Archeological Preservation Plan for Kealakomo Ahupua‘a, Hawai‘i Volcanoes National Park

Prepared for

Hawai‘i Volcanoes National Park
P.O. Box 52
Hawai‘i National Park, Hawai‘i 96718

Purchase Order P8306084114

January 2011

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ARCHEOLOGICAL PRESERVATION PLAN FOR KEALAKOMO AHUPUA‘A, HAWAI‘I VOLCANOES NATIONAL PARK

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I. INTRODUCTION

At the request of Hawai‘i Volcanoes National Park (HAVO), International Archaeological Research Institute, Inc. (IARII) has prepared an Archeological Preservation Plan for archeological resources in a 186-acre area of Kealakomowaena in the coastal portion of HAVO.

PROJECT LOCATION

The Kealakomowaena project area lies on a geological terrace at the base of Hōlei Pali and consists of two *kīpuka* (islands of pre-lava flow landscape) on either side of Chain of Craters Road (Fig. 1). The *kīpuka* are defined by *‘a‘ā* and *pāhoehoe* flows from Mauna Ulu eruptions between 1969 and 1974 (Photo 1). The surveyed areas of the two *kīpuka* extend from about 120 to 800 feet above sea level (asl), and fall within a mid-elevation section of the traditional Hawaiian land unit (*ahupua‘a*) of Kealakomo.

The eastern *kīpuka* is a large, elongated area, of which about 46 acres have been archeologically surveyed. The *kīpuka* extends inland above Hōlei Pali and seaward almost to the ocean. The primary site within this *kīpuka* is Road Cut Cave (Site 25940[1]), an extensive lava tube system that has at least eight major entrances over a distance of almost one-half mile (Moniz Nakamura and Durst 2010:B-1 to B-8). The occurrence of numerous and complex archeological structures within and just outside of the cave attests to its function as a central place of activity in this area. Radiocarbon dating places use of the cave, probably as a source of water, as early as the 15th century (Moniz Nakamura and Durst 2010:9).

The western *kīpuka* encompasses about 140 acres and has been surveyed at various levels of detail. In contrast to the lava tube and associated structures in the eastern *kīpuka*, primary sites within the western *kīpuka* include extensive surface localities of rock piles, modified outcrops, and walls representing an expansive late pre-Contact agricultural complex (Site 27195), at least two major historic period habitation complexes (Sites 27204/27250 and 27205), and a wall that marks a land boundary or trail (Site 27200). A section of the original Chain of Craters Road (Site 27197), now largely buried by a 1972 Mauna Ulu flow, is still visible.

The two *kīpuka* are notably different in their geological base (Wolfe and Morris 1996). The surface of the western *kīpuka* is a lava flow dating to before A.D. 450. The eastern *kīpuka* is a more recent flow dating to AD 1200 to 1500. Thus, it is conceivable that people were living in the area of the western *kīpuka* at the time that lava was flowing through the area of the eastern *kīpuka*.

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[1] All five-digit site numbers in Kealakomowaena are State of Hawai‘i numbers and should be preceded by the prefix “50-10-62-,” which stands for State of Hawai‘i (50-), island of Hawai‘i (10-), and the USGS Makaopuhi Crater topographic quadrangle map (62-). The “HV-” site numbers were assigned by the B.P. Bishop Museum in the 1950s and 1960s.

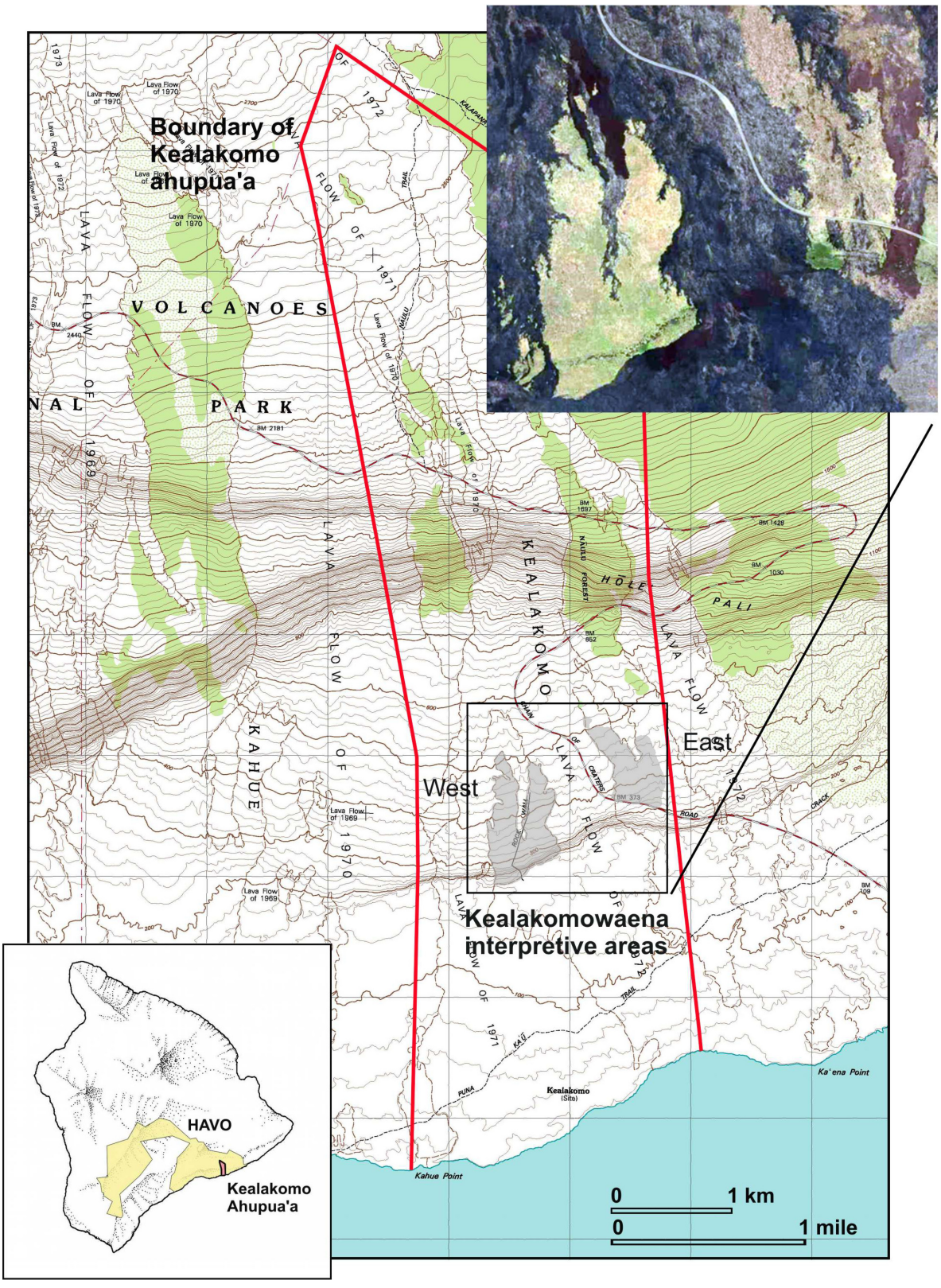


Figure 1. The Kealakomowaena project area (base map: portion of USGS Makaopuhi Crater topographic quadrangle; base aerial photograph inset: downloaded image from GoogleEarth 2010).



Photo 1. Mauna Ulu lava flows define the Kealakomowaena *kīpuka*; this is a view of western *kīpuka* from the Puna-Kaʻū Trail.

SCOPE OF SERVICES

The scope of services (SOS; dated December 3, 2007) for the present project calls for the preparation of an Archeological Preservation Plan for a mid-elevation portion of the *ahupuaʻa* of Kealakomo in HAVO. As described in the SOS (2007:item A.4, brackets added), the plan will be the basis for the development of a new interpretive area:

> The focus of this site [Kealakomowaena] will be to highlight Hawaii Volcanoes rich pre-Contact and early historic period archeology. The plan will assist the park in identifying the archeological sites to be interpreted. The plan will recommend appropriate interpretive themes and primary messages for interpretive trails and signage that will mitigate impacts to sensitive resources. The Preservation Plan will discuss specific archeological sites and clusters to be interpreted and make recommendations for site preparation requirements, and help guide the park in managing the natural and cultural resources within the designated interpretive site. The Preservation Plan will also recommend appropriate artifacts from the project area that may be used in tactile exhibits and hands on activities.

The SOS identifies four tasks to be carried out to prepare the Preservation Plan:

Task 1. Archival research and field visit. Archival research will involve review of existing archeological and historical documents relating to Kealakomo. The purpose of the subsequent field visit is to examine opportunities and constraints for interpretation and to visit prospective sites for interpretive development. Park staff and

kūpuna (Hawaiian elders who advise the park on cultural matters) will be consulted about ideas for interpretation, especially the scale of the proposed interpretive area.

Task 2. Development of a Concept Plan. The Concept Plan will incorporate ideas and concerns identified during the Task 1 field visit and will:

- outline suggestions for primary cultural interpretive themes, presentation methods, and possible interpretive projects (e.g., interpretive trail, signage at roads or lookouts, trail guide, off-site interpretation); and

- identify specific areas to be interpreted that will mitigate impacts to sensitive resources.

Task 3. Second field visit. A second visit will be carried out following park review of the Concept Plan. The field visit will include an on-site review of the plan and continuing consultation with park staff and other interested parties such as the park *kūpuna* group.

Task 4. Preparation of a detailed Preservation Plan. A detailed Preservation Plan will be prepared based on the field visits and consultations. It will expand on the projects and themes proposed in the Concept Plan.

COMPLETION OF PROJECT TASKS

Work on the Kealakomo Preservation Plan project began in late 2008. The four tasks stipulated in the SOW were accomplished in the following manner.

ARCHIVAL RESEARCH

Archival research (Task 1) was carried out throughout the duration of the project, although the primary effort was conducted in the period prior to the first field visit. Reports on archeological investigations in the Kealakomo region (e.g., Emory et al. 1959; Smart et al. 1965; Moniz Nakamura and Durst 2010) were reviewed, as was the Archeological Overview and Assessment (AOA) for HAVO (Tuggle and Tomonari-Tuggle 2008). Additional background research was also carried out at the HAVO Archives and Cultural Resources Management office during both field visits, with a focus on researching historical accounts, photographs, and maps of the project area.

FIELD VISITS

Two field visits to HAVO were made as part of Tasks 1 and 3. The purpose of both visits was to consult with park staff and the park *kūpuna* group, and to carry out a field examination of the project area to evaluate potential interpretive localities. Additional informal visits were also made to continue dialogue with park staff.

First Field Visit

The first of two field visits (Task 1) was made by IARII archeologists M.J. Tomonari-Tuggle and Dave Tuggle from February 2 to 9, 2009; it is summarized in a letter report dated February 20, 2009 (H.D. Tuggle, IARII, to J. Moniz Nakamura, HAVO). The visit provided an overview of the archeological sites of

the two *kīpuka*, the landscape, and the conditions for interpretation and preservation. Meetings were held with park staff and the park *kūpuna* group to solicit ideas for preservation and interpretation, as well as to identify problems, issues, and opportunities that would need to be addressed in the Preservation Plan; prior to the visit, a general project information sheet was prepared for circulation to participants in the consultation process. Archival research was carried out in the HAVO Archives, and in the HAVO Cultural Resources Management library.

Second Field Visit

The second field visit (Task 3) was made by IARII archeologists M.J. Tomonari-Tuggle and Dave Tuggle from January 25 to 29, 2010; it is summarized in a letter report dated February 25, 2010 (M.J. Tuggle, IARII, to J. Moniz Nakamura, HAVO). The purpose of the visit was to more closely examine the archeological sites proposed for interpretive development in the western *kīpuka*; and to continue discussions with HAVO staff and interested parties regarding the Concept Plan that had been prepared in October 2009 (Tomonari-Tuggle 2009; see below).

The site visit followed a June 2009 controlled vegetation burn in the western portion of Kealakomowaena. It was hoped that the burn would allow a more detailed view of the archeological complexes; although the vegetation had grown back more quickly than anticipated, ground visibility was considerably better than during the first site visit. The burn removed much of the dense growth in the area and provided exceptional exposure of archeological structures.

Consultation during the second field visit consisted of a combination of field trips to Kealakomowaena, formal meetings, and informal discussions. Field trips included an on-site review of the proposed trail route and selected sites with Cultural Resources and Interpretive staff, an abbreviated on-site review with the project interdisciplinary team (IDT) and *kūpuna*, and a review of selected sites with a Cultural Resources staff member who had participated in the inventory survey. A formal meeting with the IDT and *kūpuna* was also held.

Additional Field Visits

In addition to the field visits prescribed by the SOS, informal visits were made in 2008 prior to the beginning of the project and in the summer of 2010 in advance of submittal of the draft preservation plan.

CONCEPT PLAN

The Concept Plan (Task 2), which was based on the 2009 field visit along with the background research, was submitted in October 2009 (Tomonari-Tuggle 2009). The purpose of the Concept Plan was to provide general ideas and concepts on preservation and interpretation of archeological sites in Kealakomowaena, as a framework for continuing discussions with park staff and other interested parties, particularly the park *kūpuna* group.

Ideas presented in the Concept Plan were assessed and evaluated based on subsequent discussions with the IDT and *kūpuna* during the second field visit.

DETAILED PRESERVATION PLAN

The Task 4 detailed Preservation Plan is the present document. As stipulated in the SOW, the purpose of the Preservation Plan is to provide guidance for development of a new interpretive area at Kealakomowaena; the primary goal of the interpretation is preservation of the archeological resources. The plan recommends primary messages and themes for interpretive trails and signage, sites to be interpreted, and site preparation requirements that will mitigate impacts to sensitive resources. It also is intended to guide the park in managing the natural and cultural resources within Kealakomowaena.

The ideas presented in the Preservation Plan have been extracted from the Concept Plan, with modifications and additions based on discussions with park staff and the *kūpuna* group. One result of consultation was the removal of eastern Kealakomowaena from consideration for interpretive development because of the highly sensitive nature of Road Cut Cave; this decision is consistent with a HAVO policy to close all caves to the public, except for Thurston Lava Tube (interpretive trail), Pua Po‘o (with NPS guide), and Bird Park (by special use permit) (J. Moniz Nakamura, pers. comm., 2011).

The Preservation Plan makes recommendations for interpretation and protection of Kealakomowaena resources. Throughout the consultation process of the present project, a continuing concern was the need for adequate site protection; that is, if interpretation and protection are not done correctly and adequately, then it would perhaps be better to not open the area to the public at all. The Preservation Plan lays a framework for protection and interpretation, but the final step toward implementation will demand the greatest creativity of design and commitment.

CULTURAL RESOURCES AND INTERPRETIVE PLANNING

The following is a brief introduction to modern interpretive planning, with a general discussion of public interpretation of cultural sites at HAVO.

THE CHANGING WORLD OF PUBLIC INTERPRETATION

The public interpretation of historic, cultural, and natural places, as well as museum presentations, has been changing rapidly in the last few years. Parks and museums draw an ever increasing number of visitors, and the concepts and methods employed to make visits meaningful have become a major focus of investigation, analysis, and innovation. There are now several journals that include studies of public interpretation of cultural and historical places as a major component of their subject matter; these include *Heritage Management*, *International Journal of Heritage Studies*, and *The Public Historian*, as well as the National Park Service (NPS) journal *CRM: The Journal of Heritage Stewardship*. The numerous museum journals also have an increasing focus on public interpretation, and there are now a number of books that address the evolution of the museum, including *The Museum in Transition* (Hein 2000).

The new directions in interpretation include an increased emphasis on the visitor’s experience, inclusion of native and/or minority voices in the interpretation, concern for authenticity of experience and presentation (and conversely, limiting the intrusiveness of the interpretive mechanisms), and attention to sustainable conservation. Professional principles to guide these new directions are codified in an international-based *Charter for the Interpretation and Presentation of Cultural Heritage Sites* (ICOMOS 2008), which lays out seven objectives:

1. Facilitate understanding and appreciation of cultural heritage sites and foster public awareness and engagement in the need for their protection and conservation.

2. Communicate the meaning of cultural heritage sites to a range of audiences through careful, documented recognition of significance, through accepted scientific and scholarly methods as well as from living cultural traditions.

3. Safeguard the tangible and intangible values of cultural heritage sites in their natural and cultural settings and social contexts.

4. Respect the authenticity of cultural heritage sites, by communicating the significance of their historic fabric and cultural values and protecting them from the adverse impact of intrusive interpretive infrastructure, visitor pressure, inaccurate or inappropriate interpretation.

5. Contribute to the sustainable conservation of cultural heritage sites, through promoting public understanding of, and participation in, ongoing conservation efforts, ensuring long-term maintenance of the interpretive infrastructure and regular review of its interpretive contents.

6. Encourage inclusiveness in the interpretation of cultural heritage sites, by facilitating the involvement of stakeholders and associated communities in the development and implementation of interpretive programmes.

7. Develop technical and professional guidelines for heritage interpretation and presentation, including technologies, research, and training. Such guidelines must be appropriate and sustainable in their social contexts.

On paper, much of this may sound like buzzwords, but those who have seen the new face of public interpretation—in places such as the recently redesigned Smithsonian National Museum of American History and archeological site interpretation at Mesa Verde National Park—will understand its effective reality. Photo 2 shows examples of exhibits at archeology museums and sites in Utah and Arizona that invite visitors to participate in the interpretation.

INTERPRETATION OF CULTURAL AND HISTORICAL SITES AT HAVO

Park interpretation has always had a focus on the natural landscape. The place now called Hawai‘i Volcanoes National Park was created in 1916 under the name Hawaii National Park (which until 1960 included Haleakalā on Maui), with its original mission being the recognition and preservation of the natural and geological resources of the active volcanoes of Kīlauea and Haleakalā. The crest of Mauna Loa was added in 1921, and over the years, the numerous additions have been acquired largely because of their natural significance.

In 1938, Congress took action that added cultural preservation to the park mission. It authorized the addition of Kalapana Extension (as well as the Footprints area) to ensure that “protection for all time will be extended to this historic and legendary land” (Nature Notes 1953). In the 1950s and early 1960s, the park formally acquired the Kalapana Extension. Chain of Craters Road was built to connect the summit region with this coastal region, and provided access to the one cultural site that was intensively developed for public interpretation, namely Waha‘ula Heiau, which was covered by lava in 1999.



Excavated site that has been left exposed for interpretation, one of a series of interpreted sites along Mesa Top Drive, Mesa Verde National Park (CO). The walls in the background are retracted during the summer months so the site is experienced in its ponderosa forest context.

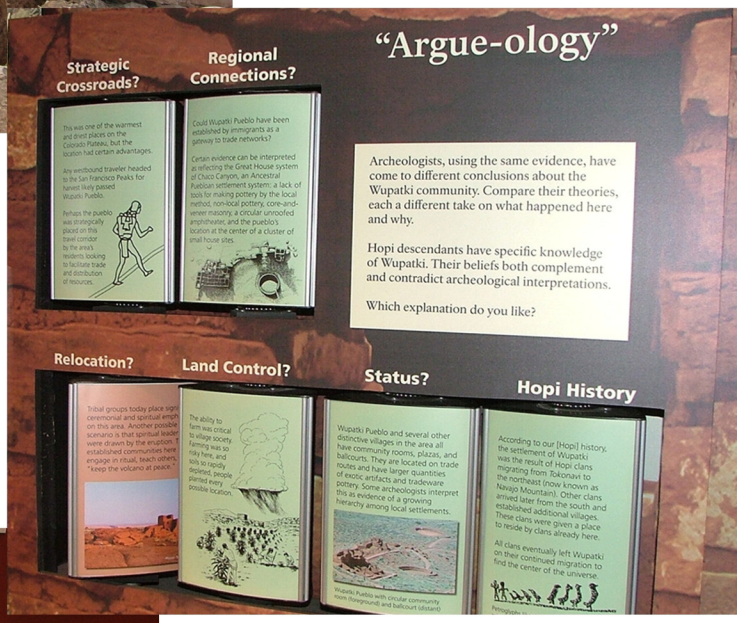


Exhibit at Wupatki National Park (AZ) that challenges the visitor to think about alternative explanations for events at the site, from Hopi and archeological perspectives.



Exhibit at the Anasazi Heritage Center (Dolores, CO) that invites the visitor to explore and touch the artifacts found at the Dolores sites.

Photo 2. Interpretive examples from Southwestern archeology museums and sites.

At present, the opportunities for visitors to become aware of cultural sites and cultural history at the park are limited. The Visitor Center has some publications on HAVO cultural resources, but formal interpretation of cultural history is generally a footnote to the natural history and environmental interpretation. The only cultural site in the park with relatively easy access and on-site interpretation is the Pu‘uloa Petroglyphs.

Recognizing that HAVO is not designated a historical park, the limited attention to culture and history has nonetheless been noted as a significant deficiency (see Tuggle and Tomonari-Tuggle 2008:188). In a 2008 resource assessment of HAVO prepared by the National Parks Conservation Association (NPCA 2008) as part of its State of the Parks program, one of the primary conclusions was expressed as "Cultural Resources—Native Hawaiian Voices Need More Interpretation." In this assessment, one of the questions asked of visitors was "If you were a manager planning for the future of Hawai'i Volcanoes NP, what would you propose?" The second highest response in the area of Interpretive Services (following "More information on preparedness") was "More information on Hawaiian culture/history/language."

During the on-going General Management Plan (GMP) process, comments from the public regarding cultural resources included the following assessment (HAVO 2010:4):

> Many respondents emphasized the need to increase the park's educational offerings related to cultural information, suggesting numerous topics and sites for interpretation. Many … emphasized the need to increase education and interpretive opportunities related to Native Hawaiian cultural significance and cultural history. Mention was repeatedly made of the void in Native Hawaiian cultural information presented to the public created by the loss of the park's Waha'ula Visitor Center. … One respondent requested that a broader Hawaiian cultural history be interpreted to include pre-Pelehonuamea history. Several urged the park to use the traditional Hawaiian language, Hawaiian place names, and chants on maps and educational materials.

GMP comments also specifically identified the need for more wayside exhibits and cultural interpretive trails in the park (HAVO 2010:7)

At HAVO (as well as other national parks that were created with an emphasis on the natural landscape), a shift to include more attention to cultural heritage raises not only the issues related to developing new interpretive themes (as noted above), but the problems of integrating a new subject into the park's existing interpretive framework. Further, efforts at cultural interpretation at HAVO have been challenged by overpowering volcanic processes. In recent years, high levels of sulphur dioxide in the air have closed access to the Footprints area downwind of the summit, and as noted in the SOS:

> The park's premier and primary interpretive sites, Wahaula, Kamoamoa, and the coastal area between Popoukauka to Laeapuki were covered by Kilauea lava flows in the late 1980's. Since then, the park has had few opportunities to provide the public with an interpretive experience regarding the parks' vast archeological resources.

HAVO has begun to take steps to give more attention to the public interpretation of the cultural component of the landscape. One of these steps is the park website that has a valuable cultural and historical summary. Another step is the long-term planning identified in the draft *Hawai'i Volcanoes National Park Comprehensive Interpretive Plan* (HAVO 1999), which presents cultural interpretation as an important goal. New interpretive signs that emphasize cultural history are in preparation for installation along Crater Rim Drive and at the overlooks at Kealakomo and Hālona Kahakai; new trail guides and brochures have also recently been published (A. Kaawaloa, pers. comm., 2011).

KEALAKOMOWAENA AS INTERPRETIVE OPPORTUNITY

As expressed in the present project, HAVO recognizes the interpretive opportunity afforded by the Kealakomowaena area, where many of the themes emphasized in the 1999 Interpretive Plan can be developed. The park has made a substantial commitment to interpretation at Kealakomowaena by means of

the archeological investigations carried out as preparation for interpretive planning (Moniz Nakamura and Durst 2010).

Further, interpretation is a means to protect sites in this area by raising visitors' awareness of the value and sensitivity of the park's archeological resources. Beyond site protection specifically at Kealakomowaena, interpretive projects can educate visitors on the broader values of heritage management and preservation.

Based on the archival research, consultations with park staff and *kūpuna*, and the field visits, it is clear that the Kealakomowaena area has attributes that make it an exceptional locale for interpretation. These attributes are both conceptual as well as practical.

CONCEPTUAL ATTRIBUTES

- Vistas (e.g., from the Hālona Kahakai pull-out and from the lower edge of the western *kīpuka*) allow the concept of *ahupua'a* to be well demonstrated, and there are numerous place names that can be identified and explained.
- Kealakomo is a setting of sensations: visual (grand vistas of lava flows spilling over high cliffs, endless sky above and over the ocean, volcanic plumes), tactile (rock underfoot, and wind, heat, and rain on the skin), and smell (pungent volcanic fumes and sweet rain).
- A wide variety of archeological remains demonstrates the remarkable life of late pre-Contact and early post-Contact life of native Hawaiians; how they lived with the land, not only surviving but thriving.
- The Kealakomo landscape illustrates a wide range of cultural and historical themes: for example, the story of Pele, which can be told from the perspective of the landscape where people lived in the shadow of the volcano; traditions of resource collection and how these traditions continue to the present; and tales of specific historical events such as the tradition related to the coming of Pā'ao from Kahiki and the 1821 journey of the missionary William Ellis (told either by reference to local features or by reference to features that can be seen within the view planes of the *kīpuka*).
- The Kealakomo landscape and locale provide numerous possibilities for the redevelopment of native Hawaiian living culture activities.

PRACTICAL ATTRIBUTES

- There are existing automobile pull-outs on either side of the Chain of Craters Road (signed as the Hōlei Pali pull-out). These pull-outs provide substantial parking for visitors to the Kealakomowaena interpretive area (Photo 3), and in fact, offer more parking space than is currently available at the Pu'uloa Petroglyph trailhead.
- Most of the terrain in the areas of the archeological sites is relatively level (Photo 4), making trail development and use comparatively easy.
- The Kealakomo coast and Kealakomowaena *kīpuka* are easily seen from the Hālona Kahakai overlook on Chain of Craters Road above Hōlei Pali (Photo 5), thus providing a good place for an overview interpretation of the *ahupua'a*.



Photo 3. Hōlei Pali pull-out, view to northwest from east side of Chain of Craters Road.

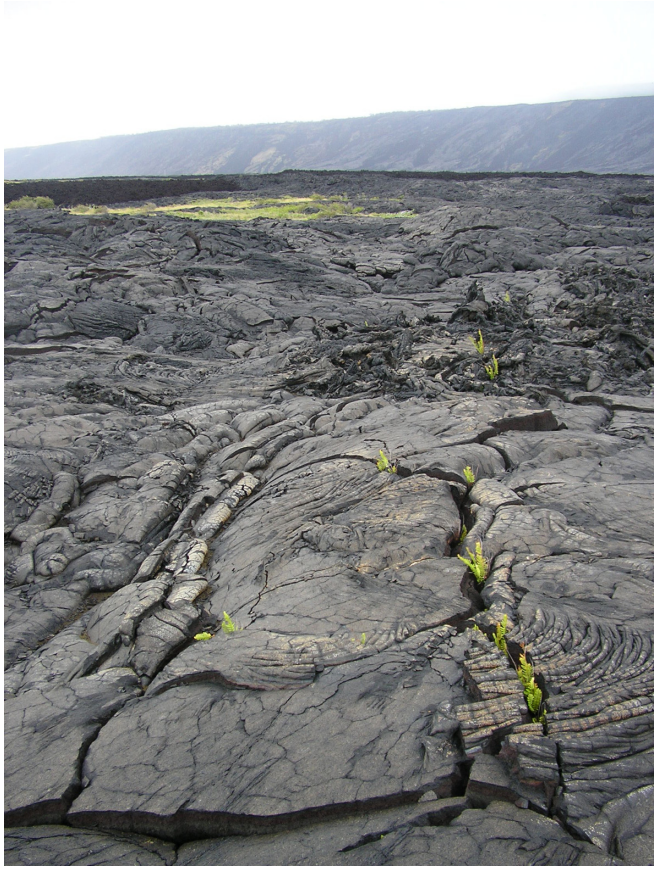


Photo 4. *Pāhoehoe* flow on west side of Hōlei Pali pull-out, view to west toward western Kealakomowaena *kīpuka*.



Photo 5. View of the western *kīpuka* of Kealakomowaena from the Hālona Kahakai pull-out.

- The proposed Kealakomowaena interpretive area is close to the Pu‘uloa Petroglyph Trail (ca. 1.5 miles seaward on Chain of Craters Road). This allows visitors with interests in cultural places to easily combine site visits. In addition, there is an opportunity to develop complementary interpretive programs and, perhaps ultimately, complementary trail systems, including an expansion of interpretive trails into longer distance hiking trails (e.g., connecting the Kealakomowaena interpretive trail to the Puna- Ka‘ū Trail along the coast, the Pu‘uloa Petroglyph Trail to the east, and Keauhou Trail to the west; Fig. 2).
- Development of an interpretive complex at a lower elevation of Chain of Craters Road provides an alternate visitor opportunity when the weather is inclement at the summit of Kīlauea; also, during periods of southerly winds when the summit experiences high sulphur dioxide levels, air quality in the Kealakomowaena area is generally acceptable. It also provides a visitor opportunity in the near-coastal area when there is no active lava flow in the area.



Figure 2. Interpretive and hiking trails near the Kealakomowaena project area.

ORGANIZATION OF THE PRESERVATION PLAN

The Preservation Plan is organized into six chapters. Chapter I is an introduction to the plan. Chapter II presents background on the project area environment, history, and archeology. Chapter III discusses the general framework for preservation and interpretation at Kealakomowaena. Chapter IV deals specifically with the proposed interpretive trail through the western *kīpuka* of Kealakomowaena. Chapter V addresses interpretive components of the Preservation Plan for park locations away from Kealakomo (i.e., off-site). Chapter VI presents management considerations and recommendations, including a schedule for phased

development of the interpretive program. Appendix A consists of comments and notes for the Preservation Plan prepared by the HAVO Interpretive Planning and Media Development (IPMD 2010) in response to the Concept Plan, discussions during the two field visits, and a preliminary version of the present draft Preservation Plan. Appendix B is a sample standard operating procedure in the event that disturbance or damage to sites is observed.

II. PROJECT AREA BACKGROUND

This section of the Preservation Plan provides background information on Kealakomo in general and on the archeological sites in the Kealakomowaena project area specifically, as a foundation for the recommendations presented in subsequent chapters on the interpretive/preservation plan. The discussion places the sites in the context of the overall history and archeology of HAVO. Credit for the background data goes to the report on the HAVO survey of Kealakomowaena (Moniz Nakamura and Durst 2010).

PROJECT AREA SETTING

The interpretive project area lies in the traditional Hawaiian land area or *ahupua'a* of Kealakomo in the district of Puna, on the southeast coast of the island of Hawai'i (see inset in Fig. 1). Situated on the southern slopes of Kīlauea volcano, the Kealakomo area has been subject to flows from the volcano, particularly by lavas from Mauna Ulu, a large shield that was formed during the 1969-1974 eruption phase of the volcano. Over 70 percent of the *ahupua'a* of Kealakomo has been covered by Mauna Ulu flows (primarily in 1971 and 1972) (Moniz Nakamura and Durst 2010:7).

The specific project area is known as Kealakomowaena, a mid-level location some 120 to 800 feet asl on the geological terrace below Hōlei Pali (see Fig. 1). Rainfall in this mid-elevation region ranges from 40 to 60 inches per year, with most falling between October and March when south (*kona*) winds are dominant. The project area focuses on two *kīpuka*, or pockets of pre-flow landscape that are oases of vegetation surrounded by hardened masses of *'a'ā* and *pāhoehoe* lavas from Mauna Ulu.

The eastern *kīpuka* is an elongated island of vegetation extending from Hōlei Pali to almost the coast; approximately 46 acres of the *kīpuka* has been archeologically surveyed. The geological base of the *kīpuka* dates to about 400 to 750 years ago, or around AD 1200 to 1500 (Wolfe and Morris 1996). The *kīpuka* is surrounded by *pāhoehoe* flows from the 1972-1974 phases of the Mauna Ulu eruption.

The western *kīpuka* encompasses about 140 acres and measures roughly 3,300 by 1,800 feet. It rises from 120 to 500 feet asl. The upper end of the *kīpuka* is divided into eastern and western lobes by a narrow finger of Mauna Ulu lavas: the underlying lava is *pāhoehoe* that extends seaward almost two-thirds of the *kīpuka*; over this *pāhoehoe* are two smaller flows of *'a'ā* that extend only about one-fourth the length of the *kīpuka*. Small fingers of *pāhoehoe* project into the *kīpuka* from the east and west. The seaward end of the *kīpuka* is marked by a low, unnamed *pali*, below which is a small peninsula of vegetation on the barren coastal expanse of 1971-1972 Mauna Ulu lavas that extend to the ocean, over a mile away.

The general slope of the *kīpuka* is slight and to the seaward, with a relatively steep slope at the lower end of the *kīpuka* that ends at the unnamed *pali*. The *kīpuka* surface is gently undulating with ridges and hillocks. Several tumuli[2] are distinctive projections that can be seen from all over the *kīpuka*.

The geological base of the *kīpuka* dates to 1,500 to 3,000 years ago, or around AD 450 at the latest (Wolfe and Morris 1996). It is possible that people were living in this area at the time that lavas flowed

2 A dome or small mound on the crest of a lava flow; caused by pressure due to the difference in the rate of flow between the cooler crust and the more fluid, underlying lava.

across the area to the east (sometime between A.D. 1200 and 1500). Both *kīpuka* are completely surrounded by lavas from 1971 and 1972 Mauna Ulu flows.

The *kīpuka* may once have been higher ground on the landscape. The new lava flowed around elevated areas of the terrain and created a rim around this original high ground, leaving an impression of the *kīpuka* being low-lying ground (Moniz Nakamura and Durst 2010:17). Vegetation in the general area, prior to human modification, may have consisted of an *ʻōhiʻa* (*Metrosideros polymorpha*) or a mixed *ʻōhiʻa* and *lama* (*Diospyros sandwicensis*) forest with an understory of smaller trees and shrubs such as *ʻalaheʻe* (*Psydrax odorata*), *naio* (*Myoporum sandwicensis*), sandalwood (*Santalum paniculatum*), *ʻākia* (*Wikstroemia sandwicensis*), and *ʻaʻaliʻi* (*Dodonaea viscosa*) (Linda Pratt, quoted in Moniz Nakamura and Durst 2010:23). *Kukui* (*Aleurites moluccana*), *kolea* (*Myrsine lessertiana*), and *ʻūlei* (*Osteomeles anthyllidifolia*), have been found in excavations at Road Cut Cave (Moniz Nakamura and Durst 2010: 145-148). Present vegetation is largely introduced/invasive shrubs and grasses, although examples of *ʻōhiʻa* and the Polynesian introduction *noni* (*Morinda citrifolia*) have been observed.

At the beginning of the project, the eastern *kīpuka* was considered for interpretation, but was eliminated from consideration because of the highly sensitive and vulnerable resources in the area, primarily Road Cut Cave.

The project area lies within the National Register of Historic Places Puna-Kaʻū Historic District (Site 5503), which was nominated to the National Register on July 1, 1974. It is about 1.5 miles northwest of the trailheads for the Puna-Kaʻū Trail and the Puʻuloa Petroglyph Trail; both trailheads are located along Chain of Craters Road seaward of the Kealakomowaena *kīpuka*.

KEALAKOMO "THE ENTRANCE PATH"

The *ahupuaʻa* of Kealakomo is one of the westernmost land units in the traditional Hawaiian district of Puna. To the west are two small *ahupuaʻa*, ʻĀpua and Kahue, that lie at the border with neighboring Kaʻū.[3]

Pukui et al. (1974:102) translate the name Kealakomo as "The Entrance Path," which Moniz Nakamura and Durst (2010:13) suggest refers to Kealakomo as an entrance to greater Kaʻū, since it was the Puna land unit that fell at the boundary with Kaʻū. Also, Kealakomo could refer to a connection or entrance to the realm of Pele at Kīlauea crater; a major *mauka-makai* (inland-seaward) trail once connected the crater with coastal Kealakomo (referenced in Ellis' account of his 1823 travels around the island of Hawaiʻi).

HISTORICAL ACCOUNTS

Moniz Nakamura and Durst (2010:63-69) summarize historical writings related to western Puna District. Of these, several describe Kealakomo specifically and provide information that is useful for interpretive purposes.

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[3] On current maps, two Puna *ahupuaʻa* Kahue and ʻĀpua, which lie to the west of Kealakomo, are the border land units with neighboring Kaʻū District. Moniz Nakamura and Durst (2010:13, citing Allen 1979) note that Kahue was once an *ʻili kupono* or division of Kealakomo and ʻĀpua was part of Kaʻū. If so, then Kealakomo would have been on the border with Kaʻū.

19TH CENTURY VISITORS

The first mention of Kealakomo in historical writings is the account of Reverend William Ellis (2004:253, 260-263), who traveled a circuit around the island of Hawai'i in 1823. His party descended from the Kīlauea summit to the coast at Kealakomo, where they stayed two nights and preached to crowds of 200 and 300 people. Ellis (2004:260) describes Kealakomo as a "populous, though desolate-looking village." Of note for the present project, he records that the "head man of the village" offered provisions for the party but that they "were at his farm, which was some distance inland, and that tomorrow he intended to bring us a pig, and some potatoes." When told that the party was leaving early in the morning, the head man returned with a "raw salted albacore, and a basket of baked sweet potatoes, which … was all he could furnish us with to-day."

Ellis (2004:264, brackets added) also notes that residents of the Kealakomo coast:

> cure large quantities [of fish] as an article of commerce, which they exchange for the vegetable productions of Hiro [Hilo] and Hamakua, or the mamake and other tapas of era [sic] and the more fertile districts of Hawaii.

In 1846, Chester A. Lyman (1924:103, brackets added) accompanied Hilo missionary Titus Coan on a trip through Puna. He describes Kealakomo:

> Kealakomo is usually his [Coan's] last stopping place as on the present tour. There are but few people in this region, scattered thro' the few poor villages that lie beyond [west of Kealakomo]. They are miserably poor & for some time past have been almost in a state of famine. They get their living by fishing, making salt & getting fern roots, & a few potatoes in the mountains.
>
> Their salt works are on the naked lava near the sea the water of which is evaporated in little cups or vessels made of the Ki leaf & holding of course but a minute quantity of water. These are laid in parallel rows over several acres & the water poured into them a little at a time from Calabashes. The process is an extremely slow one, tho' the salt is said to be excellent for the table. It is sold at the exceedingly low price of 25 cts a bag which will contain I sh'd judge 1/2 a bushel or more.

At the end of the 19th century, missionary Charles Wetmore (1894, quoted in Moniz Nakamura and Durst 2010:70) visited Kealakomo and describes this same method of salt manufacturing. He notes that the salt was wrapped in ti leaf bags, generally about 50 pounds in weight, that were often taken to Hilo for sale for 50 cents. He writes:

> Their salt was of course tempered with small quantities of magnesia … lime and minute particles of other mineral substances. Many persons considered their product more delicious than any brought to the island from foreign sources.

20TH CENTURY RANGER REPORTS

In the 1940s and 1950s, park rangers documented patrols through the HAVO back country. In 1941, Gunder E. Olson (1941) wrote about a trail through Kealakomowaena (represented now by only Site 27265, a zigzag trail):

> An ancient trail … now partially overgrown, is so straight and well made that one is led to believe that it was laid out with a surveyor's instrument. It is 4 feet wide and easily followed

from the top of the first *pali* to the top of Poli o Keawe Pali, a distance of about 3 miles. It is said that the natives used this trail in commuting between the inland where crops were grown and the seashore where fish, shellfish and seaweeds were obtained.

Rangers Hamilton and Bright (1963) made their way from the coast at Pānau Nui to Kealakomowaena and on to Nāʻulu village at the base of Hōlei Pali. Their map (on a USGS topographic base) shows the Site 27200 rock wall, an "old curbstone trail" (now covered by Mauna Ulu lavas and/or Chain of Craters Road), a "cistern site" and "drip cave" in the eastern *kīpuka*, and Nāʻulu village (Fig. 3). Photo 6 shows the "cistern site," which is probably the cistern located in the upper eastern *kīpuka*; the structure is almost identical in construction to the cistern in Site 27205.

On the same trip, Hamilton (1963) specifically describes Kealakomowaena, where he notes: "Here grows the only known keawe tree in the park outside Keauhou Landing." On the Hamilton and Bright map (see Fig. 3), the location of Kealakomowaena (roughly marked in pencil) corresponds to the west side of the western *kīpuka* in the general location of Site 27205.



Photo 6. Undated photograph of backcountry ranger next to a cistern; photograph caption reads "Holei pali, below Naulu forest, one of several water cisterns" (HAVO neg. 2192).

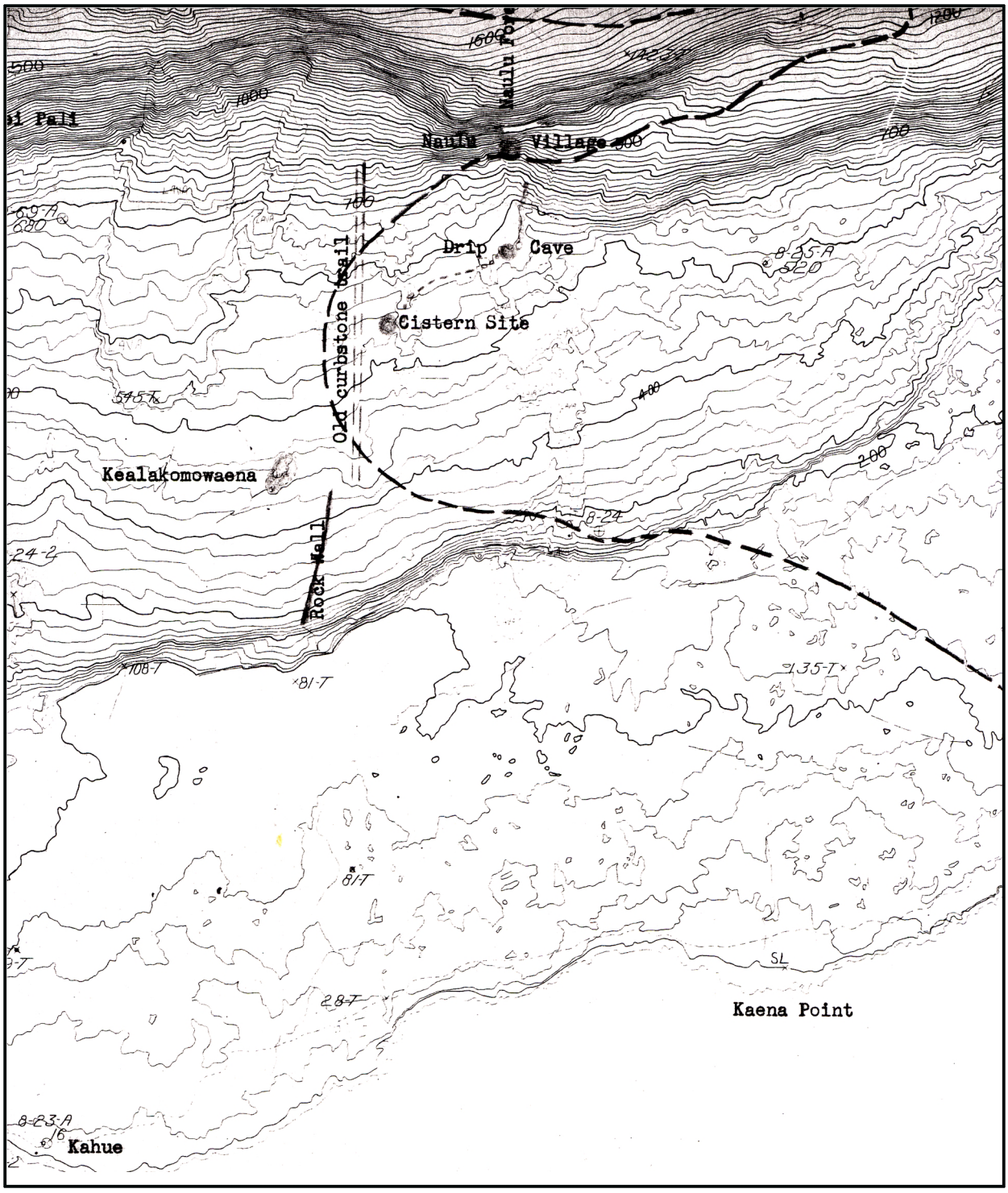


Figure 3. Map from Hamilton and Bright's 1963 visit to Nā'ulu village.

ARCHEOLOGICAL RESEARCH AND SITE IDENTIFICATION

The first formal archeological inventory of the *ahupua'a* of Kealakomo was carried out in 1959 by the B.P. Bishop Museum as part of an evaluation survey for the Chain of Craters Road extension into Kalapana (Emory et al. 1959). In 1964, Bishop Museum archeologists followed up with an approximately three day reconnaissance survey of the largest structures and trails within the *ahupua'a* (Smart et al. 1965). Most of the field time in Kealakomo was spent at coastal sites, with very little time expended in the interior regions of Kealakomowaena and Kealakomouka.

The sites located and identified at the coastal village of Kealakomo (Photos 7 and 8) were subsequently covered in 1971 by Mauna Ulu lava flows. Most of the remaining known archeological sites in Kealakomo *ahupua'a* are located within *kīpuka* in Kealakomowaena.

A narrow *mauka-makai* transect along the eastern boundary of the *ahupua'a* was surveyed by L.C. Schuster in 1989 and 1990 (Carter and Somers 1990; L. C. Schuster pers. comm.). Between 1999 and 2003, two inventory level surveys were conducted within Kealakomowaena to more fully document the archeological sites. Documenting these surveys, Moniz Nakamura and Durst (2010) present the history, culture, and archeological research at Kealakomo, detail the two inventory surveys and testing, and describe the nearly continuous distribution of archeological structures, trails, and historic artifacts in both areas.

Phase I survey, which covered the *kīpuka* on the west side of Chain of Craters Road, was coordinated with a controlled burn for a Vegetation Management project to develop experimental plots for native plants (Moniz Nakamura and Durst 2010:5). The emphasis of the survey was on the upper lobes of the *kīpuka* "in an attempt to identify an area that would be suitable for a new interpretive trail (Moniz Nakamura and Durst 2010:5).



Photo 7. Coastal Kealakomo house site in 1959 (courtesy of HAVO Archives).



Photo 8. Coastal Kealakomo house site and petroglyphs in 1970 (courtesy of HAVO Archives).

Phase II survey took place in 2002 and covered the east side of the road. It focused on formally recording features associated with Road Cut Cave.

Testing at Road Cut Cave in the eastern *kīpuka* and Sites 27205 and 27258 in the western *kīpuka* occurred between December 2005 and November 2007. The primary purpose of the testing was to collect charcoal suitable for radiocarbon dating; secondary purposes were to "better understand the function of these features, and to describe the paleoenvironment of the project area" (Moniz Nakamura and Durst 2010:141). Radiocarbon results indicate that use of Road Cut Cave occurred sometime between the 15th and 17th centuries (AD 1437-1634) and use of the Site 27258 shelter occurred in the mid-17th to 19th century (AD 1655-1886); Site 27205 was occupied during the historic period (Moniz Nakamura and Durst 2010:9).

Thus, it could be proposed that Kealakomowaena was settled by at least the early 15th century (based on the Road Cut Cave radiocarbon date), a time that corresponds with the end of the ʻĀilaʻau lava flow[4], the subsequent collapse of the Kīlauea caldera, and accompanying explosive eruptions at the summit. Occupation of this mid-elevation region continued into the historic period.

[4] ʻĀilaʻau was a major eruptive event that has been geologically dated to AD 1470; the collapse of the caldera occurred not more than 100 to 150 years after that.

III. FRAMEWORK FOR THE KEALAKOMOWAENA PRESERVATION PLAN

This section presents the foundation for and recommendations to achieve archeological site preservation combined with an exceptional interpretive product for Kealakomo. The proposed ideas are based on archival research, field visits, and consultations with park staff and the park *kūpuna* group. They build on preliminary ideas presented in the 2009 Concept Plan (Tomonari-Tuggle 2009), and subsequent review and comment from park staff and *kūpuna*. Interpretive Planning and Media Development provided a substantial formal review and interpretive comments in response to the Concept Plan (IPMD 2010) and a preliminary version of the present draft Preservation Plan; many of the comments have been incorporated into the present document and the entire review is included as Appendix A.

KEALAKOMOWAENA AS INTERPRETIVE STAGE

As noted by Moniz Nakamura and Durst (2010:1):

> The National Park Service is always seeking ways to better the experience of the visitor and to expose them to the wonders of the natural and cultural landscape. Few areas within the park are actively interpreted for their archeological resources. One of the goals of the Kealakomowaena project was to explore the possibility of opening the site as a new interpretive area for the public.

The most recent archeological work highlights the potential of Kealakomowaena as an interpretive stage. This interior zone of Kealakomo *ahupua'a* was an important area for agricultural production in the coastal region. It has a high concentration of planting mounds (in contrast to the garden pits and tumuli on the coastal plain), with scattered farm shelters that indicate a small local resident population. Caves in the region likely provided a much sought after water source. Several trails, which were probably used throughout the pre-Contact and post-Contact periods, connected interior and coastal residential areas. Major trail systems connected the interior households and agricultural lots with neighbors in adjacent *ahupua'a*; examples of such trails include the Puna-Ka'ū Trail along the coast to the south and the Volcano-Kalapana Trail to the north. Human occupation in Road Cut Cave has been radiocarbon dated to possibly the early 15th century, one of the earliest cultural dates at HAVO.

These archeological sites are bounded by massive lava flows that destroyed much but also now serve to clearly frame the human landscape within a powerful natural context.

In addition, the archeological landscape is a backdrop to Hawaiian traditions, late pre-Contact and 19th century histories, and modern day accounts of life in this region. Kealakomowaena interpretation offers an opportunity to tell the human story of change: from people collecting water in caves in the early 15th century, to farmers cultivating sweet potato in the late pre-Contact period, to 20th century fishermen from Kalapana searching the best fishing grounds along the Puna-Ka'ū coast.

INTERPRETIVE PHILOSOPHY

The interpretive philosophy of the Kealakomo Preservation Plan includes the following:

- Interpretation that emphasizes the linkages between setting and associated sensations is an effective way to enhance the visitor experience.
- Interpretation is not necessarily a single point-of-view. Multiple interpretations are possible and sometimes, differing interpretations are complementary (see for example, Swanson 2008 on Hawaiian traditions of Pele and the history of geological flows). Even conflicting views can be presented in a positive fashion (the museum of the Makah tribe at Neah Bay in western Washington State is an outstanding example of this, presenting side-by-side interpretations from native American and archeological perspectives; see www.makah.com/mcrchome.htm; see also the example from Wupatki National Park in Photo 2).
- Native Hawaiian discussion and consultation in the planning and interpretation process is essential to the successful achievement of all of the goals.

GENERAL OBJECTIVES

The Preservation Plan has been developed with the following general objectives for public interpretation of Kealakomowaena:

- Highlight the rich pre-Contact and early historic period archeology of HAVO, as specified in the SOS.
- Project a sense of place, a concept that underlies all public interpretation. This is consistent with the 1999 *Comprehensive Interpretive Plan* (HAVO 1999), which emphasizes "power of place."
- Provide interpretation that will develop and enhance the visitor experience.

INTERPRETIVE VISION

The general concept proposed for interpretation at Kealakomowaena envisions a multi-leveled presentation that incorporates both on-site (at Kealakomowaena) and off-site (elsewhere in the park) venues. Information relevant to the visitor experience is presented by levels of increasing detail and by multiple methods, with more general background information presented in off-site locations and more detailed information presented in on-site interpretation. The generalized off-site interpretation is intended to not only inform the visitor at a broad level, but also to draw or entice him or her to experience the on-site interpretive locality.

The natural and cultural history of Kealakomo and Kealakomowaena, combined with the awe-inspiring views from many vantage points in the area, provides an enormous range of potential interpretive stories (to name only a few): geological history; land formation and age; vegetation history; Hawaiian history and adaptation; Hawaiian traditions (myths and legends); events during the pre-Contact and early post-Contact Hawaiian era; and modern use of the area by long-time residents.

This abundance of interpretive riches has the inherent problem that it cannot all be presented or incorporated into any specific interpretive program, particularly on-site interpretation. The archeological report on Kealakomowaena (Moniz Nakamura and Durst 2010), itself a summary, has over 100 pages devoted to the natural history, human history, culture, and archeology of the area.

The solution to this plethora of interpretive possibilities is to provide interpretation in levels of information that focus on different interpretive themes, using a variety of interpretive media and methods.

OFF-SITE INTERPRETATION

The SOS directs interpretive development to "focus primarily on discussing specific areas to be interpreted that will mitigate impacts to sensitive resources." Interpretive possibilities at other locations in the park (i.e., off-site) are a means to convey the interpretive message with no or minimal direct impact to resources.

Interpretation of Kealakomowaena can begin at the Main Visitor Center, the Kealakomo and Hālona Kahakai overlooks, and the Hōlei Pali pull-out (see Fig. 2), with interpretation at each of these venues bringing the visitor closer to the actual site area through increasing levels of detail in the interpretive stories. A supplementary exhibit at the Jaggar Museum may also be a possibility. If a coastal visitor center is developed, this can be an additional venue for off-site interpretation.

Off-site interpretive possibilities are presented in Chapter V.

ON-SITE INTERPRETATION

On-site interpretation refers to direct visitor access to a site or site area. As indicated in the Background chapter, archeological investigations in Kealakomowaena were undertaken with the primary goal of providing "baseline data that will assist park management in developing a plan to interpret the area for public visitation" (Moniz Nakamura and Durst 2010:v).

The east and west *kīpuka* of Kealakomowaena were originally considered as on-site interpretive localities, with evaluation of potential using the SOS development directive to "focus primarily on … specific areas … that will mitigate impacts to sensitive resources." Based on input during the planning process, it is recommended that interpretation focus on the western Kealakomowaena area, which offers better opportunities for on-site development with less potential for site impacts. In contrast, the featured site in the eastern *kīpuka* of Kealakomowaena is Road Cut Cave, a highly interpretable but sensitive natural and cultural cave. There are logistical and preservation issues that limit its potential for interpretation.

In contrast to the background-oriented information in the off-site interpretation, on-site interpretation focuses on a very limited set of themes, with presentation via options such as [1] trail guides linked to numbered posts; [2] interpretive signs similar to the signs on the Puʻuloa Petroglyph Trail; [3] personal media such as information via iPods and GPS-based units; [4] ranger- or docent-led tours; [5] *kūpuna* presentations (if appropriate); and [6] development of hands-on interpretation of Hawaiian sites (e.g., restoring planting mounds to a usable condition and replanting with Hawaiian dryland crops). A trailhead exhibit at the Hōlei Pali pull-out (discussed in detail in the section, "Other Interpretive Projects in the Park") can provide a comprehensive introduction to the on-site interpretation.

Chapter IV details the proposed on-site interpretation of the western *kīpuka*.

COMMUNITY LIVING CULTURE ACTIVITIES

An important component of the Kealakomowaena interpretation and preservation is Native Hawaiian participation, particularly by members of the Kalapana community. The project area is a landscape and a locale that provides numerous possibilities for Native Hawaiian contribution, especially in the redevelopment of "living culture" activities similar to what had taken place at the Waha'ula Visitor Center and Kamoamoa before they were covered by lava in the 1990s. These types of activities are identified in the 2008 Resource

Assessment of HAVO by the National Parks Conservation Association; one of the primary conclusions of the assessment was expressed as "Cultural Resources—Native Hawaiian Voices Need More Interpretation."

Hawaiian involvement is an integral part of the living culture theme, which envisions the landscape and archeological sites as dynamic, that is, expressions not only of the past but of the present and future. Possibilities for this involvement include restoration of traditional agriculture, interpretation of living memory lifeways, and special programs of site, landscape, and sky (day and night) with interpretation given in both Hawaiian and English. Points to be considered include:

- Involvement of Native Hawaiians in planning development and implementation, with special attention to rights of the residents of Kalapana under existing park agreements and laws.
- Attention to knowledge and beliefs of Native Hawaiians, and the recognition that there are many individuals with knowledge of the area (who have used and continue to use the area).
- Recognition of the fact that Hawaiian culture is a living culture, and that "archeological sites" are more than just physical remains of the past, but are part of the living culture.
- Ensuring that all areas open to the public are treated with respect and properly maintained.

The nature of this living activity will need to be more fully considered as part of the continuing planning process and dialogue between HAVO staff and community members. Questions for discussion include:

- What is the primary purpose of living culture activity? Options include: to provide Native Hawaiians with an opportunity to practice traditional activities as a community endeavor; to provide visitors with an enhanced interpretive experience; to help local children learn about traditional Hawaiian culture. The answer to this question will guide the ways in which living culture activities are conceived, developed, and implemented.
- If portions of the agricultural complex (Site 27195) are rehabilitated and replanted, should the agricultural activity be traditional, in the sense of replicating traditional Hawaiian cultural practices for cultivation (tools, cultigens, planting ceremonies) or should modern, practical applications be allowed.
- What kind of relationship between HAVO, the community, and visitors should there be? Who will decide who can participate? What kinds of visitor interaction will there be?
- Should there be a primary community manager (similar to a *konohiki*) who would be the point of contact with the park, or should there be a consultation group like the present *kūpuna* group? If there is a *konohiki*-like manager, could that person take on duties similar to a park conservation officer, which would help in ensuring site protection?

During the present planning process, the possibility of resurrecting and rehabilitating agricultural sites for current use was raised on many occasions, and is one of the main living culture activities proposed. Reuse or redevelopment of the agricultural fields at Kealakomowaena is an opportunity for Hawaiians, especially from the Kalapana community, to reconnect with the land. If open to visitors in some manner (see below), this would be an immediate way for visitors to experience the coastal area as more than a presumed barren lava flow.

Several possible locations are suggested, with a key factor being proximity to Chain of Craters Road for logistical reasons. Figure 4 shows possible locations for revitalizing agriculture at Kealakomowaena.

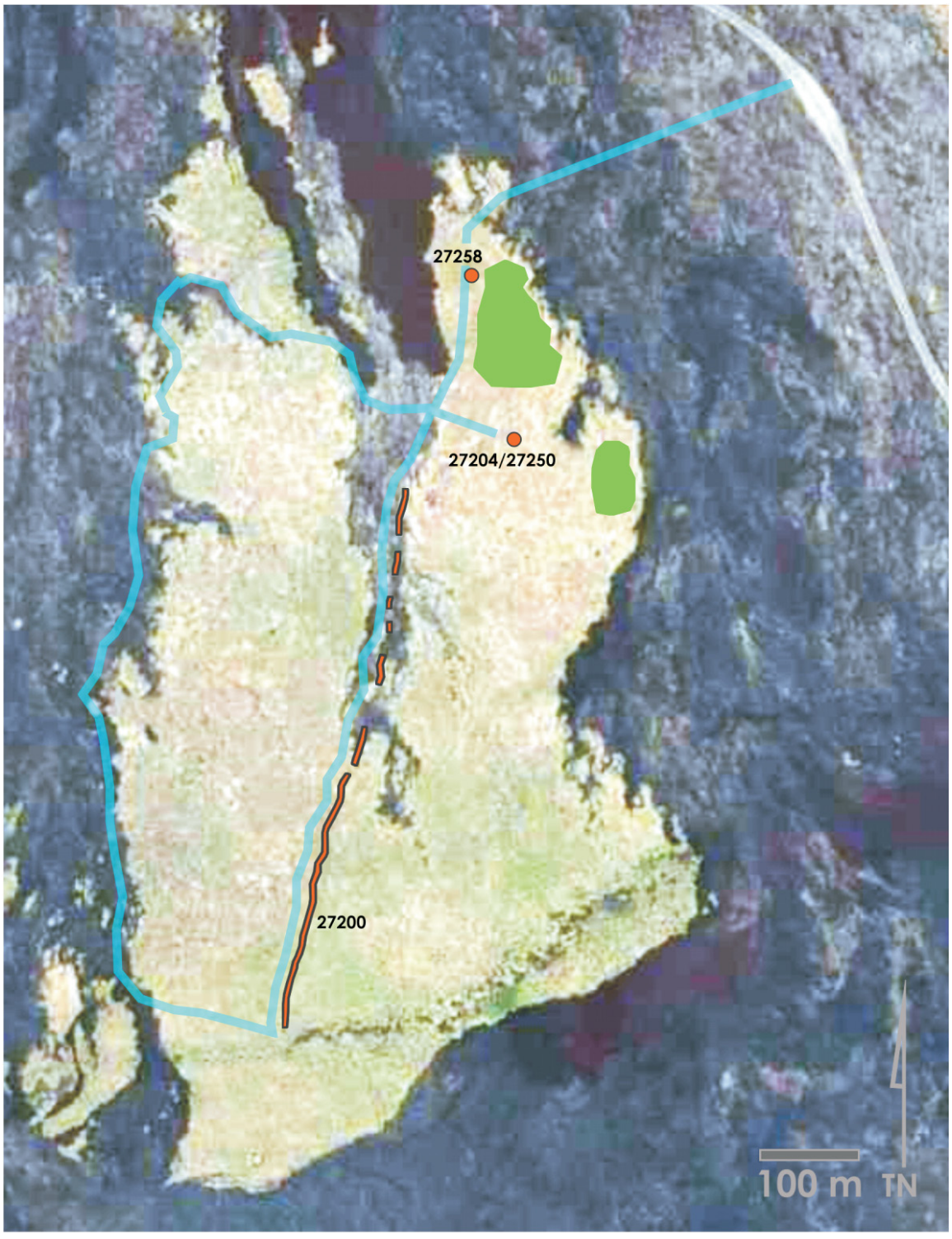


Figure 4. Possible locations for revitalizing agriculture at Kealakomowaena.

The area along the east edge of the *kīpuka* (just seaward of the single *ʻōhiʻa* tree) is a particularly good location for a community project to reconstruct agricultural mounds. Logistically, this area is easy to access from the road (the *ʻōhiʻa* tree is visible from the Hōlei Pali pull-out). It is on a slight slope that suggests that drainage would be good. The area is slightly removed from the main interpretive trail and thus would allow local activity without the activity being a "show" for visitors (this consideration would need to be discussed as part of the community goals for the project). The *ʻōhiʻa* tree itself is an auspicious feature (Photo 9); its lonely presence is a marker of a long ago landscape that might have also included other native plants such as *kukui*, *alaheʻe*, *ʻaʻaliʻi*, *kolea*, *ʻūlei*, and *ʻākia* (remains of which were identified in charcoal samples from Road Cut Cave; see Moniz Nakamura and Durst 2010:145-148).

It was suggested during IDT and *kūpuna* meetings that these fields should be totally cleared of vegetation so the field mounds can be seen. This idea raised the additional question about the whole vegetation pattern for sweet potato fields (if sweet potato was grown in the rock mounds, were there other plants, such as *pili* grass and trees, that were cultivated between and among the mounds).

The agricultural features of Kealakomowaena are designated Site 27195. Prior to revitalization of any agricultural area, the selected section of Site 27195 should be fully cleared, and archeologically mapped and tested. Community members involved in the revitalization project should be invited to participate in the archeological investigations.

In addition to redeveloping agricultural fields, another historical activity that could be recreated is salt-making, an activity that is well-documented for the Kealakomo area. Other ideas for Hawaiian participation in interpretive activities include acting as docents and site monitors. Several people referred to the cultural programs at the Waha'ula Visitor Center as a model.



Photo 9. Lone *ʻōhiʻa* tree on the east edge of the *kīpuka*.

IV. THE WESTERN KĪPUKA: KEALAKOMOWAENA INTERPRETIVE TRAIL

An interpretive trail through the western *kīpuka* of Kealakomowaena is the setting for an effective integration of the visitor experience with a powerful sense of place. Nowhere else in the park is there an opportunity to transport visitors into the dominant sensations of a singular, bounded space, an island of ancient landscape surrounded by lava that was formed less than a generation ago.

The interpretive trail will introduce visitors to the sensations of the place: visual (the great vistas, landscape, clouds and sky, and volcanic plumes); tactile (rock underfoot, wind, heat, and rain on the skin); smell (volcanic fumes, rain); and cultural (the physical archeological remains). And undoubtedly, visitors will ask questions related to time and age (how old is the lava? when did the Hawaiians come here?) and reason (how did the Hawaiians survive here in this seemingly inhospitable environment?).

The interpretive trail will take visitors across a barren lava flow as the transition from present (the paved Hōlei Pali pull-out) to past (the *kīpuka*). It will answer their questions about time, age, and reason. And it will challenge them to better understand the merging of humans and nature in this singular place.

THE CONCEPT

The concept for the Kealakomowaena interpretive trail is to offer guided and self-guided options along a single route, visiting the same sites. Each option, however, will convey the interpretive message in a slightly different manner, with the guided trail offering an opportunity for intensified interchange between visitor and guide.

The primary message of the interpretation emphasizes the ability and capability of Hawaiians to live within a difficult and often hostile natural landscape; not just surviving, but thriving, in the challenging environment. This message ties together natural history elements (geology, volcanism, astronomy) with Hawaiian culture (traditions of Pele, subsistence and adaptation, technology) and archeology (sites, age of sites, settlement patterns).

The "*ahupua'a*" as an explicit organizing concept in interpretation has been much used in Hawai'i. To avoid redundancy with interpretive programs elsewhere, the concept proposed for Kealakomowaena is to interpret life in an *ahupua'a*, but without explicitly restating the "*ahupua'a*" description (i.e., a traditional land unit that extends from the ocean to mountains and that provides its residents with a full range of resources). Rather, the interpretation takes visitors *through* Kealakomowaena, with a concluding interpretive point that says "you have now experienced life in an *ahupua'a*."

GUIDED TOURS

The primary message for the guided interpretation is *Nature Shapes the Land; People Shape the Landscape*. This interpretation emphasizes the interplay of nature and humans in the shadow of Kīlauea, the physical volcano, and with Pele, the metaphysical volcano deity. It allows multiple conversations in the interpretation, including supplementary interpretive topics that may not be appropriate for inclusion in the trail guide or on trail signs, but would still be valuable to convey to visitors. An example of a supplementary

topic relates to the geological landscape history: what happened in the past (the age of the lava flows), what is happening today (volcanic fumes and plumes), what could be happening at any time (the reality of being in a dynamic landscape where what exists today may soon be buried under a new lava flow).

Guided tours of the interpretive trail can be conducted by park rangers and/or private tour groups (see discussion on training program for tour guide certification, below).

Guided tours are envisioned as a first phase of interpretive development that can be implemented in fairly short order with minimal infrastructure requirements. Impacts on archeological sites will be controlled by the guide, with subsidiary monitoring by HAVO Visitor and Resources Protection personnel.

SELF-GUIDED TOURS

For the self-guided interpretation, the primary message is *Life on the Lava Landscape*, through which the interpretation will peel back the layers of time, starting on the recent Mauna Ulu flow, moving to the old Chain of Craters Road, and then into Hawaiian times within the *kīpuka*. Possible topics include:

- Hawaiian-identified landscape (Hawaiian descriptions of what can be seen; Hawaiian place names, traditional land unit boundaries, including the concept that *ahupua'a* extended into the ocean to incorporate fishing rights).
- Hawaiian-identified sky (day and night) as it can be perceived from Kealakomowaena (a sense of place within the Hawaiian cultural framework).
- Hawaiian history as it relates to the landscape history (that is, the age of Hawaiian sites).
- Hawaiian subsistence and adaptation; use of natural resources (e.g., Kealakomowaena as a fire-manipulated landscape, with a tie to the current HAVO Natural Resources prescribed burn program to revitalize *pili* grasslands); development of agriculture; nature of livelihood; contact with other locales at the coast and in the upland. This theme answers the question of how people survived here, with emphasis on the fact that they not only survived, but thrived in a challenging environment. An extension of this theme is the continuing use of the Kealakomo area by local residents, particularly from Kalapana.
- Hawaiian technology, with emphasis on the use of natural materials and the production of tools. This anchors the sense of place with the use of local rock, and can be one aspect of the tactile component of interpretation.

A trail guide linked to numbered posts is recommended as the information medium for the self-guided tours.[5] This form has the advantages of flexibility in space and design for the interpretive message, as well as being relatively easy to implement and visually and physically unobtrusive. Disadvantages include ensuring that trail guides are available to visitors, and the potential for trash from casually discarded trail guides. Trail guides can be disseminated at the Visitor Center, Jaggar Museum, and at the Hōlei Pali kiosk; Iron Ranger lock boxes such as the ones at the Kīlauea Iki trailhead allow distribution at the trail location. The trail brochure should also be made available in downloadable form from the HAVO website.

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[5] Trailside signs were initially considered as the interpretive medium, but there are disadvantages of, among others, high initial cost, difficult installation (signs and sign frames would have to be carried into the *kīpuka*), and potential for being visually intrusive. This option, however, should be kept open as a complementary device to the trail guide.

In addition to the trail guide, small information signs that emphasize the preservation ethic should be placed at selected locations along the trail, at particularly sensitive sites such as Site 27205. Both the trail guide and any signs should include warnings per the Archaeological Resources Protection Act (ARPA), indicating that is a felony offense for any person to excavate, remove, damage, alter, or deface any archeological resource in the park, or for any person to sell, purchase, transport, or receive any archeological resource that was excavated or removed from the park.

TRAIL ROUTE AND SELECTED SITES

Figure 5 illustrates the proposed trail route. The total distance of the trail is approximately 1.9 miles, beginning and ending at the Hōlei Pali pull-out. The total trail is assessed as moderately difficult. However, there are several points at which visitors will have the option of returning to the trailhead, thus providing a range of trail difficulty. The shortest option (from Chain of Craters Road to a *kīpuka* overlook, see Stop 3 on Fig. 5) is assessed as an easy, 0.4 mile round-trip across smooth, level lava. A short loop that includes Stops 1 through 5 is assessed as a moderate, 0.7 mile walk. For site protection purposes, the trail route utilizes the recent lava flows for the main visitor paths. This allows views of, but not direct access to, many of the archeological remains in the *kīpuka*; it also allows access to archeological sites that are partially covered by recent flows and thus, not easily damaged by visitors.

There are also places suggested as points for rest and contemplation, that is, as places to quietly experience the sensations of the *kīpuka*. These are indicated on the key to Figure 5.

Table 1 lists the archeological sites that are proposed for interpretation, in the order of their location along the proposed interpretive trail route. The western *kīpuka* of Kealakomowaena contains good examples of agricultural features, habitation sites, animal pens, a possible shrine, and an old trail (probably a pre-Contact *mauka-makai* trail rebuilt as a post-Contact horse trail). There is also a segment of the original Chain of Craters Road (Site 27197). Because of the sensitive nature of cave sites, interpretation related to the use of caves is made at unmodified caves in the recent lava flow (i.e., non-cultural caves).

LIFE ON A LAVA LANDSCAPE

Sites that exemplify the theme of living on the lava landscape include the major agricultural complex of Site 27195, which consists of the extensive occurrence of mounds, modified outcrops, and linear walls that forms the agricultural system in the western *kīpuka*. As noted by Moniz Nakamura and Durst (2010:137, brackets added), "*pu'e* [mounds] are the most abundant features in the Phase I area [the western *kīpuka*]."

A set of unnumbered structures southeast of Site 27252 form an interesting complex of agricultural fields and a probable shrine. The shrine consists of a tumulus that has been modified by the construction of a small enclosure at the base and retaining walls along one side that create an access to a prominent and distinctive point at the top of the natural feature. The tumulus is visible from long distances in the upper *kīpuka*.

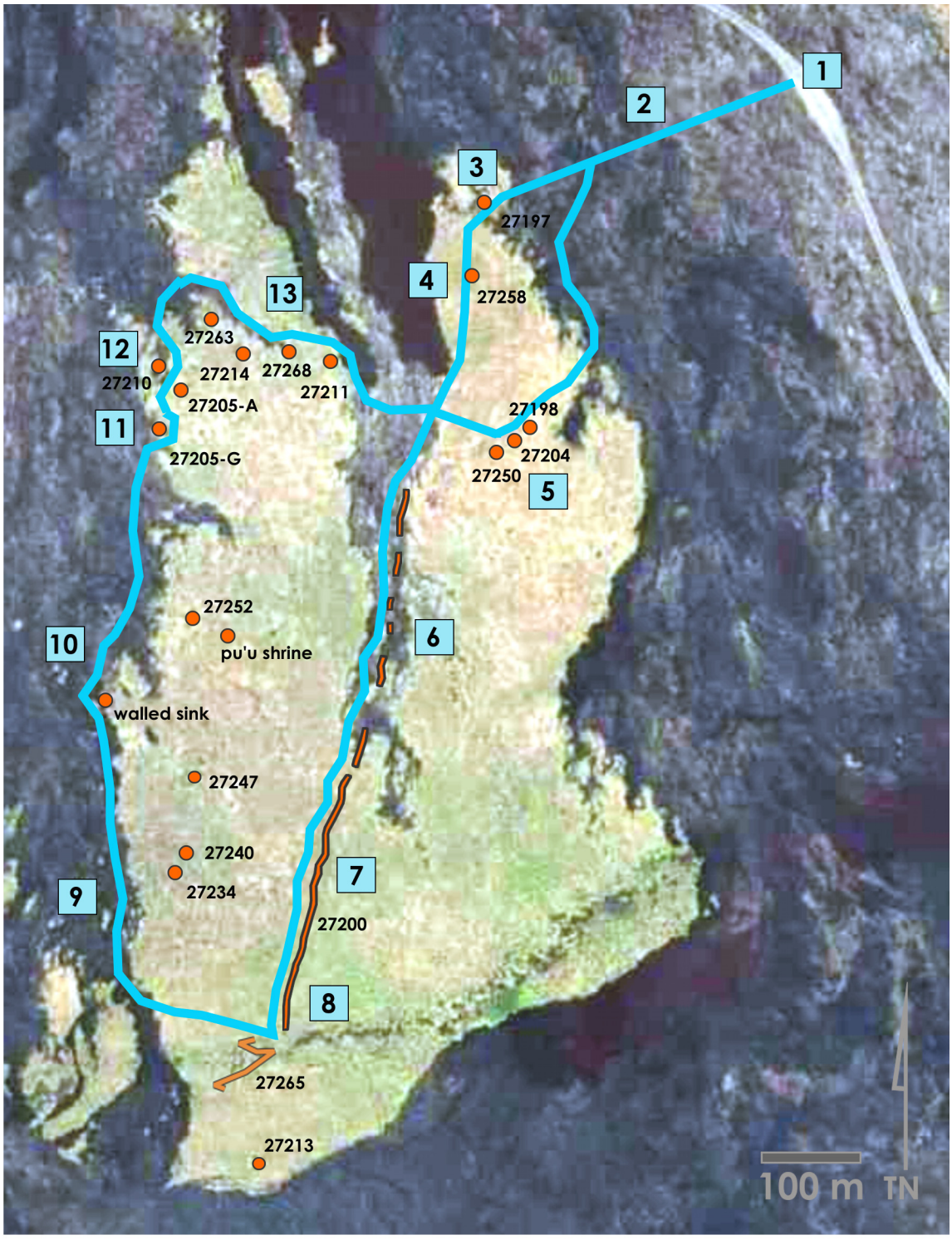


Figure 5. Proposed route of the Kealakomowaena interpretive trail (see next page for key to sites and points along trail).

Key to Figure 5, proposed route of the Kealakomowaena interpretive trail

1 Hōlei Pali trailhead

2 Trail across the *pāhoehoe*; approximately 0.2 miles (1,000 feet) from the trailhead to Point 3

3 At the edge of the *kīpuka*, overlooking Site 27197 (segment of original Chain of Craters Road); first view of the *kīpuka*; this stop is a "rest and contemplation point" as well as a point of return on the trail

4 Upper east lobe of the *kīpuka*; trail passes Site 27258 and numerous mounds; approximately 0.13 miles (700 feet) from Point 3 to Point 5

5 Side loop to Sites 27250 and 27204; Site 27198 is a set of historic petroglyphs; first view of the coastline from the *kīpuka*; optional 0.7 mile (3,700 feet) loop back to trailhead; this stop is a "rest and contemplation point"

6 Lower *kīpuka*; trail follows the alignment of the Site 27200 wall over smooth *pāhoehoe*, very easy terrain for walking; approximately 0.2 miles (1,150 feet) from the beginning of the side loop to Sites 27204/27250 to the seaward end of the central *pāhoehoe* flow, which can be a "rest and contemplation point" as well as a point of return on the trail

7 Lower *kīpuka*; trail follows the alignment of the Site 27200 wall seaward of the central *pāhoehoe* flow; approximately 0.2 miles (1,150 feet) from the seaward end of the *pāhoehoe* flow to the lower *pali*

8 Top of the lower unnamed *pali*; views of Sites 27265 (zigzag trail down the face of the *pali*) and 27213 (enclosure on the coastal flat), as well as expansive view of the coastline from Puʻuloa to Puʻukapukapu; this stop is a "rest and contemplation point;" terrain from Point 8 to the western edge of the *kīpuka* is rocky and moderately steep, approximately 0.1 miles (500 feet)

9 Western edge of the *kīpuka*; relatively steep, but smooth terrain with views of tumuli and mounds on the *kīpuka* slope; approximately 0.2 miles (1,150 feet) to Point 10

10 Western edge of the *kīpuka*; terrain is more level, with views of central *kīpuka*, including possible *puʻu* shrine, small tumuli, numerous mounds; *pāhoehoe*-filled walled sink (technically termed a lava-rise pit) similar to Site 27258; this stop is a "rest and contemplation point;" approximately 0.19 miles (1,000 feet) from the walled sink to lower end of Site 27205 (Structure G)

11 Upper west lobe of the *kīpuka* at Structure G, Site 27205; trail crosses the center of Structure G; approximately 0.04 miles (230 feet) from Point 11 to Point 12

12 Upper west lobe of the *kīpuka* at the upper end of Site 27205 that includes paved platform with hearth, concrete cistern, and stone bowl; recommended formal viewing platform to keep visitors from walking through the site

13 Back to the central flow; trail follows a narrow ridge of *pāhoehoe* and passes Sites 27263, 27214, 27268, and 27211; approximately 0.23 miles (1,200 feet) from upper end of Site 27205 to the central flow, and another 0.07 miles (350 feet) across the central flow to the beginning of the side loop to Sites 27250 and 27204

NOTE: Site 27195 is the agricultural complex that covers most of the *kīpuka* surface.

Table 1. Suggested Sites for Interpretation.

General Location	Site No. (50-10-62-)	Other Nos.	Description	Interpretive Position
upper east lobe	27197	—	segment of Chain of Craters Road	guide
upper east lobe	27258	B-61 (C-108)	walled sink (technically termed a lava-rise pit), cave, petroglyph; probable animal pen; tested, with radiocarbon date	signage on main interp trail
upper east lobe	27250	B-65 (C-25, HV-37)	large square enclosure, to west and associated with 27204; probable animal pen	signage on side loop trail; option to return to Chain of Craters Road from this interp stop
upper east lobe	27204	B-28 (1684, HV-38)	enclosure, wall, and three terraces, to east and associated with 27250; probable habitation complex	signage on side loop trail; option to return to Chain of Craters Road from this interp stop
upper east lobe	27198	—	petroglyphs; probably associated with 27250 and 27204	
central *pāhoehoe* flow to lower *pali*	27200	B-1381–1393 (WS 21-32)	central wall; boundary marker and/or trail	signage on main interp trail; trail follows alignment of wall
on face of lower *pali*	27265		trail	viewed from top of lower *pali*
below lower *pali*	27213	B-54	rectangular enclosure with 1+ meter high, core-filled and stacked walls; circular enclosure against interior east wall; habitation	viewed from top of lower *pali*
lower west side	27247	B-34 (1685)	C-shape on low *pāhoehoe* rise; shelter	viewed from trail on recent *pāhoehoe* west edge of *kīpuka*
lower west side	27234	B-1275b/c (SB15) B-1230 (P8)	complex of C-shapes and modified tumuli; papamu; shelter	viewed from trail on recent *pāhoehoe* west edge of *kīpuka*
lower west side	27240	B-1274 (SB14)	C-shape; shelter	viewed from trail on recent *pāhoehoe* west edge of *kīpuka*
lower west side	27252	B-38 (A-42)	C-shape on low *pāhoehoe* rise; shelter	viewed from trail on recent *pāhoehoe* west edge of *kīpuka*
middle west side	—	—	unnumbered walled sink, almost fully filled with Mauna Ulu *pāhoehoe*	viewed from trail on recent *pāhoehoe* west edge of *kīpuka*
upper west lobe	27205	B-29 (HV-30)	complex of platforms, walls, enclosures, cistern; probable habitation; tested, with radiocarbon date	major interpretive stop; viewed primarily from trail on recent *pāhoehoe*, with one section of trail through Structure G; viewing platform at upper end of site

Table 1. Suggested Sites for Interpretation (continued).

General Location	Site No. (50-10-62-)	Other Nos.	Description	Interpretive Position
upper west lobe	27210	B-50	rectangular enclosure with 3 to 4 course high, core-filled walls; completely surrounded by Mauna Ulu lava; probable habitation	signage on interp trail
upper west lobe	27211	B-57 (HV-25)	rectangular enclosure with 1 meter high walls; shell midden; nearby rock mounds; probable habitation	signage on interp trail loop back to central flow
upper west lobe	27214	B-56 (HV-29)	rectangular enclosure with 4 to 7 course high, core-filled walls; probable habitation	viewed from trail loop back to central flow
upper west lobe	27263	B-125, B-370	L-shape on *pāhoehoe* outcrop and associated terrace; shelter	viewed from trail loop back to central flow
upper west lobe	27268	B-48	circular enclosure on *pāhoehoe* outcrop; undetermined function	signage on trail loop back to central flow
central west side	—	—	complex of unnumbered structures southeast of 27252; possible shrine?	viewed from trail on central flow and from recent *pāhoehoe* on west edge of *kīpuka*
all	27195	—	complex of mounds, modified outcrops; agricultural complex	viewed along all trail sections in upper *kīpuka*

NATURE SHAPES THE LAND; PEOPLE SHAPE THE LANDSCAPE

Throughout time, the people of Kealakomo have lived with the power of Kīlauea and Pele. As Moniz Nakamura and Durst (2010:88) write: "their land, homes, crops, and lifestyles [were] under constant threat from earthqueakes, lava flows, choking gases and tidal waves." There are numerous sites within Kealakomowaena that exemplify this theme, notably the Chain of Craters Road (Site 27197), sections of the *mauka-makai* wall (Site 27200) that are covered by Mauna Ulu *pāhoehoe*, and structures along the western edge of the *kīpuka* (e.g., at Site 27205). Further, the entire lava landscape is imposingly representational of this theme, particularly along the edges of the *kīpuka* where the contrast between recent flow and vegetated *kīpuka* is stark.

The interpretive link between nature and humans can be particularly expressed through Hawaiian oral traditions. Swanson (2008, referenced in Moniz Nakamura and Durst 2010:88) correlates over 400 years of volcanic activity with chants and legends.

SITE TREATMENT

The interpretive trail should be designed so that it is clearly delineated and does not leave visitors with options to leave the designated route. In addition, there should be a sufficient number of interpretive stops to keep visitors focused. A preservation ethic should be incorporated into all interpretive materials.

Sites to be interpreted should be cleared and stabilized, but reconstruction[6] is not recommended. The point is to allow visitors to imagine the past, not be explicitly told what that past looked like (since there are a number of possibilities). One section of the agricultural complex (Site 27195) should be completely cleared to allow a clear view of the rock mounds and walls.

Wherever possible, the movement of visitors in and around archeological sites should be controlled in an effective but unobtrusive manner. For most sites and areas within the *kīpuka*, the placement of the interpretive trail and of interpretive signs or numbered posts should suffice, particularly in combination with the general vegetation and rocky, rough terrain, which serve as natural deterrents. In the case of sensitive sites that are also inviting to explore (e.g., Sites 27204 and 27205), additional protection should be provided in the form of physical barriers, either planted vegetation or constructed barriers; viewing platforms at sensitive sites will reinforce the idea of staying off site features.

TRAIL CONSTRUCTION

Trail design and construction are critical elements for site protection, as well as to protect the natural environment by precluding the creation of social user trails.

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[6] The 1995 *Secretary of the Interior's Standards for the Treatment of Historic Properties* defines reconstruction as "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."

Options for trail delineation on *pāhoehoe* (from the trailhead to the edge of the *kīpuka*, along the central *pāhoehoe* flow, and on the western edge of the *kīpuka*) include a worn path or cairns (Photo 10). If cairns are used, they should be placed in close proximity so there is no question as to the trail alignment. Within the *kīpuka*, it is recommended that the trail be a simple, cleared path through the vegetation. Like the cairns on the *pāhoehoe*, numbered markers linked to a self-guided brochure should be placed to reinforce the trail alignment.

In and around archeological sites, the trails should be more clearly marked, either as graveled paths or boardwalks, to ensure that visitors are kept off structures. Interpretive signs or posts should be strategically placed to guide visitor movement.

Benches placed at selected locations serve as rest stops for visitors to relax and enjoy surrounding features and landscape views.



Photo 10. Example of a worn path on *pāhoehoe*, Puna-Kaʻū Trail.

TACTILE EXHIBITS

Development of the tactile component of presentation and interpretation has a number of possibilities, including, for example, access to reproduced (not original) artifacts (per the SOS). Management of artifacts is difficult except in controlled environments (e.g., the Visitor Center or ranger/*kūpuna* demonstrations), but for the unattended visitor, reproduced artifacts can be made accessible through the "sculpturing" of signs and exhibits (Photo 11). Photo 12 shows a recently completed interpretive sign at the Kīlauea overlook that incorporates a replica of a hafted adze. Concrete or cast-iron can also be used for replicas.



Photo 11. Turtle image incorporated into rock wall at the visitor contact station at Kaloko-Honokōhau National Historic Park.



Photo 12. Reproduction of a hafted adze incorporated into an interpretive sign at the Kīlauea overlook on Crater Rim Drive.

Examples of artifacts that could be designed into a tactile exhibit include volcanic glass adzes found at Sites 27205 and 27248 and vessels based on ceramic sherds found at Sites 27204 and 27205.

Another type of tactile exhibit that could be developed for Kealakomo is a hands-on activity that recreates Hawaiian water catchment in a drip cave. In this dry part of the island, Hawaiians collected water by placing gourd calabashes at strategic locations in lava tube caves, where water would percolate from the surface. The exhibit, which would be set up in a non-cultural cave (to avoid impacts on caves with archeological remains), would include water collection in a Hawaiian-style calabash within the cave, with a modern rain gauge on the surface to indicate the amount of rainfall to compare with the amount of water collected. Because this type of exhibit requires regular maintenance, it may be appropriate to carry out as part of the living culture activities.

An audio component of the interpretation consists of outdoor Eco-boxes that can be placed at key interpretive stops. This hand crank unit, which can provide first person interpretation, has the capability for four different messages through a high quality marine grade speaker (see Appendix A).

Suggested tactile exhibits are presented in the following section on trail segments and themes.

INTERPRETATION: TRAIL SEGMENTS AND THEMES

The following discussion is organized by segments of the proposed interpretive trail, beginning with the trailhead at the Hōlei Pali pull-out (refer to Fig. 5 for locations). Each section describes the segment,

proposes themes for interpretation on guided and self-guided visits, and makes suggestions for illustrative material.

STOP 1 (TRAILHEAD): INTRODUCTION

Trail Route: The interpretive trail is introduced at a roadside interpretive exhibit located on the *pāhoehoe* off the pavement of the Hōlei Pali pull-out. The exhibit sets the stage for the primary interpretive message, as well as includes basic information such as safety precautions and trail length and difficulty.

Primary Message: From this location, the visitor can only see the expanse of Mauna Ulu *pāhoehoe* (the Kealakomo *kīpuka* is not visible). This setting makes it ideal to introduce both messages about life in a harsh environment (*Life on the Lava Landscape*) and the interplay of nature and humans (*Nature Shapes the Land, People Shape the Landscape*). What is presented must verbally and graphically invite the visitor to go out onto the trail.

Interpretive Medium: The trailhead exhibit is discussed in more detail in the section on Other Interpretive Projects in the Park (see below).

STOP 2: TRAIL ACROSS THE PĀHOEHOE

Trail Route: From the trailhead, the trail crosses the 1972 Mauna Ulu *pāhoehoe* flow, a distance of approximately 0.2 miles (1,000 feet). The route, which can be marked by either cairns or a worn path, must be clearly defined since the *kīpuka* is not visible from the trailhead and therefore cannot be seen as a destination from Chain of Craters Road. This section of trail can be classified as an easy walk (although not compliant with standards of the Americans for Disabilities Act [ADA]), and allows visitors a view of the *kīpuka*.

Primary Message: This section of the interpretive trail is a good place to emphasize to visitors the hazardous conditions of living within and on an active volcanic landscape, by pointing out that they are walking on lava that has covered the remains of people who lived here ("walk lightly over the flow, because there are sites beneath the lava"). As Moniz Nakamura and Durst (2010:48) write:

> The impact of lava flows would have been dramatic. In this region, ninety percent of surface flows are younger than 1,100 years old and seventy percent of the flows are less than 500 years old (Holcomb 1987). Within the time of human occupation, this landscape came under immense change. The lava flows not only would have destroyed potential areas for cultivation, but also forest lands resulting in a young, immature landscape.

Interpretation in this segment of the trail can also describe the postulated native vegetation that would have existed prior to the flows, including *ʻōhiʻa*, *lama*, *ʻalaheʻe*, *naio*, sandalwood, *ʻākia*, and *ʻaʻaliʻi* (Moniz Nakamura and Durst 2010:23). Breadfruit, as well as *kukui*, *kolea*, and *ʻūlei* may also have existed in the area.

Illustrative Materials: Illustrations can include aerial photographs of the area taken prior to the flow to show the sites that are now covered by lava. Photographs by park rangers and Bishop Museum archeologists would also illustrate how the area looked as recently as 60 or 70 years ago.

STOP 3: AT THE EDGE OF THE KĪPUKA

Trail Route: About a fifth of a mile (1,050 feet) from the parking area, there is a high point in the *pāhoehoe* flow that looks down into the upper east lobe of the *kīpuka*. From here, visitors will have their initial visual overview of the Kealakomowaena *kīpuka* from a location (at the boundary of bare *pāhoehoe* with vegetated *kīpuka*) that is a stark contrast and sets the stage for entering the realm of Hawaiian life. At this stop, visitors will have the option of continuing into the *kīpuka* or returning to the trailhead.

Sites: One of the first structures that is visible from this vantage is the original Chain of Craters Road (Site 27197; Photo 13), which was built between 1963 and 1965 and covered over less than a decade later by Mauna Ulu flows.



Photo 13. Asphalt section of the original Chain of Craters Road remaining after a Mauna Ulu lava flow.

Primary Message: The message at this interpretive location, which offers the first view of the *kīpuka*, is an introduction to the theme of humans thriving in a hostile environment. The short span of time that the original Chain of Craters Road was functional is testimony to the hazards of living in this volatile landscape, and as the first archeological stop on the trail, is the introduction to moving back through the history of the area. In addition, a point on natural landscape formation processes can be made: the *kīpuka* is a former high spot in the Kealakomowaena landform, and it now appears lower only because of the build-up of surrounding lavas from Mauna Ulu.

Safety and general trail information should also be included in the interpretation at this location.

Illustrative Material: Illustrative material can include a schematic of the interplay of humans and nature at this location, beginning with early settlement of Kealakomowaena, the ʻĀilaʻau eruptive event that occurred in the mid-15th century, subsequent Hawaiian as well as historic occupation and activities in the region, the construction of the Chain of Craters Road, and its destruction by the Mauna Ulu flows.

STOP 4: THE UPPER EAST LOBE OF THE KĪPUKA

Trail Route: The trail then crosses the northern point of the *kīpuka* and follows along the eastern edge of the high *ʻaʻā* flow toward the ocean, passing archeological features in the *kīpuka*.

Sites: One of the substantial structures in this area is Site 27258, a walled lava sink and tube; a petroglyph is carved into a large portion of *pāhoehoe* that has broken off the edge of the flow (Photo 14). Marine shell midden is scattered in the interior of the tube and in the sink (Moniz Nakamura and Durst 2010:A-84 to A-85). Radiocarbon analysis of a charcoal sample from under the overhang produced a date range of AD 1655 to 1886, indicating the site was used during the late pre-Contact period, or possibly during the 19th century. Agricultural rock mounds occur in dense concentrations to the northeast of the sink. This site is the primary interpretive stop along this segment of trail.

Primary Message: Interpretation at Site 27258 introduces the visitor to the interrelationship of habitation and subsistence activities in this mid-elevation agricultural region. Hawaiian farmers took shelter from the hot sun in natural features such as the lava tube. They modified the tube and sink to make best use of them, perhaps building up the edges of the sink to make a pen for domesticated animals. Shell midden are the remains of a meal.

In addition, a natural lava cave or depression near Site 27258 can be utilized to show how water was collected in this arid region, using calabashes set in strategic locations within a cave to catch water dripping from the cave roof. A modern rain gauge on the surface adjacent to the cave can be used to contrast the amount of water falling on the surface with the amount of water collected by the calabash. Ellis (2004:262) notes that water that had sat in a calabash is bitter-tasting.

Interpretation can also describe the Hawaiian cultigens that could have been grown in this area: sweet potato, breadfruit, and gourds.



North end of sinkhole; shelter overhang in center of photo.



Southwest end of sinkhole; petroglyph at left side of photo. Note central aa flow in background.



Close-up of petroglyph.

Photo 14. Views of Site 27258.

STOP 5: SIDE LOOP TO SITES 27250 AND 27204

Trail Route: The trail continues past Site 27258 seaward to the point on the central lava flow where the more recent *ʻaʻā* flow stops and the earlier *pāhoehoe* flow is the exposed surface (Photo 15). From this point, a side loop trail will take visitors to Sites 27250 and 27204, a large house/animal pen complex. This site is highly visible from the central flow and would likely be inviting to visitors on the interpretive trail. Thus, the loop trail is suggested as a means to control access and forestall the development of a social user trail to the site. From this point, visitors will have the option of continuing *makai* on the longer loop trail or returning to the trailhead; the round-trip distance between the trailhead and this point is approximately 0.7 miles (3,700 feet).

Sites: Site 27204 consists of a three-tiered terrace, an enclosure, and an adjoining wall (Moniz Nakamura and Durst 2010:A-96 to A-97). There is marine shell midden, historic glass fragments, and ceramics on the surface; an historic petroglyph in the shape of a "K" is located in the enclosure interior. Site 27250 is large rectangular enclosure with high, core-filled walls that is interpreted as a corral or animal pen.

The view from Sites 27204/27250 is expansive: in the near ground are the central *pāhoehoe* flow and the Site 27200 wall/trail; in the far distance is ʻĀpua on the coast.

Primary Message: Interpretation at Sites 27204/27250 can include:

- the function and period of occupation of Site 27204/27250. This is an opportune place to convey the idea of the people who lived here as real individuals who picked this location because of its prominent high spot on the landform, the continual breeze, and great views, just as people today would pick an ideal location for a house. The presence of bottle glass sherds and the "K" petroglyph brings the occupation into the historic period.



Photo 15. The seaward end of the *ʻaʻā* flow on the older central *pāhoehoe* flow in the western Kealakomowaena *kīpuka*, view to north.

- the *kīpuka* in its geographic context. This is the first opportunity for visitors to see the coastline (Photo 16). Interpretation can describe the various activities that went on along the coast (e.g., coastal settlement, salt-making, and fishing) and their links to the inland agricultural region. ʻĀpua is clearly visible from this location and can be described in the context of its appeal to fishermen as a favorite place for throw net fishing because of its shallow, sandy beach (in contrast to the rest of the rocky shoreline where hook and line fishing was required). Salt-making was another common activity along the coast; Emory, Cox et al (1959, quoted in Moniz Nakamura and Durst 2010:46, brackets added) write:

  > What supported the amazing populace village of Kealakomo [at the coast], situated on such a barren plain of lava and *pili* grass, was its facility for producing salt and drying fish. These were exchanged for other needs with relatives who could be reached by the trail which led inland and along the coast.

- pointing out the central wall (Site 27200) and describing the interpretive route that continues to the lower *pali*.

Illustrative Materials: Illustrations can include the archeological photograph of salt beds at Kaʻena (Moniz Nakamura and Durst 2010:80), combined with a drawing of how salt might have been used at this site.



Photo 16. Site 27250, with view of coastline; photograph taken from the upper end of Site 27204.

STOPS 6 AND 7: THE LOWER KĪPUKA

Trail Route: The interpretive trail continues *makai* following Site 27200, a low wall and possible trail alignment that bisects the *kīpuka* in a north-south alignment. It has been partially covered by the lower end of the central *pāhoehoe* flow (Photo 17).[7] About 0.25 miles (1,300 feet) seaward of the Site 27250 side loop trail, the central *pāhoehoe* flow ends; the Site 27200 wall continues *makai* on the original *kīpuka* terrain to the top of the lower *pali* (Photo 18).

Sites: The Site 27200 wall is the primary focus of this segment of the interpretive trail. Visible from the trail is the postulated agricultural shrine constructed on the top of a prominent tumulus in the western portion of the *kīpuka*.



Photo 17. The Site 27200 wall partially covered by *pāhoehoe*.

[7] The upper end of the wall within the *kīpuka* was fully covered by the large *ʻaʻā* flow.



Photo 18. The Site 27200 wall seaward of the central *pāhoehoe* flow.

Primary Message: Interpretation can include:

- The views along this segment of trail include rock mounds and tumuli in the western half of the *kīpuka* that will be more closely visible on the western leg of the interpretive trail (see below). More discussion on the role of sweet potato in the Hawaiian diet (and Hawaiian culture), as well as how it was grown, can be presented.
- Up close, an interpretive highlight includes the segments of the Site 27200 wall that have been covered by recent *pāhoehoe*. The interpretation can challenge visitors to identify what is the wall and what is the flow.
- Interpretation can discuss travel between the coast and the uplands along *mauka-makai* trails.
- In the lower section of the *kīpuka*, the interpretive trail follows the Site 27200 wall through a sloping, grassy area. Interpretation can discuss how Hawaiians used fire to manipulate the landscape, with a side story on the HAVO Natural Resources prescribed burn program to revitalize *pili* grasslands in the *kīpuka*. Examples of native plants along this section of trail can be pointed out.

Illustrative Material: Illustrative material can include the historic photograph of park personnel on this trail.

STOP 8: THE LOWER PALI

Trail Route: The central wall (and the interpretive trail) ends at the top of the lower unnamed *pali*, where the view to the coast is sublime. The trail then continues west along the top of the *pali* to the recent *pāhoehoe* flow at the west edge of the *kīpuka*. This area is relatively level and easy walking, but interpretation will have to be directed to the ocean/*makai* because the terrain rises steeply to the inland and most of the *kīpuka* is not visible from this lower elevation.

Sites: Site 27265, a zigzag trail down the face of the *pali*, is likely the seaward extension of the Site 27200 trail. Site 27213, a large enclosure on the peninsula of level *kīpuka* below the *pali*, is noticeably visible from the end of the central wall (Photo 19).



Photo 19. View of Site 27213 from the end of the central wall (Site 27200).

Primary Message: From the top of the unnamed *pali*, the view is truly expansive, spanning the coastline from Puʻuloa to Puʻukapukapu. Interpretation at this point can take several tracks:

- It can reach beyond the daily existence of Hawaiians in this landscape to interpret the symbolic aspects of the landscape as expressed in place names. Tuggle and Tomonari-Tuggle (2008:80-88, especially Figure 17) discuss the various traditions that connect Puʻuloa with Puʻukapukapu and Hōlei, in particular wherein Puʻuloa is the child, Puʻukapukapu is the father, and Hōlei is the mother.
- It can use the expansive view to relate historical events that took place along this coastline. For example, in the mid-1760s, the Puna chief Imakakaloa led a revolt against high chief Kalaniʻōpuʻu. The revolt was put down but Imakakaloa escaped to Puna. Kalaniʻōpuʻu sent his army on a scourge of the district, to (Barrere 1959:19):

  > ravage the Puna district with fire, i.e., to burn every village and hamlet until Imakakaloa should be found or the people surrender him Commencing with the land of Apua, it was literally laid in ashes.

  The Puna chief Imakakaloa was eventually captured and sacrified at Pākini Heiau in Kaʻū.

  Other historical events include the passage of early Western visitors to the coast, such as William Ellis in 1823 and Chester Lyman in 1846.

- Another message can focus on activities of daily life along the coast. Using prominent landmarks, interpretation can discuss the Kealakomo coastal settlement (e.g., the sand beach at ʻĀpua that was an attraction for net fishermen and the sea cliffs as a place for hook and line fishing). There is also the impressive view of the wide, lava-covered flat land that extends to the coastal edge; interpretation can indicate that archeologists believe that it was not intensively utilized even before the Mauna Ulu flows covered it completely with lava, based on historical descriptions, pre-1970s aerial photographs, and the early HAVO archeological surveys. The story of daily life along the coast can also be continued into modern times with descriptions of the use of the area by Kalapana residents before the park was established.

- Interpretation can also continue the story of salt-making activities at the coast that was begun at the Site 27204/27250 stop, by bringing the story into the historic period. Moniz Nakamura and Durst (2010:79-80) quote two visitors to the area (in 1846 and 1894) who made long descriptions of the salt-making process; the latter account (by Charles Wetmore) concludes:

  > Their salt was of course tempered with small quantities of magnesia – lime and minute particles of other mineral substances. Many persons considered their product more delicious than any brought to the island from foreign sources.

Illustrative Material: The walk down the central wall to the top of the *pali* can be rewarded with a more elaborate interpretive stop, with a place to sit and contemplate the view and perhaps multiple interpretive themes. An Eco-Box can offer an audio, first-person interpretive story, particularly those of Kalapana residents who lived and/or used this area.

Illustrative material can include the backcountry ranger description and photographs of the Site 27265 zigzag trail (Moniz Nakamura and Durst 2010:A-6). Rangers report that the trail extended from coastal Kealakomo through Kealakomowaena and Nāʻulu to the Kalapana Trail. Another possibility is an artist's

panorama or annotated panoramic photograph of the Pu‘uloa to Pu‘ukapukapu landscape that shows notable locations (including the extent of *ahupua‘a* resources out to sea). This somewhat duplicates the suggested interpretation at the Kealakomo overlook (see section on Other Interpretive Projects in the Park, below), but this duplication is ameliorated by the closer perspective to the coast.

STOPS 9 AND 10: THE WESTERN EDGE OF THE KĪPUKA

Trail Route: The trail along the western edge of the *kīpuka* rises steeply from the lower *pali* up the western edge of the *kīpuka*, following the Mauna Ulu *pāhoehoe*. There are large tumuli and numerous mounds on the *kīpuka* slope.

Sites: Site 27234 is the largest complex of the set of sites visible from the western edge of the *kīpuka*. It consists of a cluster of C-shaped structures and modified tumuli. At the northwest end of the site is a single *papamu*. There are several rough mounds of older *pāhoehoe* boulders trapped in the recent Mauna Ulu flow (Photo 20) that indicate that the agricultural fields likely extended west of the *kīpuka* in areas that are now covered by lava.



Photo 20. Probable agricultural mounds trapped by the Mauna Ulu *pāhoehoe* flow. Note the large tumulus and mounds in the *kīpuka* in the background.

An unnumbered walled sink that has been partially filled with Mauna Ulu lava is located along the western edge (Photo 21). Interpretation at this site can be used as a contrast with Site 27258 at the beginning of the interpretive trail (at Stop 4).

The unnumbered structures southeast of Site 27252 are an interesting complex of agricultural fields and a probable shrine (Photo 22). The shrine is visible from all points along the upper portion of the interpretive trail.

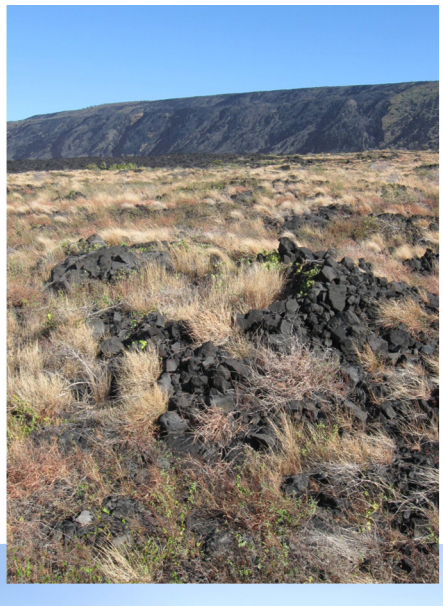
Primary Message: The tumuli are the dominant features of the landscape along this section of the trail. The message focuses on natural formation processes in the lower section of the trail, and transitions to Hawaiian modification of the tumuli in the upper end of the trail. There are fewer tumuli along the upper trail section, but many have been modified by the construction of C-shaped structures, walls, and terraces. This is a good example of the theme of *Nature Shapes the Land; People Shape the Landscape*.

This may also be an opportune place to replant native dry forest species as part of describing the natural landscape before human modification.



Photo 21. Walled sink similar to Site 27258, but the smooth *pāhoehoe* of the Mauna Ulu flow has completely filled the interior of the sink; the wall remnant runs across the middle of the photograph, the *noni* tree at the lower right is growing out of an overhang; view to southwest.

Enclosure to north, view from top of shrine



Mounds to west, view from top of shrine





Shrine, view to east; the prominent knob is visible from long distances (photo courtesy of National Park Service).

Modified outcrop to south of shrine, note Site 27247 tumulus in upper left of photo.



Photo 22. Views of and from a probable shrine in the western portion of the *kīpuka*.

STOPS 11 AND 12: THE UPPER WEST LOBE

Trail Route: The interpretive trail along the western side of the *kīpuka* comes to Site 27205, the major historical habitation complex in the upper west lobe of the *kīpuka*. For the most part, the trail stays on the recent *pāhoehoe*, except at the lower end of the site at Structure G, a circular enclosure that has been breached by Mauna Ulu lava. The trail enters the enclosure from the lower end and exits through the break in the enclosing wall at the upper end (Photo 23), thus offering a close-up view of this particularly good juxtaposition of recent lava on the older landscape. The trail then follows the recent flow to a point above the main part of the site complex.

At the upper end of the site, interpretation is presented from a viewing platform that includes a railing to emphasize that visitors should remain off the site (Photo 24). Although the primary method of interpretation is the trail guide, this is a location where an interpretive sign and tactile exhibit would be effective for focusing visitor attention. A first person story through an audio Eco-Box is also a good possibility for interpretation.



Photo 23. West wall of Structure G enclosure in Site 27250, view to seaward (south); shows the Mauna Ulu lava flowing over the wall at the inland end of the enclosure. The trail would enter the structure at the upper left corner of the photograph and exit on the recent *pāhoehoe* at the bottom of the photograph.



Photo 24. Interpretive point along the Sulfur Banks trail. The viewing platform and railing emphasize that visitors should remain on the trail.

Sites: The main site in the upper west lobe of the *kīpuka* is Site 27205 (also called HV-30, the Bishop Museum designation), a complex of impressive structures that are clearly historic in character but may contain remnants of earlier occupation (see Moniz Nakamura and Durst 2010:A-46 to A-48). Features include a concrete-lined cistern (Structure A) and a paved platform with a slab-lined hearth (Structure B). Like Site 27204/27250 on the east side of the *kīpuka*, Site 27205 sits on high ground with an expansive view of the landscape.

The cistern is intriguing because of its construction (integration of concrete), which is unique along the interpretive trail (although there are other examples of concrete cisterns in the general area; see Photo 6). This clearly places the site in the historic period, which is also evidenced by glass fragments, ceramic pieces, and metal fragments on the surface of the Structure B platform. However, there remains the possibility for a pre-Contact occupation component, based on characteristics of other features in the site, such as dry-stacked construction, shell midden, typical traditional structures such as enclosures, low walls, and platforms; excavations in a 19th century house site at Poupou-Kauka Village east of Waha‘ula Heiau exposed an underlying buried cultural deposit dating to the 13th to 16th centuries (Carter and Somers 1990:14)

Site 27205 is the largest, most complex, and arguably most well-constructed set of archeological structures in the Kealakomowaena *kīpuka*. As such, it is the primary interpretive focus, the jewel for interpretation. At the same time, it presents a challenge for site preservation since its very complexity invites visitors to explore sensitive and fragile portions of the site.

Primary Message: Interpretation at Site 27250 merges both messages of living in a harsh environment and the interplay between nature and man. The clearly historical context of the surface structures in the site can be juxtaposed against postulated earlier deposits underlying the structures.

Illustrative Material: Interpretive illustrations can emphasize the evolution of the site, from original land surface (the *kīpuka*), to a pre-Contact occupation, to construction of the historic period structures, to the Mauna Ulu lava flow.

Tactile exhibits could include reproductions of a volcanic glass adze that was found in Structure E (Moniz Nakamura and Durst 2010:A-47) and the postulated vessel from which the ceramic pieces on Structure B originated (to compare traditional tools with western implements). Another possibility is a replica of the slab-lined hearth on Structure B (the main paved platform) that could be constructed into the viewing platform surface.

The interpretive sign on the viewing platform, as well as the trail brochure, should reiterate the preservation ethic, as well as include an Archaeological Resources Protection Act (ARPA) warning.

STOP 13: BACK TO THE CENTRAL FLOW

Trail Route: The trail route continues inland of Site 27205 along the recent *pāhoehoe* and then crosses the upper western lobe of the *kīpuka* on a finger of *pāhoehoe*, joining the central flow at the point where the *ʻaʻā* flow meets the underlying *pāhoehoe*. This is an easy, clear route back to the central flow where the trail loops back to the trailhead.

Sites: This section of trail is highlighted by well-constructed enclosures, and numerous mounds and modified outcrops in the upper west lobe of the *kīpuka* (Sites 27211, 27214, 27263, and 27268). There is another great view of the general *kīpuka* landscape, both seaward and inland.

Primary Message: As the concluding segment of the trail, interpretation emphasizes the idea that "you have now experienced life in an *ahupuaʻa*."

Illustrative Material: An illustration of the *ahupuaʻa* of Kealakomo, showing the *kīpuka*, places the sites that have been viewed along the trail in a regional context.

V. OTHER INTERPRETIVE PROJECTS IN THE PARK

Preparation of off-site interpretive projects within the park, such as Visitor Center exhibits and ranger presentations, roadside overlook interpretive signs at the Kealakomo and Hālona Kahakai pull-outs, and roadside interpretive signs or exhibits at the Hōlei Pali pull-out, should be conceived as a single, integrated presentation of information and design. Implementation, however, can occur in phases as funding becomes available. Table 2 summarizes the interpretive possibilities for these off-site locations.

VISITOR CENTER AND JAGGAR MUSEUM

Visitor Center exhibits would offer general introductory information, acquainting visitors with the existence of the interpretive areas, what they are in general, and how to get to them. Such exhibits can effectively provide geological and cultural information by means of graphics and multi-media presentations. An example of an exhibit that can be relatively easy to develop is a free-standing exhibit in the outdoor area, perhaps next to the model of Hawai‘i Island, that ties the interpretation of the lava flows and creation of *kīpuka* with the interpretation of Kealakomowaena. In addition, the Kealakomowaena interpretation can be highlighted on the “4 hours or More” orientation panels (Photo 25), with information on hiking conditions, duration of the hike in time, along with an additional interpretive statement describing the interpretive trail.

Interpretation at the Visitor Center has the added benefit of personal interaction with rangers; for example, the Kealakomo interpretation can be incorporated into the ranger talk in the outdoor exhibit area. Special presentations can be made through the “After Dark in the Park” program.

The Visitor Center and Jaggar Museum are ideal venues for the distribution of publications that deal with multiple themes of natural history, history, culture, and archeology (an added advantage of publications is that they can be sold to generate revenue for programs). The core material for publications is already at hand in the archeological, cultural, and historical reports for Kealakomo (Moniz Nakamura and Durst 2010) and other related areas such as Keauhou (Durst and Moniz Nakamura 2005). Examples of public-oriented publications include:

- trail guides that can be used on the interpretive trail as well as taken home as a keepsake of the visit
- highly illustrated (drawings and photographs) brochures or short books that expand on the interpretive messages presented on the ground
- children’s books that offer hands-on projects to reinforce Kealakomo interpretive themes and encourage heritage preservation; these books can be incorporated into the on-going Junior Ranger program, as well as distributed to visiting school groups.
- hands-on project books for adults, similar to those prepared for the Junior Ranger program.

Publications can also be made available through the HAVO website (see discussion, below).

Table 2. Summary of Suggested Interpretative Projects at Other Locations in the Park.

Interpretive Location	**Message ***	**Presentation Method**	**Other Presentation Options**
Main Visitor Center	introduction to Hawaiian life in the park, with specific reference to Kealakomo and Pu‘uloa Petroglyphs invitation to visit coastal area (Kealakomo and Pu‘uloa Petroglyphs) in the “If you have 4 hours or more…” exhibit	display video publication ranger contact	distribution point for car tour guide (brochure, audio)
Kealakomo overlook	introduction to the Puna-Ka‘ū region overview of the coastal region provides broad perspective, including identification of coastal places from Pu‘uloa to Pu‘ukapukapu connection to the uplands via reference to the Nā‘ulu Trail trailhead	signage outdoor exhibit	stop on car tour route ranger/docent presentation
Hālona Kahakai overlook	introduction to Kealakomo natural landscape information (flows and their ages, what a *kīpuka* is, range of environments) cultural landscape information (Hawaiian organization of land and settlement, ahupua‘a concept, place names, boundaries)	signage outdoor exhibit	stop on car tour route ranger/docent presentation
Hōlei Pali pull-out	introduction to interpretive trail life on the lava (view to *pali* and former Nā‘ulu village area, as well as across lava flow)	trailhead signage outdoor exhibit	stop on car tour route ranger/docent presentation
Coastal contact station (proposed?)	introduction to Hawaiian life in the coastal region, integrated with interpretation of active lava flows	display video publication ranger contact	stop on car tour route ranger/docent presentation
Jaggar Museum	Hawaiian life in a volatile natural environment	display publication ranger contact	stop on car tour route ranger/docent presentation
HAVO website	electronic field trip virtual tour downloadable PDFs of trail guide, scientific reports, other publications	on-line	—

* The specific message or story is dependent on the interpretive theme or themes developed for the on-site interpretation at Kealakomowaena.



Photo 25. "4 Hours or More" orientation panel at Kīlauea Visitor Center.

PALI OVERLOOKS

The overlooks at the Kealakomo and Hālona Kahakai pull-outs offer vast views of the Puna and Kaʻū coast and provide the opportunity for a broad introduction to the Kealakomowaena interpretation (see Photo 5). Interpretive waysides at these pull-outs can provide general physical and cultural landscape backgrounds for the more specific Kealakomowaena interpretation that will be presented at the Hōlei Pali pull-out and on the interpretive trail. It is recommended that the *pali* overlook interpretation be developed separate from and preceding development of the on-site interpretive trail (see Phased Development, below).

KEALAKOMO OVERLOOK

The view from the Kealakomo overlook is expansive, covering the coastal area from Puʻuloa Petroglyphs to Puʻukapukapu (Photo 26). However, the projection of the ridge on which the viewing platform is built obscures the view of the Kealakomowaena *kīpuka* and most of the mid-elevation portions of this region. Thus, the interpretive opportunity at this location is, by necessity, focused on the coastline.

Notable locations visible from the overlook are the Puʻuloa Petroglyphs, the Puna-Kaʻū Trail, and ʻĀpua Point (a major stop on the Puna-Kaʻū Trail). The Nāʻulu Trail to the uplands also starts at this overlook. This provides an opportunity to discuss the traditional *mauka-makai* social, economic, and political connections.



Photo 26. View from Puʻukapukapu (at right) to ʻĀpua Point (at left) from Chain of Craters Road on Hōlei Pali.

The present interpretive sign includes a Hawaiian poem and translation which can be incorporated into the new wayside. However, there should be more of an explanation of the poem as it relates to the wayside message.

Hele ke ala mauka o Kaʻū,	The path goes upland to Kaʻū,
Hele ke ala makai o Puna,	The path goes seaward to Puna,
I Kamaʻamaʻa, I Kapualei.	To Kamaʻamaʻa, to Kapualei.
E loa ka wāʻi ʻĀpua.	Long is the time in ʻĀpua.
Ka piʻina i Kūkalāʻula,	The ascent is to Kūkalāʻula,
Hoʻopuka aku la ka Puʻulena,	The path emerges at Puʻulena,
ʻĀina a ke akua i noho ai.	Land where the goddess dwells.

The roadside interpretation should include a panorama photographic or illustration on which places and place names are shown (e.g., ʻĀpua, Kahue, Kealakomo, Panau *ahupuaʻa*).

HĀLONA KAHAKAI OVERLOOK

The roadside interpretation at the Hālona Kahakai pull-out can be directly related to Kealakomowaena, since the *kīpuka* is clearly visible from this pull-out. At this location, interpretive wayside signs or a roadside exhibit can emphasize the natural and cultural landscape of the Kealakomo region: flows and their ages; what a *kīpuka* is; and traditional Hawaiian land divisions, with their names and boundaries. The interpretation can convey a picture of the region before the Mauna Ulu flows.

HŌLEI PALI PULL-OUT

The roadside interpretation at the Hōlei Pali pull-out provides an orientation to the area, with several levels of information depending on the nature and complexity of the interpretive facility that is developed. A kiosk with shade and benches would be an ideal platform for the introduction, providing the possibility for multiple panels of information. This could be situated off the asphalt pull-out and in the area of the recent *pāhoehoe* flow, thus allowing a lowered profile in a natural setting.

Interpretive Planning and Media Development (IPMD 2010; see Appendix A) suggests an outdoor exhibit that includes two 36 by 48 inch, vertically oriented outdoor panels to provide the foundation for the interpretive trail. One panel would provide orientation material: trail information along with safety and regulatory information. Through use of a map, the visitor would discover where he/she is located, the trail route, and how the trail fits into the larger landscape. The second panel would provide a cultural foundation for the visit, and present the primary message of the interpretive trail. A gap between the angled panels, along with a trail cairn, would act as a funnel to guide the visitor to the start of the hike.

Interpretation at this location can include the recent history of Kealakomo, including historical and modern activities at the coast and inland, movement of people between Kalapana and Kealakomo, and the acquisition of the Kalapana Extension by the Park Service. The roadside interpretation can include a tactile, three-dimensional map of the western Kealakomowaena *kīpuka*, similar to the island model at the Visitor Center (Photo 27). This would provide an alternative interpretation for individuals who cannot maneuver the trail to the *kīpuka*. Interpretation would also introduce the visitor to the living culture activities along the trail.

The pull-out interpretation can also serve as the focal point for interaction between visitors and local resident interpreters. It could also be used for formal ranger presentations, including night sky viewing sessions.

OTHER ROADSIDE SIGNAGE

Roadside signs of *ahupua'a* names should be placed at *ahupua'a* boundaries along the Chain of Craters Road. This will give visitors a feel for their location within the traditional landscape. As noted in IPMD (2010:6):

> Visitors, while driving down the Chain of Craters Road will observe signs announcing their entry in the various *ahupua'a*: Keauhou, ʻĀpua, Kahue, Kealakomo, Pānau Nui, and Pānau Iki. This will initiate their orientation to how lands were culturally divided while providing them a sense of place.

The use of Hawaiian place names in this manner also addresses one of the points made during the GMP process; namely, that HAVO should use traditional Hawaiian place names on maps and educational materials (HAVO 2010:4).

COASTAL CONTACT STATION

There are possible plans for a coastal contact station. If such a visitor facility is established, interpretation should include reference to the Kealakomowaena interpretive activities.

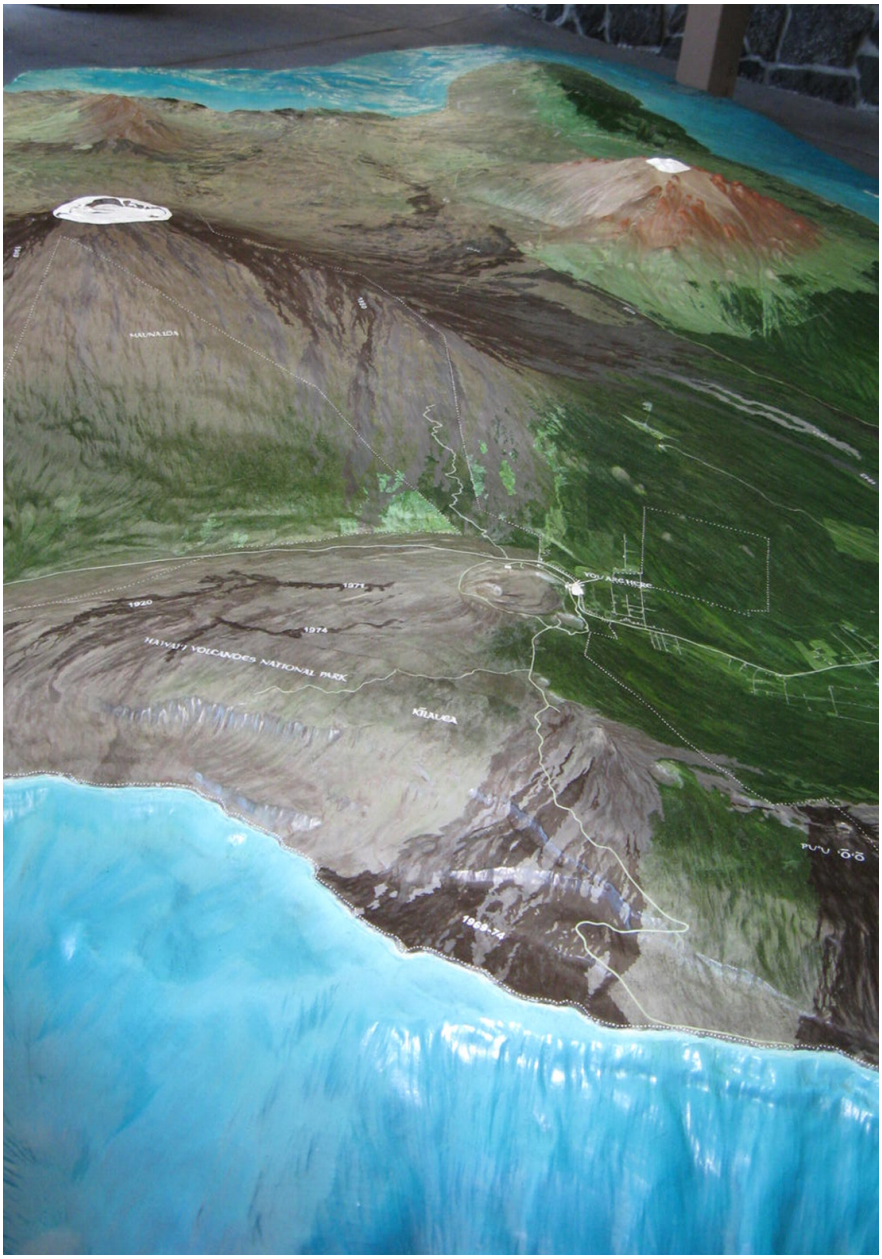


Photo 27. The three-dimensional model of Hawai‘i Island in the outdoor area of the Kīlauea Visitor Center, showing a close-up of the Kealakomo area.

CONNECTING HIKING TRAIL

A future possibility for development is a connection from the seaward end of the Kealakomowaena interpretive trail to the coastal Puna-Kaʻū Trail. This, in turn, provides an opportunity to extend these trails to other areas, thus providing hiking and interpretive possibilities to complement the Puna-Kaʻū Trail along the coast and Keauhou Trail to the west.

The interpretive trail could be extended from the top of the lower *pali* toward the sea (Photo 28), which would allow more hardy hikers with a connection to the coastal Puna-Kaʻū Trail. From the coast trail, hikers can [1] return to the Chain of Craters Road and continue on to the Puʻuloa Petroglyph Trail, or [2] head east toward the Keauhou Trail.

A long-term project that develops the *ahupuaʻa* concept is connecting different elevation *kīpuka* within Kealakomo *ahupuaʻa* through interpretive exhibits and trails, so that visitors can experience the whole *ahupuaʻa*.



Photo 28. View from the top of the *makai pali* across the coastal plain.

HAVO WEBSITE

The HAVO website at http://www.nps.gov/havo/ is a primary source for long-distance access to information about the archeology and history of the park, and can offer considerable information on the Kealakomo interpretation. As is already the case, the History and Culture/Archeological Sites page provides links to downloadable scientific reports. The Plan Your Visit page contains links to park brochures and maps, Junior Ranger program and publications, and places to go in the park. There are plans to develop a virtual tour component that would allow on-line visitors to experience park highlights (A. Kaawaloa, pers. comm., September 2010).

Information on some parts of the website is multi-lingual.

COMMUNITY PARTNERSHIPS

An important component of the interpretive program in terms of implementation and long-term management involves the development of partnerships and collaborative efforts with outside programs and organizations. As expressed in the GMP process, partnerships are "a critical tool for expanding the park's ability to achieve park goals and the park service mission" and that "community connections with neighbors and local populations would build a foundation of future park stewards" (HAVO 2010:12).

Examples of organizations include the University of Hawai'i at Hilo Anthropology, Hawaiian Studies, and Historic Preservation Departments, Hawai'i Natural History Association, Three Mountain Alliance, and Friends of Hawai'i Volcanoes National Park. Volunteer gardening groups that presently assist in grounds landscaping could be solicited for assistance with maintaining native plants around interpreted sites. The participation of Kalapana residents in living culture activities is an integral part of the proposed interpretive program.

With its mission "to support the National Park Service in the protection, preservation and interpretation of the natural and cultural resources at Hawai'i Volcanoes National Park for the enjoyment of current and future generations" (http://www.fhvnp.org/Institute.htm), the Friends of Hawai'i Volcanoes National Park (FHVNP) can help with interpretive and learning programs through its Hawai'i Volcanoes Institute, as well as with trail upkeep through its regular Friends program (similar to volunteer work carried out at Ainahou Ranch).

VI. MITIGATION OF IMPACTS AND PRESERVATION

The interpretation of archeological sites at Kealakomowaena, both off-site and on-site, is a multi-faceted opportunity for HAVO to educate its visitors and enhance their park experience, and to strengthen its connections with important community partners. At the same time, the interpretation opens avenues for potential negative impacts to the archeological resources: an increased awareness of the existence of the resources invites possible vandalism and pothunting; increased access to the resources along the interpretive trail raises the potential for inadvertent (as well as intentional) damage.

A point that should not be overlooked is that while the success of interpretation ultimately depends on visitor interaction (the visitor experience) and knowledge, these should not be considered static. The visitor experience should be monitored and efforts made to continue to improve it, as visitor interests evolve, technology changes, and knowledge is enhanced. And ideally, knowledge should be enhanced by an unrelenting program of investigation: working with *kūpuna*, collecting oral histories, conducting archival research, carrying on archeological investigations, and constantly rethinking the understanding of the past, so that the "rich pre-Contact and early history period archeology" of Kealakomo will not be allowed to become trivialized.

SHORT-TERM MITIGATION OF IMPACTS

In the short term, as the interpretive program for Kealakomo is developed, potential impacts can be mitigated by several preventive actions.

DATA RECOVERY

Potential adverse effects of opening the area to the public can be mitigated by a combination of data recovery and site protection. In addition, one of the key objectives of data recovery should be integration with interpretation; that is, providing information that can be used in interpretive materials.

Data recovery should include a combination of detailed mapping and excavation at sites selected for interpretation and for development as a living cultural activity, as well as at sites that may provide information to contribute to the interpretation. Table 3 lists sites and suggested data recovery actions. In addition, all sites along the interpretive trail should be photographed in detail (or possibly videotaped) to establish baseline conditions prior to opening the trail to the public for monitoring site condition and effects from visitor access; photographs and/or videos should be linked to the detailed maps to easily relocate photograph positions in future monitoring.

Data recovery should also include continued oral history and ethnographic research, particularly on place names and historic/modern use of the Kealakomo region.

An effort should be made to include community partners in carrying out the data recovery. Active participation in the data recovery would encourage a connection with the place; personal identification with the place would encourage long-term stewardship.

Table 3. Summary of Suggested Data Recovery Actions at Sites to be Interpreted.

Site No.	Description	Detailed Mapping	Excavation	Comment
27195	agricultural complex of mounds, walls, modified outcrops	x	x	map and excavate the portion of agricultural complex selected for living culture activity; select other sample areas for mapping and testing based on criteria such as terrain, elevation
27197	segment of Chain of Craters Road	—	—	search for historic photographs of road before Mauna Ulu flows
27198	petroglyphs; probably associated with 27250 and 27204	x	—	map to combine with 27204 and 27250; drawing of petroglyphs could be used in interpretation
27200	central wall; boundary marker and/or trail	x	—	identify and map best locations for interpretation; clear vegetation around presumed junction of 27200 and 27265 to determine connection, if any; search for historic photographs that could be used in interpretation
27204	enclosure, wall, and three terraces, to east and associated with 27250	x	x	map to combine with 27250 and 27198, and locate best trail route; excavate to define structure function and collect chronometric samples
27205	complex of platforms, walls, enclosures, cistern	x	—	locate best trail route, position of recommended viewing platform; search for historic photographs that could be used in interpretation
27210	rectangular enclosure with 3 to 4 course high, core-filled walls; completely surrounded by Mauna Ulu lava	—	—	has been mapped
27211	rectangular enclosure with 1 m high walls; shell midden; nearby rock mounds	x	—	map mounds in surrounding area and integrate with existing site map; locate best trail route
27213	rectangular enclosure with 1+ m high, core-filled and stacked walls; circular enclosure against interior east wall	—	—	not immediately on trail
27214	rectangular enclosure with 4 to 7 course high, core-filled walls	—	—	has been mapped
27234	complex of C-shapes and modified tumuli	x	x	not immediately on trail but should be mapped and excavated for information to contribute to interpretation
27240	C-shape	x	—	may be part of 27234 complex
27247	C-shape on low *pāhoehoe* rise	x	—	map entire tumulus on which C-shape is located; walls and possible shelter on west and south sides of tumulus not yet mapped
27250	large square enclosure, to west and associated with 27204	x	—	map to combine with 27204 and 27198, and locate best trail route

Table 3. Summary of Suggested Data Recovery Actions at Sites to be Interpreted (continued).

Site No.	Description	Detailed Mapping	Excavation	Comment
27252	C-shape on low *pāhoehoe* rise	x	—	may be part of complex of tumuli, mounds, enclosures (see discussion of unnumbered sites, below)
27258	walled sink, cave, petroglyph	—	—	has been mapped and tested; review map to locate best position of interpretive trail
27263	L-shape on *pāhoehoe* outcrop and associated terrace	x	—	map to provide context with *pāhoehoe* outcrop, earth cracks, and general surrounding natural features
27265	trail	—	—	clear vegetation around presumed junction of 27200 and 27265 to determine connection, if any; search for historic photographs that could be used in interpretation
27268	circular enclosure on *pāhoehoe* outcrop	x	—	map to provide context with *pāhoehoe* outcrop, surrounding area
—	complex of unnumbered structures southeast of 27252			

Detailed Mapping

The existing site maps focus on the built structures within sites. Additional mapping should address the natural context of the built structures (i.e., maps should include lava features, with particular emphasis on areas where the interpretive trail would be appropriate) and any smaller features that may not have been noticed because of more dense vegetation. As noted above, locations of baseline photograph positions should be linked to the detailed maps.

Excavation

Excavation should focus on better understanding site formation process, chronometric context, and structure function, with the intent of facilitating interpretation of sites.

A major component of the archeological complex at Kealakomowaena is agricultural. For Site 27195 (the agricultural complex), excavation should also include an analytical component that addresses the nature of agricultural use of the entire system (e.g., what was grown in the mounds? was anything grown in the low-lying areas between mounds?) and should include the collection of samples for phytolith, pollen, and soils laboratory analyses from beneath mounds, as well as areas between structures.

Report

Beyond the standard technical data and discussion, the report on data recovery excavations and laboratory work should include recommendations for additional work, if warranted, recommendations for content in interpretive materials, and recommendations for site protection measures, including the degree and

extent of vegetation clearance (the balance between exposing structures for interpretation and maintaining vegetation to protect sites) and what to do with identified portable artifacts.

SITE AND TRAIL PREPARATION

Site preservation and protection measures should be well-developed before interpretation and public access take place. In general, the proposed interpretive trail uses the recent flows as the primary trail arteries in order to control visitor access to individual sites and to minimize the creation of social user trails. Where the trail crosses through the *kīpuka* (for example, in the upper east lobe and seaward areas of the *kīpuka*), clearing of natural vegetation will be minimized to discourage visitors from venturing off the trail. This combination of trail location and vegetation will allow visitors to get within close viewing range of sites, but will constrain actual access to the sites themselves.

A sample of Site 27195 (the agricultural complex) should be cleared of vegetation to provide visitors with an unobstructed view of the agricultural mounds. A possible location for consideration is in the vicinity of Site 27258 in the upper east lobe of the *kīpuka*, which would show the relationship of shelters and fields. The mounds are the archeological site type with least potential for disturbance.

HAVO Natural Resources should be consulted on possibilities for revegetation around interpreted sites using native taxa. This replanting can serve the dual purpose of providing screening vegetation, as well as offering a subject for interpretation (e.g., illustrating what the *kīpuka* may have looked like during Hawaiian prehistory).

Portable artifacts are particularly susceptible to vandalism, either through damage on-site or theft. Small portable artifacts should be collected and curated. Large artifacts, such as the stone bowl at Site 27205 (Photo 29), that would be difficult to collect and curate should be turned over or placed in well-concealed locations on-site.



Photo 29. Stone bowl on surface at Site 27205 (photograph courtesy of National Park Service).

LONG-TERM PRESERVATION

In the long term, site preservation will require continued vigilance through maintenance, monitoring, and training and education. A recommendation regarding Road Cut Cave is also made in this section.

MAINTENANCE

The maintenance of trails will be critical for focusing visitors and to prevent the creation of social user trails (in the absence of a clear path, people will make their own route). HAVO will have the responsibility of maintaining interpretive areas, including simple routine cleaning, as well as trail and interpretive care, and revegetation progress.

RESTROOMS

Given the proposed extent of the interpretive trail, as well as the possible use of the area for community living culture activities, restroom facilities will be imperative to prevent damage to the environment and littering.

MONITORING

Monitoring entails two components: one that addresses impacts on sites from interpretive development and one that addresses visitor response to the interpretation.

Monitoring of Impacts on Sites

One of the challenges of opening up the Kealakomowaena area is its remote location, which makes effective monitoring difficult particularly given the current problem of limited staffing in Visitor and Resources Protection. One option is for Visitor and Resources Protection, during its regular patrol along the Chain of Craters Road, to carry out surveillance of the *kīpuka* from the top of Hōlei Pali (the view of the *kīpuka* from Hālona Kahakai pull-out is excellent); if the ranger observes an unwarranted presence in the *kīpuka*, he/she can immediately follow-up with an on-site check.

Impact on sites can also be carried out by Interpretive staff that will be the most likely HAVO personnel on the interpretive trail. They should be trained to identify damage to sites so they can report to Visitor and Resources Protection and Cultural Resources Management. Visitor and Resources Protection staff should also be trained to identify damage and reporting protocols (see Appendix B for a sample standard operating procedure for reporting site damage).

Interpretive Feedback

Monitoring of visitor response to the interpretation should also be carried out, particularly as it relates to the effectiveness of the preservation message. Visitor surveys should be conducted on a regular basis during the first year that the trail is opened, and annually in subsequent years, with modification of the interpretation if it is apparent that the concept of site preservation is not being effectively transmitted.

In addition, feedback from community partners in this same regard should also be solicited.

TRAINING AND EDUCATION

The underlying intent of the interpretive program for Kealakomo is archeological site preservation, with the primary goal of interpretation being to convey a preservation ethic that applies specifically to Kealakomo and generally to all archeological resources in the park.

Education

Educational programs should also be developed to support the educational component built into the interpretive media discussed in previous sections.

Coinciding with the opening of the interpretive area to the general public, there should be an intensive educational blitz about site preservation, possibly as much as six months prior to the trail opening. The goal is to educate the public about the value of the cultural resources and the need to protect them. The Public Information Officer (PIO) in Interpretive Planning and Media Development can take the lead role in planning the media exposure.

The Kealakomo interpretive trail, and the underlying theme of site preservation, should continue to be publicized through park programs such as After Dark in the Park talks, special ranger-led hikes, and the HAVO website, and local events such as the FHVNP annual cultural festival and the Kalapana community festival.

An important component of public education is the training program to certify tour operators who would be allowed to lead tours into Kealakomo. An ecotourism certification program, this training would emphasize the historic preservation theme and would encourage tour operators to pass that message to tour participants.

Internal Training

Internal training (i.e., for HAVO staff) should include:

- Trail Maintenance: The Kealakomo trail is the first archeological/cultural interpretive trail at the park in recent times; development of the trail (i.e., initial trail construction and maintenance) can be used as a training opportunity for Trail Maintenance staff to learn about maintenance parameters for cultural trails, which are different from nature trails.
- Interpretive Planning and Media Development: The IPMD staff, including front-line interpreters, should receive training on the archeology of Kealakomo generally, and specifically on how to recognize damage to sites and the protocol for alerting Cultural Resources Management on impacts to site (see Appendix B for a sample standard operating procedure).
- Visitor and Resources Protection: Similarly, Visitor and Resources Protection staff should receive training on archeological features, how to recognize damage to sites, and the protocol for alerting Cultural Resources Management on impacts to site.

ROAD CUT CAVE AND EASTERN KĪPUKA OF KEALAKOMO

Road Cut Cave (Site 25940), which is located east of the proposed Kealakomo interpretive area, requires special consideration for long-term protection. The cave has a highly visible opening on the north side of Chain of Craters Road that allows access to the cave interior; the opening to the cave is just west of an unsigned pull-out. The cave is frequently visited as an ad hoc visitation point (Photo 30) with no in-place park management controls or interpretation. There are archeological features on the ridge above the cave opening that are relatively easily accessed from the pull-out (Photo 31).

Although the road-side cave opening is not visible from the pull-out, it is recommended that this opening be blocked to ensure that access to the cave interior is controlled. It is also recommended that the pull-out be eliminated by moving the concrete curbing into alignment with the road curb and either removing the asphalt or covering the asphalt with natural material (soil or gravel). Elimination of the pull-out will also limit access to and potential negative impacts on the archeological features on the ridge above the cave opening.



Photo 30. Pull-out below Road Cut Cave (note the two individuals on the top of the flow ridge).



Photo 31. Archeological feature (pavement of *pāhoehoe* slabs) on the flow ridge above Road Cut Cave.

PHASED DEVELOPMENT

Given the constraints of limited funds and staffing, development of the Kealakomowaena interpretation is proposed to be carried out in phases, with the ultimate goal being the full implementation of the interpretive vision. The phased approach uses a projected timeline of five years for three phases. This section describes the actions for each phase; actions are summarized from the more detailed recommendations and discussions in the previous chapter.

Phase I, which is projected for Years 1 and 2, entails preparatory actions for the Kealakomowaena interpretive program. Phase II, which is projected for Years 2 and 3 of the timeline, focuses on design and development of the Kealakomowaena interpretive trail, as well as implementation of some of the Phase I projects. Phase III, which is projected for Years 4 and 5 of the timeline, constitutes implementation of the Kealakomowaena interpretive project.

Cultural Resources Management, Interpretive Planning and Media Development, Natural Resources Management, and Visitor and Resources Protection are the primary organizations within the park that will have key roles in the development of the Kealakomowaena interpretive program. Tables 4, 5, and 6, presented at the end of this section, summarize the phase actions and suggest the HAVO division that would be responsible for implementation.

PHASE I: INTERPRETIVE PREPARATION

The following actions are proposed for Phase I (Years 1 and 2 of the project timeline). The objective of this phase is to set the stage for design, development, and implementation of the interpretive project.

Archeological Requirements

- **Final Site Selection**: finalize site selection for the interpretive trail route. Although the present plan recommends sites for interpretation, further discussion among HAVO staff (subsequent to this plan) may identify other localities better suited for interpretation. As part of this action, the portions of Site 27195 that will be cleared for public viewing should be designated.
- **Data Recovery**: design and carry out data recovery at selected sites along the interpretive trail route, as well as at sites that may contribute information that can be used in the interpretation. Data recovery should also include continued oral history and ethnographic research, particularly on place names. A report detailing the data recovery should include recommendations for the interpretation, including interpretive themes and messages that can be applied to sites along the trail and specific methods of site protection related to visitor presence on the interpretive trail (including protection of portable artifacts); if warranted, recommendations for additional investigations should also be made. Community participation in the data recovery efforts should be considered.
- **Prescribed Vegetation Burns**: consider scheduling Natural Resources prescribed vegetation burns to facilitate data recovery activities.

Site Protection Actions

- **Baseline Data**: create a baseline data set of site condition for all sites along the interpretive trail route, for future monitoring of site condition.
- **Site Protection Methods**: investigate various methods of site protection (e.g., physical barriers, vegetative barriers) relating to visitor presence on the interpretive trail.
- **Road Cut Cave**: develop options for securing the entrance to Road Cut Cave at Chain of Craters Road, and consider eliminating the pull-out near the cave entrance.
- **Monitoring**: design a monitoring program for the interpretive project, with the goal of ensuring preservation of archeological resources when guided tours begin and/or the interpretive trail is opened. The program should consider alternative methods of site monitoring (given staffing limits in Visitor and Resources Protection), for example, long distance surveillance from the Hālona Kahakai lookout.
- **Standard Operating Procedure**: develop and institute a standard operating procedure (SOP) for HAVO staff and others who may encounter damage to archeological sites in Kealakomowaena (see Appendix B); carry out training with appropriate HAVO staff to reinforce the SOP.

Interpretive Design and Development

- **Trail Design**: investigate alternative design and construction options for the interpretive trail.

- **Revegetation**: develop a native plant list that may be appropriate for revegetation in Kealakomowaena. The plant list should take into consideration the results of previous archeological work that has identified plant remains in cultural deposits, as well as remnant populations and historical records (e.g., ranger reports from the 1960s, see Moniz Nakamura and Durst 2010:27). The plant list should also contribute to the interpretive design. HAVO staff should coordinate in regard to long-term trail maintenance requirements as it relates to the revegetation program.
- **Prescribed Burns**. HAVO staff should coordinate in regard to the location and extent of prescribed burns to ensure that on-site interpretive media will not be damaged.

Other Interpretive Projects in the Park

- **Interpretive Projects**: develop interpretive projects elsewhere in the park (see Table 2); ensure that content is archeologically and culturally accurate.
- **Visitor Center**: design and install Visitor Center interpretation that introduces visitors to the Kealakomo region.
- **Overlooks**: design and install wayside exhibits for Hālona Kahakai and Kealakomo pull-outs on the Chain of Craters Road.
- **Along Chain of Craters Road**: design and install *ahupua'a* name signs for placement at *ahupua'a* boundary locations along Chain of Craters Road.
- **Printed and On-Line Materials**: develop printed and on-line interpretive materials.

Training and Education

- **Tour Operators Training**: design, develop, and implement a training program for tour operators seeking certification.
- **HAVO Staff Training**: develop a training program for HAVO staff, particularly those who may be at Kealakomo on a regular basis (e.g., IMPD, Natural Resources, and Visitor and Resource Protection personnel), to understand the archeology of the area and to recognize damage to archeological resources.

Partnerships

- **Kūpuna Advisory Group**: consult with the *kūpuna* advisory group on an on-going basis.
- **Kalapana Community**: work with key individuals in the Kalapana community to develop a living culture component to the Kealakomowaena interpretation (identify specific and long-range goals for the activity, and begin developing specific projects that will coincide with the proposed phased development).
- **Partnerships**: cultivate partnerships with outside organizations (e.g., HNHA, FHVNP, University of Hawai'i-Hilo programs, Three Mountain Alliance, local gardening groups) to participate in various aspects of the Kealakomowaena interpretive program.

PHASE II: DESIGN AND DEVELOPMENT OF INTERPRETIVE TRAIL

The following actions are proposed for Phase II (Years 2 and 3 of the project timeline). The objective of this phase focuses on design and development of the interpretive trail, as well as implementation of some of the Phase I actions. Phase II actions should build on what has been completed in Phase I.

Compliance Requirements

- **NEPA and Section 106 Review**: initiate National Environmental Policy Act (NEPA) compliance and National Historic Preservation Act (NHPA) Section 106 reviews of the proposed interpretive development; this action should be taken as early as possible in Phase II. One component of the reviews will be the opportunity for individuals and organizations to comment and give their thoughts on the project.

Archeological Requirements

- **Data Recovery Recommendations**: implement recommendations of the data recovery project in regard to additional investigations and site protection measures (e.g., physical barriers near particularly sensitive structures).

Site Protection Actions

- **Monitoring Protocol**: develop a standardized monitoring protocol that can be used to evaluate the impact of visitor access on archeological sites. This protocol should address the kinds of baseline data and the method to collect them (if not already done so), the method of assessing impacts, and penalties for impact. HAVO staff should meet on a regular basis to discuss monitoring actions and results.
- **Guided Tours**: monitor guided tours carried out by tour operators who have attended the certification training program.
- **Road Cut Cave**: design, implement, and monitor security measures for the entrance to Road Cut Cave at Chain of Craters Road.

Interpretive Design and Development

- **Detailed Interpretive Plan**: develop a detailed interpretive plan for the proposed Kealakomowaena interpretive trail that includes sign text, illustration, and layout, trail construction and location, sign placement along trails, site protection measures, and safety and comfort facilities (especially restrooms); the plan should include a living culture component. Interpretive content should be consistent with the existing state of archeological knowledge and site protection measures. The plan should have a monitoring component that provides a means to evaluate the visitor experience.
- **Hōlei Pali Pull-Out**: design and install a wayside exhibit and/or kiosk at Hōlei Pali pull-out. Interpretive content should be consistent with the existing state of archeological knowledge and site protection measures.

- **Guided Tours**: initiate guided tours through tour operators who have attended the certification training program; monitor visitor response to the tours by soliciting feedback from visitors and tour operators.
- **Trail Connection**: consider connecting the lower section of the interpretive trail (from Stop 8) with the Puna-Kaʻū Trail.
- **Revegetation**: revise native plant list for revegetation, based on the results of Phase I archeological data recovery.
- **Prescribed Burns**: HAVO staff should coordinate scheduled vegetation burns to best meet the needs of the interpretive development; scheduled burns should be planned to ensure that on-site interpretive media will not be damaged.

Other Interpretive Projects in the Park

- **Off-Site Projects**: continue development of off-site interpretive projects and printed/on-line interpretive materials.

Training and Education

- **Tour Operator Training**: continue the training program for tour operators.
- **Staff Training**: carry out training for Trail Maintenance staff on appropriate methods for trail development and maintenance to ensure that archeological resources are not impacted.

Partnerships

- **Kūpuna Advisory Group**: the *kūpuna* advisory group should be consulted throughout all phases of the interpretive project.
- **Kalapana Community**: continue working with the Kalapana community in the development of living cultural activities.
- **Partnerships**: continue developing partnerships with outside organizations (e.g., HNHA, FHVNP, University of Hawaiʻi-Hilo programs, Three Mountain Alliance, local gardening groups) to participate in various aspects of the interpretive program.

PHASE III: INTERPRETIVE IMPLEMENTATION

Phase III, which is projected for Years 4 and 5 of the timeline, constitutes implementation of the Kealakomowaena interpretive project. Phase III actions should build on Phases I and II actions.

Archeological Requirements

- **Data Recovery Recommendations**: continue implementing recommendations of the data recovery project in regard to additional investigations and site protection measures (e.g., physical barriers near particularly sensitive structures).

Site Protection Actions

- **Site Protection Measures**: ensure that site protection measures are in place prior to opening the interpretive trail to the public, and monitor the effectiveness of the measures.
- **Guided Tours**: continue monitoring guided tours carried out by tour operators who have attended the training program.
- **Visitor Access**: monitor impacts of visitor access to sites on the self-guided trail after the trail has been opened to the public.

Interpretive Implementation and Trail Maintenance

- **Plan Implementation**: implement the detailed interpretive plan for the proposed Kealakomowaena interpretive trail: design, fabricate and install numbered trail markers and/or interpretive signs, construct the interpretive trail, construct safety and comfort facilities (especially restrooms), and work with outside organizations and individuals who will participate in the interpretation (e.g., Kalapana residents).
- **Trail Maintenance**: ensure that the interpretive trail is maintained and that any social user trails are immediately dismantled.
- **Revegetation**: ensure that revegetation efforts are completed or near completion prior to opening the interpretive trail to the public.
- **Prescribed Burns**: HAVO staff should coordinate scheduled vegetation burns to best meet the needs of the interpretive implementation; scheduled burns should be planned to ensure that on-site interpretive media will not be damaged.
- **Visitor Response**: carry out visitor surveys on a regular basis after the interpretive trail has been opened to the public.

Other Interpretive Projects in the Park

- **Off-Site Projects**: continue development of off-site interpretive projects and printed/on-line interpretive materials.

Training and Education

- **Pre-Opening Promotion**: prior to opening the interpretive trail to the general public, conduct a six-month media promotion to educate the public on site protection and historic preservation at Kealakomowaena; this will enable the development of a public consciousness on the value of historic properties and the need for preservation.

Partnerships

- **Consultation**: consult and work with outside organizations and individuals who will or who may wish to participate in the interpretation.
- **Kūpuna Advisory Group**: the *kūpuna* advisory group should be consulted throughout all phases of the interpretive project.

- **Kalapana Community**: continue working with the Kalapana community to implement living cultural activities.

Table 4. Phase I Actions for Kealakomo Interpretive Program Implementation, Listed by Suggested Staff Responsibility.

Suggested HAVO Office	**Lead Action**	**Consultation with:**
Cultural Resources	• Finalize site selection for interpretive trail • Design and carry out data recovery on selected sites; continued oral history and ethnographic research • Create baseline data set of site condition for all sites along trail route, for future monitoring of site condition • Consult with the kūpuna advisory group • Develop and institute a standard operating procedure for reporting damage/disturbance to sites on interpretive trail • Conduct training for other HAVO staff on identifying damage to archeological sites • Cultivate partnerships and collaborative arrangements • Develop options for securing entrance to Road Cut Cave	• Interpretive Planning: [1] methods of site protection relating to visitor presence; [2] accuracy of content of interpretive materials; [3] developing certification program for tour operators; [4] training for IPMD personnel to recognize damage to the resources • Interpretive Planning and Trail Maintenance: design options for trail construction • Natural Resources: [1] future prescribed vegetation burns at Kealakomowaena; [2] long-term trail maintenance requirements as it relates to revegetation program; [3] revegetation for site protection and interpretation; [4] training for NR personnel to recognize damage to the resources • Visitor and Resources Protection: [1] site protection monitoring program; [2] training for Visitor and Resources Protection personnel, particularly in recognizing damage to the resources; [3] SOP in the event that damage is recognized • Maintenance: remove Road Cut Cave pull-out on Chain of Craters Road • Other outside organizations and individuals who may wish to participate in the interpretation and/or in the data recovery • Kūpuna advisory group: all aspects of the process
Interpretive Planning and Media Development	• Design, install Visitor Center interpretation • Design, install wayside exhibits for Hālona Kahakai and Kealakomo pull-outs • Design, install ahupua‘a name signs for placement along Chain of Craters Road • Develop printed and/or on-line interpretive materials • Design and implement a certification program for tour operators • Work with the Kalapana community on living culture component to Kealakomo interpretation.	• Cultural Resources: [1] site protection methods relating to visitor presence; [2] accuracy of interpretive content • Cultural Resources and Concession Specialist/CUA: certification program for tour operators • Cultural Resources and Trail Maintenance: design options for trail construction • Maintenance: installation of interpretive exhibits • Other outside organizations and individuals who may wish to participate in the interpretation and/or in the data recovery • Kūpuna advisory group: all aspects of the process

Table 4. Phase I Actions for Kealakomo Interpretive Program Implementation, Listed by Suggested Staff Responsibility (continued).

Suggested HAVO Office	**Lead Action**	**Consultation with:**
Natural Resources	• Develop a native plant list that may be appropriate for revegetation in Kealakomowaena	• Cultural Resources: [1] prescribed vegetation burns, particularly scheduling that would facilitate data recovery activities, [2] appropriate native plants for revegetation • Interpretive Planning: location and extent of prescribed burns to ensure that on-site interpretive media will not be damaged • Cultural Resources and Interpretive Planning: revegetation with native plants in a manner that contributes to the interpretive design
Visitor and Resources Protection	• Develop monitoring program for Kealakomowaena • Experiment with long-distance surveillance from Hālona Kahakai lookout	• Cultural Resources: [1] site protection monitoring program; [2] training for Visitor and Resources Protection personnel, particularly in recognizing damage to the resources; [3] secure entrance to Road Cut Cave

Table 5. Phase II Actions for Kealakomo Interpretive Program Implementation, Listed by Suggested Staff Responsibility.

HAVO Office	Lead Action	Consultation with:
Cultural Resources	• Initiate NEPA compliance and Section 106 review of proposed trail • Implement recommendations of data recovery project • Develop a standardized monitoring protocol to evaluate visitor impact on sites • Monitor guided tours by certified tour operators • Design and implement security measures for Road Cut Cave entrance • Carry out training for Trail Maintenance staff	• Interpretive Planning: on detailed interpretive plan for the proposed interpretive trail • Natural Resources: on native plant list for revegetation and scheduling for prescribed vegetation burns • Visitor and Resources Protection: securing the entrance to Road Cut Cave; meet on regular basis to report on monitoring actions and results • Kūpuna advisory group: all aspects of the process
Interpretive Planning and Media Development	• Develop detailed interpretive plan for proposed Kealakomowaena interpretive trail • Design and install a wayside exhibit and/or kiosk at Hōlei Pali pull-out • Continue development of off-site interpretive projects and printed/on-line interpretive materials • Continue working with community members on the living culture component of the interpretation • Monitor visitor response to the guided tours • Consider extension of interpretive trail to the Puna-Kaʻū Trail	• Cultural Resources: [1] on detailed interpretive plan for the proposed interpretive trail, particularly in regard to accuracy of sign text relative to the existing state of archeological knowledge and site protection measures; [2] design of the Hōlei Pali exhibit; [3] extension of interpretive trail to the Puna-Kaʻū Trail • Maintenance: installation of the Hōlei Pali exhibit • Outside organizations and individuals who will participate in the interpretation • Kūpuna advisory group: all aspects of the process
Natural Resources	• Revise native plant list for revegetation, based on Phase I archeological data recovery • Establish revegetation program as part of Kealakomowaena interpretation	• Cultural Resources and Interpretive Planning: on scheduled prescribed vegetation burns
Visitor and Resources Protection	• Monitor tours carried out by certified tour operators • Monitor effectiveness of security measures at the Road Cut Cave entrance at Chain of Craters Road	• Cultural Resources: meet on regular basis to report on monitoring actions and results

Table 6. Phase III Actions for Kealakomo Interpretive Program Implementation, Listed by Suggested Staff Responsibility.

HAVO Office	Lead Action	Consultation with:
Cultural Resources	• Ensure that site protection measures are in place prior to opening the interpretive trail to the public • Continue monitoring guided tours carried out by tour operators who have attended the training program • Monitor impacts of visitor access to sites on the self-guided trail • Consult with the kūpuna advisory group	• Interpretive Planning: implementation of detailed interpretive plan for proposed interpretive trail • Trail Maintenance: routine trail maintenance; dismantling of any social user trails • Visitor and Resources Protection: effectiveness of monitoring efforts • Outside organizations and individuals who may wish to participate in the interpretation • Kūpuna advisory group: all aspects of the process
Interpretive Planning and Media Development	• Implement detailed interpretive plan for the proposed Kealakomowaena interpretive trail • Implement living culture component of the interpretation • Monitor visitor response to the guided tours • Conduct a six-month media promotion prior to opening the interpretive trail to the general public • Carry out visitor surveys on a regular basis after the interpretive trail has been opened to the public	• Cultural Resources: implementation of detailed interpretive plan for proposed interpretive trail • Natural Resources: ensure that revegetation efforts are completed or near completion prior to public opening of interpretive trail • Outside organizations and individuals who will participate in the interpretation • Kūpuna advisory group: all aspects of the process
Natural Resources	• Ensure that revegetation efforts are completed or near completion prior to public opening of interpretive trail	• Cultural Resources and Interpretive Planning: scheduled prescribed vegetation burns
Visitor and Resources Protection	• Monitor tours carried out by certified tour operators • Monitor site visitation after interpretive trail has been opened to the public	• Cultural Resources: review effectiveness of monitoring efforts

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APPENDIX A.
INTERPRETIVE COMMENTS AND NOTES FOR PRESERVATION PLAN. KEALAKOMO AHUPUA‘A

Prepared by
Interpretive Planning and Media Development Branch
March 2010

The following document was prepared by the HAVO Interpretive Planning and Media Development Branch in March 2010. It was developed in response to the Concept Plan for Kealakomo interpretation (Tomonari-Tuggle and Tuggle 2009), and builds on project discussions with park staff and *kūpuna*, and a preliminary version of the present Preservation Plan.

Hawai‘i Volcanoes National Park

Interpretive Comments and Notes for Preservation Plan

Kealakomo Ahupua‘a



Prepared by

Interpretive Planning and
Media Development Branch

MARCH 15, 2010

Kealakomo

.....I Poupou	At Poupou
I Lē'apuki	At Lē'apuki
I Pānau Iki	At Pānau Iki
I Pānau Nui	At Pānau Nui
I ka pāhoehoe	On the hard, smooth pāhoehoe lava
I ke pulu 'ōhi'a	In the soft wetness of the 'Ōhi'a

Ku'u aikāne i Kealakomo lā, i 'Āpua...
My companion at Kealakomo, at 'Āpua

-The epic tale of Hi'iakaikapoliopele, Ho'oulumāhiehie & Nogelmeier

The land of Kealakomo is a site rich in cultural heritage and great in diversity. Once home to a sustaining community, the breathe of Kealakomo bestowed life onto generations of native Hawaiians. This relationship between the Hawaiians native to these lands, and the 'āina they call home was inspired out of a respect, mālama and aloha. Cultivated for sustenance and cared-for for prosperity, this 'āina sustained life.

Opening the remnant kīpuka of Kealakomo will provide visitors with unique opportunities to discover one of the few remaining traditional Hawaiian village sites in the Park. It will unveil stories about the land and the people who lived there—stories that can't be told anywhere else in Hawai'i Volcanoes National Park. Although this 'āina lends it's own interpretation through a purely sensory and emotional experience, establiblished interpretation would enhance that experience to tell the human stories; what life was like for these Hawaiians who guided by their kūpuna, lived here in harmony with their lands, the ocean, and the surrounding elements. Interpretive media would also provide visitors with multiple opportunities to make both tangible (house, agricultural fields and uala) and intangible (life, birth, survival, sharing, and death) connections to these people (their life and lifestyles), to these lands and sea as their source of life, and to those who continue their lineage to it.

The challenge of how best to open this site while providing for preservation is an obtainable and necessary goal. Although a project of this nature hasn't been undertaken in many years, it will be well worth the time and effort as its benefits will have far reaching implications. It will be a learning experience, an experiment that we believe will require active monitoring, evaluation, and change if and when necessary.

The following are the recommendations of Interpretation with regards to this project:

- Develop this project in stages:
  - Phase I:
    - Develop 1-3 interpretive waysides for the following possible locations; Kealakomoweana overlook, Hālona Kahakai pullout, or Alanui Kahiko.
  - Phase II:
    - Develop a single designated and thematic loop trail starting and ending from the Hōlei Pali pullout.
    - Develop interpretive exhibits for onsite interpretation prior to the opening the village site.
    - Develop content for the website that can be accessed either before visitors arrive or once in park. These can take the form of pdf. scientific papers, video podcasts, maps, and etc. Information can be multilingual.
    - Develop content for orientation panels in Kīlauea Visitor Center
  - Phase III:
    - Design a corridor connecting this site to the lower Puna coast trail based on thematic interpretive principles.

- Design the interpretation along the loop trail so that it provides for optimum views of the features being interpreted, and of the surrounding landscape (both ma uka and ma kai). This will enhance preservation by keeping visitors on the designated trail and curtail rouge exploration. Install 1-3 outdoor Eco-box at key interpretive stops to provide first person interpretation to the site. This hand crank unit can provide up to four different messages through a high quality marine grade speaker.

- Develop into the interpretation the content proposed for the East side. What information about caves would we like interpreted and where along the loop trail can we incorporate that information.

- Reconstruct a hale traditional to this landscape and restore key agricultural mounds. Work with the community to engage youth and elders in an intergenerational exchange of wisdom, fun and lifelong shared memories. This would add a touch of real Hawai‘i to the site along with insure the protection of Kealakomo for future generations.

- Incorporate into the interpretation a Konohiki(s); community member(s), volunteer(s), or employee(s). Visitors would have the ability to interact with this individual(s), and help restore portions of this cultural landscape by lending a hand with either the replanting of mounds, rebuilding the hale, or other such activities. This success could be celebrated, and the role parks play, as part of the 2016 centennial.

• Provide benches as rest areas for visitors to relax and enjoy surrounding features and landscape views. These benches along with the interpretation will support protection of the surrounding fragile features—"Keep your feet off the furniture" concept. Benches could be located at stops 5c, 5f, & 5h.

• Defer inclusion of the Parks burn efforts in the permanent waysides and allow this story to be told either by onsite staff or through the use of temporary waysides as it doesn't resonate with the overarching exhibit theme.

Recommended Comprehensive Interpretive Plan for the Ahupua'a of Kealakomo

1) Park Brochure

Visitor Experience and Notes

1. Visitors discover the lands of Hawai'i were traditionally divided into ahupua'a; Keauhou, 'Āpua, Kahue, Kealakomo, Pānau Nui, and Pānau Iki.

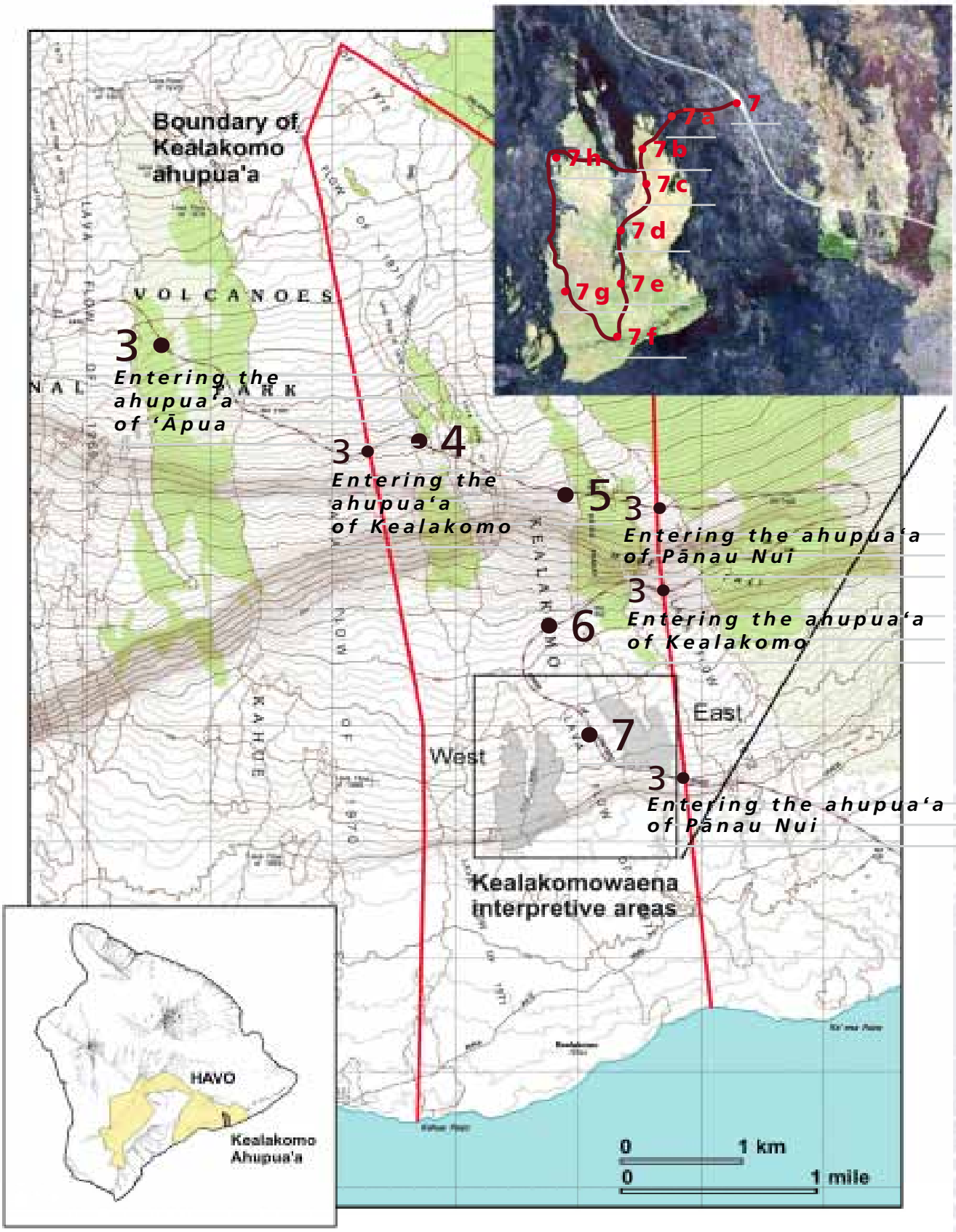
2. Visitor garnish a better understanding of the Native Hawaiian people, their culture, and their many connections to the land in the "People of these lands" cultural section of the Park brochure.

2) Kīlauea Visitor Center

Visitor Experience and Notes

1. Visitors, while planning their trip using the "4-hours or more" orientation panels, learn that they can visit this unique cultural village. The are able to read a brief description of the site which would include hiking information, duration of program in time, along with an additional interpretive statement describing the program.

2. Questions: Where should I go? What should I do? I only have 1-4 hours what are best places to see in the park? Where do I go if I want to experience the traditional Hawaiian sites? Are there any sacred sites?



Map from Draft Preservation Plan

3) Chain of Craters Road interpretive signage:

Exhibit Theme: Your travels will take you through several traditional Hawaiian sections of land—the birthplace of Hawaiians.

Visitor Experience and Notes

1. Visitors, while driving down the chain of craters road will observe signs announcing their entry in the various ahupua'a; Keauhou, 'Āpua, Kahue, Kealakomo, Pānau Nui, and Pānau Iki. This will initiate their orientation to how lands were culturally divided while providing them a sense of place.

2. Questions: Where am I? Why were these lands added to the Park? What is so special about this place? What was here before the National Park took over? Did Hawaiians live here? Where and Why here?

4) Kealakomo Overlook:

Exhibit Theme: Generations of Native Hawaiians identify these ahupua'a as the birthlands of their küpuna.

Visitor Experience and Notes

1. Visitors descend the paved trail to the Kealakomo platform. While taking in the incredible vista they learn about the significance of the lands that surround them. Placed on the railing will be 1 or 2 wayside panels each of which would include an illustration (possibly a tactile relief model)of the landscape before them. The panels will identify the traditional Hawaiian land boundaries (both the vertical and horizontal land divisions) along with the district for which they are in. Village sites, and sacred areas that exist within their field of view along with the ancient trails could be identified. The text will elaborate on the theme, by putting into context the importance of these divisions to the people of these lands as well as how they were used.

2. Questions: What are ahupua'a? What are the different Wao? Why are they important? Who designated this system and why? How was it used? How long was it in place? Is it still used today?

5) Hālona Kahakai Pullout:

Exhibit Theme: Natural forces like eruptions, earthquakes, and tsunamis affected the residents of these coastal communities.

Visitor Experience and Notes

1. Visitors approach multiple wayside that introduce them the affects of eruptions (prehistoric and historic), earthquakes, and tsunami's. Maps could be used to show how many village sites (i.e. the Mauna Ulu eruption covered some 100 square kilometers of prehistoric homes and agricultural areas) have been covered by eruptions, and tsunami's. Discussions could outline the large devastating earthquakes that have occurred and photo's would show the destruction they cause.

2. Questions: How old is this lava flow that's surrounding us? How old is the grassy areas? What were its effects on the Hawaiian communities if any? What kinds of other natural disasters have happened here? Can you imagine living on these lands?

3. After the village site is opened this content can be evolved to be more site specific. Possibly include, through the use of a modified archeological survey map, the outline the rich village site below them. The panel could intertwine use of modern and historic images of the area along with images of sustenance practices to illustrate the interdependence of the native peoples on the lands and oceans for food and their respect for these sources of survival.

6) Alanui Kahiko Pullout:

Exhibit Theme: The construction of these two roads show a different level of respect and craftsmanship for the land and its unique features.

Visitor Experience and Notes

1. Visitors are drawn to 1 or 2 wayside exhibits that illustrates the varied road construction techniques that were used during the different time periods from which they were created. Early techniques often didn't take into account the location of village sites and other unique geological features. Lessons have taught us to show more respect for the land.

2. Questions: What is that section of road? When was it created? When was it covered? Why did it get built here? Why did the park rebuild it here if it might just get covered again?

7) Hōlei Pali Pullout:

Overarching Theme

The journeys of the people native to Kīlauea, who have adapted and subsisted for generations on these quickly changing raw lands, is a story of survival, ingenuity, and assimilations that provide enduring lessons about human resourcefulness, interdependence, and respect for the life of the land.

Visitor Experiences and Notes

1. Visitors approach two 36 x 48 vertically oriented outdoor exhibit panels that help provide the foundation for their hike. The first panel will provide orientation material; trail information along with safety and regulatory information. Visitors, through the use of a map, discover where they are located, the location of the hike, and how this site fits into the larger landscape. A gap left between the angled panel, along with an ahu, will be used to indicate the start of the trail. The waysides would act as a funnel and encourage reading of panels prior to the start of their hike.

2. The second exhibit titled "Native Hawaiians thrived and survived on these lands—they welcome you into their community with aloha," will provide the cultural foundation for their visit. The panel would start to answer why you would have visited this site; yesterday verses today. Audio of kūpuna, addressing the Hawaiian perspective of "Malama ʻāina", "respect", and "kuleana" would complement this exhibit. This content will be continued throughout the hike to illustrate the importance and use of these concept in the Hawaiian culture.

3. Questions: What's here? Why should I go? How long is it? What should I take with me? What should I know before I go? In traditional times, why would I have come here? How would I have gotten here?

7a) Top of tumuli:

Exhibit Themes

The lavas of Pelehonuamea have permanently preserved portions of this ancient village.

Visitor Experiences and Notes

1. Visitors approach their first wayside where they learn about Pele's history with these lands. Visitors learn about the respect these Hawaiians have for Pele and her creations. They are amazed to learn just how many traditional, now archelogical, features have been reclaimed by Pele and in what densities (i.e. 9,700->10,000). Visitors are offered the opportunity to envision what the larger landscape would have looked like before these lava flows; a landscape where grandparents, parents, and keiki all roaming about.

2. Questions: Wow, what's out there? How much? Who lived here and how did that change over time? Does anyone live here now? What happened here? How did they survive here?

3. Because we have to change the time period to discuss the old road, we recommend that we don't interpret the old road. Discussion of the road doesn't relate to the overarching exhibit theme. Visitor, having stopped at Alanui Kahakai would have already received this information. We recommend that the trail continue through the road so as not create social trails to it.

7b) Feature 27258 (Water cave with Petroglyph):

Exhibit Theme

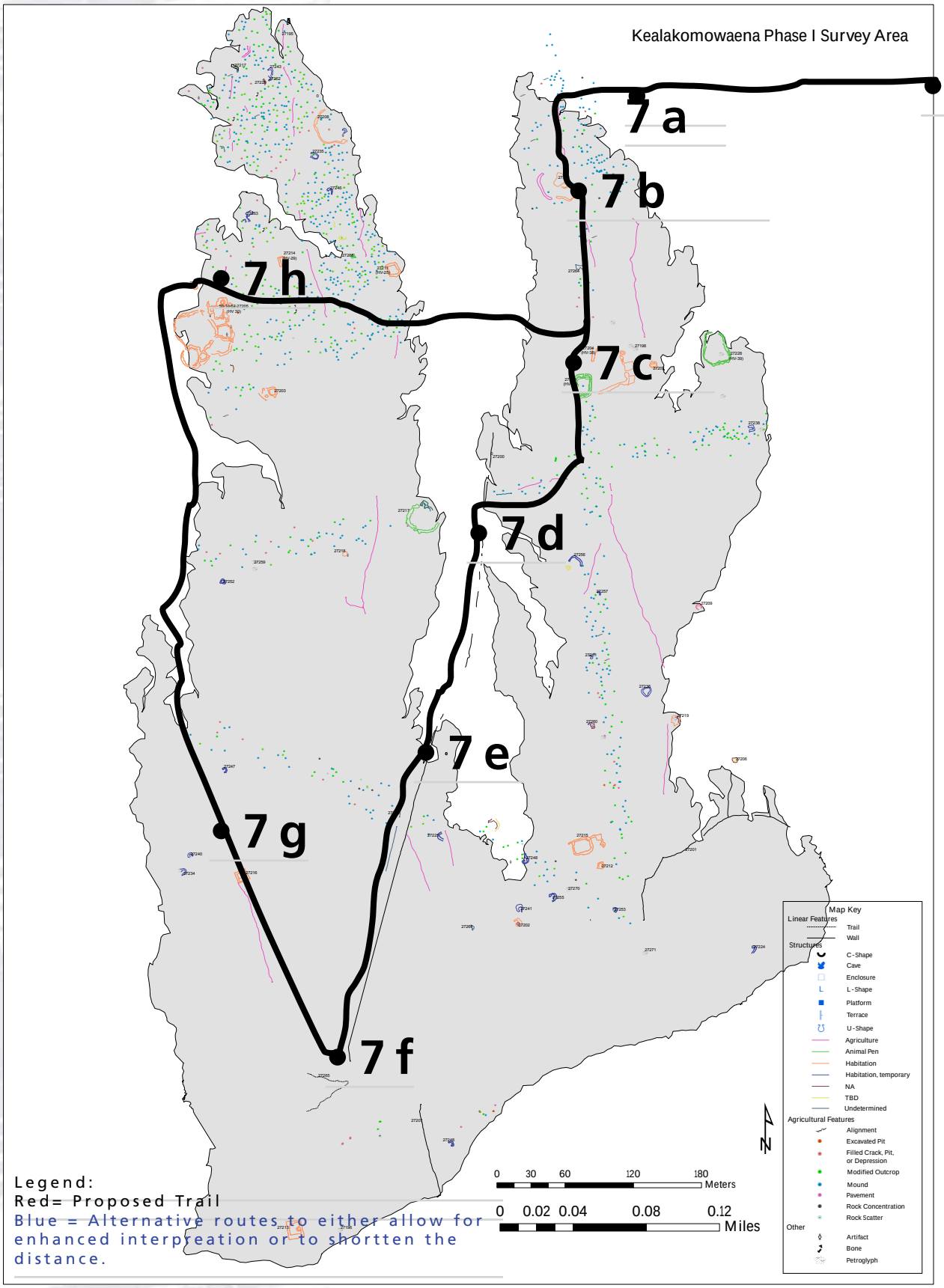
Survival required shelter and water, drop by drop from this lava tube the kuleana of the all who lived here.

Visitor Experiences and Notes

1. Approaching visitors are presented with a seemingly indiscrete circular pile of rocks. They learn that it is so much more than just a "pile of rocks." Highlighted is the interior cave opening and the neighboring petroglyph. While at this site, visitors learn about how water was collected here and how. They can see a modern rain collector on the surface and a gourd in the cave and be able to compare catchment amounts.

2. Prior to leaving this site they are presented with an activity; How many hours would it take for you to collect water from this site to feed your animals at the next stop. Along the way count the number the features you encounter and imagine what they might have been used for? This activity will help them understand just how many features are packed into this landscape. Along the way, we identify some of the different types of features and explain their significance (use). Visitors learn the importance of treading light on the land and watching where they walk—a rock isn't just a rock.

3. Questions: How did they collect water? How long did it take? Where did it come from? How much could be collected in a day's time, weeks time? Where else could they go for water? Was the water potable? What other methods were used to collect water? If it was such a hot commodity, who regulated it? How much of the day was spent collecting water?



Map courtsey of Cultural Resources Management; Dr. Moniz-Nakamura

7c) Feature 277250 (Animal Pen):

Exhibit Theme

These carefully stacked rocks corralled animals for food, travel, and to share with other families.

Visitor Experiences and Notes

1. As visitors view an animal enclosure (stone structure), they learn about what animals were kept by native Hawaiians and for what purpose—what animals were housed in this enclosure. Visitors are intrigued to learn about how animals were kept, hunted and shared with other families within the ahupua‘a with other ahupua‘a.

2. Questions: What animals did Polynesians bring to Hawai‘i and why? What animals made it to this part of Hawai‘i? What animals were kept for food? How were they cooked? How did this wall keep in goats that were excellent jumpers? Did it work for pigs and horses? When were these animals first introduced to Hawai‘i. What did they eat? Were they affected by disease or other illnesses? How were these tended to?

3. Where in the park do we tell the goat invasion story and their effects on the landscape? We don’t feel this is the place to do it as it requires us to jump to very modern times and stray from the overarching exhibit theme. This is a different story that distracts from the history of the native Hawaiian.

7d) Historic Stone Wall:

Exhibit Theme

These carefully crafted stone walls defined whose kuleana it was to mālama the land.

Visitor Experiences and Notes

1. Visitors discover the possible prehistoric and historic uses of this wall. Along this section of trail, visitors learn that they are walking in the footsteps of the residents that once lived and worked here. Visitors learn about how the varied techniques for building trails and why trails were so important to the native Hawaiian community.

2. Questions: How long did it take to build this wall? Where did all the rocks come from? How where they obtained? Who owned what? Did the trail only do up the West side of the wall or were both sides used? Did wall keep out animals? Did residents cross over into the other side?

7e) Agricultural Mounds:

Exhibit Theme

Hawaiian ingenuity proved successful in growing sweet potatoes from piles of rocks.

Visitor Experiences and Notes

1. Visitors have been experiencing the lowland heat and are wondering how these residents sustained themselves. They see before them several indiscriminate piles of rocks and discover what they were used for, how they were made, and how important this style of agriculture was to these Native Hawaiians.

2. Questions: How were they grown, cooked, and stored. How long would they last uncooked, after cooked. How long would it take to collect them and how often was it done? Who tended to these crops and what was the best environment for growing them? With proficiency were more mounds activated? Did they like fun sun or shade?

3. It would be fun to add a sweet potato recipe here and allow for visitor to help in the restoration of mounds in this area. This would care and respect for the land, the people, and work it took to survive.

7f) Pali View:

Exhibit Theme

Native Hawaiians quickly adapted to this ever changing landscape.

Visitor Experiences and Notes

1. Amazed by the views before them, visitors discover that there used to be other communities living in the area. They learn why many of these communities are no longer present today and how there were impacted by natural forces. With the loss of their surrounds family, it could have drove these residents to move as well.

2. Questions: How many communities were there down here? How big were their populations? Where was the last settlement and when was it vacated? What is the Hawaiian perspective of land ownership; once you leave do you still have ties to those lands? Where did they all go after they left? Are there historical accounts of this area?

7g) Tumuli modified for agriculture and other uses:

Exhibit Theme
Hawaiians modified their landscape to best suite their needs of survival.

Visitor Experiences and Notes
1. Visitors discover that not only did these Hawaiians congregate rocks to grow their desired crops but they also modified existing lava flow features to increase their yield and to collect rain water run off via natural means.

2. Questions: What are we looking at? Why is this important? What are the different parts used for? How much work did it take to make this? Was it worth it? What else could this be used for and how was that determined? Could we survive on this land utilizing the lessons learned from these residents? What else was grown out here? Where was it cooked and eaten?

7g) HV-30 House Complex:

Exhibit Theme
The life of the native Hawaiian is centered around caring their ohana (family).

Visitor Experiences
1. Here visitors discover a large house complex and learn about the site and it's implications for sustaining life. They discover how fire was made after viewing the hearth and what was cooked here. They see where water was collected within the cistern and learn how it was collected.

2. Questions: How many people lived here? Was there a roof over their heads? How was the rest of the house made? How many people slept here? Where animals kept in some portion of the house? What the house segregated; men, women, kids? Was there a "storage room" of sorts and if so which one was probably it? What were all the other spaces used for? How long did it take to make this whole site? Was it built at one time or in stages? Do you think it was built here for the view? What materials were used to build the hale? How often did they have make repairs to their home? What did they use to make the repairs? Where did that material come from? Did it require weaving and if so how long did it take to make it? Did a big family live here? Where Hawaiian families usually big or small?

APPENDIX B.
SAMPLE STANDARD OPERATING PROCEDURE

The following is a sample standard operating procedure (SOP) to be followed by HAVO staff who discover damage to archeological sites in the Kealakomo interpretive area. This will apply primarily to Interpretive Planning and Media Development and Visitor and Resources Protection staff; Natural Resources staff carrying out revegetation projects in Kealakomowaena may also encounter damage to sites and should follow this SOP. Community participants in any activity in the interpretive area should also be informed of the SOP.

As part of the development of the Kealakomo interpretive trail, Cultural Resources staff will create a baseline data set on site condition for all sites along the interpretive trail, and will provide training to other HAVO staff and volunteers, community participants in the interpretive activities, and certified private tour operators on identification of damage to these sites.

Standard Operating Procedure for Identification of Damage to Archeological Remains

PURPOSE: This SOP provides uniform guidelines in the event that archeological remains along the Kealakomo interpretive trail are found to have been disturbed or damaged, including damage from removal of portable artifacts.

REFERENCE: Archaeological Resources Protection Act (ARPA) and its implementing regulations at 43 CFR Part 7; National Park System Resources Protection Act (16 USC 19jj); NPS Director's Orders 14 and 28a.

RESPONSIBILITY: Primary responsibility for carrying out this SOP lies with all HAVO staff, volunteers, community participants in interpretive programs, and/or certified private tour guides. The main point-of-contact is Cultural Resources at 985-6193.

PROCEDURES:

1. Upon discovery of damage to archeological remains, the individual making the discovery will notify Cultural Resources with information on date and time of the discovery, location, circumstances of the discovery, character of the damage, and any other information that might contribute to defining the cause of the damage.

2. Cultural Resources will immediately contact Visitor and Resources Protection, and representatives of each office will jointly go on-site to examine the damage.

3. If the damage is evaluated to be the result of a prohibited act under ARPA regulations (i.e., excavation, removal, damage, or otherwise alteration or defacement of any archeological resource), Visitor and Resources Protection will document the damage as a violation of ARPA and will pursue the violators as called for by law.

4. Cultural Resources will document the damage as part of site monitoring protocols for the interpretive trail, through written notes and photography and/or videography, will update the baseline data set on site condition, and will determine if additional archeological work is needed to mitigate the impacts of the damage.

5. The damage should be recorded using guidance as set forth in NPS Director's Order 17 so that restitution can be sought in the event that the perpetrator is caught or may be caught. Restitution can include the costs of response and assessment of damage.

6. New data on the site will be added to the Cultural Resources data files (hard copy, database, and GIS).

7. Cultural Resources will review the circumstances of the reported damage and make recommendations to [a] Interpretive Planning and Media Development on changes to the interpretive program to prevent further impacts on sites, including the enhancement of public education components to the interpretation, and [b] Visitor and Resources Protection on the need for additional monitoring.

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