
Archaeological Technician Training Kaho'olawe Practicum Report

**Prepared for
Pacific American Foundation**



**Prepared by
Kelley Lehuakeaopuna Uyeoka,
Katie Kamelamela
and
Hallett H. Hammatt, Ph.D.**

**Cultural Surveys Hawai'i, Inc.
Kailua, Hawai'i
(Job Code: KAHOOLawe 1)**

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**O'ahu Office
P.O. Box 1114
Kailua, Hawai'i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950**

www.culturalsurveys.com

**Maui Office
1993 Main St.
Wailuku, Hawai'i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994**

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Section 1 Introduction

1.1 Project Background

Cultural Survey's Hawai'i has partnered with the Pacific American Foundation (PAF) to provide archaeological technician training, consulting, and mentoring services to individuals in the Kaho'olawe Island Reserve Commission (KIRC) and the Protect Kaho'olawe 'Ohana (PKO). The Pacific American Foundation's Mālama Kaho'olawe project is a partnership between the KIRC, PKO, Polynesian Voyaging Society (PVS) and Hawai'i Department of Education (Maui County). This project is funded by the U.S. Department of Education to develop and implement vocational curricula that are related to the long-term stewardship needs of Kaho'olawe. The objective of the Archaeological Technician Training program was to expose post-high school individuals to career fields that would lead to an eventual career in the long-term management of Kaho'olawe.

1.2 Training Objectives

The first training session for the Archaeological Technician Training program took place on O'ahu from August 9-10, 2009 and August 23-24, 2009. In the first training session, students were exposed to the field of archaeology. The training objectives were as follows:

- Ability to identify a Hawaiian archaeological site.
- Understand the role of archaeology in land management, preservation and planning.
- Understand the basic principles and methods of archaeology.
- Understand the basic operating principles of Global Position System (GPS).
- Demonstrate use of GPS, compass and tape for archaeological site mapping.
- Understand the principles of site mapping, mapping conventions and professional standards.

The second training session took place on the island of Kaho'olawe from July 1, 2009 to July 5, 2009. In this training session, the students applied the lessons learned in the first training session by conducting actual surveying and mapping exercises in the field on Kaho'olawe. The training objectives of this session were:

- Develop the ability to recognize and identify the various types of archaeological sites and features found on Kaho'olawe.
- Utilizing standard methods for mapping develop the ability to properly locate an archaeological site utilizing accurate GPS as well as scaled maps and aerial photographs depicting the surrounding environment.
- Develop the ability to draw a scaled plan view sketch map of any remains, artifacts and/or cultural features.

- Utilize standard methods for recording profiles and plans showing stratigraphic layers, natural and cultural formations, and subsurface portable materials
- Be familiar with the professional standards and regulatory procedures when protecting, preserving or restoring an archaeological site or feature.



Figure 1. Training in the classroom.



Figure 2. Training in the field.

Section 2 Field Methods and Results

2.1 Field Methods

Field work at the Kāneloa and Kealaikahiki sites were conducted on July 3 and 4, 2009. Field work at Ka Piko o Wākea was conducted on July 3, 4, and 5, 2009. Field methods for all three sites varied, but consisted primarily of reconnaissance survey, site identification, documentation, and description.

2.1.1 Scope of Work and Field Methods at Ka Piko O Wākea

An archaeological assessment of the current conditions of Ka Piko o Wākea was carried out over a period of three days from July 3rd through July 5th, 2009. The July 3rd crew consisted of Protect Kaho'olawe Ohana (PKO) members Michelle Norman, Ikaika Nakahashi, Blake Brutus LaBenz, Leina Wender, and Momi Wheeler (PKO and Cultural Surveys Hawai'i [CSH] archaeologist) along with CSH archaeologist Tanya L. Lee-Greig and Kaho'olawe Island Reserve Commission (KIRC) Safety Specialist Bart Maybee. Crew members on July 4th included the above mentioned team with the addition of PKO members Dr. Emmett Aluli and Luna Kekoa, as well as KIRC Cultural Resources Project Coordinator and PKO member Kahale Saito and KIRC Executive Director and PKO member Michael Naho'opi'i. Finally, the July 5th crewmembers consisted of CSH archaeologists Momi Wheeler (also PKO), Dominique Cordy, Auli'i Mitchell, Tanya L. Lee-Greig, and Hallett H. Hammatt.

The following tasks were carried out during the course of this archaeological assessment:

1. Reconnaissance of the current conditions and horizontal extent of cultural material associated with Ka Piko o Wākea;
2. Mapping of both the heavy concentration of cultural material surrounding the hummock feature and the outermost extent of the cultural material associated with Ka Piko o Wākea;
3. GPS mapping of potential erosion threats that may contribute to site degradation of Ka Piko o Wākea;
4. Updated cross-section of the hummock and architectural features along the Y baseline that was mapped and recorded during the Kaho'olawe Island Reserve Unexploded Ordnance (UXO) Clearance Project (hereafter referred to as the Clearance Project) on August 27, 1998; and
5. Mapping of the current condition of the hummock feature associated with Ka Piko o Wākea.

Mapping of both the heavy concentration of cultural material surrounding the hummock feature and the outermost extent of the cultural material associated with Ka Piko o Wākea was accomplished in the following manner:

1. The boundaries of both the cultural material concentration, outermost site extent, and current erosion threats (e.g. developing erosion gullies and tributaries) were flagged and located using Garmin GPSMap 60CSx;

2. GPS points associated with the boundary of the cultural material concentrations and developing erosion threats were plotted on the 1998 field map by working off mapped location of Grid Map Unit (GMU) Stake 75282757;
 - a. In order to distinguish between the archaeological work completed in 1998 and the current update, different symbols were generated and keyed in the upper left hand corner of the field map.
3. GPS points associated with the boundary of the outermost extent were plotted on the overall Task Order 007 Figure 3-7 (after Hammatt, et al. 1999:Oversized) GMU map;
4. Photographic record of the current site conditions was taken using the Gigapan Camera Equipment (courtesy of UH Manoa and Katie) from four vantage points that were located using the Garmin GPSMap 60CSx;
5. Cross-Sections were accomplished using a line level and inclinometer.

2.1.2 GigaPan Methods

Landscape snapshots, utilizing GigaPan technology as provided by the Fine Outreach for Science grant part of the Botany department at the University of Hawai'i at Mānoa (UHM), were taken at Ka Piko o Wākea, Kāneloa (Site 110 BU) and Kealaikahiki. In conjunction with the Pacific American Foundation Archeological Technician Training team members from both Cultural Surveys Hawai'i and Protect Kaho'olawe 'Ohana were trained in operation and maintenance of GigaPan equipment. Post processing was facilitated by Dr. Kim Bridges and Katie Kamelamela of the UHM Botany Department.

GigaPan is the newest development of the [Global Connection Project](#), which aims to help us meet our neighbors across the globe, and learn about our planet itself. GigaPan brings distant communities and peoples together through images that have so much detail that they are, themselves, the objects of exploration, discovery and wonder. Enabling people to explore, experience, and share each other's worlds can be a transforming experience. The mission is to make all aspects of the GigaPan experience accessible and affordable to the broadest possible community.

GigaPan consists of three technological developments: a robotic camera mount for capturing very high-resolution (gigapixel and up) panoramic images using a standard digital camera; custom software for constructing very high-resolution gigapixel panoramas; and, a new type of website for exploring, sharing and commenting on gigapixel panoramas and the detail our users will discover within them. The GigaPan website allows hosting and sharing all kinds of panoramas, and so the robotic GigaPan mount is recommended but is certainly not required to be part of this community. (www.gigapan.org)

2.1.3 GigaPan Results

Landscape snapshots were completed for Ka Piko o Wākea, Kāneloa, Kealaikahiki (official training sites) as well as Pu'u Mo'iwi and Honokanai'a (unofficial training sites).

Table 1. GigaPan photos and descriptions

Location	Picture Description
Ka Piko o Wākea	North view to the hummock
Ka Piko o Wākea	South view to the hummock
Ka Piko o Wākea	East view to the hummock
Ka Piko o Wākea	West view to the hummock
Kāneloa	<i>pōhaku</i> Kāneloa from across the gulch
Kāneloa	Kāneloa petroglyphs
Kealaikahiki	Southwest view next to Feature E
Kealaikahiki	Southwest view atop Feature B
Kealaikahiki	Northeast view atop Feature D
Kealaikahiki	Northeast view from Feature C
Honokanai'a	Northwest view from Atwood Makanani's <i>paepae</i>
Pu'u Mo'iwi	360 degree view

2.1.4 GigaPan Summary and Interpretation

Landscape snapshots are available on www.gigapan.org. To access the snapshots, conduct a site search for *Kahoolawe*, and all available panoramas are located in this folder. Visitors may create snapshots within the panoramas as well as include notations of the image. Post processing is still underway, and site names, features, notes and GPS points will be uploaded to the panoramas shortly. Panorama locations will also be aligned with Google Earth so visitors may ground truth imagery. Visitors may not download or print panoramas.

2.2 Site Descriptions

2.2.1 Observations at Site 101, Ka Piko o Wākea (Figure 3 through Figure 5)

During the Clearance Project, the extent and features of this historic property, as well as the natural features (e.g. hummock, erosional gullies, vegetation) associated with the landscape surrounding Ka Piko o Wākea was mapped to scale. This map provided a baseline for gauging the extent of environmental degradation over the last 11 years and the potential for adverse effects on the cultural material scatter, hummock feature containing intact cultural deposits, and architectural features associated with Ka Piko o Wākea.



Figure 3. Ka Piko o Wākea site, north side of hummock



Figure 4. Ka Piko o Wākea site, east side of hummock



Figure 5. Ka Piko o Wākea site, southwest side of hummock

Overall, there appears to be active downslope erosion of the cultural material associated with Ka Piko o Wākea. This downslope migration, illustrated by the difference in the site boundary recorded in 1998 versus that which was recorded in 2009 (Figure 6), is potentially due to sheet erosion during the winter rain season along with the natural progression of soil erosion. It should also be noted, that the southeastern extent of the historic property, as recorded in 1998 has been recently re-planted and may account for some of the shift in the southern site boundary.

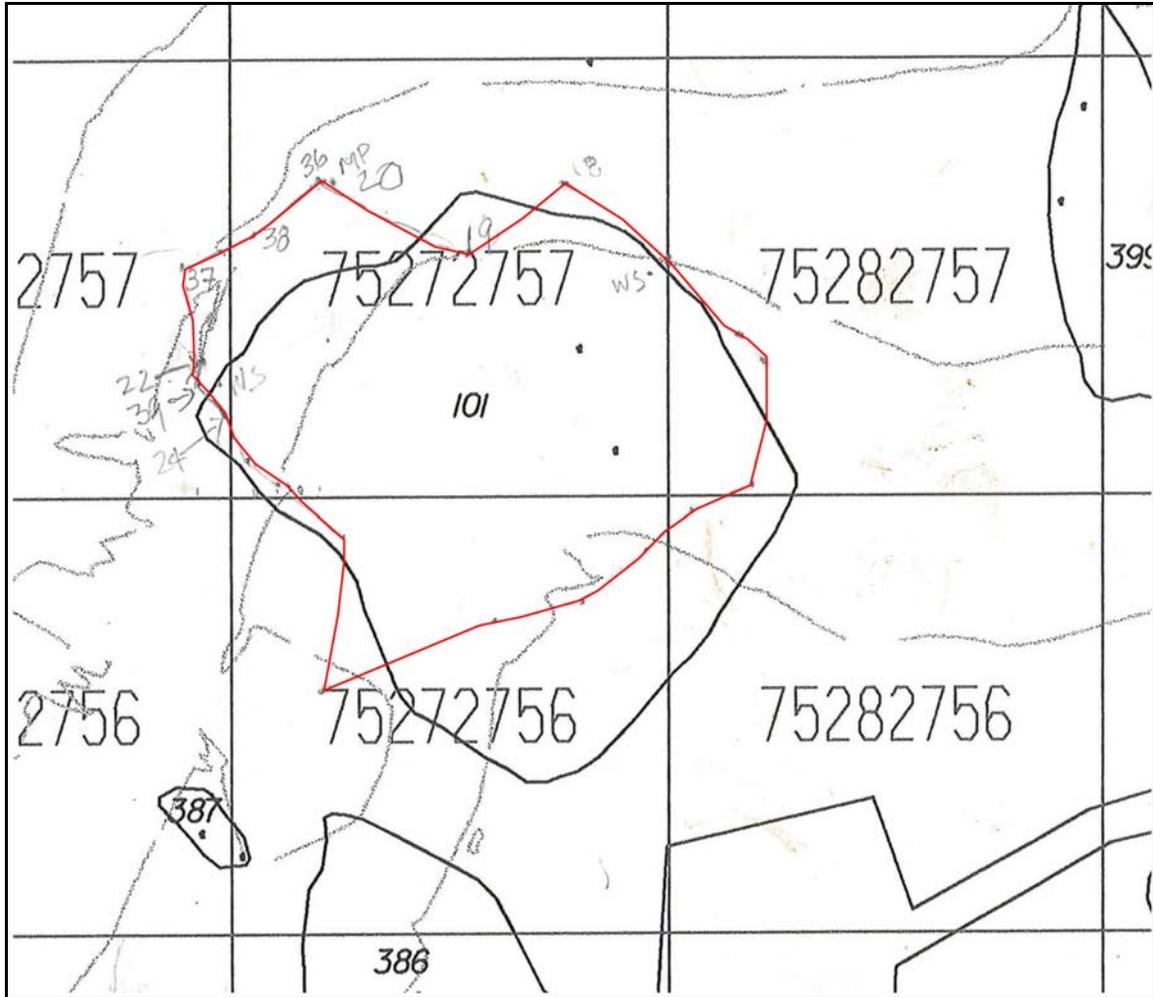


Figure 6. Ka Piko O Wākea (Site 101) showing boundary extent as documented in 1998 (black line) and current boundary extent (red line).

The advancement of soil erosion within the site boundary is best illustrated by the development of new rills that are continuing to progress upslope toward the base of the hummock. During the course of this field work, we were able to more accurately map the location and extent of the hummock feature of Ka Piko O Wākea and have determined that many of the rills and continued headwall erosion would present a threat to the westernmost extent of this feature (Figure 7). Such erosion would potentially compromise any intact cultural deposits within this portion of the hummock.

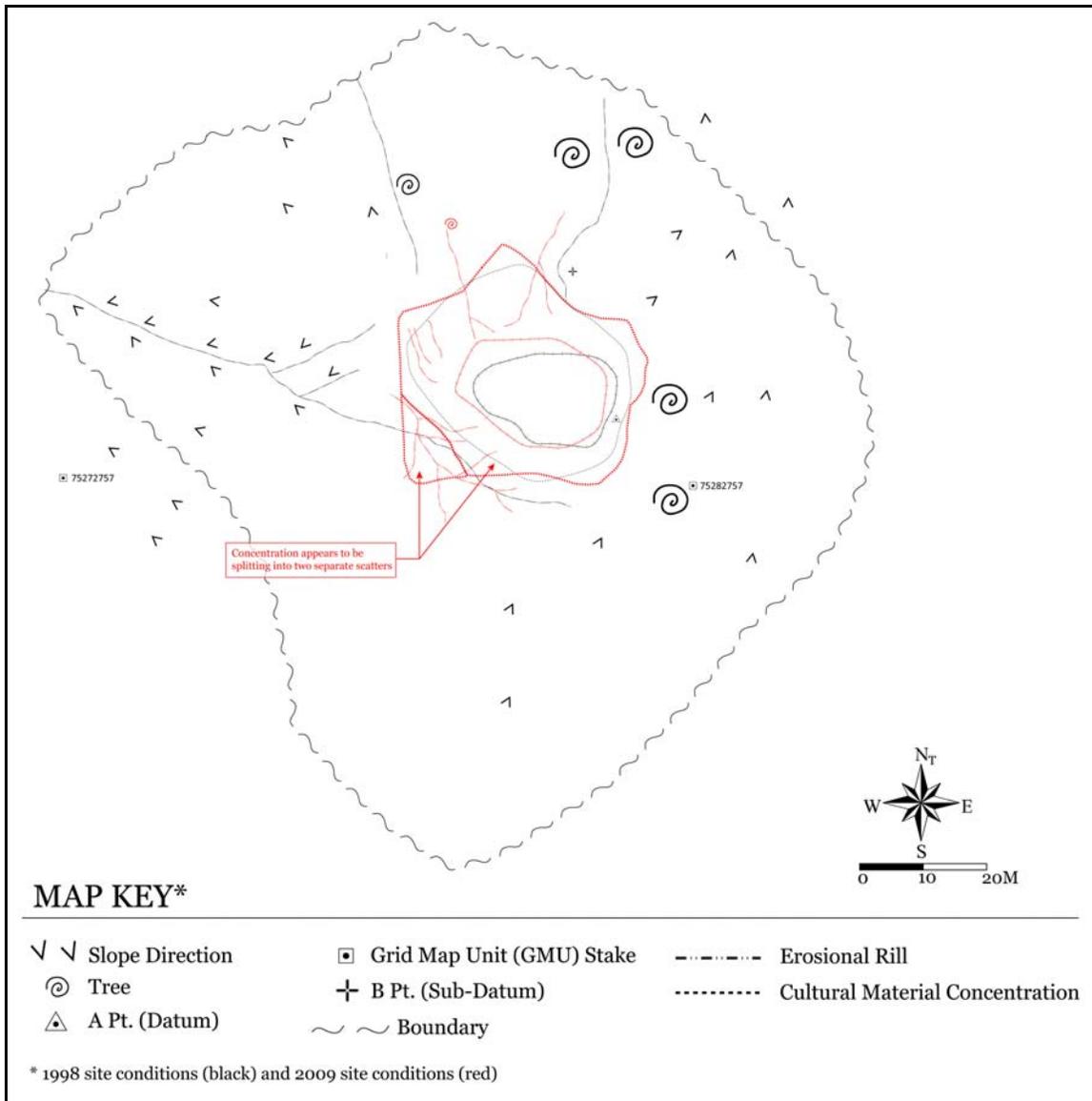


Figure 7. Plan view of Ka Piko O Wākea focusing on horizontal shifts of the cultural material concentration surrounding the hummock feature and current conditions of the natural landscape (after Hammatt, et al. 1999).

The eastern portion of the hummock and remnant architecture appears to be fairly stable (Figure 8). Given the accumulation of Aeolian (or windblown) deposits on top of the western portion of the hummock, it appears that the intact architecture of Ka Piko O Wākea may have played some role in the stabilization of the soils within this feature.

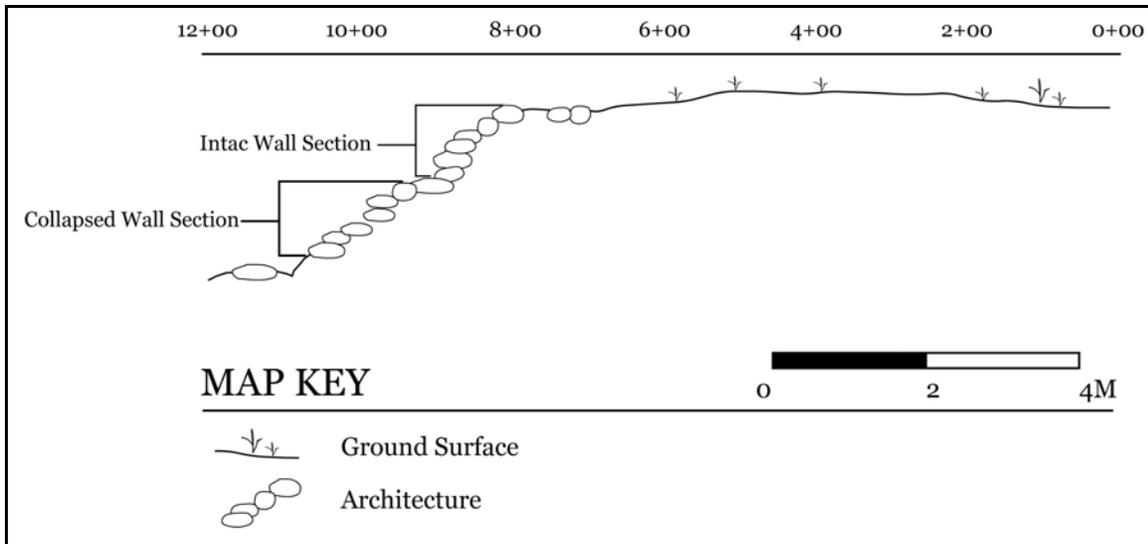


Figure 8. Cross-section documenting current condition of hummock feature and remnant architecture.

2.2.2 Site 110-BU, Kāneloa

Field work at Site 110-BU, or Kāneloa, was conducted from July 3 to July 4, 2009. Team members included Kelley Uyeoka (CSH), Dominique Cordy (CSH), Tina Keko'olani (KIRC), Mike Naho'opi'i (KIRC), Luna Kekoa (PKO), Kahale Saito (KIRC/PKO), Keoni Wilhelm (PKO), and Tom Brennon (PKO).

Work tasks included a reconnaissance survey to locate previously identified and mapped features. The reconnaissance survey located all of the previously identified features as well as three new features (Features A, B, and C). After new site boundaries were determined, all of the features and the adjacent gulch were mapped with plan view and profile sketch maps. Mapping of the site was carried out with tape, compass and GPS. Further documentation included field notes, site forms, and photographs.

The overall goal of the site documentation was to compare the current conditions to the previous conditions that were recorded during the initial historic property survey conducted in 1999 for the UXO Clearance project. The new data collected at this site can provide information to help determine the impact of environmental threats, such as erosion, and mitigation measures to secure protection and access to the site for the benefit of future generations.



Figure 9. Overview photo of Site 110-BU. View to the northeast.



Figure 10. Profile shot of pōhaku Kāneloa. View to the northeast.



Figure 11. Pōhaku Kāneloa and carsonite marker located directly above gulch. View to the southwest.



Figure 12. Pōhaku Kāneloa as viewed from the gulch. View to the southwest.



Figure 13. Mapping of site 110-BU. Photo taken from in the gulch, view to the west.

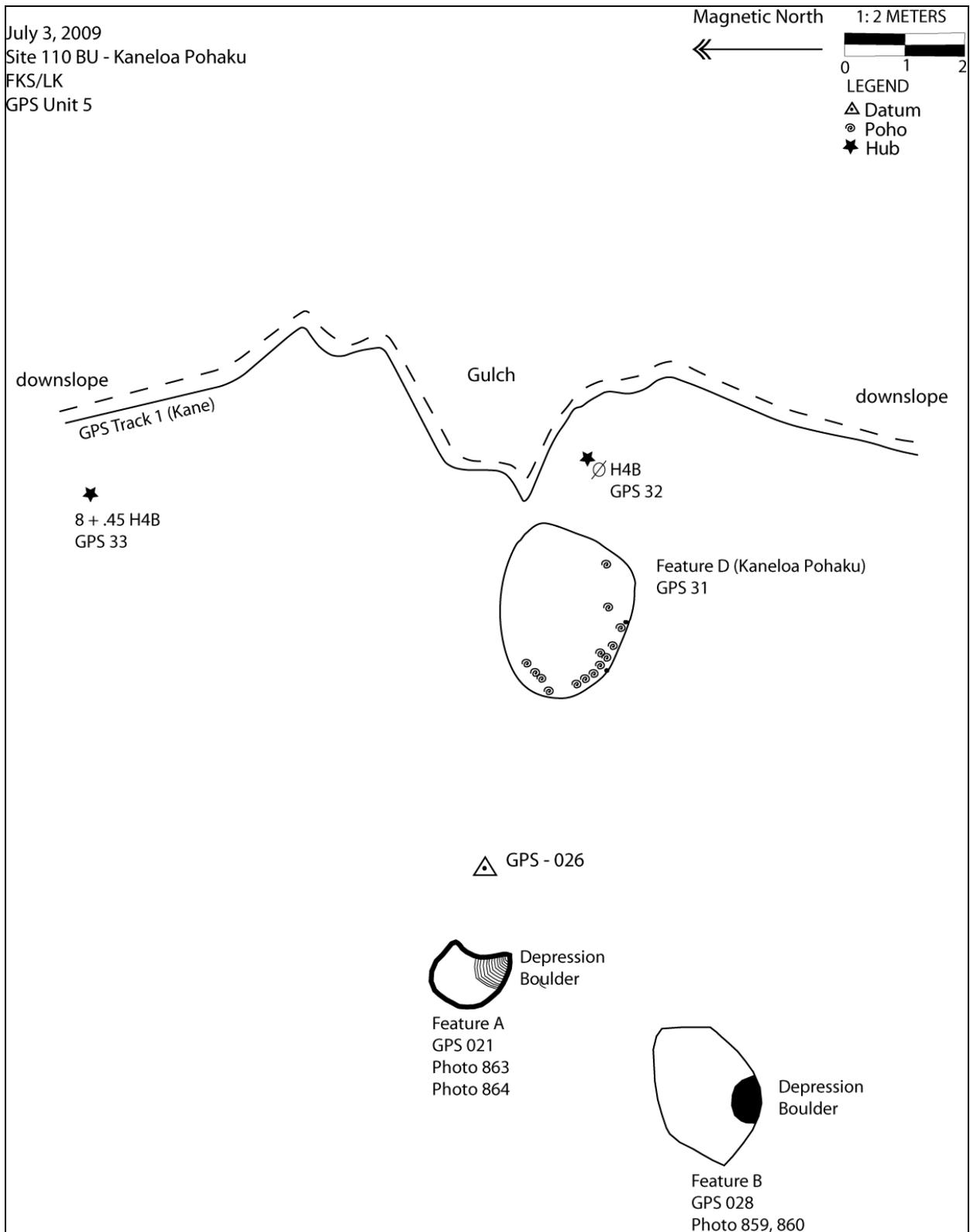


Figure 14. Map of Site 110-BU, the *pōhaku* Kāneloa and surrounding features

Site 110-BU consists of three features, one previously identified feature and two new features. Feature D (Figures 18-21), the *pōhaku* Kāneloa, was previously identified and recorded. The two newly identified features are Feature A (Figures 15-16) and Feature B (Figure 17), two *pōhaku* with a possible human-made depression.

2.2.2.1 Feature A: Depression Boulder

Feature A, a boulder with a large depression located on its southern side was noted as a possible feature. The boulder measures 1.2 meters in length and 0.9 meters in width.



Figure 15. Site 110-BU, Feature A. View to the west.



Figure 16. Site 110-BU, Feature A. View to the northwest.

2.2.2.2 Feature B: Depression Boulder

Feature B, a large boulder with a deep depression on its southern side was noted as another possible feature. The boulder measures 2.2 meters in length and 1.8 meters in width.



Figure 17. Site 110-BU, Feature B. View to the northwest.

2.2.2.3 Feature D: Pōhaku Kāneloa

Feature D consists of a large flat boulder, referred to as the pōhaku Kāneloa. The boulder contains three petroglyphs, and 25 human-made depressions, or *poho*, pecked into the top surface. At least two of the three petroglyphs located on the pōhaku Kāneloa appear to have a human form and all appear to have been pecked. The boulder measures 3.1 meters in length and 1.7 meters in width and is one in a cluster of boulders located at the edge of a gulch.

This site is located approximately 40 meters to the northeast of site 110-AP, an existing petroglyph field. This site was recorded by Lee and Stasack in 1993, as one boulder with twelve petroglyphs on top, and one smaller boulder a few meters to the south with one petroglyph figure. No cultural materials were observed in the surrounding area.



Figure 18. Site 110-BU, Feature D. Plan view, view to the south.



Figure 19. Site 110-BU, Feature D, *poho* depressions. View to the southeast.



Figure 20. Site 110-BU, Feature D. Petroglyph located on pōhaku Kāneloa. View to the west.



Figure 21. Site 110-BU, pōhaku Kāneloa petroglyphs and *poho*. View to the southeast.

2.2.3 Kealaikahiki Site

Field work at the Kealaikahiki site took place from July 3 to July 4, 2009. Team members included Hal Hammatt (CSH), Auli'i Mitchell (CSH), Davianna McGregor (PKO), John Ching (PKO), Kiki Hee (PKO), and Katie Kamelamela (CSH/PKO). Team members were tasked to conduct a reconnaissance survey, GPS features and trails, determine site boundaries and map features in the area.

Team members were able to recognize and identify various types of archaeological sites and features. Standard methods were utilized for locating and mapping archaeological sites, metric measuring tapes, graph paper, scale rulers, compass and pencil to complete plan view maps for the platform area (Figures 22-24), Compass Pōhaku (Figures 30-31) and *ala loa*, post processing digital formats were created with Adobe Illustrator. Team members were familiarized with professional standards and regulator procedures when protecting, preserving or restoring and archaeological site or feature.



Figure 22. Feature A, Kuhike'e Ahu. View to the southeast

2.2.3.1 .Feature A

Feature A, known as the Kuhike'e Ahu, is described as a platform with boulder [missing word] built around bedrock with some moved rocks set upright, and surrounding features were surveyed and mapped. The platform was constructed under the direction of Atwood Makanani (*kahu*), member of the Protect Kaho'olawe 'Ohana and Polynesian Voyaging Society, in October 2004.

Kuhike'e is a new intact property site (October 2004, oral statement) located in a coastal environment with slope ranging from 3-15 degrees. There are historic property scatters that have

ceremonial function in the area. Material characteristics of the historic property includes abraders, basalt artifacts, fractured- basalt, marine shell midden, an intact cultural layer as well as other artifacts. In all there are 11-110 artifacts in the area at a medium density of 1-3/m². There is a 180 degree horizon view. There is no potential for sub-surface cultural materials

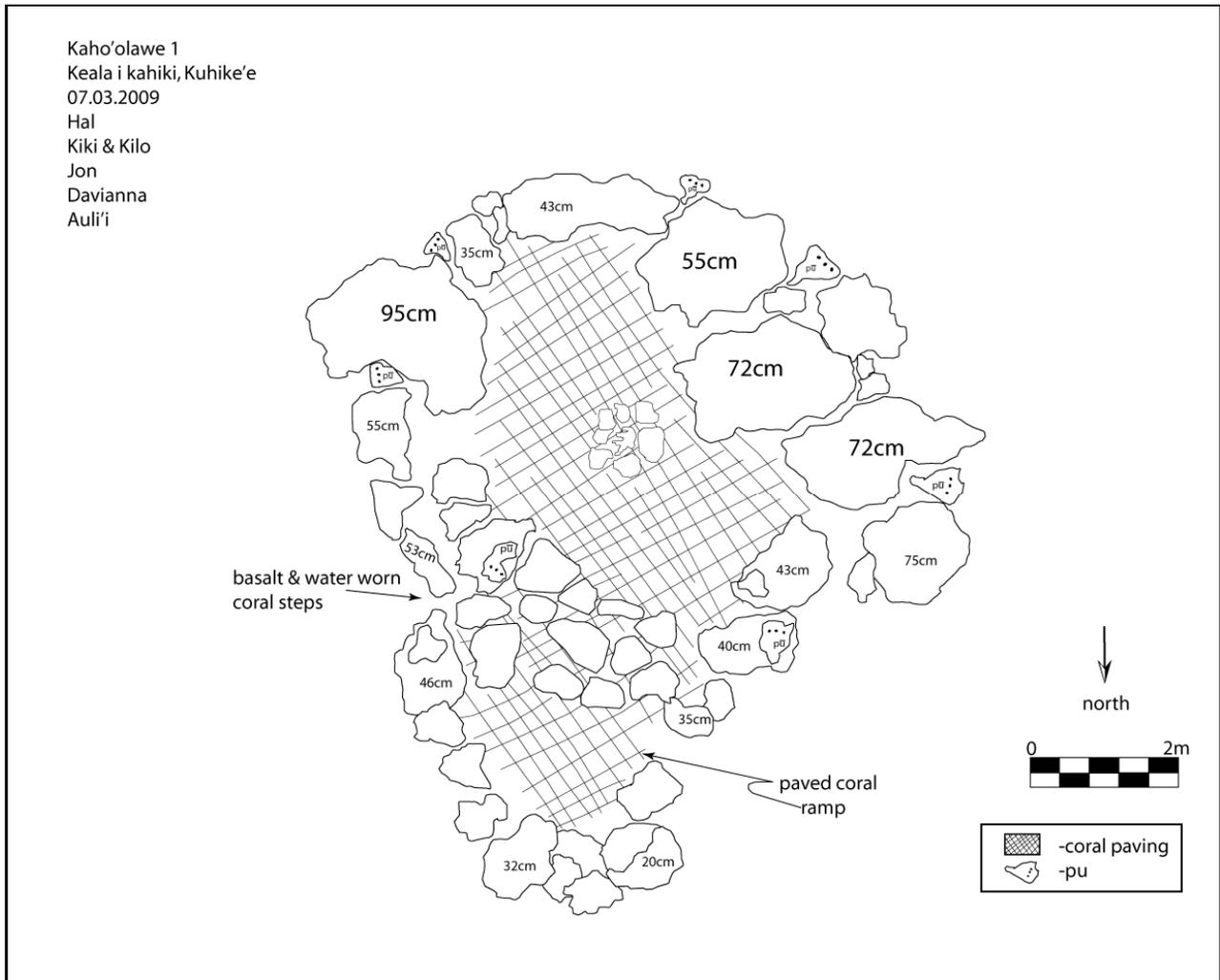


Figure 23. Kuhike'e Ahu, plan view map.



Figure 24. Kuhike'e Ahu. View to the southwest

2.2.3.2 Feature B

Feature B is an *ahu* on the northern side of Feature A, the Kuhike'e Ahu main platform:



Figure 25. Kealaikahiki site, Feature B, *ahu*. View to the north.



Figure 26. Kealaikahiki site, Feature B showing rock pile and wood. View to the northeast.

2.2.3.3 Feature C

Feature C is a shoreline trail or *ala loa*:



Figure 27. Kealaikahiki site, Feature C, *ala loa*. View to the southeast.



Figure 28. Kealaikahiki site, Feature C, *ala loa* intersecting with Kuhike'e trail. View to the southeast.



Figure 29. Kealaikahiki site, Feature C, *ala loa*. View to the southeast.

2.2.3.4 Feature D

Feature D is a *pōhaku* compass located north of Feature A, the Kuhike'e Ahu:



Figure 30. Kealaikahiki site, Feature D, *pōhaku* compass. View to the southwest.



Figure 31. Kealaikahiki site, Feature D, *pōhaku* compass. View to the southwest.

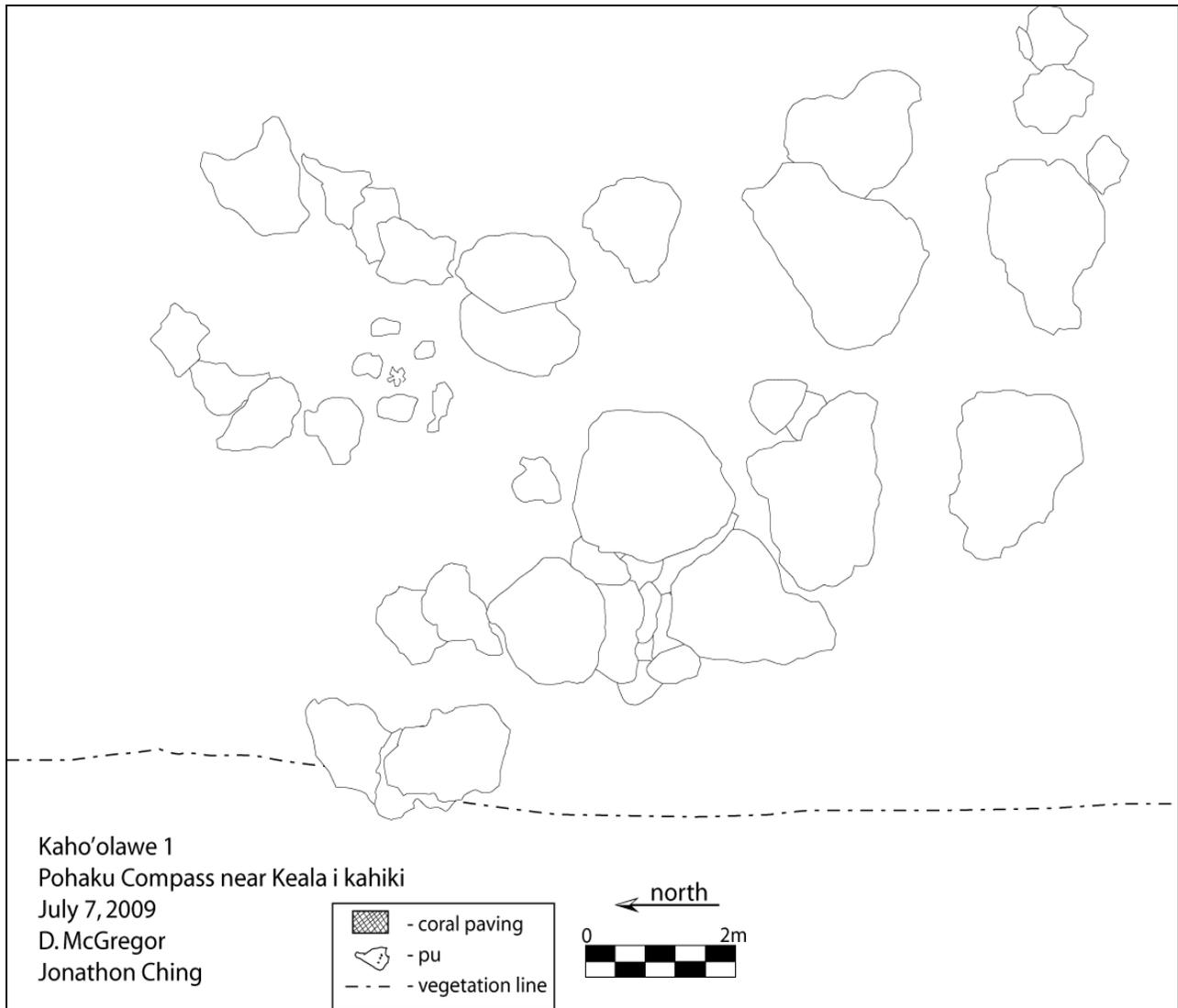


Figure 32. Pōhaku compass near Kealaikahiki site

2.2.3.5 Feature E

Feature E is an *ahu* on the south side of Feature A, the Kuhike'e Ahu. A wooden stake with a grid and site number was located at this feature:



Figure 33. Kealaikahiki Site, Feature E (boulder located beneath the field crew), located directly to the southwest of Feature A, the Kuhike'e Ahu.

2.2.3.6 Feature F

Feature F consists of stacked *pōhaku* and coral. It is located on the north side of Feature A, the Kuhike'e Ahu:



Figure 34. Kealaikahiki site, Feature F. View to the northeast

Section 3 Protection and Stewardship Recommendations

3.1 Recommendations

The three sites that were surveyed and mapped during this practicum are *wahi kūpuna* (ancestral sites) significant to the maintenance, function, and perpetuation of Kaho'olawe as a living and learning cultural landscape. All of the cultural sites and features on island are interconnected and essential to understanding the relationship *nā po'e kāhiko* (ancient Hawaiians) had with the 'āina and the universe. Many of the cultural sites on Kaho'olawe, including the three that were surveyed, are threatened by effects of the natural elements and environment. Fortunately, the unique management and stewardship agreements established for Kaho'olawe provides special protection measures from the typical human threats such as development, looting, and excessive access.

There is great potential for the preservation and stewardship of the numerous *wahi kūpuna* that extend over Kaho'olawe's sacred landscape. With the appropriate training, as experienced in the two PAF training sessions conducted on O'ahu and Kaho'olawe, individuals will be equipped to take on the *kuleana* of caring for these sites.

3.1.1 Site 101, Ka Piko o Wākea

It is clear that water runoff and soil erosion at Ka Piko o Wākea is playing a significant role in the downslope migration of cultural materials and presents major potential for further degradation of the intact soils and cultural deposits within the hummock. Erosion threats notwithstanding, there is still some time to study the rate of erosion with the data presented above¹ and develop an effective site stabilization plan. The National Clearinghouse for Archaeological Site Stabilization (<http://www.nps.gov/seac/stabil-clearinghouse.htm>) may provide a good start for determining which method of erosion control and site stabilization would be appropriate for Kaho'olawe and Ka Piko o Wākea.

3.1.2 Site 110-BU, Kāneloa

As observed during the field survey and mapping exercises, the affects of water run off and soil erosion have severely impacted the Kāneloa site. The *pōhaku* Kāneloa is slipping closer towards the gulch and a portion of the *pōhaku* is not secured on stable ground. Erosion control and stabilization of the *pōhaku* Kāneloa should be dealt with immediately. It is strongly recommend that the *pōhaku* Kāneloa remain in its current location and that all efforts be made to secure its position.



Figure 35. Unstable conditions of the *pōhaku* Kāneloa. Note- the gulch is located directly to the right of the *pōhaku*

3.1.3 Kealaikahiki

Means to preserve and up keep this new intact historic property site includes maintaining open communication with Atwood Makanani (*kahu*), maintaining open communication between the KIRC and PKO, recording of oral traditions relating to site, identify other individuals linked to construction of area as well as re-establishment of voyaging traditions associated with Kealaikahiki and the *pōhaku* Compass.

ⁱ The original data, both electronic data and field maps, will be given to the Kahoolawe Island Reserve Commission for use and curation.

Section 4 References Cited

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1999 *Historic Properties Task Order Report Uxo Clearance Project Kaho`Olawe Island Reserve, Hawai`I*. Prepared for Naval Facilities Engineering Command Pacific Division. Contract No.:N62742-95-D-1369 Task Order: 0007. Cultural Surveys Hawaii and Parsons-UXB Joint Venture. Honolulu, HI.