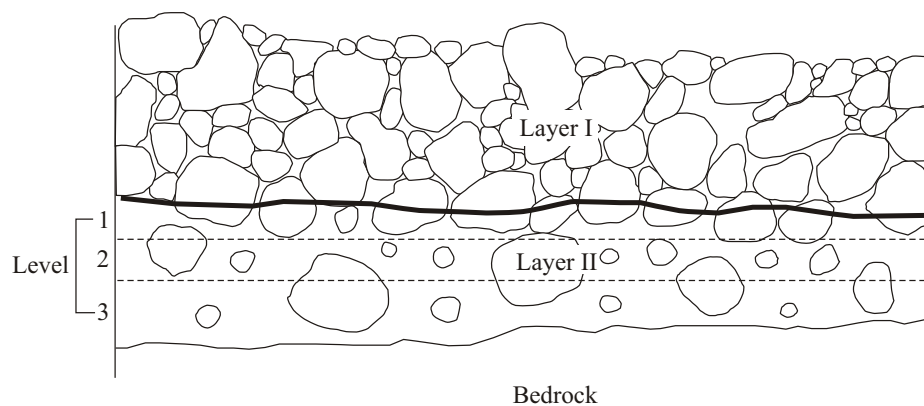


0 20 30
Scale in centimeters



Layer I - Architectural layer with piled small to large 'a' 'ā cobbles and a few small boulders

Layer II, Level 1 - Dark brown (10YR 3/3) silt with 'a' 'ā cobbles from architectural layer.

Layer II, Level 2 - Dark brown (10YR 3/3) silt with 20% 'a' 'ā gravels.

Layer II, Level 3 - Dark brown (10YR 3/3) silt with crumbly 'a' 'ā cobble fragments.

Figure 115. SIHP Site 23686 Feature 289 EU-19 north wall profile.

Table 33. Recovered items from SIHP Site 23686, Feature 289, EU-19.

<i>ACC#</i>	<i>Layer</i>	<i>Level</i>	<i>Material</i>	<i>Species/type</i>	<i>Count</i>	<i>MNI</i>	<i>Weight (g)</i>
282	II	1	Marine shell	<i>Cypraea</i> sp.	10	2	7.6
284	II	1	Marine shell	<i>Isognomon</i> sp.	2	1	0.4
283	II	1	Marine shell	<i>Conus</i> sp.	1	1	0.2
285	II	1	Coral	Unidentified	1	-	0.3
Layer II, Level 1 Total:					14	4	8.5
286	II	2	Marine shell	<i>Cypraea</i> sp.	1	1	0.7
Layer II, Level 2 Total:					1	1	0.7
287	II	3	Marine shell	<i>Cypraea</i> sp.	3	1	1.0
288	II	3	Marine shell	<i>Morula</i> sp.	1	1	0.7
Layer II Level 3 Total:					4	2	1.7
EU-19 Total:					19	7	10.9

A 2 x 2 meter excavation unit (EU-20) was placed near the central portion of the pavement (immediately east of and abutting EU-19) and revealed the following stratigraphic profile (Figures 116 and 117):

- Layer I (0-30cmbs).....architectural layer with piled small to large 'a'ā cobbles and a few small boulders.
- Layer II, Level 1 (30-40cmbs).....brown (10YR 4/3) silt with 60% 'a'ā cobbles from architectural layer.
- Layer II, Level 2 (40-50cmbs).....brown (10YR 4/3) silt with 60% 'a'ā gravels.
- Layer II, Level 3 (50-60cmbs).....brown (10YR 4/3) silt with crumbly 'a'ā cobble fragments from underlying bedrock.

Items recovered from EU-20 include *Cypraea* sp., *Cymatium* sp., *Conus* sp., coral, and a volcanic glass flake (Table 34). The architectural layer yielded more remains than the underlying Layer II.

Table 34. Recovered items from SIHP Site 23686, Feature 289, EU-20.

<i>ACC#</i>	<i>Layer</i>	<i>Level</i>	<i>Material</i>	<i>Species/type</i>	<i>Count</i>	<i>MNI</i>	<i>Weight (g)</i>
289	I	1	Marine shell	<i>Cypraea</i> sp.	2	1	5.6
292	I	1	Marine shell	<i>Cypraea</i> sp.	14	2	7.8
294	I	1	Marine shell	<i>Cymatium</i> sp.	1	1	3.1
293	I	1	Marine shell	<i>Conus</i> sp.	2	1	2.9
290	I	1	Coral	Unidentified	1	-	17.2
291	I	1	Volcanic glass	Flake	1	-	0.5
Layer I, Level 1 Total:					21	5	37.1
295	II	2	Marine shell	<i>Cypraea</i> sp.	4	1	1.6
296	II	2	Marine shell	<i>Conus</i> sp.	2	1	1.5
297	II	2	Coral	Unidentified	1	-	2.5
Layer II, Level 2 Total:					7	2	5.6
EU-20 Total:					28	7	42.7

Feature 81

Feature 81 is a linear terrace constructed of 'a'ā cobbles within the southeastern quadrant of the project area (see Figure 76). The southeast to northwest aligned wall is 60 meters long, one meter wide, and 50 centimeters above the surrounding ground surface.



Figure 116. SIHP Site 23686 Feature 289 EU-20 base of excavation, view to the east.

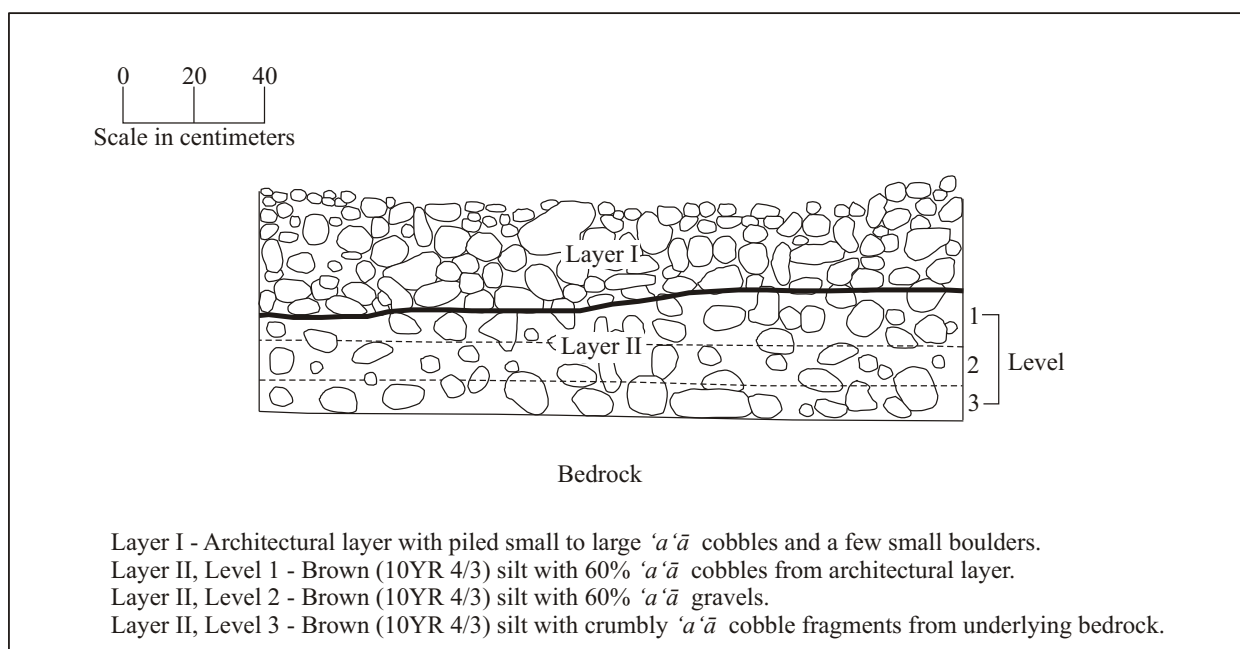


Figure 117. SIHP Site 23686 Feature 289 EU-20 south wall profile.

A 2 x 1 m excavation unit (EU-25), aligned southeast-northwest, was placed in the *makai* portion of the terrace wall. EU-25 revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 118 and 119):

- Layer I (0-30cmbs).....architectural layer with piled small to large 'a'ā cobbles.
- Layer II, Level 1 (30-40cmbs).....dark brown (10YR 3/3) silt with 60% 'a'ā cobbles.
- Layer II, Level 2 (40-50cmbs).....brown (10YR 4/3) silt with 80% 'a'ā gravels on bedrock.

Feature 82

Feature 82 is a linear *kuaiwi* constructed of 'a'ā cobbles within the southeastern quadrant of the project area (see Figure 76). The southwest to northeast aligned wall is 108 meters long, 2.1 meters wide, and 70 centimeters high. The wall is composed of loosely piled small to medium cobbles and exhibits a considerable degree of post-constructional disturbance.

A 2 x 1 meter excavation unit (EU-26) was placed from east to west across the wall near its right-angled intersection with the Feature 81 wall and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 120 and 121):

- Layer I (0-15cmbs)..... architectural layer with small to large piled 'a'ā cobbles.
- Layer II (15-28cmbs) dark brown (10YR 3/3) and dark yellowish brown (10YR 3/4) mottled silt with small cobbles on crumbly 'a'ā bedrock.

Feature 17

Feature 17 is a linear *kuaiwi* constructed of 'a'ā cobbles close to the southwestern quadrant of the project area (see Figure 76). The southwest to northeast aligned wall is 38.7 meters long, two meters wide, and 80 centimeters high. The wall consists of loosely piled small to medium cobbles.

A 2 x 1 meter excavation unit (EU-35) was placed from southeast to northwest across the wall and revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 122 and 123):

- Layer I (0-60cmbs)..... architectural layer with small to large piled 'a'ā cobbles.
- Layer II (60-65cmbs) dark yellowish brown (10YR 3/4) silt with organic debris on uneven 'a'ā bedrock.

Feature 293

Feature 293 is a square enclosure constructed of 'a'ā cobbles towards the southwestern portion of the project area (see Figure 76). The enclosure wall is 1.9 meters long by 1.9 meters thick and 50 centimeters above ground surface. Extensive modern-day activities in and around the feature have impacted the configuration and height of the enclosure wall as well as introduced recent items to the deposits, such as glass, plastic and metal containers, automobile parts, clothing, and fish remains.

A 2 x 1 meter excavation unit (EU-36) aligned south to north, was placed in the central portion of the enclosed space covered by inwardly collapsed wall remnants. EU-36 revealed the following stratigraphic profile with evidence of disturbance (Figures 124 and 125):

- Layer I (0-40cmbs).....architectural layer with piled small to large 'a'ā cobbles, 'ili'ili pebbles, coral, and marine shell.
- Layer II Level 1 (40-60cmbs)dark brown (10YR 3/3) silt with 30% 'a'ā gravel.
- Layer II Level 2 (60-80cmbs)dark brown (10YR 3/3) and brown (10YR 4/3) mottled silt on undulating 'a'ā bedrock.



Figure 118. SIHP Site 23686 Feature 81 EU-25 base of excavation, view to the northwest.

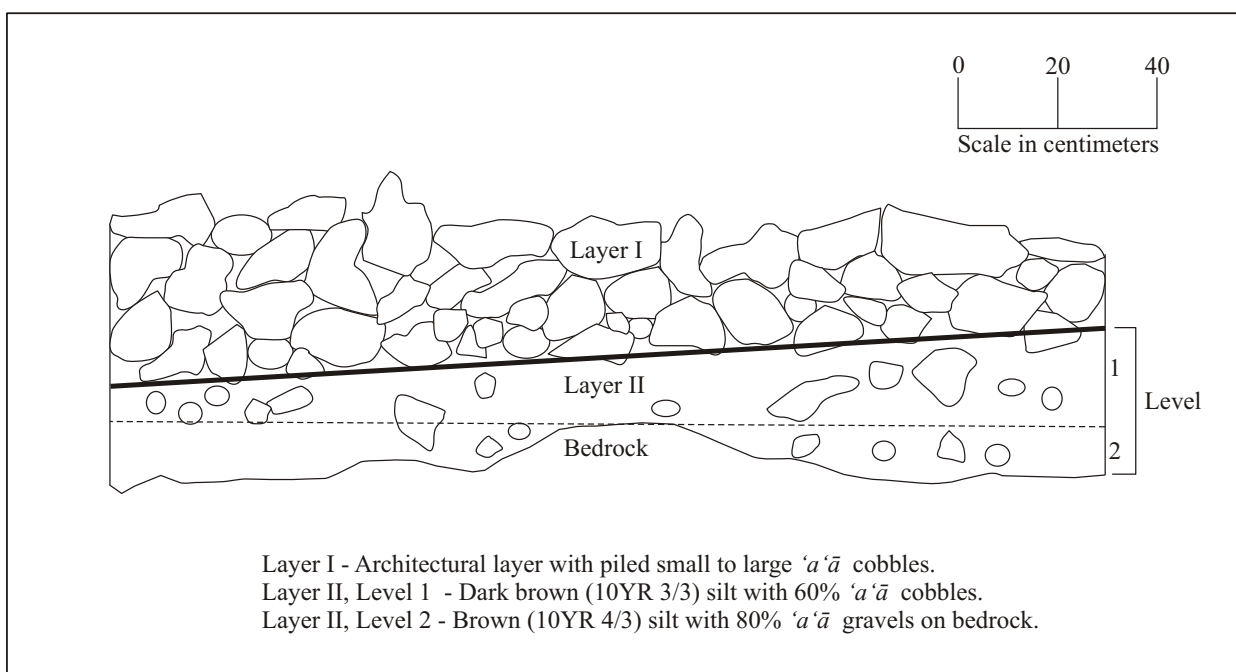


Figure 119. SIHP Site 23686 Feature 81 EU-25 northeast wall profile.



Figure 120. SIHP Site 23686 Feature 82 EU-26 base of excavation, view to the north.

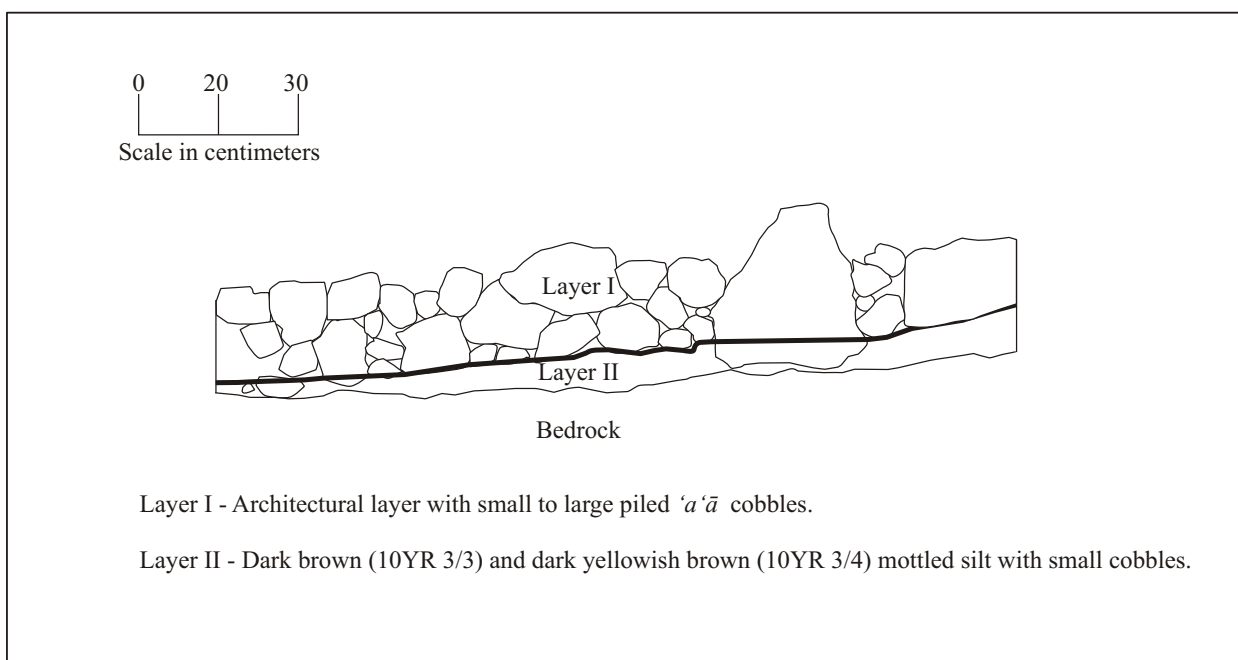


Figure 121. SIHP Site 23686 Feature 82 EU-26 north wall profile.



Figure 122. SIHP Site 23686 Feature 17 EU-35 base of excavation, view to the east.

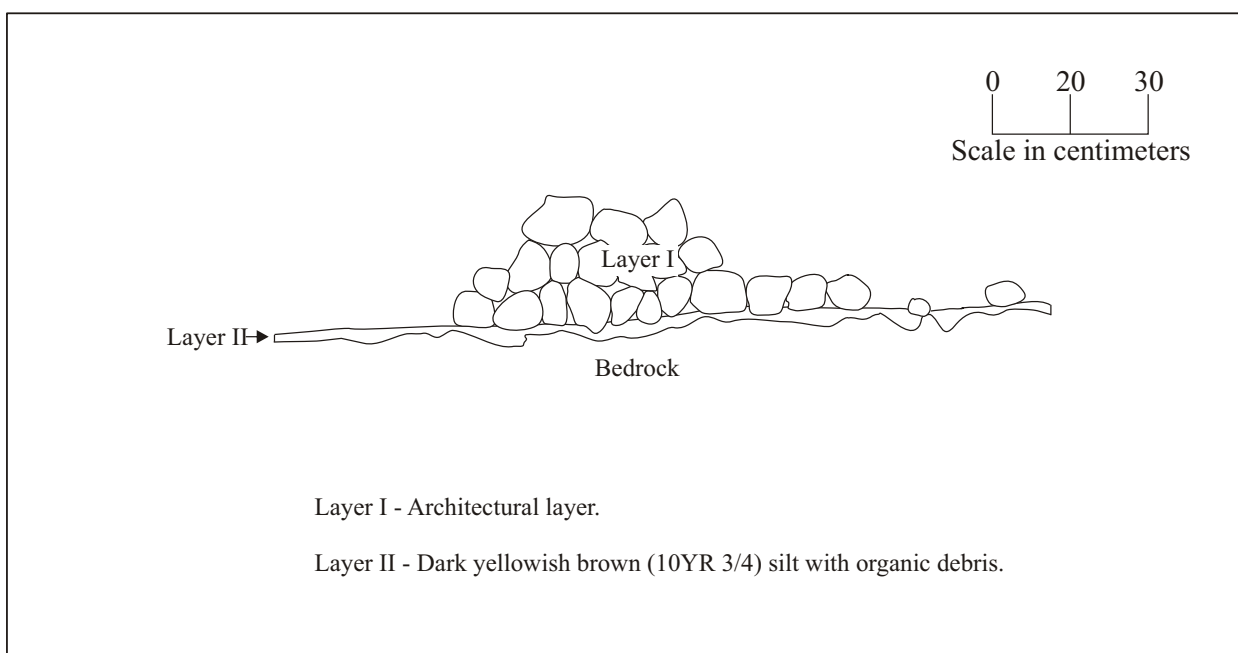


Figure 123. SIHP Site 23686 Feature 17 EU-35 northeast wall profile.



Figure 124. SIHP Site 23686 Feature 293 EU-36 base of excavation, view to the west.

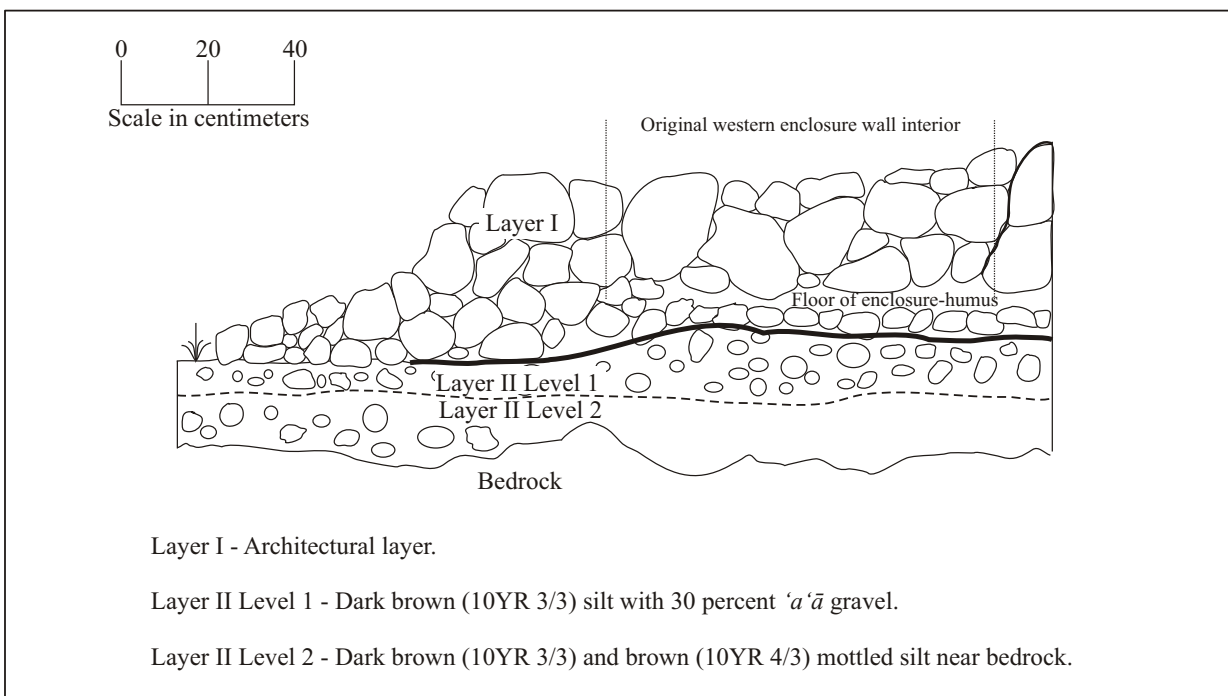


Figure 125. SIHP Site 23686 Feature 293 EU-36 west wall profile.

Items recovered from EU-36 include fish, *Cypraea* sp., coral, Echinoidea, *Sus* sp., *Rattus* sp., *kukui* nutshell, charcoal, a volcanic glass flake, and waterworn basalt (Table 35). Historic Period items include steel nuts, screws, nails, bottle glass, and a plastic container. A steel common nail (Acc # 530) from Level 1 in Layer II appears modern. It is 38.5 millimeters long, 6.3 millimeters wide, and 2.85 millimeters thick. A steel finish nail (Acc# 546) from Level 2 in Layer II also appears modern. This nail is 51 millimeters long, 4 millimeters wide, and 2.9 millimeters thick. And finally, a hexagonal steel nut (Acc# 532) from Level 1 in Layer II also appears modern. This nut is sheared and corroded on the inside. It is 13.7 millimeters long, 12.5 millimeters wide, and 8.9 millimeters thick. The recovery of Historic Period materials from the deepest levels within EU-36 indicate post-depositional disturbance.

Table 35. Recovered items from SIHP Site 23686, Feature 293, EU-36.

ACC#	Layer	Level	Material	Species/type	Count	MNI	Weight (g)
526	I	1	Marine shell	<i>Cypraea</i> sp.	1	1	8.3
525	I	1	Coral	Unidentified	3	-	16.1
524	I	1	Basalt	Waterworn	1	-	5.5
Layer I, Level 1 Total:					5	1	30
533	II	1	Fish bone	Unidentified	2	-	0.3
527	II	1	Basalt	Waterworn	22	-	47.1
535	II	1	Organic	<i>Kukui</i> nutshell	1	1	0.9
528	II	1	Organic	Charcoal	-	-	1.8
530	II	1	Metal	Steel nail	1	-	1.5
531	II	1	Metal	Iron fragments rusted	43	-	15.6
532	II	1	Metal	Steel nut	1	-	6.1
534	II	1	Glass	Brown bottle	3	-	4.8
536	II	1	Glass	Clear thin fragments	4	-	3.3
537	II	1	Glass	Clear thick fragments	2	-	0.7
538	II	1	Glass	Light green bottle	2	-	0.7
539	II	1	Glass	Clear fragments	2	-	1.1
529	II	1	Synthetic	Plastic container	9	-	4.9
Layer II, Level 1 Total:					92	1	89
552	II	2	Fish bone	Unidentified vertebrae	1	-	1.8
553	II	2	Fish bone	Unidentified	1	-	0.2
545	II	2	Marine shell	<i>Cypraea</i> sp.	1	1	3.0
544	II	2	Coral	Unidentified	4	-	1.7
556	II	2	Echinoderm	Echinoidea	1	-	>0.1
541	II	2	Mammal bone	<i>Sus</i> sp. rib	2	1	6.4
551	II	2	Mammal bone	<i>Rattus</i> sp. jaw	1	1	0.1
542	II	2	Basalt	Waterworn	13	-	24.1
550	II	2	Volcanic glass	Flake	1	-	0.5
543	II	2	Organic	<i>Kukui</i> nutshell	1	-	0.9
561	II	2	Organic	Charcoal	4	-	0.2
540	II	2	Metal	Iron fragments rusted	57	-	33.4
546	II	2	Metal	Steel finish nails	3	-	5.6
555	II	2	Metal	Steel screw	1	-	3.8
547	II	2	Glass	Clear bottle fragments	8	-	10.5
548	II	2	Glass	Light green bottle	3	-	5.8
549	II	2	Glass	Brown bottle	6	-	2.5
554	II	2	Glass	Clear fragments	5	-	4.2
557	II	2	Glass	Clear fragment	1	-	2.7
558	II	2	Glass	Clear fragment	1	-	0.3
559	II	2	Synthetic	Plastic	4	-	0.9
560	II	2	Synthetic	Plastic	9	-	0.8
Layer II, Level 2 Total:					128	3	109
EU-36 Total:					225	5	228

Charcoal collected from Layer II Level 1 of EU-36, Feature 293, was submitted for radiocarbon assaying. The sample (Beta-212770) intercepts the tree-ring calibration curve at AD 1410 and has a 2-sigma standard deviation calibrated date range of AD 1290 to 1480.

Feature 294

Feature 294 is a square enclosure constructed of loosely piled 'a'ā cobbles. The feature is located towards the southwestern portion of the project area (see Figure 76). The enclosure wall is two meters long by two meters thick and 60 centimeters above ground surface. Extensive modern-day activities in and around the feature have impacted the configuration and height of the enclosure wall as well as introduced recent items to the architectural layer, such as glass, plastic and metal containers, and automobile parts.

A 2 x 1 meter excavation unit (EU-37), aligned west to east, was placed across Feature 294, including the enclosed space and the surrounding wall. EU-37 revealed the following stratigraphic profile (apart from the modern items, the deposits yielded no cultural items) (Figures 126 and 127):

Layer I (0-40cmbs).....architectural layer with piled small to large 'a'ā cobbles and a few small boulders.
 Layer II (40-42cmbs)dark brown (10YR 3/3) silt on uneven 'a'ā bedrock.

Feature 212

Feature 212 is a linear terrace constructed of very loosely piled *pāhoehoe* cobbles. The feature is located in the north-central portion of the project area (see Figure 76). The terrace wall is 5.2 meters long by 1.4 meters thick and 50 centimeters high. The orientation of the wall is southwest to northeast.

A 2 x 1 meter excavation unit (EU-38), aligned southeast to northwest, was placed perpendicularly across Feature 212. EU-38 revealed the following stratigraphic profile (the deposits yielded no cultural items) (Figures 128 and 129):

Layer I (0-10cmbs).....architectural layer with loosely piled *pāhoehoe* cobbles.
 Layer II (10-20cmbs)dark brown (10YR 3/3) silt on uneven *pāhoehoe* bedrock.



Figure 126. SIHP Site 23686 Feature 294 EU-37 base of excavation, view to the south.

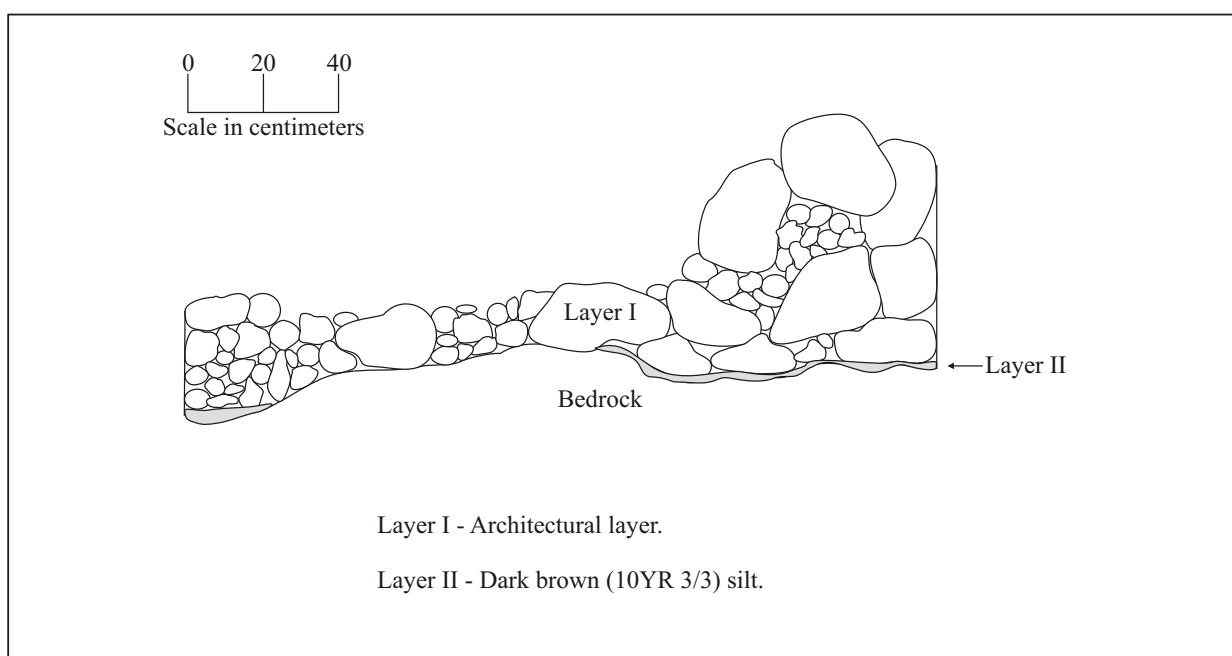


Figure 127. SIHP Site 23686 Feature 294 EU-37 south wall profile.



Figure 128. SIHP Site23686 Feature 212 EU-38 base of excavation, view to the southwest.

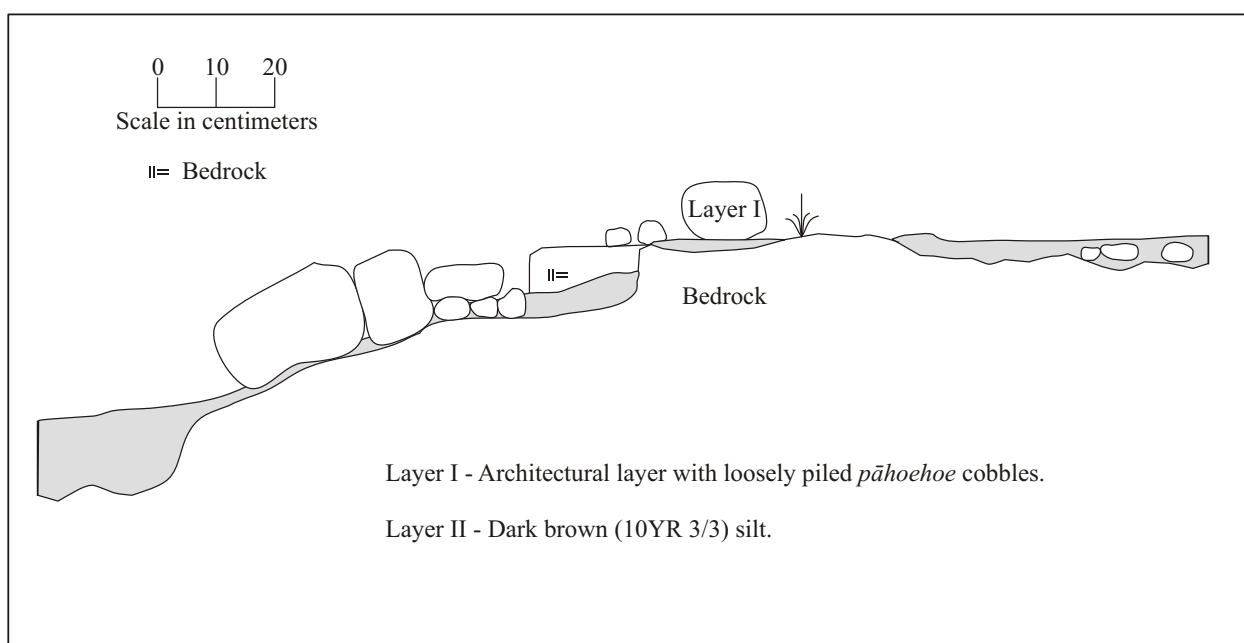


Figure 129. SIHP Site23686 Feature 212 EU-38 southwest wall profile.

SYNTHESIS OF EXCAVATION RESULTS

Introduction

The following synthesis considers together the results from the inventory survey and from the data recovery work. The synthesis is presented to evaluate the hypotheses outlined in the research objective. First, as far as radiocarbon assays and cross-dating evidence allow, habitation and agricultural sites and features are ordered within a chronological framework. Secondly, the identity and function of roughly contemporaneous habitation and agricultural sites and features are interpreted in terms of architectural criteria and associated items. Once roughly contemporary sets of habitation and agricultural sites and features and associated items are compared and contrasted with sets from different periods, it would be possible to evaluate the primary hypothesis. The primary research question was to determine if short term habitation and associated opportunistic agriculture was indeed followed by recurrent habitation and associated formal agriculture and finally by more consistent habitation with associated household gardens and animal pens. Changes in resource exploitation through time are also considered as is an assessment of tentatively identified permanent and temporary habitation features, and agricultural features.

Site and Feature Chronology

Altogether, seventeen charcoal samples were submitted for radiocarbon assaying (Table 36). Of these, two were previously submitted samples from Test Units 13 and 16. Of the remaining fifteen, eleven came from suspected habitation features and four came from suspected agricultural features.

Table 36. Charcoal samples submitted for radiocarbon assaying, by laboratory number.

Beta-	RC-	Site	Feature	EU	Layer	Level	Measured BP	Standard Deviation	13C/12C	Conventional BP
175916	-	23672	B	TU-13	I	-	-	-	-	210
175917	-	23677	A	TU-16	I	-	-	40	-	160
212756	0223-10	23671	-	4	I	2	340	40	-23.1‰	370
212757	0223-43	23686	247	5	II	2	350	40	-26.9‰	320
212758	0223-98	23675	-	10	I	in situ	100	40	-21.7‰	150
212759	0223-130	23675	-	10	II	3	190	80	-26.2‰	170
212760	0223-150	23686	250	11	II	2	300	40	-27.4‰	260
212761	0223-160	23686	254	12	II	2	250	40	-24.4‰	260
212762	0223-209	23678	-	14	I	2	200	40	-24.1‰	210
212763	0223-298	23676	-	21	I	-	390	60	-23.4‰	410
212764	0223-314	23676	-	21	II	1	410	70	-25.4‰	410
212765	0223-332	23676	-	21	II	2	340	60	-25.1‰	340
212766	0223-378	23677	A	22	II	1	60	40	-24.1‰	70
212767	0223-409	23677	A	22	III	3	120	40	-22.6‰	160
212768	0223-474	23673	B	29	II	3	400	80	-22.5‰	440
212769	0223-498	23673	B	29	II	4	300	50	-24.4‰	310
212770	0223-528	23686	293	36	II	1	520	80	-23.5‰	540

Table 37 presents the calibrated dates sequentially, starting with the most recent ones and moving back in time. The two calibrated dates from EU-22 (i.e., Feature A of Site 23677) appear to match the stratigraphy in terms of chronological succession; charcoal from Layer II Level 1 is slightly younger than charcoal from Layer III Level 3. The two calibrated dates from EU-10 (i.e., Site 23675) are similarly compatible with stratigraphic depth; charcoal from Layer I is younger than charcoal from Layer II Level 3. However, the three radiocarbon dates from EU-21 (i.e., Site 23676) appear to be jumbled when viewed in their stratigraphic contexts; Layer II Level 1 is sandwiched between Layer I and Layer II Level 2 has yielded the earliest charcoal, whereas the charcoal from the deepest the three proveniences (i.e., Layer II Level 2) is the most recent. Two charcoal dates from EU-29 (i.e., Feature B of Site 23673) are also inverted; Layer II Level 3 contained older charcoal than the underlying Level 4. The calibrated standard

deviation ranges of the dates from each of these four excavation units (i.e., EU-10, EU-21, EU-22, and EU-29) overlap within the same unit, suggesting that the dates represent different estimates of a site's occupation. Of the four sites, the dates from Site 23676 and Site 23677 appear to have the tightest range (Figure 130). The ostensibly “inverted” dates could actually be the result of fluctuations in counting radioactive carbon instead of stratigraphic disturbance or post-depositional movement of charcoal. Indeed, “split dates” of the same charcoal sample are known to produce slightly different results, not unlike the overlapping but tight range of variation as exhibited by the three dates from EU-21 in Site 23676.

Table 37. Calibrated radiocarbon dates by increasing age.

Beta-	Site	Feature	EU	Layer	Level	Conventional AD	AD intercept(s)	2- σ calibration
212766	23677	A	22	II	1	1880	1950	1680-1960
212767	23677	A	22	III	3	1790	1680/1740/1800/1930/1950	1660-1950
175917	23677	A	TU-16	I		1790	1680/1740/1800/1930/1950	1660-1950
212762	23678	-	14	I	2	1740	1660	1640-1950
212758	23675	-	10	I	in situ	1800	1680/1740/1810/1930/1950	1660-1950
212759	23675	-	10	II	3	1780	1680/1770/1800/1940/1950	1520-1960
212760	23686	250	11	II	2	1690	1650	1520-1950
212761	23686	254	12	II	2	1690	1650	1520-1950
175916	23672	B	TU-13	I		1740	1660	1510-1950
212756	23671	-	4	I	2	1580	1490	1440-1640
212765	23676	-	21	II	2	1610	1520/1590/1620	1440-1660
212763	23676	-	21	I	-	1540	1460	1420-1640
212764	23676	-	21	II	1	1540	1460	1410-1650
212769	23673	B	29	II	4	1640	1530/1550/1630	1460-1660
212768	23673	B	29	II	3	1510	1440	1320-1640
212757	23686	247	5	II	2	1630	1530/1560/1630	1460-1660
212770	23686	293	36	II	1	1410	1410	1290-1480

A “best estimate” age of different radiocarbon dates from the same unit or the same feature can be derived from calculating a weighted average of the dates and then calibrate the weighted average against the tree-ring calibration curve (Table 38, Figure 131). Judging from roughly contemporary calibration intercepts (which, by the way, do not necessarily represent the most probable date) and from similarities in the calibrated standard deviation ranges, four phases, labeled A to D, appear to be represented. The breaks between the phases are somewhat arbitrary, especially considering overlaps in standard deviation ranges. Nonetheless, for comparative purposes and for the detection of possible habitation and agricultural trends through time, grouping together roughly contemporary sites and features can be useful.

Table 38. Single and weighted average calibrated radiocarbon dates by increasing age.

Site	Feature	Unit (x dates per unit)	Layer	Level	AD multiple date weighted average and single date calibration intercept(s)	AD calibrated 2- σ range	Phase
23677	A	EU-22 (x2) and TU-16	I-III	1-3	1690/1730/1810/1920/1950	1690-1950	D
23678	-	EU-14	I	2	1660	1640-1950	D
23675	-	EU-10 (x2)	I-II	3	1690/1740/1800/1930/1950	1670-1950	D
23686	250	EU-11	II	2	1650	1520-1950	C
23686	254	EU-12	II	2	1660	1510-1950	C
23672	B	TU-13	I		1660	1510-1950	C
23686	247	EU-5	II	2	1530/1560/1630	1460-1660	B
23671	-	EU-4	I	2	1490	1440-1640	B
23676	-	EU-21 (x3)	I-II	1-2	1470	1450-1620	B
23673	B	EU-29 (x2)	II	3-4	1500	1470-1630	B
23686	293	EU 36	II	1	1410	1290-1480	A

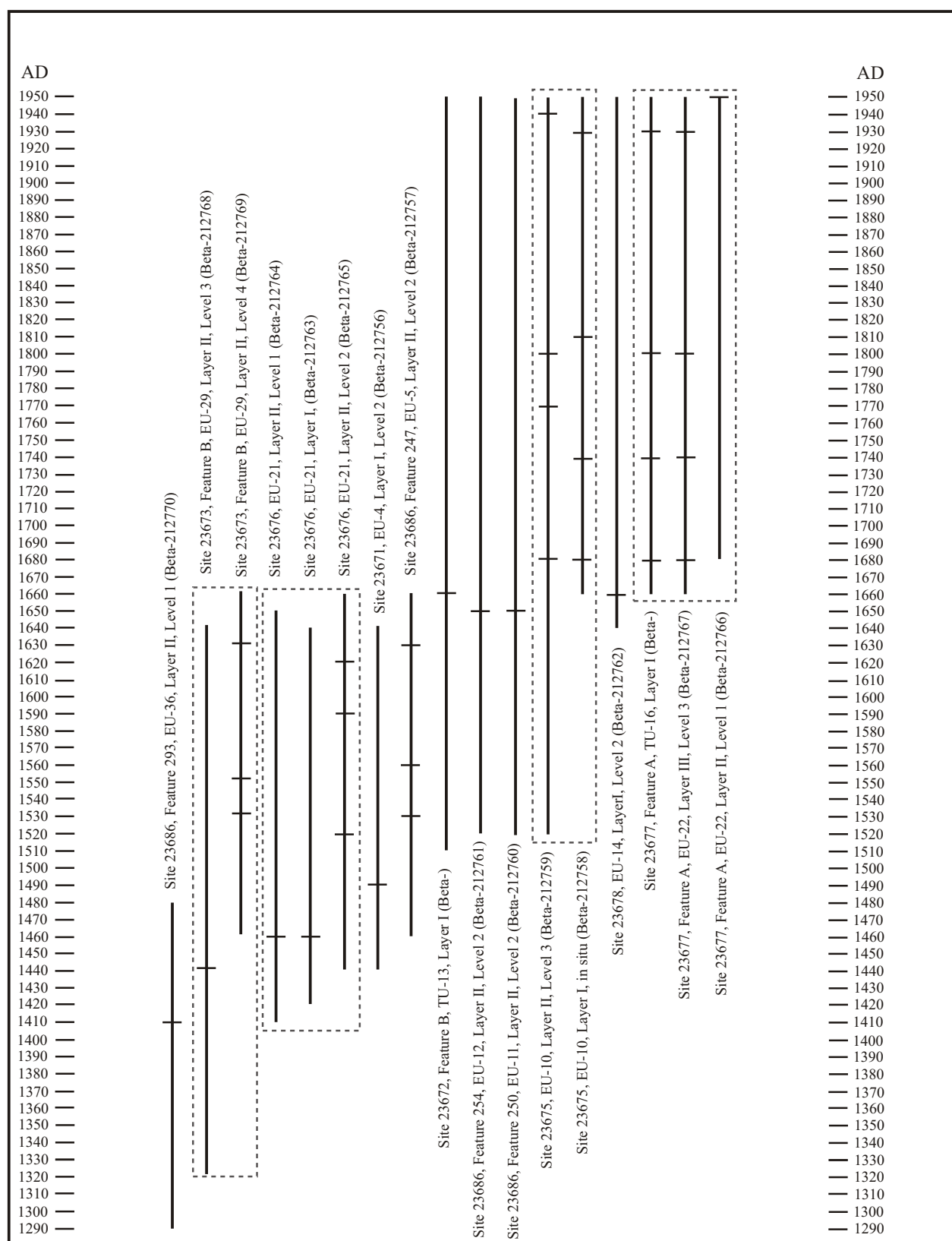


Figure 130. Diagrammatic representation of calibrated radiocarbon dates.

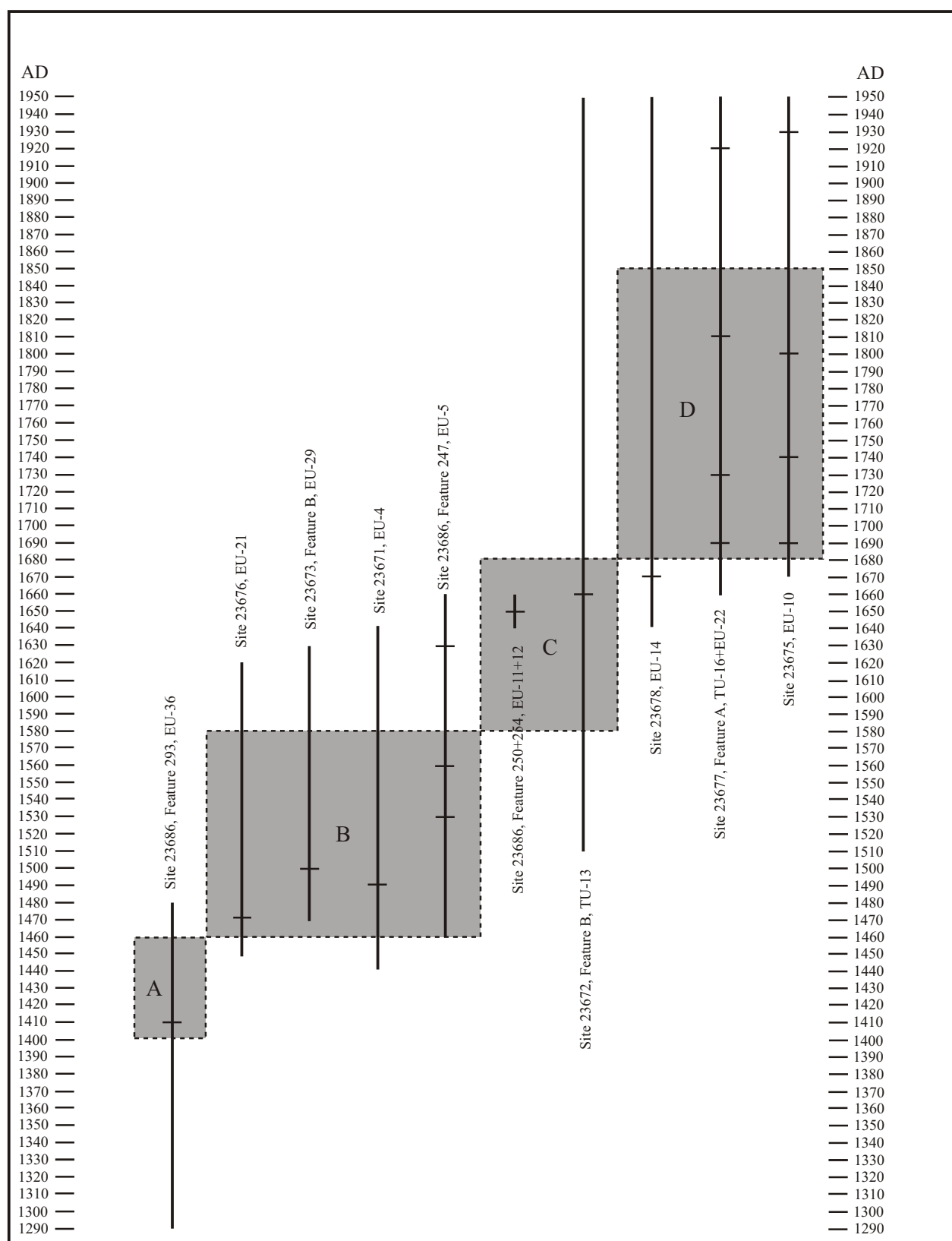


Figure 131. Diagrammatic representation of calibrated weighted averages with proposed phases.

Based on the information in Table 38 and Figure 129, the suggested phases probably span the following four somewhat arbitrary time periods: Phase A from AD 1400 to AD 1460, Phase B from AD 1460 to AD 1580, Phase C from AD 1580 to AD 1680, and Phase D from AD 1680 to AD 1850. The AD 1850 cut-off date is based on the probable AD 1830 to AD 1850 time range for the inscribed brass button from EU-31 in Feature A of Site 23670. Albeit overlapping and probably representing a gradual development, the phases are used as heuristic devices to help detect similarities and differences of site use and recovered items through time.

SITE AND FEATURE FUNCTION

Now that the time periods have been established in broad outline, roughly contemporary sites and features can be grouped by phase and then compared to sites and features from different phases. Doing this would help determine if the primary hypothesis is valid or if it needs modification. To re-iterate, this hypothesis states that: The first use was for short term habitation and associated opportunistic agriculture, followed by formal agriculture and associated recurrent habitation, then the end of the sequence is marked by more consistent habitation with associated household gardens and animal pens.

Starting with the earliest dated feature in the project area and then progressively moving towards the Historic Period, the following discussion synthesizes the field and laboratory results, first on a intra-site feature-by-feature basis and then on a inter-site settlement level. Undated features and sites are lumped with dated features and structures whenever possible, using criteria such as spatial proximity (i.e., closely juxtaposed sites are likely to be contemporary), architectural connectedness (e.g., a wall surrounding a platform), similarity and/or relatedness of recovered items, and related feature types as suggested in the ethnographic record (cf. primarily Handy and Handy 1972).

Phase A (ca. AD 1400-1460)

Two features associated with the earliest dated evidence of occupation within the project area are Feature 293 and the nearby Feature 294 of Site 23686. Both features, which are located near the southwestern corner of the project area (Figure 132), have been preliminary identified as being related to agricultural activities. Almost five meters of empty ground separate the features, both of which are square enclosures of roughly equal size (i.e., approximately 4 m²). Both features also have been disturbed somewhat by modern-day activities and are covered in recent refuse, such as glass, plastic and metal containers, and automobile parts. The features also have a similar architectural layer comprised of 'a'ā cobbles and small boulders, roughly 40 centimeters thick. Considering the generally similar size, shape, architectural attributes, and deposits from Features 293 and 294, it is proposed that the two are roughly contemporary (i.e., the charcoal date from Feature 293 is plausibly an indicator of Feature 294's antiquity).

In spite of these similarities between the two features some differences are also apparent. First, the thirty-centimeter thick dark brown (10YR3/3) silt layer within Feature 293 far exceeds the two-centimeter thick silt layer within Feature 294. Secondly, Feature 293 showed signs of once having had a pavement of 'ili'ili pebbles, coral, and marine shell, which was absent within Feature 294. And finally, Feature 293 yielded ten different kinds of items, mostly from the silt layer, whereas Feature 294 yielded no items (Table 39). Overall then, Feature 293 appears to have been more elaborate and used more extensively than the nearby Feature 294. Whether these differences translate into significant chronological differences is not certain, although it is proposed here that the differences probably have more to do with different functions, intensity of use, and/or persistence of use than with time differences.

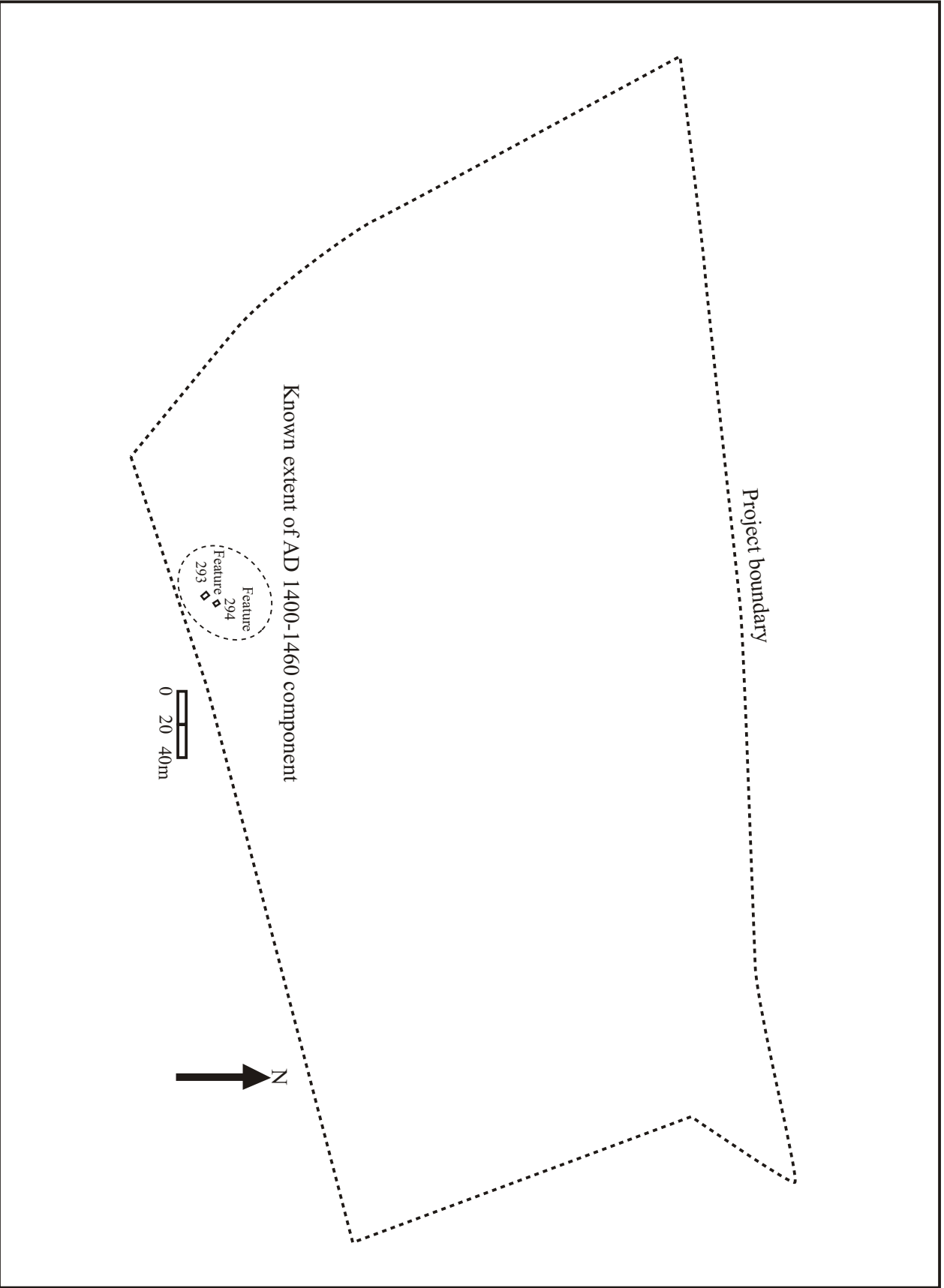


Figure 132. Probable extent of known Phase A features.

As can be seen in Table 39, items recovered from Feature 293 include fish, *Cypraea* sp., coral, Echinoidea, pig, rodent, *kukui* nutshell, wood charcoal, volcanic glass flakes, and waterworn basalt. These items indicate that resources from the ocean, rocky coast line, local area, and interior were utilized (no beach shells were recovered). The presence of pig remains suggests the possibility that males used the structure. Based on its small size and the comparatively low combined weight of recovered items per square meter (i.e., 58.2 g), the structure was most likely used on an intermittent or temporary basis. Being isolated in the *kula* zone during this relatively early period, suggests that Feature 293 was probably used by men cultivating fields away from the main habitation area. The nearby Feature 294 was probably used for a shorter period or as temporary sleeping quarters. Whatever the case might have been, the available radiocarbon and site functional evidence suggests that the initial fifteenth century AD occupation of the project area was restricted and temporary.

Table 39. Weight (grams) of recovered items from Phase A features.

Site	Feature	Unit	Fish UID	<i>Cypraea</i>	Branch coral	Echinoidea	Pig	Rodent	<i>Kukui</i> nutshell	Charcoal	Volcanic glass flake	Basalt waterworn	Total
23686	293	E36	2.3	8.6	17.8	0.1	6.4	0.1	1.8	2	0.5	76.7	116.3
23686	294	E37	-	-	-	-	-	-	-	-	-	-	-

Phase B (ca. AD 1460-1580)

The five features that can be associated with the second oldest period of occupation within the project area are the following: (1.) the Site 23676 platform, (2.) the Feature B enclosure of Site 23673; (3.) the Feature A platform of Site 23673; (4.) the Site 23671 platform, and (5.) the Feature 247 terrace within Site 23686. Considering that Features B and A of are part of one Site 23673 and that Site 23671 and Feature 247 are neighbors (an approximately 15 m gap separates 23671 and 247) with virtually identical radiocarbon dates, the following three separate sites can be said to be presented during Phase B: (1.) Site 23676; (2.) Site 23673, and (3.) Site 23671/Feature 247. Viewed together, these three sites extend from the southeast to the northwest, more-or-less within the southeastern portion of the project area (Figure 133).

Based on the kinds and weight of items recovered, plus considerations of feature shape and size, the function of each feature can be inferred. First, the presence of certain animal species and artifacts are indicative of the highly gendered dietary and activity “preferences” in Hawaiian culture. Shark, tuna, chicken, pig, and dog remains particularly indicate male consumption, activities, and rituals. According to Malo (1951), prior to 1819 shark meat was *kapu* for Hawaiian women. The recovery of a burnt shark tooth from Site 23676 could be the remains of a meal or a discarded tool (see Table 40). Malo (1951) notes that tuna, or ‘*ahi*, was particularly favored by men of high status. The concentration of tuna remains within the Feature B enclosure of Site 23673 is suggestive that the feature was used by high status males. The recovery of pig and dog remains from the same Feature B underscores its male association. The recovery of pig, dog, and bird (chicken?) remains from Site 23676 (Table 40) is also significant in this regard; all three animal species were consumed as food by men or used as offerings to the family ancestor spirits in the *hale mua* (Handy and Handy 1972:24, 252, 256, 387). Even after the early nineteenth century abolition of the *kapu* against women eating pig and dog, these animals were still considered a favorite among men (ibid. 245). Moreover, according to Handy and Handy (1972:301) fishing and the making of fishing gear were essentially male activities. The *Cypraea* sp. shell lure from Site 23676 is an example of a composite fishing tool that took some time and skill to manufacture. The entire composite tool was lowered on a line from a canoe to the ocean floor, where the cowry lure attracted octopus (Kirch 1997:203-204). The recovery of fishing gear, albeit minimal, suggests that at least some of the men who cultivated the *kula* zone also fished in the ocean. Bone awls recovered from Sites 23676 and 23673 further suggest male-related activities in these two locales.

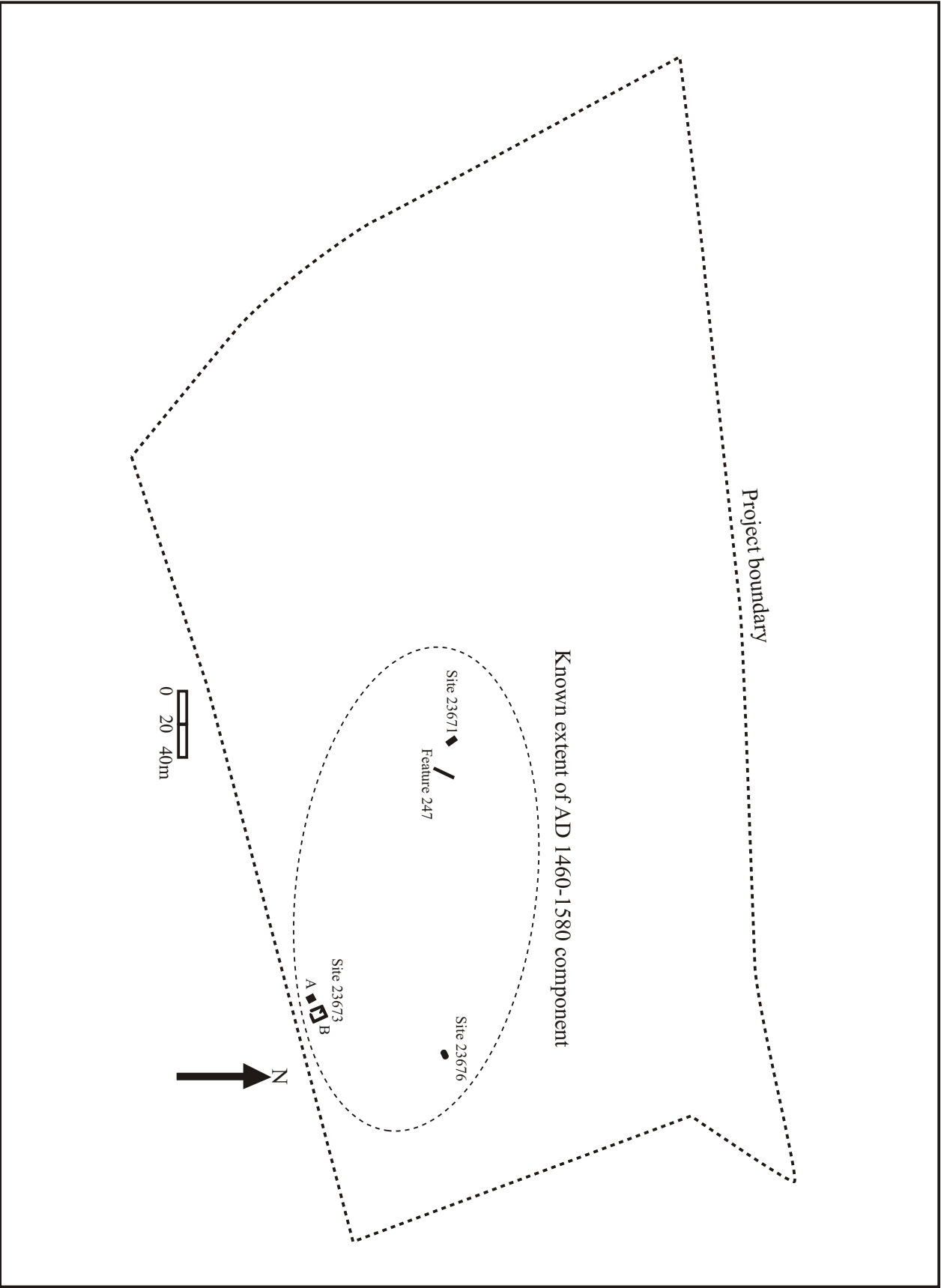


Figure 133. Probable extent of known Phase B sites and features.

Table 40. Weight (grams) of recovered fish, fishing gear, and land animals from Phase B features.*

Site	Feature	Unit	Tuna	Shark	Fish Scariidae	Fish UID	He'e lure	Avian bone	Pig	Dog	Rodent	Mammal bone	Medium mammal bone cut	Small mammal	Small mammal bone owl	Small mammal worked bone
23676	-	E21	-	0.5	-	-	-	0.2	8.8	1.7	0.2	1	0.4	-	3.2	-
23676	-	T18	-	-	0.1	-	32.0	-	1.4	-	0.3	-	-	0.8	-	-
23673	B	E29	0.8	-	-	0.1	-	-	2.2	-	-	-	-	-	0.7	-
23673	B	E30	9.1	-	-	-	-	-	-	0.2	0.1	-	-	4.7	-	13
23673	A	E27	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23673	A	E28	-	-	-	1	-	-	-	-	0.4	-	-	-	-	-
23673	A	T17	-	-	4.2	-	-	-	-	-	0.2	-	-	-	-	-
23671	-	E04	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-
23686	247	E05	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*male related items are shaded

Of note is the absence of male-related remains from Site 23671 and from the contemporary Feature 247 (Table 40), suggesting some other function for these two features which will be discussed below. Although the Feature A platform at Site 23673 also lacks male-related items, its proximity to the Feature B enclosure suggests that the platform and enclosure are related. Indeed, the high combined average weight of recovered items per square meter (i.e., 104 g) from the three Feature A units is higher than that for the average per square meter weight from the nearby two Feature B units (i.e., 40.2 g). The average mass of recovered items from the Feature A platform, however, is less than that from the Site 23676 platform (i.e., 115 g). The deposits within both platforms are dark in color, suggesting some kind of cooking residue. But perhaps more importantly, the Feature A and Site 23676 platforms have similar rectangular shapes, even though Feature A (i.e., 26.5 m²) is somewhat bigger than Site 23676 (i.e., 18 m²). Based on the similar architecture and deposits of the platforms at Feature A and Site 23676, it is suggested that they could have functioned primarily as cooking areas for male consumption, whereas Feature B of Site 23673 was actually a *hale mua* structure in which males consumed and discarded their food. The partition wall within this Feature B, together with a branch coral on the wall and tuna remains, suggests that it was a comparatively important structure in the project area, perhaps with a shrine-like area behind the partition. The absence of pig and dog remains at Feature A could be that these prestige animals were all taken to the nearby Feature B for consumption, whereas the more isolated location Site 23676 meant that the pigs and dogs cooked on site were also consumed and discarded on site. Sites 23676 and 23673 are contemporary in terms of the radiocarbon time-scale, so it is likely that they existed on the landscape at roughly the same time, perhaps serving different sections of the work force. Alternatively, Site 23676 could be slightly earlier than the more elaborate Site 23673. If this was indeed the scenario, then the addition of an enclosure next-to the platform at Site 22673 could signify the beginning of settling down in the project area.

The more-or-less simultaneous appearance of the Site 23671 platform and Feature 247 terrace wall roughly 180 meters northwest of Site 23673 is an additional sign of filling-in of the landscape. Albeit disturbed, the intact portions of the Site 23671 platform exhibits a level surface paved with small 'a'ā cobbles. Although the size of this platform (i.e., 26.2 m²) is somewhat small for a *hale noa* sleeping hut, it could indeed have served as the foundation of a somewhat temporary hut. The brown (10YR 4/3) deposits within the platform were slightly lighter than the very dark gray brown (10YR 3/2) silt within the *hale mua* features discussed above, suggesting less cooking activities inside the platform. But perhaps more importantly, the excavation unit within Site 23671 only yielded a total of 27.2 grams of items per square

meter. The nearby contemporary terrace wall midden yielded 37.4 grams. This comparatively low mass of items recovered suggests far less food preparation, consumption, and discard at this proposed *hale noa* locale than the *hale mua* area to the southeast and east.

Nonetheless, as can be seen in Tables 41 to 43, the shell and lithic items recovered from the proposed *hale noa* and associated wall midden broadly match those from the contemporary *hale mua*. A variety of shells from a rocky coastline, corals, Echinoidea, beach shells, *kukui* nutshell, wood charcoal fragments, volcanic glass flakes, and waterworn basalt came from all the features dating to Period B. These items indicate that resources from the ocean, rocky coastline, beach, local area, and interior were utilized.

Table 41. Weight (grams) of recovered rocky shore shell from Phase B features.

Site	Feature	Unit	<i>Serpulorhis</i> sp.	<i>Trochus</i> sp.	<i>Cypraea</i> sp.	<i>Drupa</i> sp.	<i>Morula</i> sp.	<i>Cellana</i> sp.	<i>Isognomon</i> sp.	<i>Chama</i> sp.	<i>Nerita</i> sp.	<i>Strombina</i> sp.	<i>Thais</i> sp.	
23676	-	E21	4.1	-	160.2	26.8	4.3	4.1	-	4.0	0.6	-	-	<i>hale mua</i> kitchen
23676	-	T18	-	-	44.7	0.1	-	0.5	-	-	0.3	0.3	-	
23673	B	E29	-	0.3	151.2	0.6	-	-	1.2	-	0.3	-	0.5	<i>hale mua</i>
23673	B	E30	-	-	-	1.9	-	-	-	-	-	-	-	
23673	-	E27	-	-	3.9	-	-	-	0.2	-	-	-	-	
23673	A	E28	-	-	19.5	0.9	-	-	-	-	-	-	-	<i>hale mua</i> kitchen
23673	A	T17	-	-	16.6	1.0	-	0.5	-	-	0.4	-	-	
23671	-	E04	-	-	41.8	4.8	2.7	-	5.8	-	0.4	-	-	<i>hale noa</i>
23686	247	E05	-	-	37.8	2.8	-	0.7	-	-	-	-	-	<i>hale noa</i> boundary

Table 42. Weight (grams) of recovered coral, Echinoidea, and beach shell from Phase B features.

Site	Feature	Unit	Coral abrader	Branch coral	Echinoidea	Turbo	Nassarius	Brachidontes	Fimbria sp.	Conus	Mitra sp.	Terebra sp.	Shell UID	
23676	-	E21	-	168.0	4.2	-	6.6	-	0.3	4.9	-	-	8.2	<i>hale mua</i> kitchen
23676	-	T18	-	-	4.4	-	-	-	-	0.2	-	-	1.3	
23673	B	E29	-	68	33.5	-	-	-	-	0.9	-	-	4.9	<i>hale mua</i>
23673	B	E30	-	8.7	0.1	-	-	-	-	-	-	-	-	
23673	A	E27	-	113.3	0.8	-	-	-	2.6	-	-	-	0.7	
23673	A	E28	17.8	131	1.9	-	-	-	-	-	0.1	0.05	3.9	<i>hale mua</i> kitchen
23673	A	T17	-	29.1	11.0	-	-	-	-	2.1	-	-	-	
23671	-	E04	-	3.8	28.1	0.5	-	7.2	-	3.7	-	-	0.4	<i>hale noa</i>
23686	247	E05	-	10.9	-	-	-	-	-	-	-	-	-	<i>hale noa</i> boundary

Table 43. Weight (grams) of recovered plants and lithics from Phase B features.

Site	Feature	Unit	Kukui nutshell	Charcoal	Basalt flake	Volcanic glass flake	Volcanic shatter	Basalt waterworn	
23676		E21	8.2	10.4	-	40.6	-	-	<i>hale mua</i> kitchen
23676		T18	6.9	0.7	-	11.0	-	-	
23673	B	E29	-	10.4	-	4	-	-	<i>hale mua</i>
23673	B	E30	4.2	-	-	-	-	-	
23673	A	E27	7.2	0.4	-	4.2	35	51.4	<i>hale mua</i> kitchen
23673	A	E28	0.4	0.3	5.7	1.5	12.6	-	
23673	A	T17	6.3	-	-	23.7	-	-	
23671		E04	-	2.1	7.2	-	-	-	<i>hale noa</i>
23686	247	E05	7	3.3	10.9	1.4	-	-	<i>hale noa</i> boundary

Based on the evidence then, the following two main categories of features were used during Phase B: (1.) *hale mua* male eating house (Feature B walled structure of Site 23673) and *hale mua* kitchen (Feature A platform of Site 23673 and platform at Site 23676); and (2.) *hale noa* sleeping house (platform at Site 23671) and the possibly related *hale noa* midden that accumulated within the nearby agricultural terrace (Feature 247 of Site 23686). Furthermore, the appearance of a terrace wall, albeit diagonal to later *kuaiwi* walls, shows that by the late fifteenth to early sixteenth centuries, agricultural land started to have short partitions, in this case seemingly some kind of a boundary wall between the *hale noa makai* and *hale mua mauka*.

Phase C (ca. AD 1580-1680)

The seven features that can be associated with the third phase of occupation within the project area are the following: (1.) the Feature 250 pavement within Site 23686; (2.) the Feature 254 terrace within Site 23686; (3.) possibly the Site 23674 articulated platform and circular enclosure; (4.) the Feature A enclosure of Site 23672; (5.) the smaller Feature B enclosure of Site 23672; (5.) possibly the Feature 289 pavement within Site 23686; and (6.) possibly the large Feature 282 pavement within Site 23686. Although Site 23674 has not been dated, its placement between the contemporary Features 250/254 *mauka* and Site 23672 *makai* suggests that Site 23674 belongs to the same period. The observation that Features 282 and 289 fall on the *mauka* end of the same line tentatively suggests that they too date to Phase C, although this is less certain.

Considering that 20 meters separates Features 250 and 254 that have virtually identical radiocarbon dates, these two features are treated as part of one site, labeled Feature 250/254. Also considering that six meters separate Features A and B of Site 23672, this site too is treated as one entity. The following five sites can then be said to be present during Phase C: (1.) Feature 250/254; (2.) Site 23674; (3.) Site 23672; (4.) Feature 289; and (5.) Feature 282. Viewed together, these five sites form a long line that stretches west to east along the east-central portion of the project area (Figure 134).

Based on the kinds and weight of items recovered and on considerations of feature shape and size, the function of each Phase C feature is interpreted. The recovery of pig and dog from Features 250/254 (Table 44) suggests that males cooked, consumed, and discarded food in these structures. However, the average weight per square meter of all the items recovered from Features 250/254 is comparatively light (i.e., 18 g). This suggests that the fairly small Feature 250 platform (i.e., 4.5 m²) was only a temporary or short-term cooking and/or eating house, perhaps catering for men laboring in the fields. The contemporary south to north aligned Feature 254 terrace wall probably marked a boundary *mauka* of this small platform (reminiscent of the earlier Feature 247 terrace wall *mauka* of the Site 23671 *hale noa*).

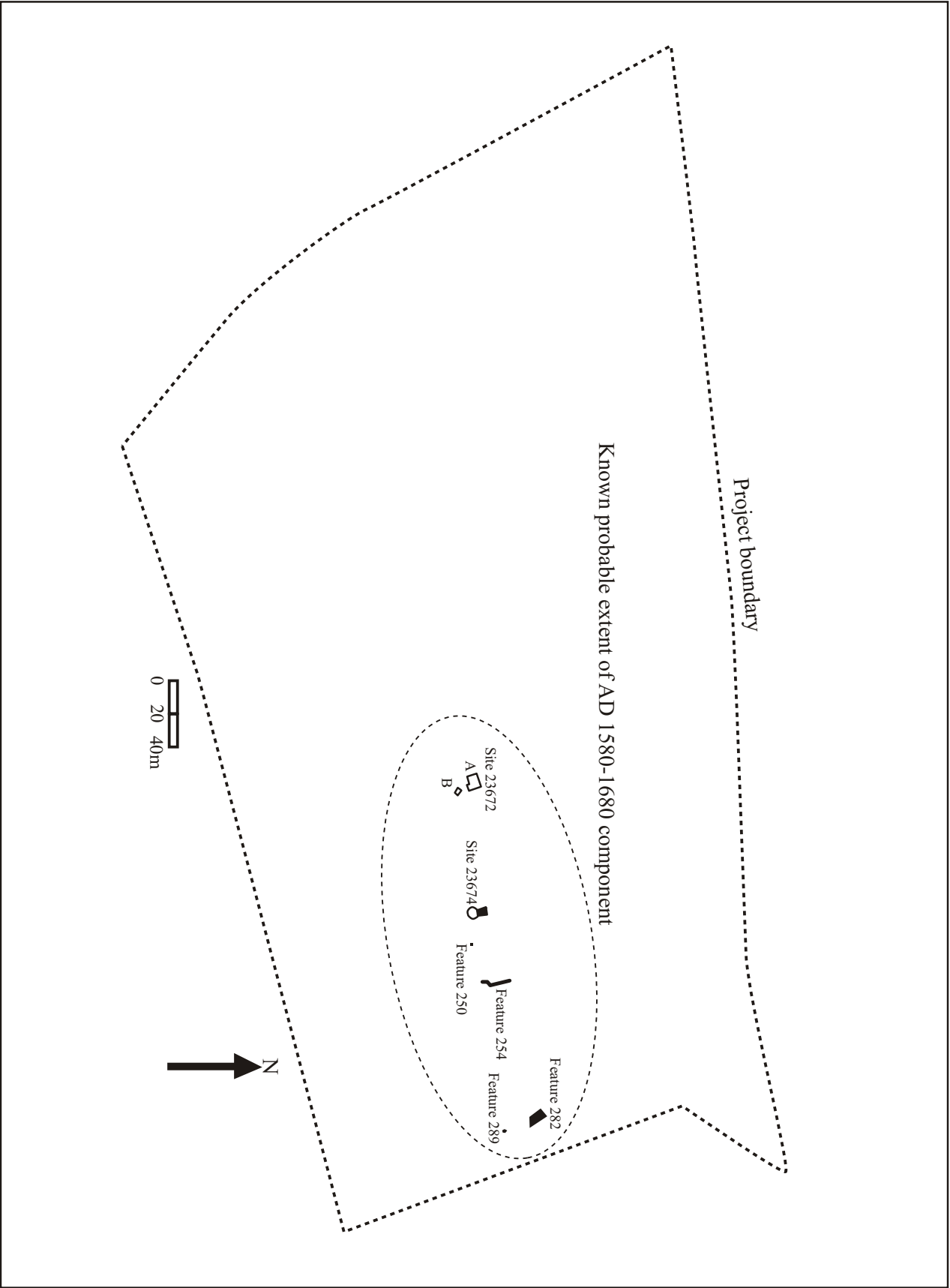


Figure 134. Probable extent of known and possible Phase C sites and features.

Roughly 15 meters *makai* from Feature 250 platform is the more substantial Site 23674 platform. The recovery of bird (chicken?) and dog from Site 23674 suggests that it too is associated with male eating. Judging from the size, weight, and variety of items, the Site 23674 platform seems to be a more substantial and permanent *hale mua* than Feature 250. The Site 23674 platform, which covers 17.2 m², has a wider variety of items than Feature 250 (i.e., 20 versus 10 different kinds of items). The items recovered from Site 23674 also weigh more (i.e., 62.3 g per square meter) and came from comparatively dark 10 YR3/2 grayish brown silt compared to the lighter 10 YR3/3 dark brown of Feature 250. The circular enclosure that is attached to the Site 23674 was sterile with lighter and thinner soil, however, suggesting that this space was kept clean.

The two shark teeth from Feature B of Site 23672 (Table 44) could also have been associated with male-related activities. It should be noted that once a day men cooked meals for women and children of their family in a temporary shed, called *hale 'aina*, near the common sleeping house, or *hale noa*. At times a substantial oven would have been built into the surface of the *hale 'aina* cooking shed (e.g., Handy and Handy 1972:302). It could indeed be that Feature B of Site 23672 with its 69.5 grams of items and very dark grayish brown (10YR 3/2) fine silt was such a cooking locale. The shark teeth found within could have been introduced while men were preparing food.

The nearby Feature A walled enclosure of Site 23672 is probably a *hale noa* where everybody slept. This identification is supported by the comparatively big size of the walled enclosure (i.e., 114.8 m²), bearing in mind that a *hale noa* was normally the largest building around (Handy and Handy 1972:291). Also, the absence of male-related items, the low average weight of items recovered (i.e., 1.94 g per square meter), and the low variety of items identified (i.e., 5 different kinds of items) fit the specifications of a typical *hale noa*.

The likely functions of Features 282 and 289 near the extreme eastern boundary of the project area are less certain. The mere size and even surface of the rectangular Feature 282 platform (i.e., 106.3 m²) suggests that it could have been a *heiau* platform. Together with its big size, rectangular shape, the paucity of associated items are attributes of *heiau* elsewhere in Hawai'i (e.g., Loubser and Rechtman 2007). A wide variety of *heiau* existed in Hawai'i, both in terms of architectural layout and function. *Heiau* vary from seemingly insignificant natural rock outcrops to elaborately constructed platforms. Moreover, like *hale mua*, *heiau* were placed at the approach toward a settlement, such as in front of a household cluster (Valeri 1985:174) or agricultural plots; people had to pass through these "gateways" to reach destinations beyond. It is worth noting that in relation to the *hale noa* dating to Phases B and C, the *hale mua* and proposed *heiau* were all on the *mauka* side. If these identifications are indeed correct, then the agricultural settlement within the project area was approached from the *mauka* side. The south to north orientation of the terrace walls dating to Phases B and C could also be significant in this regard, providing a "front" fence as people approached the nearby *hale noa* (i.e., the Feature 247 wall and Site 23671) and *hale mua* (i.e., Feature 254 and Site 23674) from the interior.

Feature 289 yielded a more restricted range of items than the other features with the exception of the nearby Feature 282 that yielded nothing (see Tables 44 and 45). Only shell and a volcanic glass flake were recovered from the small (i.e., 49.5 m²) platform; the feature could have been a convenient stopping and snacking point on the way to agricultural plots.

Fish, shell, coral, urchin, crab, bird, mammal, terrestrial plants, and volcanic glass and basalt were found at most of the excavated Phase C locales (Tables 44 and 45). Shell from beach-like settings only came from the Site 23674 *hale mua* and Feature 289 platform. The recovered items indicate that resources from the ocean, rocky coast line, beach (at two locales), local area, and interior were utilized.

Table 44. Weight (grams) of recovered shark, land animals, plants, and lithics from Phase C features.*

Site	Feature	Unit	Shark	Avian bone	Pig	Dog	Rodent	Small mammal	Kukui nutshell	Charcoal	Basalt flake	Volcanic glass flake	Volcanic shatter	Basalt waterworn	
23686	250	E11	-	-	-	1.0	-	-	1.9	0.5	-	5.0	-	-	<i>hale mua</i>
23686	254	E12	-	-	1.1	-	-	-	-	1.0	-	-	-	-	<i>hale mua</i> boundary
23674	-	E06	-	1.9	-	2.0	0.7	0.1	1.4	1.2	2.8	78.2	12.1	-	<i>hale mua</i>
23674	-	E07	-	-	-	-	-	-	-	-	-	-	-	-	
23672	A	E03	-	-	-	-	2.0	-	-	0.4	-	0.6	-	-	<i>hale noa</i>
23672	A	E02	-	-	-	-	-	-	-	-	-	2.8	-	-	
23672	A	T11	-	-	-	-	-	-	-	-	-	-	-	-	
23672	B	T13	0.2	-	-	-	0.05	-	3.00	1.80	-	1.50	17.50	45.10	<i>hale noa</i> kitchen
23672	B	E1b	-	-	-	-	-	-	-	-	-	-	-	-	
23686	289	E19	-	-	-	-	-	-	-	-	-	-	-	-	agricultural platform
23686	289	E20	-	-	-	-	-	-	-	-	-	0.5	-	-	
23686	282	E17	-	-	-	-	-	-	-	-	-	-	-	-	<i>heiau?</i>
23686	282	E18	-	-	-	-	-	-	-	-	-	-	-	-	

*male related items are shaded

Table 45. Weight (grams) of recovered fish and shell from Phase C features.

Site	Feature	Unit	Fish Scariidae	Fish UID	Cypraea sp.	Drupa sp.	Morula sp.	Cellana sp.	Isognomon sp.	Cynatium sp.	Nerita sp.	Branch coral	Echinoidea	Crustacean	Brachiodontes sp.	Conus sp.	Shell UID
23686	250	E11	0.6	0.1	1.3	26.2	-	59.1	-	-	-	7.9	-	-	-	-	-
23686	254	E12	-	-	0.7	-	-	-	-	-	-	1.5	-	-	-	-	0.2
23674	-	E06	0.6	1.2	79.0	16	-	0.8	-	-	0.4	27.3	7.5	0.2	-	11	4.8
23674	-	E07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23672	A	E03	-	-	-	-	-	-	-	-	-	2.1	-	-	-	-	-
23672	A	E02	-	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-
23672	A	T11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23672	B	T13	-	-	-	0.10	-	-	-	0.20	-	-	-	-	-	-	-
23672	B	E1b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23686	289	E19	-	-	9.3	-	0.7	-	0.4	-	-	0.3	-	-	-	0.2	-
23686	289	E20	-	-	15.0	-	-	-	-	3.1	-	19.7	-	-	4.4	-	-
23686	282	E17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23686	282	E18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Based on the evidence then, the following four main categories of features were used during Phase C: (1.) *hale mua* male eating houses (Site 23674 and Feature 250 of Site 23686) and an associated terrace wall (Feature 254 of Site 23686); (2.) a *hale noa* sleeping house (Feature A of Site 23672) and the possibly associated *hale noa* kitchen (Feature B of Site 23672); (3.) an agricultural platform (Feature 289); and (4.) a possible *heiau* platform. The Feature 254 terrace wall could be a partition between the *hale mua makai* and *heiau mauka*. The increase in the different kinds of features on the late sixteenth to mid- seventeenth century landscape suggests a settling in and increasingly permanent use of the area. However, as will be

discussed below, Phase C represents an overall drop in the mass and variety of resources exploited when compared to the earlier Phase B. Phase D, nonetheless, shows a dramatic increase over Phase C.

Phase D (ca. AD 1680-1850)

The nine excavated features that can be associated with the fourth phase of occupation within the project area are the following: (1.) the Site 23675 enclosed platform; (2.) the Site 23670A lower tier platform; (3.) the Site 23670B upper tier platform; (4.) the Site 23670C platform; the Site 23678 oval enclosure; (5.) the Site 23677A enclosure; (6.) the Site 23677B platform; (7.) (8.) the Feature 251 enclosure within Site 23686; and (9.) the Feature 23686 *kuaiwi*. Although the *kuaiwi* has not been dated directly, its age can be inferred from it being an extension of the late-seventeenth century Site 23678 oval enclosure.

Considering that Features A and B are two platforms arranged at different levels within the same “stepped” platform structure of Site 23670, they are really part of one feature. Moreover, considering that Feature C is a small rectangular platform some 1.5 meters south of Feature A, it too is an integral part of Site 23670. Knowing that the Feature A platform at Site 23677 is partly enclosed by the Feature B wall, these features are treated as part of the same occupation. Accordingly, the following six sites are present during Phase D: (1.) Site 23675; (2.) Site 23670; (3.) Site 23678; (4.) Site 23677; (5.) Feature 251; and (6.) Feature 291. Viewed together, these six sites stretch from south to north in the eastern half of the project area. Site 23670 appears as an outlier *makai* from this settlement line (Figure 135).

The function of each Phase D feature is interpreted based on the kinds and weight of items recovered and on considerations of feature shape and size. The recovery of pig and dog from Site 23675 (Table 46) suggests that males cooked, consumed, and discarded food in this structure. The average weight per square meter of all items recovered from Site 23675 is comparatively heavy (i.e., 112 g). This suggests that the comparatively big Site 23675 enclosure (i.e., 33.1 m²) was a permanent eating house. Two depressions and a C-shaped rock alignment visible on the paved surface could be remnants of hearths. Also, black (10YR 2/1) silt from EU-10 suggests organic refuse generated by cooking. The comparatively robust Site 23675 being in the vicinity of the earlier but smaller male cooking structures at Feature 250 and Site 23674 suggests that the *hale mua* was a more permanent fixture on the landscape.

The tiered Site 23670A and B platform structure probably functioned as a *heiau*. The overall size (approximately 56 m²) of Site 23670, its roughly rectangular shape, its fairly level but stepped surface, and general paucity of associated items are attributes of *heiau* elsewhere in Hawai‘i (e.g., Loubser and Rechtman 2007). The nearby Feature C is aligned in a similar direction as Features A and B. This suggests that the small Feature C platform, albeit sterile, was somehow related to the Features A and B platform. In this regard then one can perhaps refer to Site 23670 as a complex.

Unlike the location of the proposed *heiau* from the earlier Phases B and C on the *mauka* end of the occupation, the Phase D *heiau* complex appears to be *makai* from the main settlement. If the identification of the Phase D *heiau* is correct, then the settlement would probably have been approached from the *makai* side. This suggests that the main approach to the agricultural settlement changed 180° during Phase D times.

The southwest to northeast aligned Feature 291 wall runs more-or-less perpendicular to the coast line. In this regard the wall is roughly parallel to nearby but longer *kuaiwi* in the project area. The appearance of a wall that runs perpendicular instead of parallel to the coast by the mid- to late seventeenth century suggests that new kinds of divisions emerged on the agricultural landscape of the project area; up slope-down slope boundary walls appeared alongside earlier terraced walls.

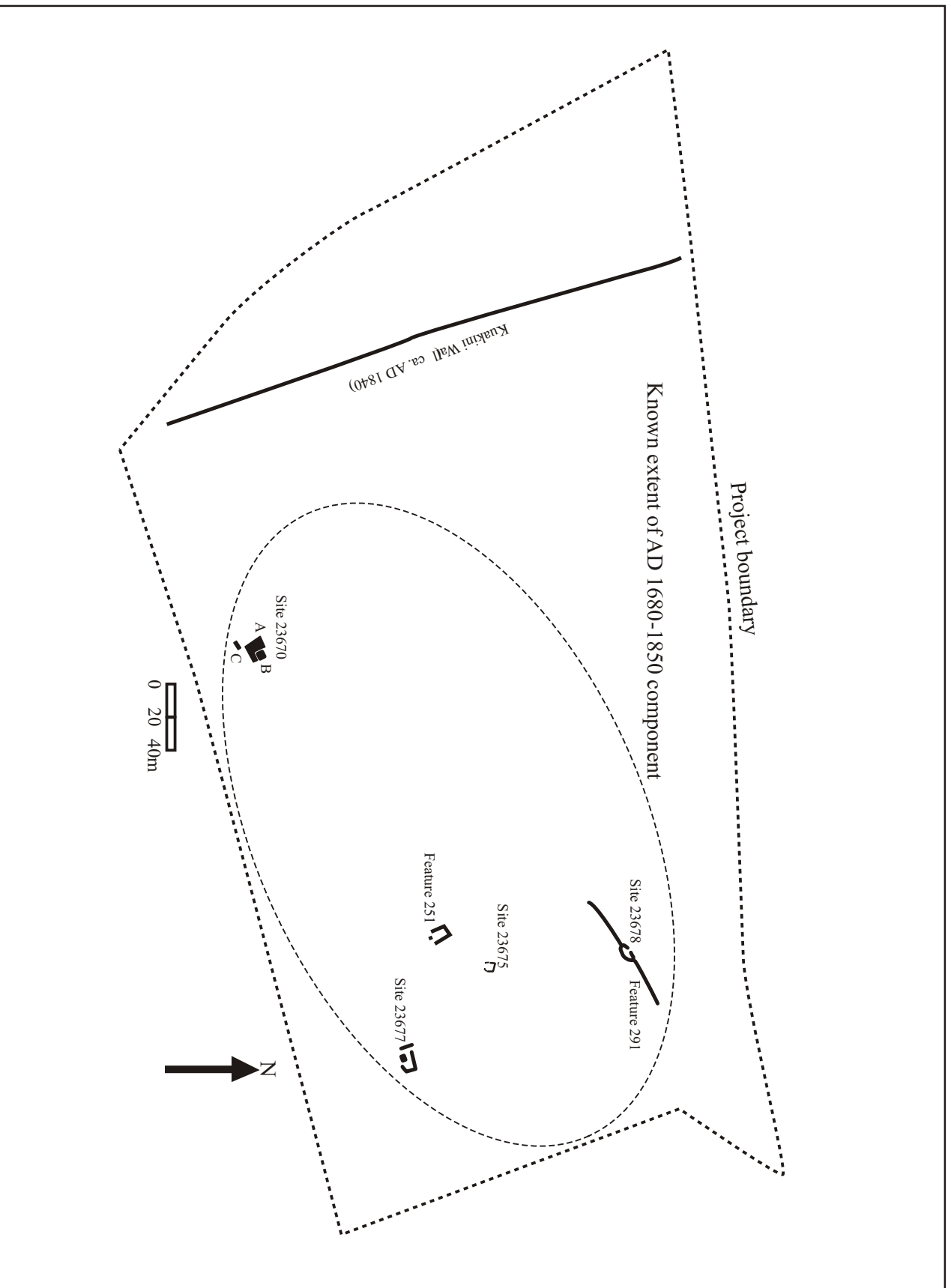


Figure 135. Probable extent of known Phase D sites and features.

Built within the Feature 291 wall is the oval-shaped Site 23678 (judging from how their walls abut, the undated Feature 291 is either contemporary or slightly later than the dated Site 23678). Judging from the medium-sized structure (55 m²) and the absence of male-related items (Table 46), Site 23678 might very well have been a common sleeping house, or *hale noa*. However, the unusually high average weight of items recovered (i.e., 178 g per square meter) and high variety of items identified (i.e., 21 different kinds of items) exceed the specifications of a typical *hale noa*. Nonetheless, instead of suggesting a different function, an increase in the mass and variety of items deposited within could simply be the result of increased and more intensive use of the structure. A fragment of a basalt adze found within the Feature 23678 is the only one recovered from the project area. The recovery of fire cracked rock and dark brown (10YR 3/3) silt from Site 23678 suggests that cooking occurred within, an activity that typically generate an above average amount of refuse. Excess trash was also probably disposed within the nearby wall, roughly two meters to the northeast of the proposed *hale noa*. Whatever the function of Site 23678 might have been, the weight and variety of items from within and from nearby deposits strongly suggests increased and more intensified occupation.

On the opposite side of the Phase D occupation within the project area, at Site 23677 Features A and B, are the remains of what could be a second *hale noa*. As already mentioned, the Feature A platform being partly enclosed by the Feature B wall shows that these two features are part of the same structure. Whereas the wall yielded only a few shell remains and nothing else, the platform yielded 19 different kinds of items and an average weight of 69.2 grams per square meter of items. Recovered remains from the platform include fish, rocky shore shell, beach shell, mammals and plants from around the settlement, and volcanic glass from the interior. Together with these items, the presence of 10YR 2/1 black ashy silt within the platform suggests that cooking occurred on this platform. If so, then as in the case of Site 23678, Site 23677 had a cooking area within. The cooking areas being part of the proposed *hale noa* structures at Sites 23677 and 23678 of Phase D contrast with the earlier Phase C Site 23672 proposed *hale noa* where the cooking area was a spatially separate structure. The incorporation of the cooking areas within structures during the eighteenth century, whatever the function of the structures might have been, is a topic worth pursuing in future data recovery projects.

Fish, shell, coral, Echinoidea, bird, mammals, terrestrial plants, and volcanic glass and basalt were found at most of the excavated Phase D locales (Tables 46 and 49). The recovered items indicate that resources from the ocean, rocky coast line, beach, local area, and interior were utilized.

Not shown in Table 46 are the cattle bones recovered from within the rectangular Feature 251 enclosure. The size (143.8 m²) of this enclosure, together with the absence of items apart from the cow carcass, strongly suggests that the enclosure served as a cattle pen. Cattle were first introduced to Hawai'i in 1793 and by 1810 big herds roamed across the island. By 1812 the *kapu* against capturing feral cattle was lifted, marking the beginning of fully fledged ranching activities. Captured animals were taken to stone-walled paddocks where they were given food and water. By the 1830s, ranching was an important part of the Hawaiian economy and by the late 1800s cattle ranches had grown up in the Kona District (e.g., Kelly 1980). The presence of cattle bones within Feature 251 suggests that it could have been used as a paddock, most likely some time between 1812 and the 1850s. In this regard the Feature 251 probable stock pen probably post-dates the radiocarbon dated structures.

Table 46. Weight (grams) of recovered bone and plant from Phase D features.*

Site	Feature	Unit	Avian bone	Pig	Dog	Rodent	Small mammal	Mammal bone	Small mammal worked bone	Kukui nutshell	Charcoal	
23675	-	E10	-	4.3	0.9	-	0.8	-	0.2	0.5	10.9	<i>Hale mua</i>
23675	-	T20	-	9.6	-	-	-	-	-	-	0.6	
23675	-	E09	-	-	-	-	-	-	-	-	0.4	
23670	A	E31	-	-	-	-	-	-	-	8.9	0.6	<i>Heiau platforms</i>
23670	A	E32	-	-	-	-	-	-	-	0.5	-	
23670	B	E34	-	-	-	-	-	-	-	-	-	
23670	B	T12	-	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	-	<i>Hale noa</i>
23678	-	E14	-	-	-	-	-	-	-	-	1.3	
23678	-	E15	0.1	-	-	-	-	-	-	-	0.3	
23677	B	E24	-	-	-	-	-	-	-	-	-	<i>Hale noa</i>
23677	B	E23	-	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	-	0.2	-	0.9	-	0.2	3.3	<i>Hale noa kitchen</i>
23677	A	T16	-	-	-	-	3.4	-	-	-	3.9	
23686	251	E08	-	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	-	-	-	-	-	-	-	<i>Kuaiwi wall</i>

*male related items are shaded

Table 47. Weight (grams) of recovered fish and shell from Phase D features.

Site	Feature	Unit	Fish <i>Scoridæ</i>	Fish <i>UID</i>	<i>Cypræa</i> sp.	<i>Drupa</i> sp.	<i>Morula</i> sp.	<i>Cellana</i> sp.	<i>Isognomon</i> sp.	<i>Chama</i> sp.	<i>Nerita</i> sp.	
23675	-	E10	0.7	0.05	62.7	3.1	-	2.4	-	-	11.2	<i>Hale mua</i>
23675	-	T20	-	-	1.3	-	-	-	-	-	-	
23675	-	E09	-	-	2.6	-	-	-	-	-	-	
23670	A	E31	-	-	3.3	-	-	-	-	-	-	<i>Heiau platforms</i>
23670	A	E32	-	-	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	-	-	
23670	B	T12	-	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	-	<i>Hale noa</i>
23678	-	E14	-	-	50.6	2.3	-	0.6	0.1	-	-	
23678	-	E15	-	0.05	67.7	4.6	1	0.1	0.3	-	0.1	
23677	B	E24	-	-	5.2	-	-	-	-	-	-	<i>Hale noa</i>
23677	B	E23	-	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	50.6	1.5	-	-	-	0.3	2.3	<i>Hale noa kitchen</i>
23677	A	T16	0.2	-	23.5	4.1	-	0.2	-	-	2.1	
23686	251	E08	-	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	31.9	4.2	1	-	0.05	-	-	<i>Kuaiwi wall</i>

Table 48. Weight (grams) of recovered shell, coral, and Echinoidea from Phase D features.

Site	Feature	Unit	<i>Strombina</i> sp.	Coral abrader	Branch coral	Echinoidea	<i>Cantharus</i> sp.	<i>Conus</i> sp.	<i>Venus</i> sp.	Shell UID	
23675	-	E10	-	1	345.8	1.3	-	-	-	0.4	<i>Hale mua</i>
23675	-	T20	-	-	-	-	-	-	-	-	
23675	-	E09	-	-	-	-	-	-	-	-	
23670	A	E31	-	-	-	0.7	-	-	-	-	<i>Heiau</i> platforms
23670	A	E32	-	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	-	
23670	B	T12	-	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	-	
23678	-	E14	-	-	77.2	0.95	-	7.6	1.9	8.7	<i>Hale noa</i>
23678	-	E15	0.6	-	333.4	4.9	-	22.3	3.7	33.2	
23677	B	E24	-	-	-	-	-	0.3	-	-	<i>Hale noa</i>
23677	B	E23	-	-	-	-	-	-	-	-	
23677	A	E22	-	-	16.5	5	-	1.9	-	2.2	<i>Hale noa</i> kitchen
23677	A	T16	-	-	4.1	5.8	0.1	0.7	0.1	0.1	
23686	251	E08	-	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	90	0.75	-	9.93	-	2.9	<i>Kuaiwi</i> wall

Table 49. Weight (grams) of recovered lithics from Phase D features.

Site	Feature	Unit	Basalt fire cracked rock	Basalt adze fragment	Basalt flake	Volcanic glass flake	Volcanic shatter	Basalt grinder	Basalt waterworn	
23675	-	E10	-	-	2.2	20.3	-	-	-	<i>Hale mua</i>
23675	-	T20	-	-	-	-	-	116.7	71.4	
23675	-	E09	-	-	-	-	-	-	-	
23670	A	E31	-	-	-	-	-	-	-	<i>Heiau</i> platforms
23670	A	E32	-	-	-	-	-	-	-	
23670	B	E34	-	-	-	-	-	-	-	
23670	B	T12	-	-	-	-	-	-	-	
23670	C	E33	-	-	-	-	-	-	-	
23678	-	E14	54.2	0.2	0.7	12.2	2.5	-	0.5	<i>Hale noa</i>
23678	-	E15	-	-	2.8	9.3	1.8	-	2.8	
23677	B	E24	-	-	-	-	-	-	-	<i>Hale noa</i>
23677	B	E23	-	-	-	-	-	-	-	
23677	A	E22	-	-	-	4.4	-	-	-	<i>Hale noa</i> kitchen
23677	A	T16	-	-	-	0.5	0.3	-	-	
23686	251	E08	-	-	-	-	-	-	-	Cattle enclosure
23686	291	E13	-	-	-	0.9	-	-	3.7	<i>Kuaiwi</i> wall

Based on the available evidence, the following five main categories of features were used during Phase D: (1.) a *hale mua* male eating house (Site 23675); (2.) two *hale noa* sleeping houses containing kitchens within (Sites 23678 and 23677); (3.) a *kuaiwi* (Feature 291) associated with the Site 23678 *hale noa*; (4.) a

possible *heiau* platform complex (Site 23670, Features A-C); and (5.) a likely cattle enclosure (Feature 251). Except for the *heiau* platform complex *makai* of the main site concentration, all the Phase D features were sandwiched between the Feature 291 *kuaiwi* to the north and the Feature 82 *kuaiwi* wall to the south. Considering that these *kuaiwi* walls followed the slope they were not soil retention or water-holding devices (e.g., Kirch 1985:228). Rather, these walls were intended to define boundaries between plots and/or homestead units, or *kauhale*. Generally speaking, the presence of *kuaiwi* walls on the landscape suggests that a permanent cropping system replaced a shifting system of rotating cultivation by the eighteenth century.

The probable post- AD 1680 date for the *kuaiwi* within the project area supports evidence from Ka‘awaloa that the formal walled fields (*kuaiwi*) immediately above Kealakekua Bay were established after AD 1670 (Clark and Rechtman 2002), during what has been termed the Competition Period (Burtchard 1995).

It could be that the land sandwiched between the *kuaiwi* represented an ‘*ili*, or land division. An ‘*ili* was typically a long and narrow strip of land running lengthwise along an *ahupua‘a*, or tax unit. An ‘*ili* could be discontinuous and represented portions of *ahupua‘a* land allotted to the families who lived on them and cultivated them. The right to continue to use and cultivate these small strips of land stayed with the ‘*ohana* (extended families) living on them regardless of any transfer of title to the *ahupua‘a* (Kelly 1980:22-25). Division chiefs of any particular *ahupua‘a* could construct an agricultural shrine, or *heiau*, where increase ceremonies could be attended by those who worked the land.

The Kuakini Wall (SIHP 50-10-28-6302/-7276), that falls in the *makai* third of the project area, was probably constructed during Governor Kuakini’s administration (AD 1820-1844). The most likely date of this wall’s construction falls within the latter portion of Phase D and so the wall is probably roughly contemporary with the Feature 251 proposed cattle enclosure. Indeed, one likely function of the Kuakini Wall was to keep cattle away from settlements along the coast.

Data recovery results have for the most part upheld the primary hypothesis given above under research objectives. As can be inferred from summary information in Table 50, the first use (ca. AD 1400-1460, or Phase A) was for short term habitation and associated opportunistic agriculture (i.e., only one probable cooking and eating facility of a temporary nature and an associated structure of uncertain function), followed by formal agriculture and associated recurrent habitation (ca. AD 1460-1680, or Phases B and C) (i.e., *hale noa* sleeping quarters appearing not far from fairly permanent-looking *hale mua* eating houses as well as the eventual appearance of *heiau*-looking platforms and terrace walls), then the end of the sequence (ca. AD 1680-1850, or Phase D) is marked by more consistent habitation (i.e., more than two *hale noa* common houses and *kuaiwi*) with associated animal pens. The dates of associated household gardens are not certain due to the lack of charcoal from these contexts (but see discussion below).

Table 50. Summary of site and feature function types through time.

<i>Phase</i>	<i>Date range (AD)</i>	<i>Sites/ Features (n)</i>	<i>hale mua (n)</i>	<i>hale noa (n)</i>	<i>terrace wall (n)</i>	<i>heiau (n)</i>	<i>unknown agricultural (n)</i>	<i>Kuaiwi (n)</i>	<i>cattle enclosure (n)</i>
A	1400-1460	2	1	-	-	-	1	-	-
B	1460-1580	5	3	1	1	-	-	-	-
C	1580-1680	7	2	2	1	1	1	-	-
D	1680-1850	9	1	3	-	3	-	1	1

Material traces that survived on the landscape suggest changing trends in gender presence and activities. The two temporary Phase A structures probably represent temporary male eating and sleeping quarters. The drastic increase of Phase B structures, particularly the prominent Site 23673 proposed *hale mua*, suggests that some time after AD 1460 men slept and ate in the fields on a more permanent basis. However, the fairly rudimentary Site 23671 probable *hale noa* suggests that common sleeping structures for the entire family was still temporary. This situation seemed to have changed by the late sixteenth and

early seventeenth centuries, for by then the prominent Site 23672 probable *hale noa* appears on the landscape with an associated cooking area. This is also the time period that a possible *heiau* platform makes its appearance. By the late seventeenth century a prominent *hale mua* (i.e., Site 23675) occurs in the roughly the same locale of where an earlier but smaller *hale mua* structures (i.e., Site 23674 and Feature 250) stood previously. The late seventeenth to early eighteenth centuries also witnessed the construction of two prominent probable *hale noa*, one at Site 23678 and the other at Site 23677. Both of these latter two sites yielded considerable amounts of items, suggesting that by that time families were more-or-less permanently settled in the *kula* zone of the project area. The stepped platform probable *heiau* at Site 23670 and Feature 291 *kuaiwi* wall support this evidence for increasingly permanent occupation of the area.

It is perhaps of tangential interest that through time recognizable concentrations of sites and features shifted *makai* (southwest) to *mauka* (northeast): the two Phase A features are in the southwestern portion of the project area; the five Phase B features are in the center to the southeastern portion of the project area; the seven Phase C features are in the east-central portion of the project area; whereas the Phase D occupation expanded to the north of the previous three (compare Figures 132, 133, 134, and 135).

Assuming that agricultural features, such as field-clearing piles and modified outcrops, were not far from the dated features, certain tentative inferences can be made about the intensity of agricultural activities based on the number of agricultural features near dated features. As six agricultural features (i.e., Features 19-24) occur near Features 293 and 294 of Phase A, it can be assumed that these features probably date to the earlier known phase of agricultural activity in the project area (see Figure 76). Site 23673 of Phase B is the only dated structure near twenty seven agricultural features (i.e., Features 34-37, Features 84-93, Features 102-104, Feature 106, Feature 112, Feature 118, Feature 260, Feature 263, and Features 276-279) in the southeastern portion of the project area. Bearing in mind that the eastern portion of Phase D overlaps Phase C, it is not clear to what component the agricultural features in the eastern third of the project area belong. However, the forty two agricultural features *makai* of the westernmost known Phase C structure, Site 23672, seem to best fit the spatial spread of Phase D sites and features. These are Features 1 to 17 and Features 218 to 242. An addition eleven agricultural features (i.e., Features 146, 148, 150, 152, 154, 156, 158, 160-163) *mauka* of the Phase D Feature 291 *kuaiwi* most likely are associated with the Site 23678 proposed *hale noa* structure. Judging from these spatial associations then, the latest occupation, Phase D, witnessed the culmination of agricultural activity within the project area. Due to its spatial overlap with Phase D, the agricultural activity during Phase C is uncertain, although a fair number of agricultural features occur in the vicinity of Sites 23672 and Features 250 and 254. Undated and ostensibly sterile agricultural features in the far western and far northern portions of the project area probably date to the latest phase of Hawaiian occupation.

From the evidence presented thus far it would appear that each phase is more extensive than the preceding one. Most notably, Phase A is represented by two habitation features and six agricultural features, Phase B by five substantial features and at least twenty seven associated features, Phase C by seven substantial features and an unknown number of associated features, and Phase D by nine substantial features and at least fifty three associated features. However, it is proposed that these ostensible increases in site and feature numbers and their spatial expansion across the landscape are not echoed by the mass, kinds, and varieties of resources extracted during the different time periods. Once the weights of recovered items and variety of items from the different phases are compared it would become apparent that resource exploitation did not necessarily increase linearly with time.

Changes in Resource Exploitation through Time

Albeit not directly addressed in the research objectives, a potentially interesting trend apparent in the results is variation in the weight and variety of items used through time. When recovered items from only the twelve radiocarbon dated proveniences are considered (taking into consideration that EU-10 yielded 2 dates, EU-21 yielded 3 dates, EU-22 yielded 2 dates, and EU-29 yielded 2 dates, so the number of dated proveniences (n=12) are less than the total of radiocarbon dates (n=17)), temporal associations are more tight and reliable. The following dated proveniences are included in this assessment: Feature 293 of Site 23686 (Phase A); Site 23676 (Phase B); Feature B of Site 23673 (Phase B); Site 23671 (Phase B); Feature 247 of Site 23686 (Phase B); Feature 250 of Site 23686 (Phase C); Feature 254 of Site 23686 (Phase C);

Feature B of Site 23672 (Phase C); Site 23675 (Phase D); Site 23678 (Phase D); Feature A of Site 23677 (Phase D); Feature A of Site 23677 (Phase D).

From the radiocarbon evidence we can see that one provenience dates to Phase A, four proveniences date to Phase B, three proveniences date to Phase C, and four proveniences date to Phase D. The number of dates alone suggests that there is an ostensible drop in intensity (as opposed to extensiveness) of occupation during Phase C (i.e., the period roughly dating to between AD 1580 and AD 1680). Fluctuations in the total weight of charcoal recovered from the different phases indeed suggest that wood was not equally available or exploited with the same intensity through time. This can be seen when the following total weights of charcoal recovered from the different dated proveniences are compared: 2 grams from Phase A; 26.2 grams from Phase B; 3.3 grams from Phase C; and 19.4 grams from Phase D. According to these numbers then most wood was burned during Phase B and then picking up again in Phase D after a drop in Phase C.

This fluctuation in the amount of recovered charcoal is mirrored by other items recovered from the different phases (Table 51). As can be seen in Table 51, Phase B (i.e., the period dating to roughly between AD 1460 and 1580) has a greater average weight and variety of items than the other three phases. Phase C represents a drop in weight and variety of items recovered, whereas Phase D represents an increase. The Phase D increase is perhaps not that substantial, however, considering that it lasted roughly two centuries (i.e., from approximately AD 1680 to AD 1850) as opposed to the shorter century-long duration of each other phase.

Table 51. Weight and variety of items recovered by Phase.

<i>Phase</i>	<i>Number of Dated Proveniences</i>	<i>Total weight of recovered items (g)</i>	<i>Corrected weight per square meter (g)</i>	<i>Different kinds of items recovered</i>
A	1	116	58	10
B	4	935	63	32
C	3	118	32	17
D	4	829	91	29

The same fluctuation trend is apparent when the presence/absence of recovered items is considered; Phase B represents a rapid increase in variety of items recovered over Phase A. This increase contrasts with a drop during Phase C and a rise in Phase D (Table 52). Specifically, beach shell (i.e., *Turbo* sp., *Nassarius* sp., *Cantharus* sp., *Brachidontes* sp., *Fimbria* sp., *Conus* sp., *Mitra* sp., *Terebra* sp., and *Venus* sp.) and basalt tools/flakes are absent from directly dated Phase A and Phase C proveniences. Moreover, comparatively rare items, such as tuna, octopus lure, and bird (chicken?) remains were only recovered from Phase B deposits. Considered overall then, Phase B, dating to roughly between AD 1460 and AD 1580, represents both an expansion and an intensification of activities over the previous Phase A. Even though Phase C might have been associated with more sites and features than the earlier Phase B, individually dated Phase C sites and features yielded a smaller mass of items and a smaller variety of items than their Phase B predecessors. The drop-off in weight and variety of items during the period dating roughly to between AD 1580 and AD 1680 is worth additional investigation in neighboring areas. Depending on results from neighboring areas, it can be determined if the drop-off is of local or regional extent, for instance.

Table 52. Presence/absence and percentage ubiquity of recovered items by Phase.

	<i>Ocean fish</i>	<i>Rocky shell</i>	<i>Beach shell</i>	<i>UID shell</i>	<i>Bird</i>	<i>Pig</i>	<i>Dog</i>	<i>Rat</i>	<i>UID bone</i>	<i>Kukui nutshell</i>	<i>Charcoal</i>	<i>Basalt adze</i>	<i>Basalt flake</i>	<i>Volcanic flake</i>	<i>Volcanic shatter</i>	<i>Basalt utilized</i>	<i>Total presence</i>
Phase A presence	1	3	-	-	-	1	-	1	-	1	1	-	-	1	-	1	10
Phase A ubiquity %	10	30	-	-	-	10	-	10	-	10	10	-	-	10	-	10	100
Phase B presence	3	26	7	3	1	2	1	2	4	2	4	-	2	3	-	-	60
Phase B ubiquity %	5	43	12	5	2	3	2	3	7	3	7	-	3	5	-	-	100
Phase C presence	3	8	-	1	-	1	1	1	-	2	3	-	-	2	1	1	24
Phase C ubiquity %	13	33	-	4	-	4	4	4	-	8	13	-	-	8	4	4	100
Phase D presence	3	25	5	4	-	1	1	1	4	2	4	1	2	4	2	2	61
Phase D ubiquity %	5	41	8	7	-	2	2	2	7	3	7	2	3	7	3	3	100

Assessing Permanent, Temporary, and Agricultural Features

The above discussed features were identified not only through the nature and variety of items recovered, but also in terms of their shapes, sizes, and the deposits they contain. Ultimately, the functions of the excavated sites and features could be inferred via certain similarities with ethnographically recorded instances. However, due to variations in human behavior, even within one cultural group living during the same time period, residues left at sites and their shapes and sizes are bound to vary somewhat. Idiosyncrasies, especially between families, are bound to result in some variation between sites with similar functions. For instance, one *hale mua* can be expected to differ somewhat in architecture from the next, depending on preferences and wealth of a particular family. The nature and time of site abandonment or even possible re-use are also factors to consider. For example, were sites abandoned in a “clean” or “messy” state and were they left in a hurry or gradually? It is for reasons such as these then that rigidly quantifiable categories or threshold values might not be realistic ways to categorize sites.

With these caveats in mind the following discussion uses the results from the excavated sites and features to assess Cordy’s (1981) model that uses surface attributes to differentiate permanent from temporary occupations (also included are features identified as agricultural in terms of surface criteria). Related to Clark’s (1987) use of abundance and diversity of accumulated habitation debris to assess permanence of habitation, the following assessment considers total average weight and variety of recovered items per square meter. Basically, if assessments based on surface features alone are valid, then permanent habitations will have a greater weight and variety of items than temporary habitations or agricultural features. In other words, there would be a clear rank ordering of permanent habitations, temporary habitations, and agricultural features in terms of descending weight and variety of items recovered. That this is clearly not the case within the project area is shown in Table 53; proposed temporary habitations are interspersed with permanent habitations and agricultural features. Of particular note are the oval structure of Site 23678 and the platform of Site 23676 that were both thought to be temporary but turned out to be at the top of the list in terms of weight and variety of items recovered. On the opposite side of the spectrum is the paucity of items from the proposed permanent platform complex at Site 23670. If anything, Table 53 shows that the relationship between feature shape, size, and associated items is a complicated one.

Table 53. Sites and features by descending weight and variety of items recovered.

Site	Feature	Unit	Form	Function	Tentative assignment	Area (sq. m)	Total weight of items (g)	Weight per sq.m (g)	Variety of items
23678		E15	Oval enclosure	<i>Hale noa</i>	Temporary habitation	55.0	489	245	19
23675		T20	Enclosed platform depression	<i>Hale mua</i>	Permanent habitation	33.1	200	200	5
23676		E21	Platform	<i>Hale mua</i> kitchen	Temporary habitation	18.0	472	118	24
23675		E10	Enclosed platform depression	<i>Hale mua</i>	Permanent habitation	33.1	469	117	18
23678		E14	Oval enclosure	<i>Hale noa</i>	Temporary habitation	55.0	222	111	16
23673	A	E27	Platform	<i>Hale mua</i> kitchen	Permanent habitation	26.5	220	110	11
23676		T18	Platform	<i>Hale mua</i> kitchen	Temporary habitation	18.0	105	105	16
23673	A	E28	Platform	<i>Hale mua</i> kitchen	Permanent habitation	26.5	207	103	14
23673	A	T17	Platform	<i>Hale mua</i> kitchen	Permanent habitation	26.5	95	95	12
23677	A	E22	Small platform in enclosure	<i>Hale noa</i> kitchen	Temporary habitation	7.3	89	89	13
23686	291	E13	Linear wall	<i>Kuaiwi</i>	Agricultural	273.0	145	73	10
23673	B	E29	Enclosure	<i>Hale mua</i>	Permanent habitation	74.8	280	70	16
23672	B	T13	Enclosure	<i>Hale noa</i> kitchen	Permanent habitation	8.8	69	69	9
23674		E06	Platform	<i>Hale mua</i>	Temporary habitation	17.2	249	62	20
23686	293	E36	Enclosure	<i>Hale mua</i>	Agricultural	3.6	116	58	10
23677	A	T16	Small platform in enclosure	<i>Hale noa</i> kitchen	Temporary habitation	7.3	49	49	15
23686	247	E05	Terrace	Wall w/midden	Agricultural	28.6	75	37	8
23671		E04	Platform	<i>Hale noa</i>	Temporary habitation	26.2	109	27	14
23686	250	E11	Pavement	<i>Hale mua</i>	Agricultural	4.5	104	26	10
23686	289	E20	Pavement	Platform	Agricultural	49.5	43	11	5
23673	B	E30	Enclosure	<i>Hale mua</i>	Permanent habitation	74.8	42	11	9
23686	289	E19	Pavement	Platform	Agricultural	49.5	11	5.5	5
23672	A	E02	Enclosure	<i>Hale noa</i>	Permanent habitation	114.8	4.6	4.6	2
23670	A	E31	Lower two-tiered platform	<i>Heiau</i>	Permanent habitation	10.2	14	3.4	4
23675		E09	Enclosed platform depression	<i>Hale mua</i>	Permanent habitation	33.1	3	3	2
23677	B	E24	Enclosure	<i>Hale noa</i>	Temporary habitation	125.4	5.5	2.8	2
23686	254	E12	Terrace	Terrace wall	Agricultural	54.0	4.5	2.3	5
23672	A	E03	Enclosure	<i>Hale noa</i>	Permanent habitation	114.8	5.1	1.3	4
23670	A	E32	Lower two-tiered platform	<i>Heiau</i>	Permanent habitation	55.8	0.5	0.1	1
23677	B	E23	Enclosure	<i>Hale noa</i>	Temporary habitation	125.4	0	0	0
23672	A	T11	Enclosure	<i>Hale noa</i>	Permanent habitation	114.8	0	0	0
23674		E07	Circular enclosure	<i>Hale mua</i> yard	Temporary habitation	18.0	0	0	0
23670	B	E34	Upper two-tiered platform	<i>Heiau</i>	Permanent habitation	10.2	0	0	0
23670	B	T12	Upper two-tiered platform	<i>Heiau</i>	Permanent habitation	10.2	0	0	0
23670	C	E33	Platform	<i>Heiau</i>	Permanent habitation	9.5	0	0	0
23672	B	E1b	Enclosure	<i>Hale noa</i> kitchen	Permanent habitation	8.8	0	0	0

Perhaps it can be argued that the permanent versus temporary dichotomy is problematic due to the terms used. Substantial and carefully constructed structures, such as the residences of royalty, can be labeled as temporary if they are occupied for a brief period only, whereas a seemingly insignificant agricultural shed can be re-occupied over a long period and so become a permanent fixture. One potentially effective way of distinguishing permanent from temporary structures might be to compare thickness of stratigraphic build-up between structures and/or temporal spread of different radiocarbon dates from the same structure. Arguably the most important finding that emerges from this assessment is the need for excavation, bearing in mind that interpretations based on surface inspections alone can be misleading.

CONCLUDING REMARKS

This data recovery effort satisfactorily mitigated the adverse effects to Ten Sites on TMKs: 3-7-5-10:85 and 3-7-5-17:06 that resulted from development of the area. The research objectives were addressed concerning the determination of both dates and possible duration of occupation as well as site function assessment. The information collected from this data recovery project will hopefully contribute to the growing corpus of knowledge concerning Pre-contact use of Kona's *kula* zone, and is available for use into future regional syntheses. It is hoped that the interpretations of feature use and site layout proposed in the concluding section would prove to be of heuristic value, especially if the interpretations help generate opposing interpretations and encourage looking at the archaeological record in innovative and revealing ways.