SCS Report 541-Data Recovery-1

DATA RECOVERY PLAN FOR KALOKO HEIGHTS
Kohanaiki and Kaloko Ahupua‘a
TMK: 3-7-3-009:32

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SCIENTIFIC CONSULTANT SERVICES Inc.

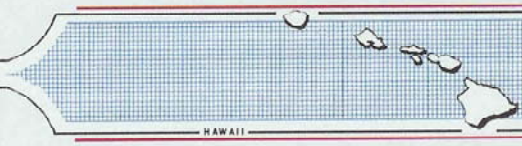

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Exhibit 40

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

Stanford Carr Development, LLC proposes to develop approximately 213 acres into residential and light commercial occupancy in portions of the *ahupua'a* of Kohanaiki and Kaloko (Figure 1) in TMK: 3-7-3-09:32 (Figure 2), North Kona, island of Hawai'i. The project area is an irregular polygon defined by Hina Lani Street on the south, an irregular line at the *makai* end of residential development on the east, the boundary between the *ahupua'a* of Kohanaiki and 'O'oma on the north, and a line perpendicular to the northern boundary at roughly the 720 foot elevation on the west.

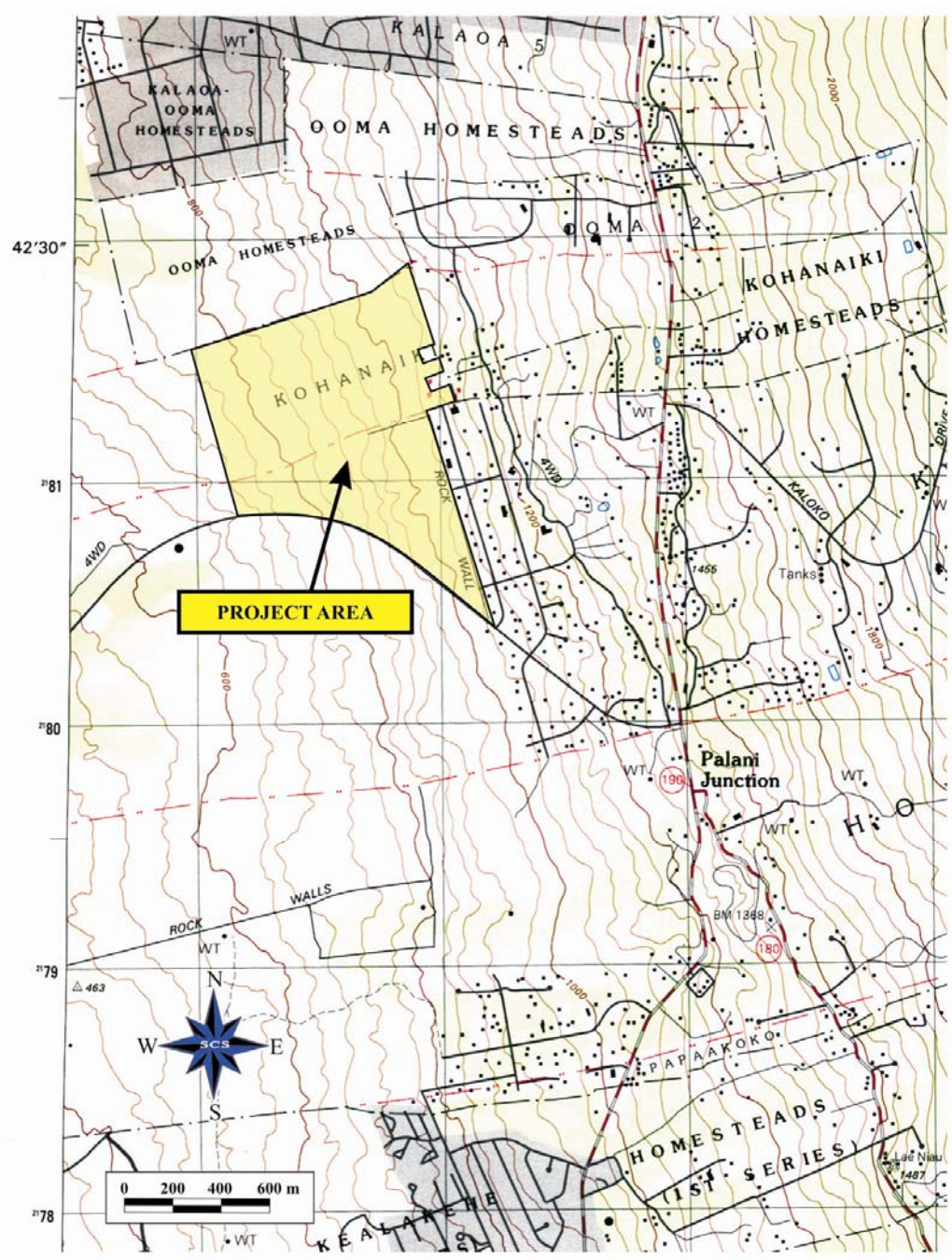

Figure 1. Project Location.

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey on this property, hereafter referred to as the Kaloko Heights project, to identify and evaluate historical properties pursuant to state cultural resource management regulations (HAR § 275 and 276). The Inventory Survey report was submitted to the State Historic Preservation Division (SHPD) on January 20, 2005. SHPD responded with comments in a letter dated July 13, 2005 (SHPD Log No. 2005.1457). A revised Inventory Survey was submitted to SHPD on October 13, 2005. SHPD responded to that second submittal with a letter dated October 24, 2005 (SHPD Log No. 2005.2296) concurring with the recommendation for 26 sites.

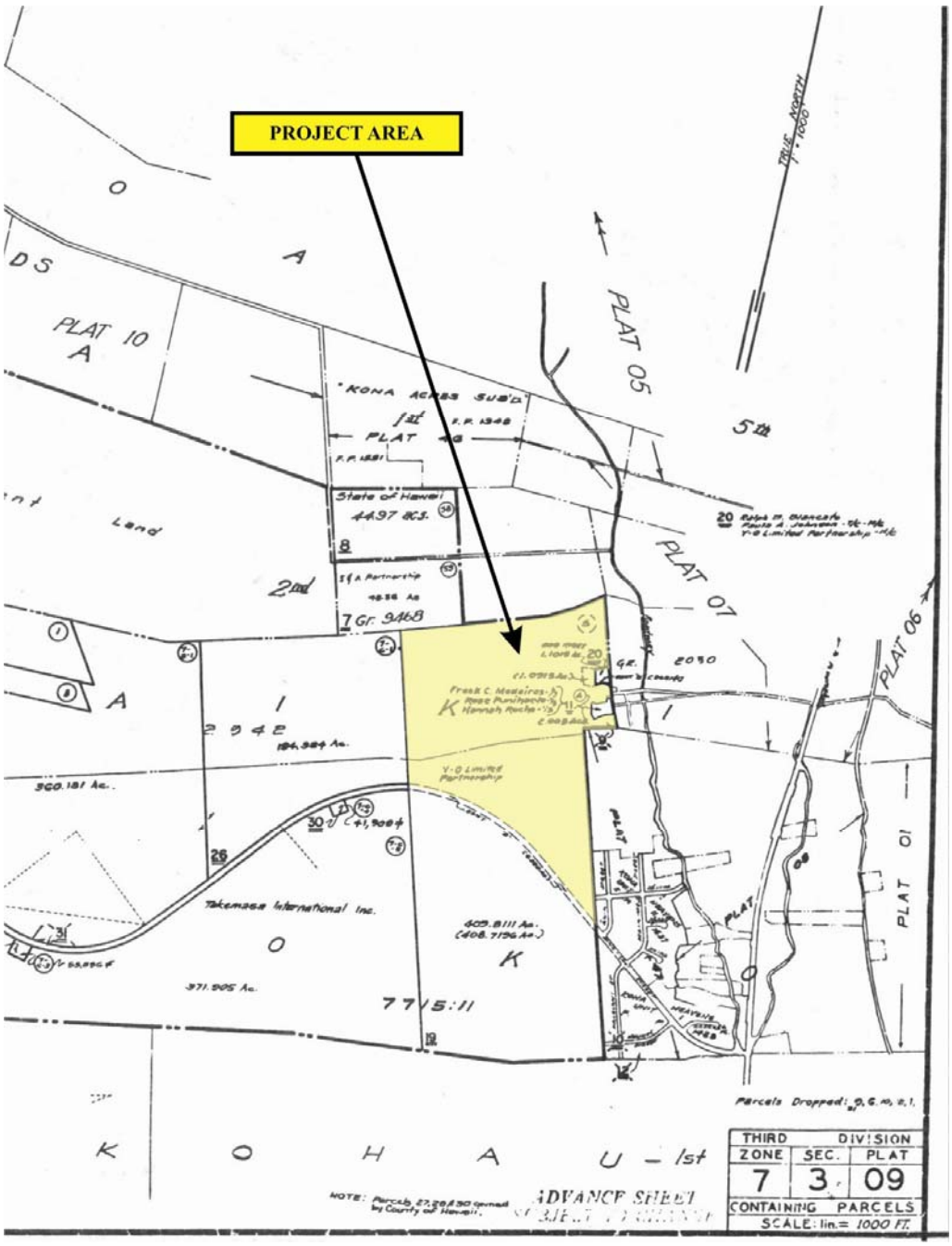

Figure 2. TMK.

GENERAL OVERVIEW OF RESULTS OF THE INVENTORY SURVEY

The Inventory Survey determined that approximately half of the project area has been bulldozed. The bulldozed portion is within Kaloko, and is south of the wall that marks the boundary between Kaloko and Kohanaiki. The Kohanaiki side has not been bulldozed.

There are many pre-Contact archaeological resources in Kohanaiki (Figure 3). Most are agricultural features. There are also habitation features, trails, *heiau*, caves for water collection, and burials. Although the Kaloko side has been bulldozed, there are a few resources, mostly caves, that remain. There are also historical resources in the project area, most prominently represented by the Kohanaiki Homesteads.

Twenty-six sites were recommended for data recovery (Table 1) in the Inventory Survey (Wolforth *et al*. 2005). The principal research topic is to examine pre-Contact and historical patterns of permanent habitation. This will focus on the historical Kohanaiki Homesteads, and several pre-Contact permanent habitation sites. A secondary research topic is to find out when, and perhaps how long, water has been collected in the water collection caves sites. Most of the sites recommended for data recovery directly relate to these two topics. Other data recovery sites contribute to these to topics indirectly.

Table 1. Data Recovery Sites.

Site #	Site Type	Function	Significance Criterion	Recommended Treatment
10690	Complex	Permanent habitation	D	DR
10693	Walled fields	Habitation and garden	D	DR
10694	Complex	Permanent habitation	D	DR
10700	Walled fields	Habitation and garden	D	DR
10705	Complex	Permanent habitation	D	DR
10706	Enclosure	Permanent habitation/ceremonial	D	DR
10721	Cave	Water source	D	DR
10729	Cave	Water source/ ceremonial/habitation	D	DR
10730	Walled fields	Habitation and garden	D	DR
10732	Cave	Temporary habitation	D	DR
10734	Walled fields	Habitation and garden	D	DR
10735	Complex	Permanent habitation	D	DR
10737	Complex	Permanent habitation	D	DR
10742	Cave	Permanent habitation	D	DR
10743	Cave and petroglyphs	Temporary habitation	D	DR
10751	Cave	Water source	D	DR
10753	Cave	Water source	D	DR
10755	Cave	Water source/ ceremonial	D	DR
10756	Cave	Water source/storage	D	DR
10757	Cave	Permanent habitation	D	DR
10758	Cave	Permanent habitation	D	DR
10763	Trail with petroglyph	Pathway	D	DR
10764	Homestead, Kapa	Historic homestead	D, E	DR
10767	Trail with petroglyph	Pathway	D	DR
10768	Complex	Permanent habitation	D	DR
10778	Homestead, Punihaole	Historic homestead	D, E	DR

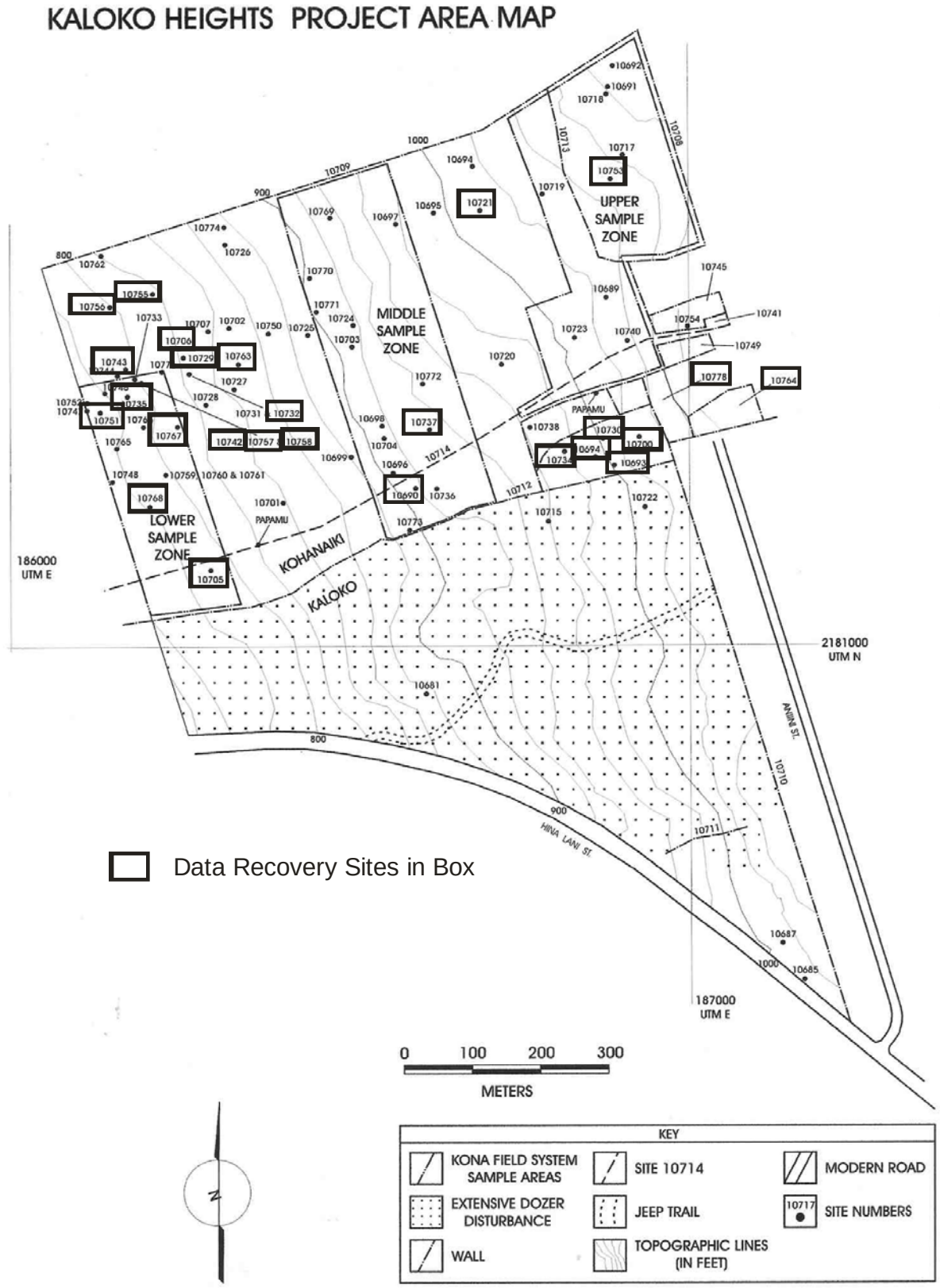

Figure 3. Archaeology Sites in the Project Area.

The data recovery sites can be grouped into several types: Kohanaiki homesteads; walled fields near the homesteads; permanent habitations on the surface; caves used to collect water, and; pathways.

KOHANAIKI HOMESTEADS

Approximately 20% of the area of original abandoned Kohanaiki Homesteads is within the project area (Figure 4). Most of the homestead area beyond the project area has been destroyed by previous development *mauka* of the project area. Portions of five of the total of 18 homesteads lots are within the Kaloko Heights project area. Two homesteads are completely within the project area, Kiaha and Pahuole (Figure 5). For each of the three homesteads that are partially within the project area, Kapa, Punihaole and Kaholi, the portion that contained the house is outside of the project area, and consequently, has been destroyed by previous developments. Data recovery was recommended for two of the partial remaining homesteads: Site 10764, Kapa, and Site 10778, Punihaole.

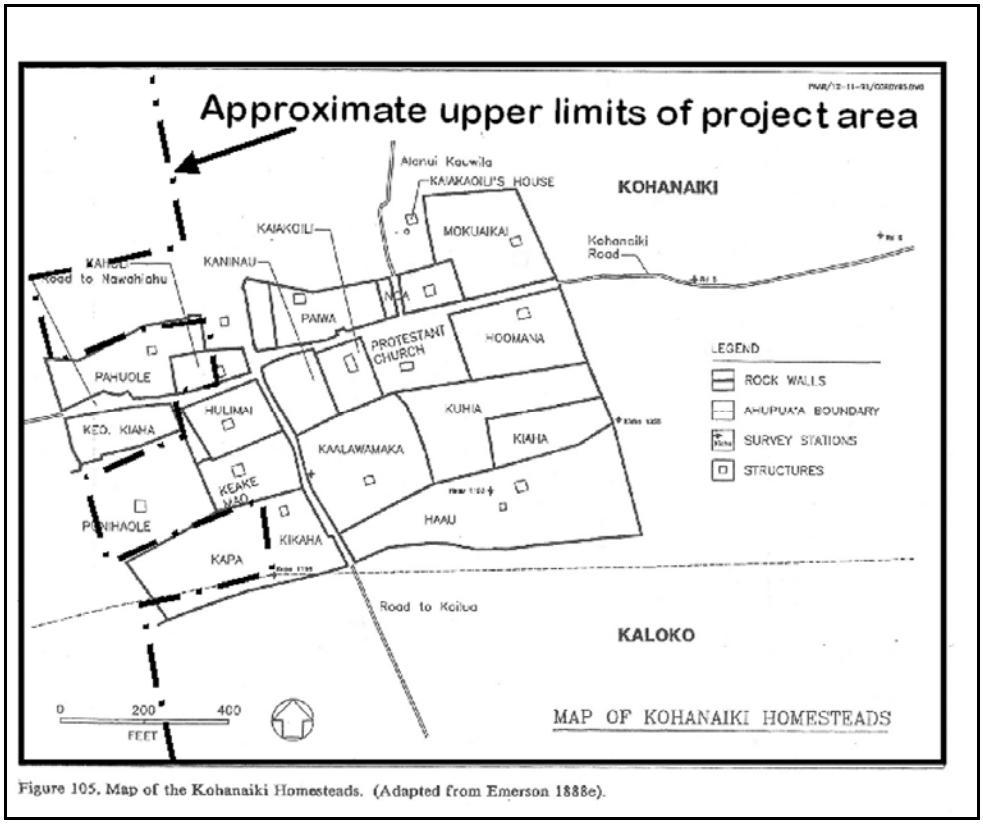

Figure 105. Map of the Kohanaiki Homesteads. (Adapted from Emerson 1888e).

Figure 4. Homesteads.

The research topics for the homesteads area are:

- Were the homesteads built on pre-contact residential areas?
- Was there more than one house (and presumably family group) in each homestead?
- What are the types of functions that took place within a homestead, and how were these distributed?

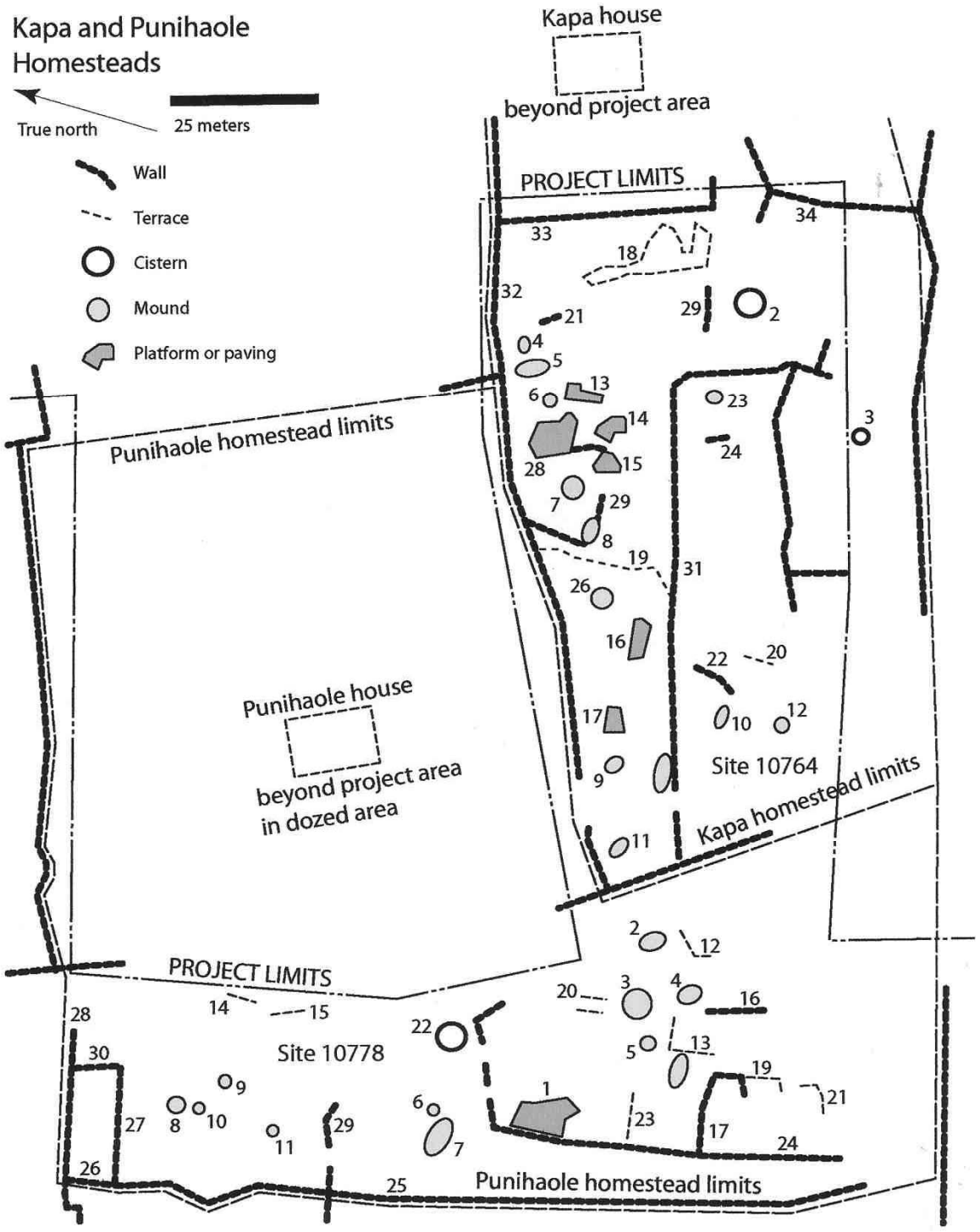

Figure 5. Kapa and Punihaole Homesteads.

KAPA HOMESTEAD, SITE 10765

Approximately two-thirds of the Kapa Homestead is within the project area. The other one-third is to the east and south of the project area. The old Emerson map of the homesteads indicates that the house for this homestead was located beyond the project area. Thirty-four Kapa Homestead features were identified within the project area.

Excavation within Feature 1, the largest platform in the site, indicates that the there were no material remains in the shallow paving on the outcrop. Based on the inventory survey and historical documentation, it appears that the Kapa family resided in the eastern one-third of the homestead and farmed the western two-thirds.

PUNIHAOLE HOMESTEAD, SITE 10778

Over half of the Punihaole homestead, including the area where the house was located, is beyond the project area, and has been bulldozed. Thirty features were recorded, and no excavation units were dug.

HOMESTEAD DATA RECOVERY

Data recovery investigations at the homesteads are designed to: examine whether there are pre-contact deposits somewhere within the homestead; find and examine activity areas, and; determine whether there are other areas of habitation in the homesteads other than the missing central houses.

Searching for activity areas

A 5-meter interval grid will be established over each homestead. Shovel probes will be conducted on that grid, and the soil from those probes will be screened. This technique is designed to identify material remains that might provide insights into activity areas. Consequently, the recordation of these probes will include notation of quantity and type of material remains, depth of probe to bedrock, but not soil stratigraphy. This expeditious approach maximizes opportunities to identify activity areas that can subsequently be examined with controlled excavation.

The results of the probing can provide information on the patterning of activity areas. Concentrations of flakes suggest tool manufacture and use areas. Concentrations of shell and bone indicate food processing and/or consuming areas. So too charred material. Total lack of material probably indicates garden spots. These generalizations are then examined with greater focus with controlled excavation.

Examining activity areas

Controlled excavation[1] units will be conducted at 3 areas within each of the homesteads, as indicated by the results of the probing. For instance, after the probing results are tabulated in the field, excavation units will be set up over probed locations that indicate certain were likely conducted there. Each excavation area may be up to 4 m^2 (a total of four 1 by 1 meter units). If the maximum size excavation area is reached for 3 excavation areas at the 2 sites, then a maximum of 24 m^2 would be excavated at the 2 homesteads for the task of examining activity areas.

Farming as an activity area within a homestead

An investigation within the agricultural setting of the Kona Field System at the Amy B. Greenwell gardens designed to investigate patterns of floral and cultigen use concluded that

> "Charred plant remains were most frequent inside the stone planting features and less common in open field areas, suggesting that some of the charred plant materials are by-

[1] Details on what constitutes "controlled excavation" and how the materials that area gathered from such endeavors are treated are provided in the chapter in this plan regarding Methods.

products of agricultural practices. The low frequencies in open areas suggest either that the materials have eroded away or that the activities that produce charred plant remains occurred less often in these areas" [Lennstrom 2001:124].

Macrobotanical data can be obtained from stone and non-stone features. Identification of floral species provides insights into the surrounding paleoenvironment (Allen and Murakami 1999), modes and patterns of selection of wood for specific tasks (Malo 1951), and subsistence strategies (Dixon et al. 2002).

Excavation units will be conducted at 2 stone agricultural features at both homesteads to collect macrobotanical data. The features to be excavated will be selected in the field based on perceived integrity of the feature. Stones will be removed from one-half of each feature, and the soils beneath the features will be excavated to bedrock.

Multiple houses in one homestead, or an earlier residential area?

One platform (Feature 1) in the Punihaole homestead may be a habitation area. This could represent: a second contemporaneous house; an earlier house, or; some other kind of activity area. Information about any or all of these situations is essential to understanding how a homestead evolved and operated. Excavations will be conducted in Feature 1 of Site 10778 to assess this situation.

The feature will be mapped in greater detail, then a 1 by 4 meter trench will be excavated to recover material remains and examine stratigraphy that might supply information on multiple building episodes. Feature configuration will be examined to assess whether construction techniques suggest pre- or post-contact methods. The excavation unit may be expanded to facilitate examination of any subsurface features that may be encountered.

WALLED FIELDS

The Walled Fields area has been divided into five sites: 10693, 10700, 10716, 10730, and 10734 (Figure 6). One site (10716) is the network of *kuaiwi* and terraces, and the rest of the sites are the features that are separated by the *kuaiwi* and terraces. Many excavations were conducted in this area in the earlier investigations (Barrera 1991). These indicate that the area was used primarily during pre-contact. The area is adjacent to the Kohanaiki Homesteads, and may represent what the Kohanaiki Homesteads looked like prior to the historical developments in the homesteads. Consequently, understanding the Walled Fields area provides insights into pre-contact agricultural and habitation, and the transition into historical patterns of habitation and agricultural.

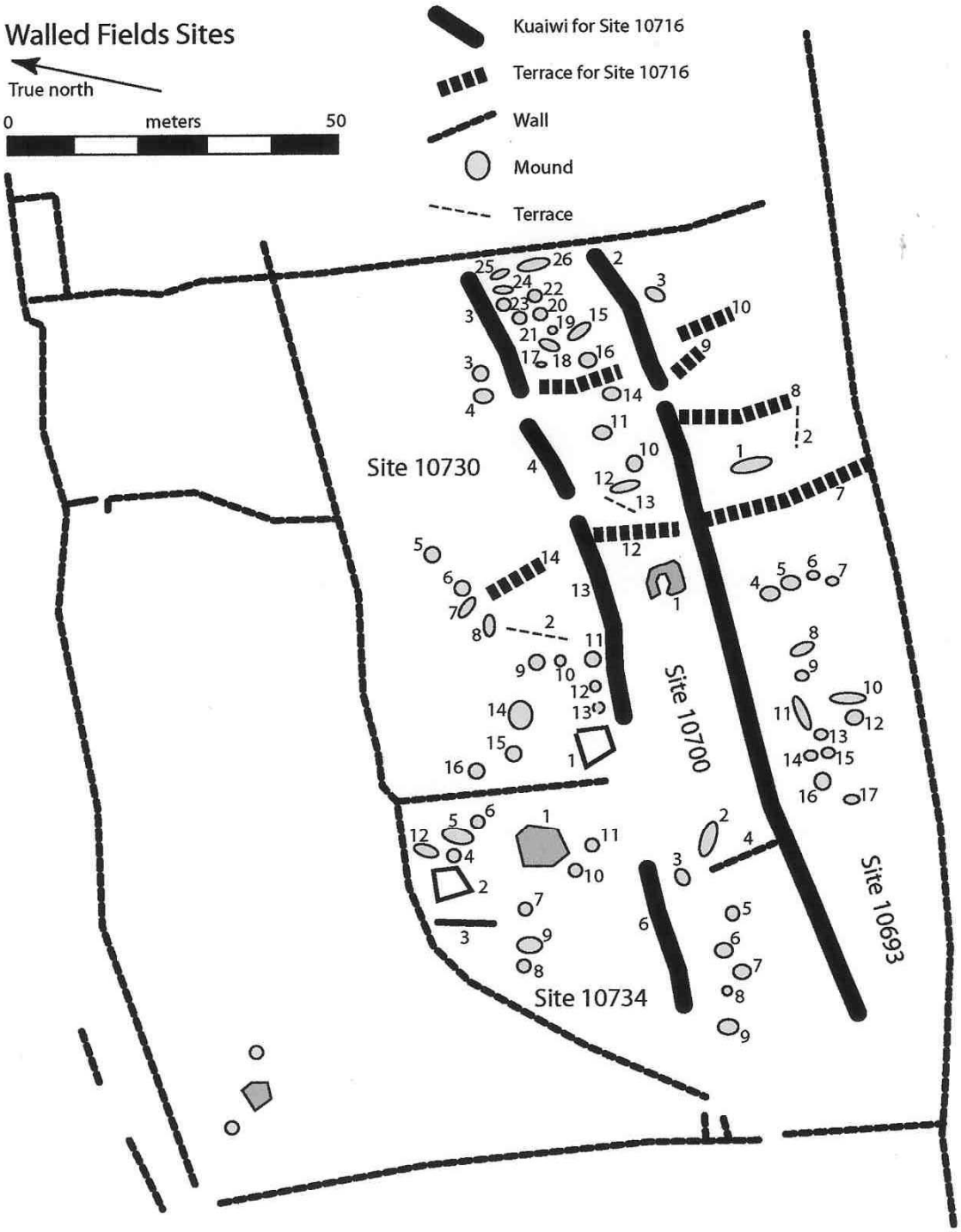

Figure 6. Walled Fields.

WALLED FIELDS DATA RECOVERY

The hydration rind dates indicate that this area was occupied and used from as early as the 1400's AD through the late 1600's. There are very few historical material remains in the excavated deposits, indicating that the area was abandoned prior to the development of the Kohanaiki Homesteads. Habitation areas can be identified by their high quantity and diversity of material remains at Site 10693 Feature 1, Site 10700 Feature 1, Site 10730 Feature 1, and Site 10734 Feature 1. There appears to be a relationship of habitation areas to "garden areas" as delineated by *kuaiwi*. These could be settlement configurations similar to those of the chronological later, and nearby Kohanaiki Homesteads.

The principal research topic for the Walled Fields area is: How are pre-Contact residential units arranged on the agricultural landscape?

This research topic can be addressed with a combination of examining the existing data available from the previous test excavations, spatial analysis of the features, and excavations at one habitation feature (Site 10734, Feature 1).

To increase our understanding of the habitation areas, those features will be mapped in more detail. Size of habitation space will be compared to size of garden space, and that will be analyzed within the framework of carrying capacity models from other archaeological and anthropological contexts.

The quantity of the previous test units at these sites precludes the need to conduct many additional excavation units. Excavation units should, however, be conducted at Feature 1 at Site 10734 to examine whether there are indeed (as suggested in Barrera 1991) evidence of multiple episodes of occupation.

PERMANENT HABITATION

Seven permanent habitation sites were recommended for data recovery in the inventory survey report: 10690; 10694; 10705; 10706; 10735; 10737, and; 10768. A sample of five of those are planned to be excavated in the proposed data recovery implementation: 10690; 10706; 10735; 10737, and; 10768

SITE 10690

Site 10690 has six features over an area of about 45 by 25 m (Figure 7). The features include an irregular-shaped enclosure, four terraces, and a trail. Subsurface testing was conducted at all features for a total of 10 m^2 (3 TUs, 2 STs). Cultural materials recovered in excavation consisted exclusively of traditional artifacts, including several adze fragments and/or performs, a coral abrader, and several volcanic glass cores. No historic artifacts were observed at the ground surface or recovered in excavation. Midden included invertebrates (including at least 17 taxa of shell), vertebrates (including fish and dog), charcoal, *kukui* nut shell, and coral.

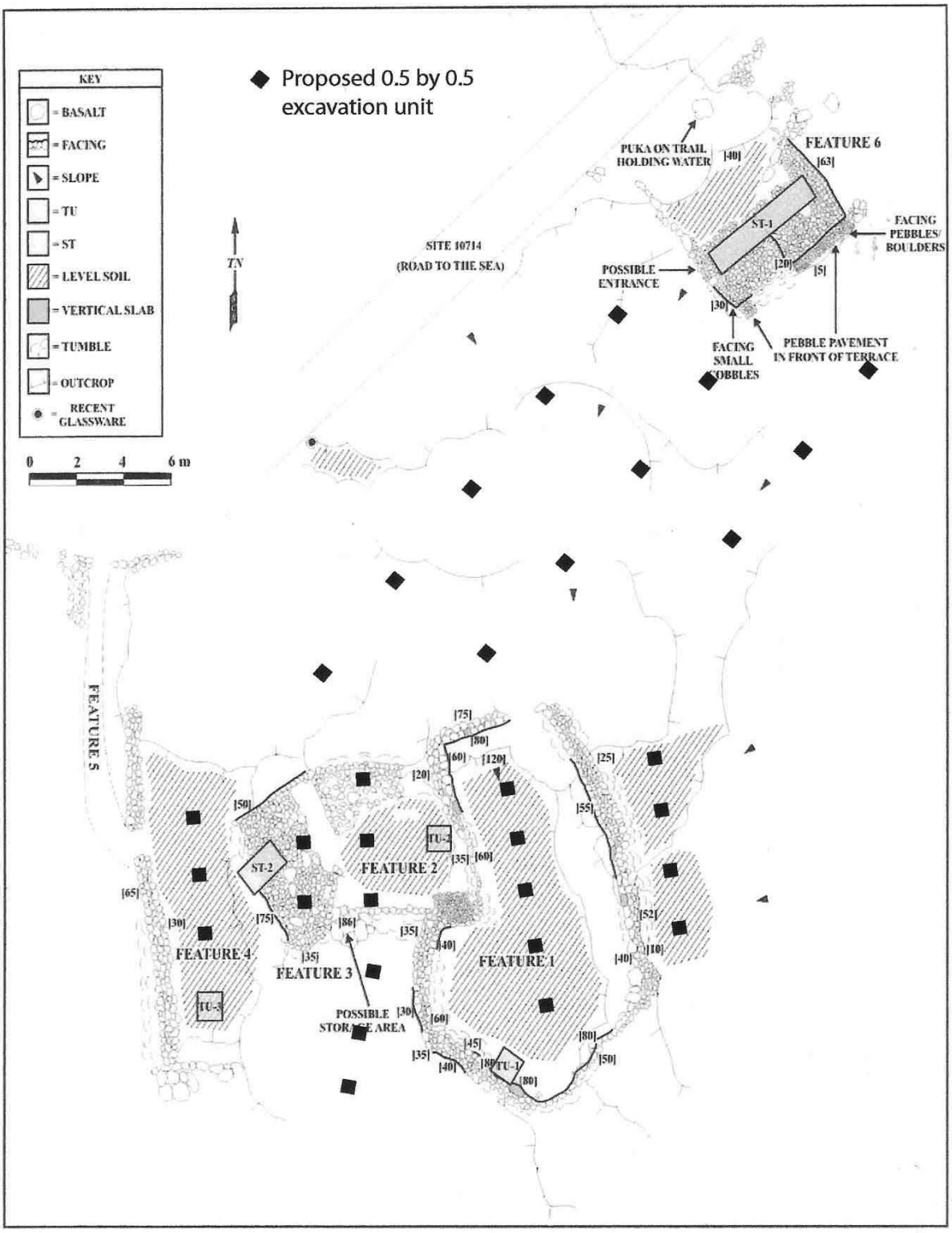

Figure 7. Site 10690.

SITE 10706

Feature 1 is a large rectilinear enclosure that utilizes bedrock outcrops in its east wall and southwest corner (Figure 8). Walls range from around 1.5 to 2.0 m thick and are constructed of stacked boulders and cobbles with an interior pebble fill. Interior facing is most noticeable on its north and west walls, although limited areas occur on the east wall also. Exterior facing occurs almost exclusively on the north wall. Much of the existing facing is of nicely stacked boulders. The exterior of the west wall is quite collapsed, but from the terminus of its rubble to the top of the wall, it is over 2.0 m high. An entrance may occur in the southern portion of the west wall. One excavation unit encountered a small amount of charcoal (1.6 g), marine shell (*Cypraea* sp.) (7.3 g), a single piece of branch coral (12.3 g), and two pieces of volcanic debitage. All of this material was derived from Layer II.

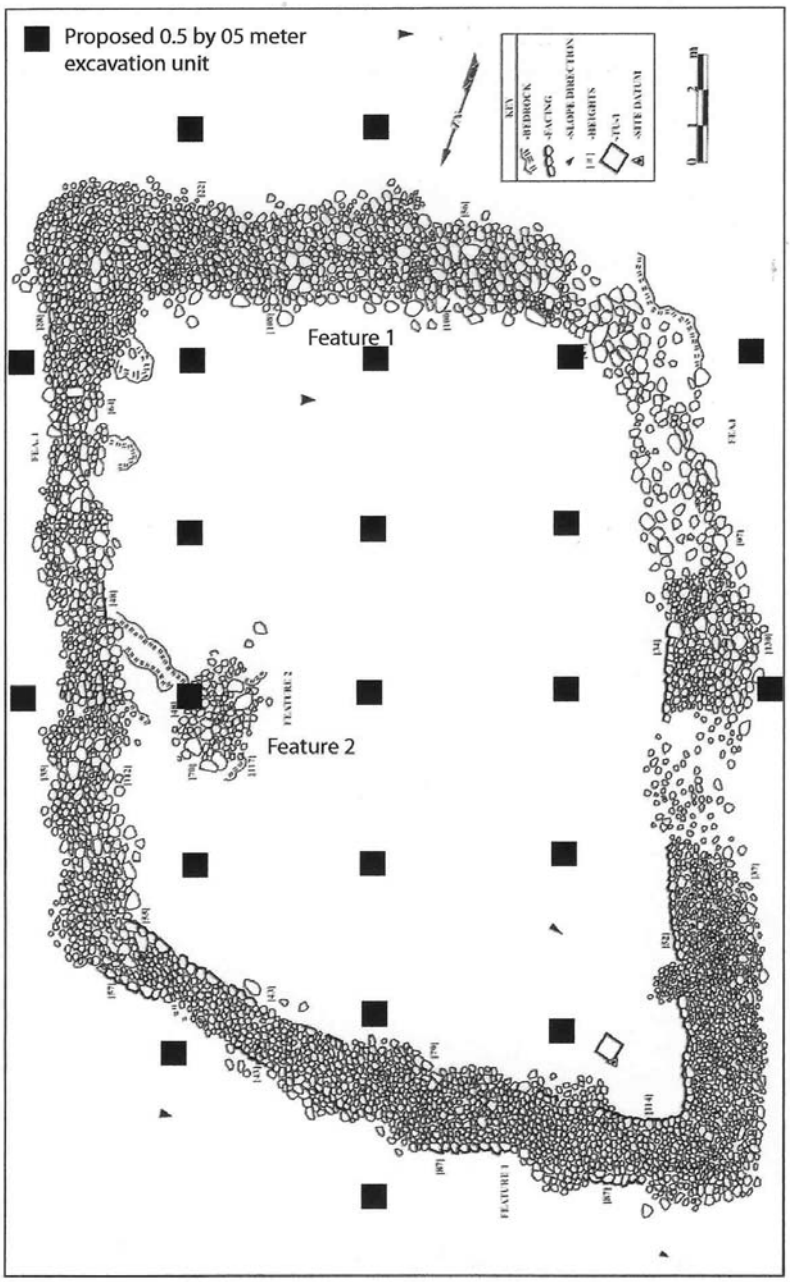

Figure 8. Site 10706.

SITE 10735

Site 10735 is a permanent habitation site covering an area 15.0 by 40 meters (Figure 9). All of these features are located directly *makai* of a complex of caves (Sites 10733, 10742 and 10744). Site 10735 and the nearby caves are situated within the modified landscape of the Kona Field System. No excavation was conducted at this site and no radiocarbon date was obtained.

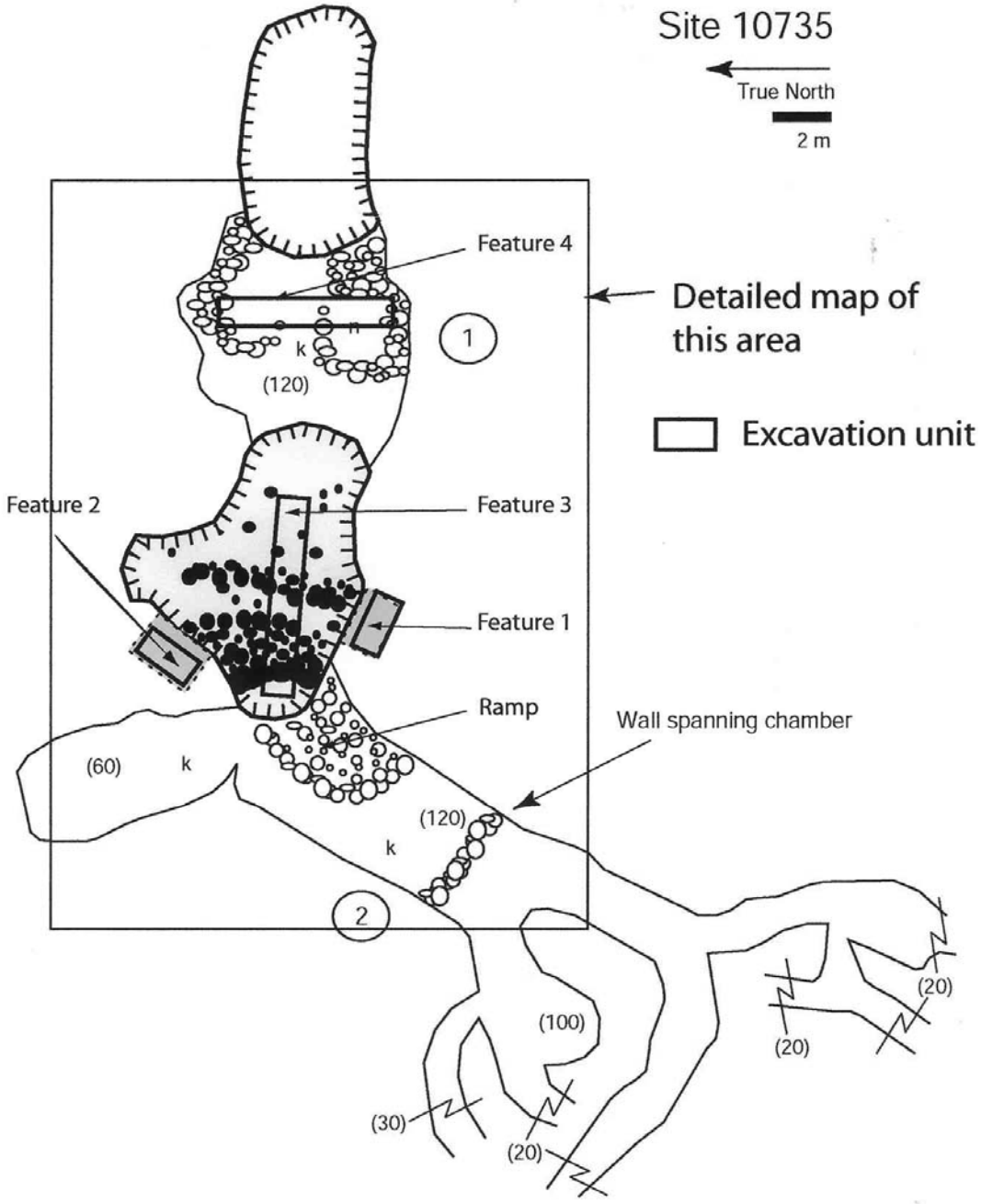

Figure 9. Site 10735.

SITE 10737

The site has five features, including a dry-stacked, rectangular enclosure, within an area of 17.0 by 30.0 m (Figure 10). A total of 35 m^2 was excavated within Site 10737. Excavation yielded historical artifacts only. Most of the material was recovered from the enclosure, but some was recovered from the front 'yard'. No radiocarbon dates were obtained at this site, and the material remains were not analyzed for socio-economic indicators. Invertebrate remains included 106.2 g of marine shell, including a single cowrie (weighing 50.6 g), representing at least four distinct taxa. No vertebrate remains were recovered in excavation. Floral remains consisted of charcoal (63.4 g) and *kukui* (*Aleurites moluccana*) (1,119.7 g). The relatively large amount of *kukui* was interpreted by Barrera (1988, 1991) as a natural occurrence, rather than a cultural introduction (*i.e.,* as "midden") due to the large number of extant *kukui* trees and the fact that these finds predominantly derived from the upper 5 cm of the excavations.

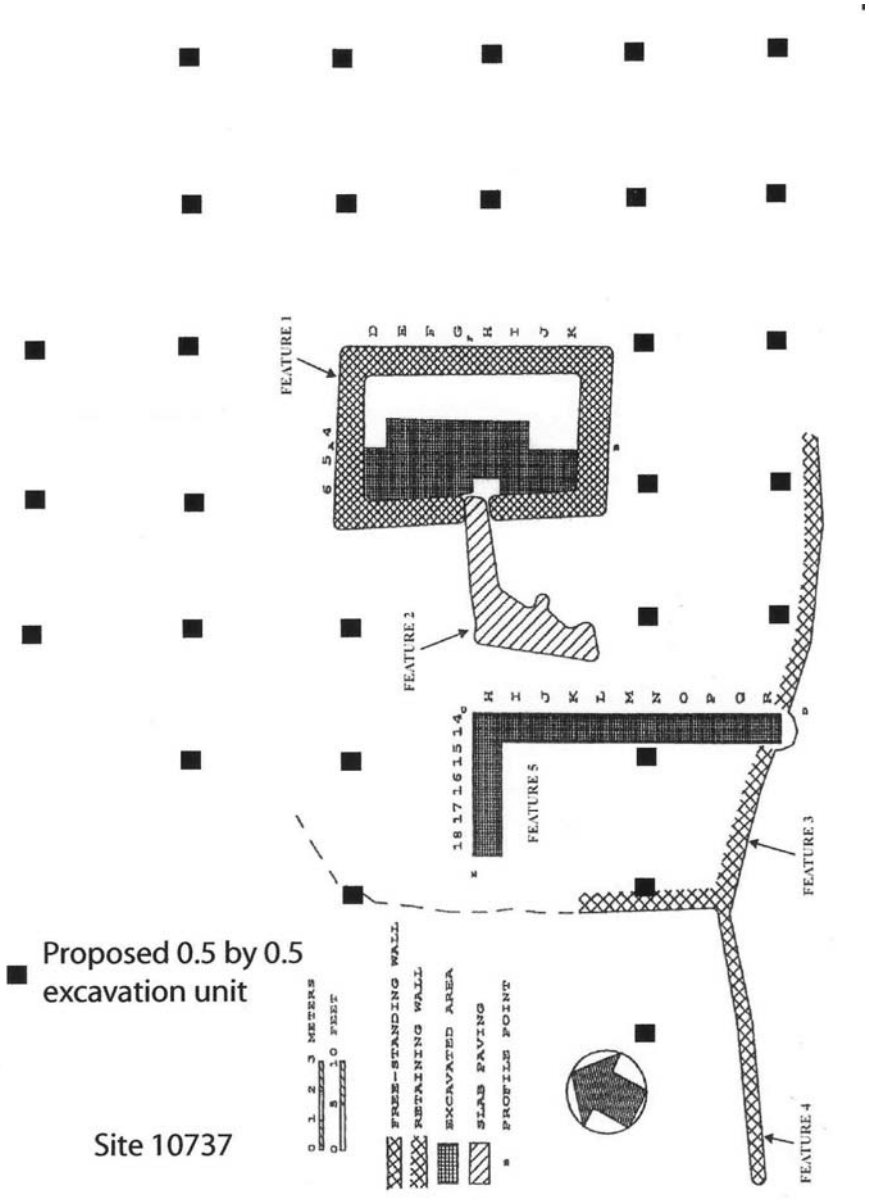

Figure 10. Site 10737.

SITE 10768

Site 10768 has 43 features, 35 of which are agricultural features (Figure 11). No excavation was undertaken at this site. Based on the site's size, number of features, feature distribution, and feature types, the site is interpreted as a pre-Contact permanent habitation and garden. Of the 35 features interpreted as agricultural, 23 were mounds, 4 were *kuaiwi*, 3 were linear mounds, 3 were terraces, 1 was a large C-shape, and 1 was the modified edge of a flow. There are two platforms and three enclosures that are probably directly related to habitation.

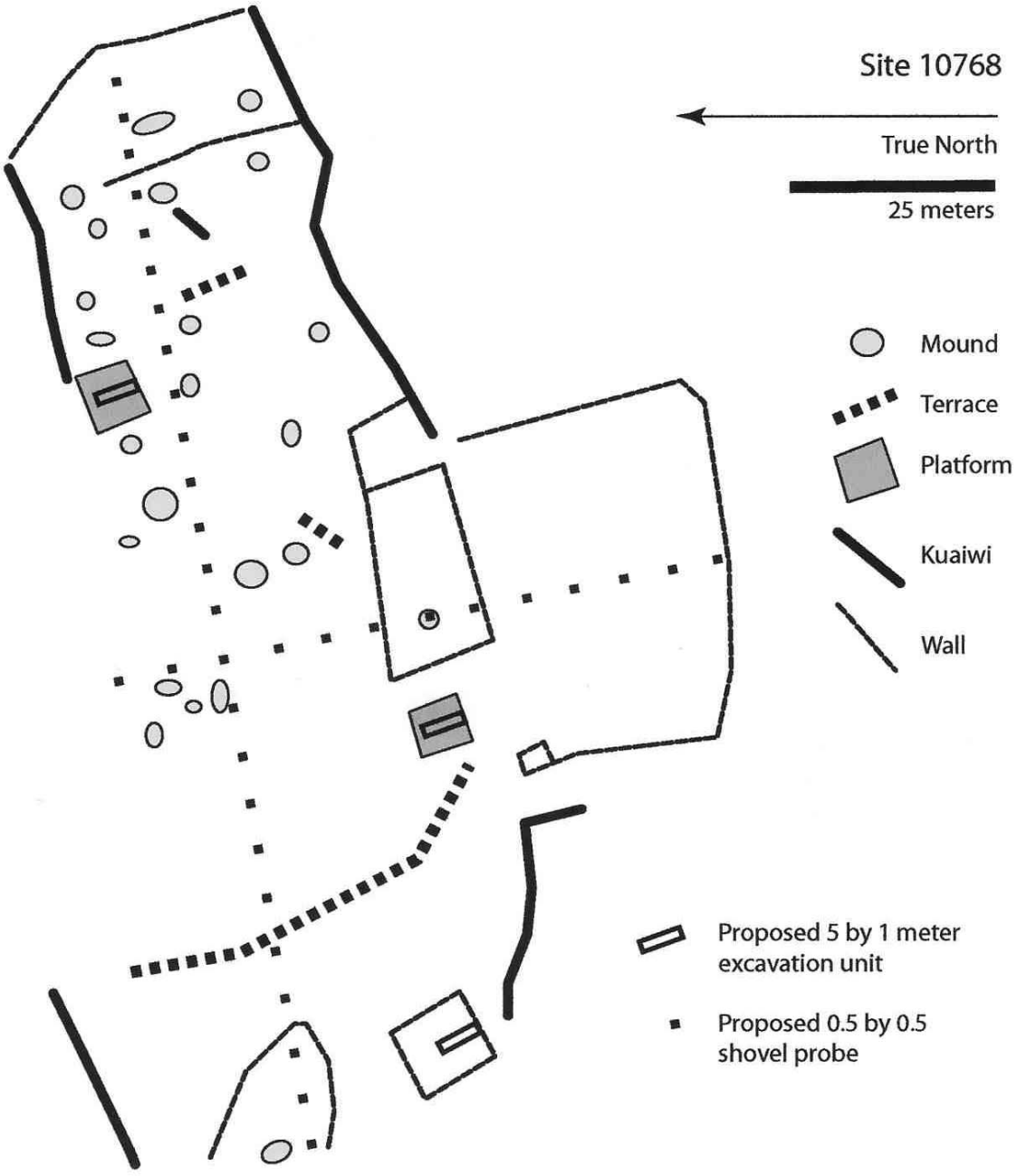

Figure 11. Site 10768.

SITE 10742, 10757, AND 10759 COMPLEX

There are three sinks (one with a natural arch over it) that link together at this site (Figure 12). The principal activity area where cultural material and modification is most noticeable—is along the westernmost opening of Site 1042. A coral abrader, charred material, *opihi*, and Echinoidea (urchin species) are present among the modified roof fall. An ashy look to the soil may represent a burned area. The paving in Site 10758 has urchin remains.

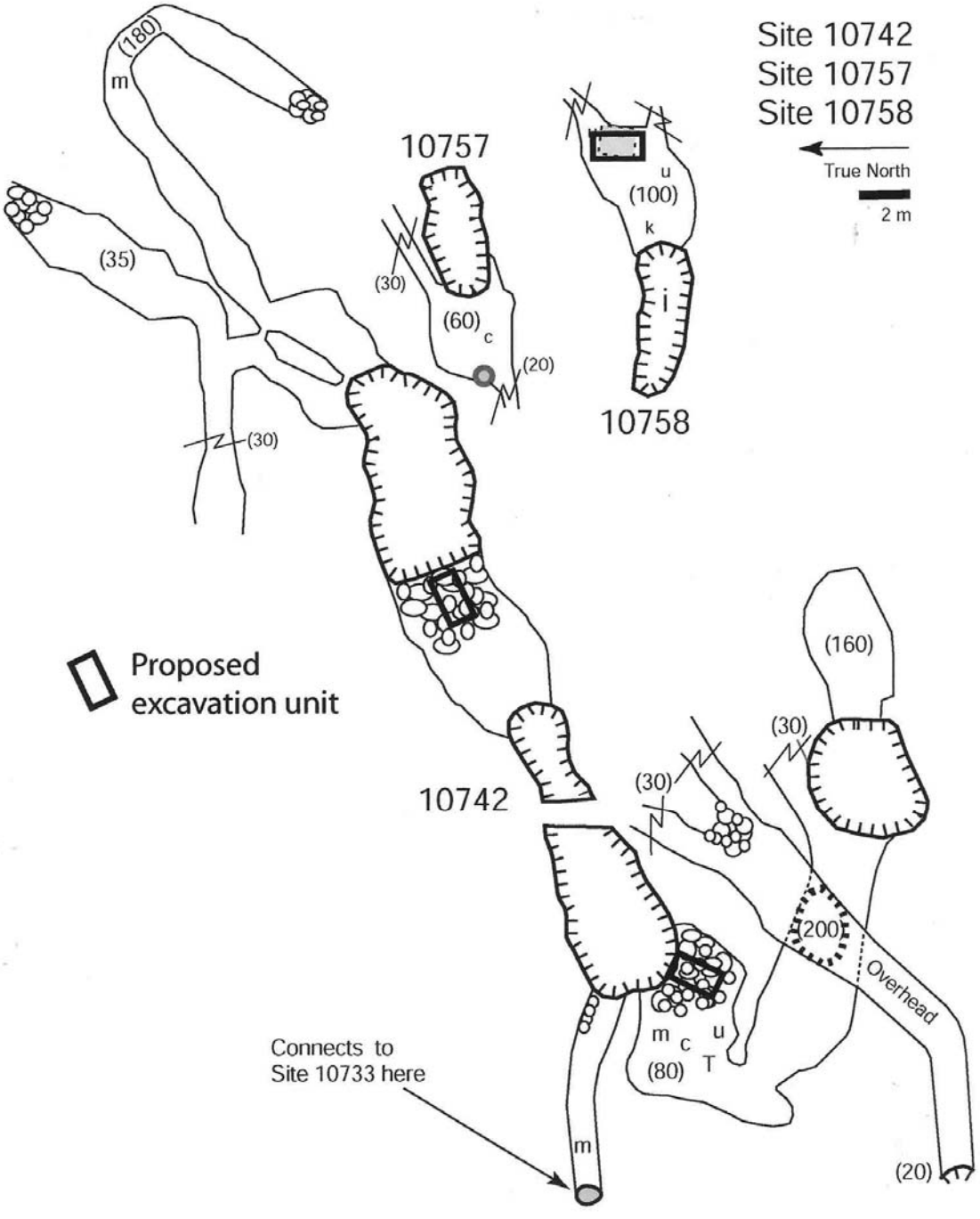

Figure 12. Site 10742.

PERMANENT HABITATION DATA RECOVERY

- How were the areas immediately surrounding the stone features at habitation sites used?

Site 10690

Site 10690 was mapped in detail, and the test units recovered material remains, including radiocarbon dates, sufficient to understand the activities conducted at the stone features. It can be expected that food processing and cooking, tool manufacture and maintenance, debris disposal, and other activities were conducted off the stone features. The data recovery task is designed to examine how the area around the stone features and the areas of soil within the stone features were used. Controlled excavation units that are 0.5 by 0.5 meters will be positioned in two ways:

- At 5 meter intervals between features, and
- At 2 meter intervals within features.

Results of these units are expected to yield different quantities and types of material remains that will provide insights into how:

- Each feature was used differently/or the same from each other,
- Different or same activities were conducted within each feature, and
- How areas around stone features were used.

Thirty-two 0.5 by 0.5 meter units (total of 8 m^2) will be excavated at Site 10690. It is expected that some of these units may expose or encounter subsurface features. Up to five subsurface features will be explored by expanding the 0.5 by 0.5 meter units to 2 by 1 meter units to examine and retrieve more data from the subsurface features.

Site 10706

Site 10706 was mapped in detail, and the test unit recovered material remains within the enclosure. The data recovery task is designed to locate the activity areas within are around the wall. Shovel probes at 5 meter intervals will be located within and around the walls. A maximum of four of these units (based on the results of the shovel probing) will be expanded to 2 by 1 meter controlled excavation units to recover more material.

- Twenty-two 0.5 by 0.5 shovel probes will be conducted within and just outside of the enclosure, and
- Based on the results of the shovel probes, four 2 by 1 meter controlled excavation units will be dug.

Site 10735

Site 10735 is a complicated site with features on the surface and below ground. In addition, the main cave opening has been extensively modified. The data recovery task is designed to locate the activity areas within the various types of features in this unusual site.

- Create a detailed map of the features to be excavated.
- 2 by 1 meter excavation unit in Feature 1,
- 2 by 1 meter excavation unit in Feature 2
- 6 by 1 meter excavation unit in Feature 3, and
- 6 by 1 meter excavation unit in Feature 4.

Site 10737

Site 10737 may also have been utilized in earlier (*i.e.,* traditional) times, and may therefore represent a multi-component site. As no materials from this site have been dated, additional work involving both stratigraphic observations and chronometric dating will ultimately be necessary to resolve this question. The historical homestead needs to be mapped better and explored more.

- Site area will be cleared in the "yard" of the historical homestead.
- Twenty-nine shovel probes will be conducted around the yard to explore potential activity areas.
- A maximum of four 2 by 1 controlled excavation units will be dug based on the results of the shovel probes.
- Existing material remains will be analyzed in greater depth focusing on chronology, status, and ethnicity indicators. All materials recovered in the data recovery effort will be analyzed the same.

Site 10768

Site 10768 has been mapped in general, but the habitation platforms have not been mapped in detail. Data to be collected at this site includes information on how the functions were distributed around the site. To accomplish this, shovel probe excavations will be conducted across the sites, and controlled excavation units will be dug at three habitation foci.

- One 5 by 1 meter excavation unit will be dug in each of the three main habitation features.
- Thirty-eight 0.5 by 0.5 meter shovel probes will be dug on a cross pattern across the site.
- Two 1 by 1 meter excavation units will be placed over shovel proves that yield meaningful data.

Site 10742, 10757, and 10758 complex

The proximity of the caves suggests that they might be related. Data recovery efforts for this area are designed to examine whether similar activities took place at the different caves (suggesting separate sites), of different activities took place at the different caves (suggesting parts of one residential unit).

- One 2 by 1 meter unit will be excavated in the stone features near the *mauka* opening of Site 10742.
- One 2 by 1 meter unit will be excavated in the stone features near the *makai* opening of Site 10742.
- One 2 by 1 meter unit will be excavated in the stone feature in Site 10758.

Radiocarbon dates

There are eight permanent habitation loci to be studied in this investigation. Two radiocarbon dates from each site may be submitted for analysis. Each sample will be analyzed by a macrobotanical specialist prior to submitting for dating.

CAVES

There are eight other caves recommended for data recovery: 10721; 10729; 10732; 10743; 10751; 10753; 10755, and; 10756. These are grouped into two categories: those with water collection features (10721, 10729, 10751, 10753, 10755, and 10756), and those used for temporary habitation (10732 and 10743). The water collection caves are distinguished from other caves by the inclusion of a particular type of feature: a circle of rock situated beneath dripping water. In some cases, there is black, greasy, organic matter within the rock circle. This is presumed to be the decomposed remnants of a water collection vessels that may have been a gourd, or carved wood. Charred wood and burnt *kukui* remains are also in these caves.

Site 10721

The cave sink has been filled in to create a constricted opening that is less than a meter diameter. The first opening connects to a small chamber (Chamber 1) where there is only some *kukui*. There is a hole in the floor of the first chamber that connects to a deeper, and slightly larger chamber (Chamber 2). Stones have been piled up to create a pathway from the opening into the central portion of Chamber 2 (Figure 13). There is one rock circle on the *ʻaʻā* cave floor in Chamber 2. Charred material, including burnt *kukui*, is plentiful in Chamber 2.

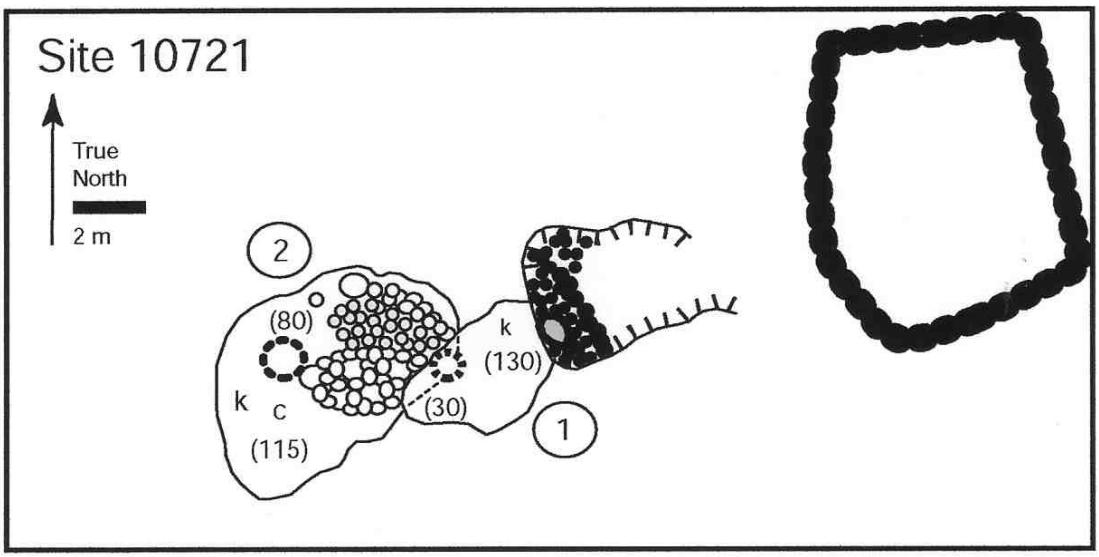

Figure 13. Site 10721.

Site 10729

There are two openings in the modified sink, and the chambers from both openings connect in a network of complicated passages (Figure 14). There are several terraces in the sink, and one 2.0 by 1.0 m depression in the western portion of the sink. This western portion was filled to fill the cave opening, and create a constricted access passageway in the cave system. Charred material and *kukui* are scattered throughout the many other chambers, indicating that the cave was fully explored. There are several other features situated in various places in the cave system. There are three stone alignments that serve an unknown function. There is a stone "box" made out of slabs, lacking any internal contents. A paved terrace is near the box. There is one rock circle next to a slab that has apparently been placed on its side.

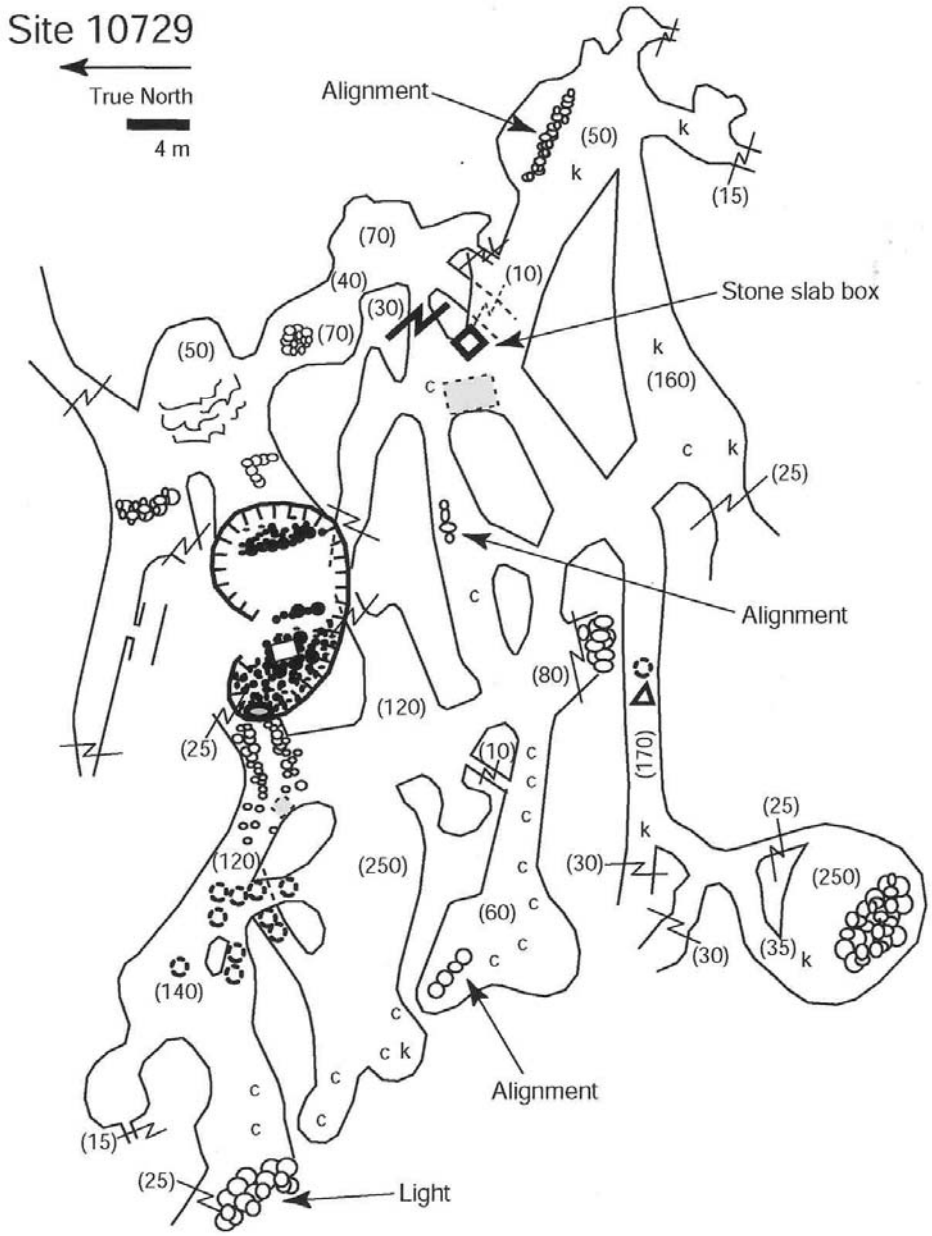

Figure 14. Site 10729.

Site 10732

Site 10731 and Site 10732 are caves associated with a platform in Kohanaiki Ahupua‘a at 830 ft. elevation (Figure 15). Site 10731 is a cave directly below a platform. Portions of the cave’s floor exhibit possible paving. This natural cave originally continued further to the east, but that entire area has been filled and modified with stones that serve as the foundation for the platform. Marine shell and a broken water-worn stone are possible evidence of temporary habitation. Passages in the Site 10732 cave are also blocked with a wall in one chamber, and loosely piled rocks in another chamber. No artifacts were found within Site 10732. The blocked chamber in Site 10732, and the platform foundation and paving in Site 10731, block and fill passages in these two small caves. It is not clear whether the chambers continue beyond these blocked areas. It is probable that the function of these caves is directly related to the adjacent platform. A temporary habitation area is a likely explanation of the cultural modification. No excavation was conducted at these sites and no radiocarbon date was obtained.

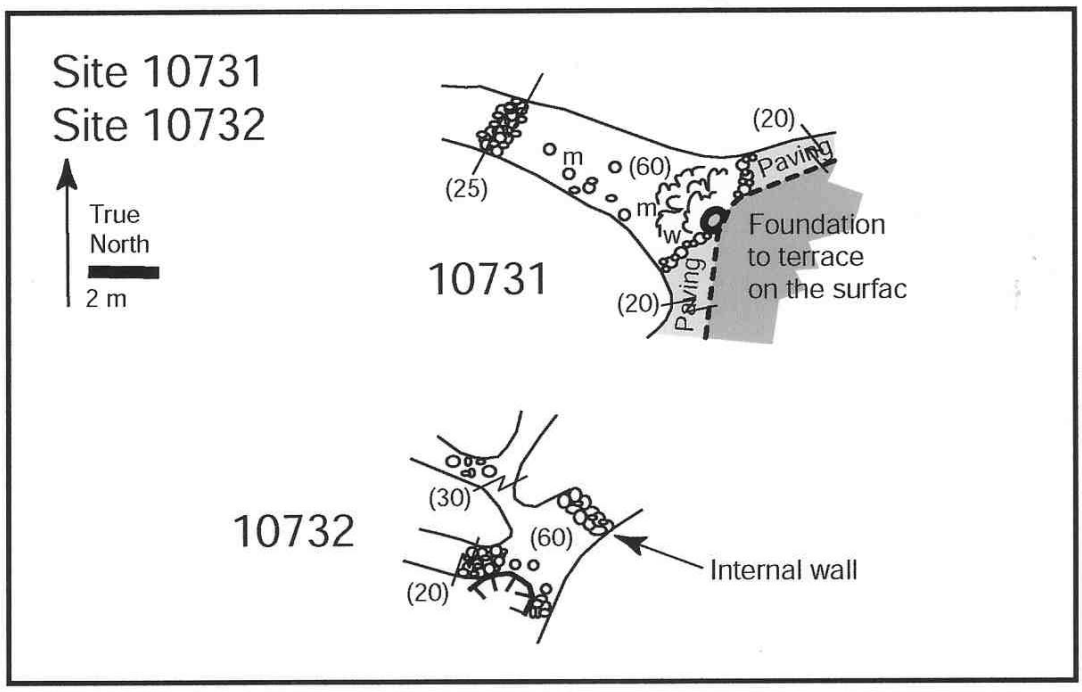

Figure 15. Site 10732.

Site 10743

Site 10743 is a temporary habitation cave in Kohanaiki Ahupua‘a. Both ends of the sink are modified; an entrance to another cave is on the west side of the sink (Figure 16). This constricted entrance connects to a passageway where rocks have been moved to the sides of the cave chamber. There is a skylight near the distal end of the cave where two passages are blocked by roof fall. An additional cultural indicator, other than the modification, is *kukui* found on the cave floor. These are probable cultural remnants, as no sign of present or former *kukui* trees are nearby on the surface.

This small cave has a constricted entrance. The most compelling item associated with this cave is a set of petroglyphs along the northern edge of the sink. The precise outlines of the petroglyphs are not clear, but at least one of the images is an anthropomorph (Figure 16).

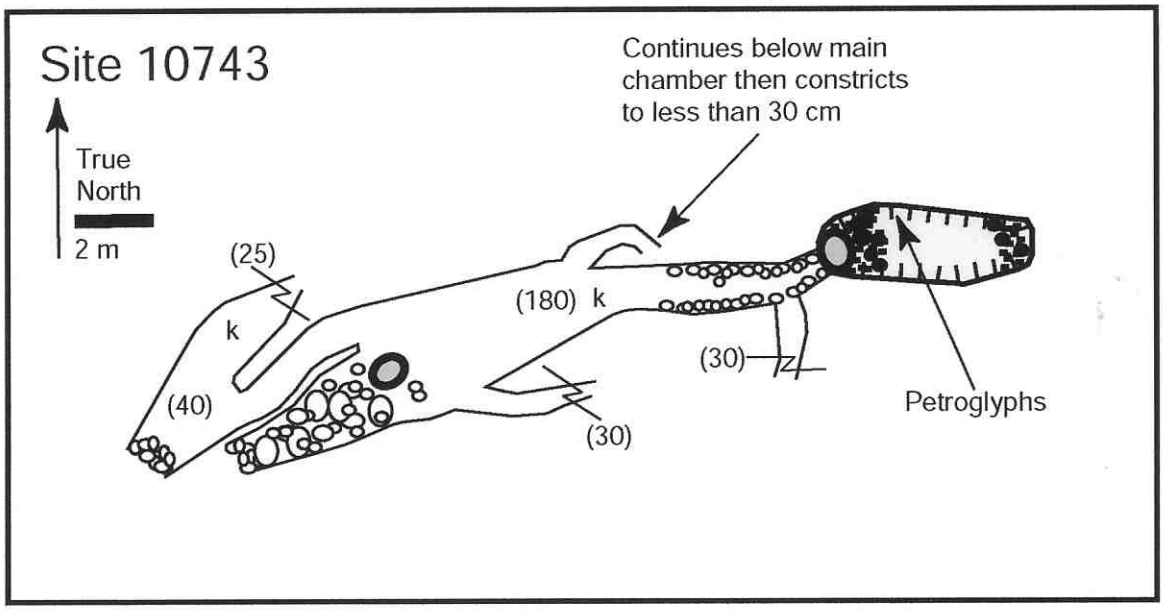

Figure 16. Site 10743.

Figure 17. Site 10743 Petroglyph.

Site 10751

There is a vertical entrance into a chamber that has recent pig bone, *kukui*, some charred material, and a broken water-worn pebble to the north of the entrance (Figure 18). There is a wall on the south part of the opening that creates a smaller, constricted entrance into the chamber with three rock circles.

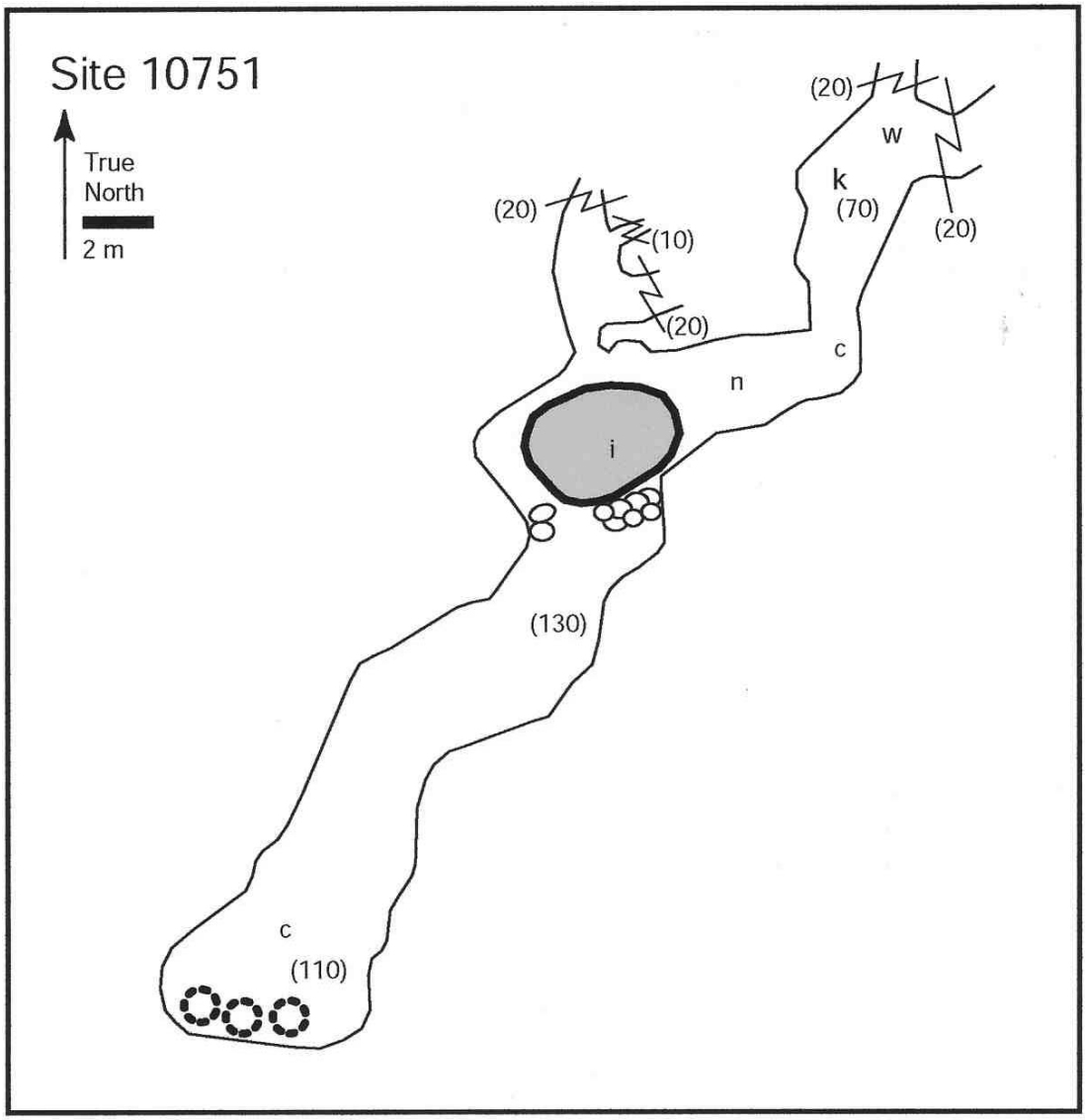

Figure 18. Site 10751.

Site 10753

The vertical opening is modified to be constricted and there are three rock circles in the small cave (Figure 19). The constricted entrance and rock circles indicate that this small cave was used for water collection.

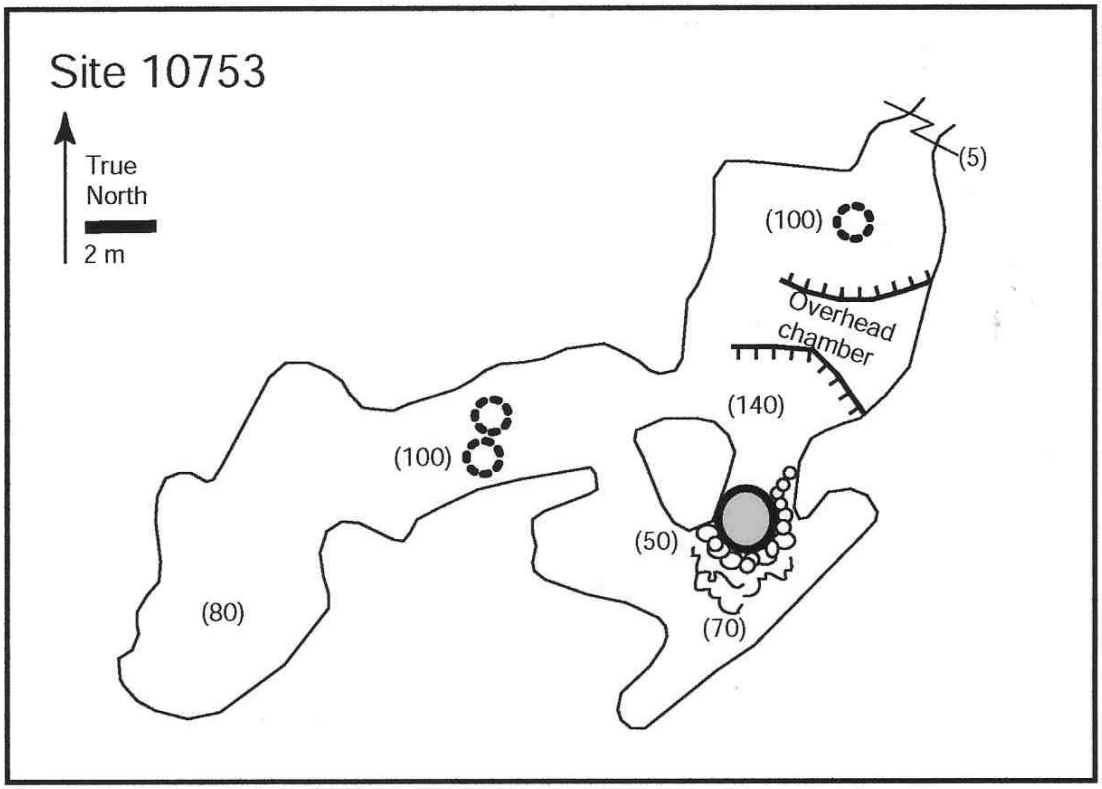

Figure 19. Site 10753.

Site 10755

The entrance is a vertical drop into the *mauka* and *makai* chambers (Figure 20). Paved platforms have been created in the roof fall surrounding the opening in both the *mauka* and *makai* perimeters. Water drips from the ceiling. There is a stacked 0.6 m high *ahu* and a 1.2 by 1.2 m triangular stone slab set on edge east of the entrance before the *mauka* chamber splits into two chambers. The northern chamber (Chamber 1) has two rock circles with some charred material nearby. The remainder of Chamber one has few cultural items limited to charred material. The southern *mauka* chamber (Chamber 2) also has five rock circles. Only a few pieces of charred material are in Chamber 2 beyond the rock circles.

There are eight rock circles in the *makai* chambers (Chamber 3 collectively). The large solitary "circle" is an oval with a line of rocks in the central axis dividing it into two halves. A few pieces of *kukui*, and land crab carcass are present beyond the circles. Chamber 3 connects to cave Site 10756 at a constriction that is 28 cm high. This small constriction is below the designated "cultural end" of the cave, and consequently, cave Site 10755 is considered to end there, and be separate from, Site 10756. It is possible, however, for a small person to pass through this constriction.

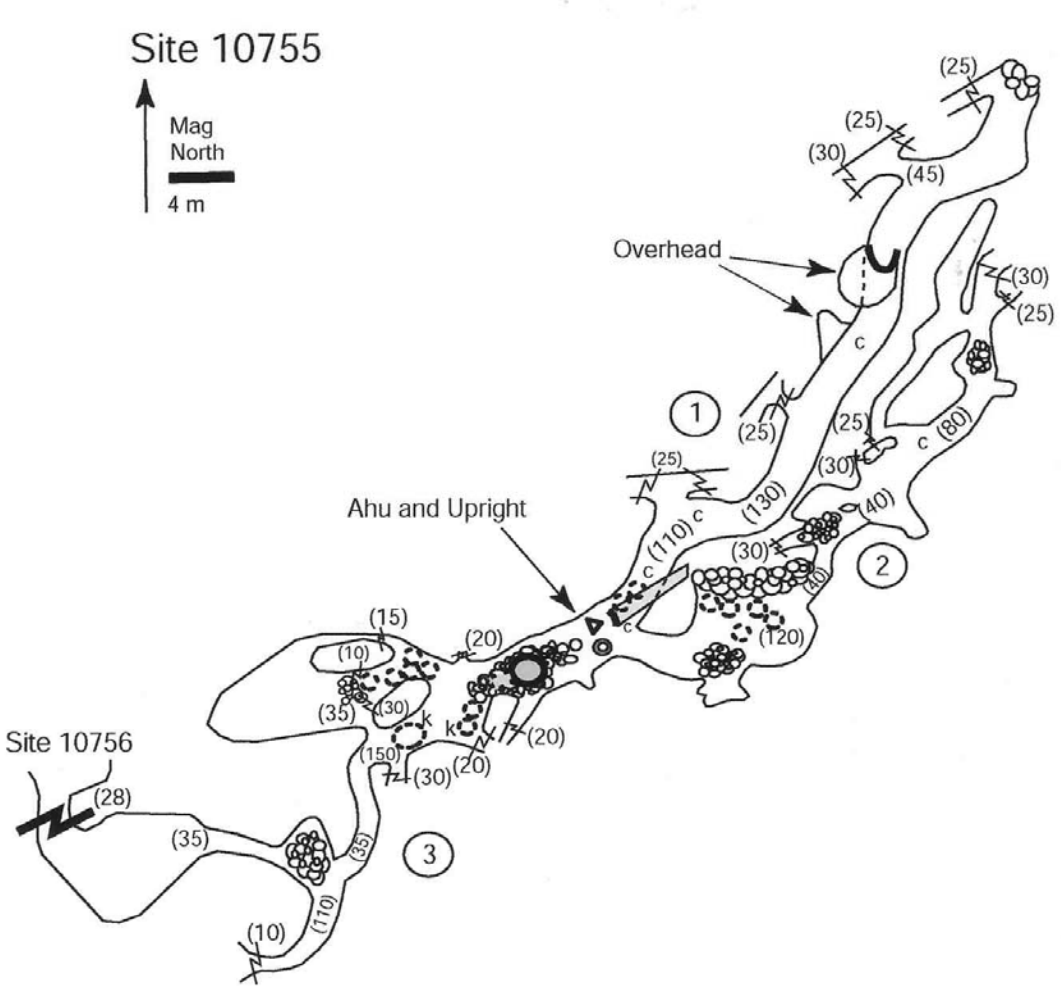

Figure 20. Site 10755.

Site 10756

There are many chambers that link up to three sinks (Figure 21). A paved area has been created within the roof fall near the westernmost entrance. There is a concentration of eight rock circles in the eastern end of the cave. Three other rock circles are scattered about the system, with one near a trail built in roof fall. Other unusual elements of this cave include pooled water near the western end, and pieces of wood in a southern chamber. A concentration of material remains was situated within a small and low (40 cm high) chamber connecting to the southern entrance (Table 2). The material was resting on an 64 by 40 cm spread of read soil.

Table 2. Site 10756 Artifact cache.

Item	Quantity	Function
Complete and polished small adze	4	Wood working
Small adze perform	1	Tool manufacture
Small adze fragment with polish	1	Tool recycling
Opihi	3	Scraping
Leho (drilled cowrie)	1	Octopus fishing
Bird bone	13	Piercing
Pig teeth	10	Ornament
Pig tusk (drilled)	1	Ornament
Shark teeth	6	Weapon, ornament

The material represents a diverse set of tool types, reflecting a variety of activities (Figure 22). They could represent materials placed in the cave as in interment, either with a burial, in place of a burial, or as a burial in and of themselves. Alternatively, they may have been cached in this location for storage.

This latter interpretation seems most parsimonious, because the place where these were located is a difficult to reach location. Indeed, they were stored in a safe place. The presence of imported soil emphasizes the significance of the materials to their owner. These tools were perhaps used for special purposes, or the imported soil somehow enhanced the productivity of these everyday tools.

It seems unlikely that all of the material were used simultaneously. Instead, they appear to represent a diverse set of mundane (fishing, wood working) and perhaps ceremonial (ornamentation) tasks. And they represent tasks conducted on land and sea. A similar diverse set of materials was observed in a cave in Waikoloa (Wolforth *et al*. 2004), suggesting that this kind of caching was probably common. The principal function for this cave was probably for water collection. The person responsible for maintaining this cave may also be responsible for the cached materials.

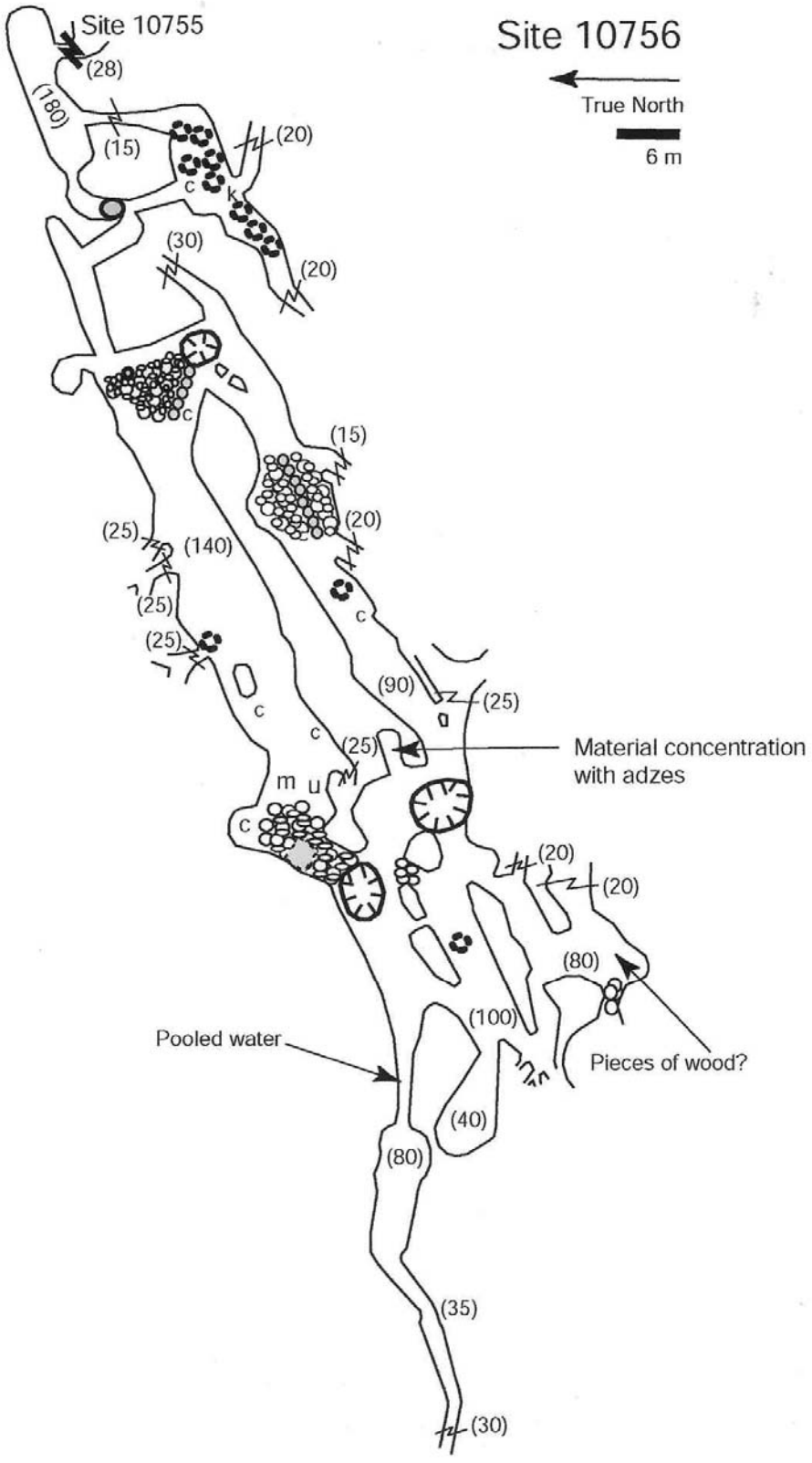

Figure 21. Site 10756.

Figure 22. Site 10756 Artifacts.

CAVE DATA RECOVERY

The caves have already been mapped in detail. Data recovery will be focused on chronology of use. Charred material remains (including wood and *kukui*), will be collected from each cave. Those samples will be submitted for radiocarbon assay. To increase the likelihood that the samples yield dates that are "tight" (as opposed to the all too frequent "wide" dates like 1660 to 1955 AD), each sample will be one individual piece, and not a conglomerate of charred pieces. The dating of one piece may require AMS radiometric analysis.

In addition to these activities that will be carried out at each water collection cave, some of the caves will receive additional attention.

- If macrobotanical material is observed, a sample t will be collected and submitted for identification of plant species.
- Site 10729: the "stone box" and *ahu* will be photodocumented.
- Site 10755: *ahu* will be photodocumented.
- Site 10732 has an internal wall that will be attempted to be removed in data recovery.
- Site 10743 has petroglyphs on the lava in the sink exposed to the ground surface. These petroglyphs will be recorded to the highest standards, as provided in (Lee and Stasack 1999). That includes photodocumentation and detailed mapping. Results will be analyzed within the context established by Lee and Stasack (1999). The petroglyphs will then be removed and preserved in a preservation area outlined in a preservation plan for this project.

TRAILS

Site 10763

Site 10763 is a trail with an associated petroglyph. This trail is oriented parallel to the ocean at the 850 ft. elevation. The pathway is visible for approximately 15 meters. It is most apparent in a low lying area that was built up with cobbles (5.0 by 1.5 meters, and a maximum of 0.6 meters high). Flat slabs set in single file are on top of the built up area (Figure 23). This is very similar to Site 10767 which is also a trail with a petroglyph on a *pāhoehoe* slab. The trail is oriented to Sites 10702 and 10727. The slab with the petroglyph is 52 by 48 centimeters (Figure 24). The head of the image is oriented to True North.

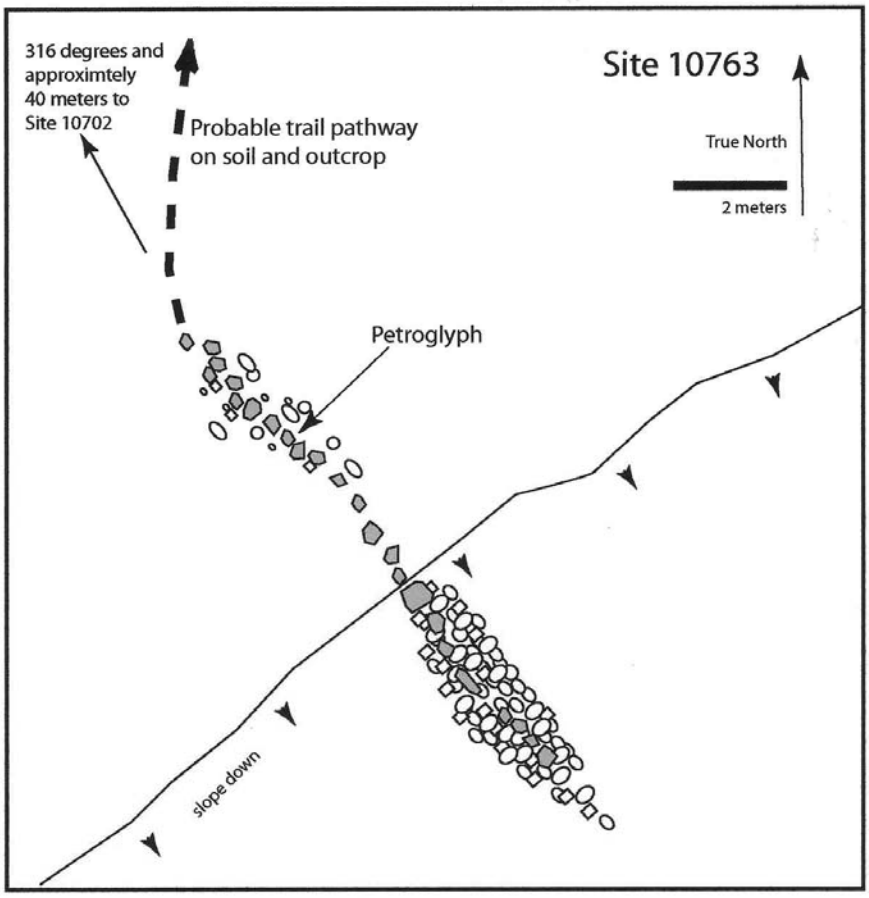

Figure 23. Site 10763.

Figure 24. Site 10763 Petroglyph.

Site 10767

Site 10767 is a trail oriented parallel to the ocean at the 810 ft. elevation. The pathway of *pāhoehoe* slabs serving as stepping-stones through an *ʻa'ā* lava flow. There is a petroglyph on one of these *pāhoehoe* slabs (Figure 25). This is very similar to Site 10763 which is also a trail with a petroglyph on a *pāhoehoe* slab. The trail segment at Site 10767 is visible for 10.0 m. Although there is no physical evidence of the trail beyond what is reported here, it is oriented to connect to the *mauka* edge of Site 10768 and the dense collection of cave Sites 10733, 10742, 10735 and 10744.

Figure 25. Site 10767 Petroglyph.

TRAIL DATA RECOVERY

The three pathways have been thoroughly documented. Data recovery at Sites 10763 and 10767 will be concentrated on recording the two petroglyphs associated with. These petroglyphs will be recorded to the highest standards, as provided in (Lee and Stasack 1999). That includes photodocumentation and detailed mapping. Results will be analyzed within the context established by Lee and Stasack (1999). The petroglyphs will then be removed and preserved in a preservation area outlined in a preservation plan for this project.

CONSULTATION

Pursuant to HAR §13-278-3(b) for those properties deemed significant for Criterion E, consultation is required as part of the data recovery plan process. There are two sites that are significant for Criterion E in this Data Recovery Plan: the two homesteads (Sites 10765 and 10778). Information on the history and cultural activities of the project area was sought in two ways: through interviews with knowledgeable local residents (Table 3), and by reviewing transcripts of other interviews associated with nearby projects. The Punihaole family members were involved in discussions regarding the data recovery of the Punihaole homestead, and understand that data recovery will be conducted there.

Table 3. Consultation.

Last Name	First Name	Related Family in Homestead	First call	Latest call	Met 1	Met 2	Site visit
Cobb-Adams	Alexis	Hulikoa	4/12	4/15	4/22		
Arakaki	Iwalani	Paiwa	6/25	7/12	6/5	7/13	7/13
McDonald	Ruby	Haʻau, Kapa	3/22	3/22	3/24		
Lee	Robert	Levi, Puli	6/8	6/28	7/7		
Maluʻihi Ako	Elizabeth	Levi, Puli			7/7		
Ching	Keala				7/13		7/13
Springer	Hannah	Ranch	6/17	7/25	7/14	8/1	8/1
Mahi	Arthur	Homestead	7/15	7/18	7/19		7/19
Cottrell	Curt		6/25	7/25	*7/25**		
Kanuhi	Kawehi	Kaholi	7/12	7/25	7/27		7/27
Mahiʻai	Del Thia				7/27		7/27
Flying Hawk	Sheri				7/27		7/27
Kaʻiwi	Ed				7/27		7/27
Punihaole	Cindy	Punihaole	6/8	9/23	9/22		
Punihaole	Robert Kaʻiwi Jr.	Punihaole			9/22		
Coelho	Annie Kalaniʻiʻini	Punihaole			9/22		
Kahananui	George Kinoulu Sr.	Ranch	7/18	7/18	9/22		

* phone interview

METHODS, COLLECTIONS, REPORT

COLLECTING DATA IN THE FIELD

Excavations will be conducted in two ways: shovel probes and controlled excavations (Table 4).

Table 4. Data Recovery Activities.

Site #	Site Type	Function	Data Recovery	Suggested # of square meters to dig
10764	Homestead, Kapa	Historic homestead	Shovel probes, activity areas	14 plus 2 stone mound deconstructions
10778	Homestead, Punihaole	Historic homestead	Shovel probes, activity areas, habitation area	18 plus 2 stone mound deconstructions
10693	Walled fields	Habitation and garden	Spatial analysis	0
10700	Walled fields	Habitation and garden	Spatial analysis	0
10730	Walled fields	Habitation and garden	Spatial analysis	0
10734	Walled fields	Habitation and garden	Excavation unit, spatial analysis, 3 AMS radiocarbon dates	4
10690	Complex	Permanent habitation	Grid of units	18
10694	Complex	Permanent habitation	No Data Recovery	0
10705	Complex	Permanent habitation	No Data Recovery	0
10706	Enclosure	Permanent habitation/ceremonial	Grid of probes, excavation units	13.5
10735	Complex	Permanent habitation	Excavation units	16
10737	Complex	Permanent habitation	Grid of probes, excavation units	15.5
10742 10757 10758	Cave	Permanent habitation	Excavation units	6
10768	Complex	Permanent habitation	Grid of probes, excavation units	26.5
10732	Cave	Temporary habitation	Remove internal ‘wall’	1
10743	Cave and petroglyphs	Temporary habitation	Document petroglyph	0
10721	Cave	Water source	Radiocarbon date, and measure productivity	0
10751	Cave	Water source	Radiocarbon date, and measure productivity	0
10753	Cave	Water source	Radiocarbon date, and measure productivity	0
10755	Cave	Water source	Radiocarbon date, and measure productivity	0
10729	Cave	Water source	Radiocarbon date, and measure productivity	0
10756	Cave	Water source	Radiocarbon date, and measure productivity	0
10763	Trail with petroglyph	Pathway	Petroglyph analysis	0
10767	Trail with petroglyph	Pathway	Petroglyph analysis	0
			TOTAL	**136.5**

Shovel Probes

The shovel probe method facilitates the collection of small amounts of data from many locations quickly. The results of this approach are used in two ways:

- To observe how material remains (and consequently, activity areas) are distributed over large areas, and
- To situate subsequent controlled excavations at places identified in the shovel probing as containing high quantities, or certain types of, material remains. In this way, the shovel probes are used to direct the placement of controlled excavations at areas that are very likely to yield valuable information.

Shovel probes are 0.5 by 0.5 meters in plan view, and are dug to bedrock. The collected matrix is screened through 1/8 inch hardware mesh. All materials are collected, and are analyzed as outlined below. Material remains are collected separately for each natural layer encountered in the probe.

Controlled Excavations

Controlled excavations are larger, and more comprehensive in data collection. Primarily, they 'control' for the vertical and horizontal context of the materials and matrix moved. The matrix is screened through 1/8 inch hardware mesh, and materials are collected 10 levels within natural layers encountered. Recordation of the natural layers is enhanced with the use of Munsell color charts and detailed soil descriptions. Controlled excavations vary in size according to the feature context.

Petroglyphs

Lee and Stasack (1999) has devised a system of petroglyph recordation that facilitates analysis. The typology, recording structure, and analytical processes outlined in that book will be used in this data recovery.

ANALYZING DATA IN THE LABORATORY

Material Remains

All collected material remains will be analyzed at the SCS laboratory in Honolulu. Materials will be counted and weighted. Photographs will be provided of artifacts relevant to the discussion of the issues outlined in this plan.

SCS has obtained the materials that were collected by Barrera during the earlier archaeological investigations for this project. SCS has made a commitment to the Society for Hawaiian Archaeology to analyze and report on those materials, and to curate the materials appropriately. To fulfill that commitment, SCS will count and weigh those materials, and incorporate that information in the data recovery analysis and reporting.

Radiocarbon Dating

Charred material will be sent to BETA Analytic, INC. for radiocarbon assay. Approximately 25 samples will be submitted. Some samples will be treated with standard processing, and others will use AMS techniques.

Macrobotanical

All standard processing radiocarbon samples will be sent to Gail Murakami for macrobotanical analysis prior to submitting to BETA Analytic, Inc. Information from this analysis will relate directly to the understanding of the paleoenvironment (identifying the kinds of species present and used), an important aspect of understanding how the landscape was or was not altered for agricultural purposes during the pre-Contact and post-contact eras.

REPORTING AND STORAGE

The report on these investigations will abide by the directives of HAR §13-278. Materials will be stored at the SCS storage facility in Honolulu.

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