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Annual Report---- July 1, 2004 thru June 30, 2005

Cultural Resources Management Projects Performed Under the Ecosystems Management Program at the Pōhakuloa Training Area, Island of Hawai'i, Hawai'i.

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TABLE OF CONTENTS

TABLE OF CONTENTS	II
LIST OF FIGURES	III
LIST OF PHOTOS	IV
EXECUTIVE SUMMARY	1
CULTURAL RESOURCES PROGRAM DETAIL REPORTS	6
Pedestrian Field Survey Projects (Section 5.b.(1)(a-f))	6
Site Monitoring Program (Section 5.b.(2)(a-d))	23
Archaeological Site Inventory Database And GIS/GPS Program (Section 5.b.(3)(a-d))	65
Site Protection (Section 5.b.(4))	83
Assist DPW Architectural Historian (Section 5.b.(5))	89
Share Information with US Army GIS Specialist (Section 5.b.(6))	89
Coordination of training missions with preservation of Cultural Resources (Section 5.b.(7))	90
Public Outreach (Section 5.b.(9))	108
Curation Facility (Section 5.b.(12))	112
Coordination with USAG-HI Integrated Training Area Management (Section 5.b.(10))	116
REFERENCES CITED	117

List of Figures

Figure 1. Sites visited on January 7, 2005.	8
Figure 2. Site map of Site 10268, from Reinman and Schilz (1999:67).....	9
Figure 3. Site map of Site 10267 taken from Reinman and Schilz (1999:109).	10
Figure 4. Site map of 10268 taken from Reinman and Schilz (1999:67).	12
Figure 5. Sites visited on January 14, 2005.	14
Figure 6. Entrance locations of the “D” cave system visited on January 27,2005.	19
Figure 7. Entrance locations of the D cave system visited on January 28 and February 3, 2005.	21
Figure 8. Sites visited on March 17, 2005	26
Figure 9. Sites visited on Sept 10, 2004.....	32
Figure 10. State Site 19512, Sketch map.	34
Figure 11. Temporary Site T-091004-1, sketch map.....	35
Figure 12. Sites visited on December 17, 2004	38
Figure 13. Site 17161 (Reinman & Schilz 1999, Figure 209).....	39
Figure 14. Site locations.	46
Figure 15. KMC Historic District (From Tomonari-Tuggle and Slocumb 2000).	52
Figure 16. Recommended Boundary for KMC Historic District (From Tomonari-Tuggle and Slocumb 2000).	57
Figure 17. Existing plan view of Building #64 (provided by KMC DPW).	58
Figure 18. Building #64 after completion (provided by KMC DPW).	59
Figure 19. Screenshot of the <i>Archysites.mdb</i> database table.	66
Figure 20. Screenshot showing the linked tables.	67
Figure 21. Screenshot of the Recorders Worksheet.....	70
Figure 22. Screenshot of the Project Worksheet.....	70
Figure 23. Screenshot of the Reports Worksheet.....	71
Figure 24. Screenshot of the Sites Worksheet.....	72
Figure 25. Screenshot of Photos Worksheet.....	74
Figure 26. Screenshot of Dimensions Worksheet.....	75
Figure 27. Screenshot of Stations Worksheet.....	76
Figure 28. Task_tbl table from the Project.mdb Access database.	77
Figure 29. Screenshot of <i>Project.mdb</i> table relationships.	78
Figure 30. <i>Project.xls</i> Table and Field comparisons.....	79
Figure 31. Screenshot of Startup Form.....	80
Figure 32. Location of LIDAR Monuments in Training Areas 9, 8, 7 and 21	93
Figure 33. Field counts of military features. More than one feature was often noted when recorded military structures. *	98
Figure 34. Assigned functions of military features. Note that there can be several features assigned to one function. *	99
Figure 35. Existing rock quarry and testing area.	105
Figure 36. Survey area for the proposed road upgrades along the Old Kona Highway	107

List of Plates

Plate 1. State Site 10267, overview of hearth (feature F).	11
Plate 2. State Site 19491, cave entrance, view to the northwest.	15
Plate 3. State Site 19491, skylight, view to north.	15
Plate 4. State Site 19492, overview of broken bird stone.	16
Plate 5. State Site 19492, cave entrance, view to the west.	16
Plate 6. State Site 19510.	17
Plate 7. Site T-012805-1, view to the north.	22
Plate 8. Site C-031705-01, view to the north.	27
Plate 9. Site C-031705-02, view to the east.	27
Plate 10. Site C-031705-03, view to the east.	28
Plate 11. Looters Cave entrance.	28
Plate 12. Site C-031705-4, view to the north.	29
Plate 13. State Site 19512, cave entrance (Shapiro and Cleghorn 1995: 73, photo 30)	33
Plate 14. Temporary Site T-091004-1, wooden stick on cave floor, view to the east.	36
Plate 15. State Site 17161, view to the northwest.	40
Plate 16. Bobcat Trail Habitation Cave, evidence of “looting” in cave entrance.	43
Plate 17. Project area before excavation. Bldgs. #97, 98 and 99 in background, view to the west	53
Plate 18. Leg 1 after excavation, view to the east.	53
Plate 19. Leg 3, concrete post footer removed by backhoe, view to the north.	54
Plate 20. Construction area on the north side of Bldg. #64 (Bldg. 63 in the background).	60
Plate 21. Proposed construction area to the right of Bldg. #64, view to the west.	60
Plate 22. Building #92 with temporary garage, view to the west.	64
Plate 23. Site T-101204-01, feature C, view to the south.	99
Plate 24. Site T-101204-02, view to the northeast.	100
Plate 25. Site T-101304-01, feature C.	100
Plate 26. Site T-101304-01, feature A.	101
Plate 27. Site MT-102204-34, view to the southwest.	101
Plate 28. Site MT-102204-19, view to the southeast.	102
Plate 29. Site MT-102204-36, view to the east.	102
Photo 30. Site MT-102204-35, view to the southeast.	103
Plate 31. Site MT-102204-20, view to the northeast.	103

EXECUTIVE SUMMARY

This report documents the preliminary results of the first year of a two year contract as outlined in the Scope of Work (SOW) dated February 20, 2004 for Cultural Resources Activities under the *Ecosystems Management Program* at the Pōhakuloa Training Area, Island of Hawai'i and Various Training Areas, Island of 'Oahu (revised 16 April 2002). The contract is between the US Army Garrison, Hawai'i (USAG-HI) and The Pacific Cooperative Studies Unit (PCSU). This report specifically addresses projects outlined in Section 5.b.(1-10), Cultural Resources Management.

The *Ecosystems Management Program* Scope of Work was implemented to conserve, protect and enhance the natural and cultural resources in the State of Hawai'i as well as to comply with all applicable Federal and State laws and regulations while also improving the US Army's ability to conduct and maintain military readiness. In order to obtain this goal and ensure proper management measures/decisions are implemented, a better understanding of the natural and cultural resources of the State of Hawai'i must be achieved.

The period of work represented in this report is from July 1st 2004 thru June 30th 2005.

The project consists of inventory survey, site identification, site monitoring, database management, site relocation, maintenance of a curation facility, implementation of monitoring schedule and various other duties performed outside the SOW.

All Cultural Resource Management Projects are designed to meet the following requirements:

- Section 106 of the National Historic Preservation Act and associated Codes of Federal Regulations
- Archaeological Resources Protection Act (ARPA)
- Native American Graves Protection and Repatriation Act (NAGPRA).
- Army Regulation AR-200-4

The accomplishments of the 2004-2005 year related to the Scope of Work are discussed here. The remainder of the report presents the activity reports for specific activities that document the steps taken toward accomplishing the goals set out in the Scope of Work.

All work reported herein was conducted at the Pōhakuloa Training Area in the center of Hawai'i Island. Elevations for PTA range between 4060 feet (1,238 m) to 8,880 feet (2707 m) above sea level (Shapiro and Cleghorn 1995:4.) The climate is relatively cool and dry. Average temperatures range between 50 and 60 degrees Fahrenheit (Hommon and Ahlo 1982:10.) Although rainfall is relatively low (between 100 mm to 400 mm [4 to 16 inches]), moisture, especially on the eastern range, is observed by the occurrence of fog and mist. During the winter months, PTA may experience an occasional frost (Hommon and Ahlo 1982). PTA is covered by lava flows of *pāhoehoe* and *'a'a* derived from Mauna Loa and Mauna Kea Volcanoes (Hommon and Ahlo 1983:7). A majority of the lava flows that cross through PTA are prehistoric lava flows derived from the Mauna Loa volcano and date from 200-400yr B.P. up to 10,000yr B.P. The only other prehistoric lava flow present on PTA lands is very limited in size and locale and

originated from the Mauna Kea volcano more than 10,000 B.P. There are several recent historic flows that originated from the Mauna Loa volcano and cross through parts of the Training Area lands as well. The lava flows that date to 1843, 1899, and 1935 are located on the eastern portion of the Training Area. The 1859 lava flow is the only historic lava flow on the Southwest section of PTA. Soils are generally shallow in PTA and are often comprised of loamy sand, silt loam, and fine sand derived from eluvial volcanic ash and cinder deposits.

Today, PTA vegetation is primarily classified as a sparse, open, or intermediate 'Ohi'a (*Metrosideros collina*) tree land with sparse to dense shrub understory with *kīpuka* of *naio-māmāne* scrub woodland vegetation. The *naio-māmāne* community: includes grasses (e.g., *Eragrostis*), low shrubs (e.g., *Chenopodium oahuense*) 'a'ali'i [*Dodonaea viscosa*], and scattered trees (e.g., *naio* [*Myoporum sandwicense*]).

Wildlife in PTA is dominated by introduced feral species. The pig (*Sus scrofa*), and dog (*Canis familiaris*) were originally brought to the Hawaiian Islands by the prehistoric Polynesian settlers and have overtime become feral animals. Other feral species that were introduced historically to Hawai'i and now run free at PTA include sheep (*Ovis aries*), goat (*Capra hircus*), cat (*Felis catus*), mongoose, black rat, and house mouse. Birds in PTA include many native and introduced species. Non-native bird species observed at PTA include several taxa of introduced gamebirds such as chukar, Erckel's francolin, and turkey. Other non-gamebird taxa include the skylark, melodious laughing thrush, red-billed leothrix, Japanese white-eye, northern cardinal, and the house finch (Welch 1993:16). Native birds include a migratory *kōlea* (American golden plover) as well as 'io, *pueo*, *palila*, 'apapane, 'i'iwi, 'elepaio, and 'amakihī. Although the dark-rumped petrel, 'alalā, nēnē, and at least one species of rail once dominated the landscape, these taxa are no longer commonly seen in the area (Moniz Nakamura 1999).

At the time of European contact, the area that encompasses most of PTA lay in the *ahupua'a* of *Ka'ohe* (Hāmākua District) (Cordy 1994:105). Portions of four ancient districts (Hāmākua, Hilo, Kona, and Kōhala) cross the PTA region. PTA is remote from the general island wide pattern of dense lowland settlement, being some 27 air-miles west of the coastal town of Hilo and 18 miles east of Kailua-Kona (Figure 1). Since there was never a permanent Hawaiian settlement in the Saddle region due to the inconducive sub alpine environment, traditional Hawaiian agricultural systems of dryland taro or sweet potato were not adapted to this area. However, archaeological studies in PTA and neighboring areas demonstrate that this upland plateau was nevertheless utilized by Hawaiians in prehistory for various types of resource acquisition. Radiocarbon dates indicate that the Saddle region was used by Native Hawaiians for more than 1,000 years, from ca. A.D. 775 to the nineteenth century, with the most intense use of the Hawai'i Island uplands extending from A.D. 1200 to 1600.

Despite the remote location of the area from the foci of settlement, PTA is surrounded by a number of highly significant sites. Located approximately 5 miles west of the post on the slopes of Hualālai, Ahu a 'Umi Heiau is the closest known large *heiau* to PTA.. Traditional accounts state that the *heiau* was constructed in commemoration of the unification of Hawai'i Island by chief 'Umi a Liloa around A.D. 1600 (Hommon and Ahlo 1983:23; Kirch 1985:179). The importance of this *heiau* site lies in its embodiment of the actions of the chiefly ruling class and their effects on regional land use patterns and resource exploitation. To the northeast of PTA on

December 2008

the upper slopes of Mauna Kea, at elevations ranging from approximately 8,600 to 13,000 feet, is the Mauna Kea Adze Quarry Complex, covering an area in excess of 7.5 square miles. Within this extensive area are large site complexes as well as smaller clusters and isolated site locations. Located just northeast of the PTA Cantonment on the lower slopes of Mauna Kea below the main adze quarry are Hopukani, Waihu, and Liloé springs. Associated spring sites evidence basalt tool manufacturing activities and subsistence items specific to different elevations (McCoy 1986).

The archaeological remains found across PTA demonstrate the use of this area throughout human occupation of the island. Archaeological sites found across PTA include chill glass quarries where volcanic glass was obtained, excavated pits, lava tube habitation and water collection sites, and shrines. These sites and the physical remains found in them demonstrate the variety of activities that took place in the Saddle region. The Cultural Resources Program at PTA continues to contribute data that increases understanding of the past uses of the area, as well as managing the resources so that they may be preserved for future generations. The remainder of this summary discusses the progress that has been made under the various sections of the SOW toward the established goals.

The Scope of Work specifies specific tasks to be carried out for the project. In practice, many of these tasks overlap, particularly those involving field work. For instance, on a single field trip that involved pedestrian survey a known site might be monitored for disturbance, several previously unidentified sites recorded, and previously identified sites mapped, photographed and accurate GPS locational data recorded. The trip reports have been grouped under headings that seem to reflect the majority of the activity that took place during the project.

Pedestrian Field Survey Projects (Section 5.b.(1)(a-f)): All surveys meet the requirements of the National Historic Preservation Act (NHPA), 36 CFR 800, 36 CFR 79, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and Army Regulation AR-200-4. Many of the surveys conducted during this year documented lava tube entrances. Ten new cave entrances were identified during several of the field trips, as well as two new archaeological sites. Four sites could not be relocated during the surveys. It was noted that no change was obvious at Looter's cave, which was also monitored during one of the survey trips. State Sites 10268 and 10267 were also monitored during a separate survey; minimal goat disturbance was noted at both sites, and continued monitoring was recommended. Six new site tags were also placed at five sites. The surveys took place in Training Areas 22 and 23.

Site Monitoring Program (Section 5.b.(2)(a-d)): presents the information collected during the PTA site monitoring program initiated in 1999 at PTA. Monitoring took place in Training Areas 21, 22 and 23. The areas monitored are based on the Archaeological Sensitivity Areas (ASA) identified in 2002. Two of the monitoring events took place after unexploded ordinance (UXO) was detonated. No damage from the detonation was noted at the sites visited. Monitoring was conducted following training in Training Area 21 to determine if the soldiers modified any existing sites, constructed new ones, or entered any sites. There was no evidence of any modification to the landscape or disturbance of archaeological sites, nor any off-road vehicle driving in the areas targeted.

December 2008

Five sites were observed for monitoring purposes. Four new sites were located, and one new historic site was identified during monitoring activities. Goat scat was noted at some sites, and fencing recommended. At other sites, minimal damage from goats was noted. The Bobcat Trail Habitation Complex was evaluated for possible looting activity because of past reports. Only one pit observed at the site was determined to be from looting. Continued monitoring was recommended for most of the sites, and protective fencing at some.

Archaeological Site Inventory Database And GIS/GPS Program (Section 5.b.(3)(a-d)):

Beginning in October 2004, the Microsoft Access database was rebuilt to utilize the benefits of a relational database. By the end of 2004 the new relational database was assembled and working with all the data from the "Archaesites.mdb" database imported into it. New data collected in 2004 was being brought into the database as well.

An issue of duplication and inconsistent data was identified during this process as a result of all staff members working on separate computers that were not linked through a network. This problem was particularly acute with regard to GPS data collected in the field. Solutions were proposed for this problem, including the development of a centralized repository for data; use of the database to link data sources such as photos, GPS and GIS files, and reports; and the development of a data collection file for use in a PDA or GPS that will be easy to import into the computers in the office. These solutions had been implemented as discussed in the report, and were being used. Details of the database tables and fields are contained in the report. Information presented in this section is confidential and shall only be released to the public under Section 7.18 of the Archaeological Resources Protection Act (ARPA).

Site Protection (Section 5.b.(4)): presents site protection measures that were developed and implemented.

Need info from Bill

Assist DPW Architectural Historian (Section 5.b.(5)): Assisting the DPW Architectural Historian in assessing and evaluating structures for the National Register of Historic Places (NHRP) eligibility. **Need info from Bill, or Cary.**

Share Information with US Army GIS Specialist (Section 5.b.(6)): Information and data gathered on cultural resources are shared with US Army Geographic Information System specialist upon request.

Coordination of training missions with preservation of Cultural Resources (Section 5.b.(7)): Five projects were conducted in support of the Army's training mission. One of these projects, in Training Area (TA) 21, consisted of monitoring following a training exercise. No damage to cultural resources was noted. Archaeological and historical monitoring also took place in TAs 9, 8, 7, 5 and 21 during installation of survey monuments for the LIDAR project. No cultural resources were identified during this project. Approximately 600 acres were surveyed in TAs 6, 7 and 8 in response to a revised cultural resources survey requirement for the Battle Area Complex (BAX) and administration area. The project involved primarily pedestrian survey, with aerial coverage of the southern and eastern portion of TA 8. Four new cultural resources were

December 2008

recorded during this survey, and a number of recent military features were also documented. An aerial survey was conducted of the proposed expansion area of the PTA quarry, which Federal Highways was proposing to use for the Saddle Road realignment project. No cultural resources were found in this area. The final survey in support of the Army's training mission was of the Old Kona Highway in portions of TA's 19, 20 and 22. No cultural resources were found along this route, and no further work was recommended.

During this year, none of the proposed projects were found to have any effect on cultural resources or historic properties. The training exercise did not disturb any cultural resources, and it appeared that the soldiers followed the instructions to avoid these resources.

Record and Report any Damage to Archaeological Sites in the course of Routine Fieldwork (Section 5.b.(8)): As can be seen from the trip reports presented in the other sections, only minimal damage was observed during the course of routine fieldwork at PTA. This minimal damage was from goats walking through some of the lava tubes.

Public Outreach (Section 5.b.(9)): Two groups of twelve (12) students each from the *'Imi Pono no ka 'Aina* program visited PTA on two separate days to learn about cultural resources at PTA and the program to document and preserve them.

Coordination with USAG-HI Integrated Training Area Management (Section 5.b.(10)): There was no known coordination with ITAM during this fiscal year.

Curation Facility (Section 5.b.(12)): presents the progress and maintenance efforts involving the PTA curation facility at PTA.

It is recommended that the facility be upgraded with the six Lane professional curation cabinets and that more time and space be allotted for maintaining the facility. It is recommended that a full-time position be created to assist in this task. Additional surveys slated at PTA are likely to produce demands for both space and for labor hours of maintaining the facility. A possible solution to this problem may be to enlist outside help in the form of volunteers, interns, or perhaps integrating a curriculum with the UH-Hilo into PTA curation facility needs. It is also suggested that the future value of our archaeological studies be envisioned to guide the development of our goals and practices. The Cultural Advisory Committee should be consulted for this task.

CULTURAL RESOURCES PROGRAM DETAIL REPORTS

The remainder of this report contains individual reports describing in detail activities carried out in accordance with the Scope of Work.

PEDESTRIAN FIELD SURVEY PROJECTS (SECTION 5.B.(1)(A-F))

Performing pedestrian field surveys to relocate previously recorded and previously unrecorded sites at PTA per direction of the Cultural Resource manager (CRM).

- (a) Transects will be walked in 10m widths.*
- (b) Photographic documentation of all prehistoric and selected military features shall occur. Original photographs shall be taken on 35mm color print film and/or by digital camera and will become US Army property. A photo record will be maintained and shall include the following information: date, general location or station, specific subject, and photographer.*
- (c) Identifying all prehistoric features during the pedestrian survey with permanent site tags and GPS coordinates.*
- (d) GPS locations shall be collected on all military features but will not be flagged or assigned site numbers. When such features are located within archaeological site boundaries they shall be included in recorded data regarding the site for future management purposes.*
- (e) General location of the military features shall be plotted on a grid using ArcView and/or Geographic Information System software. A representative number will be selected for detailed mapping based on site type with approximate size of feature noted.*
- (f) Map all features within a site using GPS. Establish feature database.*

Trip Report 1

7 January 2005

Cultural Resource Site Location and in Training Area 23

1. On 7 January 2005, Aron King, Cary Stine, and James Head, PTA Cultural Resource Specialists, along with William Godby, GS Archaeologist traveled to Training Area 23 (Hamakua District, Ka'ohē Ahupua'a, TMK (3) 4-4-016:001). The reason of the visit was to monitor the condition of archaeological sites identified during historic preservation studies in 1992 (Reinman and Schilz 1999). See figure 1 for visited site locations.
2. During transit to the site areas, a new site (**T-010705-1**) was found and appeared to be a foot trail across the lava oriented in a NE/SW direction and approximately 30-40m long. No further information or photographs are available, but it will be necessary to visit the site to collect further data.
4. The first site to be located was **State Site 10268** (Reinman and Schilz 1999: 65-72), a tube shelter approximately 300m long with at least six (A-F) known sinks along the length. The site consists of at least 10 examined features including hearths, terraces, and a cleared area (Figure 2 – R & S Figure 28). Both bird bone and charcoal are present with the charcoal dates approximating around 400 years B.P.
5. The original site tag for **State Site 10268** was not found, so an embossed galvanized washer was established close by. Examination of the cave system did not indicate recent ungulate usage. There are the remains of dead goats in the eastern end, but the site did not appear to have been impacted since those individuals.
6. **State Site 10267** is revisited about 20-30m south of the long tube containing **State Site 10268**. This site consists of a large sink approximately 15m by 9m by 3m deep (Figure 3 – R & S Figure 51). The original site identification tag was found under the overhang on the west side.
7. Reinman and Schilz indicate the presence of five features including cleared circles, terraces, pavement, a hearth (photo1), and an ash lens. Fragments of ground stone and a whole gourd were also reported. Two charcoal samples were collected during testing: one dated ca. 300 years B.P., the other returned a modern date (1999:106-114).
8. Examination of the cave disclosed the presence of artifacts and features as described by the original recorders in 1992. As at **State Site 10268**, ungulate damage appears to be minimal and there are no indications of recent human activities at either of the sites.
9. It is recommended that regular monitoring of conditions at **State Sites 10268** and **10267** (Figure 4- R & S Figure 28) continue, although the sites' location inside of the large enclosure fence will likely prevent subsequent damage to the historic properties. Temporary Site T-010705-1, the historic trail, should be mapped and recorded as soon as feasible.

Map removed to protect rare resources. Available upon request

Map removed to protect rare resources. Available upon request

Map removed to protect rare resources. Available upon request

December 2008

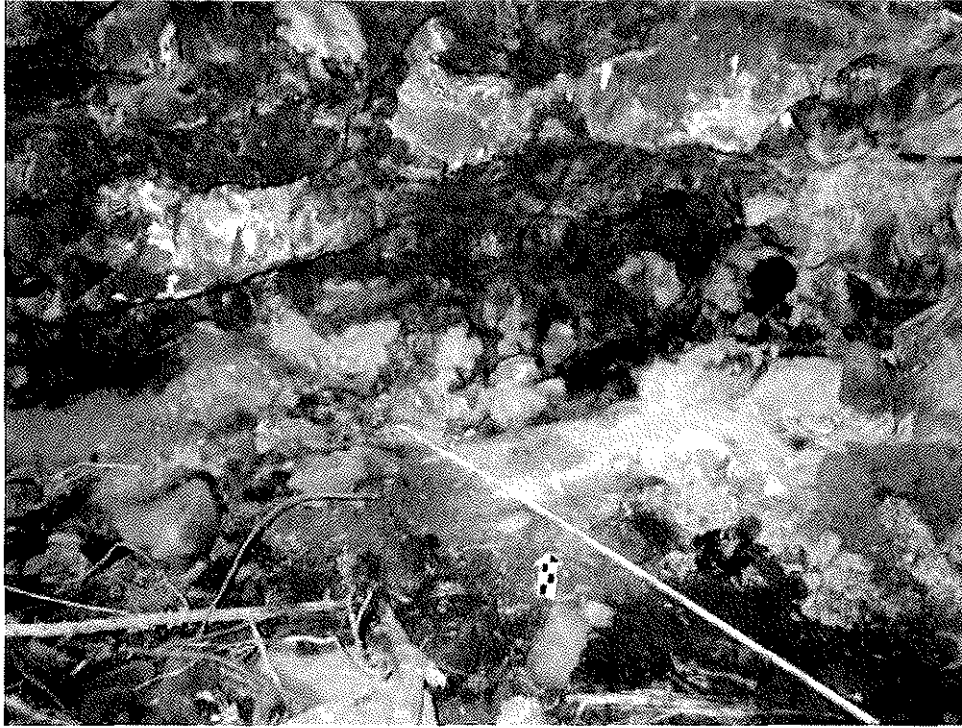


Plate 1. State Site 10267, overview of hearth (feature F).

Map removed to protect rare resources. Available upon request

Trip Report 2

18 January 2005

Relocation and placement of permanent site tags on five archaeological sites in Training Area 22

1. On January 18, 2005, James Head and Aron C. King, using previously gathered GPS data, relocated five sites, took photographs and placed permanent site tags in Training Area 22, located in North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007. They also collected new, more accurate Trimble GPS locations for all visited sites (Figure 5). Trimble locations were collected from as near to the new permanent site tags as possible generally within 2m.
2. State Site 19491 is a lava tube shelter and the condition of the cultural materials present in the tube appeared to be the same as those outlined in the GANDA report dated March of 1998. The temporary aluminum site tag was relocated, a photo was taken of the entrance (Photo 2) and the cave skylight (Photo 3), and a new permanent tag was placed near the existing aluminum tag.
3. State Site 19492 is a multi component tube system. The site has two lava tubes and three entrances. In the western entranceway a small (0.08m) ground basalt bird stone was located and photographed (Photo 4). The artifact is circular in cross section with a 45 degree cleavage. The third entrance present at the site is the larger of two entrances to the main chamber and is located approximately 15m to the northeast of the double entrance (Photo 5). The original site tag was not relocated but a new site tag was placed on the pāhoehoe above the two tiered entrance mentioned above.
4. State Site 19510 is described as an isolated volcanic quarry site (Roberts et al, 2004) located approximately 200m south of State Sites 19512 and 24778 (discussed below). The original aluminum site tag was relocated, a Trimble bearing was acquired, photographs were taken, and a permanent site tag was tied to the communication pole that is used as the site datum (Photo 7). The site is largely overgrown with grass, drastically limiting the visibility of the quarried pāhoehoe.
5. In the afternoon, we placed a permanent site tag on State Site 19512. The cave site relocated by that team and recorded as State Site 19512 has since been given a new site number (State Site 24778). The actual State Site 19512 is located about 40m to the east. Both sets of corrected points have been entered into the PTA Cultural Resources Database.

Map removed to protect rare resources. Available upon request



Plate 2. State Site 19491, cave entrance, view to the northwest.



Plate 3. State Site 19491, skylight, view to north.



Plate 4. State Site 19492, overview of broken bird stone. .

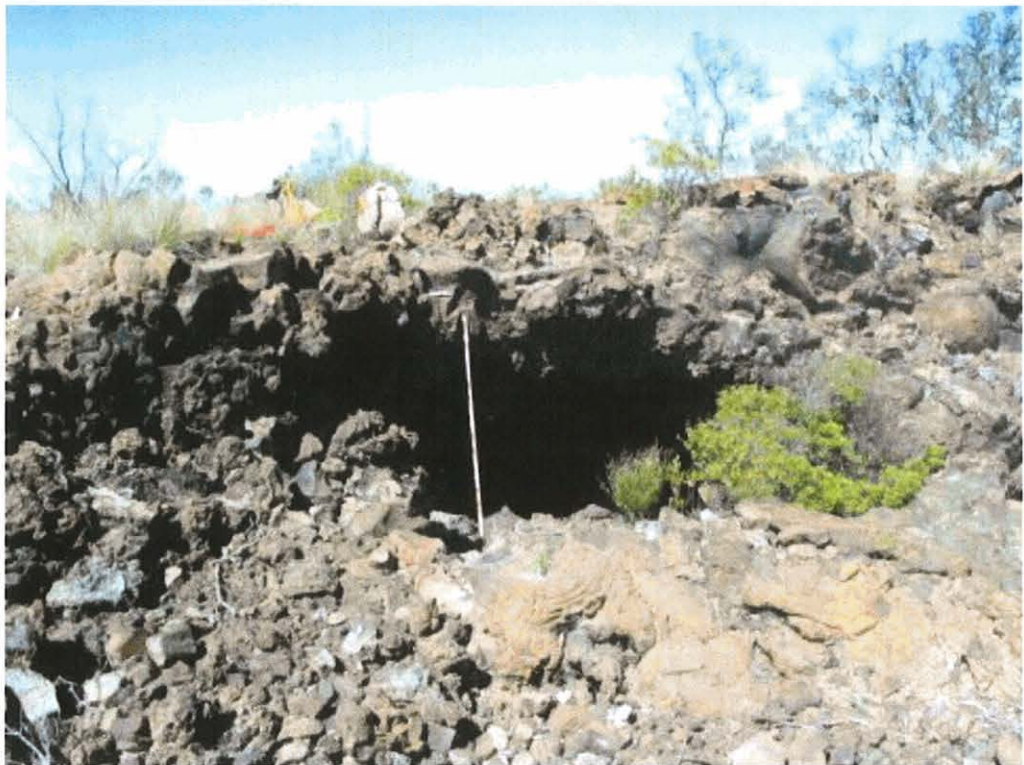


Plate 5. State Site 19492, cave entrance, view to the west.

December 2008



Plate 6. State Site 19510.

December 2008

Trip Report 3

27 January 2005

Relocation of 15 Cave Entrances in the “D” Cave System, Training Area 22

1. On 27 January 2005, Don Coons, PTA Cave Resource Specialist accompanied Aron C. King and James Head, PTA Cultural Resource Specialists to the “D” cave system located northwest of New Bobcat Trail, Training Area 22 in North Kona District, Pu’u Anahulu Mauka Ahupua’a, TMK (3) 7-1-004:007.
2. The purpose of the trip was to relocate surface lava tube entrances found originally by Pearthree, et al. (1996). Several of these entrances had been recorded by BSAI (Shapiro and Cleghorn 1995), but the exact locations have not been finalized.
3. A total of 15 cave entrances were located with the Trimble Pro XR system. This data will be used to correct subsurface mapping of the “D” system by the PTA Cave Resource Specialist and Hawai’i Speleological Society (HSS) volunteers.
4. Seven of the entrances were originally found and discussed by Pearthree, et al. (1996), and contained cultural material. These same entrances were visited by Shapiro and Cleghorn who recorded them and secured State of Hawai’i site numbers. A small collapse, dubbed the Kī Cave, associated with State Site 50-10-30-19504, and other, non-cultural cave entrances discussed in the Biological Inventory of Caves report (Stone, et al. 1995) were also located with the Trimble System.
5. Two new cave entrances were found on the surface and located as well. These will aid in the location of the subsurface inventory.
6. No new archaeological sites were found during this location of the cave entrances in the “D” System.

Map removed to protect rare resources. Available upon request

Trip Report 4

28 January 2005 and
3 February 2005

Relocation of 6 Cave Entrances in the "D" Cave System, Training Area 22

1. On 28 January and 3 February 2005, Don Coons, PTA Cave Resource Specialist accompanied Aron C. King and James Head, PTA Cultural Resource Specialists to the D cave system located northwest of New Bobcat Trail, Training Area 22 in North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007.
2. The purpose of the trip was to relocate surface lava tube entrances found originally by Pearthree, et al. (1996). Several of these entrances had been recorded by BSAI (Shapiro and Cleghorn 1995), but the exact locations had not been finalized.
3. A total of 6 cave entrances were located with the Trimble Pro XR, locations shown in Figure 7. This data will be used to correct subsurface mapping of the D system by the PTA Cave Resource Specialist and Hawai'i Speleological Society (HSS) volunteers.
4. Two of the entrances were partially explored (Entrance 16 and T-27) and discussed by Pearthree, et al. (1996). Apparently T-27 was visited by Shapiro and Cleghorn who recorded it as State Site number 50-10-30-19514. Other, possibly non-cultural cave entrances discussed in the Biological Inventory of Caves report (Stone, et al. 1995) were also located with the Trimble System.
5. One additional cave entrance was found and located with a hand-held GPS. The entrance will be explored during cave surveys and its location will aid in the HSS subsurface inventory.
6. Two additional sites were found during this trip, Temporary Site T-012805-1 (Photo 7) a low overhang/cave with a mound /stacked wall to the south, and Temporary Site T-012805-2, a low rock mound at the base of a natural basalt outcrop. It is worth noting that Site T-012805-2 was found during the return to the road and may not be part of the D System.
7. These sites will be recorded and mapped when the PTA Cave survey is in the area.

Map removed to protect rare resources. Available upon request



Plate 7. Site T-012805-1, view to the north.

SITE MONITORING PROGRAM (SECTION 5.B.(2)(A-D))

Periodic monitoring of known archaeological sites (approximately 14) in training area 5, 6, and 21 for human and animal damage and natural soil erosion twice a year or as needed.

- (g) Findings (Trampling, digging and collapse of features, etc.) and damage assessments shall be entered on a GIS database with systematic recording sheet for each site.*
- (h) Damage shall be assessed by recording and/or measuring changes in feature dimensions, measuring width and depth of holes or pits, presence or absence of animal feces and human trash, and determination of the extent of natural erosion or other damage.*
- (i) Photos from established photo prints shall be used to document the periodic monitoring and damage assessments.*
- (j) Based on the findings and damage assessments, management recommendation shall be made.*

Cultural Resource Site Monitoring in Training Area 22,

1. On 17 March 2005, Aron King, Cary Stine, and James Head, PTA Cultural Resource Specialists, traveled to Training Area 22 in North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007. The purpose of this trip was to visit the Looter's Cave site, and check for any disturbance since the previous visit by Moniz-Nakamura in 1999. Additionally a survey of the surrounding area was performed to identify any other sites in the area. A total of five possible features were found, including, three sinks and two small overhangs.
2. The three sinks were found east of the Looter's Cave, C-031705-01, C-031705-02, and C-031705-03. The first two sinks, C-031705-01 and C-031705-02 were observed to be connected by a tube system and approximately 23 meters apart from each other.
 - Sink C-031705-01 was 1.5 x 3.5 x 1.5m deep (Figure 8). There were five cave leads found on the south end of sink C-031705-01 including the one leading to C-031705-02 (Figure 9).
 - Sink C-031705-01 was 3.5 x 3.5 x 1.5m deep. It appears to have been collapsed by bulldozing activities during previous fire break activities..
 - Sink C-031705-03 was found about 63 meters to the northwest. It had two openings, the larger one measured 8 x 18 x 2.5m deep. See Photo10. The smaller sink, 7 m to the south, was 8 x 8 x 1.5m deep. This sink was not explored but it probably was part of the same cave system as C-031705-01 and C-031705-02. Further exploration will be needed to see if these sinks connect with the first two.
 - The Looter's Cave was found 76 meters south west of C-031705-03. It appears to be in the same condition as it was when last visited by Moniz-Nakamura. Two marine shell fragments were found 7 m, 210 ° (TN) from the southwest corner of the sink (Photo 11).
 - Sink C-031705-04 (Photo 12) was found along the same line from the Looter's Cave about 138 m further south west. Dimensions are 8.5 x 4 x 1.5m deep. A cave entrance appears to start in the south end and continue to the southwest. There is possibly another cave entrance in the north end.
 - Overhang C-031705-05 is a small cave facing about 190°. There is a small possible entrance leading off to the north.
 - Overhang-031705-6 is a low overhang facing approximately 130°. There is a very small possible entrance leading north.
3. All the sinks observed in this survey were found on k3 pahoehoe flows dating to about 750-1500 years BP. Further exploration will be needed to determine if these sinks are connected

by the same cave system and to compile complete cultural inventory of the system. After this exploration, Looter's Cave will be given a State Site number.

Map removed to protect rare resources. Available upon request



Plate 8. Site C-031705-01, view to the north.



Plate 9. Site C-031705-02, view to the east.



Plate 10 Site C-031705-03 , view to the east



Plate 11. Looters Cave entrance

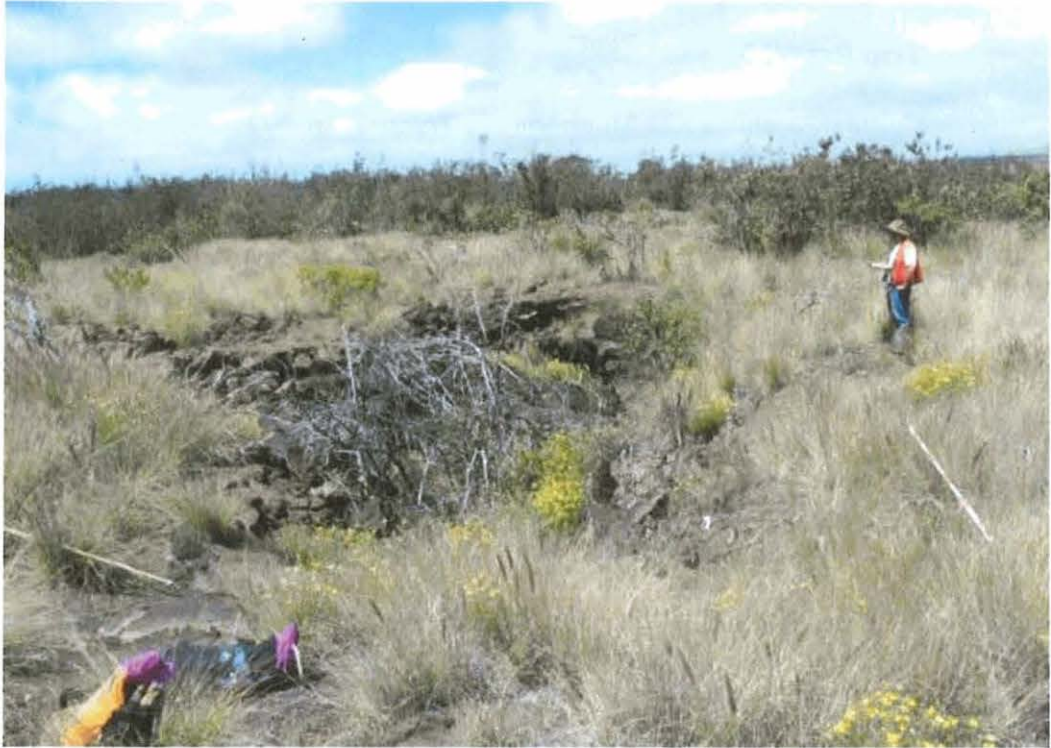


Plate 12. Site C-031705-4, view to the north.

Trip Report 6

11 September 2004

Cultural Resource Site Monitoring in Training Area 22

1. On 11 September 2004, Aron King, Cary Stine, and James Head, PTA Cultural Resource Specialists, traveled to Training Area 22 in North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007. The purpose of the visit was to monitor the condition of archaeological sites identified during historic preservation studies in 1994 (Shapiro and Cleghorn 1995).
2. The monitoring was in response to the planned detonation of two 750 lb. General Purpose (GP) bombs (located ca. 670 east-northeast and 900m southwest of State Site 19512) on August 31 and September 1, 2004. The purpose of the visit was to examine impacts to subsurface archaeological sites from ordnance detonation, to provide locational data (Figure 9), and to monitor the sites for other human and ungulate damage.
3. **State Site 19512** was recorded as a small southeast-trending lava tube shelter (Photo 30, Shapiro & Cleghorn 1995: 73) During the original recording, bird bone, charcoal, and water were noted. Also included was a concentration of bird bone and four birdstones in a caves shelf. The concentration of bird bone was not relocated, but the four stones were. There is no site map on file at PTA, so a field map was generated during this visit (Figure 10).
4. No features were designated during the original recording, but a small, circular alignment was noted at the eastern limits of the rock pile resulting from sink collapse. The interior of the alignment measures ca. 0.70m by 0.45m and the outside alignments are a maximum of 0.40m high. No charcoal was noted inside of the alignment, but placement of the possible feature near the cave entrance could be evidence of a hearth.
5. No damage from the earlier Unexploded Ordnance (UXO) detonation was noted within the lava tube or in the surrounding area of State Site 19512. A cluster of spent .50 caliber cartridges and links were located about 45m @ 292° from the entrance, but no indications of recent military training features were seen in the area. There is no evidence of ungulate activity at State Site 1951.
6. Temporary Site T-091004-1 was recorded near State Site 19512 and appears to be part of the same cave system. T-091004-1 measures approximately 14.0 by 20.0 by 2.0m high (Figure 11). The main sink entrance is about 4.5m² and accesses the main east-west trending lava tube and a smaller cave to the south.. No features were designated, but there is a possible cleared floor area on the south, as well as possible modification of roof fall materials around the entrance sink area.

7. Cultural materials found within the interior of the cave include two partial waterworn basalt stones found in the south, volcanic glass, and a .50 caliber cartridge. Large amounts of bird bone, some *'opihi* shell fragments, and a possibly modified wood stick with ground (pointed) ends (Photo 14).
8. No damages from the nearby detonation of UXO were noted at Temporary Site T-090104-1. Ungulate activity was noted at the site with goat scat and bones present within the modified lava tube.
9. Temporary aluminum PTA-CR site tags were placed at the datum of both sites. After a permanent site number is obtained for Temporary Site T-091004-1, the team will return to replace these tags with permanent site washers.
10. At the completion of the field work, an attempt was made to find State Site 19510, using Geographical Positioning System (GPS) locations. The site was not found during this visit.
11. This visit of archaeological sites in Training Area 21 was primarily to ascertain impacts from recent detonation of UXO in the area. No evidence of damage from ordnance was found. As is common at PTA, some impacts are the result of ungulates in the area. Site protection methods (such as fencing) are recommended for selected archaeological sites.

Map removed to protect rare resources. Available upon request



Plate 13. State Site 19512, cave entrance (Shapiro and Cleghorn 1995: 73, photo 30)



Figure 10. State Site 19512, Sketch map.

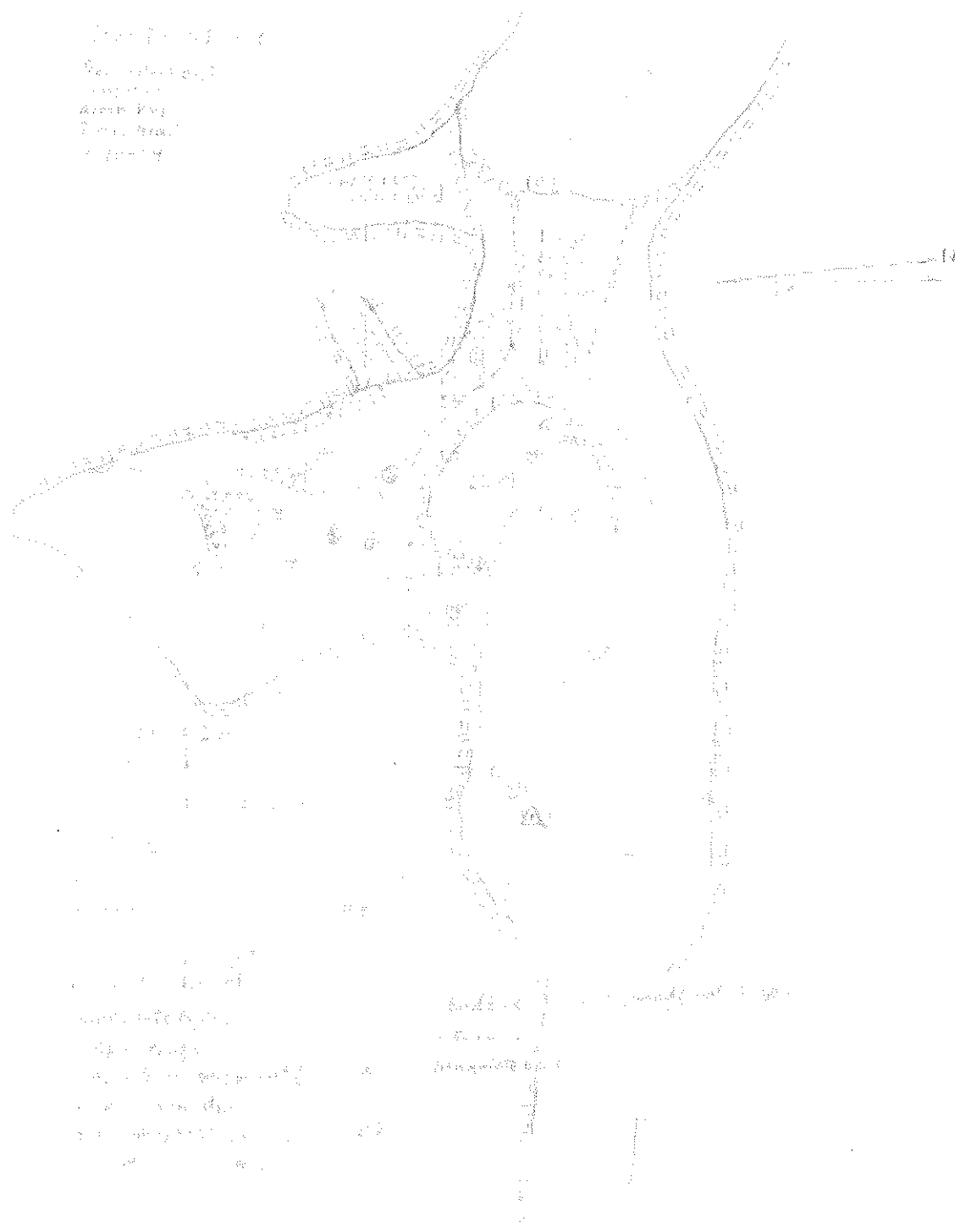


Figure 11. Temporary Site T-091004-1, sketch map

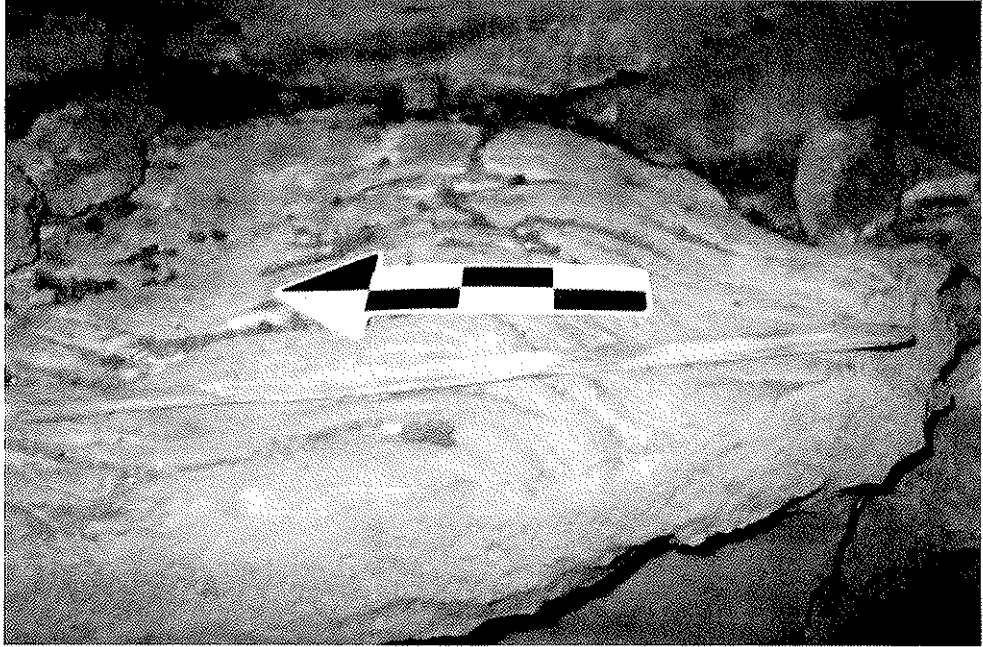


Plate 14. Temporary Site T-091004-1, wooden stick on cave floor, view to the east.

Cultural Resource Site Monitoring in Training Area 22

1. On 17 December 2004, Aron King, and James Head, PTA Cultural Resource Specialists, traveled to Training Area 22 in North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007. The purpose of the visit was to monitor the condition of archaeological sites identified during historic preservation studies in 1992 (Reinman and Schilz 1999) and to examine impacts to surface and subsurface archaeological sites from ordnance detonation that occurred in the general area on August 31 and September 1, 2004 (Figure 12).
2. **State Site 17161** originally recorded by Reinman & Schilz (1999:208) as a shelter overhang in a low pāhoehoe ridge (Figure 13-R&S, Fig 209). A glassy sheet of pāhoehoe is present at the entrance and the shelter floor is characterized by ash, charcoal and half burnt wood. The authors noted a small area of roof fall possibly modified by piling, but no artifacts or other ecofacts were recorded.
3. During this visit a PTA-CR monitoring form was completed with little to no disturbance to report as the site appeared exactly as described. There was no ungulate/human impact. It will be interesting to track any changes to the site on subsequent monitoring trips.
4. After assessing State Site 17161, the PTA-CR team attempted to locate other historic properties in this complex of seven known sites. State Sites 17160 and 17162 were then located and their positions confirmed using the Trimble ProXR system to obtain corrected Rover Files. A comparison of the corrected files to GPS positions given in Reinman and Schilz (1999) then determined the level of positional error resulting from Selective Availability. The corrected data then helped to locate State Site 17161, but did not aid further in finding State Sites 17163, 17164, 17165, or 17166, see Figure 12.
5. A small quarry, Temporary Site – T092304-1 was located in the area and was thought to be the location of State Sites 17164, 17165, or 17166, although the descriptions did not match. This temporary site is located several hundred meters north of the site complex, and is most likely an unrecorded feature.

Map removed to protect rare resources. Available upon request

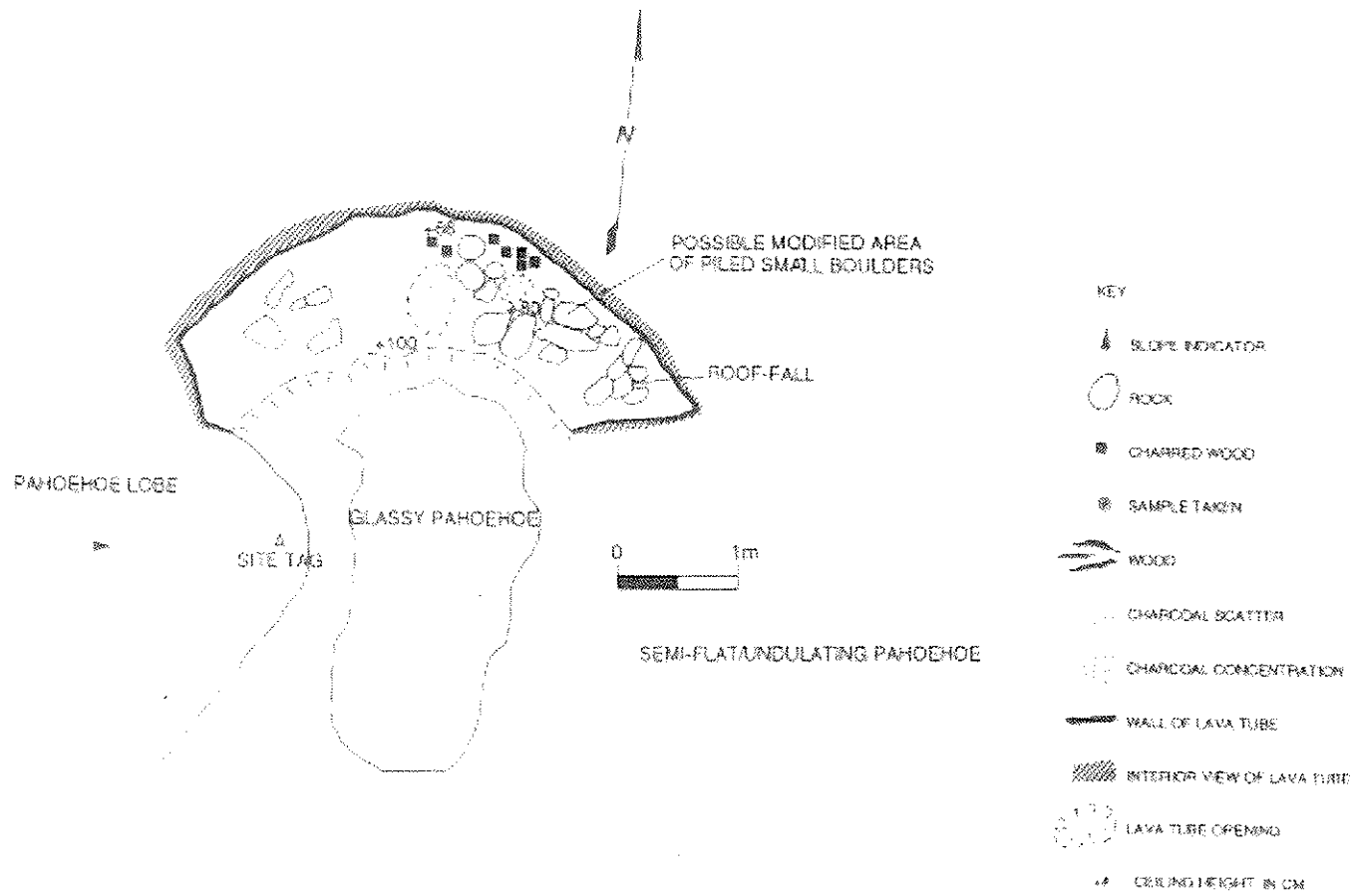


Figure 13. Site 17161 (Reinman & Schilz 1999, Figure 209)



Plate 15. State Site 17161, view to the northwest

Trip Report 8

25 February 2005

Monitoring of Marine Deployment and Previously Identified Archaeological Sites in Training Area 21

1. On February 25, 2005, Cary Stine, Aron King, and James Head, Cultural Resource Specialists at PTA, traveled to the southern portion of TA 21 along Redleg Trail in the eastern portion of PTA, in Hamakua District, Ka'ohē Ahupua'a, TMK (3) 4-4-016: 001.
2. This inspection was in response to a large deployment of Marine Combat Units in the area, scheduled for January 15 – February 15, 2005. In past deployments, stacked stone features have been disassembled and rebuilt for training, lava tubes were entered, and rubbish was found in the area
3. On the trip, the cultural resource staff found no evidence of impact to the previously-recorded archaeological sites. No recent stacked-rock features were found in this portion of TA 21. There are no indications that either off-road driving or unauthorized cave entry occurred during the assesment
4. The Cultural Resources team traveled north along the interpretive trail north from Pu'u Koli in southeast PTA. **State Site 18675** (Shapiro, et al 1994:33-36) was the first site visited. A cultural resources monitoring form was completed and a permanent washer (with 18675 embossed) was nailed at the BioSystems Analysis, Inc. (BSAI) datum location.

Trip Report 9

11 March 2005

Site Visit to State Site 50-10-30-5004 or Bobcat Trail Habitation Cave (BTHC) and associated systems.

1. On March 11 2005, Bill Godby, PTA Cultural Resources Manager; Frank Trusdell, United States Geological Survey, Hawai'i Volcanoes Observatory; Don Coons, PTA Caves Specialist; with PTA Cultural Specialists James Head, Cary Stine, and Aron C. King visited the Bobcat Trail Habitation Cave in Training Area 22, North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007. The crew left the PTA Cantonment at approximately 1200 hrs. and returned at about 1600 hrs. The purpose of the trip was to monitor conditions at State Site 5004 and to acquaint PTA Cave Specialist Don Coons with the system so that he could prepare a Cave Management Plan for the next field season.
2. A known burial located near entrance T-14 was examined and appeared to be in the same condition as reported in 1986. However, during the site visit it became evident that the maps from Pearthree, et al. (1996) are not consistent with site numbers and descriptions used in earlier reports. Future work in the area will require clarification of such details.
3. Previously published accounts of vandalism were examined while at the site. We investigated the areas previously referred to as 'looters' pits and by our judgment only one of the pits is potentially a looters pit. (Cleghorn 1999, Rosendahl & Haun 1986) The pit is located in the earth oven (adjacent to an old test unit) and was originally noted by Rosendahl and Haun in 1986. Plastic was evident in at least two of the pits and all pits appeared to be backfilled, which is not a common looting tactic.(Figure 14)
4. Ungulate damage at the site does not appear to have significantly increased since the previous visit. Soil conditions within the cave appeared quite damp and stable. Although the site is within walking distance of the MPRC Access Road, it does not appear that either this cave or others within the tube system have been affected by human visitation.
5. It is recommended that State Site 5004 and other lava tube caves within both this system and the unnamed system further to the north be regularly monitored by the PTA Cultural Resources Staff to determine if changes occur within the cave systems



Plate 16. Bobcat Trail Habitation Cave, evidence of "looting" in cave entrance.

Cultural Resource Site Monitoring in Training Area 22.

1. On September 23, 2004, J. Head, C. Stine and A. King, Cultural Resource Specialists at PTA attempted to relocate and monitor State Site 17163 in Training Area 22, North Kona District, Pu'u Anahulu Mauka Ahupua'a, TMK (3) 7-1-004:007 (Figure 15). The data used for the relocation attempt can be found in the final OGDEN report from May of 1999 that was written for the archaeological reconnaissance associated with the planned MPRC project. The coordinates taken from the report were located in the middle of an 'a'a field and so an informal survey was conducted in the vicinity.
2. State Site 17160 and a new site T-092304-01, both volcanic glass quarries in fair condition, were located however State Site 17163 was not. A location and bearing was taken for the series of communication poles and copper lines in the vicinity.
3. The communication lines appeared to be approximately 25-50 years old and run as far as the eye can see in both directions. At this time no definitive date can be placed on them, nor was a site number assigned. The poles appeared to be 'ohi'a and were anchored with a pile of rocks around the bottom. They are strung with 8 copper lines attached via brown porcelain insulators and nails. Two different stringing methods were observed, one style has insulators attached directly to the upright pole while the other style would be closer to the more traditional 'T' shape. Using the Garmin, a reference point was taken for one of the poles and a compass bearing in the predominant direction of the lines was taken at 290°/110°.
4. T-092304-1 measures approximately 15m x 3m with the long axis roughly running ESE or WNW. Cores and primary/secondary flakes were evident at the site but no hammer stones were identified. Toward the west end of the concentration there may have been a small alignment or a sort of 'C-shape' arrangement and toward the center of the quarry was a small-mounded area measuring approximately 1m across. A site form was completed including a sketch map, geographic information was collected with the Trimble and we added a temporary aluminum site tag. The quality of glass is good but the site appears to have limited potential for any further data collection due to the lack of soil and other than the worked volcanic glass itself, the absence of cultural materials. Photos were not taken.
5. State Site 17160 is located about 25 meters off the north side of MPRC access road. Work at State Site 17160 included a site monitoring form, collection of more accurate geographic coordinates with the Trimble and the placement of a new aluminum site tag. The site had not been monitored since its original recordation but it appeared to be in the same condition as described in the final OGDEN report, which includes photos and a site map. Neither of the archaeological sites visited during this project appear to have suffered from the recent bomb detonation.

6. With the new geographic data taken for State Site 17160 locations of the other sites in the area, including the original target 17163 may be extrapolated from the written accounts in the OGDEN report.

Map removed to protect rare resources. Available upon request

Archaeological and Historical Survey and Monitor of trenching for Underground Utilities at Kīlauea Military Camp, Kā'u District, Hawai'i Island, Hawai'i.

1. On 26 April 2005, James Head PTA Cultural Resources Specialist, traveled to Kīlauea Military Camp (KMC) in the *ahupua'a* of Keauhou, Ka'u District, TMK (3) 9-9-001:001 within Hawai'i Volcanoes National Park (Figure 16). This trip was to support an archaeological and historical examination of subsurface trenching activities within the boundaries of KMC. Mr. Head met with Mr. Roger Panzer, Maintenance Mechanic Supervisor, at KMC.
2. The planned trenching project followed up a surface inspection of the proposed project route by Mr. Head and Mr. Panzer on 4 February 2005. The proposed project will be located wholly within existing lawn areas, near existing buildings, or under paved roads and walkways. No prehistoric archaeological features or sites were found during the surface examination.
3. An Integrated Cultural Resources Management Plan (ICRMP) was prepared for Kīlauea Military Camp (Tomonari-Tuggle and Slocumb) in December of 2000. The goal of this document "is to preserve and protect the significant archaeological and architectural resources of Kīlauea Military in a manner that meets legal compliance requirements, as well as supports the rest and recreation mission of KMC." (ibid. iii).

In 1994, the National Park Service Pacific Western Area office had carried out the inventory of historic lands under their control. Building assessment forms were completed for each structure over 50 years old at KMC. All buildings evaluated by the NPS survey are included in the ICRMP.

The Hawai'i State Historic Preservation Officer concurred with the NPS that meets the criteria as a Historic District, and is eligible for listing on the National Register. The NPS evaluation did not define the boundaries for the historic district, but Figure 16 (Tomonari-Tuggle and Slocumb 2000:1-16) indicates these proposed boundaries. All five historic structures in the project area are within the boundaries.

The ICRMP considers just over 100 historic structures and one archaeological site at KMC. The one archaeological site is an anthropomorphic petroglyph found in a rock wall near Building 43. This figure is in a secondary context and will not be affected by the proposed excavation project.

Several historic buildings including Buildings 45, 74, 97, 98, and 99 (Figure 16) are within the proposed project area, but are not slated for impact during trenching or construction of the buried utility lines.

4. Excavation and construction of utilities in the KMC trench lines was done by the Naval Mobile Construction Battalion Fourteen (NMCB 14). The Seabee's were combining the buried utility lines with the historic upgrades to Recreation Billets #97 and #98. There were various legs of the trench that were excavated at different times. Because of this, the legs were numbered Leg 1 – Leg 6 (Photo 17 and 18). All trenches are about 0.70-0.80m wide and 0.70-0.80m deep.

26 April 2005

5. On 26 April 2005, excavation of Leg 1 began near Pole K9 on the eastern edge of the project area. This is found about 15-20m south of Bldg. 45, the KMC Chapel. The excavation team consisted of two Seabee's, one of which operated the backhoe and one who served as a ground monitor to assist and look for buried pipes and other features. One archaeologist was present at all times during machine and hand excavations to monitor for buried cultural sites and features.
6. An additional goal during excavation was the location and avoidance of all buried pipelines in the project area. Since construction at KMC has progressed in at least three separate phases, there is no overall map of the buried utility lines. As these lines were found during trenching, their exact location was determined by GPS, along with a depth below surface, type of pipe, and bearing of the pipe. As these data are collected, a database of buried utilities at KMC will be constructed. This will be combined with a Geographical Information System to build a map of these utilities. The map can be used to avoid these developments in future trenching activities.
7. The initial Leg 1 excavation was completed by lunch and was about 40m long. No prehistoric or historic cultural items or features were found during the excavation. A total of four buried pipelines were found during the excavation, and a soil profile was performed on the north-facing trench wall near Pole K9. The findings are as follows:

- **Layer I** – 0-0.07 meters below surface (mbs)

This is the humus or grass layer. It is composed of a dark brown silty loam with many roots and sparse coral sands (10YR 3/3 – Wet - Dark Brown).

- **Layer II** – 0.07-0.33 mbs

These are medium gray sandy soils with small pea gravels and roots (10YR 4/2 – Wet - Dark Grayish Brown). This layer appears to be the result of the Kīlauea eruption in 1924. There are a number of ejecta stones found in the lower areas of volcanic ash.

- **Layer III** – 0.33-0.55 mbs

This layer is composed of gray brown clay with tiny stones and roots at the bottom of the layer (10YR4/4 – Wet – Dark yellowish brown).

- **Layer IV** – 0.55-0.70 mbs

This layer is a red orange clay with small stones and no roots (7.5YR 3/2 – Wet – Dark Brown). The trench was unexcavated by the backhoe below this point.

8. The excavation of Leg 2 began in the afternoon. The route passes between Bldg. #97 and #98, closer to Bldg. #98, to avoid a cesspool between the two buildings. A total of four buried pipe crossings were found during excavation. No cultural material was recorded during excavation
9. The excavation of Leg 2 was completed by about 1600 hrs. The archaeologist spent another 1.5 hours seeking the location of Wilke's camp thought to be located immediately to the east of KMC. The grass is very thick in this area and prevents adequate examination of the ground surface. No indications of historic camping activity were found.

27 April 2005

10. At 0700 hrs on 27 April 2005, James Head, PTA Cultural Resource Specialist, attended a construction meeting between Mr. Roger Panzer of KMC, Petty Officer First Class (PO1) Brian Murphy, and Petty Officer Second Class (PO2) Tom Arnold. Both PO1 Murphy and PO2 Arnold are crew leaders with NMCB 14. It was agreed that excavation of Leg 3 would begin today.
11. Leg 3 is proposed to run between the northeast corner of Bldg. #97 and travel northerly to the northeast corner of Bldg. #98. This was planned to also tie to the northwest corner of Bldg. 99 via Leg 4. It also intersects with Leg 2 near the midpoint of its run.
12. Excavation of Leg 3 began at the northeast corner of Bldg. #98, but this area was soon abandoned due to a number of buried pipes. A small lava tube opening was located at the east end. The lava tube appears about a meter in diameter and trending off to the west. The entrance was too small for entry and the tube was not entered.
13. Excavation was then begun at the northwestern corner of Bldg. #97, and an object thought to be a rock was soon encountered. This "rock" turned out to be a cylindrical concrete footer for a metal post that was rusted off (figure 18). The concrete object measures about 0.60m long by 0.40m diameter with the rusted base of a 2½" post or pipe .
14. Another lava tube was found about 8m to the northeast. The lava tube appears about a meter in diameter and trending off to the west. The entrance was too small for entry and the tube was not entered.
15. Leg 3 is approximately 15m long and passes with an 80° for 5m and then turns to 40° for the remainder. A total of four pipe crossings were found in Leg 3. No prehistoric archaeology

was noted during the excavation. It was not possible to determine the age of the concrete footer, but the GPS location was noted.

16. In the afternoon, the excavation team progressed from Bldg. #98 to near Bldg. #99 while excavating Leg 4. Excavation of the trench ended about 5m @225° from the west edge of Bldg. #99. No archaeological items were seen during the excavation of Leg 4. Because of a camera malfunction, there are no photographs of Leg 4.

29 April 2005

17. At 0700 hrs., PO1 Murphy disclosed that the crew would not be digging again until Monday. The crew would be working on building construction for the rest of the day.
18. While the archaeologist was at KMC, two additional projects were also examined. These involve planned construction projects at Bldgs. #64 and #92. The results of these examinations will be discussed in separate Trip Reports (Head 2005b, Head 2005c).
19. The remainder of the day was spent obtaining Trimble GPS points in the project area. Heavy rains began about 1500 hrs. and stopped work for the rest of the day.

30 April 2005

20. A brief visit to the project site to finish up the Trimble GPS plotting that was cut short by the heavy rains on Friday.

2 May 2005

21. At 0700 hrs. PO2 Arnold agreed to begin excavation in Leg 5. This trench is slated to begin at the intersection of Leg 1 and Leg 2, progress south and then to the east for a total length of approximately 30m. The width and depth remains the same.
22. The excavation of Leg 5 began at about 1030 hrs. and excavation ceased by about 1530 hrs. Two buried pipes were located during the route, but no evidence of cultural materials were observed.

4 May 2005

23. Excavation resumed on Leg 5 at 0800 hrs. After an hour of digging, another pipe crossing was encountered and excavation ceased. No further excavation was done on Leg 5, since it was planned to trench through the road; place the utility lines and backfill the trench in one day. All this activity was planned for 6 May 2005.
24. In the afternoon, two short (3-5m) trenches were dug. The first was at the beginning of Leg 1, near Pole K9. This is perpendicular to the long trench and will be the location of a service box. No cultural evidence was noted in the first trench. The second trench was another short

excavation from the end of Leg 4 to about 1m from the corner of Bldg. #99. A single buried water collection pipe was located but no other cultural evidence was apparent.

5 May 2005

25. Excavation of Leg 6 began at 0800 hrs. and ran from the end of Leg 5 under an existing paved road and ended at an existing utility pole near Bldg. #74. Total length of this excavation is approximately 20m. Three broken bricks (two red, one tan) were found in the excavation. None appeared to have embossed marker's marks or other diagnostics. In an attempt to locate additional items, an area within the trench measuring about 1.0m² was hand excavated. No intact deposits or additional materials were found in the expanded area. Because of a camera malfunction, there are no photographs of Leg 6 or of the bricks.

26. As mentioned above, no prehistoric or historic cultural evidence were noticed during the surface inspection of Leg 1-6. The only possibly historic items found during excavation of the trenches was the concrete footer found in Leg 3 and the broken bricks in Leg 6. Both have good locational data and have been described. No prehistoric features or sites were found during this inventory.

27. Based on the findings of the surface examination and excavation monitoring, it is recommended that no further archaeological work be needed prior to the construction of this project. Should additional development plans occur outside of the cleared project footprints, it is recommended that further examination and limited testing take place prior to surface disturbance. If additional surface disturbance is planned, it is recommended that all activities be monitored by a qualified archaeologist.

Map removed to protect rare resources. Available upon request



Plate 17. Project area before excavation. Bldgs. #97, 98 and 99 in background, view to the west



Plate 18. Leg 1 after excavation, view to the east



Plate 19. Leg 3, concrete post footer removed by backhoe, view to the north..

Archaeological and Historical Survey of a Proposed Upgrade to Building 64 at Kīlauea Military Camp, Kā'u District, Hawai'i Island, Hawai'i.

1. On 29 April 2005, James Head PTA Cultural Resources Specialist, traveled to Kīlauea Military Camp (KMC) in Keauhou *ahupua'a*, Ka'ū District, TMK (3) 9-9-001:001, inside of Hawai'i Volcanoes National Park (Figure). This trip was to support an archaeological and historical examination of building construction activities within the boundaries of KMC. Mr. Head met with Mr. Roger Panzer, Maintenance Mechanic Supervisor, KMC-DPW Engineering/Maintenance Shop at KMC.
2. The proposed remodeling will be located within the southwest corner of KMC, an area of the complex surrounded by manicured lawns and 'ōhi'a trees. No prehistoric archaeological features or sites were found during the surface examination.
3. An Integrated Cultural Resources Management Plan (ICRMP) was prepared for Kīlauea Military Camp (Tomonari-Tuggle and Slocumb) in December of 2000. The goal of this document "is to preserve and protect the significant archaeological and architectural resources of Kīlauea Military in a manner that meets legal compliance requirements, as well as supports the rest and recreation mission of KMC." (ibid. iii).

In 1994, the National Park Service Pacific Western Area office had carried out the inventory of historic lands under their control. Building assessment forms were completed for each structure over 50 years old at KMC. All buildings evaluated by the NPS survey are included in the ICRMP.

The Hawai'i State Historic Preservation Officer concurred with the NPS that meets the criteria as a Historic District, and is eligible for listing on the National Register. The NPS evaluation did not define the boundaries for the historic district, but Figure 17 (Tomonari-Tuggle and Slocumb 2000:I-16) indicates these proposed boundaries. All five historic structures in the project area are within the boundaries.

The ICRMP considers just over 100 historic structures and one archaeological site at KMC. The one archaeological site is an anthropomorphic petroglyph found in a rock wall near Building 43. This figure is in a secondary context and will not be affected by the proposed excavation project.

4. Building #64 is located about 30m west of the eastern boundary of the recommended KMC Historic District. Under the Historic preservation category, Bldg. #64 is listed as Laundry/Dry Cleaning facilities which do not qualify for preservation. This building is currently in use as a laundry facility at KMC.
5. The proposed remodeling at Bldg. #64 will involve the extension of the existing building (Figure 18) approximately 10 feet (3m) to the north. The existing north wall will be removed and moved approximately 2 feet (0.61m) to the north with another room added. An existing

heater room will be removed from the northwest corner of the existing building and all new heating and storage facilities will be located in the newly-constructed room on the north. A 500 gallon Hot Water Storage tank will be installed to service both the existing laundry and a planned Hot Water and Hydronic Heating System to provide heating in Bldg. 47, located just to the southwest. The heat will be transferred by utilizing buried 1½” copper lines between the buildings (Figure 19).

6. An underground trench about 24” (0.61m) wide by 24” (0.61m) deep to accommodate the copper pipe will be dug from Bldg. #64 to Bldg. #47. The heating system will later be extended to support additional cabins in the area. This heating system is designed to replace an electric baseboard system and will reduce energy consumption at KMC.
7. This construction will also involve the excavation on an area north of the existing building and the placement of a concrete slab to provide a foundation for the utilities and the building. There was not sufficient soil to conduct shovel tests in the lawn area to the north, so a series of 20 probes were undertaken to determine deposition. Depth of these probes ranged from 0-0.12m of soil consisting of wet grass-filled duff. Soil color was 7.5 YR 3/2 – Dusky Red (Wet) – aeolian sandy silts with small basalt gravels. No cultural materials were evident.
8. As mentioned above, no prehistoric or historic cultural features or remains were located during the surface inspection of Bldg. #64. The subsequent probe test results were also negative and indicted a maximum of 0.12m deposits, most likely imported for the lawn.
9. Based on the findings of the surface examination and limited probing, it is recommended that no further archaeological work be needed prior to the beginning of this project. It is recommended when surface disturbance or excavations for construction (including foundations and trenches) are planned, that all activities be monitored by a qualified archaeologist.

Map removed to protect rare resources. Available upon request



Figure 17. Existing plan view of Building #64 (provided by KMC DPW).



Figure 18. Building #64 after completion (provided by KMC DPW).



Plate 20. Construction area on the north side of Bldg. #64 (Bldg. 63 in the background).



Plate 21. Proposed construction area to the right of Bldg. #64, view to the west.

Archaeological and Historical Survey of a Proposed Upgrade to Building 92 at Kīlauea Military Camp, Kāʻu District, Hawaiʻi Island, Hawaii.

1. On 2 May 2005, James Head PTA Cultural Resources Specialist, traveled to Kīlauea Military Camp (KMC) in Keauhou *ahupuaʻa*, Kāʻu District, TMK (3) 9-9-001:001, inside of Hawaiʻi Volcanoes National Park (Figure 1). This trip was to support an archaeological and historical examination of building construction activities within the boundaries of KMC. Mr. Head met with Mr. Roger Panzer, Maintenance Mechanic Supervisor, KMC-DPW Engineering/Maintenance Shop at KMC.
2. This planned building construction at BLDG; #92 was first inspected by the author and Mr. Panzer on 4 February 2005. The proposed remodeling will be located within the extreme northwest corner of KMC, with trees and heavy grass cover immediately to the east. No prehistoric archaeological features or sites were found during the surface examination.
3. An Integrated Cultural Resources Management Plan (ICRMP) was prepared for Kīlauea Military Camp (Tomonari-Tuggle and Slocumb) in December of 2000. The goal of this document "is to preserve and protect the significant archaeological and architectural resources of Kīlauea Military in a manner that meets legal compliance requirements, as well as supports the rest and recreation mission of KMC." (ibid. iii).

In 1994, the National Park Service Pacific Western Area office had carried out the inventory of historic lands under their control. Building assessment forms were completed for each structure over 50 years old at KMC. All buildings evaluated by the NPS survey are included in the ICRMP.

The Hawaiʻi State Historic Preservation Officer concurred with the NPS that meets the criteria as a Historic District, and is eligible for listing on the National Register. The NPS evaluation did not define the boundaries for the historic district. All five historic structures in the project area are within the boundaries.

The ICRMP considers just over 100 historic structures and one archaeological site at KMC. The one archaeological site is an anthropomorphic petroglyph found in a rock wall near Building #43. This figure is in a secondary context and will not be affected by the proposed excavation project.

4. Building #92 is located about 70 north of the northern boundary of the recommended KMC Historic District. Under the Historic preservation category, a cluster of buildings which includes Bldg. #91 and #92 are listed as Eng/Housing Maintenance which does not qualify them for preservation. Both buildings appear to have been previously remodeled and are currently used by KMC-DPW Engineering/Maintenance Shop at KMC.

5. The proposed remodeling at Bldg. #92 will involve the extension of an existing concrete slab for about 4m to the east and 12-15m to the north. The existing roofline will likewise be extended for about 4m to the east. This covered area will be used for equipment storage. There is a possibility the northern portion of Bldg. #92 may also be extended to the east (Photo 21).
6. Construction of both the cement slab will require subsurface excavation to establish grade and to provide support for the structures.
7. A small shovel test was dug in the eastern end of the proposed project to determine subsurface deposits. The shovel test measured ca. 0.70m² x 0.75m deep. The findings are as follows:
 - **Layer I** – 0-0.20 meters below surface (mbs)

This is the humus or grass layer. It is composed of a dark brown silty loam with many roots and sparse coral sands (7.5YR 3/2 – Wet - Dark Brown).
 - **Layer II** - 0.20-0.30 mbs

These are brown-gray sandy silts with tiny basalt gravels. There are sparse roots from the layer above (7.5YR 5/2 – Wet – Brown)
 - **Layer III** – 0.30-0.37 mbs

This layer consists of small-grain aeolian (?) sands which may be bedded (10YR 5/1 – Gray – Wet).
 - **Layer IV** – 0.37-0.65 mbs

These are medium gray sandy soils with small pea gravels and roots (10YR 4/2 – Wet - Dark Grayish Brown). This layer appears be the result of the 1924 phreatic explosion of Kilauea. There are a number of ejecta stones found in the lower areas of volcanic ash.
 - **Layer V** – 0.65-0.75+ mbs

This layer is a red orange clay with small stones and no roots (7.5YR 3/2 – Wet – Dark Brown).
8. As mentioned above, no prehistoric or historic cultural features or remains were located during the surface inspection of Bldg. #92. The subsequent shovel test results were also negative. The presence of the 1924 Kīlauea phreatic explosion in the side of the shovel

test confirmed the findings in the utility trench excavation but the lithic material appeared unmodified. No prehistoric features or sites were found during this inventory.

9. Based on the findings of the surface examination and limited shovel testing, it is recommended that no further archaeological work is needed prior to the construction of this project. It is recommended when surface disturbance or excavation for construction is planned, that all activities be monitored by a qualified archaeologist.



Plate 22. Building #92 with temporary garage, view to the west.

**ARCHAEOLOGICAL SITE INVENTORY DATABASE AND GIS/GPS PROGRAM
(SECTION 5.B.(3)(A-D))**

Maintain an update an archaeological site database for all previously recorded and previously unrecorded sites from information contained in cultural/archaeological reports and field investigations.

- (k) The cultural resources database shall be maintained in Microsoft Access with the minimum following fields: site location, UTM coordinates, site type, site function, artifacts, maps, photos, radiocarbon dates, and faunal and floral material.*
- (l) A GIS layer shall be created in ArcView in which the information can be downloaded into tubular form.*
- (m) Create and updata metadata for all GIS information/data gathered on cultural resources.*
- (n) Refine and updata data sheets and field forms.*

Over the years the PTA cultural database has been designed with an emphasis on data input, how much data was collect, which table fields were being filled, and which require more site visits. The data was recorded in various tables but there was never a relationship made between the tables. It is the relationships in a database that make it a relational database.

Relational Database Development:

Starting in October 2004 the cultural resources database, “Archysites.mdb” was redesigned over the next 3 months into a relational database. The advantages of a relational database over a single table are numerous. In addition to an Archaeological Site table, creating separate tables for projects, features, artifacts, and coordinates allows for an entire record of information to be collected for those things and not just a single field cell in the Archaeological Site table. Using a one-to-many relationship, all the tables can be connected together using common fields the tables share, allowing the database to still be treated like it is one big table

ID	Installation	Terrain	State Site Number	# of Features	Feature designation	Site Type	Site Function
151 PTA	74		21456	5	Ex. 1 (overhang) Ex. 2 (wall) Ex. 3 (overhang) Ex. 4 (overhang) Ex. 5 (overhang)	Shelter	Shelter
152 PTA	75	Fl.	21457	0		Shelter	Shelter
153 PTA	76		21458	0		Shelter	Shelter
154 PTA	77	Fl.	21459	4	Ex. 1 (overhang) Ex. 2 (overhang) Ex. 3 (overhang) Ex. 4 (overhang)	Shelter	Shelter
155 PTA	78	Fl.	21460	2	Ex. 1 (overhang) Ex. 2 (overhang)	Shelter	Shelter
156 PTA	79		21461	0		Shelter	Shelter
157 PTA	80	Fl.	21462	1	Ex. 1 (overhang)	Shelter	Shelter
158 PTA	81	Fl.	21463	0		Shelter	Shelter
159 PTA	82	Fl.	21464	0		Shelter	Shelter
160 PTA	83	Fl.	21465	4	Ex. 1 (overhang) Ex. 2 (overhang) Ex. 3 (overhang) Ex. 4 (overhang)	Shelter	Shelter
161 PTA	84	Fl.	21466	0		Shelter	Shelter
162 PTA	85	Fl.	21467	1	Ex. 1 (overhang)	Shelter	Shelter
163 PTA	86	Fl.	21468	0		Shelter	Shelter
164 PTA	87	Fl.	21469	0		Shelter	Shelter
165 PTA	88	Fl.	21470	1	Ex. 1 (overhang)	Shelter	Shelter

Figure 19. Screenshot of the Archysites.mdb database table.

Figure 20 shows the original Archysites.mdb database table. This table has all the feature information for the whole site in one field, “Feature Designation”, including dimensional information.

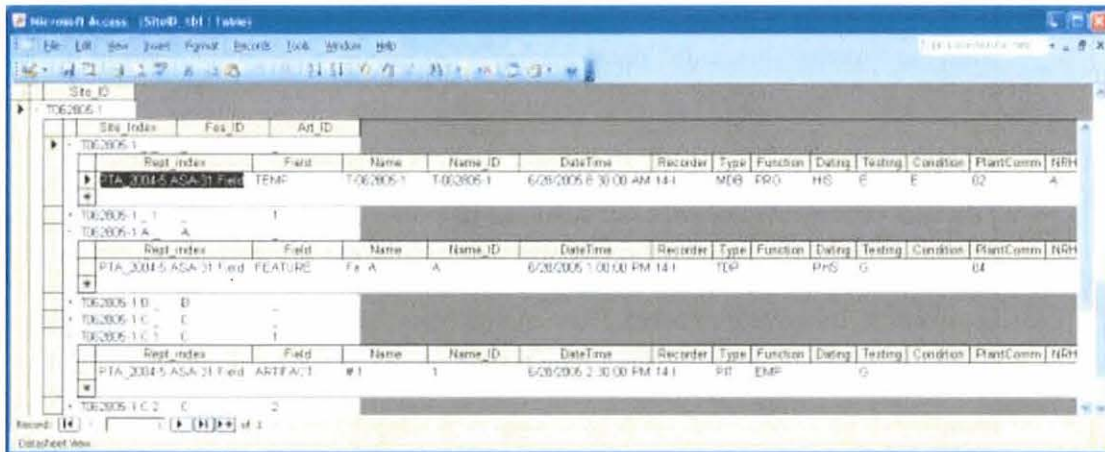


Figure 20. Screenshot showing the linked tables.

In the new Project.mdb database Sites, Features, and Artifacts have their own record for a more complete description. In Figure 21, three tables are linked together for the purpose of data management. A table with the field *Site_ID* (SiteID_tbl) and a table with the fields starting with *Site_Index* (SiteIndex_tbl) are organizational fields which link to a field form data table with the fields starting with *Report_Index* (Form_tbl)

Some of the things that can be done with this kind of relational link are;

- If the data in field *Site_ID* in the SiteID_tbl table is changed the corresponding linked data in the Forms_tbl table is updated. For example: if site T-021804-1 is given a state site number, editing the *Site_ID* field to reflect the new site number will automatically update the *Site_ID* field for the 9 records in the Form_tbl table.
- If for some reason you want to delete a site, and all subsequent data pertaining to that site, from the database simply deleting the record from the site table will automatically delete linked records in the feature table.
- The linked tables can be incorporated together in a formatted form or report.

In addition to the relational table restructuring of the Archsites.mdb database into the PTA-CRM.mdb, two forms were created to help with data input.

- A site form was created to update and manage the data on a site by site basis. Information from the feature table and the GPS coordinates table could be seen as sub-forms within the site form.
- A GPS form was created to manage the importing of Trimble and Garmin points into the database.

By the end of 2004 the new relational database was assembled and working with all the data from the "Archaeosites.mdb" database imported into it. New data collected in 2004 was being brought into the database as well.

Problems:

The GPS data collection was not working like originally planned. The GPS form in the database worked great; unfortunately no one was using it. When the data came in from the field, GPS points were being converted directly to GIS Shape files and brought straight into a GIS application. Importing the GPS files into the database as well as converting them to Shape files creates two sets of the same data which is generally not a good practice.

Issues:

- We do not have a common network drive to share and organize our files. And we probably won't get one soon. Everyone works independently of each other on their own computer.
- Habits: People are used to doing things in a way that works for them. They're not easily converted over to something different.

Solutions:

- Instead of building a database as a centralized repository which requires everything to be imported into it, design a database that links to existing data such as GIS shape files. That way GPS data can be ported into and managed separately in a GIS system and the database can link to it without worry of duplication or dereliction of data.
- Create a single location for all projects directories and a predefined sub-directory structure for all projects so that the database will know where to look when linking to GPS and GIS data, Excel tables, photos, and reports.
- Create a data collection file for recording an individual crew member's field data and which is in a format that can be ported to a PDA.

The Project.xls personal field data collection file

One way to get a broader involvement in database input is to get the electronic data recording happening as soon as possible. By skipping any paper recording and recording directly to an electronic file out in the field the database input could become very efficient. The key is to create a standardized file that would be usable on a PDA or pen-top computer as well as a standard PC. If the PDA is running Windows CE then it is possible to record data to an excel file. The Excel Workbook, Projects.xls, is such a file which has been formatted to collect data in the field and then transfer it to a database for processing and merging with the rest of the data. The Project.xls workbook has a number of worksheet tables that are designed for ease of use and minimal amount of data input. These worksheets have a database table counterpart that they will be transferred to when the Excel file is being imported into the database.

Excel Workbooks have an added benefit with their flexibility and ease of use. It is possible to copy and paste across multiple cells as well as pasting formatting on a cell by cell basis if desired. These things can't be done in a database. More people are familiar, and therefore more comfortable, using Excel than Access. All these things make an Excel Workbook a better data collecting application than Access.

PTA cultural resource data base and field data collection tables: A detailed description of tables and their fields.

The following is a list of worksheet tables in the Project.xls workbook followed by their database table counterpart in the *Project.mdb* and Cultural Resources database *CR_PTA.mdb*. The list of tables contains field names, descriptions, and instructions for recording or importing data into those fields.

Recorders: Excel Worksheet and

Recorders_tbl: Access Database Table

Recorder_ID	Unique ID of the person collecting the data. Perhaps the company name and the person's initials.
F_Name	First Name
M_Name	Middle Name
L_Name	Last Name
Title	Job Title
Default	Select only one record by typing "-1" will fill in this recorders ID by default if "Recorder" column in any of the tables are left blank.
D_Date	Will fill in the date for this recorders ID by default if <i>Date</i> column in any of the tables are left blank.
D_Time	Will fill in the time for this recorders ID by default if <i>Time</i> column in any of the tables are left blank.

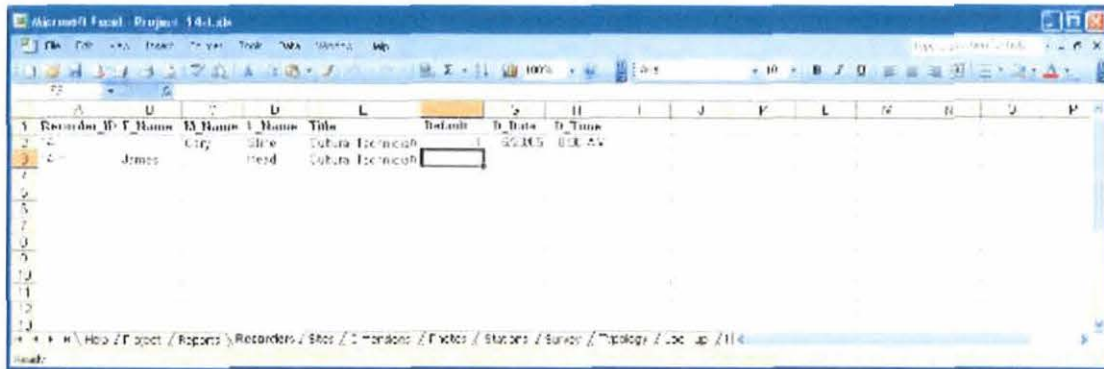


Figure 21. Screenshot of the Recorders Worksheet

The *Recorders* worksheet is directly imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into a table called *Recorders_tbl* (see Figure 22).

Project: Excel Worksheet and

Project_tbl: Access Database Table

- Name : The name of the project.
- Company : Company performing the survey or writing the report. "PTA"
- Date : Start date of the survey or report.
- PO : Primary officer: The person overseeing the survey. A pull-down menus that use Recorder_ID from the Recorders worksheet.
- Contract_ID : Contract ID
- TO : Task Order
- Proj_id : This field automatically creates a unique name by combining Company with project Type and Name which will be used in the database and file folder. *

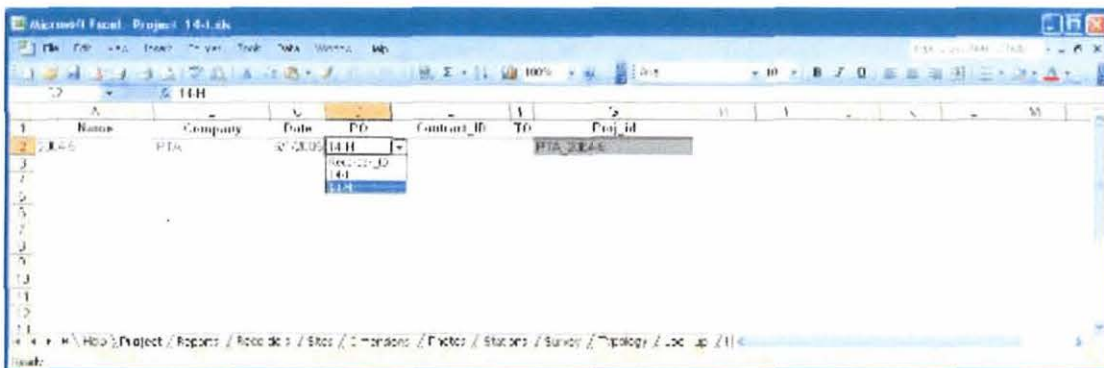


Figure 22. Screenshot of the Project Worksheet

The project worksheet is directly imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into a table called *Projects_tbl* (see Figure 23).

Reports: Excel Worksheet and

Reports_tbl: Access Database Table

Rept_Index : Automatically creates a *Rept_Index* field by combining the *Proj_ID* and *Rept_ID* fields.

Proj_ID : Automatically fills in from the *Proj_ID* field from the Project Worksheet

Rept_ID : Unique abbreviation of the report title

Status : "Field", "Prelim", "Draft", or "Final"

Author_ID : A pull-down menu that uses *Recorder_ID* from the Recorders worksheet.

Start_Date : The earliest recorded data for the data that is being discussed in the report.

End_Date : The latest recorded data for the data that is being discussed in the report.
For the purpose of this database the report dates only refer to new data or data changes made since the last report in the same project.

	Rept_Index	Proj_ID	Rept_ID	Status	Author_ID	Start_Date	End_Date	Pub_Date
1								
2	PTA_2004-5-ASA-31 Field	PTA_2004-5	ASA-31	Field	12	6/25/05	6/25/05	6/25/05
3	PTA_2004-5-ASA-30 Field	PTA_2004-5	ASA-30	Field	12	6/25/05	7/1/05	6/25/05
4	PTA_2004-5-ASA-29 Field	PTA_2004-5	ASA-29	Field	12	6/25/05	6/25/05	6/25/05
5	PTA_2004-5-ASA-28 Field	PTA_2004-5	ASA-28	Field	12	6/25/05	6/25/05	6/25/05
6								
7								
8								
9								
10								
11								
12								
13								

Figure 23. Screenshot of the Reports Worksheet

The Reports worksheet is directly imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into a table called *Reports_tbl* (See Figure 24).

Sites: Excel Worksheet

Site_Pre : Temporary site prefix: "T" or "MT" or "C" only if state site number doesn't exist.

Site_No : The current state site number here if one exists otherwise the temp number without the date.

Fea_ID : The feature number. If features are letters then the number equivalent should be used.

Art_ID : The artifact number. If artifacts are letters then the number equivalent.

Site_Index : This column fills itself based on data you put into *Site_Pre*, *Site_No*, and *Date*. *

Field : The category the site index falls under: "STATE", "TEMP", "FEATURE", "ARTIFACT", "MILITARY", or "CAVE"

Name : The site, feature, or artifact ID as it would look in your notes: "T-012605-1" or "Fe. A" or "# 1".

Name_ID : The feature or artifact ID without prefix, like "A" or "1" and site ID with out prefix dash: "T012605-1".

Time : Time of recording. A colon separator is automatically added, by typing "805" the formatting will show as "8:05"

- PM : Type a "p" for all time in the 12 hour PM range, otherwise leave blank for AM or 24 hour time.
- Date : Date of recording.
- Recorder : A pull-down list from the "Recorder_ID" column in the Recorder worksheet. Automatically repeats after you fill in the first cell. *
- Type : A pull-down list of Type.
- Material : A pull-down list of Material.
- Function : A pull-down list of Function.
- Dating : A pull-down list of Dating.
- Testing : A pull-down list of Testing.
- Condition : A pull-down list of Condition.
- PlantComm : A pull-down list of Plant Community.
- NRHP : A pull-down list of NRHP.
- Memo : Field notes.

1	Site Index	Name ID	Site Pre	Site No	Fea ID	Art ID	Field	Name	Time PM	Date	Recorder	Type	Function
2	123456	123456					TEMP		8:30	6/28/05	141	MUD - Weight Deposition	PHC - Placement
3	123456	A					FEATURE		10:00	6/28/05	141	TOP - Ash Dumps	
4	123456	B					FEATURE		9:00	6/28/05	141	ASH - Ash	PH - Ash
5	123456	C					ILLUSTR		14:00	6/28/05	141	ASH - Ash	PH - Ash
7	123456	C					FEATURE		14:30	6/28/05	141	ASH - Ash	PH - Ash
7	123456	C	12345				FEATURE	FEA-C	16:30	6/28/05	141	ASH - Ash	PH - Ash
9	123456	C					ILLUSTR		8:00	6/28/05	141	ASH - Ash	PH - Ash
9	123456	C					FEATURE		8:00	6/28/05	141	ASH - Ash	PH - Ash
11	123456	C					ILLUSTR		10:00	6/28/05	141	ASH - Ash	PH - Ash
11	123456	C					ILLUSTR		10:00	6/28/05	141	ASH - Ash	PH - Ash
12	123456	C					ILLUSTR		10:00	6/28/05	141	ASH - Ash	PH - Ash
12	123456	C					ILLUSTR		10:00	6/28/05	141	ASH - Ash	PH - Ash
13	123456	C					ILLUSTR		10:00	6/28/05	141	ASH - Ash	PH - Ash

Figure 24. Screenshot of the Sites Worksheet

The Sites worksheet is imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into the following three tables called *SiteID_tbl*, *SitesIndex_tbl*, and *Forms_tbl* (see Figure 25).

***SiteID_tbl*: Access Database Table from the Sites Excel Worksheet**

Site_ID : A unique site number imported from the composite of two fields, Site_Pre and Site_No, in the Sites worksheet.

***SitesIndex_tbl*: Access Database Table from the Sites Excel Worksheet**

Site_ID : A site number imported from the composite of two fields, Site_Pre and Site_No, in the Sites worksheet.

Fea_ID : A feature letter or number imported directly from the Sites Worksheet.

Art_ID : An Artifact letter or number imported directly from the Sites Worksheet.

Site_Index : A composite of Site_ID, Fea_ID, and Art_ID.

***Forms_tbl*: Access Database Table from the Sites Excel Worksheet**

Site_Index : A composite of *Site_ID*, *Fea_ID*, and *Art_ID* from the *Site_Index* field in the *Sites* worksheet

Rept_Index : A composite of *Proj_ID* and *Rept_ID* fields in the *Reports* worksheet. It is joined to the *Forms_tbl* table by matching the *Date* field from the *Photos* worksheet to the date range, *Start_Date* – *End_Date*, from the *Reports* worksheet.
 Field : The category the *Name* field falls under: "STATE", "TEMP", "FEATURE", "ARTIFACT", "MILITARY", or "CAVE" Imported directly from the *Sites* Worksheet.
 Name : The site, feature, or artifact ID as it would look in your notes, imported directly from the same field in the *Sites* worksheet.
 Name_ID : The feature or artifact ID without prefix, like "A" or "1" or site ID : "T-012605-1", imported directly from the same field in the *Sites* worksheet.
 DateTime : A composite of the fields *Date*, *Time*, and *PM* in the *Sites* Worksheet.
 Recorder : Recorder ID imported directly from the same field in the *Sites* worksheet.
 Type : A three letter ID imported directly from the same field in the *Sites* worksheet.
 Function : A three letter ID imported directly from the same field in the *Sites* worksheet.
 Dating : A three letter ID imported directly from the same field in the *Sites* worksheet.
 Testing : A one letter ID imported directly from the same field in the *Sites* worksheet.
 Condition : A one letter ID imported directly from the same field in the *Sites* worksheet.
 PlantComm : A numbered ID imported directly from the same field in the *Sites* worksheet.
 NRHP : A one letter ID imported directly from the same field in the *Sites* worksheet.
 Notes : Imported directly from the same field in the *Sites* worksheet.

Photos: Excel Worksheet

Site_Index : A pull-down list from the *Site_Index* column in the *Sites* worksheet.
 Prefix : Common prefix for all files, if any. Automatically repeats after first cell is filled in. *
 Incr : Automatically increments from the number put in the first cell. *
 Name_ID : The Name of the file as it appeared in the camera. This column fills itself based on data put into the *Prefix* and *Incr* fields. *
 FileType : The file extension for the photo. Automatically repeats after first cell is filled in. *
 FileName : The Name of the file including the extension. *
 Time : Time photo is taken. Not to be filled in; this data is extracted from the picture file.
 Date : Date photo is taken. Not to be filled in; this data is extracted from the picture file.
 Recorder : A pull-down list from the "Recorder_ID" column in the *Recorder* worksheet. Automatically repeats after first cell is filled in. *
 Direction : A pull-down list of compass directions.
 Description : Official photo description as seen in a report.
 Notes : Extra photo notes that pertain to the particular site, feature, or artifact.

Site Index	Name_ID	FileName	Prefix	Line	Prefix2	FileType	Time	Date	Recorder	Direction	Description	Note
1	E-305-1	103_0369	PIC_0369	103_0	369	PIC_0	.jpg		10-H	NE To The North East	relocated location of L2 4	Exc
2	E-305-1	103_0369	PIC_0369	103_0	369	PIC_0	.jpg		10-H	NE To The North East	relocated location of L2 4	Exc
3	E-305-1	103_0369	PIC_0369	103_0	369	PIC_0	.jpg		10-H	SW To The North West	in level 2 in room in the kitchen	Sub
4	E-305-1	103_0362	PIC_0362	103_0	362	PIC_0	.jpg		10-H	S To The South	action end of rock wall	
5	E-305-1	103_0363	PIC_0363	103_0	363	PIC_0	.jpg		10-H	SE To The South East	corner of wall	
6	E-305-1	103_0364	PIC_0364	103_0	364	PIC_0	.jpg		10-H	E To The East	corner of large enclosure	Hole
7	E-305-1	103_0365	PIC_0365	103_0	365	PIC_0	.jpg		10-H	SE To The South East	corner of large enclosure	Hole
8	E-305-1	103_0365	PIC_0365	103_0	365	PIC_0	.jpg		10-H	S To The South	corner of large enclosure	Hole
9	E-305-1	103_0365	PIC_0365	103_0	365	PIC_0	.jpg		10-H	SW To The South West	action photo of wall	Good
10	E-305-1	103_0363	PIC_0363	103_0	363	PIC_0	.jpg		10-H	W To The West	the eastern corner of ground	
11	E-305-1	103_0363	PIC_0363	103_0	363	PIC_0	.jpg		10-H	SW To The South West	east SAN corner - large wall	Wall
12	E-305-1	103_0363	PIC_0363	103_0	363	PIC_0	.jpg		10-H	SW To The South West	corner of wall with the hole	Hole

Figure 25. Screenshot of Photos Worksheet

The *Photos* worksheet is imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into the following two tables called *Photos_tbl*, and *Task_tbl*. The *Task_tbl* table also contains *Stations* worksheet data (see Figure 26).

Photos_tbl: Access Database Table from Photos Excel Worksheet

- Name_ID : The Name of the file as it appeared in the camera. This field is imported from the same field in the *Photos* worksheet.
- FileName : The Name of the file including the extension. This field is imported from the same field in the *Photos* worksheet.
- DateTime : Date and Time the photo is taken. This field is a composite of the *Date* and *Time* fields from the *Photos* worksheet.
- Recorder : The Recorders ID. This field is imported from the same field in the *Photos* worksheet.
- Direction : The compass direction the photo was taken. This field is imported from the same field in the *Photos* worksheet.
- Description : Official photo description as seen in a report. This field is imported from the same field in the *Photos* worksheet.

Task_tbl: Access Database Table from Photos Excel Worksheet

- Site_Index : This field is a composite of *Site_ID*, *Fea_ID*, and *Art_ID* from the *Site_Index* field in the *Photos* worksheet
- Rept_Index : This field is a composite of *Proj_ID* and *Rept_ID* fields in the *Reports* worksheet. It is joined to the *Task_tbl* table by matching the *Date* field from the *Sites* worksheet to the date range, *Start_Date* – *End_Date*, from the *Reports* worksheet.
- Field : The category that the *File* and *ID* fields fall under, In this case, "PHOTO"
- ID : The Name of the file as it appeared in the camera. This field is imported from the *Name_ID* field in the *Photos* worksheet.
- File : The Name of the file including the extension. This field is imported from the *File_Name* field in the *Photos* worksheet.
- DateTime : Date and Time the photo was taken. This field is a composite of *Date* and *Time* fields from the *Photos* worksheet.
- Recorder : This field is imported from *Recorder_ID* field in the *Photos* worksheet.

Notes : Extra photo notes that pertain to the particular site, feature, or artifact. This field is imported from the same field in the *Photos* worksheet.

In addition to holding links to photographs, the *task_tbl* table is intended to hold links to data created in other devices/applications and managed better outside the database. Applications that manage cave survey and GPS data can export to a GIS file, and there for should be managed by a GIS application.

Dimensions: Excel Worksheet and Dimensions_tbl: Access Database Table

SITE_INDEX : This field is a composite of *Site_ID*, *Fea_ID*, and *Art_ID* from a pull-down list of the *Site_Index* field in the *Sites* worksheet.

DIM1 : Measurement as dictated by the *DIM_ID* column.

DIM2 : Measurement as dictated by the *DIM_ID* column.

DIM3 : Measurement as dictated by the *DIM_ID* column.

DIM4 : Measurement as dictated by the *DIM_ID* column.

DIM_ID : A pull-down list of measurement dimensions and there order as they appear in columns *DIM1* through *DIM4*. Example: LWDH, Length-Width-Depth-Height. *

M_UNIT_ID : A pull-down list of measurement unit ID's. Example: m, meters. *

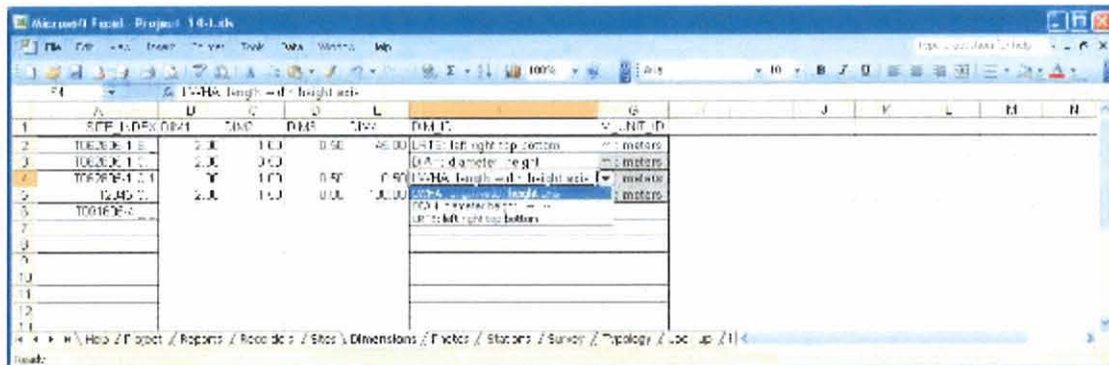


Figure 26. Screenshot of Dimensions Worksheet

The *Dimensions* worksheet is directly imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into a table called *Dimensions_tbl* (see Figure 27)

Stations: Excel Worksheet

STA_ID : This column fills itself based on data put into *Alpha* and *Incr* fields. *

ALPHA : Automatically repeats if desired by copy-pasting the grey fields. *

INCR : Automatically increments from the number put in the first cell. *

STA_Name : Station name other than the ID

SITE_INDEX : This field is a composite of *Site_ID*, *Fea_ID*, and *Art_ID* from a pull-down list of the *Site_Index* field in the *Sites* worksheet:

Description : A pull-down list of station descriptions.

Recorder_ID: A pull-down list from the "Recorder_ID" column in the Recorder worksheet. Automatically repeats after first cell is filled in. *

- File : The electronic file where the recorded station coordinates reside. *
- Notes : Any notes describing the station point location.

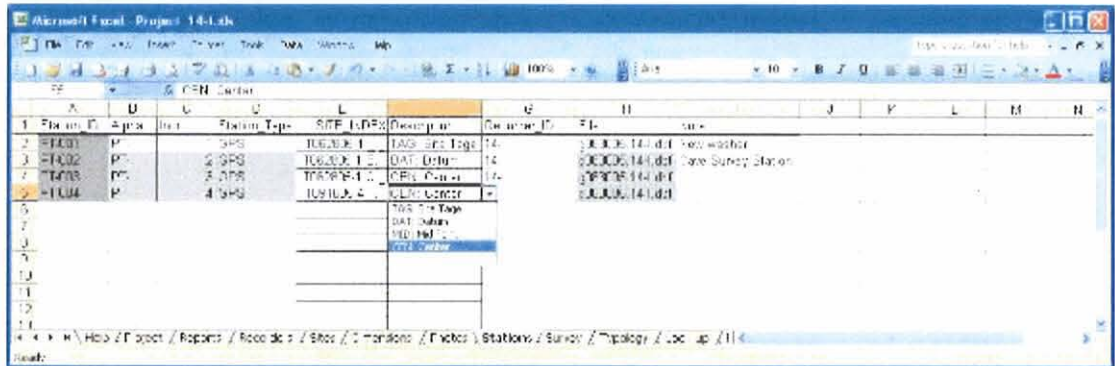


Figure 27. Screenshot of Stations Worksheet

The *Stations* worksheet is directly imported into the *Project.mdb* and Cultural Resources database *CR_PTA.mdb* into a table called *Task_tbl*. This table also contains *Photos* worksheet data (see Figure 28).

Task_tbl: Access Database Table from Stations Excel Worksheet, see Figure 28.

- Site_Index : This field is a composite of *Site_ID*, *Fea_ID*, and *Art_ID* from the *Site_Index* field in the *Stations* worksheet
- Rept_Index : This field is a composite of *Proj_ID* and *Rept_ID* fields in the *Reports* worksheet. It is joined to the *Task_tbl* table by matching the *Date* field from the *Sites* worksheet to the date range, *Start_Date* – *End_Date*, from the *Reports* worksheet.
- Field : The category that the *File* and *ID* fields fall under, in this case, “GPS” or “CAVE”.
- File : The Name of the file that was exported from the GPS. This field is imported from the same field in the *Stations* worksheet.
- ID : The Name of the station point IDs from the GPS file. This field is imported from the *STA_ID* field in the *Stations* worksheet.
- Date/Time : Date and Time the GPS point is taken. This field can be automatically filled in from the Date and time from the exported GPS file.
- Recorder : This field is imported from *Recorder_ID* field in the *Stations* worksheet.
- Notes : Extra photo notes that pertain to the particular site, feature, or artifact. This field is imported from the same field in the *Stations* worksheet.

Site_Index	Rept_name	Field	Datetime	Records_ID	File	ID	Notes
062005-1 A	FTA_2004-5 ASA-31 Field	GPS	6/28/2005 9:00:00 AM '04	g000005 141.cbf	PT001	PT001	TAG: knee washer
062005-1 B	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10389.jpg	103_0389	103_0389	Elevation is 3400M
062005-1 C	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:30:00 AM '04	PIC_0390.jpg	103_0390	103_0390	Elevation is 3400 M
062005-1 D	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:30:00 AM '04	PIC_0391.jpg	103_0391	103_0391	Saddle area / Hualaba in the background
062005-1 E	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10392.jpg	103_0392	103_0392	
062005-1 F	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:30:00 AM '04	PIC_0393.jpg	103_0393	103_0393	Note barren location of site.
062005-1 G	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10395.jpg	103_0395	103_0395	Note barren location of site
062005-1 H	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10396.jpg	103_0396	103_0396	Wall outcrops to the west
062005-1 I	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:30:00 AM '04	PIC_0397.jpg	103_0397	103_0397	Cloud presentation along south wall
062005-1 J	FTA_2004-5 ASA-31 Field	GPS	6/28/2005 9:00:00 AM '04	g000005 141.cbf	PT002	PT002	DAT: Data Survey Station
062005-1 K	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10399.jpg	103_0399	103_0399	
062005-1 L	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_0399.jpg	103_0399	103_0399	Wall presentation
062005-1 M	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_0400.jpg	103_0400	103_0400	Note wall presentation
062005-1 N	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_0401.jpg	103_0401	103_0401	
062005-1 O	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10402.jpg	103_0402	103_0402	
062005-1 P	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10403.jpg	103_0403	103_0403	Wall location is near the NW corner.
062005-1 Q	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_0404.jpg	103_0404	103_0404	
062005-1 R	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 9:00:00 AM '04	PIC_10405.jpg	103_0405	103_0405	
062005-1 S	FTA_2004-5 ASA-31 Field	GPS	6/28/2005 2:00:00 PM '04	g883005 141.cbf	PT003	PT003	GEN.
062005-1 T	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_0406.jpg	103_0406	103_0406	
062005-1 U	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_0407.jpg	103_0407	103_0407	
062005-1 V	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_10408.jpg	103_0408	103_0408	Shot is taken from NW corner
062005-1 W	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_0409.jpg	103_0409	103_0409	Shot is taken from NW corner.
062005-1 X	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_0410.jpg	103_0410	103_0410	Location is near L3
062005-1 Y	FTA_2004-5 ASA-31 Field	PHOTO	6/28/2005 2:00:00 PM '04	PIC_10411.jpg	103_0411	103_0411	Near L3
062005-1 Z	FTA_2004-5 ASA-31 Field	GPS	6/28/2005 14-	g883005 141.cbf	PT004	PT004	GEN.

Figure 28. Task_tbl table from the Project.mdb Access database.

Survey: Excel Worksheet and

Survey_tbl: Access Database Table, see Figure 29.

- FROM : A pull-down list from the STA_ID column in the Station worksheet. *
- TO : A pull-down list from the STA_ID column in the Station worksheet.
- HORZ1 : Measurement as dictated by the S_UNIT_ID column.
- HORZ2 : Measurement as dictated by the S_UNIT_ID column.
- VERT : Measurement as dictated by the S_UNIT_ID column.
- S_UNIT_ID : A pull-down list of measurement types and their order as they appear in columns HORZ, HORZ2, and VERT. *
- M_UNIT_ID : A pull-down list of measurement unit ID's. *

The Survey worksheet is directly imported into the Project.mdb and Cultural Resources database CR_PTA.mdb into a table called Survey_tbl

Extra information about the cell formatting in the Project.xls Workbook.

*	All grayed cells have special coding which pulls data from other cells. You can copy-paste these gray cells as you add new records to the table. It is a good idea to keep these cells grayed so that you know which cells have actual data in them and which are referencing other cells.
Pull-Down	All cells with a box outline use a pull-down list to select from.

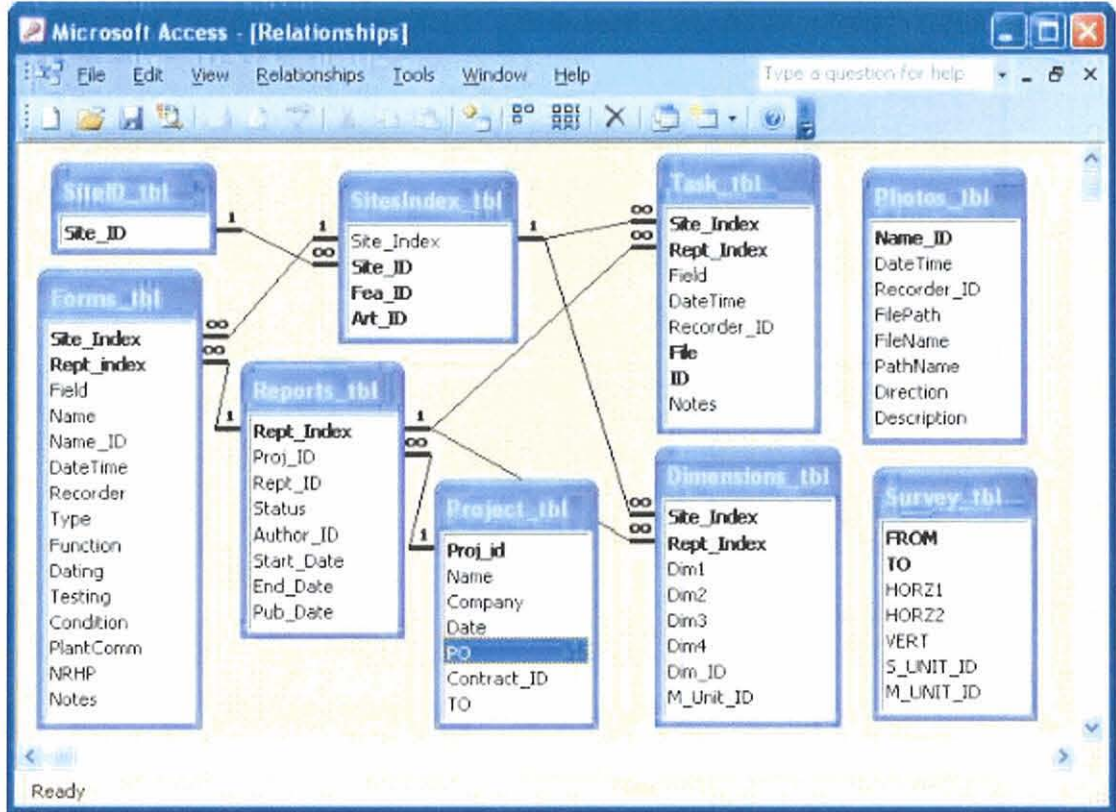


Figure 29. Screenshot of *Project.mdb* table relationships.

The following table has the worksheet table (Figure 31) names from the *Project.xls* file across the top and their respective field names down the left side. This table shows the kind of data that can be found in each field and the relationship of each table's fields to the other tables. The grey cells are automatically calculated through a formula in the cell.

FIELDS	TABLES	Project	Recorders	Sites	Dimensions	Photos	Stations	Survey
Rpt_Type		Field						
Proj_Name		ASA 31						
Company		PTA						
PO		14-H						
Contract_ID		DACA83-95-D-0006						
TO		15						
Proj_id		PTA_ASA 31_Field						
F_Name			Joseph					
M_Name			Cary					
L_Name			Stine					
Title			Cult. Tech.					
Recorder_ID			14-I	14-I	14-I	14-I	14-I	
Site_Index				T090805-1.B.	T090805-1.B.	T090805-1.B.	T090805-1.B.	
Prefix				T		103 0	PT-	
Site_No				1				
Fea_ID				A				
Art_ID								
Field				TEMP				
Name				Fe. B				
Name_ID				B				
Time				1:00				
PM				PM				
Date		9/8/05		9/8/05				
Type				PEX: Pahoehoe Excavation				
Function				REP: Resource Exploitation				
Dating				PHS: Prehistoric				
Testing				E: Excavated				
Condition				E: Excellent				
PlantComm				02: Sparse Metrosideros Treeland				
NRHP				A: Properties that are associated ...				
Notes		Project Notes		Site Notes		Photo Notes	Station Notes	
Description						Photo Desc.	TAG: Site Tage	
DIM1					2.00			
DIM2					1.00			
DIM3					0.50			
DIM4					45.00			
DIM_ID					LWHA: length width height axis			
M_UNIT_ID					m : meters			m: meters
Incr						389	001	
Name_ID						103 0389		
Prefix2						PIC 0		
FileType						jpg		
FileName						PIC 0389.jpg	g083005.14-I.dbf	
Direction						NE : To The North East		
Station_ID							PT-001	
Station_Type							Garmin	
FROM								PT-001
TO								PT-002
HORZ1								2.00
HORZ2								1.00
VERT								0.50
S_UNIT_ID								ADI: angle distance incline

Figure 30. *Project.xls* Table and Field comparisons.

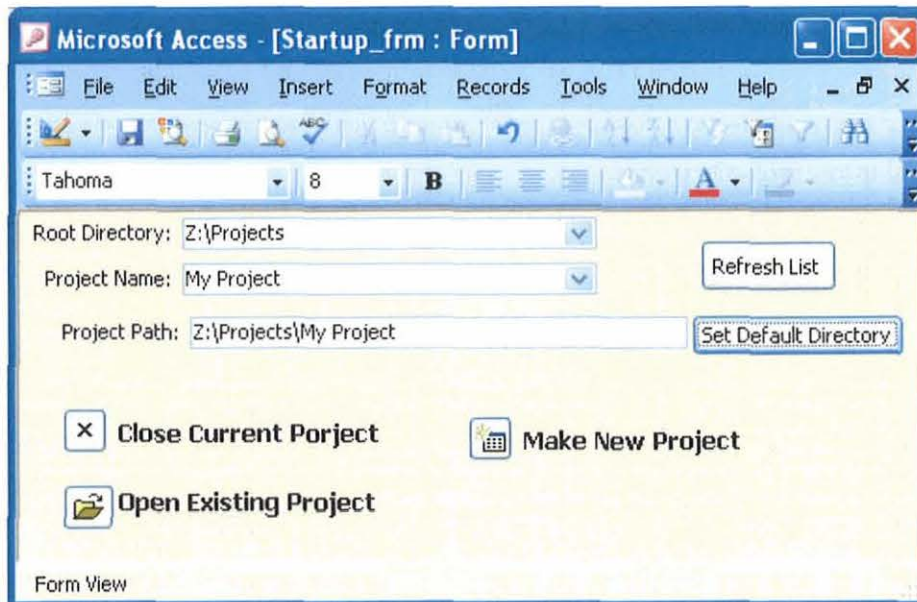


Figure 31. Screenshot of Startup Form

A project startup form in an Access database (see Figure 32) has been created to allow the user to create a new project folder and new Excel project tables or work with existing project tables within existing project folders.

When you click on "Make New Project" a new project directory is created, based on the name you typed into the "Project Name:" field, and sub folders are then created for GIS, GPS, report data, and photos.

When you click on "Open Existing Project" you can navigate to an existing project folder. There is an option to link to and view one or more Excel project tables within that folder and transfer data back and forth between the Access database and the excel table(s).

In addition to the in-house projects discussed above, PTA-CR staff attended a Hawai'i Island User's Group meeting at the University of Hawai'i, Hilo campus. The trip report for that meeting is below.

Trip Report 14

10 December 2004

PTA Cultural Resources Staff attendance to Hawai'i Island Users Group (HIUG), University of Hawai'i, Marine Science Building, Room 101, Hilo, Hawai'i.

1. The regular December meeting of HIUG began just after 0900 hrs. on Friday, December 10, 2004. PTA-CR personnel at the meeting consisted of William Godby, James Head, Aron King, and Cary Stine. The planned Agenda provided presentations in the morning, a pizza lunch (provided by Pacific GPS), and a GPS meeting/presentation in the afternoon.
2. The meeting began with an introduction by Lisa Naho'opi'i, GIS Analyst for the County of Hawaii Data Systems Department (lnahoopii@co.hawaii.hi.us).
3. The first speaker was A.J. Romanelli (aromanelli@ema-inc.com), Senior Consultant at EMA, Inc. His presentation concerned Mobile GIS utilized by the Board of Water Supply, City and County of Honolulu. Rather than carrying paper maps into the field, mobile GIS allows crews to access the latest data. As well, field crews can submit "redline markups" which pinpoint errors and changes in the database which can be entered into the system by editors working overnight. AJ's PowerPoint Presentation on this subject will soon be available on the HIUG User group site (<http://groups.yahoo.com/group/gpsusergroup/>). This was interesting with possible implications for the database at Pohakuloa Training Area.
4. A.J. Romanelli (www.ema-inc.com) also gave the next presentation that concerned another project undertaken by his company. Using Post-process differential GPS in conjunction with digital photography, the City of Akron, Ohio was able to inventory 25,000+ streetlights in about three months. The digital camera allows attributes of the location to be embedded directly into the photos of the assets as they are captured in the field. The system used a Ricoh Caplio Pro G3 Digital Camera, GPS Photolink Software, Leica Post-Process Differential GPS, ArcMap, a Custom Load Tool, Arc SDE, Active Server Pages, and ArcMap Viewer Tool. Again, the PowerPoint presentation should be available on the User Group site, and there are some definite applications to Cultural Resources at PTA.
5. Royce Jones (rjones@esri.com) and Hans Santiago (hsantiago@co.hawaii.hi.us) presented a piece on the development of Hawai'i County's tax map key (TMK) numbers. Royce talked about the development of this GIS system by his company in the late 1990's and how to use ArcGIS to display and use the data.
6. Lisa Naho'opi'i (County of Hawai'i) talked about a road video log with GPS that recently was completed for the State Roads on the island. She discussed dataset acquisition, uses for the data, and public access applicability. Although interesting, it did not seem very useful to our work at PTA.

7. The final presentation was by Talena Adams of the Forest Team (Hawai'i Community College). She talked about a mapping project she performed at Lava Trees State Park in Puna. She used Trimble, ArcMap and ArcView to make a good map underneath the canopy at the park.
8. After lunch, the GPS session began with an introduction by Karyn Nolan (nolan@pacificgps.com), then a short presentation on the Forest Team Program (HCC) by Kenneth Boche (boche@hawaii.edu). This program is actively working toward awarding associate degrees for Resource Managers. They are seeking training projects and internships for their students and might be available for projects at PTA.
9. Barbara Natale (info@pacificgps.com) gave a presentation on Trimble Tech Tips & Tricks. This was geared more toward the Windows CE Data Collector and was not handy since PTA-CR uses the TSC-1 Data Collector. She, however, did present a discussion on PDOP and SNR ratios that was helpful.
10. In Conclusion, the meeting was helpful since new ideas in mobile GIS were presented that may be appropriate for use at PTA. The use of digital cameras that embedded information directly into the digital photos may also be applicable. The opportunity to talk with the Trimble vendors at Pacific GPS was helpful and it was good to meet other local people involved in GPS/GIS.

SITE PROTECTION (SECTION 5.B.(4))

Develop and Implement site protection measures based on monitoring results to protect cultural resources for human and animal impacts. Protection measures include, but are not limited to, establishing exclusion areas, utilizing signage and virtual hazards, installing fence around perimeters of sites and features, as well as entrances to caves.

A Comprehensive Monitoring program began during the Contract Period for the monitoring of Archaeological Sensitivity Areas (ASA) at Pōhakuloa Training Area. An Archaeological Management Area (AMA) GIS layer had previously been created by PTA-CR staff to assist in the management of cultural resources. This GIS layer was later updated to reflect additional information, relocation of known archaeological resources and new data. The new layer was renamed Archaeological Sensitivity Area (ASA). The ASA's were created to reflect a distance of about 100m from each resource. The thirty-five units were assigned a specific number for database and resource management and a summary of ASA size, site numbers (both Temporary and permanent State Sites) and GPS or estimated location (Godby and Frazier 2003).

In May of 2005, PTA-CR staff attempted to qualify the monitoring of ASA's at PTA. It was felt that the monitoring should be done in a logical manner, beginning on the southeast and progressing counter-clockwise around the Impact Area. A proposal of the methodology was written and is included below:

Proposed Comprehensive Monitoring Plan Pōhakuloa Training Area, Island of Hawai'i

As outlined in our Scope of Work and to stay in compliance with Sections 106 and 110 of the NHPA, the Cultural Resources Staff at Pōhakuloa Training Area (PTA) propose the following comprehensive site monitoring plan. The purpose for this project is to collect more accurate data and to streamline the site monitoring process. The need for this work proposal is to establish protocol that will allow for accurate and timely site monitoring by utilizing the Archaeological Sensitivity Areas (ASA) created by Bill Godby and Morgan Frazier in 2003. It is envisioned that with the completion of this project the Cultural Resources program at PTA will have in place an efficient monitoring plan, accurate geo spatial data, current hard copy site files and a solid knowledge of the location, quality, and quantity of PTA sites. The suggested work plan is as follows:

- Archaeological Sensitivity Areas will be addressed on an individual basis. Sites not within any ASA will be included in the work done for the closest ASA.
- Work will begin in the office with the research of all background data available for sites within the selected ASA boundary. This data collection will include but is not limited to reports, maps, photographs, and monitoring forms. Copies of these materials will be made and will be placed in the hard copy site files.
- After background data has been compiled, the cultural resources staff will determine the field data that needs to be collected. This will include things such as maps, notes, photos, accurate GPS locations and monitoring. Copies of extant data will also be taken into the field for comparison.
- Each time a site is relocated it will be advanced one step in the management process. For example, sites with a T designation will have the necessary work completed to get a

number from SHPO, if deemed eligible. This work will include filling out a long site form and the creation of a good site map. Sites that already have a state issued designation will have proper monitoring duties completed. For new sites discovered while monitoring the ASA's a short site form with sketch map will be filled out, photographs will be taken and a GPS location will be recorded.

- Field work will be focused on collecting the necessary data until the selected ASA is complete. Ideally crews will be in the field for two or three days a week during the periods of field data collection. Along with the aforementioned ASA monitoring process, duties will include assigning a numeric value of 0-3 to each site visited or discovered. A site with an assignment of one will need to be monitored closely while a site with the designation of three will not need to be monitored as frequently. An assignment of 0 will be given to sites that are not relocated. The number assignment allows an opportunity to create monitoring plans based on the potential destruction or degradation of particular sites or areas. Consideration will be given to a site's proximity to roads or trails, the quality of the site and the vulnerability of the site to any other external damage such as ungulates or erosion.
- A daily log of field activities will be maintained outlining the person hours used, attempted site visits, actual sites relocated and new sites discovered. This log also includes notes discussing what work was completed at each site visited. The daily log will be particularly helpful in generating the end of the year report necessary for upward reporting.
- Following the office and field data collection periods, a brief report will be drafted. This ASA report will outline the following details: new data collected (including new sites); inaccuracies found in the background data; how to treat non-relocated sites; what to do with relocated temporary sites; and necessary changes to the ASA boundaries. This report will also include copies of the photos taken and daily work logs. Copies of the site monitoring or new site forms will be placed in the files. It is important to note that all data collected in the field will be coordinated with the needs of the developing Geodatabase.
- Finally a comprehensive report will follow the assessment of all ASA's at PTA. This report will discuss the evolution of the ASA boundaries, the status of all temporary sites relocated, the status of non-relocated sites and plans for newly located sites. The final report will also present a new comprehensive monitoring plan.

This document is intended to direct the Cultural Resources staff at PTA. After the Comprehensive Site Monitoring Plan is enacted however, variables may arise during the field/office work period that will require amendments to the procedures laid out in the above.

Using this new set of guidelines, the ASA Monitoring Program was begun on 8 April 2005 at ASA-12 in the extreme Southeast portion of Pohakuloa Training Area. According to Table 2 in Godby & Frazier (2003:131), ASA-12 contains four (4) archaeological sites and is 77 acres (31 hectares) in size (Figure xx). These sites were recorded in 1993 by BioSystems Analysis, Inc.

(BSAI) during an archaeological inventory survey of approximately 7,000 acres in the eastern portion of PTA (Shapiro et al. 1994). These four sites are:

1. 50-10-31-18677 (Site complex)
2. 50-10-31-18678 (Platform shrine)
3. 50-10-31-18679 (C-shaped structure)
4. 50-10-31-18677 (Trail)

All of the previously-recorded sites were relocated. During the fieldwork, a daily log of field activities outlined person hours expended, attempted site visits, actual sites relocated and new sites discovered was kept. These are in the MS Access forms and will form part of the permanent ASA monitor package. Printed forms are placed in the ASA monitor files and are kept in a secure location. Copies of field notes collected during the work were also placed into this file, along with printed copies of all photographs generated.

The descriptions and limited mapping of the known sites was quite good, but using the new guidelines, additional photography was taken of the sites to document changes in the features since initial discovery. As well, further documentation of these sites included accurate GPS locations with a Trimble TSC-1 and the establishment of PTA-CR permanent site washers at the original BSAI site datums. PTA-CR Monitoring Forms were completed to establish baseline site conditions. Numeric values (below) were established for each of the known sites as well as the newly discovered sites.

PTA Temporary Sites T-0420 and T-0420a were also relocated in a nearby *kīpuka* and examined. After careful examination, it is suggested that no further work be done at Temporary Site T-0420 at this time. A single burned stick may have indicated exploration of this blister cave, but no further use was noted. The location will remain in the PTA database and it will be afforded protection. Site T-0420a was determined to have archaeological remains and was recorded. This site will be assigned a State of Hawaii Site number.

Three new Temporary Sites, a cave, and an isolated find were found in the *kīpuka* containing the temporary sites. These new discoveries consisted of T-041305-1, a complex of two features, T-041305-2, two probable pāhoehoe excavations, and T-041305-3, a complex of two stacked rock features. Per the monitoring plan, these temporary sites will be fully recorded when the ASA is monitored again. Temporary site forms, sketch maps, and photographs were completed. As well, C-041305-1, a small blister cave and ASA 12-IFA were encountered. No further work was recommended at C-041305-1 since it was explored and found to be very small. The isolated find location will need further exploration when subsequent monitoring occurs at ASA 12.

After site monitoring of ASA-12, the following values were assigned to the archaeological sites:

Site	Monitoring Value
50-10-31-18677	1
50-10-31-18678	1

50-10-31-18679	2
50-10-31-18680	2
T-420a	1
T-041305-1	2
T-041305-2	3
T-041305-3	2

Because of the new discoveries, it was suggested that the current ASA boundary be modified to include the newly-mapped portions of State Site 18677 and State Site 18679, Temporary Site T-0420a, and Temporary Sites T-041305-1, -2, & -3 (Figure xx). Continued monitoring of all sites with a “1” value (18677, 18678, and T-0420) will need to be monitored yearly or whenever the area is utilized for training. Those sites with a “2” value are recommended for monitoring every other year or after training. Those sites with a “3” designation will only need occasional monitoring.

Upon the conclusion of field work in ASA 12, a report containing much of the above data was generated. A printed copy was placed in the Monitoring file.

Also during the Contract Period, monitoring of ASA 34 located to the northeast of ASA 12 was begun. The monitor was not completed, but the portion of the work completed before 30 June 2005 will be discussed.

According to Table 2 (Godby and Frazier 2003:135) ASA 34 contains 16 archaeological sites and contains a total of 107 acres (43.3 hectares).

1. 50-10-31-18675 (Quarry)
2. 50-10-31-18676 (Shrine)
3. 50-10-31-21286 (Lava tube shelter)
4. 50-10-31-21304 (Quarry)
5. 50-10-31-21306 (C-shaped shelter)
6. T-J7 (Lava tube shelter)
7. T-J9 (Lithic scatter)
8. *Ahu* #1
9. *Ahu* #2
10. T-0419-1 (*Ahu*)
11. T-0419-2 (*Ahu*)
12. T-0419-3 (*Ahu*)
13. T-0716-1 (Lava tube shelter)
14. T-0716-2 (Lava tube shelter)
15. T-0716-3 (Lava tube shelter)
16. 50-10-31-21313 (Excavated pit complex)

The above sites were found by a number of surveys: Shapiro, et al. 1994; Williams, et al. 2000; and PTA-CR. Of the above number, only State Sites 18675, 18676, 21304, and 21306 have been visited by our team. These four sites were subjected to the proposed ASA monitoring

with further documentation including accurate GPS locations with a Trimble TSC-1 and the establishment of PTA-CR permanent site washers at the original site datums. PTA-CR Monitoring Forms were completed to establish baseline site conditions.

Two Temporary Sites (not listed in the above table) lying near to the established boundary of ASA 34 were visited during this partial monitor. Sites T-092204-1 and -2 are areas of possible lithic reduction. Neither of these areas demonstrated clear evidence of lithic reduction during this visit, so they will be re-examined during subsequent monitoring activities.

The archaeological monitoring is not completed. Upon completion, findings in ASA 34 will be reported in the next Annual Report.

ASSIST DPW ARCHITECTURAL HISTORIAN (SECTION 5.B.(5)) Need info from Bill.

SHARE INFORMATION WITH US ARMY GIS SPECIALIST (SECTION 5.B.(6))

All information/data gathered on cultural resources shall be provided upon request to the U.S. Army's Geographic Information System Specialist located at Wheeler Army Air Force base, Island of O'ahu.

COORDINATION OF TRAINING MISSIONS WITH PRESERVATION OF CULTURAL RESOURCES (SECTION 5.B.(7))

Survey areas in support of the Army's training mission; coordinating and participating with other government agencies in discussions which affect cultural resources, and assisting in preparation of supporting documentation, if necessary. Provide reports describing survey methods and results. This task may support general National Environmental Policy Act (NEPA) needs not directly associated with conservation projects.

Monitoring of AAV Training and Previously Identified Archaeological Sites in Training Area 21, Pohakuloa Training Area (PTA), Hāmākua District, Hawai'i County, Hawaii.

1. On September 22 2004, William Godby, Cultural Resource Manager, PTA and James Head, Cultural Resource Specialist, PTA traveled to Range 8B along Redleg Trail in the eastern portion of PTA, Ka'ohē Ahupua'a, Hamakua District, TMK (3) 4-4-016:001.
2. This inspection was in response to a live-fire scenario by the USMC Combat Assault Company, 3D Marine Division which was held at Range 8B about 15-16 September 2004. In this scenario, a total of nine Assault Amphibian Vehicles were required to stage overnight at nearby Bivouac Area 3 (B3) just across Redleg Trail, then fire from positions at Range 8B the following night and day.
3. Prior to the implementation of this action, a Cultural Resource Specialist met with PTA Range Control and the USMC to point out cultural resources, which could be affected by the scenario. The scenario called for firing lanes located from 270° to 288°, with ordnance traveling northwest into the Impact Area. These lanes should not endanger any known cultural resources. The Marines were also cautioned not to enter any caves, stacking or unstacking stones, or to drive off-road to the east of Redleg Trail.
4. The monitor by the Cultural Resources Staff on 22 September 2004 confirmed that troops followed the instructions. However, two recently stacked-rock features were found in this portion of Range 8B, but it was not determined they are a result of this training action. There are no indications that either off-road driving or unauthorized cave entry occurred during the exercise.
5. The Cultural Resources team then traveled south on Redleg Trail to the Pu'u Koli area in southeast PTA. After walking to the top of Pu'u Koli, the team located several more flakes than were initially found in the unnumbered lithic scatter. These additional items will be located more accurately when Temporary Site T-092204-1 is recorded. This site appears to be result of material testing and lithic reduction activities, but further information is forthcoming on the site.
6. Another site lies on the southwest slope of Pu'u Koli and consists of a basalt reduction area and rough C-shaped wall. The C-shaped feature appears to be a recent military construction based on the presence of a portion of an aluminum food wrapper. Nearby are a number of dense basalt pieces including flakes and possible hammerstones/cores. This material was probably transported to this locale for reduction. The C-shaped feature may initially have been a Traditional Hawaiian feature that was reconfigured into a recent military feature used in troop training. The feature and scatter have been given the temporary site number T-092204-2.

Archaeological and Historical Monitoring for location of Survey Monument Locations in Support of LIDAR mapping in Pōhakuloa Training Area, Hāmākua District, Hawai'i County, Hawaii.

1. On December 4, 2004, James Head – PTA Cultural Resource Specialist accompanied crews from McGee Survey Consulting and Donaldson Enterprises, Inc. (DEI) through Training Areas (TA) 9, 8, 7, 5, and 21 to relocate known surveyed monuments (Figure 33) located in Ka'ohē Ahupua'a, Hāmākua District, TMK (3) 4-4-016:001, 005, 006 and 007. Eleven existing monuments were relocated and three were newly-established with a length of rebar and a numbered aluminum cap.
2. This archaeological monitoring provided archaeological clearance in support of transformation projects, in this case, project planning for construction of the Battle Area Complex (BAX). PTA Cultural Resources was involved to insure that no cultural resources would be affected by these activities.
3. The combined team began the project in the northwest corner of the project area and progressed clock-wise. As noted the majority of the monuments were large brass cartridges with the proximal end buried in a cement block. Monument #11, found at Mauna Kea State Park is an existing U.S.G.S. "Brass Cap" with a marked elevation of 6511 feet AMSL (Above Mean Sea Level). At three of the locations where the rebar markers were placed, either the monument had been removed or none were previously established.
4. At existing monument locations, a circle with a radius of five to seven meters was examined for cultural resources. The rebar locations were also examined prior to the driving of the stake. The general location of the stake was indicated by the surveyors and an area approximately 7m² was examined for cultural resources. After examination, the stakes were driven within the surveyed area and a numbered aluminum tag was placed on top of the rebar.
5. No cultural resources were noted at any of the existing or newly-established locations. Most all of the locations were found either along existing roadways gravel parking lots or atop named *pu'u*. No cultural resources appear to be effected by the relocation and establishment of survey markers and it is recommended that archaeological clearance be granted for this portion of the project.

Map removed to protect rare resources. Available upon request

Archaeological Reconnaissance Survey of Approximately 600 acres in Training Areas 6, 7, & 8.

1. Beginning in October and ending in November 2004, reconnaissance survey for cultural resources was conducted in Training Areas (TA) 6, 7, and 8 in Ka'ohē Ahupua, Hāmākua District, TMKs (3) 4-4-016:005 and 007. This survey was in response to revised cultural resource survey requirements for the Battle Area Complex (BAX) and administration area. Approximately 190 person-hours were used in the completion of this 100% surface examination.
2. The following Cultural Resource Management personnel were involved in this project: Aron C. King, Cary Stine, James Head, and William Godby. During the survey a number of recent military training features (RMF) were encountered. The RMF's were not formally recorded, meaning no site forms were filled out and no photographs were taken, however, GPS locations were collected, along with short descriptions and dimensions of the features. Figures 34 and 35 give counts of the feature functions and types as noted in the field and now present in the PTA Cultural Resources database. Four temporary sites not identified as being recent military features were also located during the survey. These features were issued temporary numbers and subsequently recorded.
3. It was initially planned that the aerial reconnaissance would include the northern portion of the PTA Impact Area, as well as large areas of 'a'a lava in the southern and eastern portions of TA 8. The Impact Area was not flown over, due to restrictions governing areas with high concentrations of UXO. All areas within the project area, with the exception of the large 'a'a areas in the southern and eastern portions of TA 8, were examined through pedestrian survey. Utilizing aerial and pedestrian surveys, the entire proposed project area was inventoried.

October 12, 2004

Field Crew: James Head, Aron C. King.

4. Archaeological survey began by looking at an older section of pāhoehoe lava in the extreme southeast of the western project area. This portion of the survey is surrounded on all sides by rough lava. Survey sweeps were conducted using 100/280° TN in an area of about 27 acres.
5. Three possible prehistoric features were found in this survey area. **T-101204-1** (State Site 24326) is a complex of pāhoehoe excavation.
6. Feature A is a small pāhoehoe excavation with a low overhang on the south. It appears too small for entry and there is a possible C-shape alignment constructed of large cobbles /small boulders on the north side of the excavated area. Feature B are two additional pāhoehoe excavations, both of which measure about 1.0 m² by 0.45m deep. Both areas appear to have been cleared out with the materials spread to the north, and Feature C, (Photo 22) is a broken pāhoehoe blister that also appears to have been cleared. The hole in the top of the blister measures about 0.70 by 0.40 with the blister about 0.75m deep. This site is consistent with the typology described for bird-catching activities (Moniz-Nakumura, et al. 1998).

7. **T-101204-2** (State Site 24327) (Photo 23) is a stacked cairn built on mostly level pāhoehoe and measures about 0.95m² and 0.90m high. It is constructed of small cobble to small boulder size pāhoehoe stones stacked eight to nine courses high. There is another possible collapsed cairn about 2.5m away at 190°. One aluminum arrow shaft was found about 25m to the north, but no other cultural items were located.
8. After completing the initial area, survey activity focused on the silty area just north of the 'a'a in the southern portion of the western survey area. An abundance of RMF's were located here and are evidently associated with Firing Points 304, 308, 310, and 312.
9. Two large areas of apparent alluvial, water worn basalt were located during this portion of the survey. The stones vary from pebble to boulder size and are distributed in an area not less than 60 square meters. Both areas appear to be the products of glaciers and do not appear to be cultural. The first is found in a low silty area just to the north of the large 'a'a flow in the southern portion of TA 8. The afternoon's coverage area amounted to approximately 44 acres and 13 military features sites were noted.

October 13, 2004

Field Crew: James Head, Aron C. King and Cary Stine.

10. Pedestrian survey was conducted on a total of 71 acres in which 35 Recent Military Features were recorded. The survey was in the vicinity of Firing Points 308, 310 and 312.
11. The afternoon survey coverage area was adjacent to the East side of Makai Rd. One unusual site was noted and has since been mapped and photographed. Site T-101304-01 (Photo 24). consists of a low stone wall which bridges a natural lava gap and two associated enclosures approximately 5.0M to the south. A modification of the ridge above the site was also evident and military garbage is present in the vicinity. Site T-101304-01 does not appear to be associated with military training activities. Unlike the typical hastily constructed military features, the three features at Site T-101304-01 are built with small to medium boulders requiring a substantial effort to place. No traditional Hawaiian cultural items were found during the reconnaissance, but testing of the interiors of the two enclosures may disclose them.

October 14, 2004

Field Crew: James Head, Aron C. King and Cary Stine.

12. A total of 29 acres were surveyed and 41 recent military features were recorded within the western portion of Training Area 7 north of Mikilua Road.
13. A historic stock fence was noted and assigned number **T-101404-01** although it is believed to be associated with features recorded by GANDA and assigned State Site numbers 23855 and 23938. The fence is in good condition but has been pushed over in several places by a dozer and materials have been incorporated into military features.

October 15, 2004

Field Crew: Bill Godby and James Head.

14. The aerial survey covered approximately 288 acres. The areas were examined for potential sites and a ground crew further investigated the areas of interest on October 20th, 2004. During the aerial survey, potential site areas were spotted and general locations recorded via Garmin GPS. These potential historical properties were then further investigated on foot.

October 19, 2004

Field Crew: James Head, Aron C. King and Cary Stine.

15. The Cultural Resources field crew surveyed 47 acres of Training Area 7 and noted 47 recent military features within the coverage area. The completed survey area is in the western portion of Training area 7 and adjacent to the section completed on the 14th of October.

October 20, 2004

Field Crew: James Head, Aron C. King and Cary Stine.

16. A survey of 14 acres that were identified in the October 15th flyover as having a high probability for the presence of historic properties was conducted. The area covered is located in the western portion of Training Area 7, just south of Mikilua Road. The area had several canyon and crevasse like geological features, which created dozens of overhangs and shallow caves. No prehistoric sites were found. Wreckage was found in this area from what appeared to be a four-cylinder, wooden propped plane that was painted red with U.S. Army markings. The plane was most likely a target vessel. The site was photographed and is included in the PTA Cultural Resources Database as MT-102004-17.
17. Twelve acres on the north side of Mikilua Road in Training Area 7 were completely surveyed. This concluded the necessary work in the western portion of Training Area 7.
18. In total for October 20th, 20 recent military features were recorded and 26 acres of ground was covered.

October 21, 2004

Field Crew: James Head, Aron C. King and Cary Stine.

19. All necessary clearance for Training Area 6 was completed and survey began in the eastern portion of Training Area 7. In all, 46 acres was surveyed and 51 recent military features were noted.

October 22, 2004

Field Crew: Aron C. King and Cary Stine.

20. The team completed survey on the northwestern portion of Training Area 7, which amounted to 14 acres.

21. Additional work included the examination of features located just north of Lava Road in Training Area 8. Several of the features located in Training Area 8 are composed of exceptional architecture in comparison to the dominant military feature types identified in the overall project area. Squared corners, faced walls and cobbled or cleared floors are examples of the kind of detail present in these features. The features are almost certainly military training features or hunting blinds, since they are located in close proximity to the road, generally within 18 meters and all are encompassed within a 17-acre polygon. Most likely military features, taking the location in relation to the impact area.

22. In total 37 sites were recorded in 32 acres of survey on October 28th.

October 29, 2004

Field Crew: Aron C. King and Cary Stine.

23. Returned to Site T-101304-01 for photographs and mapping. (Photos 24 and 25)

November 19, 2004

Field Crew: Aron C. King and Cary Stine.

24. Surveyed 46 acres in Training Area 7 and noted 25 recent military features. Location of area is adjacent to areas previously surveyed for this project.

November 22, 2004

Field Crew: Aron C. King, James Head and Cary Stine.

25. Surveyed 50 acres in Training Area 7 and noted 57 recent military features.

November 30, 2004

Field Crew: Aron C. King and James Head.

26. The team returned to Site T-101204-01 and an additional nine sites along Lava Road, MT-102204-34 thru MT-102204-38 and MT-102204-18 thru MT-102204-21, for photographs and additional data collection (Photos 26 through 30). Site T-101204-01 is composed of three potentially prehistoric features and the nine sites located along Lava Road are believed to be military features but are composed of a more refined architecture as outlined above for October 12th, 2004. Nine stacked rock features found just north of Lava road are believed to be military features, but exhibit greater care in construction.

27 In total 325 recent military features were recorded in a survey area of approximately 320 acres. This does not include the helicopter survey, which was an additional 288 acres. Military features were predominating, although not exclusive, clustered in the areas surrounding the Firing Points.

26. All areas covered in the survey seemed to have been heavily used. Bulldozing activity was evident in most areas and the presence of discarded items was also prevalent. The likelihood

of prehistoric sites maintaining integrity with the level of activity that has taken place in most of Training Areas 6, 7, and 8 is low.

27. The dominant military feature types in the project area are; small and low 'C' and 'U' shape features, shallow excavations, barrier walls and rough enclosures. The military features usually contain one or more of the following; MRE remnants, cartridges, links, clips or other various training related materials.

Feature Type	TOTALS
C Shape	103
Cache	2
Cairn	8
Cartridge Scatter	1
Complex	21
Coral Scatter	1
Dozer Push	3
Enclosure	77
Excavation	41
Filled Enclosure	3
Filled Excavation	8
Lava Tube	1
Linear Mound	1
Parallel Rock Alignments	3
Push Pile	3
Surface Hearth	1
Trash Scatter	2
Trench	2
U Shape	46
Wall	55
Wreckage	2

Figure 33. Field counts of military features. More than one feature was often noted when recorded military structures. *

Function	TOTALS
Gun Emplacement (1)	68
1 and 2	36
1 and 3	3
Bivouac (2)	94
Communication Post (3)	9
Indeterminate Military (4)	111
Unknown	5

Figure 34. Assigned functions of military features. Note that there can be several features assigned to one function. *

* Further information concerning these features and their assigned functions is available in the PTA database.



Plate 23. Site T-101204-01, feature C, view to the south.



Plate 24. Site T-101204-02, view to the northeast.



Plate 25. Site T-101304-01, feature C.



Plate 26. Site T-101304-01, feature A.



Plate 27. Site MT-102204-34, view to the southwest.



Plate 28. Site MT-102204-19, view to the southeast.



Plate 29. Site MT-102204-36, view to the east.



Photo 30. Site MT-102204-35 , view to the southeast.



Plate 31. Site MT-102204-20 ,view to the northeast.

PTA Quarry Expansion

1. On January 27, 2005 William Godby, archaeologist, performed an aerial reconnaissance of a proposed geological testing area for the proposed expansion of the PTA rock quarry. The survey took place in Ka'ohē Ahupua'a, Hāmākua District, TMKs (3) 4-4-016:005 and (3) 4-4-015:008. The Federal Highways Administration is presently in negotiation with the US Army to expand and utilize materials from this quarry for the construction of the Saddle Road realignment.
2. The survey is in response to NHPA Section 106 compliance requirements. Due to the nature of the topography of the project area, little to no vegetation and entirely 'a'a lava flow, it was determined aerial survey would be most appropriate for initial reconnaissance identification of possible historic properties, with ground inspection to follow if there were findings.
3. The rock quarry is located in TA 13 of Pohakuloa Training Area in Ka'ohē Ahupua'a, Hāmākua District. It lies in the center of the northern training areas, just west of Pu'u Ahi (Figure 36) Garcia and Associates performed previous survey of a portion of TA 13 in May-July 2003 (Roberts et al 2004). This survey did not include the any portion of 'a'a flow within TA 13.
4. The proposed quarry testing area lies within two TMKs, (3) 4-4-015:008 and (3) 4-4-016:005 (Figure 2). Four sweeps were performed of the entire 'a'a flow, also known as the Ke'āmuku flow, using the quarry and existing roads as boundaries. Lava Road provided the southern boundary, Leilani Road provided the western boundary and Kaua Road provided the eastern boundary. The northern boundary was the lava flow itself.
5. Two sweeps were performed initially at approximately 300 feet and followed by two more sweeps at approximately 75-100 feet. The sweeps included the entire Ke'āmuku flow within TA 13.
6. Historic property findings for the survey were negative. Adjacent and south of the test area are numerous recent ground disturbance events, mostly in the form of rough road cuts. Some military fortifications, such as small circular enclosures were also noted on the south side of Lava Road within the buffer of the impact area. These features are clearly modern and are most certainly related past training events.
7. Due to the high visibility and lack of vegetation confidence level in this survey is high. It is therefore concluded that no historic properties exist within the project area.

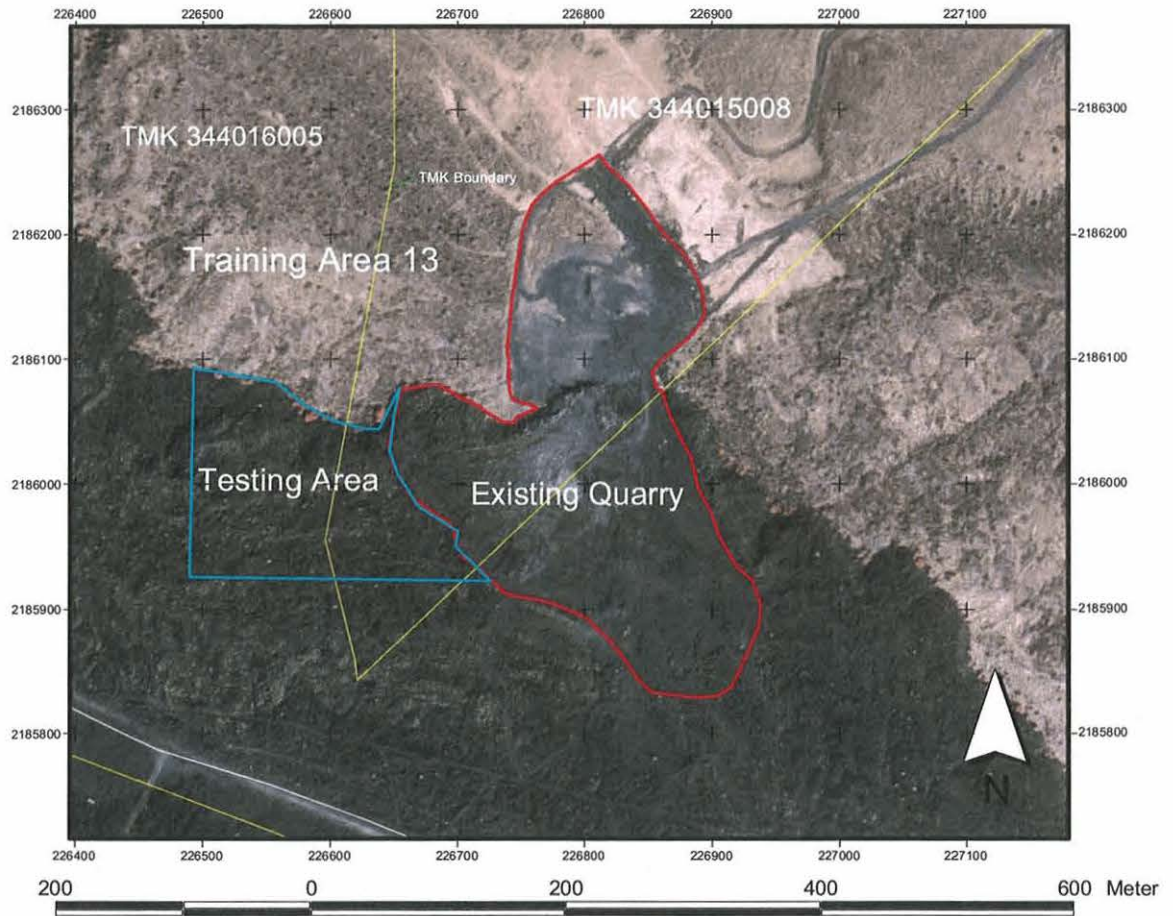


Figure 35. Existing rock quarry and testing area.

Archaeological Survey Proposed upgrading of Old Kona Highway in Portions of Training Area 20, and 22.

1. On March 31, 2005, Aron King and James Head – PTA Cultural Resource Specialists left the PTA Cantonment at 0800 and traveled to the Dip Tank along Old Kona Highway in Pu'u Anahulu (Figure 37). The purpose of this trip was to examine a corridor approximately 5m on either side of the existing road for cultural resources. The Old Kona Highway is slated to be upgraded to facilitate vehicle passage to the firebreaks in the western portion of Pōhakuoa Training Area. All examined areas lie within Pu'u Anahulu Ahupua'a, North Kona District, TMK (3) 7-1-004:007.
2. The first kilometer of the road had been cleared of weeds approximately 5-6m on either and examination of the surface did not indicate the presence of cultural materials. The majority of this first section appears bulldozed and disturbed especially near Firing Point (FP) 707.
3. At FP 708 (approximately 1.0 mile into the survey route) there is also bulldozing between the road and Firing Point. This disturbance is about 2.0 m on either side of the existing road and is covered with a thick growth of fountain grass. Again, no cultural resources were found.
4. Approximately 0.1 miles past, at FP 709, there is an access road off the Old Kona Highway to the Firing Point on the south and the existing road appears to be built up on the pāhoehoe. There are no indications of cultural features or materials in this area.
5. At FP 517, about 1.6 miles into the survey the terrain has been bladed and gravel has been imported. No cultural resources are found along this area and the road bed corridor has generally been impacted.
6. The road to the RAWs weather station at the west end of the survey area is about 2.4 miles from the beginning point. The road in this area has simply been bladed along the surface and disturbance occurs about 1.0m on either side.
7. The only cultural items noted during this inventory were recent items consisting of two small pieces of cast iron, possibly associated with ordnance, and an old muffler. There were pieces of yellow flagging tape on either side of the existing road which may indicate limits of planned upgrading.
8. Generally, much of the proposed route has been bulldozed from prior road construction activities. No other cultural items or features were noted during the archaeological survey of Old Kona Highway. It is recommended that no further archaeological fieldwork is required for the proposed road project. However, should any buried cultural items or features be discovered during construction, it is recommended that construction cease in this area and the PTA Cultural Resources Staff be alerted.

Map removed to protect rare resources. Available upon request

PUBLIC OUTREACH (SECTION 5.B.(9))

Promote a volunteer program at PTA and participate in activities to support cultural resources.

Public Outreach Visit to Training Area 21.

1. On 30 June 2005, approximately 12 students and three advisors from the Summer Enrichment Program (*'Imi Pono no ka 'Aina* – seeking excellence for the land), arrived at PTA about 0730 hrs. for a short visit.
2. The group was briefed on UXO safety, followed by an overview of PTA's cultural resources and a discussion of the day's agenda.
3. They were split into two groups with one group heading to the Curation Facility with Bill Godby, the other to the Interpretive Garden with James Head. After discussions in both facilities, the groups switched and discussions were repeated.
4. The large group then traveled to TA-21 to view and discuss cultural resources found in the area. Field work took place in Ka'ohē Ahupua'a, Hāmākua District, TMK (3) 4-4-016:001. This group was accompanied by GS Archaeologist Bill Godby, along with Cary Stine and James Head, PTA Cultural Resource Specialists. The large group proceeded from the parking area near Range 4 to an area of excavated pits to the east. Here, we discussed what is known and what is not known. We discussed possible theories such as bird nesting sites, planting sites or bomb craters. Next we talked about how to measure and record these features.
5. From this point, the large group broke into three smaller groups and each group was accompanied by a staff archaeologist. Each group used a Garmin GPS to navigate to either State Site 21291, 21295, or 21500. When the groups arrived at State Sites 21291 and 21295, they participated in the installation of permanent PTA_CR site washers and the construction of dead wood barriers to block cave entrances from ungulate intrusions. At State Site 21298, a permanent site washer was placed and the existing map was used to locate features and artifacts. Discussions of site protection and management, and descriptions of the caves and cairn complex followed the work.
6. After the tasks were completed, all three groups then proceeded to the State Site 21500-21807 area. In this area, the groups were treated to discussions of site mapping, site recording, and a cave tour of State Site 21807. After the completion of these lessons, the group began walking back to the parking area.
7. Along the way, a permanent site tag was placed at State Site 21499, another cairn complex which lies between.
8. The archaeologists arrived back at the Cantonment at 1530 hrs. and the other group went to Hilo.

9. The students gained a good idea of cultural resources at PTA and how they are handled. Site recordation, location and protection were discussed by the archaeologists, and all the participants gained new knowledge from this visit.

Public Outreach Visit to Training Area 5

1. On 22 July 2005, approximately 12 students and three advisors from the Summer Enrichment Program *'Imi Pono no ka 'Aina*, arrived at PTA about 0730 hrs. for a short visit.
2. The group was briefed on UXO safety, followed by an overview of PTA's cultural resources and a discussion of the day's agenda.
3. They were split into two groups with one group heading to the Curation Facility with Bill Godby, the other to the Interpretive Garden with James Head. After discussions in both facilities, the groups switched and discussions were repeated.
4. The large group then traveled to TA-5 to view and discuss cultural resources found in the area. This group was accompanied by GS Archaeologist Bill Godby, and James Head, PTA Cultural Resource Specialist. The large group proceeded from the parking area near the locked gate by Guadalcanal Road and walked ca. 450m south along the Road. Along the way, the group stopped at Temporary Site T-0702-1, a small blister cave with possible core and basalt water worn stone. Here, we discussed what is known and what is not known. We discussed the measurement and recordation of the site.
5. After the group reached the target area along Guadalcanal Road, two smaller groups were formed. Each group was accompanied by one archaeologist.
6. Bill Godby took a group to the State Site 23568 site complex to build dead wood site barriers in the mouths of the caves and blisters. James Head took the other group to State Site 23572 where they learned to recognize Traditional Hawaiian features on the ground and place permanent PTA_CR site washers at the features. Discussions of site protection and management, and descriptions of the cave features and artifacts followed the work.
6. After the tasks were completed, the large group began walking back to the parking area.
7. The groups arrived back at the PTA Cantonment about 1530 hours.
8. The students gained a good idea of cultural resources at PTA and how they are handled. Site recordation, location and protection were discussed by the archaeologists, and all the participants gained new knowledge from this visit.

CURATION FACILITY (SECTION 5.B.(12))

Maintain curation facility in accordance with Army Regulation 200-4 guidelines. Access artifact condition and housing, clean, label, sift, and/or deaccession artifacts when required. Purchase the proper equipment and materials to stabilize artifacts and protect them from environmental conditions, including unstable packaging (acidic), UV radiation, temperature and humidity. Monitor facility and condition of the artifacts routinely and understand the professional responsibility to preserve archaeological collections for the future.

Curation Report

Materials collected and maintained at the PTA curation facility include database information, artifacts, a small natural history collection, maps, and original field notes. A collection is defined by 36 CFR 79.4 as “material remains that are excavated or removed during a survey, excavation, or other study of a prehistoric or historic resource, and associated records that are prepared or assembled in connection with the survey, excavation or other study.” The goal is to develop a system of information sharing after a well established facility has been created in accordance with all federal regulations.

Background

The PTA curation facility was first established in September 1998 with the fundamental goal of this project was to identify collect and house all items related to previous cultural surveys at PTA. These items would include field notes, original slides, maps, computer disks, site forms, photographs and negatives, as well as all reports. Contractors who had conducted surveys at PTA and the University of Hawai‘i were contacted. Subsequently all artifacts were returned to Pōhakuloa Training Area in less than satisfactory condition. All of the materials were therefore repacked in a more stable short-term environment and entered into the curation facility database.

From November 2004 through June 2005 no staff was available to continue working at the curation facility. Prior to that time Ms Carlyn Battilla continued her efforts to stabilize the returned collections and catalog them into the curation facility database.

Curation

Of the 82 boxes in the PTA Curation facility, 16 were fully accessioned and the 17th box was in progress, totaling 541 entries as of November 2004. First the site records were reviewed, if they were present. Bag labels printed on acid free paper were completed to better preserve provenience data, which record the data entered into the database and are inserted into each bag. The assigned PTA number is then written in permanent marker on the outside of the package. These measures are taken to prevent the loss of data from misplacement and faded or illegible information. Finally, the bags are placed back into the box in order and sometimes re-housed in padded boxes. Due to poor bag labeling, many of the later boxes were curated slowly. Ogden’s database containing the provenience information is present, but is only in a hardcopy format that is organized by site number. Each box also contains a printout of its contributions to the

database. The projects that remain to be inventoried and entered into the database as of Nov. 2004 were:

- MPRC Survey and Data Recovery (Delivery Order 1) Ogden. DACA 83-91-D-0025. Contents include samples in foil in two boxes.
- Pōhakuloa Inventory Survey (Delivery Order 3) Ogden. DACA 83-95-D-0006. Contents include artifacts and faunal bone.
- Pōhakuloa Survey of Redleg Trail (Delivery Order 15) Ogden. DACA 83-91-D-0006. Contents include bone, lithics, charcoal, artifacts and flora in two boxes.
- HPP for Bobcat Trail (Delivery Order 18) Ogden. DACA 83-991-D-0006. Contents include faunal bone, charcoal, artifacts and flora in three boxes.
- PTA Bobcat survey (Delivery Order 22) Ogden. DACA 83-91-D-0006. Contents include soil, charcoal, bone, wood, gourd and lithics in two boxes.
- PTA Redleg Trail Vicinity, Survey (Delivery Order 30) Ogden. DACA 83-91-D-0006. Contents include bulk samples, artifacts, faunal and bird bone, wood, charcoal, lithics and bulk samples in sixteen boxes
- PTA Redleg Lab (Delivery Order 32) Ogden. DACA 83-91-D-0006. Contents include unknown materials in one box.
- 1997 UH Mānoa field school projects. Contents include unknown materials in eleven boxes.

The curation facility houses two fireproof metal cabinets that contain sensitive materials organized into major source material groups: plant (botanical), stone, wood, bone, shell and historical. The botanical cabinet is further classified according to material type or modified use: cordage, gourd kī, niu (coconut), woven/knotted, and various botanicals/unidentified. Each shelf has been grouped by site. The materials in these cabinets are more fragile than the other materials in the boxes and are housed for better preservation, including the kī leaf sandals, fire plow, adze handle and gourd bottle fragments. The kī leaf sandals were given more attention for better preservation and a more supported foundation in the curation box.

A detailed log of daily maintenance and curatorial processes is maintained and general clean-up is conducted as needed. Clean-up includes dusting, sweeping and shaking out the carpets, reorganizing the materials and/or field equipment, and cleaning the air conditioner filter.

Curation Facility Database

The curation database is in Microsoft Access format and is backed up on an Iomega 100mb-zip drive, on a physical hard drive and on CD ROM. Additionally a hard copy of the curation database is printed out and archived.

Accession numbers (PTA catalog numbers) are given to each artifact. The artifact information entered into the database includes:

Project Name
Site number
Grid/Test unit
Feature
Layer/level
Depth
Contents
Number of Samples
Weight
Location
Box Number
Date of repackaging
Name of curator

Curation Folders

Websites are researched for useful information and then organized by subject into folders. As new questions arise, the curation folders are added to. For example, the Identification Information folder holds reference materials to identify unknown materials. Two articles about *olonā* and cordage were recently added.

Climate Control

Although Pōhakuloa is naturally a dry and cold environment lacking much moisture, the PTA curation facility is climate controlled. Monitoring of both humidity and temperature is done with a hygrothermograph, with a monthly chart produced and kept on file. We maintain a humidity ranging from 40 – 55 percent and a relatively stable temperature averaging 60 degrees Fahrenheit. Monitoring of the facility for insect and rodent populations is done on a regular basis. A model #72MB Catchmaster glue board is utilized in the facility to trap, control and monitor. Additionally, the entire curation facility room has been carefully sealed to eliminate cracks where unwanted guests could enter.

Native Hawaiian Iwi

The PTA curation facility is presently curating one item identified as human remains. The remains consist of a fragment of the distal end of a human humerus discovered during the Ogden 1993 survey on the MPRC project. The bone was recovered from a test unit and was initially identified as animal bone. Upon later inspection it was re-identified. There is no provenience information except that the bone is from State Site 50-10-30-10657, a lava tube cave site on Pōhakuloa Training Area. This bone is being stored with respect and care at the Pōhakuloa curation facility. According to Fred Reinman and Allen Schilz in *Final Report Archaeological Data recovery at the Multipurpose Range Complex Pōhakuloa Training Area, Island of Hawaii* (1994:95-97), the radiocarbon dates indicate a probable range of 1000 BP to historic times. The

time frame and context suggests that this bone is of Native Hawaiian ancestry. Efforts are currently underway to repatriate and rebury the iwi in accordance with NAGPRA guidelines and Traditional Hawaiian protocol.

Sustainability

There has been an effort by Carlyn Battilla to make the curation facility have less of a footprint on the environment. All quality paper scraps are collected for an abundance of uses, with large sheets made into recycled notebooks and small scraps used for labels and notes. Office supplies are chosen so they can be reused, such as paperclips instead of staples and reusable printer paper. Packing materials are reused from the larger offices of the Natural and Cultural Resource Division and earth-friendly cleaning agents are used to dust.

Recommendations and Conclusions

It is recommended that the facility be upgraded with the six Lane professional curation cabinets and that more time and space be allotted for maintaining the facility. It is recommended that a full-time position be created to assist in this task. Additional surveys slated at PTA are likely to produce demands for both space and for labor hours of maintaining the facility. A possible solution to this problem may be to enlist outside help in the form of volunteers, interns, or perhaps integrating a curriculum with the UH-Hilo into PTA curation facility needs. It is also suggested that the future value of our archaeological studies be envisioned to guide the development of our goals and practices and the Cultural Advisory Committee should be consulted for this task.

**COORDINATION WITH USAG-HI INTEGRATED TRAINING AREA MANAGEMENT
(SECTION 5.B.(10))**

All information/data gathered on cultural resources shall be entered and compatible with the U.S. Army's Integrated training Area Management (ITAM) GIS. An electronic copy of information/data gathered during the period of this project shall also be submitted in Adobe Acrobat (PDF) format.

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