

# **Examining the Ritual Landscape of North Kohala: A Report on the 2008 Monumental Architecture Field School**

**Mark D. McCoy**  
San Jose State University

**Jesse W. Stephen**  
University of Hawai‘i, Manoa



Hawai‘i Archaeological Research Project

2008

## **Abstract**

The following report describes the results of an archaeological field school focused on teaching students how to document, study, and understand monumental architecture in the Hawaiian Islands. The Monumental Architecture Field School (June 2nd to 20th, 2008) - part of the larger Hawai‘i Archaeological Research Project (HARP) - centered on two study areas: (1) Pu‘ukohola Heiau National Historic Site and the Leeward Kohala Field System, both in the district of North Kohala, Hawai‘i Island. At Pu‘ukohola Heiau we conducted a GPS-based micro-topographic survey to document the natural landform upon which Kamehameha the Great created an impressive ritual landscape in the late 18<sup>th</sup> century. In the Leeward Kohala Field System, our investigations centered on collecting material for radiocarbon dating from good archaeological context; primarily under the basal stones of previously recorded ritual architecture. The goal of this aspect of the project was to use minimally destructive techniques to develop an absolute chronology of ritual site construction and test the validity of a recent architectural seriation. In total, sufficient samples of charcoal was collected from 13 sites. The results of radiocarbon dates on these samples will be reported in future publications.

## Acknowledgments

To begin we would like to thank to the National Park Service and Pono Von Holt of Ponoholo Ranch for granting us permission to conduct archaeological research and for their continued support of our work. Daniel Kawaiaea, Adam Johnson, Mark Rudo, Pono Von Holt, and Walter Wong were especially generous in lending their support to our endeavors. In addition, we would like to recognize the New Moon Foundation and Bennett Dorrance for their logistical help. We would also like to recognize our guest lectures and visitors, whose expertise added to both the educational and research goals of the project: Michael Berumen, Jonathan Carpenter, Emma Craig, Geoff Mauer, Peter Mills, and Jeremy Spoon.

San Jose State University provided key support and we are grateful to Peggy Carlson, Chuck Darrah, "Jr" John W. Gorvad, Tim Hegstrom, Alan Leventhal, Mark Loftus, Gloria Montez, and John Skyberg for their help facilitating this program.

This season's successes were made possible by an unrivaled staff: Robin Conners, Jenny DeJongh, Helen O'Brien, Emily Engan, Mark Oxley, Lilie Richards, and David Stephen. Their diverse capabilities were truly impressive to see in action. Additional thanks go to Michael Graves, Thegn Ladefoged, and Mara Mulrooney for laying the groundwork for this research and for actively encouraging and contributing to the project. Thanks to Gail Murakami for her help in identifying plant charcoal samples.

Thanks also to the talented and promising group of students whose enthusiasm and dedication made this a rewarding experience: Cecelia Baza (University of Hawai'i at Manoa), Jennifer Bellville (Ohio State University), LeeAnn Church (University of Central Florida), Emily Engan (Pima Community College), Kristina Short (George Washington University), and Tyler Powell (Bloomsburg University).

Finally, *mahalo nui loa* to all the dedicated folks reconstructing Pu'ukohola Heiau for making this field season remarkable and one we will not soon forget.

## Table of Contents

Chapter 1. Introduction .....	9
Chapter 2. Micro-topographic Survey of the Pu‘ukohola Ritual Complex.....	11
Introduction to Pu‘ukohola Heiau National Historic Site .....	11
Background.....	11
Methods .....	12
Micro-topographic Survey .....	12
Data Processing.....	12
Survey Results .....	13
Cultural Protocol for Research at Pu‘ukohola Heiau.....	16
Chapter 3. Upland Leeward Kohala Ritual Sites .....	18
Introduction to Upland Leeward Kohala Ritual Sites.....	18
Methods .....	18
Excavation Results.....	19
Upland North Study Area .....	23
Upland North Study Area, Kiiokalani <i>ahupua‘a</i> .....	24
KOL-1 .....	24
KOL-2.....	25
Upland North Study Area, Kaihooa <i>ahupua‘a</i> .....	26
KHO-1 .....	26
Upland North Study Area, Pohakulua <i>ahupua‘a</i> .....	27
PHK-1 .....	27
Upland North Study Area, Kalala <i>ahupua‘a</i> .....	27

KAL-24.....	27
KAL-26.....	27
KAL-27.....	29
Upland Central Study Area.....	30
Upland Central Study Area, Kalala <i>ahupua‘a</i> .....	30
KAL-25.....	30
KAL-28.....	31
Upland Central Study Area, Makiloa <i>ahupua‘a</i> .....	31
MKI-122 .....	31
MKI-123 .....	31
MKI-124 .....	32
MKI-125 .....	33
MKI-126 .....	35
Upland Central Study Area, Pahinahina <i>ahupua‘a</i> .....	35
PHH-1 .....	35
Upland Central Study Area, Kahua 1 <i>ahupua‘a</i> .....	36
KH1-1 and KH1-2.....	36
KH1-3 .....	36
KH1-4 .....	36
KH1-5 .....	38
Upland Central Study Area, Kahua 2 <i>ahupua‘a</i> .....	38
KH2-6 .....	38
Upland South Study Area .....	39
Upland South Study Area, Kahua 2 <i>ahupua‘a</i> .....	39
KH2-1 .....	39
KH2-2 .....	39

KH2-3, KH2-4, and KH2-5.....	39
Mid-Elevation Central Study Area .....	40
Mid-Elevation Central Study Area, Kahua 2 <i>ahupua'a</i> .....	40
KH1-6 .....	40
KH1-7 .....	41
KH1-8, KH1-9, KH1-10, and KH1-11 .....	41
Mid-Elevation Central Study Area, Pahinahina, Makiloa, and Kalala <i>ahupua'a</i> .....	41
PHH-2, PHH-3, MKI-127, MKI-128, MKI-129, MKI-130, and KAL-29 .....	41
 Chapter 4. Summary .....	 42
 Bibliography .....	 43
 Appendix I. Shovel Test Pit Field Notes for Upland Leeward Kohala.....	 44
Appendix II. Material Collected in Upland Leeward Kohala .....	46
Appendix III. Community Territory ( <i>Ahupua'a</i> ) Codes .....	47

Figure 1. Map of Study Areas for the 2008 Monumental Architecture Field School.....	9
Figure 2 - Micro-topographic Survey Transect. Surveyors shown here with roving GPS unit and an antenna on a survey rod. ....	12
Figure 3 - GPS data collected at Pu'ukohola Heiau National Historic Site. Only points with valid elevation readings shown (n = 9,759). These represent a 95% success rate in our micro-topographic survey (i.e., out of 10,268 points, only 509 (5%) were rejected). ....	13
Figure 4 - CAD Topographic Map showing Mailekini Heiau (top left), Pu'ukohola Heiau (top right), NPS Headquarters (bottom right), Visitor Center (bottom left), access road, and paths. Contour interval is 0.50 meters. .	14
Figure 5 - Close Up View of Mailekini Heiau (left) and Pu'ukohola Heiau (right) in related topographic context (contour interval of 0.50 m). Paved park visitor paths outlined, seasonal drainage indicated.....	15
Figure 6 - MAFS archaeological crew practicing the Haka Akeolokia prior to performing it at the conclusion of the field season. ....	17
Figure 7 – Major Dryland Agricultural Fields of Hawai'i Island: North Kohala (top), Waimea (center), and Kona (bottom). ....	18
Figure 8 - Photo of North Kohala Field System. Photo by M.D. McCoy.....	19
Figure 9 - USGS Map with Upland Leeward Kohala Sites. This topographic map shows the overall landform and several major hills that dominate the landscape: Pu'u Kehena, Pu'u Lepo and Pu'u o Lani, and Pu'u 'Uala.....	20
Figure 10 - Map of Study Area Showing Geographic Groupings and Community Territories, North Kohala, Hawai'i Island. Sites shown were given standardized site numbers this season (i.e., KOL-1); not all are currently interpreted as sites of ritual. ....	21
Figure 11 - Upland North Study Area. Sites shown include: KOL-1, KOL-2, KHO-1, PHK-1, KAL-24, KAL-27 and KAL-26.....	23
Figure 12 - KOL-1 STP #1 was placed on the northwest end of the site's exterior retaining wall.....	24
Figure 13 - KOL-1 STP#2 was placed on the site's north exterior retaining wall. ....	24
Figure 14 - KOL-2 STP #1 was placed on the northeast interior wall of the site. ....	25
Figure 15 - KOL-2 STP #2 was placed on the exterior of the east end of the site's retaining wall. ....	25
Figure 16 - KOL-2 STP #3 was placed on the exterior of the west end of the site's retaining wall. ....	26
Figure 17 - KHO-1 STP #1 was placed at the base of an upright stone on the makai edge of the site's main retaining wall. ....	26
Figure 18 - KAL-24 STP #1 was placed at the east end of the site's platform. ....	27
Figure 19 - KAL-26 STP #1 was placed on the southern edge of the platform at the base of a stone alignment defining the edge of the site.....	28

Figure 20 - KAL-26 STP #2 was placed at the exterior of the site’s west retaining wall.....28

Figure 21 - KAL-27 STP #1 was placed on the *makai* side of the main structure near the southern corner. ....29

Figure 22 - KAL-27 STP #2 is located on the exterior of the site’s upper southeast retaining wall.....29

Figure 23 - Upland Central Group. Sites shown include: KAL-28, KAL-25, MKI-122, MKI-123, MKI-124, MKI-125, MKI-126, PHH-1, KH1-1, KH1-2, and KH1-3. Sites not shown: KH1-4, KH1-5, and KH2-6. ....30

Figure 24 - KAL-25 STP #1 is located in the northeast corner at the base of an upright stone on the site’s southern wall. ....31

Figure 25 - MKI-122 STP #1 is located on the northern, outside face of the retaining/enclosing wall at the base of a large upright stone. ....32

Figure 26 - MKI-123 STP #1 is located on the makai, outside edge of an upright stone that appears to have been part of the main terrace (i.e., rather than the row of uprights that connect the site with MKI-122).....32

Figure 27 - MKI-124 STP #1 was placed in the southernmost row of uprights on the outside, makai side of the courtyard.....33

Figure 28 - MKI-125 STP #2 was placed on the interior of the north retaining wall below an upright basal stone 3 m west of STP #1.....34

Figure 29 - MKI-125 STP #3 was placed on the interior of the site’s north retaining wall 2 m east of STP #1. ....34

Figure 30 - PHH-1 STP #1 was placed at the base of the western lower retaining wall along two cobble basal stones. ....35

Figure 31 - KH1-3 STP #1 was placed on the southwest corner of the site’s exterior retaining wall. ....36

Figure 32 - KH1-4 STP #1 was placed against the outside edge of the site’s southernmost row of uprights.....37

Figure 33 - KH1-4 STP #2 was placed at the back of the site’s uppermost terrace.....37

Figure 34 - KH1-4 STP #3 was placed on the interior of the northern freestanding wall at the top of a small knoll. .38

Figure 35 - Upland South Study Area. Sites shown include: KH2-1, KH2-2, KH2-3, KH2-4, and KH2-5.....39

Figure 36 - Middle Elevation Central Group. Sites shown include: KH1-6, KH1-7, KH1-8, KH1-9, KH1-10, KH1-11, PHH-2, PHH-3, MKI-127, MKI-128, MKI-129, MKI-130, and KAL-29. ....40

Figure 37 - KH1-6 STP #1 was excavated on the exterior wall of the lower terrace on the site’s south end. ....41

Table 1 - Summary of Research. This table gives previous site numbers, sample numbers for collected charcoal, and general location of sites. All UTM locations in this report are NAD 83, Zone 5.....21



## Chapter 1. Introduction

The following report describes research conducted as part of the 2008 Monumental Architecture Field School (June 2-20, 2008) in the North Kohala District of Hawai‘i Island. This project represents a joint effort by archaeologists from San Jose State University, the University of New Mexico, and the University of Hawai‘i at Manoa working under the larger Hawai‘i Archaeological Research Project (HARP). Our goals were to trace long term changes in how monumental architecture was constructed and train undergraduate and graduate students in methods of recording, analyzing and interpreting these sites of enormous cultural, historical, and scientific value. To realize these goals we examined two areas: (1) the landscape surrounding Pu‘ukohola Heiau, a war temple built by Kamehameha the Great,<sup>1</sup> and (2) a portion of the Leeward Kohala Field System with architecture identified as sites of ritual.

The first study area, Pu‘ukohola Heiau, is presently a U.S. National Historical Site managed by the National Park Service (NPS). Through close consultation with the local Native Hawaiian community, the NPS is facilitating the stabilization and reconstruction of portions of the temple that were damaged several years ago in a major earthquake. In Chapter 2, we present the results of a micro-topography survey that was conducted across the main temple complex. This work allows us to investigate and represent local landform with an unprecedented degree of accuracy and reveals how the site’s architects and builders used the natural landscape to create, emphasize, and deemphasize, certain elements through their design choices.

The second set of sites – located within the massive Leeward Kohala Field System - represent a range of different sizes and styles of ritual architecture likely built in the late prehistoric era. Recently these *heiau* (temples) were the focus of two studies, one that produced a relative chronology of construction through the method of architectural seriation (Mulrooney and Ladefoged 2005) and the other which examined of the roles of landform and viewshed in how locations for these structures were chosen by Native Hawaiian architects



**Figure 1. Map of Study Areas for the 2008 Monumental Architecture Field School.**

<sup>1</sup> Hawaiian history suggests Pu‘ukohola was home to an earlier temple (*heiau*) built in the prehistoric era. Therefore it is more precise to categorize the monumental-scaled 18<sup>th</sup> century construction by Kamehameha as a re-dedication or major addition to the ritual landscape.

(Stephen ms.).<sup>2</sup> In Chapter 3, we present the results of a series of small excavations at locations that were carefully chosen to allow us to collect datable material (i.e., charcoal) from underneath the lowest, basal foundation stones of these structures. Future radiocarbon testing will thus allow us to determine the validity of previous estimates of the relative ages of sites as well as to determine if there were significant shifts in how sites were chosen in terms of landform and viewshed.

Finally in Chapter 4 we offer a brief summary of this research and reflect on how our investigations have shown both continuity and innovation in the history of the construction of monuments and monumental scaled structures in the past. However, it is important to keep in mind that the purpose of this report is simply to stand as a record of our research this season rather than a definitive or complete analysis.

---

<sup>2</sup> In this report Hawaiian terminology is commonly used to refer to different site types, directions, landform, and concepts. Please see Pukui and Elbert's (1986) Hawaiian-English dictionary for more information.

## **Chapter 2. Micro-topographic Survey of the Pu‘ukohola Ritual Complex**

### **Introduction to Pu‘ukohola Heiau National Historic Site**

Pu‘ukohola Heiau National Historic Site is a small national park near Kawaihae, Hawai‘i that includes a Native Hawaiian ritual complex whose main focus is the massive war temple Pu‘ukohola Heiau. Previous research on this focal structure by Mulrooney *et al.* (2005) centered on estimating the amount of labor required to construct the site based on precise volume estimates derived from 3D laser scanning. Our research shifts the focus off the structures themselves and on to recording the landform upon which this complex was built. Below we begin by first describing the overall goals of this research, then present methods used in our micro-topographic survey, and finally give an overview of the preliminary results of this summer’s fieldwork.

Our project coincided with reconstruction efforts at Pu‘ukohola aimed at repairing damage to architecture sustained several years ago during earthquake measuring 6.7 on the Richter scale. While sponsored and overseen by the National Park Service, the reconstruction incorporates the local community in planning, setting protocol, and physical rebuilding. Our students and staff actively engaged in said cultural protocols and we briefly describe this aspect of the project at the end of this chapter.

### **Background**

Scholars using oral traditions, ethnohistory, and archaeology have clearly shown that the decision where to build a temple, or *heiau*, was guided by religious, aesthetic, cultural, and larger social variables (Cachola-Abad 1996; Kirch 1990, 2004; Kolb 1994; McCoy 2008; Stokes 1991). However, the use of landform in monumental constructions, and their relationship to extant architecture, is not always a primary concern in architecture-focused archaeological surveys. To counterbalance this, we have chosen to conduct an extremely detailed micro-topographic survey of Pu‘ukohola National Historic Site to explore how landform was used at sites of ancient Hawaiian monumental architecture.

While topographic survey has been incorporated in archaeological work for many years, the use of GPS technology to quickly record elevation data over large continuous blocks is a relatively new method. It is more common for this type of survey to be conducted with a total station (see Kvamme *et al.* 2006). The use of GPS for topographic survey has in part been facilitated by the recent advent of real-time correction systems, especially WAAS in North America. However no such infrastructure currently exists in the Hawaiian Islands thus this survey represented somewhat of a technical challenge as well as a novel approach to recording ritual complexes.

## Methods

Our efforts to record the topography of the study area can be broken down in to two major tasks: the physical survey and processing the massive amount of data collected. The latter began in the field and continued afterwards.

### *Micro-topographic Survey*

Micro-topographic survey - defined here as recording terrain (elevation above sea level) at a high resolution ( $\pm$  centimeter 2 cm horizontal,  $\pm$  4 cm vertical) - was conducted over 24 hectares (60 acres) at a five meter interval using an integrated GPS based approach. Survey data was collected using five simultaneously deployed Ashtech ProMark II receivers as roving units and one GPS base station on an established datum. We used a stop-and-go recording procedure along survey transect blocks. In areas where satellite signal strength was an issue - usually the result of heavy vegetation - transects were abandoned in favor of directed coverage dictated by locations of adequate signal strength. This only applied to less than 3% of total area surveyed.



**Figure 2 - Micro-topographic Survey Transect. Surveyors shown here with roving GPS unit and an antenna on a survey rod.**

Roving units and their operators were kept on course through the use of two small handheld Garmin GPS units. Once in formation, the outside members of the survey line of five rovers would maintain their pre-assigned northing, with the other three rovers filling the space between. Points were taken simultaneously in each unit, and once all points were taken the group would move forward five meters, stop, and repeat the process.

In order to integrate cultural resources – namely extant monumental architecture – a Real Time Kinematic system (Topcon Hiperlite RTK GPS) was used. The Hiperlite system permitted the collection of an additional dataset at sub-centimeter accuracy. This data was valuable for defining and integrating architecture in our digital representation of the landform.

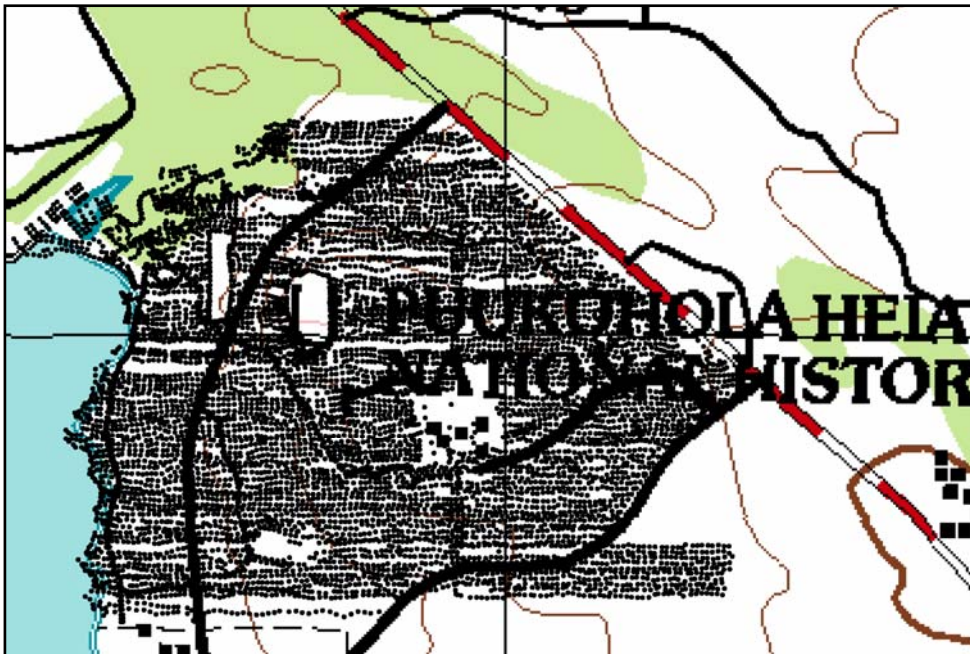
### *Data Processing*

The second task, data processing, involved downloading and archiving data in an appropriate format, turning that data in to a form readable by drafting and GIS software, and continuously checking for errors, compatibility, and overall data quality. For example, data was

archived in Receiver Independent Exchange Format (RINEX) to ensure a non-proprietary medium with compatibility between GPS instrumentation and systems. Subsequent processing of the micro-topographic and architectural data collected via survey was conducted within AutoCAD and ArcMap (ESRI) to enable processing and analyses of the dataset. All data has been archived with the National Park Service.

## Survey Results

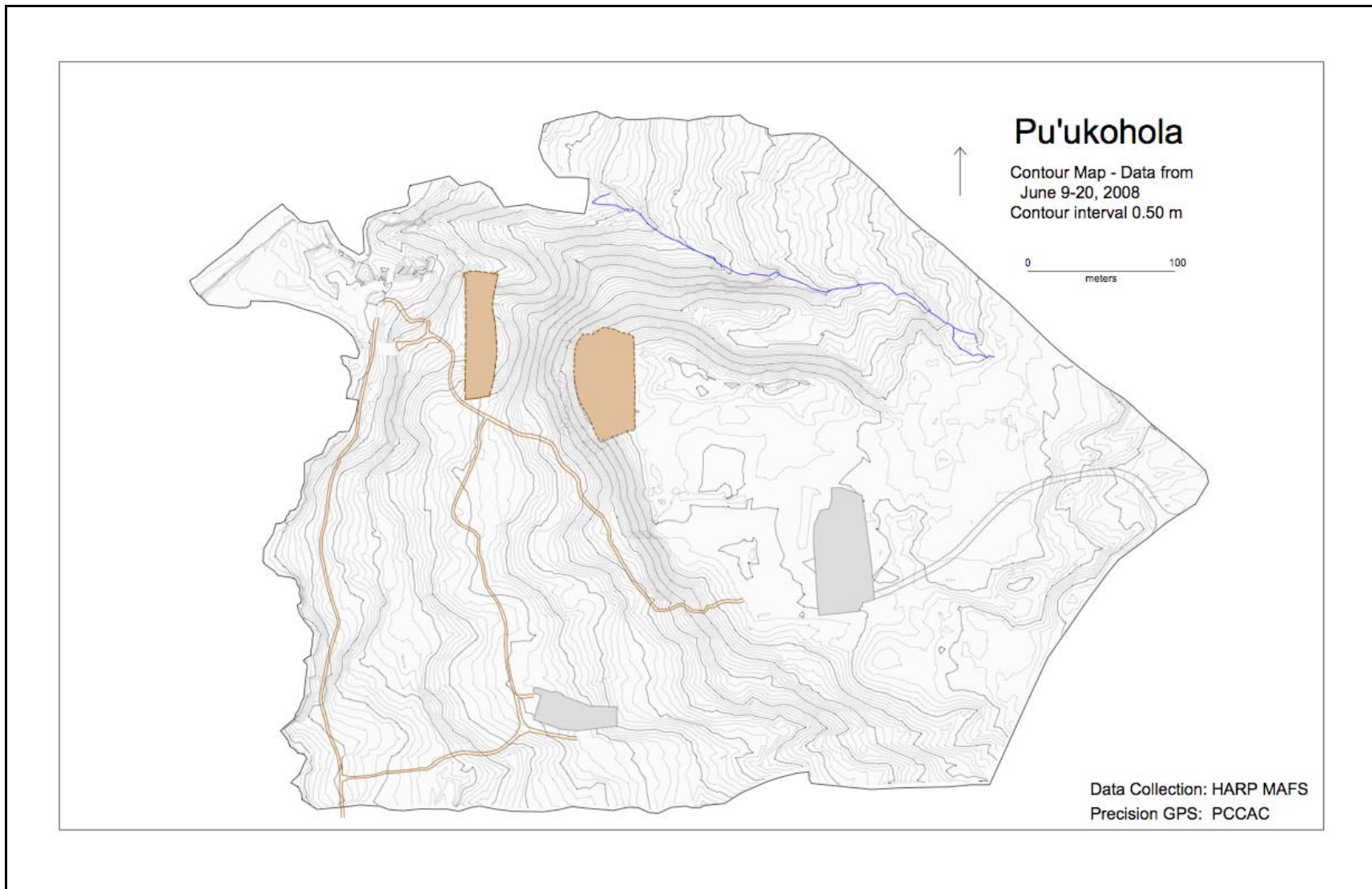
In sum, the +10,000 precision GPS points collected from June 9<sup>th</sup> to 20<sup>th</sup>, 2008 has allowed us to create a 3D model of the land surface at a resolution greater than 10 centimeters. Coverage included the vast majority of the park's land surface not presently obscured by heavy vegetation. The area where GPS coverage proved to be the most difficult to obtain was in the north and was largely the result of several deep drainages and thick mesquite (*Prosopis*



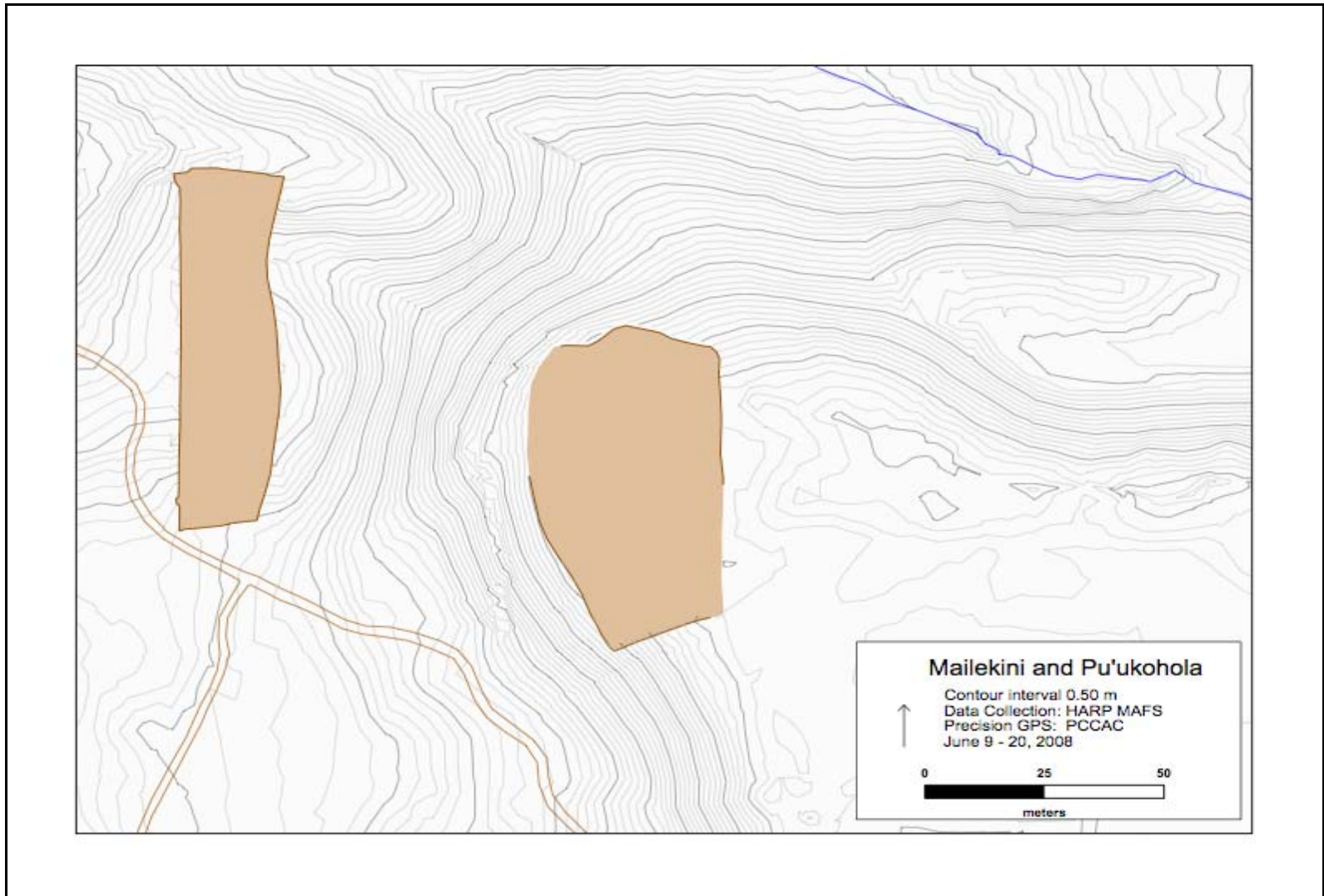
**Figure 3 - GPS data collected at Pu'ukohola Heiau National Historic Site. Only points with valid elevation readings shown (n = 9,759). These represent a 95% success rate in our micro-topographic survey (i.e., out of 10,268 points, only 509 (5%) were rejected).**

*sp.*). We should also note that the area around the John Young homestead and other federal land located across State Route 270 from the main park were not included in the survey.

Turning to the CAD software representation of this data we see a detailed view of the study area's natural topography. Several prominent drainages, park visitor paths, and modern architecture are also shown.



**Figure 4 - CAD Topographic Map showing Mailekini Heiau (top left), Pu'ukohola Heiau (top right), NPS Headquarters (bottom right), Visitor Center (bottom left), access road, and paths. Contour interval is 0.50 meters.**



**Figure 5 - Close Up View of Mailekini Heiau (left) and Pu'ukohola Heiau (right) in related topographic context (contour interval of 0.50 m). Paved park visitor paths outlined, seasonal drainage indicated.**

## Cultural Protocol for Research at Pu‘ukohola Heiau

In an effort to bring our archaeological research and training program in-line with the ongoing reconstruction effort, and in respect to this important cultural site, our group took care to observe a set of cultural protocols during fieldwork. One of our guides in this process penned a *haka*, or traditional dance, for the MAFS archaeological field crew to practice and perform at the monument upon the conclusion of the field program. The significance and meaning of this *haka* is in that it represents an example of the integration of archaeology and contemporary cultural practice in Hawai‘i. The chant that accompanies the *Haka Akeolokia* (Archaeological Haka) is as follows:

### Haka Akeolokia

Leader:	Ma koukou	Leader:	Ho a’ a ka wai wai (search diligently, looking down)
Rest:	Ai	All:	Hah Heh Huh
Leader:	Pa		Kui
All:	Ea Ma Kou na Haumana Mai	Leader:	Ka Kau Ka Mana’o
Akeolokia		All:	Kiku (pecking back)
Kane:	Pali Ku ona Manua Helena		Haki Haki (cutting motion)
Wahine:	Papa Hina o Amelika		Hamo Hamo (rub-rub)
All:	Kaaa Saaa Mana Mana	Leader:	Kiloi
All:	Hah Heh Hu x 4 (cardinal directions)	Leader:	Pehea ka hana?
(Stamp rotate) x 3	Kui after turns	All:	Mai kai!
Leader:	E Eko Ke Kahua	Leader:	Ua Pau.
All:	Hah Heh Hu (measure trowel screen)		Kui





**Figure 6 - MAFS archaeological crew practicing the Haka Akeolokia prior to performing it at the conclusion of the field season.**

Overall, we feel exceedingly fortunate to have been invited to perform and hope this experience will encourage more moments of integration and greater, regularized consultation with descendent communities.

## Chapter 3. Upland Leeward Kohala Ritual Sites

### Introduction to Upland Leeward Kohala Ritual Sites

Previous surveys of the well preserved Leeward Kohala Field System have revealed a series of architecturally elaborate sites that appear to have been used for ritual (Mulrooney and Ladefoged 2005; Rosendahl 1972; Stephen ms). Two recent studies have centered on these features: (1) a seriation of architectural elements to develop a relative chronology of eight sites (Mulrooney and Ladefoged 2005), and (2) a detailed reconstruction of local viewsheds to help qualify how location and landform were used by Hawaiian architects in constructing these sites (Stephen ms).

Our research this season focused on further describing the architectural elements present on standardized forms and obtaining datable material from underneath structures. We accomplished the latter through placing small, informal excavations next to the basal stones of key features. The resulting radiocarbon dates on these samples will allow us to define a sequence of site construction on an absolute time scale. This is especially important since presently only one ritual site in the Leeward Kohala Field System has been radiocarbon dated (Ladefoged and Graves in press). In addition we conducted a small scale microtopography survey of sections of the study area. The results of this survey will be the topic of future publications.

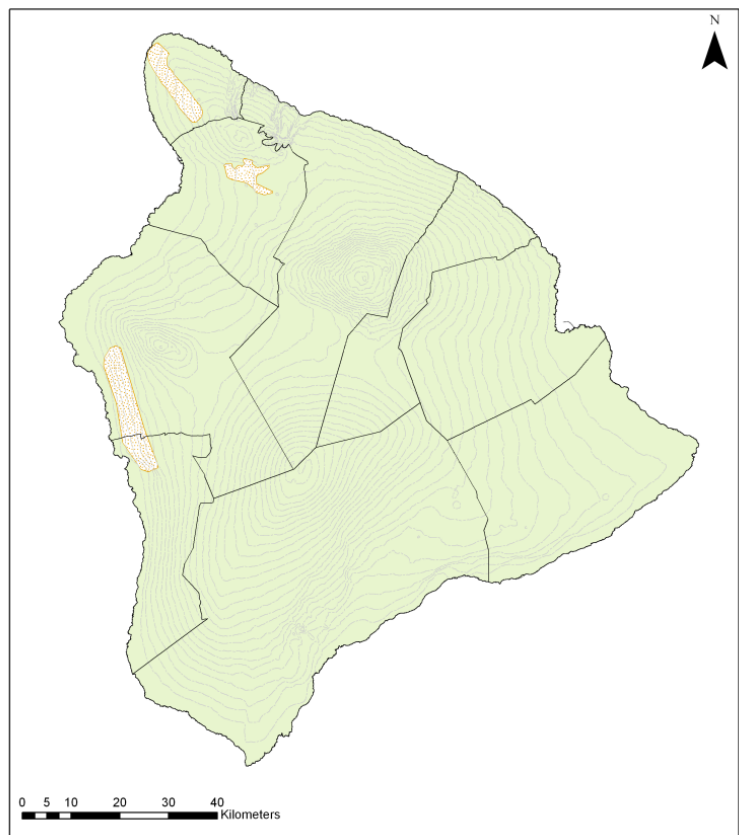


Figure 7 – Major Dryland Agricultural Fields of Hawai'i Island: North Kohala (top), Waimea (center), and Kona (bottom).

### Methods

Our methodology for recording and excavating sites was as follows: (1) a standardized survey form was filled out for the relevant site; (2) extant architecture was evaluated for condition and likelihood for having been built on soil (i.e., as opposed to having been built directly upon exposed stone outcrop), (3) a shovel test pit (STP) was excavated by natural layers, screened through 1/8 inch screen, and materials collected by type; (4) if the excavation showed soil under the basal course of stone, sediment samples and any visible charcoal were then collected, and (5) collected sediment was then subject to simple floatation to recover charcoal. At

most sites, we were successful in recovering datable material in our first excavation. In others, several pits were necessary. All excavations were backfilled. Overall the investigation was in line with a minimally invasive ethos. Currently charcoal samples are undergoing identification to taxa prior to radiocarbon dating.

## Excavation Results

For ease of reporting, the study area is divided here in to four areas: upland north, upland central, upland south, and mid-elevation central (see Figures 10 and 11). *These four geographic groupings are simply covenant units created solely for reporting purposes.* More importantly, the results are further subdivided within each group by community territory (*ahupua'a*). An effort has been made to link these results to all site names used in previous studies. To date, no artifact analysis has been conducted therefore only a summary of deposits encountered and material collected is reported here (see Appendix II).



Figure 8 - Photo of North Kohala Field System. Photo by M.D. McCoy.

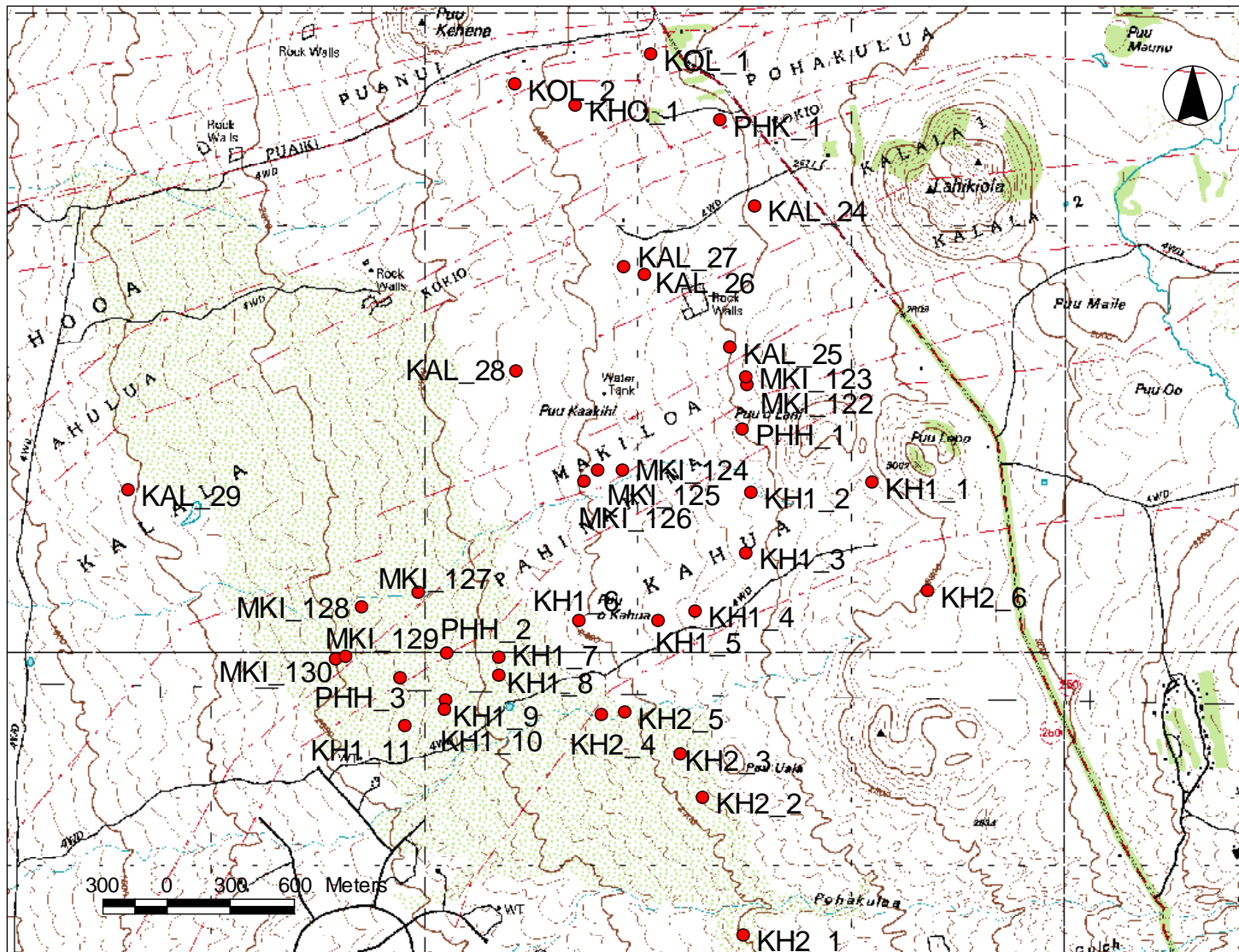
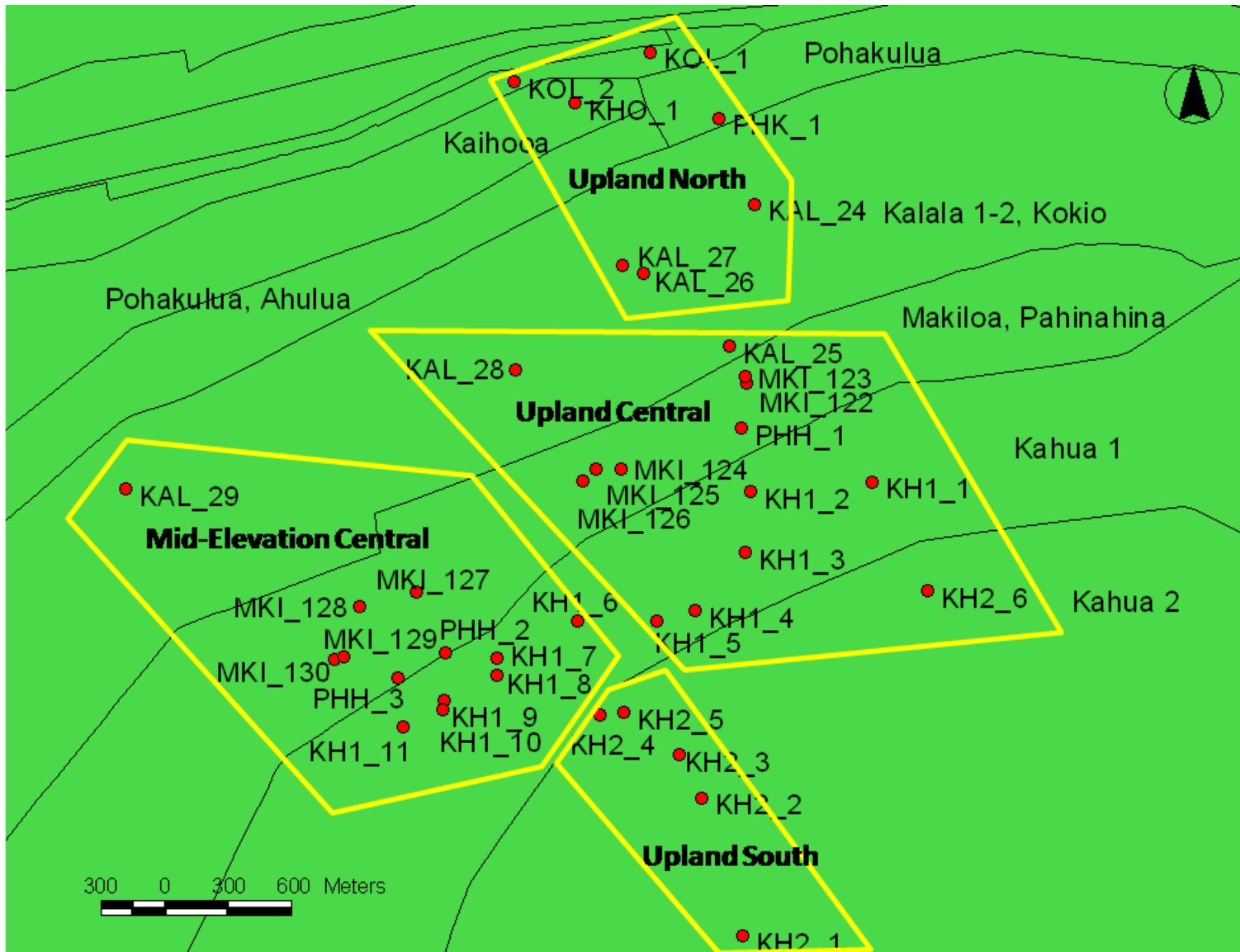


Figure 9 - USGS Map with Upland Leeward Kohala Sites. This topographic map shows the overall landform and several major hills that dominate the landscape: Pu'u Kehena, Pu'u Lepo and Pu'u o Lani, and Pu'u 'Uala.



**Figure 10 -** Map of Study Area Showing Geographic Groupings and Community Territories, North Kohala, Hawai'i Island. Sites shown were given standardized site numbers this season (i.e., KOL-1); not all are currently interpreted as sites of ritual.

**Table 1 - Summary of Research. This table gives previous site numbers, sample numbers for collected charcoal, and general location of sites. All UTM locations in this report are NAD 83, Zone 5.**

<i>Upland North Study Area</i>	Mulrooney and Ladefoged (2005)	Stephen (ms)	STP Excavations	HARP Charcoal Sample for Identification	Easting	Northing
	KOL-1	-	9	1, 2	12	206065
KOL-2	-	2	1, 2, 3	14	205430	2230654
KHO-1	-	1	1	-	205711	2230555
PHK-1	-	10	-	n/a	206392	2230485
KAL-24	-	3	1	8	206551	2230083
KAL-26	3	5	1, 2	7	206037	2229761
KAL-27	-	4	1, 2	6	205939	2229795

*Upland Central Study Area*

KAL-28	-	-	-	n/a	205432	2229311
KAL-25	4	6	1	4	206438	2229419
MKI-122	6	7	1	2	206519	2229244
MKI-123	5	-	1	3	206510	2229282
MKI-124	8	11	1	1	205934	2228848
MKI-125	-	15	1, 2, 3	5	205816	2228845
MKI-126	-	-	-	n/a	205750	2228795
PHH-1	7	8	1	13	206494	2229038
KH1-1	-	26	-	n/a	207103	2228790
KH1-2	-	-	-	n/a	206533	2228740
KH1-3	1	14	1	9	206514	2228456
KH1-4	-	16	1, 2, 3	15 *	206276	2228184
KH1-5	-	-	-	n/a	206103	2228137
KH2-6	-	-	-	n/a	207365	2228279

*Upland South Study Area*

KH2-1	-	-	-	n/a	206498	2226668
KH2-2	2	13	1	11	206310	2227311
KH2-3	-	24	-	n/a	206202	2227516
KH2-4	-	16	-	n/a	206276	2228184
KH2-5	-	-	-	n/a	206103	2228137

*Middle Elevation Central Study Area*

KH1-6	-	12	1	-	205731	2228139
KH1-7	-	18	1	10 *	205353	2227967
KH1-8	-	27	-	n/a	205350	2227883
KH1-9	-	20	-	n/a	205101	2227771
KH1-10	-	21	-	n/a	205099	2227720
KH1-11	-	23	-	n/a	204915	2227648
PHH-2	-	-	-	n/a	205107	2227987
PHH-3	-	19	-	n/a	204891	2227871
MKI-127	-	-	-	n/a	204979	2228271
MKI-128	-	-	-	n/a	204709	2228205
MKI-129	-	-	-	n/a	204633	2227971
MKI-130	-	17	-	n/a	204589	2227959
KAL-29	-	-	-	n/a	203613	2228754

\*Later removed from identification study.

## Upland North Study Area

In the Upland North Study Area - which includes portions of Kiiokalani (KOL), Kaihooa (KHO), Pohakulua (PHK), and Kalala (KAL) *ahupua'a* – a total of seven sites were given new site numbers, six were test excavated, and five samples of charcoal were recovered from under basal stones. This includes one of the eight sites in Mulrooney and Ladefoged's (2005) seriation of ritual architecture (H3).

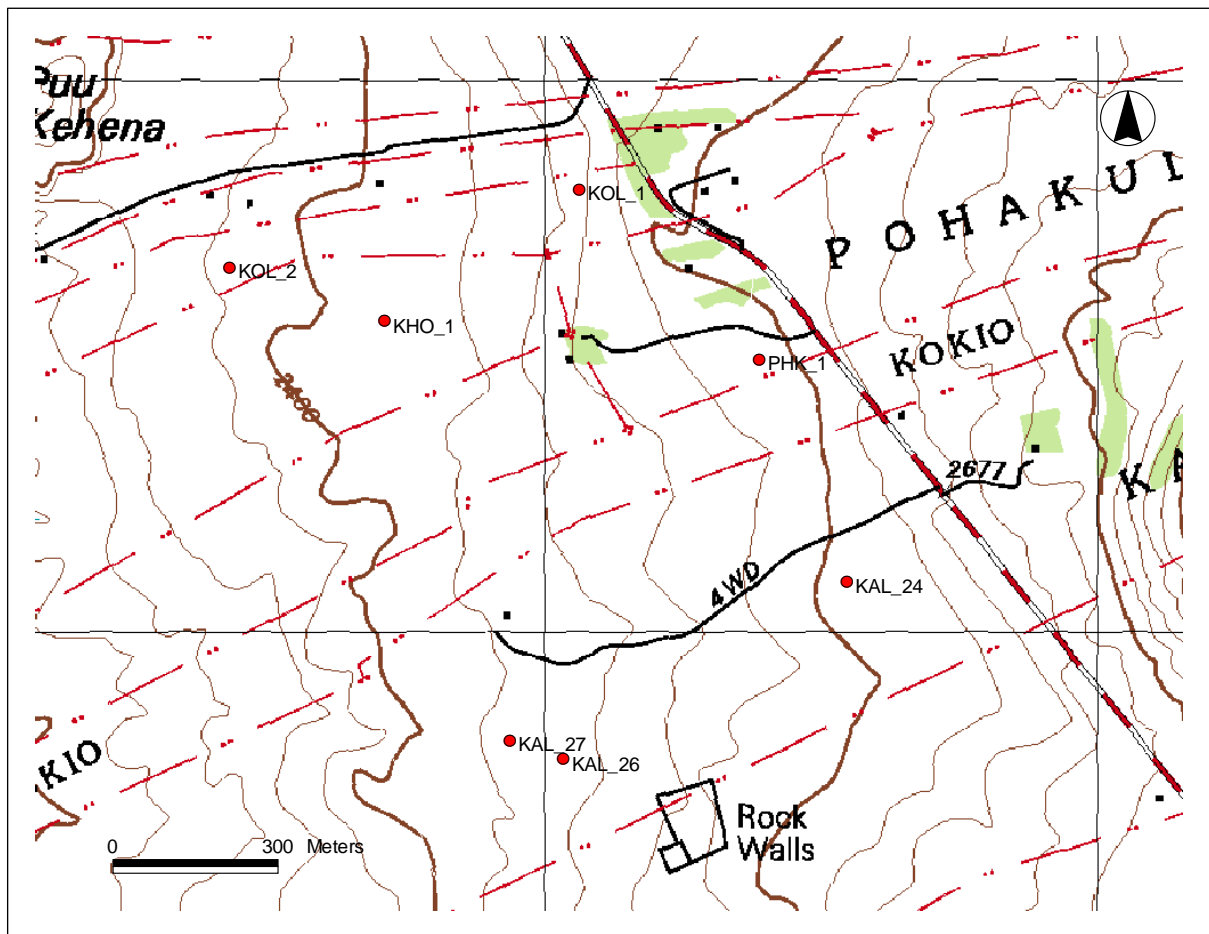


Figure 11 - Upland North Study Area. Sites shown include: KOL-1, KOL-2, KHO-1, PHK-1, KAL-24, KAL-27 and KAL-26.

## *Upland North Study Area, Kiiokalani ahupua'a*

### **KOL-1**

Also known as Feature 9 (Stephen ms), KOL-1 is a terrace with retaining wall made up of boulders and large cobbles. The retaining walls incorporate some natural outcrop at the south end. Possible stone paving present.

STP #1 was placed on the northwest end of the site's exterior retaining wall and STP#2 was placed on the north exterior retaining wall.



**Figure 12 - KOL-1 STP #1 was placed on the northwest end of the site's exterior retaining wall.**



**Figure 13 - KOL-1 STP#2 was placed on the site's north exterior retaining wall.**



## KOL-2

Previously recorded as Feature 2 (Stephen ms), KOL-2 is a stone faced terrace with outcrop within the interior and a notched-shaped, core-filled enclosing wall. Retaining wall has two large upright boulders 100 and 80 cm high.

STP excavations were located on the northeast interior wall (STP #1), the east end of exterior retaining wall (STP #2), and west end of the exterior retaining wall (STP #3).



Figure 14 - KOL-2 STP #1 was placed on the northeast interior wall of the site.



Figure 15 - KOL-2 STP #2 was placed on the exterior of the east end of the site's retaining wall.



Figure 16 - KOL-2 STP #3 was placed on the exterior of the west end of the site's retaining wall.

### *Upland North Study Area, Kaihooa ahupua'a*

#### **KHO-1**

Previously recorded as Feature 1 (Stephen ms), KHO-1 is a terrace with a retaining wall that was built with upright boulder construction on the northern half, core-filled with upright stones on the southern half, and incorporating boulder outcrop on the *mauka* side. An entry to the interior courtyard is visible on the *mauka* end of the site.

STP #1 is located at the base of an upright stone on the *makai* edge of the site's main retaining wall.



Figure 17 - KHO-1 STP #1 was placed at the base of an upright stone on the makai edge of the site's main retaining wall.

## *Upland North Study Area, Pohakulua ahupua‘a*

### **PHK-1**

Originally recorded as Feature 10 (Stephen ms), PHK-1 is a terrace and enclosure compound structure with a stone mound in the center. The site is heavily disturbed by a tree, a road, and erosion and thus no excavations were undertaken.

## *Upland North Study Area, Kalala ahupua‘a*

### **KAL-24**

Site KAL-24, also known as Feature 3 (Stephen ms), is an enclosure surrounding a pronounced knoll with a one-to-two course high retaining wall on the north, west, and south. A three-course high platform is located on the top of the knoll in the west corner of the enclosure.

STP #1 was placed at the east end of the site’s platform.



**Figure 18 - KAL-24 STP #1 was placed at the east end of the site’s platform.**

### **KAL-26**

Previously recorded as Feature 5 (Stephen ms) and H3 (Mulrooney and Ladefoged 2005), KAL-26 is a platform with a high northern and western (*makai*) face and lower southern and *mauka* sides. The northeastern corner has a cairn/ahu/mound of stone 4 to 5 courses high. There is a smaller mound on the southern half. Upright stones are incorporated throughout the site.

STP #1 was placed on the southern edge of the platform at the base of a stone alignment defining the edge of the site. There is a second larger set of stones interior of this alignment that appear to be an internal feature. STP #2 was placed at the exterior of the west retaining wall.



**Figure 19 - KAL-26 STP #1 was placed on the southern edge of the platform at the base of a stone alignment defining the edge of the site.**



**Figure 20 - KAL-26 STP #2 was placed at the exterior of the site's west retaining wall.**

## KAL-27

Previously recorded as Feature 4 (Stephen ms), KAL-27 is a paved terrace with boulder retaining face and two platforms on the *makai* and *mauka* sides, respectively. These platforms are consistent with Proto-Historic period burials.

No excavations were conducted on or near the site's possible burial platforms. STP #1 was placed on the *makai* side of the main structure near the southern corner. STP #2 is located on the exterior of the upper southeast retaining wall.



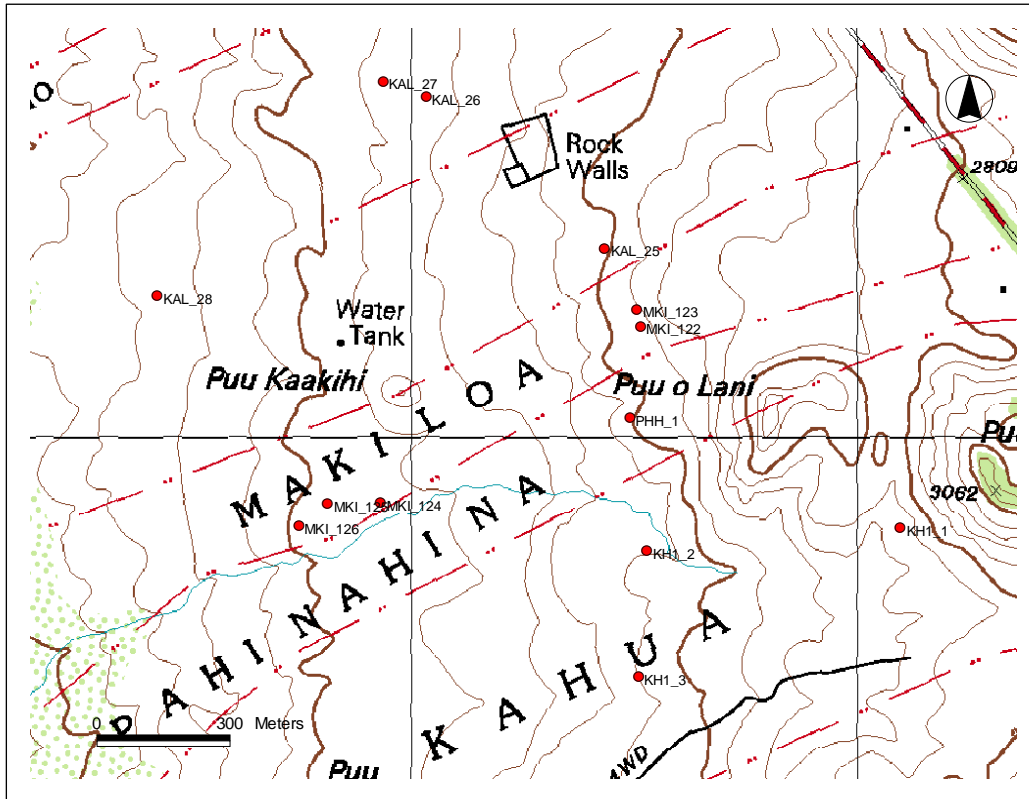
Figure 21 - KAL-27 STP #1 was placed on the *makai* side of the main structure near the southern corner.



Figure 22 - KAL-27 STP #2 is located on the exterior of the site's upper southeast retaining wall.

## Upland Central Study Area

In the Upland Central Study Area - which includes portions of Kalala (KAL), Makiloa (MKI), Pahinahina (PHH), Kahua 1 (KH1), and Kahua 2 (KH2) *ahupua'a* – a total of fourteen sites were given new site numbers, eight were test excavated, and seven samples of charcoal were recovered from under basal stones. This includes six of the eight sites in Mulrooney and Ladefoged's (2005) seriation of ritual architecture (H1, H4, H5, H6, H7, and H8).



**Figure 23 - Upland Central Group.** Sites shown include: KAL-28, KAL-25, MKI-122, MKI-123, MKI-124, MKI-125, MKI-126, PHH-1, KH1-1, KH1-2, and KH1-3. Sites not shown: KH1-4, KH1-5, and KH2-6.

### *Upland Central Study Area, Kalala ahupua'a*

#### **KAL-25**

Previously recorded as H3 and Feature 5, KAL-25 is a rectangular terrace with an enclosing retaining wall incorporating upright boulders.

STP #1 is located in the northeast corner at the base of an upright stone on the southern wall.



Figure 24 - KAL-25 STP #1 is located in the northeast corner at the base of an upright stone on the site's southern wall.

### **KAL-28**

No new field research was conducted at this site.

### ***Upland Central Study Area, Makiloa ahupua'a***

### **MKI-122**

Previously recorded as H6 and Feature 7, MKI-122 is a rectangular terrace created by an enclosing/retaining wall. The south corner has a large upright stone (ca. 150 cm high) and upright stones are incorporated throughout the feature. The west corner is connected to a long row of uprights that runs roughly northwest and connects to MKI-123.

STP #1 is located on the northern, outside face of the retaining/enclosing wall at the base of a large upright stone.

### **MKI-123**

Previously recorded as H5 and Feature 7, MKI-123 is a rectangular shaped terrace with a northern notch extension. This feature is in fair condition – a fence runs along the west side – and the overall shape and construction style is difficult to determine in places. The *makai*, southern wall has intact large upright stones. The tallest upright is in the northern corner of the notch – a similar sized upright is located in the far southern corner of nearby MKI-122.

STP #1 is located on the *makai* (outside) edge of an upright stone that appears to have been part of the main terrace (i.e., rather than the row of uprights that connect the site with MKI-122).



**Figure 25 - MKI-122 STP #1 is located on the northern, outside face of the retaining/enclosing wall at the base of a large upright stone.**



**Figure 26 - MKI-123 STP #1 is located on the makai, outside edge of an upright stone that appears to have been part of the main terrace (i.e., rather than the row of uprights that connect the site with MKI-122).**

## **MKI-124**

Originally recorded as H8 and later as Feature 11, MKI-124 is a two-tiered stone faced-earth filled terrace complex with an enclosing wall defined by upright stones and low stacked stones along the edge of a minor drainage (a small collapsed lava blister). The landscape rises steeply from south-to-north with the highest back wall defined by large boulder outcrop and the highest tier in the northeastern corner. Upright stones are incorporated throughout and range



from 50 to 100 cm high. The plan view of the enclosing wall is rectangular on the *mauka* side but comes to a point *makai*.

STP #1 was placed in the southernmost row of uprights on the outside (*makai*) side of the courtyard.

### **MKI-125**

Previously recorded as Feature 15, MKI-125 is a single terrace site with a enclosing/retaining wall. The interior is dominated by a natural outcrop 110 cm high. The condition of the site is fair – there is a wire fence through the northern side and the cobble and boulder retaining wall is in poor condition. Upright stones are used throughout.



**Figure 27 - MKI-124 STP #1 was placed in the southernmost row of uprights on the outside, makai side of the courtyard.**



**Figure 28 - MKI-125 STP #2 was placed on the interior of the north retaining wall below an upright basal stone 3 m west of STP #1.**



**Figure 29 - MKI-125 STP #3 was placed on the interior of the site's north retaining wall 2 m east of STP #1.**

STP #1 was placed on the interior, *makai* side of the northern alignment. STP #2 was placed on the interior of the north retaining wall below an upright basal stone 3 m west of STP #1 and abandoned due to a large cobble found 10 cm below ground surface. STP #3 was excavated on the interior of the north retaining wall 2 m east of STP #1. Exterior excavation was not attempted due to heavy deflation.

## MKI-126

No new field research was conducted at this site.

## *Upland Central Study Area, Pahinahina ahupua'a*

### PHH-1

Previously recorded as Feature 8 and H7, PHH-1 is a two-tiered terrace with rectangular enclosing/retaining wall. Lower, western retaining face is 112 cm high and in good condition. The interior of the structure has a small terrace 54 cm high with a walkway on the *makai* edge approaching from the south. Back (*mauka*), east wall has upright boulders and cut-bank for internal terrace.

STP #1 was excavated at the base of the western lower retaining wall along two cobble basal stones.



**Figure 30 - PHH-1 STP #1 was placed at the base of the western lower retaining wall along two cobble basal stones.**

## *Upland Central Study Area, Kahua 1 ahupua'a*

### **KH1-1 and KH1-2**

No new field research was conducted at these sites.

### **KH1-3**

Previously recorded as H1 and Feature 14, KH1-3 is a compound structure comprised of two terraces with a rectangular enclosing wall with a small notch on the *mauka*, eastern side. A fence runs through the site and deflation is a problem since the site was constructed on a small knoll.

STP #1 was excavated on the southwest corner of the exterior retaining wall.

### **KH1-4**

Originally recorded as a ritual structure (Feature 16), KH1-4 is clearly best interpreted as a house complex. The site is comprised of two main features: (1) a three-tiered stone-faced earth filled terrace with an upright stone enclosing wall and (2) a narrow rectangular enclosure. The former has what now appears to be a rectangular stone-lined pit but which is more likely a previous excavation unit (see Graves in prep.).

STP #1 was excavated against the southernmost row of uprights on the outside edge but was ended due to a lack of basal deposits. STP #2 was excavated at the back of the uppermost terrace. STP #3 was excavated on the interior of the northern freestanding wall at the top of a small knoll.



**Figure 31 - KH1-3 STP #1 was placed on the southwest corner of the site's exterior retaining wall.**



**Figure 32 - KH1-4 STP #1 was placed against the outside edge of the site's southernmost row of uprights.**



**Figure 33 - KH1-4 STP #2 was placed at the back of the site's uppermost terrace.**



Figure 34 - KH1-4 STP #3 was placed on the interior of the northern freestanding wall at the top of a small knoll.

#### **KH1-5**

No new field research was conducted at this site.

#### ***Upland Central Study Area, Kahua 2 ahupua'a***

#### **KH2-6**

No new field research was conducted at this site.

## Upland South Study Area

In the Upland South Study Area - which includes portions of Kahua 2 (KH2) *ahupua'a* – a total of five sites were given new site numbers, one was test excavated, and one sample of charcoal was recovered from under basal stones. This site is one of the eight sites in Mulrooney and Ladefoged's (2005) seriation of ritual architecture (H2).

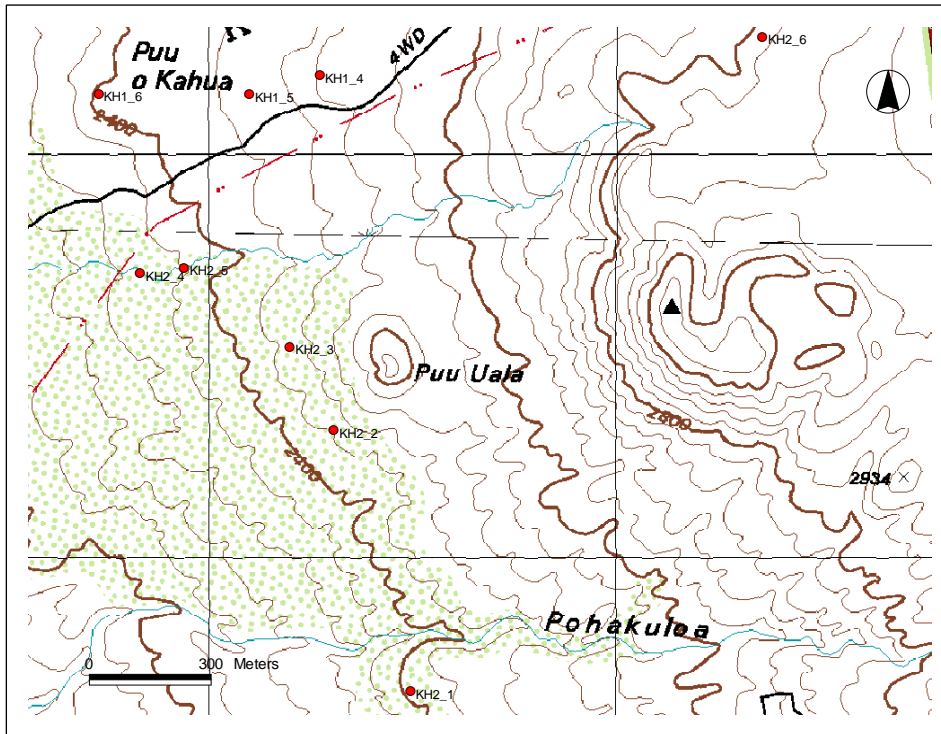


Figure 35 - Upland South Study Area. Sites shown include: KH2-1, KH2-2, KH2-3, KH2-4, and KH2-5.

### *Upland South Study Area, Kahua 2 ahupua'a*

#### **KH2-1**

No new field research was conducted at this site.

#### **KH2-2**

Previously recorded as H2 and Feature 13, KH2-2 is a compound structure comprised of a large enclosing wall and multiple terraces built on a steep outcrop. There are historic ranching period enclosures nearby.

STP #1 is located on the exterior of the northwest the enclosing wall.

#### **KH2-3, KH2-4, and KH2-5**

No new field research was conducted at these sites.

## Mid-Elevation Central Study Area

In the Mid-Elevation Central Study Area - which includes portions of Kalala (KAL), Makiloa (MKI), Pahinahina (PHH), and Kahua 1 (KH1) *ahupua'a* – a total of thirteen sites were given new site numbers, two were test excavated, and one sample of charcoal was recovered from under basal stones. However, no charcoal from this sample was included in the plant identification study since the site in question is likely not a place of ritual. None of the eight sites in Mulrooney and Ladefoged's (2005) seriation of ritual architecture are found in this part of the study area.

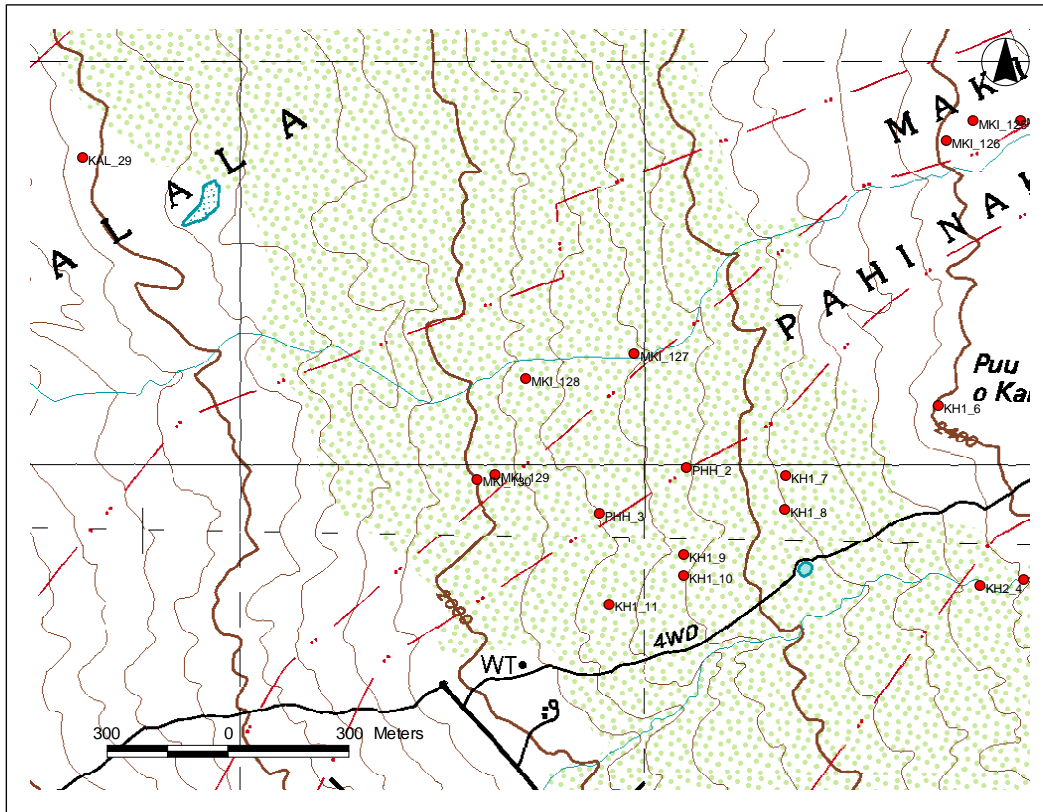


Figure 36 - Middle Elevation Central Group. Sites shown include: KH1-6, KH1-7, KH1-8, KH1-9, KH1-10, KH1-11, PHH-2, PHH-3, MKI-127, MKI-128, MKI-129, MKI-130, and KAL-29.

### *Mid-Elevation Central Study Area, Kahua 2 ahupua'a*

#### **KH1-6**

Previously recorded as Feature 12, KH1-6 is a compound structure whose main feature is a platform located on the summit of a small hill. The platform itself has an elaborate internal structure that includes a small stone cairn (*ahu*) possibly used in the past as a shrine or alter. A detailed mapping of these features should be a high priority in future work at the site.

STP #1 was excavated on the exterior wall of the lower terrace on the site's south end.



## **KH1-7**

The GPS point location of KH1-7 references a set of features that likely contain burials. No further survey or excavations were conducted on or near those features. However, other structures, previously recorded as Feature 17, were investigated and determined to be a house and ranching complex that may include features from the pre- and post-contact era. Thus, other than burial cairns located in the area there are no signs of traditional Hawaiian sites of ritual.

STP #1 was excavated on the exterior of an enclosing wall around a terraced compound structure with an upright stone in the northeastern corner.



**Figure 37 - KH1-6 STP #1 was excavated on the exterior wall of the lower terrace on the site's south end.**

## **KH1-8, KH1-9, KH1-10, and KH1-11**

No new field research was conducted at these sites.

## ***Mid-Elevation Central Study Area, Pahinahina, Makiloa, and Kalala ahupua'a***

## **PHH-2, PHH-3, MKI-127, MKI-128, MKI-129, MKI-130, and KAL-29**

No new field research was conducted at these sites.

## Chapter 4. Summary

In addition to other achievements, Native Hawaiians planned and built architecture on a monumental scale. In this research and training program we have strived to show the value of taking a contextual approach to understanding how and when such cultural sites were constructed in the North Kohala District of Hawai'i Island. Specifically, we can report that our effort to collect micro-topographic data on the landscape around Pu'ukohola Heiau was successful. Landform provides the physical context for human experiences both past and present. Thus, the survey and digital topographic model described here represents the first step to developing a more nuanced reading of the ritual landscape.

In the Leeward Kohala Field System, we recovered material for future radiocarbon dating from all eight sites within the current relative chronology (Murooney and Ladefoged 2005) as well as samples from five additional sites (Stephen ms). We will soon be able to determine the validity of this chronology and test for temporal variation in how visibility was used by architects. In addition, our re-examination of sites has shown a need for yet further study of some known sites.

Overall, we believe the results of this study – which examines proto-historic and late prehistoric sites – will help ultimately help us look at monumental architecture in terms of how long term changes in building practices reflect increasing efforts to ritualize specific places at varying scales and using different techniques (McCoy 2008). This is an important first step toward accounting for the roles of ideas, symbols, and values in shaping the development of complex societies.

## Bibliography

Cachola-Abad, C.K.

1993 The Significance of *Heiau* Diversity in Site Excavations. *Cultural Resource Management (CRM)* 19(8):11-17.

Kirch, P.V.

1990 Monumental Architecture and Power in Polynesian Chiefdoms: A Comparison of Tonga and Hawaii. *Journal of World Archaeology* 2: 206-222.

2004 Temple Sites in Kahikinui, Maui, Hawaiian Islands: Their Orientations Decoded. *Antiquity* 78(299): 102-114.

Kolb, M.

1994 Monumentality and the Rise of Religious Authority in Precontact Hawai'i. *Current Anthropology* 35:521-547.

Kvamme, K.L., Ernenwein, E.G., and C.J. Markussen

2006 Robotic total station for microtopographic mapping: an example from the Northern Great Plains. *Archaeological Prospection* 13 (2): 91-102.

Ladefoged, T.N. and Graves, M.W.

in press Variable Development of Dryland Agriculture in Hawaii: A fine-grained chronology from the Kohala Field System, Hawaii Island. *Current Anthropology*.

McCoy, M.D.

2008 Life Outside the Temple: Reconstructing Traditional Hawaiian Ritual and Religion Through Ritualized Practices. In *Religion, Archaeology, and the Material World*. Edited by Lars Fogelin. Center for Archaeological Investigations, Southern Illinois University, Carbondale, Occasional Paper No. 36, pp. 261-278.

Mulrooney, M.A. and T.N. Ladefoged

2005 Hawaiian Heiau and Agricultural Production in the Kohala Dryland Field System. *Journal of the Polynesian Society* 114:45-67.

Mulrooney, M. A., Ladefoged, T. N., Gibb, R. and D. McCurdy

2005 Eight Million Points Per Day: Archaeological Implications of Laser Scanning and Three-Dimensional Modeling of Pu'ukohola Heiau, Hawai'i Island. *Hawaiian Archaeology* 10:18-28.

Rosendahl, P.

1972 Aboriginal Agriculture and Residence Patterns in Upland Lapakhi, Island of Hawai'i. PhD, University of Hawaii, Manoa.

Stephen, J.W.

n.d. Building a Bigger Picture: Variation in Visibility Across a Prehistoric Hawaiian Landscape. Manuscript submitted in partial fulfillment for MA degree, University of Hawaii, Manoa.

Stokes, J.F.G.

1991 *Heiau of the Island of Hawai'i: A Historic Survey of Native Hawaiian Temple Sites*, edited by T.S. Dye. Bernice P. Bishop Museum Press, Honolulu.

## Appendix I. Shovel Test Pit Field Notes for Upland Leeward Kohala

KAL-24, STP#1.0-40 cmbs. Lv 1. dark brown silt (10YR3/3), 25% pebble, 10% cobble, with large charcoal chunks removed from 35cm BS at main excavation. Northern extension under basal stone possibly contains charcoal.

KAL-25, STP #1. 0-15 cmbs. Lv 1. dark yellowish brown silt (10YR3/4), v. few pebbles. No cultural material.

KAL-26, STP#1. 0-19 cmbs. dark brown silt (10 YR 3/3), peds, cobbles at base of excavation.

KAL-26, STP#2. 0-30 cmbs. Lv 1. dark brown silt (10 YR 3/3) with kukui; 10% pebble. 10cm below basal stone; East extension under basal stone. Collected 0.5 liters.

KAL-27, STP #1. 0-30 cmbs. Lv 1. very dark brown silt (10 YR 2.5/3), 5% pebble, 5% small cobble Went below basal stone 15cm. Northern extension under basal stone- collected 1.0 liter of sediment.

KAL-27, STP#2. 0-35 cmbs. Lv 1. dark brown silt (10YR3/3), 0-20cm, Lv. 2 Very dark brown silt (10 YR 2.5/3) 20-35cm, with charcoal, historic glass, and basalt flake; 10% pebble, 10% cobble. 25cm below basal stone; NW extension under basal stone. Collected 1.0 liters.

KH1-3, STP#1. 0-25 cmbs. Lv 1. dark brown silt (10YR3/3), with charcoal, VG, and coral. Northern extension under basal stone possibly contains charcoal.

KH1-4, STP#1. Excavation abandoned, basal stone rests on stone. No sediment was screened from main excavation.

KH1-4, STP#2. 0-20 cmbs. Loose few pebbles, dark brown silt (10YR3/3). Ended excavation at pebble layer (10 cm below basal stone) which likely represents building fill rather than paving. Thick layer of pebble found under basal stone that are also interpreted as building fill.

KH1-4, STP#3.0-40 cmbs. Lv 1. dark brown silt (10YR3/3) with charcoal, VG, and coral; 35% pebble, 15% cobble. 30cm below basal stone; East extension under basal stone. Collected 1.5 liters.

KH1-6, STP #1. 0-35 cmbs. Lv 1. dark brown silt (10YR3/3), 11 charcoal pieces were extracted from the main excavation. Northern extension (10 – 25cm BS) under basal stone may possibly contain small fragments of charcoal.

KH1-7, STP #1. 0-20 cmbs. Lv 1. dark brown silt (10YR3/3) a range of cultural material uncovered. Ash lens at 15 cmbs to 20 cmbs in north wall of pit. Two southern extensions under different basal stones, one SW and the other SE.

KH2-2, STP #1. 0-12 cmbs. Lv 1. dark yellowish brown silt (10YR3/6). Range of cultural material found. Thin ash lens (2 cm) at transition to Lv. 2 (12 cmbs). Lv 2. Excavated to 23 cmbs. All artifacts bagged together from main excavations. Dark soil and charcoal found under basal stone in southern extension.

KHO-1, STP#1. 0-30 cmbs. Lv 1. Brown sediment, Pebble paving at 10cm, 10% pebble below paving, 5% small cobble. Went below basal stone 16cm. NE extension under basal stone- collected 1.5 liter of sediment.

KOL-1, STP#1. 0-22 cmbs. Dark yellowish brown silt (10 YR 3/4), few pebbles, no cultural material.

KOL-1, STP#2. 0-30 cmbs. Lv 1. dark yellowish brown silt (10 YR 3/4) 20% pebble, 15% small cobble. Went below basal stone 10cm. S extension under basal stone- collected 0.75 liter of sediment.

KOL-2, STP#1. 0-35 cmbs (2 large cobbles created a small 15cm triangular digging space). Lv 1. dark brown silt (10 YR 3/3) Cobble paving at 10cm. Went below basal stone 7cm. NE extension under basal stone- collected 0.3 liter of sediment.

KOL-2, STP#2. 0-40 cmbs. Lv 1. Dark Brown sediment, 5% pebble, 1% cobble. Went below basal stone 30cm. W extension under basal stone- collected 1.0 liter of sediment.

KOL-2, STP#3. 0-30 cmbs Lv 1. dark brown silt (10 YR 3/3), 10% pebble, 10% small cobble. Went below basal stone 16cm. NE extension under basal stone- collected 1.5 liter of sediment.

MKI-122, STP #1. 0-13 cmbs. Lv 1. strong brown silt (7.5 YR 4/6) , peds, one small cobble. At 13 cmbs, transition to lighter sediment, charcoal flecks noted. Main excavation ended at 13 cmbs. Basal extension made in to Lv 1.

MKI-123, STP #1. 0-14 cmbs. Lv 1. Brown sediment, few pebbles. No cultural material.

MKI-124, STP #1.0-10 cmbs, dark brown silt (10YR3/3), loose, peds, 4 cobbles removed, few pebbles, may be wall fall. After 10 cmbs, soil is more compact, no more stone in main excavation. Main excavation ended at 30

cmbs.

MKI-125, STP #1. 0-25 cmbs. Lv 1. dark brown silt (10YR3/3) peds, few pebbles. No cultural material. Extension from 10-25 cmbs (0-12 cm below basal stone).

MKI-125, STP#2. Abandoned due to large cobble.

MKI-125, STP#3. 0-40 cmbs. Lv 1. dark brown silt (10YR3/3) with charcoal; 35% pebble, 10% cobble. 30cm below basal stone; North extension under basal stone. Collected 0.5 liters.

PHH-1, STP #1. 0-22 cmbs, dark yellowish brown silt (10 YR 3/4). Main excavation exposed buried coarse of stone to 12 cmbs. Historic materials found from 10cmbs onwards including possible diagnostic button (plastic). East extension under basal course stone uncovered charcoal but not historic artifacts. It is unclear if site was constructed and used continuously through the historic period or if deposits in main excavation represent a later cattle ranching phase.

## Appendix II. Material Collected in Upland Leeward Kohala

	STP#	Main Excavation	Collected from Extension	Easting of STP	Northing of STP	Date
KAL-24	1	(1) Charcoal	N/A	206557	2230084	10/VI/08
KAL-25	1	N/A	N/A	206453	2229413	8/VI/08
KAL-26	1	(1) Charcoal	N/A	206040	2229750	10/VI/08
KAL-26	2	(1) Kukui	(1) Charcoal	206020	2229754	18/VI/08
KAL-27	1	(1) Historic Glass poss. Flaked	N/A	205929	2229788	11/VI/08
KAL-27	2	(1) Basalt Flake (2) Charcoal (3) Historic Glass	(1) Charcoal	205932	2229787	18/VI/08
KH1-3	1	(1) Charcoal (2) Coral (3) Glass	N/A	206517	2228436	10/VI/08
KH1-4	1	N/A	N/A	206275	2228154	10/VI/08
KH1-4	2	(1) Charcoal	N/A	206271	2228179	10/VI/08
KH1-4	3	(1) Charcoal (2) VG (3) Coral	(1) Charcoal	206275	2228189	18/VI/08
KH1-6	1	(1) Charcoal	N/A	205731	2228138	9/VI/08
KH1-7	1	(1) Bone (2) Coral (3) Shell (4) Charcoal (5) Flaked Basalt (6) Kukui (Plus 3 bags: Coral, Shell, Charcoal from ash lens)	(1) Charcoal	205380	2227987	9/VI/08
KH2-2	1	(1) Faunal Bone (2) Charcoal (3) Fish Bone (4) VG	(1) Charcoal	206295	2227320	9/VI/08
KHO-1	1	(1) VG (2) Charcoal (3) Bone (4) Flaked Basalt	(1) Flaked Basalt (2) Charcoal	205679	2230553	11/VI/08
KOL-1	1	N/A	N/A	206056	2230797	11/VI/08
KOL-1	2	N/A	N/A	206059	2230798	13/VI/08
KOL-2	1	(1) Flaked Basalt	N/A	205438	2230656	11/VI/08
KOL-2	2	(1) Charcoal (2) Flaked Basalt	N/A	205435	2230659	13/VI/08
KOL-2	3	(1) VG (2) Charcoal	N/A	205418	2230660	13/VI/08
MKI-122	1	(1) Kukui (2) VG	(1) Charcoal	206519	2229258	8/VI/08
MKI-123	1	N/A	(1) Charcoal	206502	2229280	8/VI/08
MKI-124	1	(1) Charcoal	(1) Charcoal	205927	2228829	8/VI/08
MKI-125	1	N/A	N/A	205806	2228838	9/VI/08
MKI-125	2	N/A	N/A	205804	2228837	18/VI/08
MKI-125	3	(1) Charcoal	(1) Charcoal	205809	2228837	18/VI/08
PHH-1	1	(1) Charcoal	N/A	206478	2229038	10/VI/08

## Appendix III. Community Territory (*Ahupua'a*) Codes

AAM	Aamakao	Windward
AIN	Ainakea	Windward
APU	Apuakohau	Windward
AWA	Awalua	Leeward
HAE	Haena	Leeward
HUL	Halaula	Windward
HLW	Halawa	Windward
HLL	Halelua	Windward
HAW	Hawi	Windward
HON	Honoipu	Leeward
HOK	Honokane	Windward
HOM	Honomakau	Windward
HOP	Honopueo	Windward
HU1	Hualua 1	Windward
HU2	Hualua 2	Windward
HUK	Hukiaa	Windward
IOL	Iole	Windward
KA	Kaauhuhu	Windward
KAH	Kahei	Leeward
KA1	Kahei 1	Windward
KA2	Kahei 2	Windward
KA3	Kahei 3	Windward
KH1	Kahua 1	Leeward
KH2	Kahua 2	Leeward
KHL	Kaiholena	Leeward
KHO	Kaihoaa	Leeward

KAL	Kalala	Leeward
KAM	Kamano	Leeward
KP1	Kapaa 1-2	Leeward
KPN	Kapaanui	Leeward
KPU	Kapaau	Windward
KAP	Kapua	Windward
KPP	Kapunapuna	Leeward
KPL	Kaupalaoa	Leeward
KEA	Kealahewa	Windward
KE1	Kehena 1	Leeward
KE2	Kehena 2	Leeward
KOL	Kiiokalani	Leeward
KOK	Kokoiki	Windward
KKI	Kokoili	Leeward
KOU	Kou	Leeward
KPH	Kukuipahu	Leeward
KUK	Kukuiwaluhia	Windward
LAA	Laumama	Windward
LAM	Lamaloloa	Leeward
LAP	Lapakahi	Leeward
MAH	Mahukona	Leeward
MA1	Makanikahio 1	Windward
MA2	Makanikahio 2	Windward
MKP	Makapala	Windward
MKE	Makeanehu	Leeward
MKI	Makiloa	Leeward

MAU	Maulili	Windward
NAP	Napapaa	Windward
NIU	Niulii	Windward
NUK	Nunulu-iki	Windward
NUN	Nunulu-nui	Windward
OHA	Ohanaula	Windward
OPI	Opihipau	Windward
PHH	Pahinahina	Leeward
PAH	Pahoa	Windward
PHK	Pohakulua	Leeward
PHA	Pohakulua Ahula	Leeward
POL	Pololu	Windward
PUI	Puaili	Leeward
PUK	Puakea	Leeward
PUN	Puanui	Leeward
PUH	Puehuehu	Windward
PAO	Paoo	Leeward
PUK	Pueke	Windward
PU1	Puu Epa 1	Windward
PU2	Puu Epa 2	Windward
POK	Puu o Kumau	Windward
UNK	unknown	Windward
UPO	Upolu	Leeward
WAI	Waiapuka	Windward