay Trask (1999 [1993]: 133-4).

Part IV:
There are two significant post-scripts to the research generated by the airport improvement project. First, during the monitoring of construction at the airport, human remains were inadvertently discovered. Michael Pietrusewsky (1991) of the University of Hawai'i was flown into Kalaupapa to examine and evaluate the remains (see Goodwin 1994b:88). In a brief report that followed, Pietrusewsky (1991:2) noted they were found in association with a "possible bird bone, perhaps chicken," and made the following observations and assessments:

> The partial skeleton of a newborn human infant discovered during construction activities at the airport terminal on Ka-laupapa [sic], Moloka'i. . . Sex, ethnicity and cause of death are indeterminate. No pathology or evidence of unnatural death were noted.

However, the manner of interment reported, below basalt rocks and coral, and condition of the bones are consistent with what would be expected in a traditional Native Hawaiian burial. Indeed, the find is remarkably similar to the two burials previously discovered nearby (Somers 1986, 1996), although Pietrusewsky (1991), Goodwin (1994b) and Somers (1996) do not comment on the topic. No map showing the location where the remains were recovered was included in the final report.

The second point to be made is that recent archival research in the National Park offices in Kalaupapa uncovered 16 radiocarbon dates from material excavated by Goodwin (1994a, 1994b) at site -1801 (see Table 9, this volume). The laboratory work was carried out at the request of park archaeologist Earl "Buddy" Neller and received by Beta Analytic, Inc. October 30, 1995, some 4

years after the samples were recovered and after the final report on the excavations had been published (Goodwin 1994a, 1994b). The lack of substantial written material, published or unpublished, on the research or management goals of this exercise is unfortunate considering the thousands of dollars spent and the destruction of the samples dated. Twelve of the calibrated age results gave intercepts between A.D. 1650 and 1950 at one sigma (Beta-87078, -87079, -87081, -87082, -87083, -87084, -87085, -87086, -87087, -87089, -87090, and -87091). The remaining four samples gave dates that ranged about one to two hundred years older (Beta-87077, -87080, -87088, -87092). Goodwin (1994a) explicitly described the sampling technique used during excavation. "Bounded samples" in a known archaeological context, ideally in association with standing architecture, were taken (Kolb 1991:203). Two samples out of three from a slab-lined hearth feature (Feature 102) gave radiocarbon dates that most likely fall between calibrated dates A.D. 1660 and 1950 at two sigma (Beta-87079 and Beta-87087). These findings overlap Goodwin's (1994a) original c. 1845-1866 A.D. age determinations for site occupation based on historic era artifacts and ecofacts. A third sample (Beta-87077), however, is around 200 years older than the expected, with a calibrated age range between A.D. 1400 and 1950 at two sigma. One interpretation of these findings is evidence that the feature, something we might expect to have a short-term use life, contained material deposited over more than 200 years or perhaps was reused after a long period of abandonment. Since there was no identification on the material dates it is also possible a factor such as "old wood" is coloring the results of the radiocarbon dating. This problem arises when dating charcoal from long-lived trees. The results of the radiocarbon assay of such material can seem older due to the in-built age of the tree itself contaminating the results of the test. Dye (2001) has noted in single context cultural deposits on Maui Island similar results attributable to old wood. This may also explain the apparent old age of samples Beta-87080, Beta-87088, and Beta-87092, which yielded calibrated radiocarbon age ranges prior before A.D. 1650. Overall, there is no good reason to doubt Goodwin's (1994a) original age determination for the site of around 1845-1865 A.D. determined by artifacts and ecofacts. Unfortunately, these radiocarbon dates add nothing to our understanding of the site chronology or the history of Kalaupapa in general.

Time period(s): Part I and II: prehistoric to historic era; Part III and IV: early historic era.
Number of sites and features: Part I and II: 40 sites (49 features); Part III and IV: 3 sites (many features).
Types of sites and features: Part I and II: shelter (n=27), residential (n=6), boundary enclosure (n=1), agricultural (n=12), cupboards (n=2), animal enclosure (n=1), possible shrine (n=1), boundary alignment (n=2), and foundation (n=1); Part II and IV: 1 historic farmstead including a stone house platform (50-60-03-1801) and two enclosed dry land fields (50-60-03-1826 and -1827).
Maps and Photographs: All stages of work are well documented, primarily in the final reports by Athens (1989), Ladefoged (1990), and Goodwin (1994a, 1994b).

Collections: A comparison of the reported collections and the collection of material in the park is recommended since this overview has revealed some post-field research on the collection has been undertaken.
Absolute dates: 23. See Table 9, this volume.
National Register of Historic Places significance of sites: See above and individual reports.
Published and unpublished source material referenced: Athens (1989); Connolly 1974a; Dye (2001); Fletcher (1992); Fortunato de Loach (1975); Goodwin (1994a, 1994b); Hunt (1992); Kirch and Sahlins (1992); Ladefoged (1990, 1993); Mills (2002); Murakami (1993); Neller (1992b, 1995); Pietrusewsky (1991); Stoddard (1893); Thompson (1991); Tomonari-Tuggle and Tuggle (1991); H-K. Trask (1999[1993]); M.B. Trask (1992); Weber (1995); Zeigler (1994)

Project Title: Curtis' Historic Trails Overviews

Dates of Fieldwork: 1991
Author(s): Dorothe B. Curtis
Methods: Archival-based and site visit.

Descriptive Summary: In the 1990's, prior to improvements made to the well-known Kalaupapa Pali Trail that links Kalaupapa with the remainder of the island, the NPS contracted Dorothe B. Curtis (1991) to write an overview of the history of the trails in the park, based on in-depth archival research. The resulting report contains a wealth of historic information from a variety of sources (i.e., historical documents, maps, and photographs) describing the two *pali* trails that were in used during the historic era: (1) the trail currently in use, and (2) the 'Ili'ili-ka'a Trail on the western slopes of Waihanau Valley. Curtis (forthcoming:126) writes:

> Three and one-eighth miles long from top to bottom, and with a vertical fall of 1,800 feet, the Kalaupapa Trail is a good example of an archaeological/historical transitional site, whose use from very early Hawaiian times to the present has altered only some of the physical characteristics of the trail, such as the switch-backs and width. As it has been for the past one hundred years, when the Hawaiian Government officially closed the 'Ili'ili-ka'a trail and allowed it to deteriorate, the Kalaupapa Trail continues to be the only land link between Kalaupapa and topside Moloka'i.

Curtis (forthcoming) has recently built on this research in a soon to be published monograph that combines archival research and local oral history to present a detailed history of trails in the park stretching back to the prehistoric era. Future archaeological work in the park, both research and management oriented, will benefit from these valuable collections of traditional Hawaiian oral history. Although much of Curtis' work focuses on the two *pali* trails, there are a variety of other kinds of trails attested to in oral history and archival sources (Curtis forthcoming).

Time period(s): Prehistoric to historic era.
Number of sites and features: 2 sites.
Types of sites and features: Historic trails.
Maps and Photographs: See Curtis 1991.

Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Trails should be considered part of the historic settlement, thus they are currently on the register.
Published and unpublished source material referenced: Curtis (1991, forthcoming)

Project Title: Wyban's (1993) Fishpond Study

Dates of Fieldwork: 1993
Author(s): Carol Araki Wyban
Methods: Archival-based and site visit.
Descriptive Summary: To investigate rumors of a defunct dry fishpond on the northwestern end of the peninsula Wyban (1993), an expert on ancient Hawaiian fishponds, was contracted by the NPS to summarize all current evidence. Wyban's (1993) report contains a variety of documentary evidence, interviews with local residents, and the results of a brief visit to the location in question. The remains of a cement foundation for a well, pump, and windmill were discovered at the site. The scant historic evidence available all support a scenario whereby one or two adjacent fishponds were built sometime early in the 1900's and probably fell into disuse in the mid-to-late-1920's. Dr. William Goodhue, in residence at Kalaupapa until 1925, is identified as the most likely person behind the construction project. However, two other lines of evidence point to the use of the area for aquaculture in prehistoric times. Wyban (1993:1) writes:

> An oral history interview with resident-patient, Richard Marks reveals that an ancient pond may have existed inland of Iliopihi [sic] Bay in pre-leprosy settlement times. The fishpond was connected to the ocean by a channel traditionally known as an *'auwai kai*, however this outlet was said to be destroyed by natural disasters. . . This information was passed down to Marks by a man named Nailima who was known to practice ancient spiritual arts and according to Marks kept the genealogies of generations in Kalaupapa.

Marks and others identify Nailima as a non-patient *kahuna* of Kalaupapa born prior to the establishment of the settlement (Wyban 1993:1-22). Marks also related several stories about the fishpond (Wyban 1993:23):

> Nailima stated that it was a good pond which was used during the times of the year when the water was rough and people could not fish. Long before Goodhue, David Kupele, a man in his 80's and a non-patient married to a patient made canoes and put logs into the pond to season the wood. The logs were dragged by mule and were about two feet thick. A pregnant woman gave birth at the pond. In the winter, the pond was filled with ducks and geese.

It is clear from the report that Wyban (1993) is convinced by this evidence that the lithified sand deposit near 'Iliopi'i Bay (consistently called "Iliopihi Bay" in the report) correspond to the turn of the century fishponds built on the location of a defunct ancient Hawaiian fishpond. In addition to oral history, the remains at the site of a stone alignment marking a channel to the sea are cited in support of the hypothesis. Wyban (1993:50) also suggested "archaeological trenching, may reveal more information about an

ancient pond." A recent brief reconnaissance survey and auger test excavation in the lithified sand deposits near the center of the site by McCoy (2002) confirms the need for extensive archaeological test excavations at the site to test Wyban's (1993) hypothesis.

Time period(s): Prehistoric to historic.
Number of sites and features: 1 site.
Types of sites and features: Fishpond with several features (pumphouse/well foundation, possible channel (*'auwai kai*).
Maps and Photographs: See Wyban (1993).
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: See Manning and Neller (in prep.).
Published and unpublished source material referenced: Wyban (1993); McCoy (2002)

Project Title: Five Surveys by Manning and Neller (in prep.)

Dates of Fieldwork: 1991
Author(s): Elizabeth "Buffy" Manning and Earl "Buddy" Neller
Personnel: Earl "Buddy" Neller and field crew.
Methods: Inventory and intensive survey.

Descriptive Summary: Manning and Neller's (in prep.) draft report on five surveys undertaken in 1991 is summarized below in five parts (I-V), corresponding to individual projects reported.

Part I:
In 1991, park archaeologist Earl "Buddy" Neller, to meet Section 106 requirements, directed an inventory survey and construction monitoring associated with water pipeline improvements within town and along the airport road. Neller's (1992a) initial report covered sites to be affected rather than all sites recorded by the survey. The survey identified only 5 sites in the path of the pipeline, a stone platform, a stone enclosure, a possible house site, a cobble concentration, and a midden. Figure 1 of the initial report shows "Kahili Ko'a Site 298" in the location of Site 50-60-03-1801, a historic house site excavated by Goodwin (1994). A single shovel test pit in which no cultural material was found was dug at Site C, a possible house site marked by a rectangular cluster of coconut palms. Monitoring was recommended although no sites were considered eligible for nomination to the National Register. Neller (1992a:12) notes the archaeological monitoring of the fifty-eight trenches dug in town revealed no new significant sites. However, the broad distribution of the trenches gives the reader an idea of the distribution and depths of soil and cultural deposits across the area.

In Manning and Neller (in prep.), a more detailed description of the results of this same airport road survey is presented in which 28 sites made up of 93 features were identified over 3 hectares (50-60-03-1900 to 50-60-03-1927). In summary of the site distribution within the 30 meter wide survey corridor on the inland side of the road, Manning and Neller (in prep.:45) write:

> The Airport Road Survey identified sites that probably date from precontact to the early days of the leprosy settlement. The northern part of the survey area, called Kapapakikane, is dominated by a dryland agricultural field system interspersed with a few habitation sites. At 'Iliopi'i, the archaeological landscape begins to change. From there to Papaloa, postcontact house lots become the most common site type, with the exception of a site 50-60-03-1918, which may be a precontact fishing settlement.

The survey also included portions of the fishpond site (50-60-03-1927) investigated by Wyban (1993). In addition, several small possible family *heiau*, a canoe shed, boundary walls, and 5 possible burial sites were found and recorded.

Part II:
Perhaps the most important single site described in the Manning and Neller (in prep.) report is Makapulapai Burial Complex (50-60-03-1928). Makapulapai is the name given to a volcanic hill (tumulus) near the center of the northern half of the peninsula in Makanalua *ahupua'a*. The second survey in the report describes a 1.1 hectare area on and around the hill in which 117 features were recorded, including a remarkable 60 burial platforms and terraces, 2 heiau, and a number of enclosed agricultural field plots (50-60-03-1928 to 50-60-03-1932). A great deal of alien vegetation was cleared to map these features. Oral history linking Kalaupapa to a large battle is described above (Chapter 4, Makapulapai and the Story of Kuali'i). This oral history is used in this overview report to argue the petroglyph of a human figure on the summit of Makapulapai, locally called the "Rock Doctor," is likely an image of Kuali'i doing battle with the aid of his *ko'i pohaku* (stone adze) named Haulanuiakea, or alternatively Malanaihaehae, the warrior in the story who also took up the adze in the skirmish.

Just to the east of Makapulapai, and about 1.5 miles northeast of Kalaupapa Settlement is unique feature also associated with warfare: a World War II era target painted white on the black basalt stone flats. The target, designed for aerial bombing practice, can be clearly seen on aerial photos from 1949. Manning and Neller (in prep.) report remarkably little damage to the area, probably due to the use of non-explosive smoke bombs during exercises.

Part III:
The third survey reported, called the "East Transect Survey" is a long and narrow section of the eastern half of the peninsula. From Makapulapai in the west to near Kaupikiawa Cave in the east, the transect was over 1 kilometer long by 60 to 100 meters wide which Manning and Neller (in prep.) estimate covered 12.8 hectares. The purpose of the survey was to sample the *kula* dry land area that accounts for much of the peninsula itself. A total of 109 features grouped into 46 sites were recorded (50-60-03-1933 to 50-60-03-1977). The ubiquitous field wall alignments of the Kalaupapa Field System ran across the survey transect and were mapped separately by optical transit. What is called in this report the "Great Wall of Kalaupapa" marks the boundary between Makanalua and Kalawao *ahupua'a* and is located near the center of the survey. Manning and Neller (in prep.) conclude:

> Most of the sites along the transect are clusters of field shelters associated with cupboards or storage buildings and parallel field walls and scattered mounds. Only a few field systems appear to have enclosure walls. A few small possible religious sites are found scattered throughout the transect. Site variation increases closer to the coast, where substantial wall segments may be planting windbreaks and rock areas with pits and mounds may be special planting areas. The coastal area also has several fishing shelters, a few *ko'a*, one possible *ahu*, a canoe shed and several nineteenth or twentieth century houses. . . Most of the temporary field shelters probably date to the late precontact and early postcontact [periods]. There is evidence in the project area that later intensified field systems [were] superimposed [over] earlier ones.

Part IV:
The fourth survey in Manning and Neller's (in prep.) report combines early historic records and archaeology in the survey of the Mahele Award of Kanakaokai (LCA No. 8589), a Lahinaluna-educated Protestant missionary teacher who lived in Kalaupapa around 1839 and is buried at Siloama Church. The inventory survey was conducted in the lands marked by a boundary wall around the award. The crew recorded 27 sites made up of 40 features including habitation and religious sites, boundary walls, cattle pens, and a canoe ramp (50-60-03-1978 to 50-60-03-2004). As in the East Transect Survey, field walls inside the enclosing wall were mapped separately. Manning and Neller (in prep.) also present the results of extensive archival research on Kanakaokai.

Part V:
The fifth and final survey reported by Manning and Neller (in prep.) was named the "Kahio Benchmark Survey" after the U.S.G.S. benchmark of the same name on the northern tip of the peninsula near the east end of the Kalaupapa Airport in Makanalua *ahupua'a*. Manning and Neller (in prep.) write:

> This survey was undertaken during the last few weeks of the project, so the survey area had to be small and easily accessible. Three factors made Kahi'u Point attractive for such a survey: 1) the area is relatively clear of vegetation; 2) there is a U.S.G.S. Benchmark in the vicinity; and 3) McHenry recorded a ko'a in the area between Lae Ho'olehua and Lae o Kahi'u.

A total of 25 sites made up of 36 features were recorded (50-60-03-2005 to 50-60-03-2026) including and three sites previously recorded by Ladefoged (1990), 50-60-03-1838, -1839, and -1840 on his survey on the east end of the Kalaupapa Airport. The survey area of approximately 3.5 hectares includes the area immediately around the benchmark and a second transit survey station 80 meters southeast. Although authors note that site 50-60-03-2005 is the only one large enough to be the *ko'a* previously recorded by McHenry, they do not venture any further comment on the topic. Little is offered in conclusion other than noting a number of coastal site types typically found on the coast in Kalaupapa, *ko'a*, shelters, and *ahu*, as well as "several agricultural complexes and temporary fishing shelters [in the *makai* area], thus indicating that farming was occurring even relatively close to the shore."

Time period(s): Prehistoric through historic eras.
Number of sites and features: 127 new sites.

Types of sites and features: Major functional classifications of sites include habitational, shelter, agricultural, religious, storage, boundary markers, and a large hilltop burial complex.
Maps and Photographs: Maps have been rendered in digital format for publication. No maps or photographs are included in current draft manuscript.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: All sites are recommended to National Register.
Published and unpublished source material referenced: Manning and Neller (in prep.)

Project Title: Radewagen and Neller's Cave Reconnaissance Survey

Dates of Fieldwork: 1996
Author(s): Erika C. Radewagen and Earl "Buddy" Neller
Personnel: Same, plus field crew.
Methods: Reconnaissance survey.

Descriptive Summary: In 1996, park archaeologist Earl "Buddy" Neller with the help of two graduate students, Erika C. Radewagen and Angela Steiner, completed a reconnaissance survey of the Kaupikiawa lava tube system in the northeast portion of the peninsula. The draft report of their findings, made available to the author by Radewagen, describes 10 caves, including the famous Kaupikiawa Cave (50-60-03-312). Each site is evaluated in terms of the potential for archaeological deposits within the caves and relative research value for paleoenvironment reconstruction studies. No above ground surface remains were recorded but the team clearly made a concerted effort to record extant flora and fauna in and around the caves. The collection of dog tooth and shell ornaments (*kupe'e*) in 1991 from Kaupikiawa Cave is reported. The report also recommends "Kaupikiawa cave should be cleaned up. The old excavation pits should be backfilled with sand or clean dirt. Surface artifacts should be mapped and collected" (Radewagen and Neller ms).

Time period(s): Prehistoric through historic era.
Number of sites and features: 10 sites (9 new sites and 1 previously recorded site).
Types of sites and features: Rockshelters.
Maps and Photographs: Site locations hand plotted on photocopy of USGS quad map. Entrance to each cave was photographed, but photocopy of images make them indistinguishable from one another.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Not directly evaluated by the authors.
Published and unpublished source material referenced: Radewagen and Neller (ms)

Project Title: The Neller Files

Dates of Fieldwork: 1991-96
Author(s): Earl "Buddy" Neller
Methods: Reconnaissance survey and monitoring.

Descriptive Summary: Park archaeologist Earl "Buddy" Neller in his tenure at Kalaupapa made an enormous effort at public outreach, reporting 60 site tours given in a single year (Neller 1995). A weekend visit in 1994 by Hui Lama Kamehameha Schools resulted in a short report based on students' diaries describing their impressions of the Kalaupapa and a service project led by Neller to clear vegetation from Kapua Heiau (50-60-03-292) -Site 292 (Summers 1971) - located at the head of the Waihanau Valley. In addition, Neller's personal interest in paleoenthnobotany is clear from park records of an attempt to initiate phytolith analysis of soil samples from Kalaupapa, among other endeavors (Neller 1998). Overall, Neller is well remembered among the community at Kalaupapa as someone who cared deeply for the place.

These things having been said, all that remains in terms of the records of Neller's fieldwork at Kalaupapa are unfinished reports, an incomplete collection of memos and other correspondence, an NPS brochure, and material collected for the purposes of this overview. Collectively these documents are referred to as "The Neller Files." The only existing comprehensive documents reflecting some of the years of Neller's fieldwork are draft reports currently in preparation for publication (Manning and Neller in prep; Radewagen and Neller ms). One of the most surprising discoveries in the Neller Files was 16 radiocarbon dates not previously reported. These dates had all come from material excavated as part of the Airport Improvement Project described above.

Time period(s): Prehistoric to historic era.
Number of sites and features: Unknown.
Types of sites and features: Unknown.
Maps and Photographs: Unknown.
Collections: In the Neller Files there are references to artifacts and soil samples collected, but the current whereabouts of these collections are unknown.
Absolute dates: 16 unreported radiocarbon dates described above, see Airport Improvement Project.
National Register of Historic Places significance of sites: Unknown.
Published and unpublished source material referenced: Manning and Neller (in prep.); Neller (1992a, 1994, 1998); Radewagen and Neller (ms)

Project Title: Damien Productions Movie Set Archaeological Survey

Dates of Fieldwork: 1998, 2000
Author(s): Jennifer Cerny
Personnel: Jennifer Cerny, Jadelyn Moniz Nakamura, plus field crew.
Methods: Inventory survey.

Descriptive Summary: In 1998, a crew made up of archaeologists from the NPS and the State of Hawai'i Department of Land and Natural Resources (DLNR) completed a Section 106 inventory level survey of features in a small area set to be used in the filming of a movie about the life of Father Damien. Jennifer Cerny, a NPS cultural resource volunteer, was given the job of writing the first draft of report. Later in 2000, Jadelyn Moniz Nakamura (HAVO) led a one-week survey in an adjacent area that covered 11 acres (see Kalawao Makai Fields Survey, PMIS database). The final report on these surveys is in preparation, therefore the following summary only covers a limited amount of the total work completed for this project.

In the initial survey, an area of about 2 hectares on the coast of Kalawao *ahupua'a* was surveyed, once previous to filming, and once post-filming to assess the impact of the project. The first survey recorded 65 features. Features included 6 stone alignments, 1 stone enclosure, 5 modified outcrops, 2 pavings, 4 rock concentrations, 1 wall, and 46 terraces. 19 artifacts including "eight basalt hammerstones, four adze fragments or flakes, 2 glass bottle base fragments, 2 whetstone artifacts [in four fragments], one 'polished' water worn stone, one blue bead, and one worked stone" were found and collected, but their whereabouts are currently unknown (Cerny ms.:28). This project also took advantage of Global Positioning System units to record the locations of features and artifacts as points and areas. Cerny (ms.) explicitly discusses the research problem that virtually every survey in the park has had to deal with: how to analytically break down the continuous archaeological landscape into sites or a region. Features were the basic unit used in recording and evaluating the condition of the archaeological record before and after the movie was shot, the primary purpose for the project.

Time period(s): Prehistoric to historic era.
Number of sites and features: 3 sites.
Types of sites and features: 65 features.
Maps and Photographs: GPS locations and color photographs of features taken but whereabouts of data or photos are unknown. Some poor quality photographs of artifacts are included with the draft report.
Collections: 19 artifacts.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Not assessed by the author.
Published and unpublished source material referenced: Cerny (ms.)

Project Title: Crater Survey by PHRI

Dates of Fieldwork: 1998-9
Author(s): Robert B. Rechtman and Jack David Henry
Personnel: Same, plus field crew.
Methods: Intensive survey.

Descriptive Summary: In 1998 and 1999 a crew from the contract archaeology firm Paul H. Rosendahl, Ph.D., Inc. (PHRI) at the request of the NPS conducted a 49.5 acre (19.8 hectares) survey in the Kauhakō Crater to "obtain

baseline information about potential historic properties" (Rechtman and Henry 2001:ii). The intensive level survey was undertaken in an area with apparently "excellent" ground visibility and no vegetation clearing is reported (Rechtman and Henry 2001:5). The report describes what was found as "a more or less continuous distribution of archaeological features" (ibid). The landscape was for descriptive purposes broken into 32 sites containing 333 features (50-60-03-1880 to -1894 and -2406 to -2467). The majority of features found were part of the agricultural landscape, which were given a single site designation (60-50-03-1894) consisting of 269 features. Two other groups of agricultural features found near the northern lava channel were also given site numbers (50-60-2465 and -2466). Rechtman and Henry (2002:ii), aided in large part by an A.D. 1880 photograph of the landscape inside the crater showing a farm, make the following interpretations:

> These sites and features are interpreted as a large agricultural and residential complex dating from at least the early Historic Period, and possibly from late prehistoric times. The possible pre-Contact era permanent habitation sites are located on the crater's upper benches. Caves and rockshelters, which contain evidence of temporary habitation, also likely date to pre-Contact times. The bulk of the large rectilinear agricultural fields and potential storage enclosures in the crater appear to have been in use until at least the mid-nineteenth century. From a research standpoint it is recommended that KALA develop a plan for limited subsurface investigations sufficient to obtain samples for radiocarbon analysis.

From a management point of view, the authors recommend the crater be considered for nomination to the National Register as a single unit. The survey used Global Positioning units to identify the location of twenty sites and the boundaries of their survey area (Rechtman and Henry 2001: 5). The authors report in table form the UTM coordinates of these points after having been differentially corrected using base station data from the Department of Land and Natural Resources (DLNR) station located at Leeward Community College (LCC) on O'ahu Island (Rechtman and Henry 2001: Table 2).

Time period(s): Prehistoric through historic era.
Number of sites and features: 32 sites containing 333 features.
Types of sites and features: Functional types represented include habitation, storage, animal pen, transportation (trail), cooking, boundary, ceremonial, and possible burial.
Maps and Photographs: Site locations mapped by GPS, site maps, and photographs provided in report. All appear generally good quality.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: See above.
Published and unpublished source material referenced: Rechtman and Henry (2002)

Project Title: Airport Fenceline Monitoring

Dates of Fieldwork: 2000
Author(s): Ethan E. Cochrane
Personnel: Same.

Methods: Monitoring and reconnaissance survey.

Descriptive Summary: In 2000, Ethan E. Cochrane (2000a, 2000b), an archaeologist with IARII, conducted a monitoring and reconnaissance survey during the construction of a new 8,000 foot (2,438 meters) fenceline along the inland (*mauka*) side of road from town to the Kalaupapa airport. For the most part, the study area cut through previously-surveyed zones along the road and around the airstrip (Ladefoged 1990; Neller 1992a; Manning and Neller in prep.). Cochrane (2002b) nonetheless discovered 18 features in a small reconnaissance survey (259 meters by 20 meters) that were later grouped into a single site (50-60-03-1897) assessed to be eligible for the National Register. The site is described as consisting of "several rock piles, rock walls, and other rock features, two enclosures, and a platform" and functioned as habitation, agricultural, and ritual use (Cochrane 2000b: Addendum). Future archaeological research at the site is "expected to modify the site boundaries, the number of constituent features, and generate an assessment of the time period of site use" (ibid).

The actual earthmoving monitored by Cochrane was minor and did not uncover buried cultural remains. In fact, no monitoring project on the peninsula other than the airport construction project that disturbed a human burial has ever produced intact buried cultural deposits. In this case, monitoring work produced not one, but two reports that showed detailed maps of the study area, described the methodology used, the construction, the mitigation plan, the results, drew conclusions, and discovered new features, recorded them properly, reported them properly, and followed through to get them on the state site record (Cochrane 2000a, 2000b). These reports are two of the few on file at the State Historic Preservation Division pertaining to Kalaupapa.

Time period(s): Prehistoric through historic era.
Number of sites and features: 1 site with 19 features.
Types of sites and features: Habitation, agricultural, and ritual.
Maps and Photographs: See Cochrane (2000b).
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: One site assessed as eligible for the National Register.
Published and unpublished source material referenced: Cochrane (2000a, 2000b); Ladefoged (1990); Manning and Neller (in prep.); Neller (1992a); Somers (1985)

Project Title: Accidental Discoveries of Human Remains: 1980-2002

Dates of Fieldwork: 1986, 1991, 1999
Author(s): Gary F. Somers; Michael Pietrusewsky; Sara L. Collins
Personnel: Various.
Methods: Salvage excavation; field and laboratory examination.

Descriptive Summary: From 1980 to the present, there have been three episodes reported in which human remains were inadvertently discovered in the park and examined by an anthropologist trained in human osteology. An effort has been

made in this overview to keep each of the projects and findings described above separate and without repetition. Please see above for detailed information on the two episodes related to what is called here the *Moa 'Aumakua* Burial Pattern (Pietrusewsky 1991; Somers 1986, 1996). The third, more recent discovery in a known cave site (50-60-6-03-290) is also discussed below (Collins 2000), as well as a recently reported sighting of human remains (McCoy 2002b).

One of the latest accidental discoveries of human remains at Kalaupapa occurred at a cave site called Ananaluawahine Cave (50-60-03-290) previously recorded and registered with the State Historic Preservation Division. The state archaeologist in charge of the Moloka'i Island, Sara L. Collins, reported on the discovery by NPS staff of "human bone fragments and/or teeth... lying on the floor of the cave" (Collins 2000:1-2). After inspecting the site Collins (2000:3) offers the following summary:

> Remains representing a minimum of four individuals are present in three locations on the floor of the mauka chamber of Ananaluawahine Cave. While the dental and skeletal inventories for each individual are very incomplete, there is no evidence, at this time, which would support consolidating remains from one location with those of another. Consequently, the remains are considered to represent a minimum of four individuals: three adults and one child, all of unknown sex and ethnicity. The appearance of the remains is certainly consistent with a time since death of at least 50 years; the deterioration of the remains. . .make it difficult to be more precise.

Unlike the other discoveries, Collins (2000) does not report any fauna remains found in association with these remains. Since the map of the site by the 1974 Statewide Inventory does not indicate human remains are present there is the temptation to conclude the condition of the site is deteriorating, exposing these remains on the cave floor. However, the state of the find indicates this is unlikely. McCoy (2002b) also reports the discovery of a single human tooth in a rockshelter site with three recently recorded petroglyphs. Therefore, in addition to the sand dune burial complex on the northeast point of the peninsula, there are likely traditional burials in cave sites that remain unrecorded.

Time period(s): Prehistoric.
Number of sites and features: 1 sand dune burial complex and 2 cave sites.
Types of sites and features: Minimum number of individuals (MNI) represented in remains examined: 7.
Maps and Photographs: Of the three burials in the *Moa 'Aumakua* Burial Pattern, two were well documented in terms of photographs and location, but the osteological exam is not on file with the NPS (Somers 1986, 1999). At the Ananaluawahine Cave (50-60-03-290) site, a site map shows where remains were discovered and no photographs were taken. The single human tooth noted by McCoy (2002a) is shown on a sketch map of the rockshelter site designated MKL-29.
Collections: N/A.
Absolute dates: N/A.
National Register of Historic Places significance of sites: The sand dunes that produced three burials likely contain an entire burial complex that is unrecorded. However, graves and cemeteries are not usually eligible for the

National Register. The Ananaluawahine Cave (50-60-03-290) site is one of the few registered with the State Historic Preservation Division. The rockshelter site (MKL-29) was not reviewed for potential for National Register nomination.
Published and unpublished source material referenced: Collins (2000); Goodwin (1994b); McCoy (2002a); Pietrusewsky (1991); Somers (1986, 1996)

Project Title: Various Management Documents by NPS Staff: 1994-2001

Dates of Fieldwork: 1994-2001
Author(s): NPS staff.
Personnel: Same.
Methods: Archival and field visits.

Descriptive Summary: In 1995, the NPS entered into a Programmatic Agreement (PA) with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers. In essence, due to the overlapping cultural resource management goals of the two managing bodies, State Historic Preservation Offices across the country have agreed to yield more authority to park managers to carry out Section 106 responsibilities. Most of the stipulations of the agreement are set out simply to assure the continuation of high standard of cultural resource care already in place in the parks. The PA, however, is not meant to completely exclude a SHPD from participating in the management of cultural resources. In fact, on most projects communication and consultation between managing bodies occurs regularly.

Section IV of the PA is probably the most critical for the daily management of cultural resources in the parks. This allows for activities reviewed and found by the NPS not to adversely affect cultural resources in National Register sites, or sites deemed eligible for the National Register, to be excluded from further review. Generally speaking, undertakings that may be reviewed under the terms of this section include: preservation maintenance; routine grounds maintenance; installation of environmental monitoring units; archeological monitoring and testing and investigations of historic structures and cultural landscapes involving ground disturbing activities or intrusion into historic fabric for research or inventory purposes; acquisition of lands for park purposes; rehabilitation and construction of features like trails, fences, roads, and utilities in previously disturbed areas; various repairs; and improvements related to health and safety; erection of signs; and leasing of historic properties.

Below are brief summaries of documents associated with cultural resource management undertaken by park personnel guided by Section 106 and the 1995 Programmatic Agreement (PA) with the National Conference of State Historic Preservation Officers. The first part describes work completed by Earl Neller during his tenure at the park between 1992 and 1996. Most of the documents reviewed are archaeological clearance letters. The next parts describe projects undertaken between 1997 and 2001. These projects were all completed under the PA.

These summaries do not do justice to the enormous amount of time and effort the staff over the years has put into the care of the cultural resources of Kalaupapa. A recent overview of management of culture resources in Pacific Cluster, Pacific West Region, gives an idea of number and scope of total work done in the name of Section 106. Drawing from the reports summarized in this appendix, the report lists: 29 inventory surveys, 15 clearance surveys, 6 excavation/testing reports, 6 historical resource studies, 1 reconnaissance mapping, and 9 mapping studies (Wells and Hommon 2000: Table 4.1).

Section 106 documents pertaining to forty-five of these projects are summarized below. The documents described are our best continuous record of cultural resource management in the park. Most of the work centers on the occasional required maintenance or infrastructure improvements on historical properties (i.e., buildings) that date to the Kalawao or Kalaupapa Settlement eras. The preservation and management of the prehistoric and early historic component of the archaeological record are naturally always also of equal concern.

On every project several people regularly work together including the park superintendent, State Historic Preservation Division officers, PISO staff, Kalaupapa NHP historians and archaeologists, as well as staff from other parks. Therefore, no single author is listed in the summaries. In addition, there are agencies that are likely regularly consulted, such as the Hawai'i Department of Health, that are not represented in the Section 106 documents. The summaries only list those offices for which we have actual written correspondence on record. Further information regarding specific projects may be found in the NPS archives filed by funding year (FY 1992-1996, 8 projects; FY 1997-1998, 13 projects; FY 1999, 11 projects; FY 2000-2001, 13 projects).

SECTION 106 DOCUMENTS: 1992-1996

TITLE: Kalaupapa Archaeological Research Project - 1991
DATE: 1991
DISCRIPTION: Documents include a scope of work and logistical plans prior to surface survey in vicinity of road maintenance and water line repair. See Manning and Neller (in prep.).
MAPS/PHOTOGRAPHS: N/A.

TITLE: Archaeological Clearance Survey Form
DATE: June 1994.
DISCRIPTION: Documents describe plans to construction of an underground phone line between NPS Headquarters (Building 7BH), Police Station (Building 303), and Maintenance Office (Building 6BV). Project area - reported as 138 acres (56 hectares) in size - was previously surveyed in the waterline project that included archaeological monitoring of construction (Somers 1985).
MAPS/PHOTOGRAPHS: N/A.

TITLE: Archaeological Clearance Survey Form
DATE: February 1995.

DISCRIPTION: Documents describe a small archaeological reconnaissance survey covering approximately 5 acres (2 hectares) completed ahead of fence construction around Kauhakō Crater. Survey is described as "limited to a walked line about 1.86 miles long (3km)" (page 1). Documents also include additional correspondence with Trinkle Jones and Ron Beckwith, Western Archeological and Conservation Center (WACC), NPS regarding project.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Archaeological Clearance Survey Form
DATE: May 1995.
DISCRIPTION: Documents describe a small survey and excavation of a pit at the gravesite of Father Damien at St. Philomena Church for burial of a relic in 1995. Documents also include additional correspondence with Trinkle Jones and Ron Beckwith, WACC, NPS regarding the project.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Scope of Work, Archaeological Reconnaissance Survey at Kalaupapa, Hawai'i
DATE: circa 1992-1996.
DISCRIPTION: Documents include a scope of work (SOW) that outlines cultural resource management in accordance with plans to rebuild the Kalaupapa Trail, also known locally as the Pali Trail. The SOW calls for an archaeological survey of the trail followed by a report on sites recorded. See also Dorothy Curtis' (1991) historical resources report on the trail.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Historic and Archaeological Sites at Kalaupapa National Historical Park
DATE: circa 1992-1996.
DISCRIPTION: Document is a table of historic properties (i.e., buildings) and archaeological sites. The list is extensive, including sources, field numbers, state numbers, and names/descriptions of approximately 1,200 properties and sites. Descriptions are limited to a few words. No text or statistical summary provided.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Archaeological Project Information
DATE: circa 1992-1996.
DISCRIPTION: Document is a table of projects describing amount area surveyed, survey intensity, quality of maps, number of sites, and National Register of Historic Places (NRHP). The list seems to be a correlate to the Historic and Archaeological Sites at Kalaupapa National Historical Park table described above.
MAPS/PHOTOGRAPHS: N/A.

SECTION 106 DOCUMENTS: 1997-1998

TITLE: Removal of Building 118
DATE: March 1997.
DISCRIPTION: SHPD consultation.
MAPS/PHOTOGRAPHS: Photograph included.

TITLE: Construction of ungulate fence, Kuka'iwa'a Peninsula
DATE: August 1997.
DISCRIPTION: SHPD consultation and Hui Mālama notification. Documents include notes on file regarding Site 307 on Kuka'iwa'a Point, described by Summers (1971) as the location of a fishing shrine complex (*ko'a*) and a possible heiau noted from the air. Documents describe a small survey archaeological reconnaissance survey of the area completed by Rob Hommon, PISO, and Sarah Collins, SHPD archaeologist, with Sharon A. Brown, Kalaupapa NHP historian, and Rick Potts, Kalaupapa NHP wildlife biologist. From this survey we are given a rare description of the archaeological landscape of this difficult to reach area:

> The corridor [for the fence] had a moderately thick forest cover of pandanas and other trees, but most of the ground was quite free of obscuring vegetation. Throughout the gently-to-moderately sloping area, small wall, mounds, and retaining walls of local stones were visible, as well as a few larger platforms and enclosures. The abundance of the stone features are similar to indigenous Hawaiian structures seen elsewhere. . .and probably represent mainly agricultural activities. . .soil areas... may have served as small non-irrigated garden plots. . .

MAPS/PHOTOGRAPHS: Location map included.

TITLE: Construction of ungulate fence, Coastal Strand
DATE: August 1997.
DISCRIPTION: SHPD consultation. Documents describe an archaeological reconnaissance survey by Rob Hommon, PISO, and Sarah Collins, SHPD archaeologist along the 4,000 foot proposed fence line on northeast coastal strand of the peninsula.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Repair of gravestones
DATE: October 1997.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Hazardous material temporary storage
DATE: November 1997.
DISCRIPTION: PA exclusion. Documents describe a small archaeological reconnaissance survey of the project area by Rob Hommon, PISO.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Rehabilitation of Building KALA 62-120.
DATE: December 1997.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Rehabilitation of Paschoal Hall, Phase I, Stabilization
DATE: February 1998.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: Plans and photographs included.

TITLE: Installation of fire detection, alarm, suppression system at St. Philomena and Siloama churches, Kalawao.
DATE: February 1998.
DISCRIPTION: PA exclusion and consultation with SHPD and churches.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Rehabilitation of Paschoal Hall, Phase II, Roof repair
DATE: April 1998.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: Plans and photographs included.

TITLE: Demolition of Beach House, KALA 716
DATE: May 1998.
DISCRIPTION: Notification of SHPD.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Preservation Maintenance of Buildings KALA-8SR, KALA-30M, KALA-657A
DATE: August 1998.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Preservation maintenance of Buildings KALA-2M
DATE: September 1998
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: Photographs included.

TITLE: Emergency utility work
DATE: April 1998.
DISCRIPTION: SHPD consultation.
MAPS/PHOTOGRAPHS: Location maps included.

SECTION 106 DOCUMENTS: 1999 SUMMARY

TITLE: List of all known Section 106 compliance from Kalaupapa NHP 1995-1998
DATE: February 1999.
DISCRIPTION: Table gives year, type of project (rehabilitation, construction, demolition, etc.), and one-sentence description of Section 106 compliance. For 1994-1995, one project is listed, for 1995, 3 projects are listed (2 described above), for 1997 and 1998, 6 projects are listed for each year (all 12, plus one not listed, are described above).
MAPS/PHOTOGRAPHS: N/A.

SECTION 106 DOCUMENTS: 1999

TITLE: Demolition of Buildings KALA-202 and -202A
DATE: November 1998.
DISCRIPTION: SHPD and Hui Mālama consultation, ACHP notification.
MAPS/PHOTOGRAPHS: Photographs included.

TITLE: Placement of equipment at USCG Lighthouse
DATE: December 1998.
DISCRIPTION: PA exclusion, notification of USCG. A communication link for fire/smoke alarm system was installed at the Moloka'i Light House.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Stabilization of Building KALA-11M, Ed Kato workshop
DATE: January 1999.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Stabilization of Building KALA-6BV
DATE: January 1999.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Stabilization of Buildings KALA-281, Kenso Seki House
DATE: January 1999.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Bayview Home Building #6, Dining and Kitchen Stabilization
DATE: January 1999.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Construction of ungulate fence to protect *Antidesma pulvinatum* in Waihanau Valley
DATE: March 1999.
DISCRIPTION: SHPD, DLNR, and Hui Mālama consultation. Rob Hommon, PISO, and Sarah Collins, SHPD archaeologist, conducted a small archaeological reconnaissance survey of the project area. Fenceline crosses an old road track (KALA-87-002) and is visible from 2 nearby sites called KALA-87-001 (clearings and rock walls) and KALA-87-003. The fence was built to protect Kalaupapa NHP's only known example of *Antidesma pulvinatum*, also known as *hame* or *mehamehame*.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Construct ungulate fence to protect *Prichardia hillebrandii* in Kalawao
DATE: March 1999.
DISCRIPTION: SHPD, OHA, and Hui Mālama consultation. Rob Hommon, PISO, and Sarah Collins, SHPD archaeologist conducted a small archaeological reconnaissance survey of project area. In the assessment of the area, Hommon (page 3) comments:

> The fence will be within a feature or structure that appears to be Indigenous Hawaiian in form. The structure as a whole consists of several contiguous parts (terraces, walls, platforms). . .It is possible that the structure was a communal structure, perhaps a *heiau*; however, no previous archaeological survey has indicated a *heiau* in the area. While the structure is indigenous Hawaiian in form, it might date as late as the late 19th or early 20th century, and if so, could be a house foundation.

The fence was built to protect the area's only known example of *Prichardia hillebrandii,* also known as *loulu lelo.*
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Construct ungulate fence on Coastal Strand
DATE: March 1999.
DISCRIPTION: SHPD and OHA consultation. Rob Hommon, PISO, and Sarah Collins, SHPD archaeologist conducted a small archaeological reconnaissance survey of project area.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Rehabilitation of Building KALA-258, Slaughterhouse Warehouse
DATE: March 1999.
DISCRIPTION: PA exclusion, SHPD, OHA, DHHL, DLNR, and Hui Mālama consultation.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Replace Pali Trail Bridge
DATE: June 1999.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

FUNDING YEAR 2000 AND 2001

TITLE: *Termite Control Treatment for Historic Structures*
DATE: June 2000.
DISCRIPTION: PA exclusion. Documents include a scope of work for the project.
MAPS/PHOTOGRAPHS: Location maps included.

TITLE: St. Francis Roofing
DATE: June 2000.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: St. Philomena Church Roofing
DATE: June 2000.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Construction of storage shed
DATE: April 2001.
DISCRIPTION: PA exclusion. SHPD review recommended.
MAPS/PHOTOGRAPHS: N/A.

TITLE: McVeigh Residences Fumigation
DATE: April 2001.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Hawai'i Department of Health dump site clean up
DATE: April 2001.
DISCRIPTION: Documents describe the clean up of heavy-equipment and non-household garbage to be removed by the yearly barge.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Protestant Church storage shed stabilization by volunteers
DATE: May 2001.
DISCRIPTION: Documents describe repair to a shed by volunteers.
MAPS/PHOTOGRAPHS: Location map included.

TITLE: Pali Bridges Project
DATE: July 2001.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: Location maps included.

TITLE: Emergency repair of plumbing at Bay View #2
DATE: July 2001.
DISCRIPTION: Documents describe repairs made on failing buried pipeline.
MAPS/PHOTOGRAPHS: See computer archives.

TITLE: Kalaupapa NHP Preservation Project, KALA 211
DATE: August 2001.
DISCRIPTION: Documents describe proposed preservation work on several buildings and one nursery area. This long term project is currently in progress.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Emergency maintenance work, tree stump removal
DATE: October 2001.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

TITLE: Building 3A Bathroom remodel and interior painting
DATE: November 2001.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: Location and plan maps included.

TITLE: Termite control treatment for McVeigh Homes
DATE: November 2001.
DISCRIPTION: PA exclusion.
MAPS/PHOTOGRAPHS: N/A.

Time period(s): Prehistoric to historic eras.
Number of sites and features: See above.
Types of sites and features: See above.
Maps and Photographs: See above.
Collections: Artifacts are reported to be in the collections of the Bishop Museum or at the park, catalogued in ANCS.
Absolute dates: N/A.
National Register of Historic Places significance of sites: See above.
Published and unpublished source material referenced: Wells and Hommon (2000)

Project Title: Kirch's (2002) Kalaupapa Archaeological Project

Dates of Fieldwork: 2000
Author(s): Patrick V. Kirch, James Coil, Lisa Holm, John Holson, Solomon Kailihiwa, Kathy Kawelu, Sidsel Millerstrom, and Sharyn O'Day.
Personnel: Same.
Methods: Reconnaissance and intensive survey.
Descriptive Summary: Patrick Kirch of the University of California, Berkeley led a team on a three-week long project in the park in 2000. Only Kirch's (2000b) preliminary report and original site records were available as this report was written. However, the published report on the group's findings was published while a draft of this report was under review by the NPS (Kirch 2002). Below, the main content of the report is summarized followed by some lengthy quotes from volume to help guide the reader toward some of the most significant aspects of this research.

Kirch and company conduced several surveys in the park to identify variability in the distribution of archaeological sites in different physiographic zones. Reconnaissance survey areas chosen included: the Nihoa Landshelf, the area around Kaupikiawa Cave, a large section of the dryland field system called Kaupikiawa Transect, the Kalawao Talus Slopes, Waialeia Valley, and Waikolu Valley (see Kirch 2002: Table 6 for environmental description of each area). In addition, important known sites including temple (*heiau)* and fishing shrines (*ko'a*) reported by Stokes (1909) were mapped in detail with a plane table and alidade. A large section of the Kalawao *ahupua'a* (Kaupikiawa Transect) was also mapped in detail by this method. The open test pits in Kaupikiawa Cave originally excavated by Richard Pearson in the 1960's were temporarily stabilized and deposits were sampled from known stratigraphic context for dating and analysis. Copies of field forms associated with these surveys can be found both in the park and the Honolulu offices of PISO. In addition to reporting on the survey areas, Kirch (2002) includes an analysis of Mahele land records, re-excavation at Kaupikiawa Rockshelter, ethnobotanical observations, and ends with a discussion of the variability in the archaeological record, major research issues, and long-range goals for research at Kalaupapa.

After a review of the natural landscape and history of Kalaupapa, Kirch (2002:15) presents a detailed analysis of Mahele era records that were used "in an effort to extract information relevant to an understanding of traditional Hawaiian land organization, economic structure, and other details that may aid in the interpretation of the archaeological landscape." His analysis discusses the major elite land owners who received large sections of the park, land claims of the *maka'āinana* (commoners), hierarchy of lands, *konohiki* (land manager) succession, and economic infrastructure. This nuanced reading of the enthnohistoric record will enhance future research in the park.

Over one hundred (n=107) sites were recorded by the project. In Waikolu, eleven sites were recorded, mostly wet land agricultural features (WK-1 to WK-11), including pondfield terraces (n=9), a terrace (n=1), and a terrace enclosure (n=1). In Waialeia Valley, nine sites were recorded in brief survey (WL-1 to WL-9) including a walled shelter against boulder (n=1), rectangular enclosure (n=1), walled shelter (n=1), filled terrace (probably burial) (n=1), earth-filled platform (n=1), stone faced terraces (n=2), habitation terraces (stone faced) (n=1), and a free-standing wall (n=1). In Kalawao *ahupua'a*, a small reconnaissance survey in around Site 289, a *heiau* (stone-faced terrace complex), five other sites were recorded including a petroglyph and walls (n=1), rectangular enclosure (n=1), terrace and enclosure (n=1), and terraces (n=2), some of which were clearly part of the larger sacred landscape. This area is referred to as Area A. In a second portion of Kalawao *ahupua'a* the area around Site 288, a fishing shrine (*ko'a*), again a small reconnaissance survey (Area B) revealed seven other sites including rectangular enclosure and terrace (n=2), stone cairn (probable burial), parallel stone alignments, and stone faced terraces (n=4). Within the well-studied, large, Kaupikiawa Transect a total of 38 sites were recorded dispersed among over 80 field walls. The sites are mostly shelters, some of which probably made up traditional household complexes (*kauhale*). At Kaupikiawa Point, in the area immediately around the rockshelter of the same name, 16 sites were recorded while a portion of the crew mapped and cleared sections within the rockshelter. These sites included rectangular enclosures (n=2), rectangular enclosure with doorway (n=1), circular enclosures (n=2), stone walled shelter (n=1), rough enclosure (n=1), parallel field walls in depression (n=1), free standing walls (n=1), parallel field walls within irregular stone enclosure, stone-walled shelter (habitation) (n=1), C-shaped shelters (n=2), irregular enclosure (n=1), stone mound (burial?) (n=1), and a complex walled structure (n=1). Finally, in Nihoa, an area notoriously difficult to access, evidence of habitations and dry land agriculture were found on a reconnaissance survey. A total of ten sites were recorded including habitation terraces (n=1), habitation terraces (stone-faced) (n=1), habitation complex (n=1), rectangular enclosures (n=3), agricultural field complex (n=1), field system complex (n=1), free-standing wall (n=1), C-shaped shelter (n=1), semi-circular enclosure (n=1), and burials (rectangular pavement) (n=2). The crew also recorded a probable *heiau* at Kalawao and noted some structures below Pu'u Uao that had been noted by others who had visited the peninsula (Kirch 2002:82-86).

The results of the re-evaluation of Kaupikiawa Cave by Kirch (2002) in combination with new radiocarbon dates from other sites suggests the culture history of the earliest stage of the occupation of Kalaupapa needs to be revised to a shorter chronology (see above, Chapter 4).

Faunal and charcoal analysis from two units are also discussed in terms of their context and stratigraphic context. In terms of the fauna Kirch (2002:90-92) reports:

> Zooarchaeological analysis of bulk and column samples from both Units A and B was conducted by S. O'Day; full quantitative results will be presented elsewhere (Kirch et al., in prep.). In brief, the samples were dominated by invertebrate taxa (NISP = 7,671, total weight = 2,248.2 g), followed by vertebrates (NISP = 2,455, total weight = 103.02 g), primarily fish. Of the

invertebrates, some 26 different species were identified, dominated by gastropods, but also including 5 bivalve taxa, 2 sea urchin species, and a small amount of Crustacea. Among the gastropods, the dominants were *Nerita picea*, *Littorina pintado*, *Cellana* sp., and *Cypraea caputserpentis*; this array is consistent with the rocky intertidal shoreline near the rockshelter. Vertebrate taxa included 21 kinds of fish, the native Hawaiian bat (*Lasiurus cinereus*), identifiable fragments of pig (*Sus scrofa*), and the Pacific rat (*Rattus exulans*). The identified fish were generally small-to-medium sized individuals, from taxa typically inhabiting near-shore and reef environments; most frequent were Labridae (*Bodianus* sp. and *Halichoeres* sp.) and Scaridae (*Scarus* sp. and *Calotomus* sp.). Important evidence for historic-period occupation of the upper layers of the rockshelter comes from the presence of bones of both the horse (*Equus caballus*) and the European house mouse (*Mus domesticus*), from Layers I and II of Unit B.

Kirch (2002:92-93) also describes how charcoal was recovered, what was identified, and what the results mean for the paleoenvironment of Kalaupapa:

After wet screening through ¼ and 1/8" inch mesh, visible charcoal fragments of sufficient size to attempt identification were selected from the dried sediment samples from the 20x20 cm columns from Units A and B. Unit A yielded 8 charcoal samples and Unit B yielded 9 samples. Identifications were carried out by J. Coil, with methods adapted from Leney (1975). Complete results will be presented elsewhere (Kirch et al., in prep.); here we merely summarize the sequence of change in charcoal types revealed by this analysis.

The 17 samples were arrayed in stratigraphic order, following field correlations between the two stratigraphic sections, and the identified taxa plotted by frequency (Figure 50). The resulting "charcoal diagram" (similar in conception to a pollen diagram) was interpreted in terms of three analytical zones. Analytical Zone 3, at the base of the section (Unit A Layers VIa and VIb; Unit B Layers VII and VIII) was dominated by arboreal taxa, with all samples containing between 66-100% tree-derived charcoal. Dominant taxa include *Antidesma* sp. and *Diospyros* sp.; also present are the native shrubs *Chenopodium* sp., *Osteomeles* sp., *Senna* sp., and *Wikstroemia* sp. Analytical Zone 2 is represented by 9 samples in the middle part of the section (Unit A Layers IIb, IIIa, IIIb, IV/V, Unit B Layers IIb, IIc, IId, IIe, Xa), a fairly homogenous shell midden deposit. The charcoal samples from this zone are a mix of arboreal and shrubby taxa, but with arboreal taxa representing 33% or less of the total identified fragments in all cases. Many of the taxa appearing here are typical of dryland region firewood assemblages in Hawai'i. Dominant taxa in Analytical Zone 2 include *Chamaesyce* sp. *Chenopodium* sp., *Osteomeles* sp., *Senna* sp., and *Wikstroemia* sp. Also appearing here are wood charcoal of the Polynesian-introduced economic trees *Aleurites moluccana* (candlenut) and *Artocarpus altilis* (breadfruit). At the top of the stratigraphic section, Analytical Zone 1 is represented by four samples (Unit A Layers Ia and IIa, Unit B Layers I and IIa). Charcoal in these samples is almost entirely from shrubs, with only one sample containing 25% tree charcoal. Dominants include *Chamaesyce* sp., *Chenopodium* sp., and *Senna* sp., with the addition (for the first time in the sequence) of *Sida* sp.

Tentatively, we would interpret this charcoal sequence as reflecting several periods of vegetation change in the vicinity of Kaupikiawa rockshelter. The earliest charcoal assemblages (Zone 1) are, in our opinion, not derived from firewood, but rather from anthropogenic burning events outside (but in close proximity) to the shelter. It is conceivable that charcoal from trees which grew directly outside of the cave mouth, and which were consumed by fire, washed directly onto the previously bare floor of the shelter. Analytical Zone 2, on the other hand, appears to us to be a typical firewood assemblage, representing wood burned in hearths and earth ovens within the cave during periods of human occupation. The preponderance of shrubby taxa probably reflects a firewood gathering preference, although it also possible that trees had become scarce in the vicinity of the shelter. In the uppermost zone, which probably corresponds to the post-contact period,

> there is a complete absence of arboreal taxa, which would correspond with the contemporary vegetation communities in the site's catchment area.

Making ethnobotanical observations during archaeological surveys in different environmental zones within the park gave Kirch and his team an idea of some of the extant native vegetation, relations to historical developments and archaeological sites. In summary Kirch (2002:99-100) writes:

> Making concurrent ethnobotanical observations on plant distributions during the course of archaeological survey not only added another layer of cultural data, but in several cases provided clues as to the function, chronology, and or distributions of sites such as *heiau*, garden areas, and possibly a specialized craft center. Of particular note were the unexpected mono-stands of *milo* on Nihoa; the association of *kamani* trees with the Site 289 *heiau*; and, the presence of *hala* trees on a significant number of putative habitation sites. Also, on a more general level, because some plants can survive as individuals or persist as a semi-naturalized population in localized areas, they can help us reconstruct the prehistoric and historic landscape. Other plants, however, show no such tendency to stay in one place, and the spread of invasive plants such as Christmas berry, guava, Java plum, and lantana is surely the most remarkable aspect of Kalaupapa's 20th century vegetation history. It is also clear that the processes of vegetation change in Kalaupapa are increasingly dynamic, and further invasions from new exotic plants are likely to continue to occur in the future, as well as changes brought by efforts to control feral ungulates in the peninsula area.

Kirch's (2002) discussion and interpretations chapter includes a brief summary of the scientific significance of the project's findings and four recommended future research issues. The research issues identified as important to future work in the park include (i) chronology of human occupation and land use, (ii) origins and development of the Kalaupapa Field System, (iii) rise of the Ko'olau Polity, and (iv) historic period transformations.

Time period(s): Prehistoric to historic era.
Number of sites and features: 107
Types of sites and features: Habitation, agricultural, and ritual sites.
Maps and Photographs: Fieldwork included site maps and uncorrected GPS readings for locations when possible. A very large survey section and a few large sacred sites were mapped in detail by plane table and alidade. Per the scope of work, photographs are in the possession of the group and not on file with the NPS.
Collections: Soil and artifact samples in collections of the Oceanic Archaeology Laboratory, University of California, Berkeley or with material expert laboratories.
Absolute dates: 4
National Register of Historic Places significance of sites: Review for the National Register was not one of the goals of the project. The final report should be reviewed for National Register eligibility of sites and registration with State Historic Preservation Division.
Published and unpublished source material referenced: Kirch (2000b, 2002)

Project Title: McCoy's (2002a) Kalaupapa Peninsula Archaeological Project: Phase 1

Dates of Fieldwork: 2002
Author(s): Mark D. McCoy
Personnel: Mark D. McCoy, Eddie Bailey, K. Ann Horsburgh, Elaine Howard, Kathy Kawelu, and Robin Stephenson
Methods: Reconnaissance and intensive survey, test excavations.
Descriptive Summary: In 2002, a team lead by the author completed the first phase of the Kalaupapa Peninsula Archaeological Project (KPAP) which included four intensive survey transects, site relocation, reconnaissance survey, and test excavation (McCoy 2002a). Intensive survey transects were narrow (40-50 meters) and long (200-374 meters), each covering an area around 1 hectare, for a total of 4.7 hectares surveyed. Within the four survey areas 516 features were recorded which were later sorted into 56 sites. Since most of the features (440 out of 516) were used for agriculture it was deemed more useful to conglomerate the hundreds of agricultural features into a few site designations as in Rechtman and Henry's report (2001). Also, 11 additional previously known sites outside the study areas were recorded. These additional sites were predominately examples of large public architecture (*heiau*, *ko'a*, etc.) dating from the prehistoric era. Large sections of "The Great Wall of Kalaupapa" were mapped as well. Echoing what others have found in surveys of Kalaupapa, the author writes:

> Overall, features were found distributed at a high density over a continuous, well-preserved, archaeological landscape. Many of these features probably date from the pre-European contact through the early historical period. (McCoy 2002b: 1)

In the field, the team took advantage of Global Positioning units as well as a range of other standard surveying equipment kindly provided by the NPS. Maps of sites and site locations were recorded. GPS data was corrected using GeoInsights, Inc. base station on O'ahu Island. Accuracy and precision were tested by comparing points taken on different days at the same NPS survey benchmark against the reported location of that benchmark. GPS units were found to give coordinate locations within manufacturer error range specifications.

A few test excavations were undertaken with the goals of "defining the range of deposits within agricultural field plots and obtaining material in association with standing stone architecture for radiocarbon dating" (McCoy 2002a:3). Only one charcoal sample has begun the process of dating by being submitted for identification by plant species. Aside from charcoal samples, the excavations produced one artifact: a single flake of volcanic glass. The flake is currently in the collections of the NPS at Kalaupapa NHP.

The Kalaupapa Peninsula Archaeological Project (KPAP) is an ongoing research-oriented project centered on the archaeology of the late prehistoric and early historic eras on the Kalaupapa Peninsula and will form the core data set of the author's Ph.D. dissertation. The results of the first phase of the project were described in a brief report for the park superintendent that

is on file at the NPS and State Historic Preservation Division (McCoy 2002a). In addition, this same information was shared with the community at a public talk at McVeigh Social Hall, Kalaupapa and a later talk sponsored by the Society for Hawaiian Archaeology (SHA) as part of their regular speaker series (McCoy 2002d). This research was also the basis of a paper presented at the national meeting of the Society for American Archaeology (McCoy 2003). The results of these survey (Parts I to IV) and excavations (Part V) are outlined below as they were described in the report. Copies of all relevant data, site forms, etc. are on file with the NPS.

Part I:
Survey #1, called the Kaiaka Transect, is a 200 meter (north-south) by 50-80 meter (east-west) transect in the lower (*makai*) portion of the colluvial zone, near a black sand beach on the shore of Awahua Bay in Kalaupapa *ahupua'a*. The author writes:

> This area was chosen to be surveyed because it is part of a nearly continuous landscape of archaeological features to the west, south, and east mainly consisting of wetland pondfield agricultural plots (*lo'i*). The study area was broken arbitrarily into 20 sites containing within them 44 features. The features included: 31 garden plots (28 large; 3 small), 6 stone walls, 4 examples of stone architecture, and 3 other smaller features. Evidence of historic land use of the area included large, thick, core-filled walls and a small, well-built rectangular structure. Pre-Contact era use of the area may be evidenced by a stone paved enclosed structure with a hammerstone. . .nearby. The time period of use of the ubiquitous agricultural features is unknown. (McCoy 2002b:5)

Part II:
Survey #2, called the Western Kaupikiawa Transect, is a triangular area defined by the Great Wall to the east, a 2-track dirt road and high deer fence that extends nearly the entire length of the peninsula to the west, where the road and fence meet the Great Wall on the south, and parallel to the north edge of Kirch's (2002) Kaupikiawa Transect completed in the summer of 2000. The author writes:

> This area was chosen to be surveyed because it is part of a nearly continuous landscape of archaeological features mainly consisting of dryland (*kula*) agricultural plots, sometimes referred to as the Kalaupapa Dryland Agricultural Field System. The low stone alignments - called "field walls" - were mapped separately from other features using GPS. These walls are oriented northwest to protect crops from the strong prevailing trade winds. Other stone architecture was recorded. . .17 sites containing within them 18 features. Overall, a total of 73 features were recorded including: 55 garden plots (50 large and 5 small), 1 stone wall, 16 examples of stone architecture, and 2 other smaller features. At least one feature had a form consistent with a stone burial cairn. Evidence of historic land use of the area is slim. However, several lines of evidence suggest the large, thick, core-filled "Great Wall of Kalaupapa" may date to the historic era. This will be discussed in detail elsewhere. Pre-Contact era use of the area is evidenced by a dense distribution of stone structures and artifacts including shell scrapers, a basalt adze, and coral fragments. Initial estimates suggest several traditional permanent household complexes (*kauhale*) may be located within the survey area as well as temporary shelters often found associated with dryland agriculture. The time period of use of the ubiquitous agricultural features is unknown - but probably span the pre-contact to early historic eras. (McCoy (2002b:5-6)

Part III:
Survey # 3, called the Punoneino Transect, is an area 300 meters (east-west) by 40 meters (north-south) stretching across Kalaupapa into Makanalua *ahupua'a* within the coastal plain zone. McCoy (2002b:6) writes:

> Until this survey we had no idea as to the distribution of the dryland field system in Kalaupapa *ahupua'a* since the low stone alignments that can be seen clearly on air photos of other parts of the peninsula cannot be seen in this area due to the high, dense vegetation that grows in the lee of Kauhakō Crater to the east. Field walls like those found on the Western Kaupikiawa Transect were in fact found. However, more importantly, a much greater range of variation in garden plot form was found than has been recorded in any other part of the coastal plains. Along side of the long, linear field plots in low swales were terraces and many small planting clearings on the edges of rock outcrops. Little of this area was without some kind of modification for gardening. The study area was broken arbitrarily into 27 sites containing within them 219 features. The features included: 197 garden plots (102 large and 95 small), 6 stone walls, 7 examples of stone architecture, and 9 other smaller features. Evidence of historic land use of the area included large, thick, core-filled walls and what may have been a large corral complex to the south. Pre-Contact era use of the area is best seen within Makanalua *ahupua'a* at the east end of the survey area. Several stone shelters found on top of a low rock outcrop - associated with several more unrecorded examples of stone architecture - appear to have been built during the pre-contact era. A carbon sample for radiocarbon dating recovered from under the basal stone of an L-shaped shelter (MKL-22) will help refine the date of the construction of the architecture. However, a flake of volcanic glass from just above this sample already points to an early date of use. The time period of use of the ubiquitous agricultural features is unknown but probably spans the pre-contact to early historic eras.

Part IV:
Survey #4, called the Waialeia Valley Transect, is a 425 meter (north-south) by 40 meter (east-west) transect oriented north-south on the western half of the Waialeia Valley in Kalawao *ahupua'a*. McCoy (2002b:7) writes:

> This area was chosen to be surveyed because it was judged to be the portion of the taluvial zone of Kalawao *ahupua'a* that was least likely to have been directly impacted by the creation and use of the historic Kalawao settlement (c. 1866-1900). Like the portion of this zone sampled in the Kaiaka Transect, we found it too is part of a nearly continuous landscape of archaeological features mainly consisting of wetland pondfield agricultural plots (*lo'i*). The study area was broken arbitrarily into 24 sites containing within them 180 features. The features included: 157 garden plots (57 large and 100 small), 8 stone walls, 5 examples of stone architecture, and 10 other smaller features. Evidence of historic land use on the northern end of the survey included historic era house sites, ceramic, glass, and metal fragments, and large, thick, core-filled walls. In one case, a core-filled wall was found that was built over an existing garden terrace. The existence of a large *heiau* (KLW-2) also supports the notion that evidence of pre-contact use of the area has been overwhelmed by historic use. The southern portion of the transect however looks as if it may have seen less impact by historic era activities. Chief among the evidence for this interpretation is a medium-sized *heiau* (KLW-24) found at the extreme southern end of the transect. It is indeed remarkable our transect led directly to this well-preserved site. Large piles of cut brush nearby shows that the site has been the focus of a considerable clearing effort in the recent past. The time periods of use of the ubiquitous agricultural features is unknown. However, at least the plots around the *heiau* at the southern end of the survey seem to

> be contemporaneous with the site itself. This observation suggests we interpret the *heiau* as one probably dedicated to Lono, the god of agriculture, and assign a date of pre-contact to the surrounding plots.

Part V:
Test excavations included two trenches, five "basal excavations," and one auger test. No cultural material or datable material was found in any of the excavations with the exception of one basal excavation at a shelter on the eastern end of the Punoneino Transect (Survey #4) in Makanalua *ahupua'a*. McCoy (2002b:8) writes:

> . . .at site MLK-22, carbon samples were recovered both by point provenance 8 cm under the basal stone, as well as from wet screening a bulk soil sample in Basal Excavation #4. During the main excavation (i.e., before samples were taken from under the stone) a flake of volcanic glass was recovered in the first layer.

The results of laboratory testing are currently pending. It is interesting, however, that excavations in the coastal plain dryland field system, unlike the Ladefoged's (1990) excavations near the coast, did not produce any buried architecture.

Time period(s): Prehistoric to historic era.
Number of sites and features: 516 features, 56 sites.
Types of sites and features: Mostly agricultural, habitational, ritual, and boundary walls.
Maps and Photographs: GPS data and site maps on file with NPS. GPS data corrected using GeoInsights, Inc. base station on O'ahu Island. Accuracy and precision tested against NPS benchmark on different days. GPS units found to be operating within manufacturer specifications. Photo logs on file with NPS, but actual photographs are in the possession of the author.
Collections: Several charcoal samples and 1 artifact. Artifact is in park collections. See collections permit application and report OMB# 1024-0236.
Absolute dates: N/A.
National Register of Historic Places significance of sites: Review for the National Register was not one of the goals of the project. The final report should be reviewed for National Register eligibility and registration of sites with State Historic Preservation Division.
Published and unpublished source material referenced: McCoy (2002a, 2002d); Kirch (2000b, 2002)

Project Title: Proposed Paleoenviromental Research

Dates of Fieldwork: Proposed research.
Author(s): Mark D. McCoy
Methods: Soil sampling, laboratory analysis.

Descriptive Summary: Park managers have submitted for funding a proposal to conduct paleoenvironmenal research in the park. Currently there is only one published paleoenviromental core from Moloka'i Island. The analysis by Denham *et al.* (1999:54) revealed the landscape had undergone detectable changes in plant communities due to human agents:

> . . .starting around A.D. 1320-1660, the high counts of sedge and grass pollen indicate the demise of the disturbed forest and shrub canopy. It is probable that this vegetation shift reflects more intensive agricultural clearing associated with gardening. This chronology supports Athens' interpretation for agriculture and temporary occupation in inland Kalama'ula by A.D. 1400-1600 (Athens 1985:95; Weisler 1989:127). Taken together, the archaeological and paleoenvironmental data suggest that Polynesian use and settlement of the leeward lowlands of Moloka'i may have begun centuries before the time-frame originally posited from the Kawela investigations (Weisler and Kirch 1985).

Kauhakō Crater Lake may not be exhausted as a potential source of deposits; however, it is necessary to evaluate the potential of other areas. The future research will need to broaden our efforts geographically to explore the potential of Kalaupapa Peninsula and Waihanau, Waialeia, and Waikolu Valleys for paleoenviromental research. This project will proceed in three parts: (i) a review of the geomorphologic character of different geographic zones in the study area, (ii) the ranking of zones by potential for intact, deep sediments, and (iii) paleoenviromental sampling (i.e., coring) and analysis. Areas of deep duff, offshore islands, and ancient fishpond deposits, if they exist, as well as rockshelters are considered likely candidates for sampling.

Time period(s): Pre-settlement to prehistoric to historic eras.
Number of sites and features: Unspecified.
Types of sites and features: Fishpond and rockshelter deposits.
Maps and Photographs: N/A.
Collections: N/A.
Absolute dates: Radiocarbon dating is a necessary part of paleoenvironmental research.
National Register of Historic Places significance of sites: N/A.
Published and unpublished source material referenced: Denham *et al.* (1999:54), McCoy (2002b)

Project Title: Proposed Field School

Dates of Fieldwork: Proposed.
Author(s): Mark D. McCoy
Methods: Reconnaissance and intensive survey, test excavations.
Descriptive Summary:

Park managers have submitted for funding a plan for an archaeological field school. Undergraduate students from Hawai'i and the mainland U.S. will be trained in methods of survey, excavation, and analysis in this project. The scope of work includes several surveys to discover new sites, the excavation of portions of known sites, the radiocarbon dating of samples from these sites, the analysis of recovered material (i.e., glass, ceramics, stone, bone), and the development of the GIS database of cultural resources in the park.

Time period(s): Prehistoric through historic era.
Number of sites and features: Unspecified.
Types of sites and features: Agricultural, habitational, and ritual.
Maps and Photographs: GPS, plane table and alidade, optical transit, tape-and-compass mapping, and site photography planned.
Collections: Samples and artifacts planned to be removed to the Oceanic Archaeological Laboratory at the University of California, Berkeley then, after analysis, returned to become part of the collections at Kalaupapa.
Absolute dates: Radiocarbon dating of samples is planned.
National Register of Historic Places significance of sites: N/A.
Published and unpublished source material referenced: McCoy (2002c)

Appendix II. Glossary

ahu: built stone marker

ahupua'a: land division usually extending form the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua'a*), or because a pig or other tribute was laid on the alter as tax to the chief

ali'i: chief, elite person

heiau: temple

intensive survey: archaeological survey with the goal of finding and recording all sites in a given area

imu: oven

kama'āina: native born

kauhale: traditional Hawaiian household

ko'a: fishing shrine

konohiki: land manager of an *ahupua'a*

maka'āinana: commoners

Makahiki: name given to traditional festival and season on Hawai'i Island in which a high chief travels around the island as the god Lono collecting tax tribute

midden: refuse, usually food remains

moku: traditional Hawaiian district made up of *ahupua'a*

monitoring: observing and recording archaeological material and other features excavated during non-archaeological earthmoving

reconnaissance survey: archaeological survey with the goal of assessing the range and location of sites in a given area

site: location of archaeological remains, often broken into a subset of component parts called features

Appendix III. Federal Archaeology Legislation and NPS Management Documents*

List of Project Statements from SAIP Report (source: Wells and Hommon 2000: Table 5.2)

National Historic Preservation Act of 1966
*Public Law 89-665**

Protection and Enhancement of the Cultural Environment
*Executive Order 11593**

*National Environmental Policy Act, Public Law 91-190**

Department of Transportation Act
*Public Law 89-670**

Archaeological Resources Protection Act of 1979
*Public Law 96-95**

Abandoned Shipwreck Act
*Public Law 100-298**

Native American Graves Protection and Repatriation Act
*Public Law 101-601**

*1995 Programmatic Agreement (PA) Among the National Park Service (U.S. Dept. of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers***

* Entire section is directly from the web site of the North Carolina Archaeology Society (http://www.arch.dcr.state.nc.us/fedlaws.htm).
** PA can be found on the web (http://www.achp.gov/npspal.html). Park and cultural resource managers are directed to Section IV (in italics).

List of Project Statements from SAIP Report
(source: Wells and Hommon 2000: Table 5.2)

TABLE 5.2 (Continued)

PARK	SAIP PROJECT STATEMENTS	RMP #/ 10-238 PKG #/ PMIS #	SCOPE OF PROJECT	COSTS IN 1998 DOLLARS		SAIP PRIORITY FACTORS							COMMENTS
				PER YEAR	TOTAL	1	2	3	4	5	6	7	
KAHO (Cont'd)	4. Archeological Research Design		Preparation of scholarly document which can be used to direct future archeological research and investigations.	1. 40,000	40,000	X					X		Baseline Study
KALA	1. Archeological survey in Waikolu Valley	KALA-C-022.000	Survey of wet taro fields and associated features	1. 50,000 2. 50,000 3. 50,000	150,000	X			X	X		X	
	2. Archeological survey of Kauhako Trench	KALA-C-053.000	Survey of collapsed lava channel.	1. 30,000 2. 30,000	60,000	X			X	X		X	
	3. Archeological survey of Kauhako Crater, Phases I and II	KALA-C-054.001 KALA-C-054.002 Pkg 224 PMIS 6718	Crater used extensively in prehistoric and historic periods. Research and field work.	1. 14,000-FY98 2. 45,000	59,000	X			X	X		X	
	4. Archeological survey of Waihanau Valley	KALA-C-089.000	Survey approximately 50 acres of valley adjacent to parcel surveyed in 1987.	1. 40,000 2. 40,000	80,000	X			X	X		X	
	5. Archeological sample survey of Makanahua Makai Ahupua'a	KALA-C-091.000	Sample survey of one third of Kalaupapa Peninsula including numerous sweet potato fields.	1. 50,000 2. 50,000	100,000	X			X	X		X	
	6. Archeological survey of Makanahua Mauka Ahupua'a	KALA-C-057.000	Survey approximately 275 acres.	1. 50,000 2. 50,000	100,000	X			X	X		X	
	7. Archeological survey of Kalawao Makai fields	KALA-C-062.001 PMIS 34298	Survey of 12 acres. Known sites include pre-and postcontact period sites as well as sites associated with 1866 Kalawao Hansen's disease settlement.	1. 45,000	45,000	X			X	X		X	
	8. Archeological survey of Wa'ale'ia Valley	KALA-C-090.000	Survey about 200 acres in valley.	1. 50,000 2. 50,000 3. 50,000	150,000	X			X	X		X	
	9. Archeological sample survey of Kalawao Makai Ahupua'a	KALA-C-094.000	Sample survey of one third of Kalaupapa Peninsula including numerous sweet potato fields.	1. 50,000 2. 50,000 3. 50,000	150,000	X			X	X		X	

TABLE 5.2 (Continued)

PARK	SAIP PROJECT STATEMENTS	RMP #/ 10-238 PKG #/ PMIS #	SCOPE OF PROJECT	COSTS IN 1998 DOLLARS		SAIP PRIORITY FACTORS							COMMENTS
				PER YEAR	TOTAL	1	2	3	4	5	6	7	
KALA (Cont'd)	10. Archeological survey of Kalawao Settlement	KALA-C-062 PMIS 18369	Survey 73 acres of historic Kalawao Settlement, including Baldwin Home, research hospital, church grounds and section of Damien Road.	1. 50,000 2. 50,000	100,000	X			X	X		X	
	11. Archeological survey of Kalaupapa Makaha Ahupua'a	KALA-C-092.000	Survey about 150 acres Makha the settlement of Kalaupapa with numerous stone walls, platforms and terraces.	1. 50,000 2. 50,000 3. 50,000	150,000	X			X	X		X	
	12. Archeological sample survey of Kalaupapa Makai Ahupua'a	KALA-C-093.000	Sample survey of one-third of Kalaupapa Peninsula including numerous sweet potato fields.	1. 50,000 2. 50,000 3. 50,000	150,000	X			X	X		X	
	13. Archeological survey of Kalaupapa Settlement	KALA-C-063 PMIS 18370	Survey 160 acres (40 acres open ground) of historic Kalaupapa Settlement.	1. 50,000 2. 50,000	100,000	X		X	X	X		X	
	14. Archeological survey of Nihoa	KALA-C-064.000	Survey 25 acres in Nihoa coastal land section.	1. 30,000 2. 30,000	60,000	X			X	X		X	
	15. Archeological survey of submerged lands, Kalaupapa	KALA-C-065.000	Survey submerged lands around Kalaupapa Peninsula. Requires scuba equipment and boat.	1. 50,000 2. 50,000	100,000	X	X		X	X		X	
	16. Archeological survey of caves at Kalaupapa	KALA-1-20	Survey caves.	1. 50,000	50,000	X	X		X	X		X	
	17. Archeological Overview and Assessment	KALA-C-088.000 PMIS 34294	Produce an overall description of the park's archeology, describe previous research, and provide direction for future research.	1. 50,000	50,000	X					X		Baseline Study
	18. Enter archeological data in ASMIS database	KALA-C-095	Site data for 500 known sites will be entered into the Archeological Sites Management Information System (ASMIS) database.	1. 40,000	40,000	X							
	19. Archeological Research Design	KALA-C-096	Preparation of scholarly document that can be used to direct future archeological research and investigations.	1. 50,000	50,000	X					X		Baseline Study

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National Historic Preservation Act of 1966
Public Law 89-665

Enacted in 1966 and amended in 1970 and 1980, this federal law provides for a National Register of Historic Places to include districts, sites, buildings, structures and objects significant in American history, architecture, archaeology and culture. These items may bear national, state or local significance. The act provides funding for the State Historic Preservation Officer and his [or her] staff to conduct surveys and comprehensive preservation planning, establishes standards for state programs and requires states to establish mechanisms for certifying local governments to participate in the National Register nomination and funding programs.

Section 106 of the Act requires that federal agencies having direct or indirect jurisdiction over a proposed federal, federally assisted, or federally licensed undertaking, prior to approval of the expenditure of funds or the issuance of a license, take into account the effect of the undertaking on any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to the undertaking. This Council appointed by the President has implemented procedures to facilitate compliance with this provision at 36 CFR Part 800.

Section 110 of the Act directs the heads of all federal agencies to assume responsibility for the preservation of National Register listed or eligible historic properties owned or controlled by their agency. Federal agencies are directed to located, inventory and nominate properties to the National Register, to exercise caution to protect such properties and to use such properties to the maximum extent feasible. Other major provisions of Section 110 include documentation of properties adversely affected by federal undertakings, the establishment of trained federal preservation officers in each agency, and the inclusion of the costs of preservation activities.

Protection and Enhancement of the Cultural Environment
Executive Order 11593

This Executive Order, issued in 1971, mandates that all Executive Branch agencies, bureaus, and offices: 1) compile an inventory of the cultural resources--archaeological, architectural and historical properties, sites and districts--for which they are trustee; 2) nominate all eligible government properties to the National Register of Historic Places; 3) preserve and protect their cultural resources; and 4) insure that agency activities contribute to the preservation and protection of non-federally owned cultural resources. The deadline for Federal agency compliance with EO 11593 was July 1, 1973.

National Environmental Policy Act, Public Law 91-190

This legislation obligates federal agencies to prepare an environmental impact statement for every major federal action affecting the "natural and man-made environment" in order that they might exercise their responsibility

> *to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate federal plans, functions, programs, and resources to the end that the nation may...preserve important historic, cultural, and natural aspects of our national heritage... (Section 101(b)(4)).*

The federal government further reinforced this position in its codification of "Council on Environmental Quality Guidelines for the Preparation of Environmental Impact Statements" (40 CFR Part 1500). The environmental impact statements must include the comments of the Advisory Council on Historic Preservation as Section 1500.9 directs federal agencies to combine, to the extent possible, statements or findings concerning environmental impact required by other authorities such as Section 106 of the National Historic Preservation Act and Executive Order 11593.

Department of Transportation Act
Public Law 89-670

Section 4(f) of this 1966 act provides that the Secretary of Transportation:

> *...not approve any program or project which requires the use of...any land from an historic site of national, State or local significance as...determined...by the Federal, State or local officials having jurisdiction thereof unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such...historic site resulting from such use.*

This section applies to all activities of the Department of Transportation including the Federal Highway Administration, the Federal Aviation Administration, the Coast Guard, the Urban Mass Transportation Administration and the Federal Railroad Administration among others. In addition to all National Register listed or eligible properties, Section 4(f) also applies to those properties determined significant by other appropriate authorities, such as local landmarks commissions, even though such properties may not be listed in or eligible for the National Register.

Archaeological Resources Protection Act of 1979
Public Law 96-95
(via ArchNet)

This federal statute, enacted in 1979 and amended in 1988, applies to all lands the fee title to which is held by the United States (other than lands on the Outer Continental Shelf and lands which are under the jurisdiction of the Smithsonian Institution), and Indian lands which are held in trust by the United States.

The purpose of the statute is to provide for the protection of archaeological resources on federal and Indian lands. Major provisions of the law are as follows:

1. Archaeological resources are defined as any material remains of past human life or activities which are of archaeological interest and are at least 100 years old and the physical site, location or context in which they are found. An object, site, or other material is of archaeological interest if, through its scientific study and analysis, information or knowledge can be obtained concerning human life or activities.
2. Permits are required to conduct archaeological investigations on federal or Indian lands.
3. Information concerning the nature and location of any archaeological resource on federal or Indian lands may not be made available to the public unless it is determined that such disclosure would further the purposes of the act and not create a risk of harm to the resources or to the site at which such resources are located.
4. All archaeological resources, equipment and vehicles utilized in violation of this law may be subject to forfeiture.
5. Each federal land manager shall establish a program to increase public awareness of the significance of the archaeological resources located on public and Indian lands and the need to protect such resources.
6. The Secretaries of the Interior, Agriculture and Defense and the Chairman of the Board of the Tennessee Valley Authority shall

- develop plans for surveying lands under their control,
- prepare a schedule for surveying lands containing the most important resources, and
- develop documents for reporting violations of the Act and establish when and how such documents are to be completed.

Prohibitions and penalties under the law are as follows:

1. No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on federal or Indian lands without a permit.
2. No person may sell, purchase, exchange, transport, receive or offer to sell, purchase or exchange any archaeological resource if such resource was excavated or removed from federal or Indian lands in violation of this Act or in violation of any rule, regulation, or provision in effect under any other provision of federal law.
3. No person may sell, purchase, exchange, transport receive or offer to sell, purchase or exchange, in interstate or foreign commerce, any archaeological resource excavated, removed, sold, purchased, exchanged, transported, or received in violation of any provision, rule, regulation, ordinance, or permit in effect under state or local law.
4. Any person who knowingly violates, or counsels, procures, solicits, or employs any other person to violate, any prohibition contained in

numbers 1, 2, or 3 of this section shall, upon conviction, be fined not more than $10,000 or imprisoned not more than 1 year, or both; provided, however, that if the commercial or archaeological resources involved and the cost of the restoration and repair of such resources exceeds the sum of $500, such person shall be fined not more than $20,000 or imprisoned not more than two years, or both. In the case of a second or subsequent violation, upon conviction such person be fined not more than $100,000, or imprisoned not more than five years, or both.

5. Civil penalties may also be assessed against any person who violates the provisions of the Act.

Abandoned Shipwreck Act
Public Law 100-298

Under the Abandoned Shipwreck Act (ASA), the U.S. Government asserted title to three categories of abandoned shipwrecks: abandoned shipwrecks embedded in a State's submerged lands; abandoned shipwrecks embedded in coralline formations protected by a State on its submerged lands; and abandoned shipwrecks located on a State's submerged lands and included in or determined eligible for inclusion in the National Register of Historic Places. Upon asserting title, the U.S. Government transferred its title to the majority of those shipwrecks to the respective States to manage.

Guidelines prepared to implement ASA are intended to maximize the enhancement of cultural resources; foster a partnership among sport divers, fishermen, archaeologists, sailors, and other interests to manage shipwreck resources; facilitate access and utilization by recreational interests; and recognize the interests of individuals and groups engaged in shipwreck discovery and salvage. States and Federal agencies are free to adopt the Guidelines in their entirety, make changes to accommodate the diverse needs of each State or agency, reject parts as inapplicable, or use alternative approaches. Creation of public underwater parks and preserves is encouraged, and investigations of historic shipwrecks which remain in federal jurisdiction require federal ARPA permits.

Native American Graves Protection and Repatriation Act
Public Law 101-601

NAGPRA became law in 1990, and contains two main provisions. The first requires federal agencies and museums receiving federal funds to inventory collections of human remains and associated funerary objects, and develop written summaries for unassociated funerary objects, sacred objects, and objects of cultural patrimony that are in the collections they own or control. Requests for repatriation of those remains or objects may be made,

based on those inventories, by federally-recognized Indian Tribes or Native Hawaiian organizations which are culturally affiliated or for which they are lineal descendants.

Protection of Native American graves and associated cultural items is the second purpose of NAGPRA. Avoidance of archaeological sites containing graves is encouraged, as are intensive surveys to identify such sites. Archaeological investigations for planning or research purposes on federal and tribal lands, or other land modifying activities that inadvertently discover such items, require the federal agency or tribe to consult with affiliated Native Americans. Federal ARPA permits are required for archaeological investigations of grave sites on federal or tribal lands, in addition to consultation with affected groups.

NAGPRA also includes prohibitions against trafficking in human remains and related cultural items; a grants program administered by the Secretary of the Interior to assist museums and tribes with compliance with the Act; and establishment of a review committee to assist the Secretary with disputed cases and to develop regulations for the law.

1995 Programmatic Agreement Among the National Park Service (U.S. Dept. of the Interior), the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers

WHEREAS, the National Park Service (NPS) plans for, operates, manages, and administers the National Park System, and is responsible for preserving, maintaining, and interpreting the cultural resources of the System unimpaired for the enjoyment of future generations; and
WHEREAS, the operation, management, and administration of the System entail undertakings that may affect historic properties (as defined in 36 CFR 800), which are therefore subject to review under Sections 106, 110(f) and 111(a) of the National Historic Preservation Act as amended (NHPA; 16 U.S.C. 470 et seq.) and the regulations of the Advisory Council on Historic Preservation (Council) (36 CFR Part 800); and
WHEREAS, the NPS has established management policies, guidelines, standards, and technical information designed for the treatment of cultural resources consistent with the spirit and intent of the NHPA; and
WHEREAS, the NPS has a qualified staff of cultural resources specialists in parks, System Support Offices, and archeological and preservation centers to carry out programs for cultural resources; and
WHEREAS, the NPS has consulted with the National Conference of State Historic Preservation Officers (Conference) and the Council regarding ways to ensure that NPS operation, management, and administration of the System provide for management of the System's cultural resources in accordance with the intent of NPS policies and with Sections 106, 110, and 111 of the NHPA; and
WHEREAS, the National Park Service, the Conference, and the Council executed a Nationwide Programmatic Agreement in 1990 that is superseded with the execution of this Programmatic Agreement; and

WHEREAS, the NPS has restructured in order to place more resources and delegations of authorities with park managers.
NOW, THEREFORE, the NPS, Conference, and Council mutually agree that the NPS will carry out its Section 106 responsibilities with respect to management of the System in accordance with the following stipulations:

STIPULATIONS

I. POLICY

The NPS will continue to preserve and foster appreciation of the cultural resources in its custody through appropriate programs of protection, research, treatment, and interpretation. These efforts are and will remain in keeping with the NHPA, the National Environmental Policy Act (NEPA), the American Indian Religious Freedom Act, The Archaeological Resources Protection Act, the Archeological and Historic Preservation Act of 1974, the Native American Graves Protection and Repatriation Act, the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, NPS Management Policies, and the Guidelines for Federal Agency Responsibilities Under Section 110 of the National Historic Preservation Act. It remains the NPS goal to implement these programs in consultation with other Federal agencies, State Historic Preservation Officers (SHPOs), Indian Tribes, local governments and the public.
Other guidelines, standards, and regulations relevant to this Agreement and its purposes include: NPS-28, Cultural Resource Management Guideline NPS-2, Planning Process Guideline NPS-6, Interpretation and Visitor Services Guideline NPS-12, NEPA Compliance Guideline NPS-38, Historic Property Leasing Guideline 36 CFR Part 18, Leases and Exchanges of Historic Property

II. IDENTIFYING CULTURAL RESOURCES

The NPS will coordinate with SHPOs activities for research related to resource management needs and identification, evaluation, and registration of park historic properties. NPS fulfills these responsibilities under Section 110 of the NHPA and 36 CFR Part 800.4, with regard to properties potentially significant at national, State, or local levels and mindful of State preservation planning and inventory programs.

III. DELEGATION OF AUTHORITY

Park superintendents are the responsible agency officials as defined in 36 CFR Part 800.1(c) (1) (i) for purposes of Section 106 compliance. They will assume this responsibility in accordance with Stipulation VIII below. Superintendents will be held accountable for their performance in Section 106 compliance through NPS procedures for performance and program evaluation. To meet this responsibility, each park will have the following: a commitment to training park staff, including an invitation to the appropriate SHPO and the Council to participate in that training, so that park staff are generally familiar with Section 106 processes; and at least one staff person qualified to act as the park's 106 coordinator, whose 106 responsibilities are specified in his or her position description and performance standards; and a formally designed set of CRM advisers whose qualifications are consistent with OPM standards, the intent of 36 CFR Part 61, Appendix A, and the intent of Section 112 (a) (1) (B) of the National Historic Preservation Act. In park staff, System Support Offices, other parks, NPS cultural preservation and

archeological centers, Denver Service Center, other government agencies, and specialists and scholars outside NPS are all possible sources for needed expertise. Specialists who are not federal employees must meet the standards in 36 CFR Part 61, Appendix A. SHPOs and the Advisory Council may at any time raise with the appropriate Field Director any programmatic or project matters where they wish the Field Director to review a park superintendent's decision.

IV. PROJECT REVIEW-NATIONWIDE PROGRAMMATIC EXCLUSIONS

Undertakings listed in IV.B will be reviewed for Section 106 purposes within the NPS, without further review by the Council or SHPOs, provided: *that these undertakings are based upon information adequate to identify and evaluate affected cultural resources [except for IV.B.(5)]; that the NPS finds that their effects on cultural resources in or eligible for the National Register will not be adverse based on criteria in 36 CFR Part 800.9; and that decisions regarding these undertakings are made and carried out in conformity with applicable policies, guidelines, and standards as identified in Stipulation I, and are documented by NPS using the form for "Assessment of Actions Having and Effect on Cultural Resources" or another appropriate format. (See Stipulation VII below.) The following undertakings may be reviewed under the terms of IV.A: preservation maintenance (housekeeping, routine and cyclic maintenance, and stabilization) as defined in NPS-28; routine grounds maintenance, such as grass cutting and tree trimming; installation of environmental monitoring units, such as those for water and air quality; archeological monitoring and testing and investigations of historic structures and cultural landscapes involving ground disturbing activities or intrusion into historic fabric for research or inventory purposes (see also Stipulations II and IX. C); acquisition of lands for park purposes, including additions to existing parks; rehabilitation and widening of existing trails, walks, paths, and sidewalks within previously disturbed areas; repaving of existing roads or existing parking areas within previously disturbed areas; placement, maintenance, or replacement of utility lines, transmission lines, and fences within previously disturbed areas; rehabilitation work limited to actions for retaining and preserving, protecting and maintaining, and repairing and replacing in kind materials and features, consistent with the Secretary of the Interior's Standards for Rehabilitation and the accompanying guidelines; health and safety activities such as radon mitigation, and removal of asbestos, lead paint, and buried oil tanks; installation of fire detection and suppression systems, and security alarm systems, and upgrading of HVAC systems; erection of signs, wayside exhibits, and memorial plaques; leasing of historic properties consistent with NPS-38, if proposed treatments are limited to those consistent with IV.B(1) and (9) and other activities excluded under IV.A and B. Park superintendents and SHPOs may develop additions to Stipulation IV.B that identify other types of undertakings that they mutually agree will be excluded from further review.* Proposals for such additions will be provided for review to the Executive Director of the Council, the NPS Director, and the Executive Director of the Conference. Upon their acceptance, the Council, the Conference, and NPS will maintain records on those additions as amendments to this Agreement, and provide for dissemination to other appropriate SHPOs and NPS offices. In the event that a SHPO questions whether a project should be considered a programmatic exclusion under Stipulation IV.

A and B, the superintendent and SHPO will make every effort to resolve the issue informally. If those efforts fail, the question will be referred to the Field Director. If the matter is still not resolved, it will be referred to the Advisory Council in accordance with Stipulation XI.A.

V. PROJECT AND PROGRAM REVIEW-OTHER UNDERTAKINGS

All undertakings (as defined in 36 CFR Part 800), with the exception of those that meet provisions in Stipulation IV, will be reviewed in accord with 36 CFR Part 800. Superintendents are encouraged to evaluate their park's program and discuss with SHPOs ways to develop programmatic agreements for park undertakings that would otherwise require numerous individual requests for comments. Memoranda of Agreement and Programmatic Agreements specific to a project, plan, or park may be negotiated between park superintendents and SHPOs, pursuant to 36 CFR Part 800.5(e) or 800.13, and may be independent of or supplement this Agreement.

VI. RELATIONSHIP OF PROJECT REVIEW TO PLANS

To the extent that the requirements of Section 106 and NEPA overlap for a given plan or project, superintendents are encouraged to coordinate these two processes, including the preparation of documentation and public involvement processes, in accordance with the guidance in 36 CFR Part 800 or otherwise provided by the Advisory Council. In conformity with 36 CFR Part 800.3(c), park superintendents will ensure that the Section 106 process is initiated early in the planning stages of any given undertaking, when the widest feasible range of alternatives is open for consideration. General Management Plans (GMPs) establish a conceptual framework for subsequent undertakings, and can thus play an important role in this process. GMPs may constitute the basis for consultation under 36 CFR Part 800.4-5 on individual undertakings, if sufficient information exists for resource identification, determination of National Register eligibility, and assessment of the effect of a proposed undertaking on the property in question. In the absence of such information, Section 106 consultation will normally be initiated or completed at subsequent stages in the planning process [such as Development Concept Plans (DCPs) or other subsequent implementing plans, as defined in NPS-2]. The park superintendent will notify the appropriate SHPO and the Council when a GMP or DCP is scheduled for preparation, amendment, revision, or updating. The superintendent will request comments regarding preservation concerns relevant to the plan, such as management objectives, identification and evaluation of historic properties, and the potential effects of individual undertakings and alternatives on historic properties. During the planning process, the park superintendent, in consultation with the SHPO, will make a determination about which undertakings are programmatic exclusions under IV.A and B, and for all other undertakings, whether there is sufficient information about resources and potential effects on those resources to seek review and comment under 36 CFR Part 800.4-5 during the plan review process. In cases where consultation is completed on specific undertakings, documentation of this consultation will be included in the GMP or DCP. The approved plan will list all undertakings in the plan that are subject to further consultation, and the stage of planning at which consultation is most likely to be completed. NPS GMPs will include a statement about the status of the park's cultural resources inventory and will indicate needs for additional cultural resource

information, plans, or studies required before undertakings can be carried out.

VII. NPS PROCESS FOR DOCUMENTING ACTIONS HAVING AN EFFECT ON CULTURAL RESOURCES

All system-related undertakings that may have an effect on cultural resources will be appropriately documented and carried out in accordance with applicable policies, guidelines, and standards, as identified in Stipulation I. Formats for documentation include those outlined in published Advisory Council guidance (see "Preparing Agreement Documents," for example), the NPS "Assessment of Actions Having an Effect on Cultural Resources" forms, programmatic agreements and, where appropriate, NEPA documentation that addresses cultural resources issues with information consistent with requirements of 36 CFR Part 800. Cultural resources specialists will review all such actions prior to their implementation, and parks will maintain documentation of this review. Documentation of NPS reviews not already provided to SHPOs and the Council will be available for review by the Council and the appropriate SHPO upon request. Individual SHPOs who wish to review this documentation are responsible for specifying scheduling, frequency, and types of undertakings of concern to them.

VIII. PUTTING THIS AGREEMENT INTO EFFECT

The delegation of Section 106 responsibility to park superintendents will take place as of October 1, 1995. As a condition of this delegation, each park will identify: the specialists, on or off park staff, who will provide the park with advice and technical services for cultural resource issues related to Section 106 compliance. These specialists must be qualified in their areas of expertise and have a specified term of commitment to advise the park; and a contact person to coordinate the park's Section 106 compliance processes. Parks supplement on-staff expertise through advice and technical services from CRM specialists in SSOs, the Denver Service Center, preservation centers, and other specified CRM specialists inside and outside the NPS, for advice and technical services involved in responsible agency official for 106 purposes, who ensures the implementation of this agreement and 36
CFR Part 800 procedures, and who signs correspondence to SHPOs and the Advisory Council and documentation of programmatic exclusions.

IX. COOPERATION AND COMMUNICATIONS

Within six months of the date of the signature of this PA by all parties, and every two years thereafter, each park superintendent will invite the appropriate SHPO(s) to meet to discuss the compliance process and any actions necessary to improve communications between the park and SHPO. SHPOs, the Conference, and the Council will be informed and consulted about revisions to NPS standards and guidelines listed in Stipulation I. SHPOs, parks and NPS System Support Offices will share information about inventories of historic properties, preservation planning processes, and historic contexts developed by each, as well as other reports and research results related to cultural resources. SHPOs will treat the appropriate park superintendent as an interested party for purposes of State environmental and preservation laws as they may relate to park undertakings and cultural resources. The Council and SHPOs will treat the appropriate park superintendent as an interested party

under 36 CFR Part 800 for purposes of undertakings by other Federal agencies and Indian tribes that may affect NPS areas, including undertakings in areas in and around parks. As required in NPS-2, NPS-12, the Section 110 Guidelines, and 36 CFR Part 800, NPS will provide opportunities for Indian tribes and other interested persons to participate in the processes outlined in this Agreement.

X. RELATIONSHIP TO OTHER EXISTING AGREEMENTS

This Programmatic Agreement will become effective on October 1, 1995 and shall supersede the following existing Programmatic Agreements: the Memorandum of Understanding executed in June 1976, regarding NPS planning documents; the Programmatic Memorandum of Agreement executed on December 19, 1979, and its amendments dated September 1981 and December 1985 regarding planning documents, energy management, and preservation maintenance; the Programmatic Memorandum of Agreement executed on December 19, 1982, regarding leasing of historic properties; and the nationwide Programmatic Agreement of 1990.

Signature and implementation of this Agreement does not invalidate park-, Region-, or project-specific Memoranda of Agreement or programmatic agreements negotiated for Section 106 purposes prior to the effective date of this Agreement.

XI. DISPUTE RESOLUTION

Should a SHPO or the Council object to a park superintendent's decisions or actions pursuant to any portion of this Agreement, the superintendent will consult the objecting party to resolve the objection. If the park superintendent or the objecting party determines that the objection cannot be resolved, the superintendent will forward all documentation relevant to the dispute to the Field Director for further consultation. If the objection still cannot be resolved, the Field Director will forward to the Council relevant documentation not previously furnished to the Council. Within 30 days after receipt of all pertinent documentation, the Council will either: provide the Field Director with recommendations, which the Field Director will take into account in reaching a final decision regarding the dispute; or notify the Field Director that it will comment pursuant to 36 CFR Part 800.6(b), and proceed to comment. Any Council comment provided in response to such a request will be taken into account by the Field Director with reference to the subject of the dispute. Any recommendation or comment provided by the Council will be understood to pertain only to the subject of the dispute. The NPS responsibility to carry out all actions under this Agreement that are not the subjects of the dispute will remain unchanged. When requested by any person, the Council will consider NPS findings under this Agreement pursuant to the provisions of 36 CFR Part 800.6(e) on public requests to the Council.

XII. MONITORING, TERMINATION, AND EXPIRATION

The National Park Service will convene a meeting of the parties to this Agreement on or about November 15, 1996, to review implementation of the terms of this Agreement and determine whether revisions or amendments are needed. If revisions or amendments are needed, the parties will consult in accordance with 36 CFR Part 800.13. Any party to this Agreement may terminate

it by providing ninety (90) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the NPS will comply with 36 CFR Part 800 with regard to individual undertakings otherwise covered by this Agreement.

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