

**PRESERVATION PLAN FOR
SELECTED SITES AT NU'ALOLO KAI,
NĀ PALI COAST STATE WILDERNESS PARK
DISTRICT OF WAIMEA, KAUA'I**

Prepared by:



ARCHAEOLOGY PROGRAM

**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS**

and



NĀ PALI COAST 'OHANA

June 2007

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INTRODUCTION

This plan proposes preservation actions for selected archaeological surface features in Sites 50-30-01-197 and 50-30-01-7150 at Nu'alolo Kai, comprising a portion of the sandy coastal flat there. The Division of State Parks administers the land as part of Nā Pali Coast State Wilderness Park, and since 1979 has actively worked to document and preserve sites there, implementing the first sentence of the CRM (Cultural Resource Management) plan for Nu'alolo Kai:

To locate, identify, evaluate, preserve and interpret cultural resources in the park in such a way that they may be handed on to future generations unimpaired. (Yent 1983:1)

Over the past decade, Nā Pali Coast 'Ohana, a Kaua'i non-profit group formed to *mālama* (care for) the coast's natural and cultural resources, has become integral to an intensified preservation effort, recently entering into a curator agreement with Parks to *mālama* Nu'alolo Kai (Appendix A). As a result of this ongoing partnership, augmented by significant volunteer efforts from the Kaua'i, archaeological, and cartographic communities, most surface sites in Nu'alolo Kai have now been documented, and the 'Ohana has begun to look forward toward a more active preservation stance. Proposed preservation activity at Site 197 involves a trial run of the scientifically-based, culturally-informed approach to restoration favored by State Parks and Nā Pali 'Ohana. A project report will be prepared for SHPD review, and another report produced with site caretakers, restorers, and contractors in mind.

Preservation may refer to a broad range of activities, from little more than benign neglect to extensive restoration. State Parks and Nā Pali 'Ohana have always exercised a cautious, conservation-minded approach that has enhanced preservation of cultural resources in Nu'alolo Kai, but a desire to engage in restoration brings the process into the realm of the State Historic Preservation review (HAR Section 13-13-277). In these administrative rules, the main requirements are that a preservation plan be prepared, that protective buffer zones be established, and that interim and long-term measures be addressed. Because

information about the sites is to be presented to the public, it must also be shown that interpretive elements are acceptable.

The proposed actions include the following:

- Stabilization: This involves treatments such as repairing some stone structures currently collapsing, and ensuring that the surrounding ground surface is not eroding or otherwise subject to degradation.
- Restoration: Features will be returned to their condition at a specific time in history. In this case, the restoration is partial, since only the stone components are being rebuilt, and no pole and thatch structure is planned.
- Interpretation: This treatment refers to text and guided tours that present information about the sites to people ranging from Kaua'i residents to international tourists.

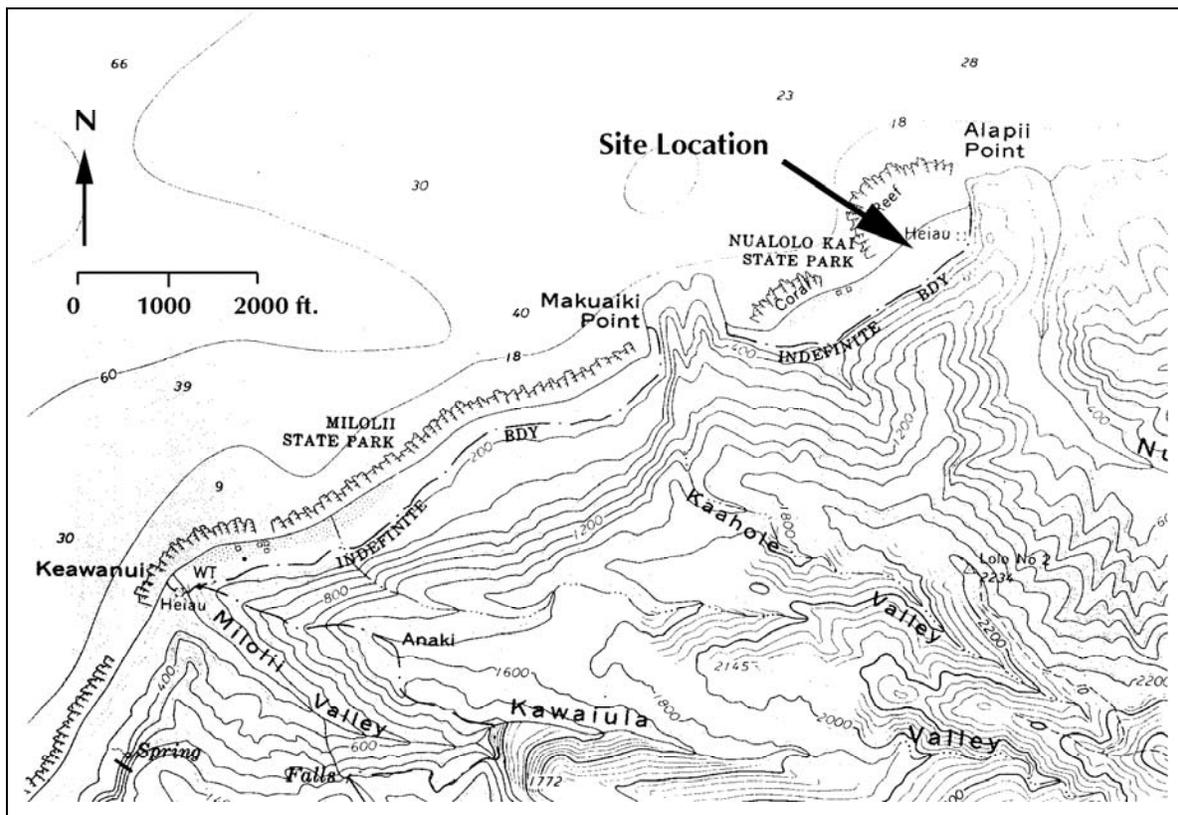


FIGURE 1. Nu'alolo Kai Location (USGS, Makaha Point Quadrangle).

PRESERVATION ISSUES

The fact that standard categories of treatments such as those just listed are applied throughout the islands does not mean that a cookie-cutter approach is appropriate for all sites. Before priorities can be set, before detailed implementation plans may be developed, and before work commences, we must examine the issues that must be addressed in Nu'alolo Kai. What is the state of knowledge about the sites? What are the threats to sites? How will sites be used? What constraints will affect restoration and monitoring? What are the physical, cultural, and interpretive goals of preservation?

Familiar preservation issues include potential sources of adverse impacts: human visitors and a large goat population. Absence of development pressure, unfortunately, does not mean that no immediate or long-term threats exist, and to the latter might be added the potential for natural surf and tsunami damage on the nearshore sites, and for rockfalls at the *mauka* extreme.

WHAT MAKES NU'ALOLO KAI DIFFERENT?

The sites at Nu'alolo Kai and the proposed actions differ from those typically addressed in preservation plans. Reasons for this include simple facts such as the large size of the parcel and that it is part of a State Park, but also patterns of use by various constituencies, and the presence of a very robust local preservation group. Nu'alolo's uniqueness means that the preservation process must play out slightly differently than in the majority of sites, but before detailing that process, it is worth reiterating the factors that make Nu'alolo Kai a special case:

- First, there is no construction or development proposed in the vicinity.
- Second, because Nu'alolo Kai is within an existing State Park, in which the default treatment for any significant site is preservation, the relevance and nature of buffers and interim measures differ from those of most sites (in fact State Parks emphasizes cultural and natural landscapes, rather than a distinct surface "site").
- Third, complexity of the sites, their remote location, and budgetary constraints mean that not all sites in Nu'alolo Kai have been

documented and reported at the Inventory level specified in historic preservation rules (HAR 13-13-276). The desire to halt degradation of sites and recognize preservation priorities raised by current patterns of park use has meant that the usual trajectory of identifying, evaluating, and then mitigating or preserving all sites in a given parcel has necessitated an approach that deals with fragments rather than the complete parcel.

- Finally, the joint effort by State Parks and Nā Pali 'Ohana not only represents an unusual partnership, but also reflects a level of community involvement far beyond that of "interested parties" anticipated by the rules. The 'Ohana instead has become a management partner.

The result of these differences is that inventory and evaluation reports, as well as preservation plans for Nu'alolo Kai address "sites" and features, rather than a complete land parcel. Inventory efforts have been ongoing seasonally and systematically for a decade, and a comprehensive inventory will eventually be compiled. In the meantime, however, damage by humans and goats has forced emergency preservation efforts at Site 196 (Carpenter 2003), regular presence of visitors has required establishment of trails and interpretive materials (State Parks n.d., see Appendix B), and completion of inventory for specific sites such as 197 allows forward movement on preservation and restoration. Were all preservation efforts to wait until an exhaustive inventory was complete, irreversible damage would have occurred. The holistic outlook toward protecting Nu'alolo Kai cultural sites involves commitment to complete inventory, but recognizes that a piecemeal approach to publication has been forced upon the land managers due to the nature of its use.

THREATS TO SITES

Humans

Human presence at Nu'alolo Kai ebbs and flows on seasonal and daily cycles. Inaccessible via land, and more often than not inaccessible by sea during high surf from October to April, most visitors arrive between May and September. These can be divided into three primary groups: local resource users, kayakers, and tourists.

Locals mostly visit Nu'alolo Kai to fish, in which case they may not even come ashore and if they do often stay close to the channel where picnic tables and a

composting toilet are located. Goat hunters visit presently during summer months, as an experimental archery season has been implemented to control the animal's population. This cooperative program involving the hunters and the Hawaii Divisions of State Parks and Forestry reduced the herd in the summer of 2006, and holds promise as a means to mitigate its impact. Both hunters and fishers may stay overnight. Impacts from these groups tend to be limited to the area near the boat landing where a long history of camping (including structures and two old pit toilets—now filled) means that site integrity is low. In addition, many fishers and hunters come from local families who are either of Hawaiian descent or have assimilated enough to Hawaiian culture to avoid damaging sites.

Kayakers are a mix of day trippers and Nā Pali “outlaws,” some of whom reside in Kalalau and other valleys; while most do not visit Nu‘alolo or come ashore briefly to rest, there is a valid concern that those who gather resources such as coconuts and papaya, or who may be scouting locations for camping or *pakalolo* (*Cannabis spp.*, or marijuana) cultivation could impact sites. Incidence of typical modifications and impacts—ill-advised clearing, new trails, fireplace rings, and caches of gear and food—appear never to have been the serious threat to sites that they are in Kalalau, and have decreased since Parks and the ‘Ohana have been actively maintaining the place.

Tourists arrive on boats between about 10:00 AM and 4:30 PM; this business activity is limited to licensed operators, not all of whom are permitted to land. Most tourists walk the short trail that loops through some of the archaeological sites. Thus far, clear demarcation of the trail has been effective in channeling the impact of foot traffic. Impacts to the channel and reef (arguable cultural sites) are within the jurisdiction of the state Divisions of Boating and Ocean Recreation and Aquatic Resources.

In recent years, none of the above groups appears to have had a noticeable impact on archaeological sites, although looting of some sites did occur in the 1950s and 1960s, a secondary unofficial campsite including makeshift fireplaces has been used since then east of the channel camp in what is now an ironwood grove, and caches of camping equipment were found hidden in various areas (including features) in the 1990s. Although people have an enormous potential for impacting

sites that cannot be ignored, recent history suggests that they do not form the worst threat.

For Sites 197 and 7150, human factors differ. Site 7150 has been cleared for nearly a decade, and because of a sign posted there and efforts by Nā Pali Coast 'Ohana and State Parks to educate tour operators and the Kaua'i community about respecting this burial area, the site has not been impacted. Thus far, human intervention has produced the positive effects of removing damaging vegetation, channeling foot traffic around rather than through the site, and clearly indicating to casual visitors that this is an area being cared for. Nevertheless, this place should be monitored lest curiosity, misguided "offerings," or other behaviors lead to impacts.

Site 197, being a habitation area, may well contain burials, but the obvious surface portions of the site consist of stone walls and a low platform. Careful routing of the interpretive trail and selective clearing have minimized any further impact to the sites, although some areas of damage appear to be the result of old trail-blazing, and continued vigilance is advisable. Most vulnerable are features such as B and F, which are near the dune crest in cleared areas; their visibility invites exploration, and in the past these features appear to have been altered by people moving stones and creating hiding places for gear caches.

Goats

Goats have become the most significant and constant threat to sites in Nu'alolo Kai. At the advent of clearing and mapping in 1996, a small herd was observed, and despite some illegal hunting, it had expanded to approximately 150 prior to permitted hunting in 2005. The ability for legalized hunting to cull the herd was apparent during the summer of 2006, by the end of which sightings of even isolated goats were rare.

The animals create erosion hazards by grazing away vegetation and wearing trails, topple stone walls and terraces by walking over and through them, disturb cave sites by entering and kicking out whatever is inside, and befoul caves and water sources with their dung. Natural resource managers have suggested that a

combination of hunting and fencing could eliminate the goats, which are post-Polynesian arrivals in the islands, but local hunters resist eradication, and the goats are likely to remain a problem for the foreseeable future. Their impacts to sites are serious and indisputable, even to the extent that they have toppled a previously repaired and stabilized terrace at Site 196.

Sites 7150 and 197 may be less affected by goats than the 196 terraces which lie astride a major goat trail, but nonetheless may be impacted by these animals. Any attempt at planting native or culturally appropriate species must contend with the voracious goat appetite. Much of the former population of *ti* (*Cordyline terminalis*), for example, has been decimated by goats. Beyond the desire to re-introduce or foster culturally significant species, preservation goals are served by plantings that stabilize sediments, which would be especially valuable for shoreline features in 197. Goats make it all the more difficult to establish a healthy strand vegetation.

Natural Forces

Although protected by a reef and oriented slightly west of the worst exposure for North Pacific tsunami, the topography of Nu'alolo Kai makes it vulnerable to catastrophic damage. Elevations in the coastal flat are generally less than 15 famsl (feet above mean sea level), and although there is some dune formation, the barrier is insufficient to protect all of the sites. Recurrent drought conditions exacerbate the risk by causing diebacks in the vegetation that would otherwise help consolidate the sandy soil. Because the steep talus that forms the *mauka* edge of the coastal flat lies just 10 to 150-m behind the shoreline, a tsunami high enough to crest the beach is likely to sweep all the way through many of the sites. Patterns of collapse on surface features in the flat suggest that a tsunami may have caused the damage, and the abundance of marine sediments and chunks of coral and other reef material in the sediments hint that much of the flat may have been deposited by tsunami. "Normal" high winter surf also has the potential to damage or remove *makai* sites.

Regardless of the cause, Site 197 (Features B, D, E, and F in particular) is especially vulnerable to high waves, and F has already been eroded to an unknown extent. In

addition to these known surface structures, features (likely to include burials) and deposits currently buried in the shoreline dunes are at risk. A secondary level of risk occurs in the aftermath of a tsunami or high surf event, since exposure of artifacts could lead to collection or looting.

Because Nu'alolo Kai is nestled at the base of vertical cliffs, another source of impact is rock-fall. Boulders tumbling off the mountain have caused substantial damage to sites on and near the talus even in the past winter, and are an ongoing source of concern. Rock-fall and landslides probably do not present a likely risk to Site 197, but the platforms at the *mauka* end of 7150 are within the zone of potential damage.

Remoteness

The relative isolation of Nu'alolo Kai, beyond roads and in some seasons beyond boats, has both positive and negative potential for preservation. On the plus side, the difficulty of getting there and the low numbers of people who visit the place help protect it from human impact. Conversely, remoteness and lack of fresh water, food, and communication hamper monitoring and enforcement efforts, not to mention creating logistical obstacles for preservation activities.

Unfortunately, remoteness cannot be relied upon to protect Nu'alolo, and can in fact serve as protection for anyone intent upon vandalizing or looting sites. In the late-1990s, thieves harvested and reportedly sold large quantities of the medicinal plant 'awa (*Piper methysticum*) from Nā Pali valleys, but were never caught in the act due to the remote settings of their crimes. Historically, organized looters targeted Miloli'i and Nu'alolo, and more recently illegal residents of Kalalau Valley have disturbed archaeological features by dismantling them for building stones and deposits by digging gardens. Tour boat crews, many of them local Hawaiians, keep an eye out for problems during summer days, but nights and periods when tours do not operate are un-monitored except for the few weeks a year when Parks and Nā Pali Coast 'Ohana crews are working and camping there.

Because all preservation activities depend on boats or helicopters for access, implementation requires planning and logistical discipline. Crew sizes are limited to 15 people, and the upper end of the allowable range creates difficulties in terms of food and water alone, to which must be added equipment and materials to be used on a given trip. For these reasons, preservation measures requiring materials such as fencing should be considered carefully. Re-vegetation with native and Polynesian plants has long been desired, but without a reliable water source in Nu'alolo, the difficulty of getting plants established (and after that, protected from goats) has proved to be an intractable problem.

One significant aid in overcoming the remoteness of the preservation sites has been the help of boat companies. As a condition of their permits, they must help DLNR, but it should be noted that several of the operators go above and beyond the requirements, not only ferrying crews in and out at the beginning and end of maintenance trips, but aiding communication, bringing in additional food and water, and helping keep an eye on site conditions between trips.

HO'OMAU

At the time when annual spring and fall trips to Nu'alolo began, "sustainability" was the byword at DLNR. Nā Pali Coast 'Ohana also came there interested in long-term preservation, and over labor and food and campfires it soon emerged that a process had begun that would unfold over generations. Rather than rushing to fence and maybe fix some sites, put up signs, and move on, a decade has been spent getting to know Nu'alolo, establishing and replenishing a cadre of volunteers. The briefer work visits by a diversity of *kūpuna*, local 'ohana and Nu'alolo descendants, students and teachers, *hula* and *lua* groups, archaeologists and scientists, officials, and various other Kaua'i folks has both broadened and deepened community interest in preservation. Just as importantly, Parks and the 'Ohana have heard numerous viewpoints and desires for Nu'alolo. From all the cross-fertilization of ideas has bloomed a commitment to carry on, to perpetuate rather than simply preserve.

As mapping draws to a completion and clearing gives way to simpler maintenance, perpetuation of the cultural significance of Nu'alolo Kai will be furthered by restoration. In keeping with the deliberate approach thus far, this plan proposes a test site (197) to work through the many logistical, procedural, cultural, and archaeological issues raised by restoration. In keeping with the commitment to honor those who came before, this plan proposes repairing tumbled platforms at the burial site (7150) as the first step in restoration. When the work is done, their restored strength and beauty will help perpetuate the physical sites, while the respect given to the *kūpuna* and lessons learned in the work will help *ho'omau* the culture and place.

PREVIOUS ARCHAEOLOGY

FROM RELICS TO DATA

Archaeological study of Nu'alolo Kai has occurred for several generations, and itself contains a history of the discipline, and of the changing perspectives of Hawaiians and archaeologists. In this section, we do not intend to cover all the archaeology of this place, but instead to follow facets of these histories as they relate to the Sites 197 and 7150, and to preservation issues in general. Hawaiians preserved and pondered their past before outsiders, and in addition to oral tradition and stories, many families have conserved both heirloom artifacts and places, passing them along to the present in some cases. Some European descendents on Kaua'i in the 19th Century introduced an antiquarian approach to the past, visiting sites and often collecting artifacts and folklore. While Nu'alolo appears in a few published sayings and stories, much knowledge and most collections from this period have since sunk out of sight.

Somewhat later, in 1922, echoes of antiquarianism emboldened by self-proclaimed "scientific" mandate that proved to be nothing of the sort caused Nu'alolo to be visited. Depending on your perspective, both Kai and 'Āina were "collected" or "desecrated." The roots of this trip go at least to 1914, when a Professor von Luschan visiting Bishop Museum informed its ethnologist that the museum "had been derelict in our duty. He expected to find in a museum of this size and

location at least three thousand well authenticated Hawaiian skulls. He found but fifty skulls all told, very few of which were Hawaiian.” In a footnote, Director William Brigham noted, “In 1865 I was able to ship some five barrels of crania to Boston,” and concluded this paragraph of the report with von Luschan’s recommendation, “He says that we owe it to science to gather as many authenticated skeletons as we can accommodate and store—at least five hundred—so that the record of Hawaiian proportions will not be lost.” (Brigham 1915:13). Amassing large skeletal collections would in fact provide a record of “Hawaiian proportions,” but osteological population studies did not materialize until decades later, and have mostly been based on modern, large-scale excavations. No mention of Hawaiian attitudes toward these collections appeared in the Director’s report, nor for that matter, in most reports from the early generations of ethnologists and archaeologists.

With this backdrop, a 1922 invitation for Bishop Museum staff to accompany some leading residents of Kaua’i on a tour of Nā Pali not surprisingly led to collection of skeletons, or in some cases, just crania, from burial caves in Nu’alolo ‘Āina and Kai. These were repatriated in 1998, when State Parks archaeologists and Nā Pali ‘Ohana worked with descendants and Hui Mālama to reinter these remains in both locations. One skeleton, a child who had been collected from an ambiguous location in Nu’alolo Kai, was reinterred beneath a new platform constructed at Site 7150 (aka NUK-1) , the cemetery. Though the Museum did conserve the bones, no “science” ever came of them during their 77-year absence.

Wendell Bennett, a visiting archaeologist, spent 9 months on Kaua’i in 1928, surveying as many sites as possible around the island. He spent enough time in Nu’alolo to publish in 1930 descriptions and serviceable maps of the archaeology in the eastern end of the coastal flat there (Figure 2). In addition to providing the first archaeological documentation of house sites nestled against the eastern cliffs (which had been visited and mentioned by visitors over much of the 19th Century), Bennett noted additional sites on the coastal flat and another on a ridge between these and the central channel landing.

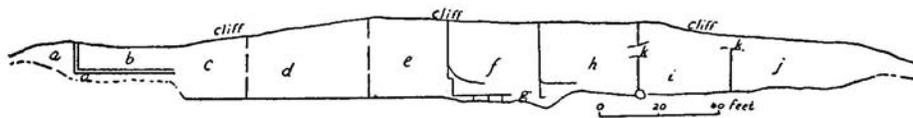


FIGURE 54.—Plan of house site on Nualolo flats, Site 196: *a*, path to the sea; *b*, enclosure 10 by 42 feet; *c*, *d*, and *e*, dirt-paved platforms respectively 20 by 24 feet, 20 by 42 feet, and 25 by 27 feet; *f*, platform 24 feet by 30 feet and 7 feet high; *g*, pathway and steps; *h*, platform 24 by 32 feet and 5 feet high; *i*, platform 24 by 28 feet and 4 feet high; *j*, platform continued at the back as a narrow, rising slope.

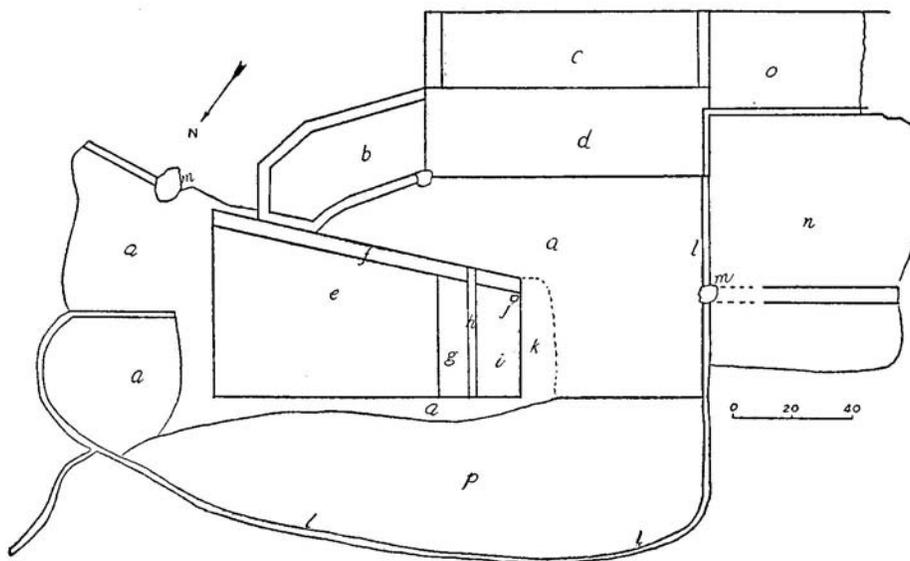
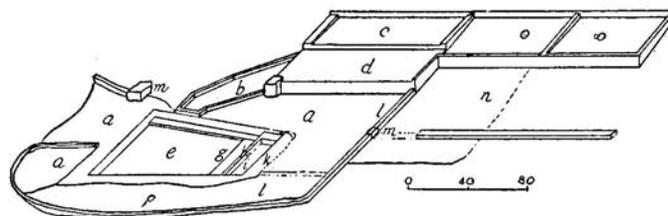


FIGURE 55.—Ground plan and perspective plan of a heiau on Nualolo Flats, Site 199: *a*, paved platform level with surrounding ground; *b*, unpaved inclosure with walls 2 to 3 feet high and 4 feet wide; *c*, paved platform 25 by 93 feet; *d*, paved platform 29 to 93 feet; *e*, eastern section of depressed area 40 to 60 feet by 74 feet; *f*, bench terrace 1 foot high, 5 feet wide; *g*, bench terrace 2 feet high, 10 feet wide; *h*, division wall 2 feet high, 3 feet wide; *i*, western section of depressed area 12 feet by 38 feet; *j*, walled spring 2.5 feet in diameter, 2 feet deep; *k*, paved area with indefinite boundaries; *l*, wall 3 feet wide, 3 feet high; *m*, cave under rock containing bones of animals; *n*, paved area crossed by a wall 5 feet wide and 2 feet high; *o*, unpaved house sites inclosed by walls 2 feet high on the inside; *p*, sand.

FIGURE 2. Sites in Nu'alolo Kai recorded by Wendell Bennett (Bennett 1931).

One of the sites Bennett recorded was Site 197, which he described as a habitation area on the coastal dune *makai* of the *heiau* (Site 199) and west of the more famous terraces (Site 196). Though the description is minimal, it appears that Bennett saw the core features as being those visible on the surface just above the beach, from Feature F in the west to C in the east.

Brief visits to Nu'alolo Kai by the Bishop Museum's Kenneth Emory in 1949 and Mary Stacey in 1953 did not result in further documentation of the archaeology there, but did convince the former that excavation at Site 196 would be rewarding, due to its sheltered, well-preserved deposits. Unfortunately, the attention, when combined with a growing mobility as combustion-engine boats (and in neighboring Miloli'i, an airstrip for small planes) became more widely available after WWII, led to a spate of looting. Recognizing that the sites were being dug by relic hunters and profiteers feeding the antiquities market, journalist Bob Krauss published a plea for salvage excavations to begin immediately (Honolulu Advertiser, May 29, 1957), and in 1958 Bishop Museum, Kaua'i community members, and the University of Hawai'i students collaborated on the first season of a project that would continue (with a hiatus in 1961-3) for six years.

Besides amassing an enormous collection of artifacts, midden, and data, these digs served the advancement of Hawaiian archaeology in several ways. First, the newly-developed technology of radiometric dating was applied, suggesting that habitation extended back to the 14th Century AD. Second, the project provided hands-on training for the first generation of home-grown archaeologists, as well as exposure to Hawaiian culture for others who began or would continue their careers elsewhere. Names such as Bartels, Bonk, Chun, Cox, Emory, Finney, Goodenough, Green, Judd, Kay, Kikuchi, Kelly, Malama, Judd, Pearson, Rice, Sinoto, Soehren, Souza and more came through Nu'alolo. For some, this was their only exposure to archaeology, while others became elders in the tribe of Hawaiian archaeologists. Nu'alolo Kai became iconic to the latter, celebrated for its incredible preservation, its deeply stratified deposits, and not least of all for the romantic allure of a dig in the remote seaside village beneath the imposing peak of Kamaile. Nu'alolo appears conspicuously in *Feathered Gods and Fishhooks*, Patrick Kirch's tome that has become a standard textbook for Hawaiian archaeology, popular even outside the discipline.

Unfortunately, the promise of Nu'alolo archaeology failed to materialize for several decades. First, as one of the field supervisors noted, the downside of a transient, untrained cadre of volunteers led to numerous mistakes and omissions in the field, greatly hampering the reliability of the data. Then, faced with an immense collection, discouraged by the difficulty of sorting it out with substandard notes, and lacking of a sufficient budget, archaeologists failed to publish the results. Lloyd Soehren began a draft report in the 1960s, and Kaua'i's own Pila Kikuchi managed to produce a revised manuscript in 1983, but a publication never materialized. To make matters worse, archaeological excavation was followed by additional looting, removing both artifacts and the opportunity to return and correlate the excavators' jumbled profiles and notes with remaining stratigraphy. Finally, with all the attention on Site 196, a site literally at the extreme edge of Nu'alolo, remaining sites faded into obscurity, and archaeological interpretation of the place has been fixated on those terraces until very recently.

PRESERVATION IN NU'ALOLO

Joe Souza, head of State Parks on Kaua'i at the time of the digs and for years before and after, began the process of managing cultural sites within the island's parks. However, cultural resource management as a specialty did not begin to affect Nu'alolo sites until the 1970s. As part of the surveys done to develop the first statewide inventory of archaeological and historical sites, Francis Ching and a small crew visited in January of 1974, noting evidence of vandalism, screening, and collapsed walls at Site 196 due to looting, and stating an "urgent need for stabilization." (Francis Ching notebook, January 31, 1974). The crew also explored other portions of Nu'alolo, including Sites 199 and 200. The former, a *heiau* described as the largest on Nā Pali and "perhaps the most impressive on the island of Kaua'i in terms of complexity, construction, etc" (ibid. February 1, 1974), had a section of collapse on the major terrace (Component D on Bennett's map), and Ching predicted that the recent planting of coconut trees near the spring (Components I and J) would have an effect on the temple and should be removed "at an early date." (ibid.)

A few years later in 1979, Myra Tomonari-Tuggle, as part of a contract to locate sites throughout Nā Pali Coast State Park and develop a management strategy, visited Nu'alolo again. Synthesizing previous archaeological work, historical accounts, and knowledge from Kikuchi and other knowledgeable locals, she was able to situate Nu'alolo Kai in relation to its neighbors, the coast in general, and in the sweep of history. Previously documented sites were relocated, and an additional 11 were discovered in Nu'alolo Kai, including NUK-1, a complex with an estimated 10-15 mounds and platforms in excellent condition and interpreted as burials, which is now known as Site 7150 (Tomonari-Tuggle 1989:93). The remaining 10 sites, most of them on or immediately below the talus slopes on either side of the drainages that occasionally flow into the channel through the reef (in other words, west of the more obvious site complexes at the eastern end of the coastal flat), included platforms, terraces, mounds, and buried deposits exposed in erosional cuts. Though some were in reasonably stable condition, those near the drainage and close to the coastline were considered at risk.

In response to this assessment (and well before the 1989 publication of the Nā Pali reconnaissance report), State Parks engaged in a series of archaeological projects aimed at better documenting the sites of Nu'alolo and salvage excavations at

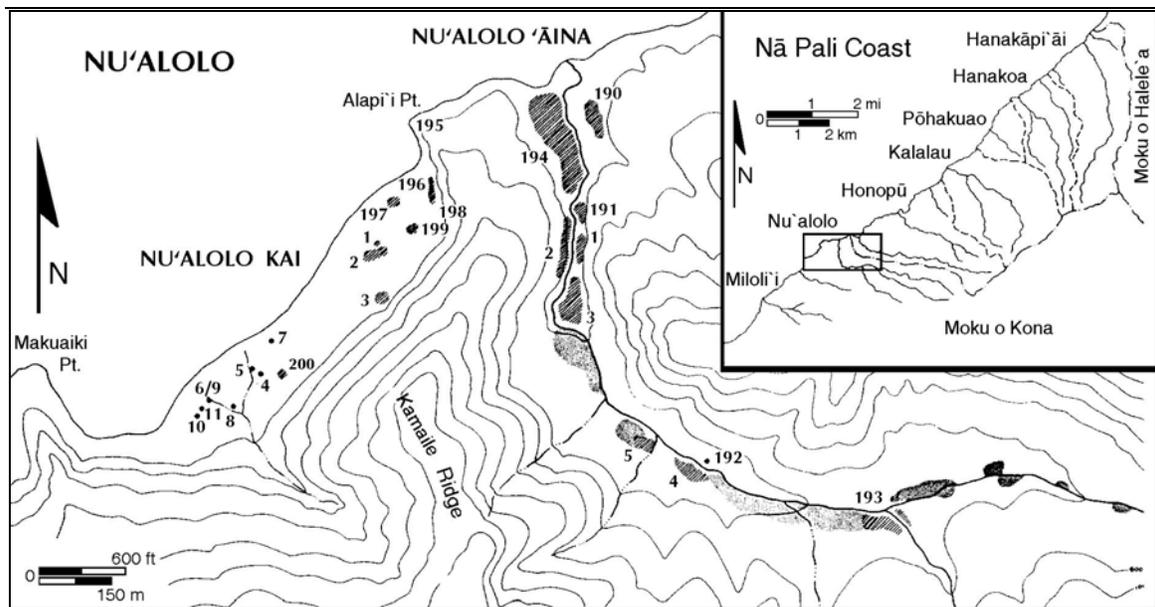


FIGURE 3. Sites in Nu'alolo recorded in 1979 (Tomonari-Tuggle 1989).

actively eroding sites. The staff archaeologist prepared a Cultural Resource Management Plan (Yent 1983b) that outlined general treatments for the known sites. For Site 197, the proposed course of action was to preserve it and eventually conduct excavations aimed at gathering data for public interpretation (ibid:5). At 7150 (NUK-1), the recommendation was to design interpretive trails to avoid traversing the site, and possibly to do research aimed at confirming their supposed burial function (ibid:6) In addition to the plan, 1983 witnessed schematic mapping and plotting of sites in the coastal flat and formulation of a research plan for excavations aimed at recovering data from unstable sites (Yent 1983a).

During 1984 and 1985, excavation occurred at an eroding platform in Site 7154 (Tomonari-Tuggle's NUK-5), an exposed cultural deposit (Site 7158, or NUK-9), and an eroding burial pit near the corner of platform Site 7160 (NUK-11) (Yent 1985). Although these excavations encountered none of the preservation of fiber, gourd and other materials evident at Site 196, and served a much more focused intent with much smaller areas (each measured no more than 1 square meter), these excavations demonstrated that buried cultural deposits, some of them unassociated with surface architecture, survived in Nu'alolo Kai away from the cliff sites. The latter two sites indicated multiple cultural strata, in the former case involving a sequence of cut and fill construction above an earlier layer, and evidence of flooding and/or alluvial deposition burying cultural layers; two major occupations were inferred (Yent 1985:40-44). Furthermore, although each of these sites was in fairly close proximity, differences in midden and artifacts suggested that functional variation could be perceived, perhaps within contemporaneous features and even more probably through time. In addition, midden variation over time suggested possible environmental change: gastropods in the earlier depths of Sites 7154 and 7160 included more sand-dwelling *Strombus*, whereas later species tend to inhabit rocky environments (Yent 1985:15,37).

While these studies reached some interesting conclusions and laid the groundwork for additional hypothesis testing, the impetus for the work came from a desire to salvage sites being eroded, and to better understand the cultural resources that were being increasingly accessible to a growing tourist industry. By this time, daily boat tours visited Nu'alolo Kai during summer months, and though camping was not permitted, visitors were coming ashore and visiting sites, and an unknown

degree of “outlaw” visitors also spent days and nights there. Being exposed, the eroding sites near the boat channel were considered especially at risk; although it proved impractical to halt erosion (though typically dry, Nu‘alolo’s “stream” channel can have flash floods during heavy upland rains and large storms), excavation at least helped characterize the nature of at-risk deposits. Additionally, fieldwork afforded the opportunity to observe patterns of visitor traffic and help predict the preservation issues that could arise due to it. During 1986-87, information from these digs, the surface mapping, and previous archaeology was used to develop a short trail and interpretive brochure that helped guide and educate visitors. Subsequent visits monitored the condition of sites.

RECENT RESEARCH AND RESOURCE MANAGEMENT

Not long after this, the University of Hawai‘i began to breathe new life into the Site 196 collections, taking boxloads from Bishop Museum storage for cataloguing, classification, and analysis. Besides educating students by exposing them to a diverse collection of archaeological materials from an actual site, this emphasis moved toward publication of the results, and helped the discipline refine artifact classification systems. In 1990, the University undertook a small (2 m) excavation at Site 196 in an effort to gather better stratigraphic information through more precise excavation techniques. Since this time, publications have begun to emerge, including analyses of discoid artifacts (Field 2003), fishhooks (Graves and McElroy 2005), and abraders (Calugay and McElroy 2005), as well as the stratigraphy (Hunt 2005) and history of excavations (Graves, Field and McElroy 2005).

The most recent period of archaeological work commenced in 1996, when State Parks began a program of clearing and intensive mapping in Nu‘alolo Kai. For several years after the devastation of Hurricane Iniki, Parks had been dealing with more urgent issues, but despite the fact that many trees were blown down and subsequently covered in secondary growth, boat tours had returned to Nu‘alolo Kai. With the interpretive trail obscured and obstructed, visitors interested in the archaeological sites made their own routes, increasing the potential for damage, and so clearing efforts began with a trail route that would minimize impact, while also affording the mappers better visibility. At this stage, State Parks archaeologists

began improving accuracy, precision, and detail by producing 1:100 and 1:50 scale maps using plane table and alidade of the main complexes, and occasional tape and compass maps of outliers. Since that time, the scope of mapping has expanded beyond the initial area of frequent visitor traffic to sites on the periphery and up on the talus, as the effort evolved from “redo the trail” to documenting all of the surface cultural sites in Nu‘alolo Kai. Mapping techniques have also expanded, bringing in an array of highly accurate instruments operated by faculty and students from the UH Department of Geography to anchor the plane table maps in real space, add topography, and begin constructing a GIS (Geographical Information System). In 2006, a laser scanner was brought in to test its use in 3D modeling of the terraced house platforms (Site 196), the ceremonial complex (Site 199), and portions of Site 197.

Besides mapping, a couple of trips to Nu‘alolo Kai have involved excavation. Plans to install a second composting toilet near the boat channel triggered testing, which showed significant stratified deposits in the chosen location, which was featureless on the surface. Because one composting toilet was already present and archaeologists considered it likely that other locations throughout the flats would also yield buried sites, it was decided to go with the proposed location and thereby concentrate impacts to the same area. The expected impacts (a meter or two of near-surface disturbance) were mitigated by a 2 square meter data recovery excavation; because of its proximity, the location was designated part of Site 7154. Finds included two levels of probable stone pavement, cultural layers spanning ancient and historic periods, and numerous buried firepit features. Charcoal from several of these contexts was identified, yielding what appeared to be a history of environmental change in which human presence resulted in introduction of some species, perhaps extirpation of others, but most intriguingly an apparently stable plant community composed of four or more species (Major 2005).

Another round of testing focused on areas of the proposed interpretive trail realignment, where it crossed what appeared to be a collapsed feature and another location interpreted as a possible *imu*. The former showed that the collapsed “feature” was amorphous and limited to shallow depths in an area with minimal cultural deposition, while the latter turned out to be a rock-filled tree root-hole.

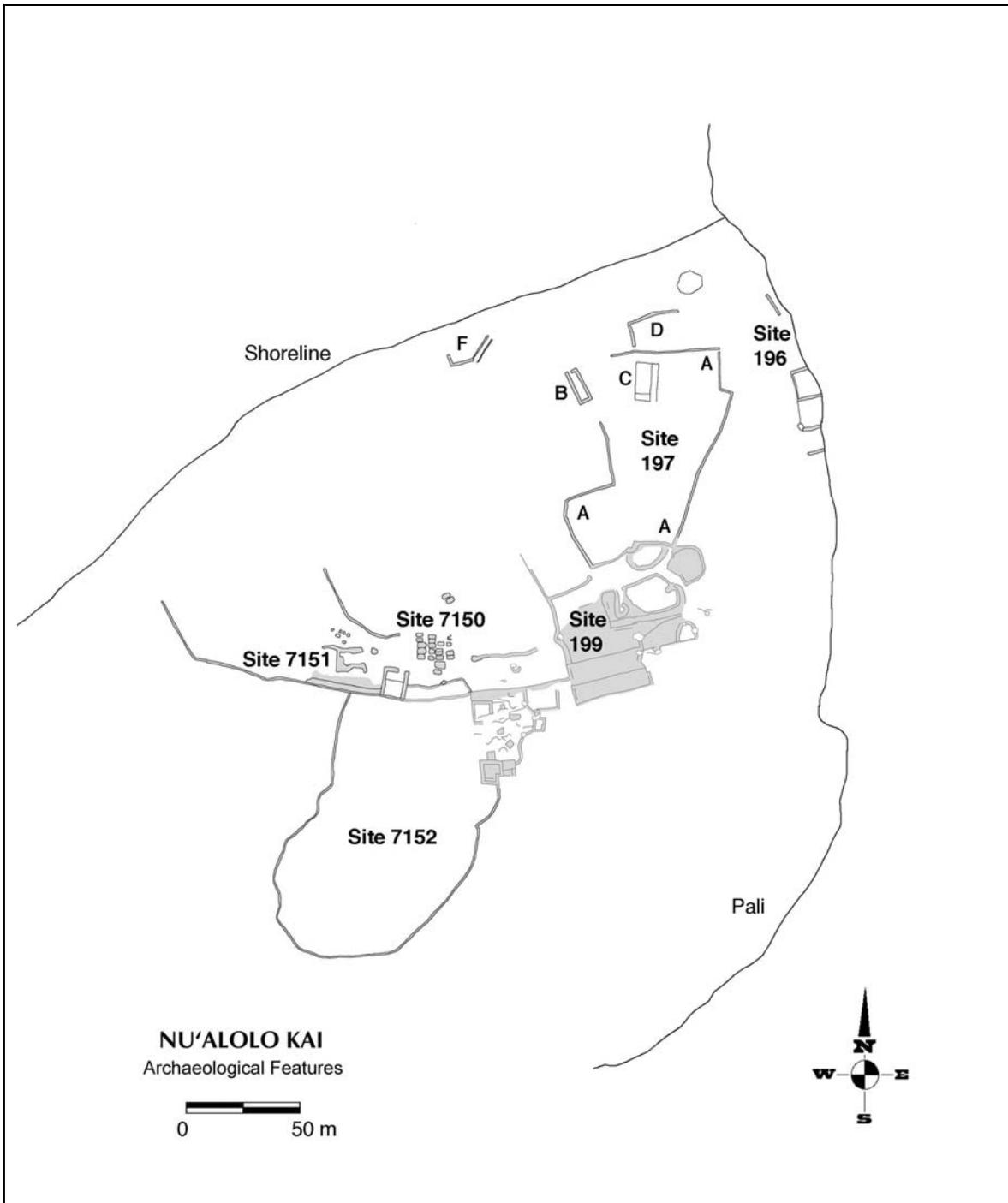


FIGURE 4. Overview of sites at eastern end of Nu'aloalo Kai.

Subsequently, installation of new sign posts keyed to the interpretive brochure was monitored by archaeologists, with no finds.

While archaeologists have continued mapping throughout the past decade, the character of trips has expanded beyond documentation to include maintenance of the sites and education. Each year, local residents, especially *kūpuna* and their descendants whose families have a history in Nu'alolo or Nā Pali, visit and help maintain the trail, *mālama* the sites, and share their knowledge of the place. Groups ranging from high school students to tourism workers and local firemen have visited and lent their labor and knowledge. Another Kaua'i resident has come out on nearly every trip, frequently hauling in a large format camera to produce archival photographs of the features as they emerge from the weeds, augmenting the archaeological record for future generations. Botanists have surveyed the vegetation, geologists have examined the formations, biologists and fishermen have assessed the reef. *Hula* and other cultural practitioners have communed with the place and given their labor and *aloha*.

Sites that were mapped years ago have been kept clear not just for the sake of visitors, but as an expression of pride in the ancient culture of Kaua'i. Two areas of Nu'alolo demonstrate this with great clarity, and both are the subject of this plan. First, from the first trip in with local volunteers, it became clear that the cemetery (NUK-1, Site 7150) represented a necessary starting point for Hawaiians. "Take care of the *kūpuna* first," we archaeologists were told, in what has turned out to be rewarding advice. So the platforms and alignments that mark graves in this site have been tenderly cleared and protected ever since, and are the first place to be cleaned again each spring. In 1998, reinterment of bones returning to Nu'alolo Kai included construction of a new platform here (enlarged in 2006), not only showing respect to the departed *kupuna*, but drawing all the site and the participants into a relationship of continuity from past to present. A living *kupuna* who participated in that trip, 83-year-old Aunty Makaleka Aipoalani, also distinguished herself by being a living link, having spent summers in Nu'alolo Kai as a child. She spent every daylight hour meticulously clearing a wall (officially designated Site 197, Feature B, but affectionately known ever since as "Makaleka's Wall"), and in so doing showed the other volunteers and archaeologists how the job is done.

Three documents produced by State Parks illustrate the expanding scope of work in Nu'alolo Kai. A 1999 report summarized efforts from the previous two years: clearing and re-establishing the trail and signposts, clearing and mapping sites, repatriating and reintering human remains, and the beginning of efforts to eradicate alien plant species (Carpenter and Major 1999, see Major 1998 for a report on the reinterment). The report also noted cultural resource management concerns, including: increased visibility and potential for impact as sites were cleared (including the cemetery, whose function was neither indicated on the brochure nor obvious to visitors), erosion and turbation impacts from goat and human trails, and unstable terrace facings at Site 196. Recommended solutions included: placement of signs used to educate and reduce foot traffic through sensitive areas, monitoring of site conditions on the trail and where goats are an issue, increased cooperation with community preservation groups, ending the interpretive trail short of Site 196, and stabilizing that site.

Also in 1999, Parks prepared a supplemental cultural resource management plan focusing on vegetation, in an effort to direct clearing efforts in ways that would protect and preserve native and Polynesian-introduced species, eradicate or control exotic species, and anticipate potential problems associated with increased erosion hazards, succession or invasion by exotics, and potential disturbance of archaeological features and deposits (Major 1999). Organized by habitats within Nu'alolo Kai, this plan recommended ongoing assessment, selective clearing, maintenance, and eventual re-vegetation with native and culturally appropriate species. Due to the remoteness and dryness of the setting, the plan proposed encouragement of extant desirable species through clearing away competition and interrupting the seeding cycle of castor bean and other invasive exotics. Since this report, a botanical survey of Nu'alolo (Fay 2002) and identification of wood charcoal from archaeological contexts (Major 2005) has provided a better awareness of baseline conditions and potential species for re-vegetation, and State Parks has a list of recommended plants (Fay n.d.). Meanwhile, most plants directly threatening site integrity have been removed, clearing has enhanced visibility and interpretive opportunities, and castor and other weedy species have been eliminated or drastically reduced.

TABLE 1: Previously Recorded Sites in Nu'alolo Kai

State Site # 50-30-01-	Bennett Site #	Tomonari- Tuggle #	Description
195	195		Trail to Nu'alolo 'Aina
196	196		Habitation terraces by pali
197	197		Habitation compound on flat
198	198		Burial caves in pali
199	199		Ceremonial/Habitation complex
200	200		Habitation/Agriculture complex on ridge
7150		NUK-1	Cemetery
7151		NUK-2	Habitation/Agriculture complex on flat
7152		NUK-3	Large Agriculture(?) enclosure on slope
7153		NUK-4	Habitation(?) enclosure above east gully
7154		NUK-5	Habitation(?) complex by east gully
7155		NUK-6	Habitation(?) platform by west gully
7156		NUK-7	Canoe shed by beach
7157		NUK-8	Terrace remnant by west gully
7158		NUK-9	Exposed deposit at NUK-6
7159		NUK-10	Terrace platform
7160		NUK-11	Platform remnant

In 2003, though Site 196 had been removed from the route of the interpretive trail, an increasing goat population had led to greater impacts, the most severe of which occurred at Site 196, where their trails were cutting into the fragile deposits and causing collapse along the stone facings. Comparison of photos from even a few years before, much less from the 1950s, showed the damage clearly. An emergency stabilization plan was produced and accepted by SHPD (Carpenter 2003), calling for use of geotextile fabric to be laid on the surface (both to protect underlying deposits and provide a clear demarcation between archaeological deposits below and fill above. Above the fabric, local fill was introduced to cover the surface, and the exposed deposits and fill were stabilized with rocks stacked atop intact facings.

Implementation of the plan managed to stabilize the site, but further increase in the goat population has meant that the negative impacts continue, and the report's other recommendation—fencing in the sites, or possibly putting fences at the back of Nu'alolo Kai to exclude the goat population—may merit implementation if funding becomes available.

Repeated mapping and maintenance trips to Nu'alolo Kai by State Parks and volunteer archaeologists, as well as the growing cadre of regular Kaua'i volunteers that would form Nā Pali Coast 'Ohana, resulted in a growing appreciation of the special qualities of the place. The complexity and impressiveness of sites known for generations only expanded as more areas were cleared and mapped. Many of the 'Ohana members were of Native Hawaiian descent, and the archaeologists had come of age (professionally, anyway) in the 1990s, when both a more enlightened education and growing Hawaiian willingness to speak out about cultural resource management combined to make the archaeologists more receptive and less inclined to claim exclusive legitimacy on those issues. Discussions in and out of Nu'alolo turned to questions of what would drive archaeology there, and eventually led to the answer: restoration.

Site 50-30-01-197

Site 197 has been known since early in the 20th Century, when Bennett first noted habitation features in the sandy flat. The presence of this site was noted again during the statewide inventory in the 1970s, and in the 1979 Nā Pali Coast State Park reconnaissance (Tomonari-Tuggle 1989), but no further data were collected until Yent and Ota mapped Nu'alolo features in 1983.

The resultant understanding of Site 197, while schematic, showed that Site 197 consisted of a large enclosure (Feature A), inside which a rectangular feature (C) appeared to be the primary habitation feature. Feature B, a smaller, oblong enclosure appeared at the incomplete northwest corner of the large enclosure (A) and appeared to have been made with stones taken from the earlier wall. Conversely, the poor condition of D and E, immediately *makai* of the Features A

and C, indicated that they had either been neglected or dismantled during occupation of the large enclosure. Feature F, at the far northwest end of Site 197, proved to be an outlier in more than one sense of the word—besides its relative isolation, this feature's proximity to the ocean and unusual form set it apart.

An archaeological inventory survey of Site 197 was recently completed, drawing on the past decade of mapping and observations, as well as a test excavation in Feature B conducted in the Summer of 2005. The data suggested that Features D and E probably formed a single structure, which was partially dismantled to make the Feature A wall, which enclosed a likely habitation compound of which Feature C was the primary household structure. Feature A, in turn, was partially dismantled to construct Feature B, whose oblong form oriented *mauka-makai* and nearshore location are suggestive of a canoe shed, although it may also be a habitation. Excavations showed that Feature B was constructed during the historic era, but also showed that two cultural layers exist beneath the structure, and were probably part of a sustained habitation likely to have included most or all of the coastal dune.

For this plan, Features A and B of this site are the most relevant, and their complete inventory descriptions are presented here. Readers interested in the subsurface findings and descriptions of the remainder of the surface features are referred to the inventory report itself (Major, Carpenter and McEldowney 2007).

Feature A. This feature is situated in the open sandy flat that begins about 30 m *mauka* of the shoreline in Nu'alolo Kai's east end. The terrain is roughly level and open near the shore, and becomes more forested toward the *mauka* end. Trees in the area include *noni*, *koa haole*, *papaya*, *coconut* and *pride of India*. Groundcover is mostly grasses and weeds, as well as occasional *naio* and *ilie'e*. The walls themselves have been cleared of vegetation by the 'Ohana volunteer work crews.

This feature was described as a large enclosure by Yent (1983) covering approximately 50 (E-W) by 80 (N-S) meters. Irregularly shaped overall (Figure 5), construction style and condition varies throughout Feature A (Figures 6-11), which could be more aptly described as a series of wall segments which once composed

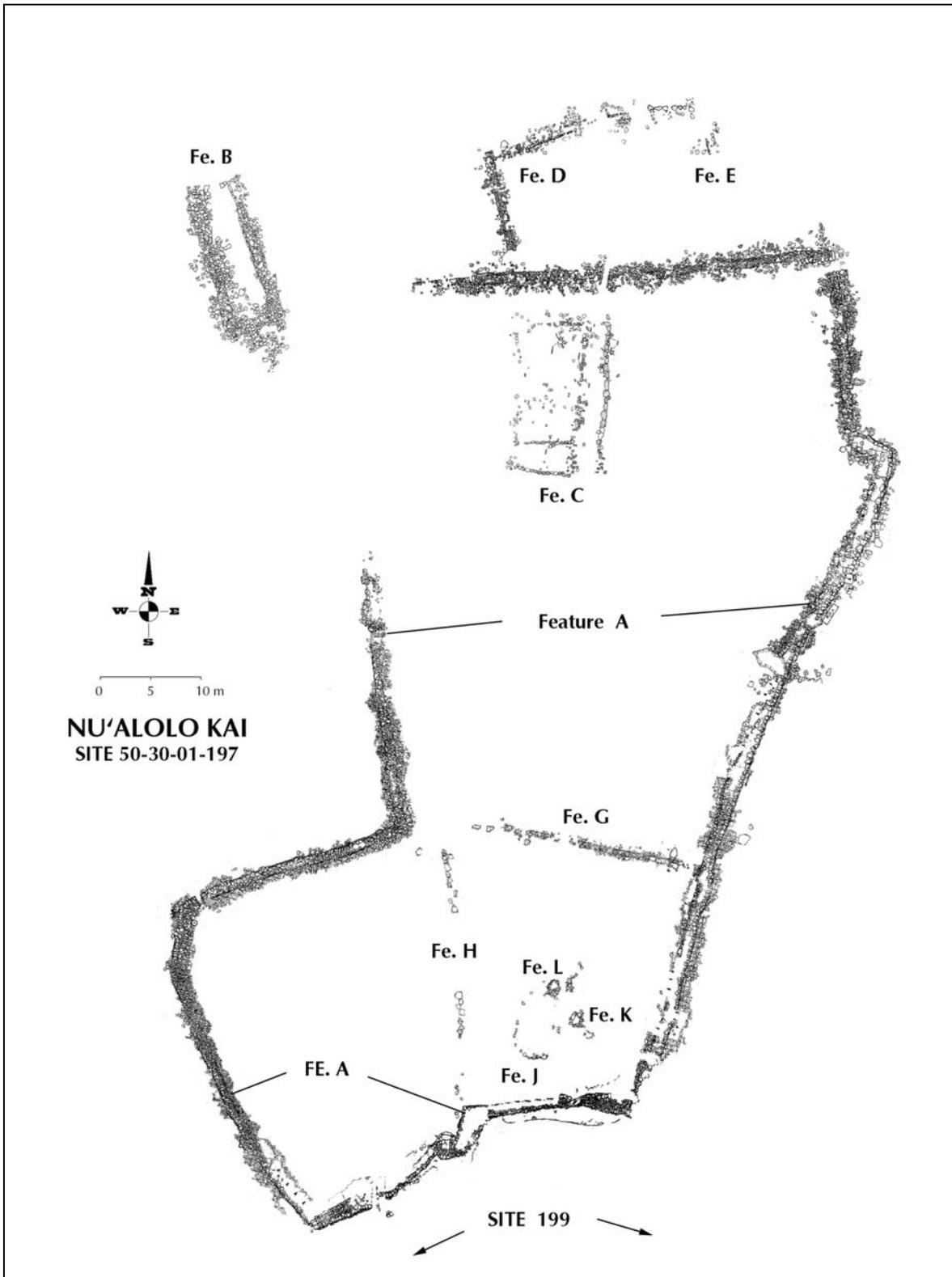


FIGURE 5. Site 197 Surface features overview.

a large enclosure, but which has been breached in several locations and dismantled in the northwest corner. The variability suggests that different segments may have been added at different times, and remnant (or perhaps incomplete) walls (Features G and H) bearing toward the notch on the enclosure's west side indicate that it may have been subdivided or formed by linking multiple smaller enclosures and walls. Virtually all sections of the wall have suffered collapse to varying degrees, and overall, the condition of Feature A is fair, however sections range from good to poor condition.

Along its approximately 250 m length, Feature A contains a number of nearly right-angle bends, but is by no means rectilinear. There is a gap at the northwest corner of the feature measuring 25 m. It can be inferred that the wall has been completely dismantled in this area, with the stones likely used to construct Feature B, located where the west and north walls would have met to form a corner. The two wall ends framing the gap have clearly been robbed of stones, as they consist of but a single course of embedded foundation stones with occasional fill and loose wall stones. The dismantled portions include the seaward-most length of the west wall (25 m in length), and the entire north wall (41.8 m in length).

Building style and materials differ along the enclosure's circumference, though all are of double-faced, core-filled construction. The western, southern and northern wall remnants are constructed more neatly than the eastern wall, which parallels the base of the talus rock-fall from the adjacent cliffs. The latter is built almost entirely of locally available, angular to subangular talus stones; while stacked, the east lacks the formal appearance of the other walls. In this section, which measures 90.5 m in length, the wall ranges from 35 to 110 cm in height, typically about 80 cm or 3 courses high and about 110 cm wide. There is a single opening at its extreme northern end (see below). This eastern wall is much more coarse in appearance than the remainder of Feature A, and also incorporates some much larger boulders, presumably located where they were found and incorporated into the wall for ease of construction. However, unlike walls at the base of the talus at the *mauka* end of the flat (south of Site 7150, for example), this feature does not abut the talus in most locations and is not a retaining wall; the surface outside of enclosure A is wide and clear enough to walk from the shore to Site 199, where a

narrow path between it and 199:Q appears to be a trail. At its southern end, the east wall transitions into the construction style of the adjacent southern wall.

The southern wall, 36 m in length, is constructed of predominantly waterworn medium sized boulders, neatly stacked, ranging from 50-80 cm in height and typically 60 cm or 3 courses high and a meter in width. Three pathways cut through the southern wall (see below). The wall in this section contains a couple of obtuse-angle bends, possibly related to features of the intricate ceremonial complex (Site 199) immediately adjacent on the south. A portion of this wall serves as the *makai* wall of Site 199, an enclosure positioned above 199:E (a low-lying feature variously interpreted as a *lo'i* cultivation pond or pool), and at a similar elevation to a paved enclosure (199:Q). The shared wall segment exhibits a *mauka* face with a stylistically distinct appearance: one course of boulders as a foundation, atop which are 2-3 courses of waterworn cobbles, above which is a single course of larger stones. Higher still, collapse has affected the wall, but remnant sections and the toppled stones suggest that another 2 courses of cobbles were capped with another single course of larger stone.

Three locations on the 197:A south wall also have crossings. Neither has a complete opening all the way to ground level, and instead they consist of low areas in the wall where it is easy to walk across. While it is possible that two of these

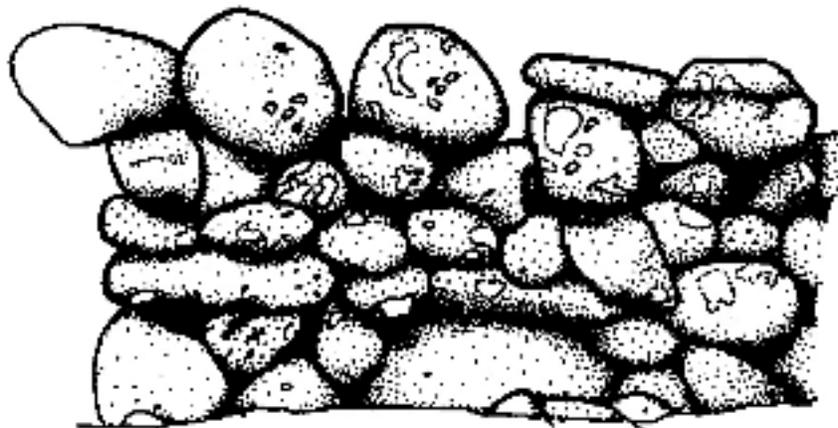


FIGURE 6. Site 197:A. Detail of south exterior/*mauka* facing where 197 and 199 meet. All stones are rounded and waterworn. Note base course of boulders interspersed with cobble fill, second course primarily of flat boulders, 3rd and 4th courses of cobbles, and 5th course of small boulders.

represent sections of collapse or informal trails used by campers and goats (these appear near the east and west ends of the south wall), the third represents intentional construction. The latter interpretation stems from the use of sandstone slabs, set horizontally to form steps whose highest elevation is just half that of the adjacent wall sections (Figure 7). In addition, this passage corresponds to a discontinuity in the Feature A wall. To the west, the wall is the common form—faced on either side with a core fill—and size—1 m wide at the base and 70 cm high. East of the passage, the wall is oriented differently, leading to a corner, and 2 m wide; this portion appears to be the exterior of the enclosure in Site 199. These features may date to a period after active use of 199, or at least after this portion of Nu'alolo Kai was segregated from the remainder by walls, representing a pathway providing direct access from *makai* down to the water level in 199:E.

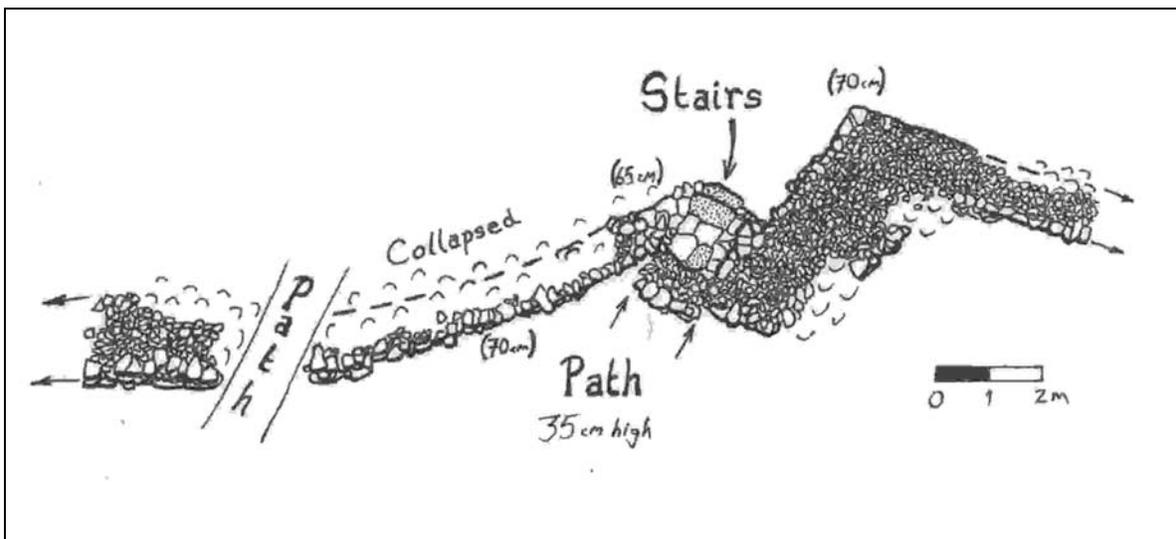


FIGURE 7. Site 197:A. Detail of south wall planview showing collapsed and constructed gaps.

The west and north walls include carefully set, upright laid foundation stones of subrounded basalt and subangular flat sandstone boulders on the north and west (exterior) faces of the enclosure, corresponding to the sides visible from *makai* or if approaching from the west. The opposite side of the wall (south or east, respectively) consists of finely stacked rounded-subrounded basalt boulders, and



FIGURE 8. Site 197:A. Detail of north-south run of west wall, view to east of exterior.



FIGURE 9. Site 197:A. Detail of north-south run of west wall, view to east of exterior.



FIGURE 10. Site 197:A. Detail of east-west run of the west wall, looking *makai*/north at interior facing.

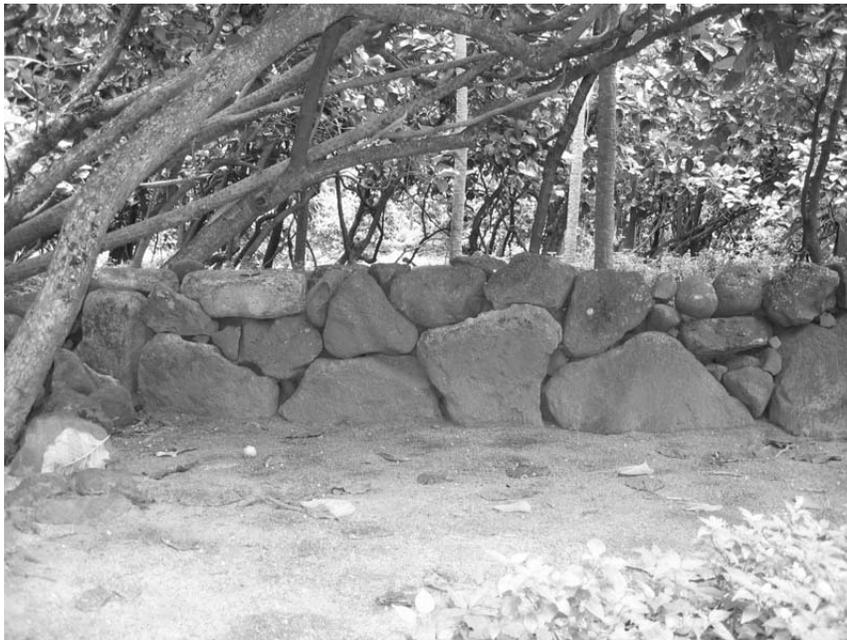


FIGURE 11. Site 197:A. Detail of east-west run of the west wall, looking *mauka*/south at exterior facing in same location as previous photograph.

incorporates almost no beachrock and few to no uprights. As with Feature B (see below) this is a dramatic contrast. The west wall segment measures 82 m overall, and contains two nearly right-angle bends. It typically stands 70 cm or 4 courses high on the interior, and 80 cm or 3 courses high on the exterior, exclusive of the northern robbed segment. The wall averages a meter in width.

The north wall, as mentioned above, has been robbed/disturbed to the extent that just its foundation stones remain in situ, as well as some remnant core fill of cobbles. A large amount of boulder and cobble material immediately adjacent to the foundation stones suggest that the wall has been damaged in addition to having stones removed for use in later features. Twentieth century tsunami are a likely factor in this damage. The wall foundation presently averages just 25 cm in height, but embedded upright beachrock slabs still stand up to 60 cm in height. This wall segment averages 90 cm in width.

There are several constructed breaks through the encompassing wall of Feature A to allow for passing through. One occurs in the northeast corner of the feature, immediately south of the northwest corner. This break is 1 m wide, and was likely constructed to allow access to the cliff house platforms located just to the east (Site 196). As evidenced by rock material piled/stacked adjacent to the opening, the opening was made through Feature A sometime after the enclosure was built. A second opening exists along the west wall, within a segment jogging to the east. This opening, 70 cm wide, may have been built by State Parks in conjunction with the creation of an interpretive trail about 25 years ago. Three other openings in the southern wall of Feature A were described above.

During a maintenance trip in 2003, two volunteers from Kaua'i repaired a portion of Feature A. Although not planned by State Parks or Nā Pali Coast 'Ohana, the action was allowed out of deference to a *kupuna* who was involved and archaeologists present monitored the activity; the other volunteer had extensive experience with repair of traditional stone masonry. Only tumbled stone adjacent to the wall was used in the repair, and ambiguous sections of the interior wall facing were left as is to avoid the potential for inauthentic reconstruction. Original foundation stones served as the guide for this repair, and no ground disturbance

was involved. The repaired section runs from the southwest corner of the enclosure (west of its junction with Site 199 at the constructed “stairs”) and continued to the northern end of the enclosure’s west wall, where it was dismantled historically for the construction of Feature B.

Seven features of Site 197 (Features C and G-L) lie within the boundaries of Feature A.

Feature B. This is a large elongated rectangular feature situated at the northwest corner of Feature A. Similarity of materials in both and the progressively more complete dismantling of A as it approaches B show that the latter was constructed of materials robbed from the northwest portion of Feature A, and therefore is more recent. Feature B is situated approximately 30 m from the shoreline, atop the low sand beach ridge that extends across Nu’alolo Kai flat (Figures 12-16). The surrounding area is generally level. Vegetation consists of dense grasses. Koa haole formerly grew within and adjacent to the feature, but has been cleared by ‘Ohana volunteer crews as part of the resource management strategy. Due to a lack of shade tree canopy in this area, the grasses must be cleared manually at the beginning of each work season.

Feature B consists of a long, rectangular enclosure or U-shaped feature constructed of stacked sandstone beachrock and waterworn to subrounded basalt boulders and cobbles. The walls are core-filled, predominantly with basalt boulders and cobbles. Due to collapse of the feature, and possible post-abandonment removal of stones, it is unclear whether the feature was enclosed on the *makai* end, though several apparently embedded stones at its north corner suggest it may have been. It is of the form commonly referred to as a “canoe shed”, though others have suggested that this feature type in fact should be more appropriately referred to as an historic habitation feature. The long axis of the feature is oriented 323°, more or less perpendicular to the shoreline.

The feature measures 15.8 m by 6.5 m overall (excluding collapse), with interior measurements of 14.0 m by 3.6 m inferred from the remaining intact foundation stones. Many portions of the wall have collapsed, although remaining portions

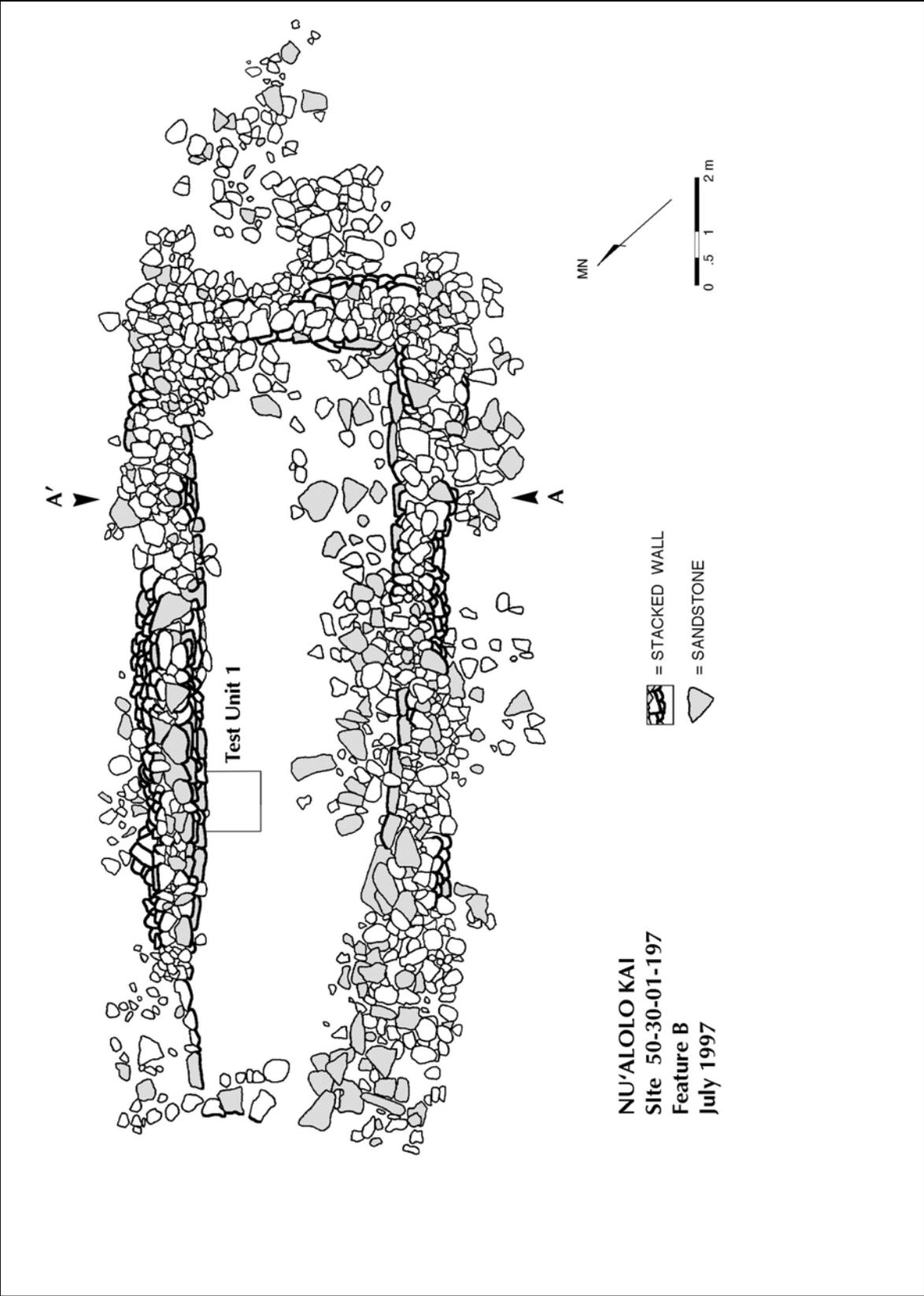


FIGURE 12. Site 197:B Planview.



FIGURE 13. Site 197:B, view *mauka*.



FIGURE 14. Site 197:B, view of interior with northwest corner in foreground.

measure up to 85 cm in height on the northeast (more intact) wall, and up to 75 cm in height on the southwest wall, though a height of 40 cm is more representative of this side of the feature (Figure 15 – x-sec). At least one local fisherman whose family has long visited Nu‘alolo Kai has suggested that much of this collapse was as a result of the 1946 tsunami, though this cannot be proved. Modern disturbance (i.e use of the area as a campsite), as well as neglect and natural forces also have likely contributed to the current condition. Many stones strewn about the interior and exterior of the feature clearly were formerly incorporated into the walls. It does not appear that any significant number of stones have been removed from the feature, with the possible exception of the *makai* end of the northeastern wall, where no fill stones are evident. Overall, the feature is in fair to poor condition.

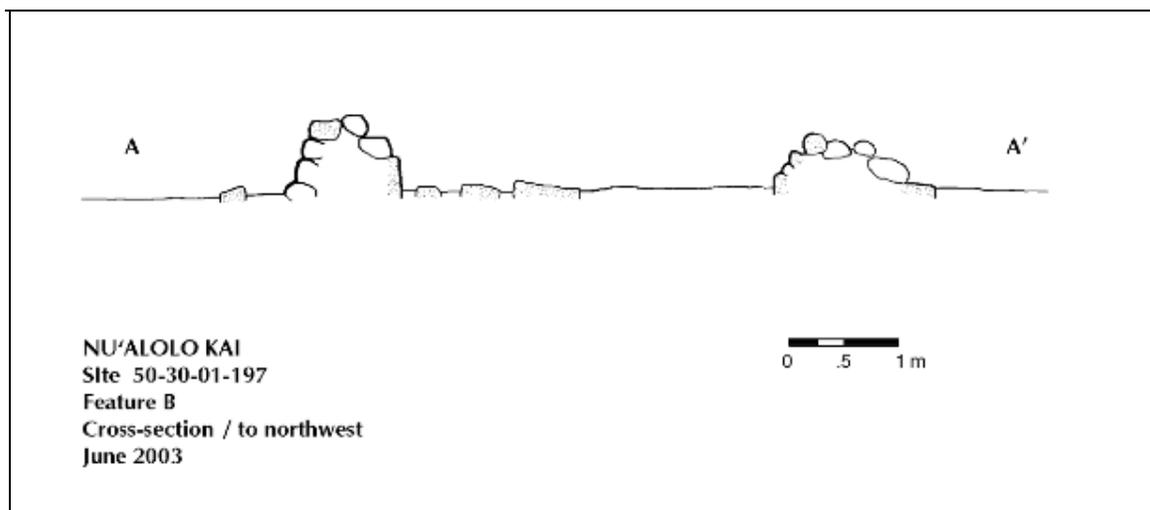


FIGURE 15. Site 197:B Cross section parallel to shore.

There is no surface evidence that the feature’s interior was paved. Though there are a large number of scattered stones within the feature, they are concentrated adjacent to the walls where the greatest amount of collapse has occurred, indicating that they are the result of wall fall and not disturbed paving stones. Several horizontal slabs of beachrock in the *mauka* third of the feature lack the closely fit joints exposed in excavated pavements beneath Feature B and in Site 7154, and although they have not been lifted or otherwise excavated, seem not to be a part of a pavement. Their alignment, which the cross-section shows to be shared with another horizontal sandstone slab on the exterior foundation of the east

wall, could conceivably be part of a former structure, but may just as well be fortuitous.

Subsurface testing within the feature similarly indicated a lack of paving. It appears the feature had a level sand floor. Materials recovered—fragments of stone artifacts and debitage and marine-oriented food remains—indicated that feature B was a habitation. Excavation continued to uncover cultural traces well beneath the level of the surface feature foundation, showing that the surface feature was just the latest in a series of activities in the area. Post features, including holes and molds, indicated the presence of earlier features, a horizontal sandstone slab may have been part of a pavement, and several pit features contained evidence of cooking and rubbish disposal consistent with earlier habitation, at least some of which may have been less lengthy and stable than the stone surface feature.

An interesting aspect of the feature is the differentiation of construction styles between the interior and exterior wall facings. On the interior, the base stones consist of deeply embedded, upright-placed flat beachrock/sandstone slabs. These are topped by horizontally laid beachrock slabs and by waterworn to subrounded



FIGURE 16. Site 197:B. Detail of east wall interior. Note upright sandstone slab foundation, and mix of horizontal sandstone and basalt in upper courses. Excavation occurred against slabs at center.

basalt boulders. On the exterior, the facing consists wholly of stacked basalt boulders, with little to no sandstone incorporated. This unique construction style shared with Site 197, Feature A, which possesses the upright slab construction on one side only, though that feature incorporates basalt as well as sandstone slabs into its base course.

Feature B was scanned with a laser in 2006, providing abundant data points that show the position of the above-ground stones in three dimensions.

Site 50-30-01-7150

Initially recorded in 1979 as Site NUK-1, the complete description of this site was:

This site consists of approximately 10 to 15 mound burials, located 50 m/40 degrees MN from the stand of coconut trees at the W end of the heiau (3200-199)...The features range from a well-constructed platform, measuring 3 m by 4 m and 75 cm high (Plate 52), to simple, oval-shaped boulder outlines. The platform burial has a boulder facing, with subangular to rounded cobble and boulder fill. It is oval-shaped with a flat surface. A smaller mound (1 m in diameter) is located 1 m to the S. Approximately 40 m makai of these two features are two other burial mounds with boulder outlines and cobble and pebble fill. They stand 75 cm high and are 2.7 m by 1.5 m. Adjacent to both features are small piles of disturbed sand and soil that contain midden. They appear like backfill material but there is no apparent excavation.

The terrain is level, though sloping slightly toward makai. Vegetation consists of a canopy of noni (3 to 4 m high), with scattered mature koa haole. Ground cover is small koa haole and vines. Features are in excellent preservation. 1 (Tomonari-Tuggle 1989:93)

Subsequent mapping and study in the past decade have increased the detail of knowledge about this site. A site inventory recorded 22 surface features, which are described in Table 1 below. Most consist of oval alignments or low platforms, although Feature 3 consists of three components closely juxtaposed, and Feature 11 is a larger platform. All but the latter appear to be individual burials, although it is far from clear whether the surface structures comprise the entire cemetery, and it remains possible, even likely, that additional burials exists in the area without any surface markers.

TABLE 1. Features in Site 7150¹

FE. NO.	EXTERIOR							INTERIOR					
	TYPE	STONE TYPE	STONE SIZE	SHAPE	L	W	H	TYPE	STONE TYPE	STONE SIZE	L	W	D
A	Align.	B,BW	Bldr. Cobble	Rect.	2.5	1.65	.2	Raised	CB,CW BW,BD	Cobble	1.25	0.85	N/A
B	Align.	B	Bldr.	Rect.	2.05	1.15	0.15	Raised	B,BW CW	Cobble	1.65	0.45	N/A
C.1	Align.	B,BW	Bldr. Cobble	Rect.	2.90	2.15	0.35	Sunken	Soil	N/A	1.55	1.20	0.35
C.2	Stack	B,BW BD	Bldr. Cobble	Rect.	3.00	2.15	0.45	Sunken	Soil	N/A	1.80	1.20	0.40
C.3	Align.	B,BW BD	Bldr.	Rect.	3.00	2.60	0.35	Sunken	Soil	N/A	1.80	1.05	0.35
D	Align.	B	Bldr.	Rect.	2.60	1.55	0.30	Raised	B,BW CW	Bldr. Cobble	1.95	1.05	N/A
E	Align.	B	Bldr. Cobble	Rect.	2.30	1.05	0.15	Sunken	B,BW BD,CW SS	Pebble Cobble	1.20	0.75	0.10
F	Align.	B,BW	Bldr. Cobble	Oval	3.50	2.60	0.20	Sunken	Soil	N/A	2.6	1.45	0.20
G	Align.	B	Bldr.	Rect.	3.25	2.25	0.20	Raised	B,BW CB,S	Cobble Bldr.	2.90	1.40	N/A
H.1	Align.	B,BW BD	Bldr. Cobble	Rect.	2.05	0.90	0.10	Level	BW, Soil	Cobble Pebble	1.60	0.70	0
H.2	Align.	BW,B	Bldr.	Rect.	1.05	0.80	0.10	Sunken	Soil	N/A	0.85	0.45	0.5
I	Align.	B,BW	Bldr.	Oval	2.80	1.20	0.15	Sunken	Soil	Pebble	2.40	1.10	0.10
J	Align.	B,BW BD	Bldr. Cobble	Rect.	3.25	1.60	0.15	Raised	BW,B CW	Cobble Pebble	2.15	1.10	N/A
K	Stack	B,BW	Bldr. Cobble	Rect. Oval	4.00	2.40	0.70	Level	B,BW BD,S CW	Bldr. Cobble	2.85	1.80	0
L	Stack	B	Bldr.	Rect.	2.25	1.20	0.50	Level	B,BW BD	Bldr. Cobble	1.45	0.85	0
M	Align.	BW,B BD,C	Cobble Bldr.	Oval	1.90	1.84	0.05	Sunken	Soil	N/A	1.35	N/A	0.05
N	Align.	BW,B	Bldr. Cobble	Oval	1.85	1.20	0.15	Sunken	B,BW Soil,S BD,CW	Cobble Pebble	1.30	0.70	0.10
O	Embed	B,BW	Bldr.	Rect.	3.00	1.65	0.20	Sunken	B,BW	Cobble	2.55	1.50	0.15

¹ **KEY: Exterior Type:** Align. = single course alignment Stack = 2 or more courses, Embe = stones embedded in soil, None = no defined edge. **Stone Types:** B = basalt, BW = waterworn basalt, BD = dike stone, C = coral CW = waterworn coral CB = branch coral, S = sandstone, SS = sandstone slab **Stone Size:** Bldr. (Boulder) = (> 25 cm), Cobble = 7.5 – 25 cm, Pebble < 7.5. **Shape:** Rect. = rectangular **Interior Type:** reports relationship of fill surface to that of surrounding feature edge

FE. NO.	EXTERIOR							INTERIOR					
	TYPE	STONE TYPE	STONE SIZE	SHAPE	L	W	H	TYPE	STONE TYPE	STONE SIZE	L	W	D
				Oval					Soil,C	Pebble			
P	Align. Stack	B,BW S	Bldr. Cobble	Oval Rect.	2.70	1.40	0.25	Raised	BW,B CW,CB BD	Cobble	2.35	0.90	N/A
Q	None	B,BW BD	Bldr.	Irreg.	2.35	2.10	0.40	N/A	N/A	N/A	N/A	N/A	N/A
R	Embed	B,BW	Bldr. Cobble	Irreg.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S	Embed	B,BW	Bldr. Cobble	Irreg.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
T	Piled	B,BW	Bldr. Cobble	Irreg.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
U	Stack	B,BW BD	Cobble Bldr.	Irreg.	1.75	1.55	0.10	N/A	N/A	N/A	N/A	N/A	N/A
V	Piled	B,BW BD,C	Cobble	Irreg.	4.20	1.90	0.45	N/A	N/A	N/A	N/A	N/A	N/A
W	Align. Stack	B,BD	Bldr.	Oval	2.90	1.55	0.35	Level	B,CW BW,BD CB	Cobble Pebble	2.05	1.05	0
X	Align. Stack	B	Bldr.	Oval	2.70	1.65	0.35	Level	BW,B CB,CW	Cobble Pebble	2.05	0.95	0

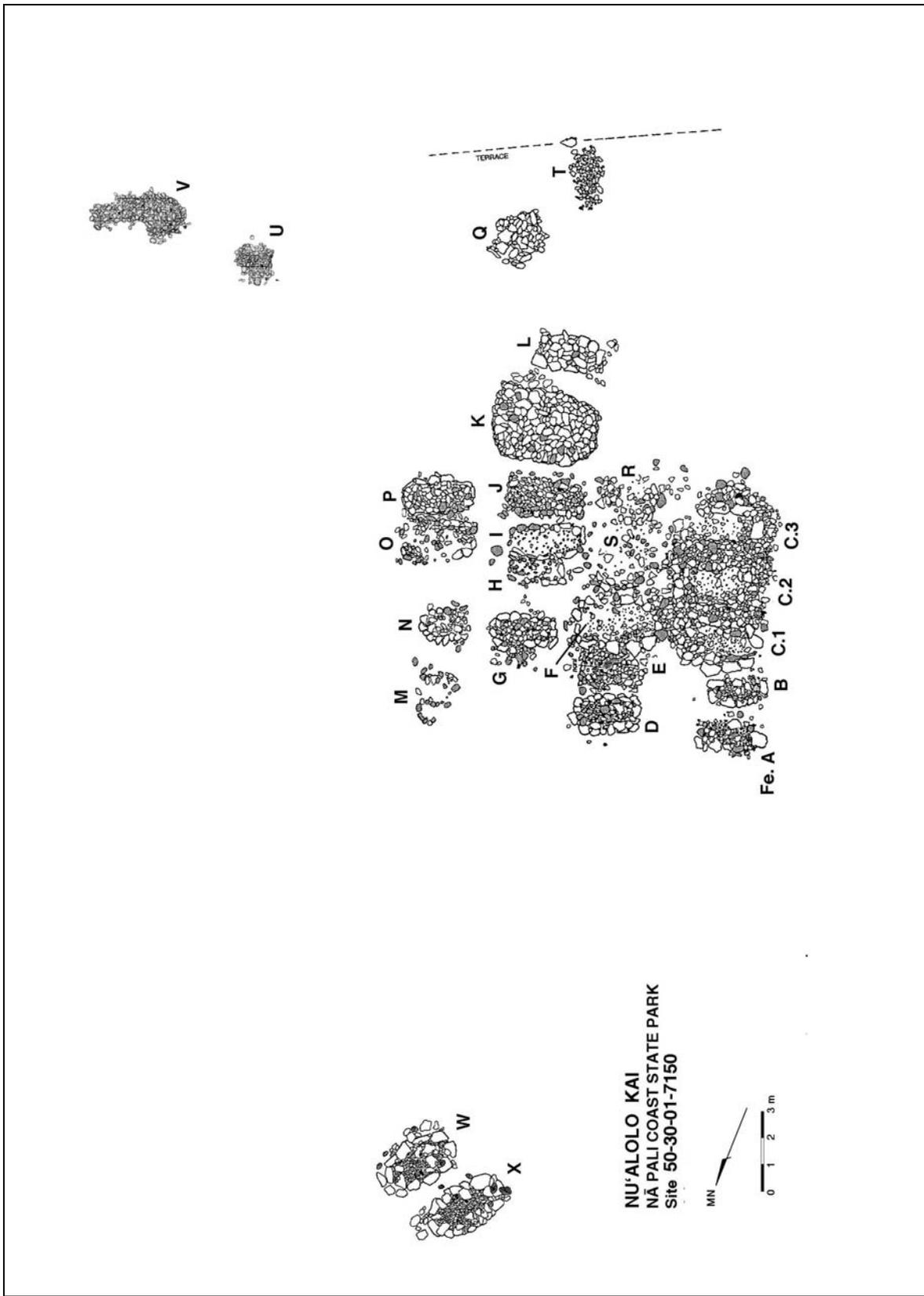


FIGURE 17. Site 7150 Overview, after Carpenter and Major 1999.

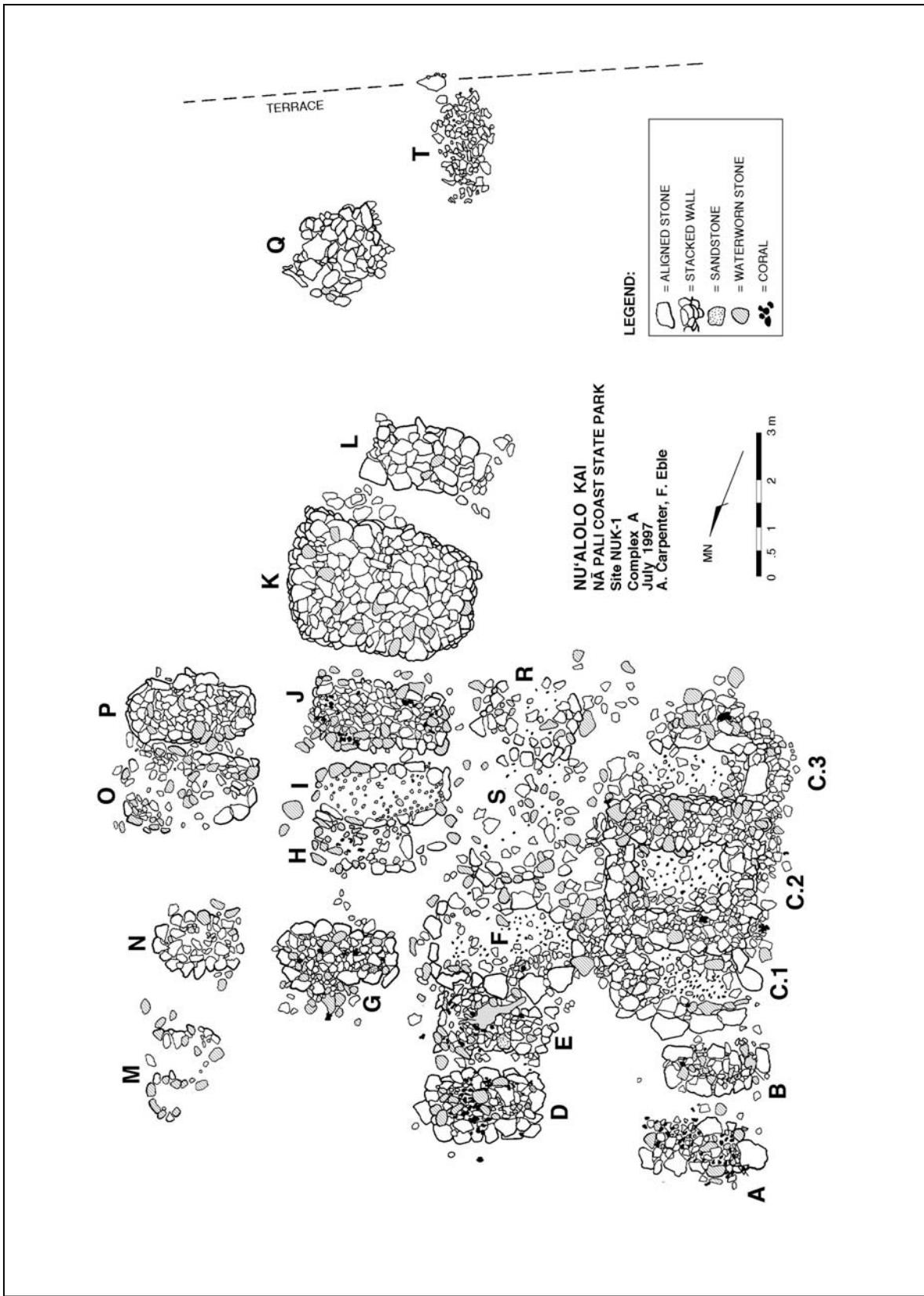


FIGURE 18. Site 7150 Main Complex, after Carpenter and Major 1999.

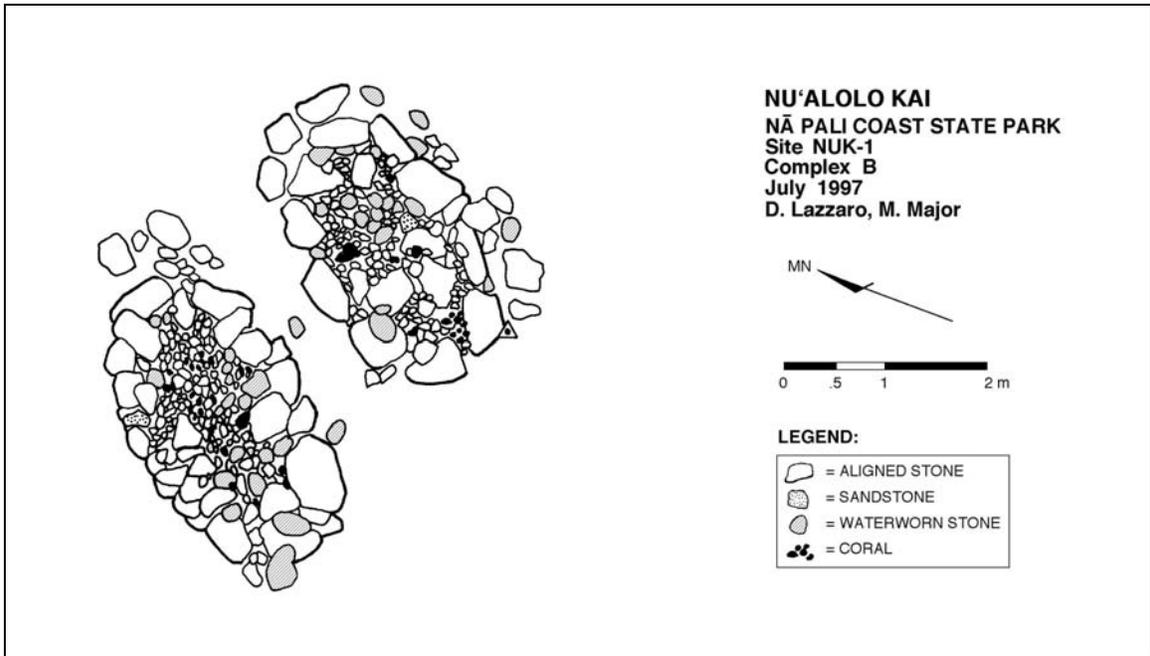


FIGURE 19. Site 7150 Outlier Complex, from Carpenter and Major 1999.

PRESERVATION PLAN

While this plan represents a shift to more active preservation activity, State Parks and Nā Pali 'Ohana have implicitly been preserving the place for years. Removal of trees threatening to fall on sites or uproot them, and of exotic weed species has helped not only stabilize the sites, but to help transform the landscape in the direction of native and Polynesian-introduced species. Gathering of Nu'alolo descendants and their family stories about the place, especially when told at the place, have helped conserve and perpetuate wisdom and observations about Nu'alolo. Maintenance of trails and cleared areas signals local commitment to *mālama* the sites and landscape.

CONSULTATION

For more than a decade, Kaua'i residents, State Parks staff, and archaeologist volunteers from other islands have worked cooperatively to clear vegetation, map sites, and record features in Nu'alolo Kai. Na Pali Coast 'Ohana, a non-profit environmental and cultural resource stewardship group formed by Kaua'i residents, formed as an organization during that time, and has since signed a curation agreement with the Division of State Parks for Nu'alolo Kai. With two to five trips to *mālama* Nu'alolo each summer since 1996, there have been ample opportunities for archaeologists, Native Hawaiian and other residents of Kaua'i, historic preservation specialists, and other resource management professionals to talk about the future of the place while in the place.

Typically, consultation for preservation planning takes place in development or other contexts in which time pressure is greater, and consequently ends up being a more formalized, finite process. In contrast, consultation regarding the goals, direction, and particulars of preservation in Nu'alolo has taken place gradually over many years, dominated by talk during breaks in the clearing and clean-up work, at the tour boat landings (many local Hawaiian families are represented among the boat crews) around the lunch and dinner mat, and under the stars over the beach at Nu'alolo. Consultation has never been systematic or formalized, but it has been extensive. During this time, members of the families associated with Nu'alolo and Nā Pali have been invited to Nu'alolo, and those who have not gone

have had the opportunity to attend informational meetings and presentations by State Parks and Na Pali Coast 'Ohana.

Much more attuned to the setting and the pace of old style talk story and *kukukuka*, and necessarily more rooted in the preservation needs that become obvious through long engagement with the sites and the local people, a consensus has emerged regarding preservation. The fact that this process has unfolded over a decade reflects a reluctance to jump into any preservation action beyond recording the current status of sites, but in recent years more and more of the Native Kauaian, other island residents, and historic preservation professionals have moved toward a more active preservation stance.

Nu'alolo Kai has for many years been a place visited by a controlled number of tourists, as well as by local fishermen and hunters, and occasionally kayakers and other recreational boaters. The opinions of those involved in the preservation planning process has been that these groups should be recognized as park users, and should be educated regarding the history, cultural significance, and special character of the place. Thus, the preservation should involve interpretation, and not simply consist of passive conservation; the commitment of many volunteers over the years to take care of the place has provided evidence of ongoing commitment to this approach. However, this has been tempered by a deep commitment to *mālama* the place for the sake of the 'aina and its people, and the consensus has been that interpretive efforts and preservation in general should not be subsidiary to a tourist focus or simply enhancing the visitor experience.

Conversations years ago regarding dreams for the place have coalesced into the current preservation plan. First and foremost, we wish to honor the place and its past inhabitants by protecting it from disturbances and keeping its landscape and sites from deteriorating. Moreover, we wish to have Nu'alolo Kai be a place of renewal for Hawaiian culture, through a program of restoration. This plan describes a process through which a few of the stone features found on the surface of the Nu'alolo sand flat can be restored. Doing so will not only demonstrate the commitment of the community to *mālama* the place and *ho'omau* the culture, but provide a well-defined restoration pilot project in what many of the people who

have aided the work in Nu'alolo Kai understand to be a restoration that may take generations to accomplish.

BUFFER ZONES

All of the land at Nu'alolo Kai lies within Nā Pali Coast State Park, and as such is being preserved. No construction is planned for the area, and therefore the need to protect Site 197 from construction impacts is moot. Protective measures therefore do not include establishment or marking of buffer zones in the typical way.

However, a secondary buffer will be established both to facilitate restoration work and to help protect the feature once it has been rebuilt. Because the immediate and long-term concern is with foot traffic, rather than grading, excavation, or other construction activities, the buffer will be smaller.

Figure 20 depicts the initial buffer that will be established for restoration work. It will be established on the trail side of features only – there is no need completely encircle features due to the nature of the terrain and visitation patterns. The buffers shown also correspond to the site areas intended for initial restoration—should other areas of Site 197, Feature A be undertaken, appropriate buffers will be established. The varying distance from the surface feature is intended to establish a work zone in which tools and materials may be kept and personnel may work safely. Tourists will be kept outside of this buffer, both for their own safety and to allow workers to focus on the tasks at hand without having to manage visitors. The project foreman may at his discretion opt to temporarily stop work in the area and allow individuals or groups of 5 or fewer within the buffer to examine the work in progress; this is intended primarily as a way to accommodate local visitors and preservation professionals with a more focused interest in the site, rather than casual visitors who should be able to see enough from outside the buffer.

During restoration, the buffer will be marked with yellow construction tape tied to vegetation, and if necessary, to stakes. Should the work extend beyond the period of a single trip, the archaeologist and project foreman will evaluate the degree of completion, the stability of complete and incomplete sections, and decide whether

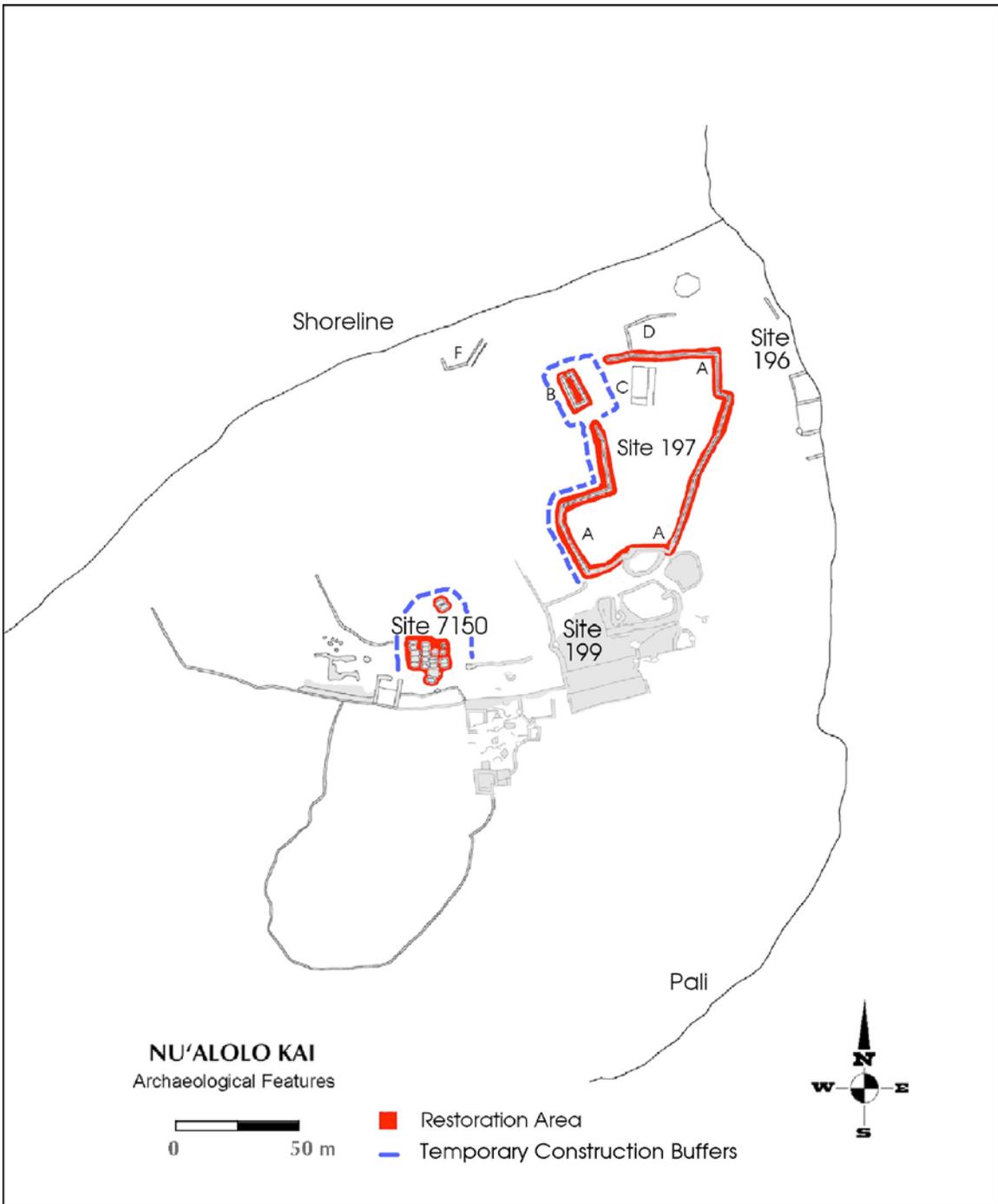


FIGURE 20: Proposed construction buffers.

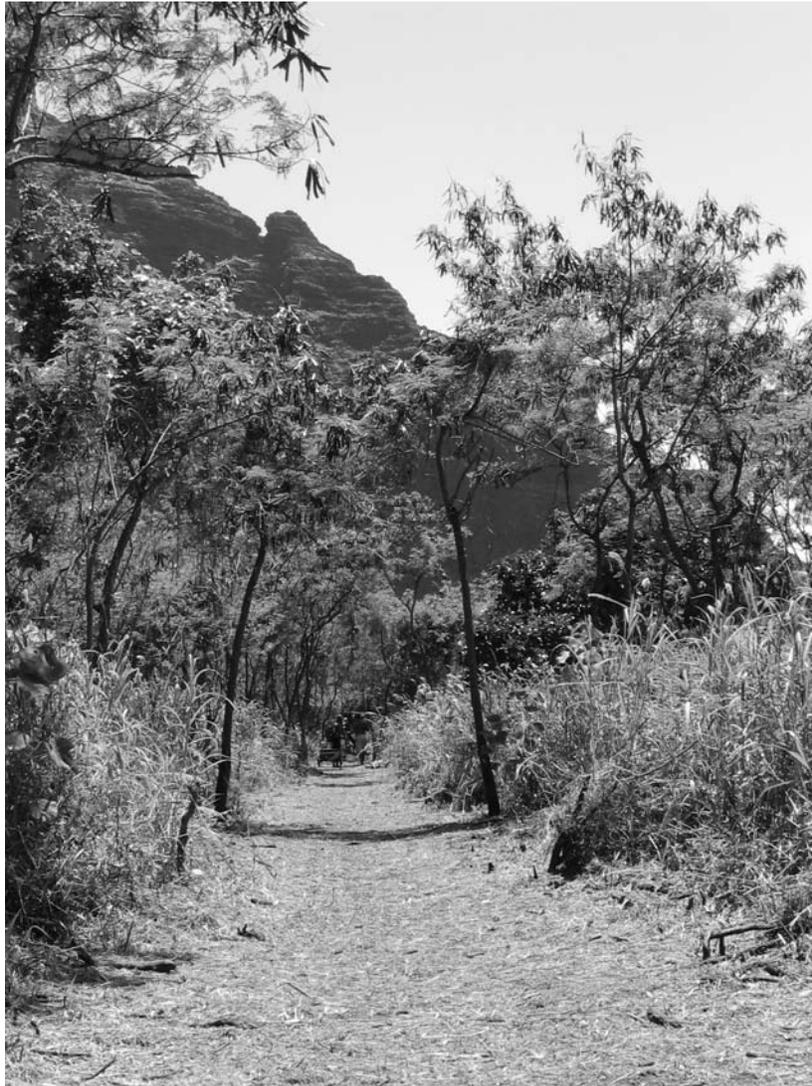


FIGURE 21. Clearing alone makes the trail easily identifiable in some areas.

the buffer marker should remain in place or be taken down until the next trip. Signs reading “Restoration in Progress” will be posted if work is not completed during the first trip.

Because Site 197 is within the area visited by the interpretive trail, buffers must also consider the effects of foot traffic and anticipate potential areas of encroachment or impact. Because Nu’alolo is remote and usually untended by DLNR personnel,

enforcement of such buffers cannot be reasonably expected except on rare occasions. Also, erection of obtrusive barriers or markers for the normal use buffers both increases the potential for physical impacts (such as excavation of postholes) and detracts from the character of the place.

For about a decade, an interpretive trail has been established and is in near daily use throughout the summer season. Vegetation clearing has been perhaps the most effective tool in establishing the trail route, and observation by archaeologists and Nā Pali Coast 'Ohana members confirms that very few people wander off of the cleared trail route into higher vegetation. In places where clearing extends beyond the trail corridor, such as the space between the trail and Makaleka's wall (Site 197A), use of tree trunks to provide a visual definition to the trail edge has proved effective as well. Though the distance varies, generally a 2-m interval between trail's edge and the closest surface feature accommodates close viewing while preventing damage.



FIGURE 22. Site 197:A. The stabilized wall makes an effective trail edge.

INTERIM MEASURES

Interim site protection measures typically involve fencing and in some cases maps and construction specifications aimed at keeping potentially damaging construction at a safe distance from preservation features. While the actions proposed in this plan could be construed as construction in a broad sense, they focus on the features themselves, and are planned such that the impact will be positive. The interim measures put forth here, therefore, focus on maintaining control over the restoration process so that archaeological deposits are not disturbed, and where movement of toppled stones and shallow deposits prove necessary, that information and cultural materials are gathered.

Investigation

Archaeological study of Nu'alolo Kai commenced long ago, and since 1997 has focused on detailed recording of the surface features. While the bulk of the effort has been to establish a baseline record of surface features, excavation last summer began the process of providing data specifically for restoration. From these studies, we have a detailed and nearly complete understanding of the surface, the intact footprint versus tumble, and the general scope of work that would be required for restoration.

For Site 197:B, excavation has showed that for this structure, which appears to have been constructed from dismantled portions of the feature A wall and thus to be of more recent origin, was constructed in the historic era. The foundation, consisting of sandstone slabs set upright and parallel to the wall orientations, is set into a builder's trench 40 to 50 cm below the present surface, which is about 10 cm higher than the ground surface associated with the period of construction. While these and other observations provide sufficient information to begin restoration (i.e., the location of the foundation and the construction techniques), questions remain. For example, it is not clear in all cases whether stones lying near the walls have collapsed, or could represent constructed elements such as a pavement or a wall spur extending from the main, rectangular feature.

Continued investigation is directed at resolving such uncertainties, and will be done to varying degrees at both sites prior to restoration. The first step will be to clear loose, tumbled stone from interior and exterior facings; this will happen at all sites, and will involve the active participation of archaeologists. Unless clearly embedded below the modern horizon, surface stones will be removed as well in Site 197²—modern camping modifications and tumbled stones appear to be less than 10-cm into the current horizon. Position of stones relative to the Layer I/II and I/IIA interfaces will be the crucial factor in deciding whether a stone should be removed.

Next, wall facings will be examined closely, with copies of feature maps annotated to show the intact foundation stones. (One such version exists for 197:B, and if clearing does not reveal any changes or additional information, it will satisfy this step in the process for that feature.) This will be particularly important for the 197:A wall, whose interior facing is much less obvious than the exterior; this phase of investigation will establish whether the interior actually differed in style, or has simply collapsed to a greater degree, or was obscured by stone tossed against the wall from inside the enclosure. The organic horizon and Layer I (unconsolidated, mixed sand) may be brushed away from the foundations in Site 197, but will cease going deeper when consolidated, intact cultural deposits appear. The cleared walls will be photographed in large format black and white and other media.

Although mapping efforts to date and the inventory excavation appear to have located the feature's footprint adequately for reconstruction, the archaeologist may excavate after this clearing if the foundation alignment remains unclear in a particular area. Unlike typical archaeological digging, the horizontal extent should be determined by the area that requires clarification, and the depth should go no further than necessary to establish presence or absence of intact wall foundation.³

² One *kupuna* who spent time in Nu'alolo Kai as a girl indicated that in the burial area, markers could be as simple as a single stone, rather than the more obvious alignments and platforms recorded by archaeologists. Since the goal is to stabilize the burials, only stones that have clearly tumbled from a feature will be moved, and there will be no attempt to clear surface sediment to identify pits.

³ Because previous excavations indicate a complex depositional history and deeply stratified deposits, the usual practice of digging down to culturally sterile substrate would involve far more investigation than would be appropriate to the restoration task, and would disturb deposits without enhancing knowledge of the surface feature being restored. Excavation at Feature B showed that Layer I (loose sand with mixed cultural materials) and Layer II (a "builder's trench" backfilled after the foundation was laid, which also held a mixture of traditional and historic materials) may be excavated without impacting intact cultural deposits.

Remaining deposits are to be preserved, illustrated in plan view, and photographed prior to being reburied.

Rebuilding

Rebuilding will commence after clearing, documentation, and investigation. Among the proposed staff are Native Hawaiian masons experienced in restoration of archaeological features, one of whom will serve as the restoration foreman with the authority to direct the work flow. An experienced archaeologist will also be present to aid in restoration, and will have the authority to halt work whenever there is a need to evaluate and archaeological find, excavate intact sediment, or otherwise document and investigate the feature and deposit. Both the masonry foreman and the archaeologist will discuss how the original walls looked, and how best to achieve an authentic reconstruction. The crew will be rounded out by volunteers from Kaua'i, including *'ōpio* (youth) who will be trained for future restorations.

During the coming years, State Parks staff and volunteers will work to rebuild portions of Site 197 Feature A and all of Feature B, as well as the surface features of Site 7150; the areas involved are shown below in Figure 24. If additional areas are restored in the future, SHPD will be notified with a supplemental preservation plan.

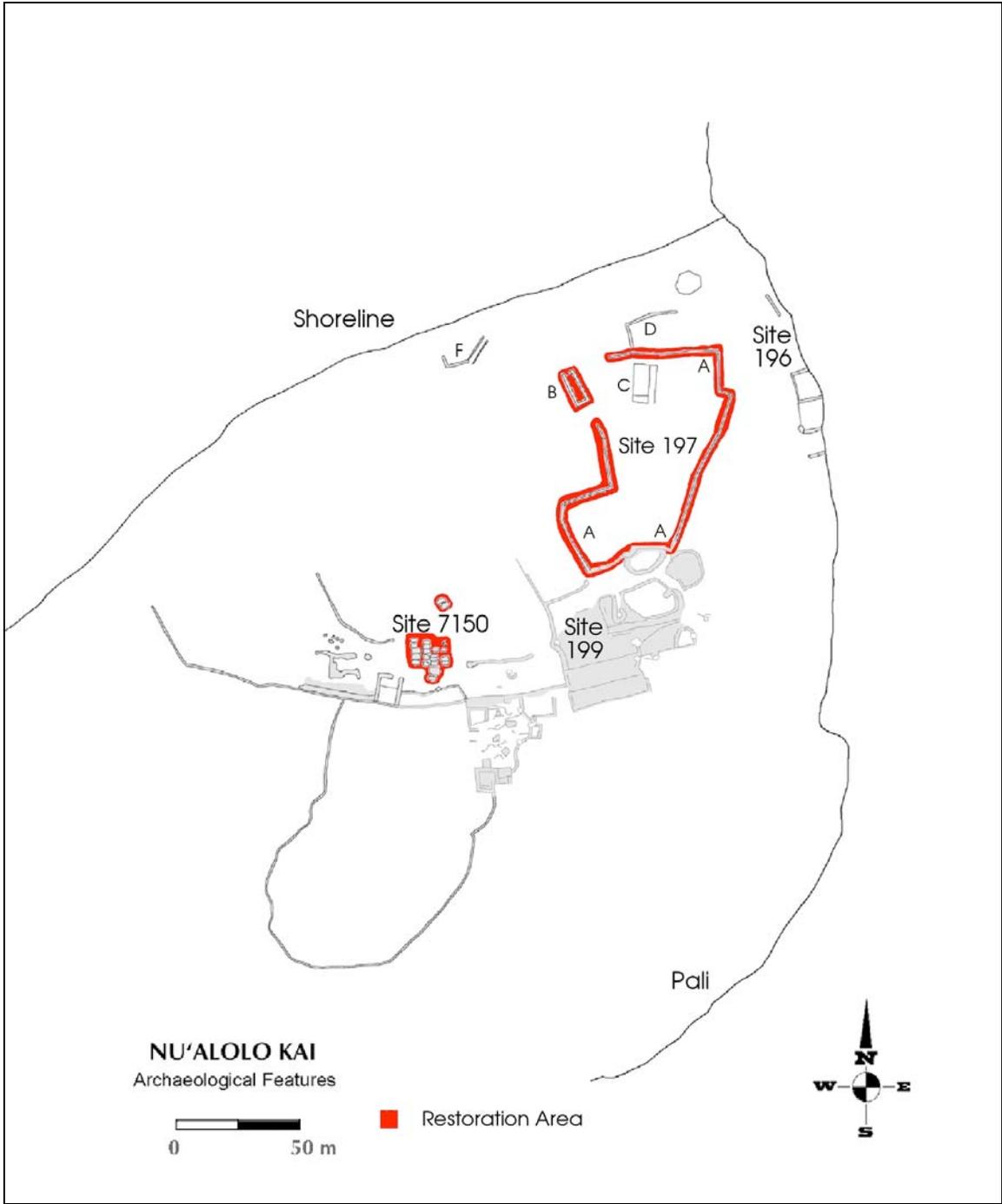


FIGURE 23. Area of proposed stabilization and restoration.



FIGURE 24. Site 197:A wall. Above, after clearing. Middle, rubble moved away from foundation. Below, repaired.

To help protect the cultural deposits around the features being stabilized and rebuilt, boards will be placed on the work surfaces surrounding them. Workers will walk on these to avoid churning up the soil. Stone will be removed down as far as it is loose and unconsolidated. In many cases, this will leave a wall base 2 or more courses high, but in some cases may consist only of a foundation.

Unless a foundation stone is obviously and extremely askew (greater than 10 degrees off vertical), it will not be moved. If it is, an archaeologist will collect and screen sediment that has to be removed. The most likely scenario for this would be if a slab needs to be re-set in a vertical position, and it is estimated that this would yield under 4 liters of sediment, and probably far less. Midden recovered during this process will be recorded in the field, and artifacts will be collected.

It appears that most or all of the original stones used to make this feature remain near the feature; furthermore, it appears that rocks remain along the section of wall from which they came, indicating simple collapse without much lateral displacement. Under guidance of the mason foreman, project staff will re-stack the wall using local material, without use of mortar or non-traditional means of stabilization. The default rule will be to use loose stone in the section of wall adjacent to it, moving stones laterally only where the mason and archaeologist reach a consensus that the stone has been displaced, and where such movement is required to maintain a relatively even finished height. In such cases, feature maps will be annotated to show the source, destination, and approximate quantity of stone moved. (Quantity likely can be expressed in number of large cobbles and boulders moved, but may also be reported in terms of volume if too large for a count.)

In 2003, two volunteers, one a *kupuna* and the other a Native Hawaiian experience in restoration of traditional stone features, stabilized much of the exterior facing of Site 197:A. Although this had not been planned, archaeologists monitored the process, and no ground disturbance or negative impacts resulted from this action. The preceding photographs show the before-during-after sequence of that work, and that experience showed that simple re-stacking increased the stability of the wall and has probably decreased the incidence of casual visitors trying to walk over the walls.

LONG TERM MEASURES

Preservation does not end with a re-stacked wall. Perpetuating the structures and the greater cultural landscape requires sustained attention, lest the restored feature slip back toward ruin. The most immediate long term measure related to restoration is the completion of a Restoration Report. Additional measures that will help do this include establishment of preservation-oriented maintenance procedures, re-vegetation, condition monitoring, interpretation, and contingency response plans.

Restoration Report

Throughout the process of restoration, a photographer will document the process of restoration in multiple media (concentrating on slides and digital images that can be used in the report and public presentations). Once the wall has been completely restacked, the feature will again be documented with large format black and white plates. After fieldwork is complete, project archaeologists will produce a report for SHPD describing the findings of archaeological investigation and detailing the restoration measures. Key elements of this report will be photographs and maps depicting the structure before and after restoration, description of any excavation or ground disturbance (including location on the map), an inventory of cultural materials discovered during excavation and reconstruction, analysis of exposed stratigraphy and foundations, and discussion of the feature's age and function. A second report, concentrating on the process of restoration, the partnership between Native Hawaiian masons and archaeologists, and lessons gained from this pilot project, will be produced for community groups, contractors, and others interested in doing restoration.

Maintenance Procedures

Typical maintenance involves a yearly cycle beginning with an early spring trip in which the crew clears the trail and identifies any impacts that may have occurred during winter, additional work and special projects during the summer, and a final

clean-up in early September. This cycle should continue, having served the landscape well over the past decade. Though many of the current cadre of volunteers have become familiar with the constraints archaeologists and cultural practitioners ask for, the procedures are recorded here to provide a record of past practices and guidance for the future.

Maintenance at Nu'alolo Kai, where people who bring in materials generally take out their rubbish (and boat companies that present the greatest potential source of garbage remove their debris as a matter of policy), consists almost completely of clearing vegetation. Although years of work has whittled down the need, some trees and large shrubs with potential to disturb structures remain, and their removal should be a priority. At Site 7150, this work is *pau* (complete), but in Site 197, trees remaining within 2-m of the wall should be removed by cutting them to the ground, repeating the process as necessary until the plant has succumbed. This has worked in Nu'alolo, where Parks and 'Ohana members have succeeded in managing vegetation without the use of pesticides. One organic method, however, cannot be used: uprooting. Only small, slender-rooted plants such as young *koa haole* (*Leucana leucocephala*) seedlings can be uprooted, pressing the other hand or a foot on the soil next to the plant to avoid disturbing sediment.

Most clearing now consists of using hand sickles and string trimmers to cut grass and other herbaceous species, as well as chainsaws to remove non-native trees and trim others. Care needs to be exercised in two ways with the string trimmers. First, avoid striking the ground with the string, as this can result in small excavations that, repeated over time, could reach and disturb intact cultural deposits. Second, avoid striking walls or other structures, since this can leave marks on the sites and with some of the sandstone even cut into the surface. Metal blades should be avoided except where new areas are being cleared, and even then should proceed with caution lest rocks be hit. When using chainsaws, crews should first assess the potential for falling limbs or trees to hit and damage features, and then plan the work so as to avoid any such impacts.

Debris from clearing should be removed with the least surface disturbance. Garden rakes or other rigid tools should not be used, and even bamboo or metal-tined leaf rakes should be used only when necessary, and even then very gently, so that only

leaves and stems are moved, not sediment. Larger material should be hauled by hand, although tarps may be used where the intervening ground has sufficient vegetation to prevent the load from disturbing the ground surface. Locations for additional vegetation dumps should be chosen as they have been in the past, to serve multiple purposes. First, avoid placing them where there are features, or where future work is expected. Second, some brush piles have been used as barriers, such as long logs placed to define trail edges and brush piles a little further out to prevent aimless wandering and trail blazing; in a few cases, logs have also been placed neatly to discourage entry into sensitive areas. Finally, the piles also represent a resource in terms of eventual re-vegetation, and their placement in proposed planting areas can provide a rich humus layer helpful in establishing new plants.

Clearing may lead to succession of species that is advantageous, and thereby aid maintenance. For example, repeated trimming favors low-growing grasses and ground cover species, which typically help stabilize sediments. Beyond the trail and interpretive areas, trimming should also continue to be used as a means of favoring cultural and native plants. Cutting exotic herbaceous species on the proper schedule or with sufficient frequency interrupts seed production and will eventually weaken the population. Cutting larger plants repeatedly can hasten their demise, or at least take away their edge where they are in competition with more desirable species.

Regular maintenance is also an opportunity to evaluate the landscape and sites for signs of trouble. The first crew in has the greatest likelihood of noticing new impacts from rock-fall or goats, but work crews throughout the season should be aware of things like erosion or changing soil levels, plants causing disturbance, or human impacts such as camping or looting. While archaeological monitoring will be part of the solution, maintenance crews spend more hours looking at the sites each year than anyone, and should be aware of what to look for.

Re-vegetation

The discussion thus far, like the work for the past decade, has been dominated by vegetation clearing. As restoration becomes the focus, so does changing the character of the floral communities around sites. Archaeological investigations have shown what plants may have been growing in the area during Hawaiian occupations (Major 2005, Abad 1995), botanical inventories in 1965 and 2002 offer more contemporary checklists of local flora, and a list of species advisable for re-vegetation has been prepared as well (Appendix C). The desire to have culturally meaningful native and Polynesian-introduced plants, however, cannot be translated into action without solving two major problems: voracious goats and lack of water. New plantings, especially in dry years, are prime grazing for goats, and nothing survives without dependable watering in the first year, augmented the following summer or two for larger plants unless the rains cooperate.

State Parks, Forestry and Wildlife, and Nā Pali Coast 'Ohana are currently devising ways to move the goat population from Nu'alolo Kai to another location, and there is hope that this threat to vegetation and site stability may decline or disappear soon. In terms of water, perhaps the best approach is to make sure that re-vegetation efforts focus on species that are adapted to periodic dry spells, and that those in the nearshore area are salt tolerant as well. This does not remove the requirement for water as plants are getting established however. Although rainfall comes more frequently during the winter, this does not happen with such consistency that it can be counted upon, and access during winter presents both logistical and safety challenges, so there is no escaping the need for irrigation for new plantings.

The initial problem for watering plants is the source. Nu'alolo Kai has a spring that may provide a limited quantity, although its salinity (measured for the past few years) should be compared to the threshold for species being considered. Neighboring Miloli'i has running water that could be boated in, and water could also be transported from Nu'alolo 'Āina stream, but both of these solutions offer only a minor improvement on boating it in from boat tour harbors. Once the source(s) of water has been identified, conservation becomes paramount. For some plantings, keeping *koa haole* or other canopy species in place can help protect

young plants until they are established, at which time the nurse trees may be removed. Mulch, utilizing the cleared vegetation from within Nu'alolo, will also be necessary. Use of drip irrigation bags (sold under trade names such as "Tregator") allows individual trees or shrubs to receive up to 20 gallons of water over half a day, and use of artificial absorbant materials (such as Potassium polyacrylimide) developed for forestry plantings can also aid in new plant establishment. Even with these aids, however, the inescapable requirement for new plantings is that they will need regular attention—at least weekly—for their first summer, and supplemental watering may prove necessary until root systems are well-established.

Once these problems have been addressed, plantings would be desirable for several reasons. Most basically, ground cover and plants with fibrous root systems protect the ground surface from wind, rain, and waves, helping consolidate sediments and hamper erosion. In Nu'alolo, an additional goal is to have plants that would have been used or enjoyed by the Hawaiian residents, restoring the environment around the sites, and also enriching the potential for interpretation and cultural education. Quite a few species could contribute sustainable harvests of products that could be used in cultural activities at Nu'alolo Kai: *'ahu'awa*, *wauke*, *'ilima*, *ipu*, *`ūlei*, *ti*, *niu*, *hala*, and more. Finally, with several areas of the trail through the flat exposed to sun, but not to tradewinds, shade is desirable.

Although small, Nu'alolo kai has several types of substrates, slopes, aspects, and ocean exposures. In the first vegetation plan, these variables were combined with observations of existing plant communities to identify a dozen vegetation zones, and Sites 7150 and 197 include a few of these: *Noni* (*Morinda citrifolia*) forest, Coconut grove, Low ground scrub, Dune crest scrub, and Strand.

Site 7150 lies at the edges of *Noni* forest and the Coconut grove west of the ceremonial complex, but has been cleared enough to be a small opening. Repeated trimming has begun to favor ground covers and grasses, and because the location is well-protected from wind and waves, and is on fairly level ground, erosion is not a major concern. Therefore, planting in this site does not have urgency based on imminent destabilization. Because of the contemporary significance of the burials to descendants of Nu'alolo, Native Hawaiians, Nā Pali 'Ohana, and others, planting in this area will reflect cultural and familial goals: honoring those who rest

there, protecting the place from disturbance, and fostering a sense of peacefulness and reflection.

Taken along with more mundane concerns for ease of maintenance and channeling foot traffic around the burials, these goals suggest an incremental plan of revegetation. Amidst the platforms, groundcover should be maintained, introducing one or more species if the curators and descendant families find it desirable to do so. Around the edges of the site, between the burials and the trail, it may be advisable to plant a border that, even if not grown tall enough to hide the features from sight, will help define a boundary between trail and cemetery, and if a gap is planned would provide a recognizable entry point to the latter. One factor that favors a boundary planting is that as clearing winds down, the supply of tree trunks formerly used to line trail edges is decreasing, making some visual reinforcement of trail boundaries a future concern. Again, descendants and Nā Pali 'Ohana should take the lead in deciding which particular species to use from the variety of shrubs that would survive in this habitat (inconsistent moisture, partial to heavy shade, sandy loam soil) and perhaps lend cultural resonance.

Site 197 crosses Nu'alolo from the beach nearly to the back of the sandy flat, and includes multiple vegetation zones: *Noni* forest, Low ground scrub, Dune crest scrub, and Strand. Vegetation needs here must focus first on stabilization. Strand and dune crest vegetation help consolidate sand that contains cultural deposits and perhaps human remains. During the past decade of work, a period of drought, perhaps exacerbated by goat browsing, occasioned at least one die-off of *naupaka* (*Scaevola*), exposing the sand in front of 197:D-E and increasing the risk of erosion there. Other important species currently growing and protecting dune deposits are *pōhinahina* (*Vitex rotundifolia*), *naio* (*Myoporum sandwicense*), and *pōhuehue* (*Ipomoea pres-caprae*). Archaeological evidence suggests that 'akoko (*Chamaesyce* spp.), and 'ūlei (*Osteomeles anthyllidifolia*) may have been important in the past; and additional species are recommended in Appendix C. Vines and grasses are especially suited to the strand, with shrubs located inland behind the high surf mark.

Behind the top of the beach, vegetation currently includes a mixture of grasses and herbaceous species, as well as *koa haole* and occasional *naio*, which become

increasingly abundant at the east. *Noni* forest covers much of the interior of Feature A, and can expand *makai* in the future if clearing practices continue to favor it. Where *noni* is already dominant, however, it is not too early to evaluate trees for their potential to damage sites. Some of the older trees are either close enough to stone features to present a danger of either falling onto a wall or pushing it up with their roots. Several have unbalanced growth or are losing vigor, and hence could be uprooted, disturbing known features in some cases and possibly buried features or deposits anywhere in the flats. An arborist and archaeologist should examine the *noni* forest throughout the flat and determine which trees or branches should be removed.

Altering the current vegetation between the dune crest and the *noni* may be a lower priority, but would aid in returning a more Hawaiian character to the cultural landscape. The interior of Feature A, precisely because it can be separated from the trail by the wall, would be a safe place to plant a *niu* (coconut) grove, although this should not be done without first doing systematic archaeological testing to determine whether it can be done without disturbing cultural features and deposits. Mounded or tree-ring plantings may help in this realm, since both offer a means to have root systems concentrate above existing deposits.

Most of the trail within Site 197 is directed by the large enclosure wall, where either untrimmed existing growth or a line of planted shrubs could define the opposite side, shrubs may also be used to define the corridor near Features B and C and discourage unfettered wandering. In these areas, as well as where the interpretive trail crosses the flat between 197 and the boat channel, long range goals include replacing the alien vegetation, dominated by large grasses and *koa haole* with more appropriate vegetation that would provide shade and cultural value. No specific plans are proposed for that, but as with elsewhere in Nu'alolo Kai, any plans for deep-rooted shrubs or trees need to include archaeological testing prior to planting.

Condition Monitoring

Preservation in the long run depends on continued awareness of the conditions in and around sites at Nu'alolo Kai. In large part, preparation of detailed maps of sites there has been to provide baseline depictions of site conditions. In the future, these should be used in annual visits by qualified archaeologists to identify any impacts that have occurred (such as wall collapse), as well as conditions that could be precursors to impacts (such as invasive roots or eroding surfaces). While the most intensive focus should be on the boat landing area, the eroding stream channel above that, the interpretive trail, and Site 196, places such as Site 200 or the *mauka* features of Site 199, which are above the trail but not so far removed as to be inaccessible, should also be regularly monitored. Further outliers, some of which have not yet received site designations, should also be monitored at least every few years.

Besides the immediate goal of identifying damage or risks to sites, condition monitoring should be used as a means to evaluate longer trajectories. With that in mind, Nā Pali Coast 'Ohana and State Parks should meet every 5 or 10 years with the express purpose of evaluating the results of annual monitoring, discussing long term processes affecting preservation, and if necessary devise strategies to respond to the findings. For example, a single year's monitoring report may not a minor collapse at a trailside feature, to which the response may be a simple repair. Because maintenance activities may not involve the same people from year to year, repeated instances of damage at the same location may not be noticed except by a 5 or 10-year evaluation, which could lead to a more permanent solution, such as re-routing the trail or installing a protective barrier. Likewise, incremental changes such as invasion by a new weed or slow erosion may not be clear on a one-year period, but may become obvious over a larger observation window.

Archaeological monitoring may be necessary, but should not preclude observations by others involved in the effort to *mālama* Nu'alolo Kai. In particular, maintenance crews at the beginning and end of each summer should be attuned to impacts that occurred over the winter or during the summer visits by tourists, fishermen, and others.

Contingency Responses

Regardless of whether an impact is noted by an archaeologist or anyone else, responses to the most common kinds of impacts should be developed beforehand. This not only increases the ability to respond rapidly, since time need not be spent developing a solution from scratch, but also may temper the urge to impose a radical solution devised in the heat of the moment.

Immediate Repair. In the case of a toppled stone or small collapse, simply restacking the damage immediately is often the best solution. Elevating such a process to the level where a restoration plan is developed, submitted for review, logistical arrangements made, and finally implemented can mean a delay of months or years, in which time further deterioration is likely to occur. Repairing the damage when it is noticed results in stabilization, and in some cases avoids risks to safety. This level of response is suitable to impacts limited to small areas, such as a course or two of stone over less than a meter of wall. Large collapses, such as that which affected the large terrace at Site 199 during the 2005-2006 winter, require a greater degree of planning and expertise.

In addition to toppled stone, another setting for immediate repair is the soil itself. Normal trail use can create divots, soil deflation, or exposure of rocks and roots that present safety hazards. In these cases, immediate repair should consist of filling the hole or covering the rock or root with sand gathered from low on the beach where cultural deposits do not occur.

It is important that instances of immediate repair be recorded, by marking their locations on archaeological maps, photographing the damaged area before and after repair, writing a brief description of the repair work completed, and forwarding this information to State Parks. Should comparison with maps or photographs of the feature in its original intact condition show that the repair has resulted in a new configuration or different appearance, then it should be dismantled and restacked correctly.

Repairs should be performed by individuals familiar with traditional masonry techniques, so that the restacked portion appears both stable and authentic. If not

such person is available on the service trip when damage is noted, then the damage should be stabilized as best possible, and repair delayed until the next trip. In conjunction with recording, the intent of this requirement is to avoid the expansion of “immediate repair” into restoration and alteration of features whose stability and integrity is not at risk.

Temporary Stabilization. The large collapse on the *heiau* mentioned above is an example of an impact that may require temporary stabilization while a more thorough, permanent response is devised. First, an archaeologist should evaluate the impact and judge whether it has resulted in instability that could lead to further damage to structures or deposits. Next, the impacted area should be stabilized using the local stone, such that further damage does not occur. Artificial material such as geotextile cloth should be placed between intact features/deposits and the stone or fill used for stabilization to facilitate later work and prevent contamination or further damage. As with repairs, this work should be documented on archaeological maps, with photos, and a brief written description of the actions taken.

Data Salvage. In some cases, such as wave or stream erosion or major collapse of a platform or terrace, impacts may reveal artifacts, cultural deposits, or internal construction details. In such instances, data salvage is an appropriate response, and investigation should commence at the earliest possible date under the direction of a qualified archaeologist. The intent of this response is collection of information at imminent risk of being lost, and may range from simply searching through the rubble of a collapse or doing a shallow excavation that does not reach the sterile substrate below all cultural layers. Excavation, recording, and analytic techniques should follow normal archaeological procedures, with the major exception being that the size and placement of the excavation necessarily is determined by the nature of the damage. Following any such excavation, a report will be prepared for State Parks files and, if necessary, for SHPD review.

Trail Alteration or Closure. Daily foot traffic through the flats, though limited by the remoteness of the area and the fact that permits are required to land, represents activity whose frequency and proximity to cultural sites makes it a primary source of concern for preservation. A few years ago, the original route of the interpretive

trail was cut short to avoid bringing people to the Site 196 terraces; although goats are the major source of damage there and the risk of injury from falling rocks was a major factor, the potential for people to cause damage to the sites also weighed in the decision. Likewise, a breach through the 197:A wall was closed recently, and the trail rerouted around it. Also, the proximity of the trail to a couple of burial platforms in Site 7150 caused a minor realignment in the interest of protecting those features.

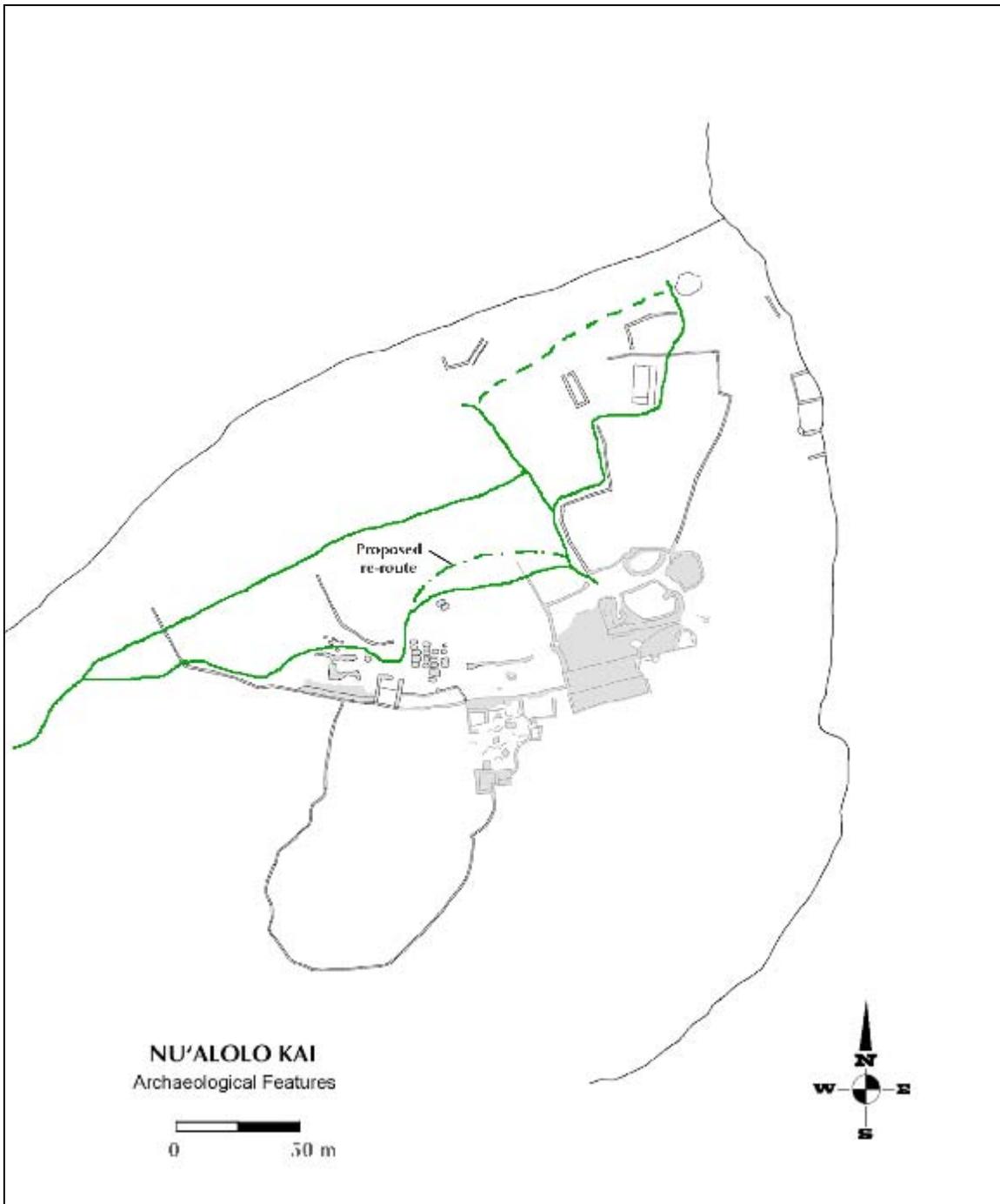


FIGURE 25. Interpretive trail route through Sites 7150 and 197.

Should future condition monitoring show that the trail is impacting deposits or features, additional rerouting may become necessary. Alternately, especially where lack of level terrain or dense archaeological features make realignment impractical

or unwise, a railing or vegetative border may be the best strategy. This approach may also be useful in cases where people have begun to wander off the interpretive trail, and there is danger that a new trail is being established that would lead into sensitive areas.

An important consideration in realigning the interpretive trail is that each instance leads to other potential impacts, even where surface architecture is not present to signal the presence of buried deposits. Because the trail has already traversed multiple routes and sections have been abandoned, it is important to keep a record of where the trail is, and what modifications are being made over time. Each realignment should be recorded on the map of Nu'alolo flat, and on more detailed site maps as appropriate; photographs should include before and after shots of realignment routes.

It is also possible that a major impact, rock-fall, or other scenario such as a storm that uproots trees may require temporary closure of the interpretive trail. Criteria for deciding on this action would include: the trail passing an exposed burial, the trail passing an impact that creates a safety hazard or looting potential, the trail becoming obscured to the point that people begin making their own routes, or the trail becoming a persistent cause of negative impacts to the sites.

Future Research

The history of archaeological research in Nu'alolo Kai is one of vast potential tempered by vast delays. Many of the materials excavated in the 1950s and 1960s have only been described and analyzed in the past decade, and more remains to be done. The 1990 excavations have never been written up, and the report for data recovery excavations in 2000 is only being finalized this year. In part, the complexity, abundance, and diversity of subsurface archaeology in Nu'alolo Kai are the culprits—it takes time to make sense of the stratigraphy and to deal with large collections—but this state of affairs also suggests that new research proposals that involve excavation should be limited and questioned thoroughly.

- First, any archaeology done in Nu‘alolo Kai should be preceded by consultation with State Parks (which must issue the required special use permit) and Nā Pali Coast ‘Ohana (who have a deep interest as managers and as cultural descendants).
- Second, any proposed archaeology must clearly benefit the preservation and perpetuation of Nu‘alolo; for example, archaeology done to facilitate authentic restoration, or that includes a training component for descendants of the place would qualify, while projects whose educational component is a single public presentation are questionable.
- Third, any proposed archaeology must demonstrate a serious research component by submitting a research design and a list of the names and qualifications of project personnel; excavation for the sake of collection-building does not provide preservation value and is not appropriate.
- Finally, any proposed archaeological project must specify its plans for cataloguing, analyzing, and curating the collections that may result, including a description of the funding basis that will allow the work to be done completely and in a timely manner. Curation on Kaua‘i is the preferred disposition.

Should a project involving new fieldwork be approved, the Principal Investigator must provide State Parks and Nā Pali Coast ‘Ohana with a brief report within two weeks of completing fieldwork. While this is obviously premature in terms of research conclusions, it will include an inventory of materials collected⁴, copies of field notes and excavation forms, copies of profile or other illustrations, photographs, a summary of work performed, and a preliminary assessment of the project results. Upon completion of sorting and identification, and updated inventory of the collections shall be submitted along with a request to have said materials be formally loaned for study. Upon completion of analysis, a report

⁴ Again, the volume and diversity of materials present at Nu‘alolo Kai make it unlikely that this inventory will contain measurements and specific sorting or identification. What is required here is on the order of a “bag list” of materials collected in the field, with a number for each bag, a brief description of the contents, and a weight.

detailing the findings and interpretations will be prepared for State Parks and Nā Pali Coast 'Ohana. Failure to complete and submit these documents will result in denial of future research requests and forfeiture of collections to State Parks. These requirements will be part of the Special Use agreement that any archaeological project director will have to sign with the Administrator of State Parks.

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