Chapter 2

The Cultural Landscape of Kīpapa and Nakaohu Ahupua'a: A Preliminary Report on an Intensive Archaeological Survey[1]

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Introduction

During the summer of 1966 the author—then a student at Punahou School in Honolulu—had the good fortune to participate as a member of an archaeological field team carrying out the first systematic settlement pattern survey of an ancient Hawaiian cultural landscape, in Kahikinui District, Maui. For reasons explained below, this pioneering archaeological effort was never completed or published. Three decades later, however, I was able to continue the work begun in 1966, and since January, 1995 have been intensively involved in renewed archaeological work in Kahikinui. This chapter presents a preliminary account of our continuing archaeological survey in the *ahupua'a* of Kīpapa and Nakaohu, in the core of Kahikinui *moku*.

The 1966-67 Chapman/Bishop Museum Survey

During the summer months of 1966 and in January 1967, an archaeological survey of portions of Kīpapa and Nakaohu Ahupua'a was undertaken under the direction of Peter S. Chapman, then an anthropology graduate student at Stanford University. Chapman had been invited by Kenneth P. Emory of the Bishop Museum to undertake this settlement pattern study for the Bishop Museum, and to use the results as the basis for the former's doctoral dissertation at Stanford. Officially under the auspices of the Bishop Museum (which had proposed the survey as one component of a National Science Foundation grant for Hawaiian archaeology), the survey was in large measure privately financed by Chapman. Tragically, Chapman became terminally ill a few years after the

[1] This chapter incorporates portions of the article by Kirch and Van Gilder (1996).

survey was carried out, and died before his intended dissertation or any final report could be prepared.

The 1966-67 survey was a pioneering effort in Hawaiian archaeology. Prior survey work in Hawai'i had been highly selective, focused for the most part on monumental sites, especially *heiau* and fishponds. (The 1929 work of Winslow Walker [1931] on Maui was typical of such early surveys.) Influenced by methodological and theoretical innovations taking place in the Americas and elsewhere, especially the emerging "settlement pattern" approach of Harvard archaeologist Gordon Willey and his students K. C. Chang and R. C. Green, Chapman decided to undertake an *intensive* or comprehensive archaeological survey of two *ahupua'a*. The main theoretical inspirations for the 1966 Kahikinui survey were Green's work in the Society Islands and Samoa (Green 1967, 1970), and Ruppe's example from the American Southwest (Ruppe 1966). Chapman's aim was to record *all* archaeological remains visible on the surface, no matter how mundane, in order to gain a greater understanding of the patterns of traditional land use, settlement distribution, and socio-political organization. The 1966-67 Kahikinui survey was the first effort of this type in the Hawaiian Islands, although it would shortly be followed by settlement-pattern oriented projects in Makaha, O'ahu (Green 1969); Halawa, Moloka'i (Kirch and Kelly 1975); and Lapakahi, Hawai'i (Pearson, ed. 1968; Tuggle and Griffin 1973; Rosendahl 1972).

Since there was no precedent in Hawai'i for this kind of intensive survey, the 1966 Kahikinui field team had to develop its own data-recording methods. The procedure developed by Chapman consisted of systematically walking the landscape, marking each archaeological feature or site as it was discovered, and assigning these with sequential numbers. An instrument survey team (W. Kikuchi and P. Kirch) then mapped these sites using plane table and telescopic alidade at a scale of 1" = 200'. The plane table survey sheets were later compiled by Kikuchi into a composite archaeological "settlement pattern map" of the Kīpapa-Nakaohu area. Meanwhile, a second team made individual sketch maps of the sites or features (using compass and tape, or sometimes by pacing), noting dimensions and making other observations. These sketches were mostly made on graph paper at various scales, although recording standards were by no means consistent; no verbal descriptions were made. Selected photographs were taken by Chapman. Thus the records of the 1966-67 survey consist of the plane table maps, and of individual feature/site sketches augmented by selected photographs.

Although Chapman's original intention was to survey both Kīpapa and Nakaohu Ahupua'a entirely, this proved beyond the resources of his 1966-67 project. As can be seen in Figure 2.1, his team succeeded in covering a large portion of the *mauka* zone (above the highway), as well as the immediate coastal strip. A transect running along a *mauka-makai* jeep trail was also surveyed. In all, a total of 544 sites or features were recorded and assigned site numbers in 1966-67. Although Chapman's survey was highly innovative for its time, from our contemporary perspective the level of data recording was less than satisfactory. The individual site/feature sketches vary in quality and level of detail; no verbal descriptions were written; observations of architectural patterns, surface midden or artifacts were not always systematic; and, there is no comprehensive photo record. Nonetheless, the 1966-67 survey does provide a wealth of data, and forms the basis upon which a renewed program of intensive survey in Kahikinui is now being built.

The U.C. Berkeley Kahikinui Project

Background and Objectives

Having been a member of the original 1966 survey team, it had long been my goal to bring the results of Chapman's project to fruition. In 1994, with the assistance of Cindy Van Gilder, I began to reanalyze the 1966 survey data. The 1966 field sketches were each scrutinized for data on feature type, architecture, dimensions, and other observations, which were then systematically coded into a computerized database using Paradox 4.0 for Windows, a relational database management system. As this work proceeded, some problems and inconsistencies with the 1966 survey records became apparent. Often it was not possible to assign a feature to a particular architectural or formal class, or to make informed decisions about probable site function. It became evident that if the 1966 survey data were to be utilized, renewed field checking would be essential. A 10 day fieldwork session in Kīpapa-Nakaohu was planned for January, 1995, to reevaluate the 1966 survey results.

Our January 1995 survey was envisioned as a "trial run" to revisit and field-check as many of the 1966 sites as possible. We wanted to determine: (1) how readily the 1966 sites could be relocated, and how accurate the map locations were; (2) to check the accuracy of the 1966 field sketches and dimensions; (3) to systematically record certain architectural and other observations not made in 1966; and (4) to photograph as many sites as possible. We were constrained by both the limited funds and the time available, and did not anticipate that it would be possible to recheck anywhere near the total of 544 sites. Our aim was more modest: to visit as many features as possible in both *mauka* and *makai* sample areas. Between January 3-12, 1995, we spent seven days in the Kīpapa-Nakaohu area (two days were spent in the coastal sector, and five in the uplands). Our field strategy was to work in two

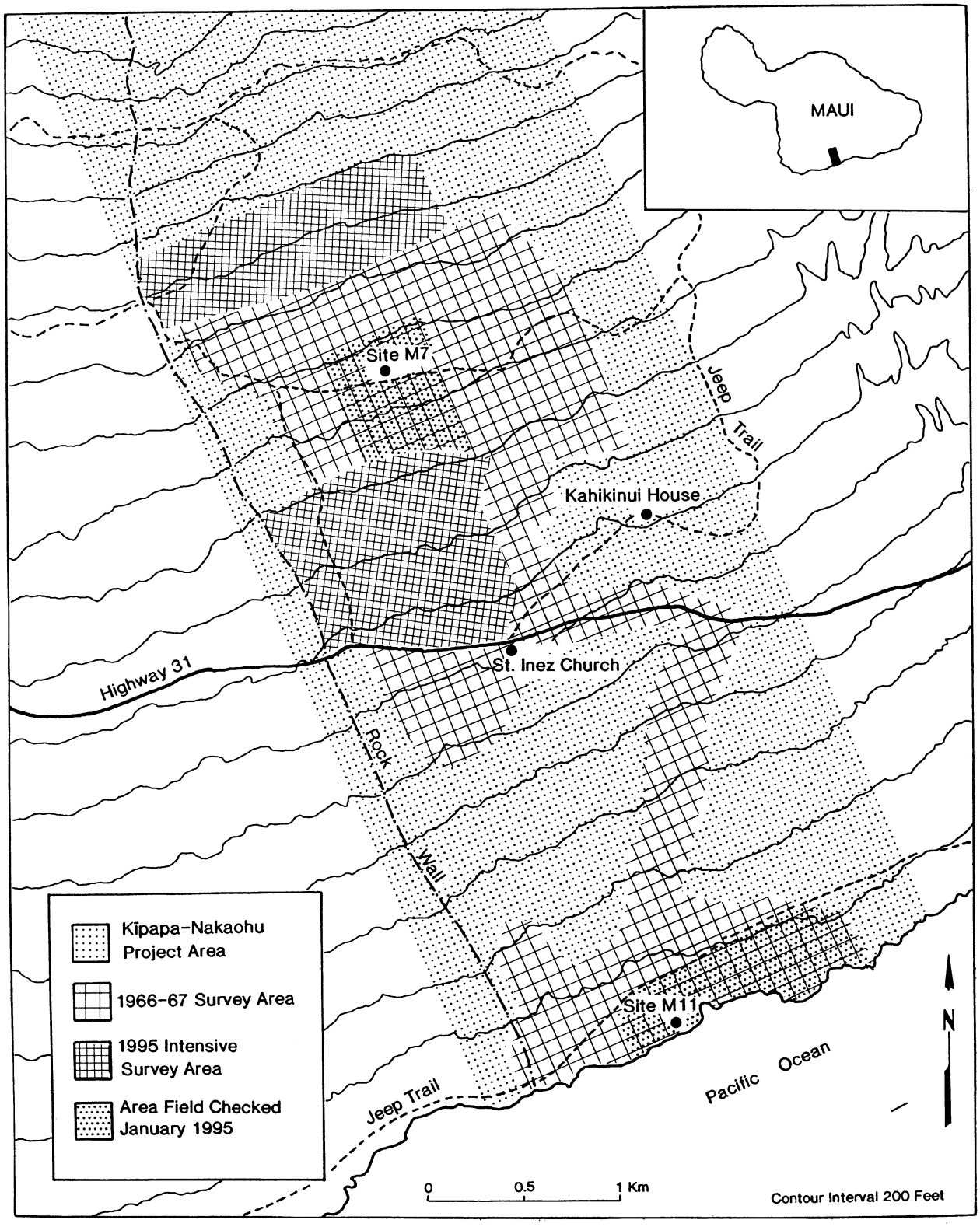

Figure 2.1 Map of the Kīpapa-Nakaohu area of Kahikinui, showing the geographic scope of the U.C. Berkeley survey project.

teams, each assigned a particular mapped area from the 1966 survey. We used xerox reproductions of the 1966 plane table sheets to relocate sites, and had bound sets of the individual site sketches for rechecking. We made systematic architectural observations on a preprinted recording form, using a protocol originally developed for an intensive survey of the Kawela Ahupua'a, Moloka'i (Weisler and Kirch 1985).

The January pilot study showed that the 1966-67 sites could readily be relocated, and that with systematic cross-checking the original data could be more readily interpreted. We were thus encouraged to lay plans for a longer-term restudy of the Kīpapa-Nakaohu area, with the goal of ultimately realizing Peter Chapman's initial vision of a comprehensive settlement-pattern study of these two *ahupua'a*. The second phase of this restudy was carried out from 29 June through 5 August, 1995 by the U.C. Berkeley team, assisted by staff of the State of Hawai'i Historic Preservation Division (SHPD). Rather than continue to focus on rechecking 1966-67 sites, we decided to concentrate on the survey and recording of sites in areas not covered by the Chapman team. In particular, we chose to survey a large block of approximately 1 km^2, *mauka* of Highway 31 and extending east from a rock boundary wall through Kīpapa and into Nakaohu Ahupua'a (see Figure 2.1). In addition, we also extended the survey into a higher-altitude zone (above the pipeline which marked the upper boundary of the 1966-67 survey area). By the close of the 1995 field season, we had recorded 462 new sites, bringing the total for Kīpapa-Nakaohu to 1,006 sites.

In 1996 and continuing to the present, the SHPD began an intensive survey of the highest elevation region within Kīpapa-Nakaohu, specifically the area above the old ranch pipeline which formed the upper boundary of the 1966 survey. Preliminary results of the SHPD work, under the direction of Boyd Dixon, are presented in Chapter 3 of this volume.

The latest phase of our U.C. Berkeley survey of Kīpapa-Nakaohu commenced on February 1, 1997, and is in progress at the time of this writing. The 1997 field season is focused on the intermediate zone lying between the *makai* strip originally surveyed in 1966, and the *mauka* area above the highway. By the end of February much of this zone had been covered, and more than 200 new sites had been recorded. By the completion of the 1997 field season—and with the collaboration of the SHPD team in the high-elevation uplands (see Chapter 3)—we anticipate that the archaeological survey of Kīpapa-Nakaohu Ahupua'a will finally be complete. We anticipate that more than 1,500 archaeological sites will have been recorded in these two *ahupua'a*. The computerized data files on these sites, when completed, will be integrated into the state-wide site file maintained by the SHPD.

Field and Laboratory Methods: 1995-97 Survey

The field and laboratory methods which we devised for the 1995 survey, and which are being used in our continuing efforts in Kīpapa-Nakaohu, are designed to take advantage of the best aspects of traditional archaeological field survey, combined with modern technological advances in data capture, storage, and analysis. A significant innovation consisted of scanning a series of enlarged, color infrared aerial photographs. The photos had been taken for the State of Hawai'i Division of Forestry, and the enlargements made for us by Air Survey Hawai'i were at a scale of approximately 1:8,000. Once scanned, it was a simple task to delineate any area of interest on the computer screen, enlarge this to the desired scale, and to process and enhance the digitized image using filtering and edge-enhancement transformations within the imaging software. Many archaeological sites, especially freestanding walls and larger structures, can readily be identified on these photographs, as well as distinctive vegetation patterns and other environmental features.

In the field, the reconnaissance team walks transects at a close interval, flagging structures for mapping and recording (no easy feat in some parts of the survey area with dense, head-high lantana and other exotic vegetation). Several low-level helicopter flights over the survey area allowed us to obtain oblique photographs of sites and terrain. Reconnaissance is followed by the mapping team which, as in 1966-67, uses a Gurley telescopic alidade and plane table to plot all sites at 1:1,000. The decision to map site locations by optical instrument was based both on a desire to maintain consistency with the 1966-67 maps, but also because plane table mapping allows one to make detailed and extensive observations on topography, geological substrate, and vegetation cover. Thus our 1:1,000 survey maps provide a basis for interpretations of remote-sensing data to be entered into our GIS (geographic information system) database for this region (see below). For many sites, moreover, we also electronically record site locations using a Trimble Global Positioning System (GPS) instrument, with differential correction of coordinates supplied by the SHPD. GPS positions were also taken on all plane table mapping stations. In the 1997 survey of the intermediate zone, where site density tends to be much lower than in the uplands, sites were plotted using low-level, infrared aerial photographs in the field.

Once sites were mapped, plotted, and assigned unique numbers in the field, they were recorded in detail using standardized, preprinted recording forms (Figure 2.2). The four-page form (printed on a single, folded sheet of stiff, green, non-reflective paper) incorporates a metric grid for plan and two cross-sections (usually drawn at 1:100), a checklist of 27 architectural, artifactual, and environmental attributes, and

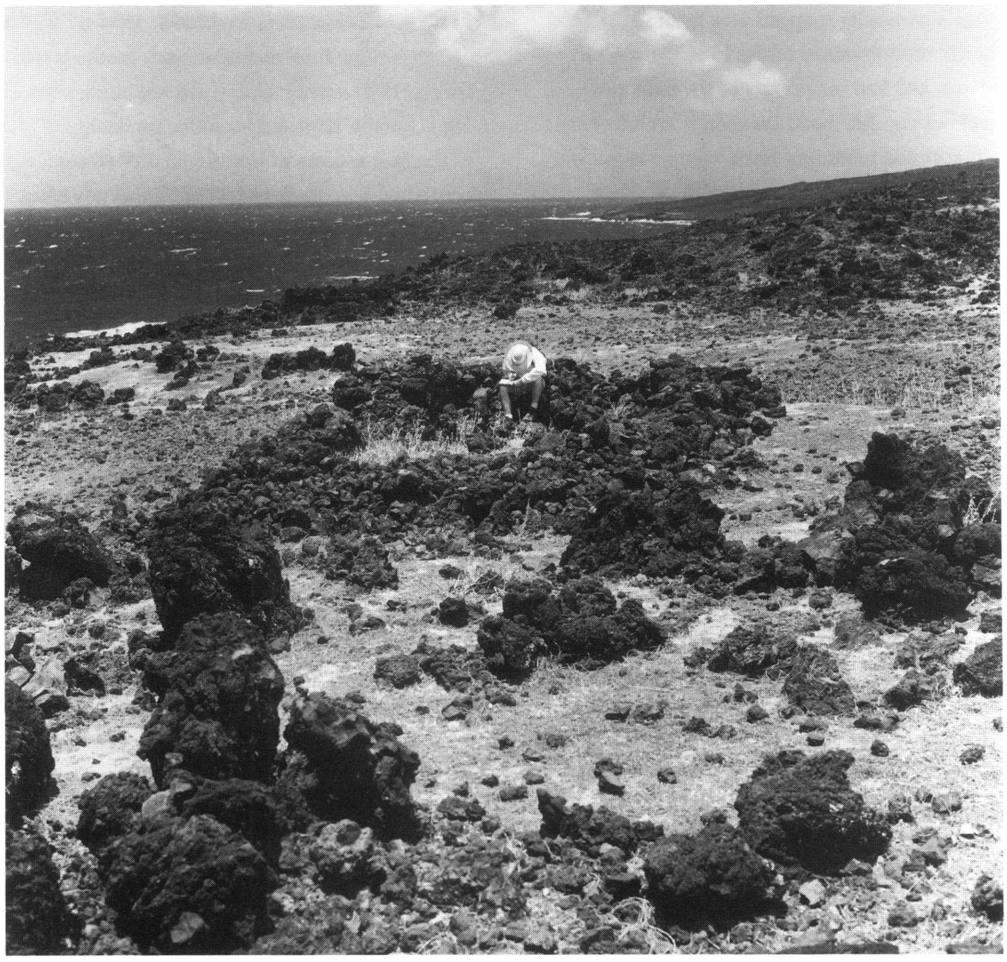

Figure 2.2 A U.C. Berkeley field team member fills out a detailed site recording form in the coastal part of Kīpapa Ahupua'a.

space for a verbal description. Use of such a preprinted format greatly enhances the quality of data capture and the comparability of results between individual recorders, a problem also addressed by regularly conferring between field team members. Some large, architecturally-complex sites have been mapped in detail with plane table and alidade at scales ranging from 1:50 to 1:200.

In the laboratory at the University of California, Berkeley, our survey data are entered into Paradox for Windows. The Paradox survey file incorporates all observations made on the preprinted recording forms. The survey area basemap has been electronically digitized, and all site locations entered into this digital map using AutoCAD version 13 for Windows (we run this software on a Pentium, with a Calcomp 9160 digitizer as the input device). The digitization of the archaeological basemap and site locations is the first phase of developing a GIS (geographic information system) database for the Kīpapa-Nakaohu area. Our objective is to create GIS coverages which combine the archaeological survey map with infrared images from aerial photography, a digital elevation model, and additional information "layers" on geology, soils, vegetation, and other variables. The preliminary digitized survey map incorporating all 1,006 sites plotted as of the end of the 1995 field season (but not including the most recent 1997 data) is shown here as Figure 2.3.

The Kīpapa-Nakaohu Survey: Results to Date

As in other leeward regions of Hawai'i, the archaeological landscape of Kīpapa-Nakaohu exhibits an initially bewildering array of stacked-stone architectural features, highly variable in morphology, ranging in size from 50 cm high stone mounds up to complex, walled, multicomponent structures enclosing as much as 1,600 m^2. The effects of a century and a half of cattle ranching—resulting in collapse and

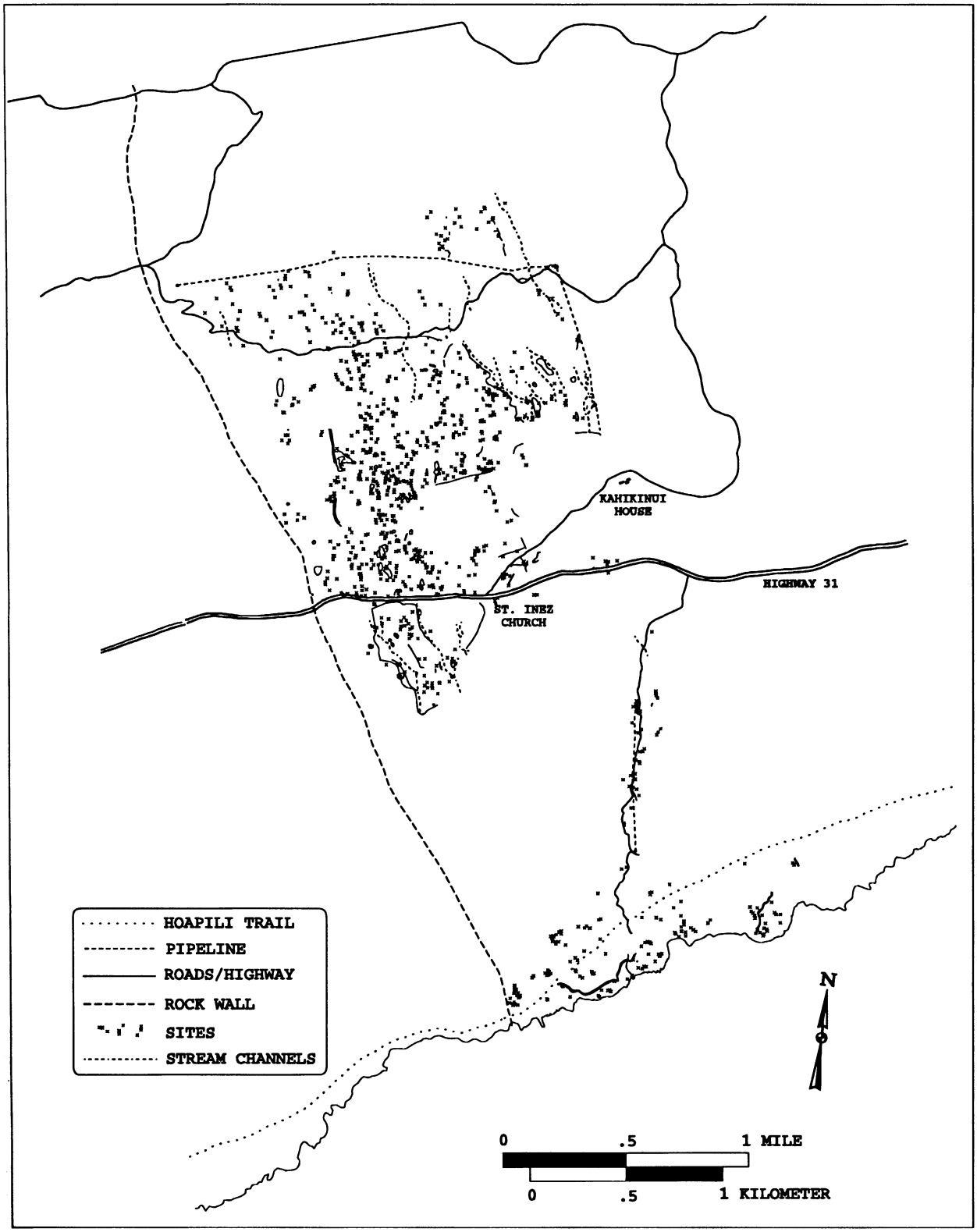

Figure 2.3 Digitized map of the Kīpapa-Nakaohu survey area.

heaping of many wall segments—further complicates architectural description. Having no precedents to inform him, Chapman struggled in 1966 with this architectural variation, defining such site types as "buttressed half-circles" (later to be called "C-shaped shelters" by most archaeologists), "walled rectangles," and "limited clearings." The problems of describing and classifying Hawaiian stone structural variation have continued in Hawaiian archaeology (e.g., Hommon 1970; Weisler and Kirch 1985; Ladefoged et al. 1987). In our 1995 fieldwork, we adopted a strict morphological system (modified from the 1980 Kawela survey on Moloka'i), noting probable functional attributions separately. A detailed report on architectural variation will be completed at a later date. In this summary, my remarks on sites follow several broad functional classes.

Patterns of Site Distribution

An exhaustive analysis of site distribution patterns must await the completion of the *ahupua'a*-wide survey and the GIS database, but several significant patterns are already evident. First, in broad geographic terms three major zones of site distribution can be defined: (1) a coastal zone about 200-350 m wide, of relatively high site density; (2) an intermediate zone of low site density extending from the inland edge of the coastal zone to an elevation of about 250-300 m above sea level (about 1.5-2 km inland); and (3) an upland zone of dense site concentration from about 250-750 m elevation. About 4.5 km from the coast, at approximately 800 m elevation, site density drops off rapidly. The precise upper boundary of archaeological sites in the Kīpapa-Nakaohu area has now been determined, thanks to the intensive survey efforts of the SHPD team (see Chapter 3, this volume).

This zonal pattern of site distribution was no doubt in part controlled by a few key environmental variables, especially rainfall and the degree of surface weathering (and hence, of soil development, so critical to agriculture). The narrow zone of coastal sites is clearly related to marine-exploitation activities, and most of these sites appear to have been only intermittently utilized, perhaps seasonally. Sites in the intermediate zone are generally small and inconsequential (such as small C-shaped shelters, and *ahu*). It is in the dense upland zone that the majority of residential and ritual features are located, and here also that rainfall and soil development would have been adequate to support intensive cultivation of dryland crops such as sweet potato and taro. An unanswered question concerns the approximate location of the forest line in pre-contact times, and whether this correlated with the decrease in site density at about 800 m elevation. Today the remnant *Acacia koa* and *Metrosideros polymorpha* forest does not extend below about 1,300 m; it is well known, however, that there was significant forest retreat in the past two centuries owing to the effects of cattle-ranching and other introduced animals (Medeiros et al. 1986:22-29). Analysis of charcoal samples excavated by both the SHPD and U.C. Berkeley teams at a variety of upland sites may provide significant data concerning the former extent of dryland forest in Kahikinui.

Within the densely settled upland zone we have also been able to detect significant variation in site distribution and density. Certain areas of high stone structure density correlate strongly with pahoehoe lava substrates, whereas areas with older and more deeply weathered aa lava substrates are characterized by relatively low stone structure density. The weathered aa substrates are also those dominated by grasses and, as noted in Chapter 1, in the Māhele records for Kanaio Ahupua'a we have some indication of grasslands (*moku mau'u*) being preferred areas for cultivation. It is likely that residential activities were being purposely situated on areas of pahoehoe lava with low agricultural productivity (and high availability of loose building stone), leaving the more fertile soil areas free for intensive cultivation. This distribution pattern is of considerable interest archaeologically, for the aa and pahoehoe substrates can be readily detected on our digitized infrared images (due to differential reflectivity of vegetation covers), and may potentially provide the basis for predicting areas of potential high site density in other leeward areas of Maui, or other islands, using a GIS approach.

Agricultural Features

When intensive archaeological surveys of leeward parts of the Hawaiian archipelago commenced in the late 1960s, investigators were struck by the extent to which agricultural features often dominated the landscape (e.g., Newman, n.d.; Green 1969). In particular, the leeward field systems of Hawai'i Island have attracted much attention (Kirch 1984:181-92, 1994:251-68; Kelly 1983; Rosendahl 1984). Given that Kahikinui exhibits a similar leeward, undissected, flowslope landscape it is all the more surprising that none of the regularized, linear field walls or terraces so typical of leeward Kohala or Kona are to be found in Kahikinui. Small stone mounds or heaps (ca. 0.5-2 m diameter) are, however, ubiquitous in the upland settlement zone in Kīpapa-Nakaohu. While settlement in parts of upland Kahikinui was unquestionably as dense as in leeward Hawai'i, there was evidently no consistent effort to construct reticulate, stone-walled field systems. (A few possible field walls have been observed in the highest elevation sections surveyed by the SHPD team; see Dixon et al., Chapter 3.)

What then, were the agronomic practices associated with what must have been a system of fairly intensive cultivation, given the density of upland residential features?

Our working hypothesis focuses on the likelihood that intensive field cultivation was practiced in two microenvironments of the uplands: (1) in areas of more deeply-weathered aa, enriched in places with light ash fall, and marked in historic times by grassland vegetation; and (2) in the swale-like depressions found between undulating lava ridges. The weathered aa slopes have a significantly lower density of residential features; one such extensive area in the eastern part of Nakaohu is almost devoid of surface stone structures. There is some historic-period evidence that such grassland-covered, weathered aa substrates were preferred microenvironments for cultivation. In the adjoining and environmentally-similar district of Honua'ula, several Māhele claimants in 1847-48 explicitly counted "grasslands" among their core holdings. For example, Kala of Waipao submitted before the Land Commission his claim for "3 sections of grassland," noting that "2 have taro growing on them," and observing also that "the *haole*" had taken control of some of this acreage (Archives of Hawai'i, L.C.A. 2405, Native Testimony, 12/26/1847).

The swales which are typical of this undulating lava flowslope would also have provided suitable areas for cultivation. These vary in size, but are generally no more than about 50-75 m across, and about 3-10 m deep. They form natural sediment catchments, and we observed that lantana thickets growing in them today are more lush, and remain green even during the dry summer months. In 1996 we excavated stratigraphic trenches in two such swales, to see if we could detect evidence of former cultivation. In one of the test trenches, an anthropogenic (human-made) cultivation soil was found to overlie an ash and cinder deposit. This cultivation layer showed several round-bottomed, pit-like features which were interpreted as depressions resulting from dryland planting, probably of sweet potatoes or taro.

The most likely field crops cultivated in the Kīpapa-Nakaohu uplands would have been sweet potato (*Ipomoea batatas*) and taro (*Colocasia esculenta*), with bananas also likely in the protected swales. Douglas Yen, who visited the field site and consulted on possible prehistoric agricultural practices, has suggested that the early, pioneering stages of settlement and cultivation in Kahikinui may have been based on a "swidden-in-forest" agricultural system with taro as the dominant crop (Yen, pers. comm., 21 Sept. 1995). As settlement became more intensive, however, one might anticipate the need to adapt this originally extensive system to changes in the degree of forest cover, wind exposure, and local moisture regimes. These are all matters that will require considerable study in the future phases of our project.

A unique agricultural feature in the upland zone, discovered during our 1995 survey in Kīpapa Ahupua'a, is a rectangular stone structure situated in the bottom of an intermittent stream channel (Figure 2.4). Elevated only a few centimeters above the streambed, the structure has an apparently water-inlet, as well as an exit channel. The interior surface is level, and consists of alluvial sediment. Given its topographic setting, the structure does not appear to be a habitation site, and we believe that it probably functioned as a small, irrigated pondfield (*lo'i*) for taro cultivation.

While most cultivation was probably focussed on the upland zone, we have also observed a few possible cultivation features in the intermediate and coastal zones. For example, some small, steeply-sloping swales or valleys just *mauka* of the coastal zone have low stone terraces constructed across them, probably for soil and moisture retention. These terraces might have been used for seasonal cultivation, or during wet years. In the intermediate zone, areas of dense aa rubble flow exhibit numerous small modifications, such as low C-shaped windbreaks. These are also most likely cultivation features. We observed that exotic vegetation such as lantana grows more luxuriantly on this aa rubble than on the adjacent weathered pahoehoe, probably due to greater moisture retention (the rubble acting as a kind of natural rock mulch). While tuber crops such as taro or sweet potato would be inhibited in such rocky terrain, other crops such as gourds or even paper mulberry (*wauke*, *Broussonetia papyrifera*) might well have been cultivated in this zone.

Residential Features

Features which we believe to have been associated with residence or habitation exhibit the greatest range of architectural variability in the survey area, and are also the most numerous; they are therefore the most difficult to summarize in a brief report such as this. Morphologically, such structures range from stone-faced terraces, to a variety of stone-walled windbreak shelters (linear, L-shaped, U-shaped, and C-shaped), to rectangular or square enclosures. Many incorporate natural outcrops and lava ridges in their construction, making it partly a subjective decision as to how to describe or classify them architecturally. In size, they are more consistent, generally falling within a maximum dimension of 4-8 m (16-64 m^2). The results of excavations undertaken in three residential complexes (*kauhale*) are described in Chapter 4 of this volume.

Numerically, the most common forms are clearly the windbreak shelters, and the enclosures (both rectangular and square in plan view). Both of these structure classes are constructed of stacked lava cobbles, with frequent use of a "core-filled" construction method in which stacked outer and inner facings are in-filled with smaller aa clinker. In the coastal zone, waterworn basalt gravel (*'ili'ili*) was used to pave interior surfaces, while in the uplands paved surfaces are of closely-

Figure 2.4 Rectangular stone structure situated in the bottom of a stream channel in Kīpapa Ahupua'a.

fitted field stone. The shelters, whether they consist of a single linear wall segment, or of two or three walls, invariably have the longest and highest wall oriented perpendicular to the prevailing easterly wind. The protected or partially-enclosed living surface is then open to the west. Walled enclosures, only a relative few of which have formal entryways, also tend to have the highest or strongest wall on the east. Walled enclosures in which wall heights reach approximately 1 m (and which are sometimes associated with larger enclosed spaces) appear to us to be post-contact or historic period features, evidenced by surface finds of ceramics, bottle-glass, and clay pipe stem fragments (see further discussion below). One large cluster of high-walled enclosures lies immediately northeast of St. Inez Church, and may represent an early nineteenth-century settlement.

There is some tendency towards clustering or aggregation of residential features, although in the uplands site density is so high that identifying discrete spatial clusters of features is at times difficult; on the coast more discrete clusters are apparent. One pattern that we have tentatively observed is a repeated group of three main features, which may on future investigation prove to be of some social significance.

Figure 2.5 shows the distribution of a number of residential features situated around a deep swale (probably used for cultivation) in the upland zone in Kīpapa Ahupua'a. There are probably at least two *kauhale* in this cluster, one on the east and one or two on the west. Excavations in the eastern *kauhale* were undertaken in 1996, and are described further in Chapter 4.

In the coastal zone, residential features tend to cluster in discrete groups, making it easier to identify *kauhale* groups. One such group in Nakaohu Ahupua'a is shown in plan view in Figure 2.6. Test excavations were carried out at this cluster in 1996, and are described in Chapter 4. The cluster includes a probable men's house (*mua*), several other dwelling features, a fishing shrine (*ko'a*), and a post-contact enclosure.

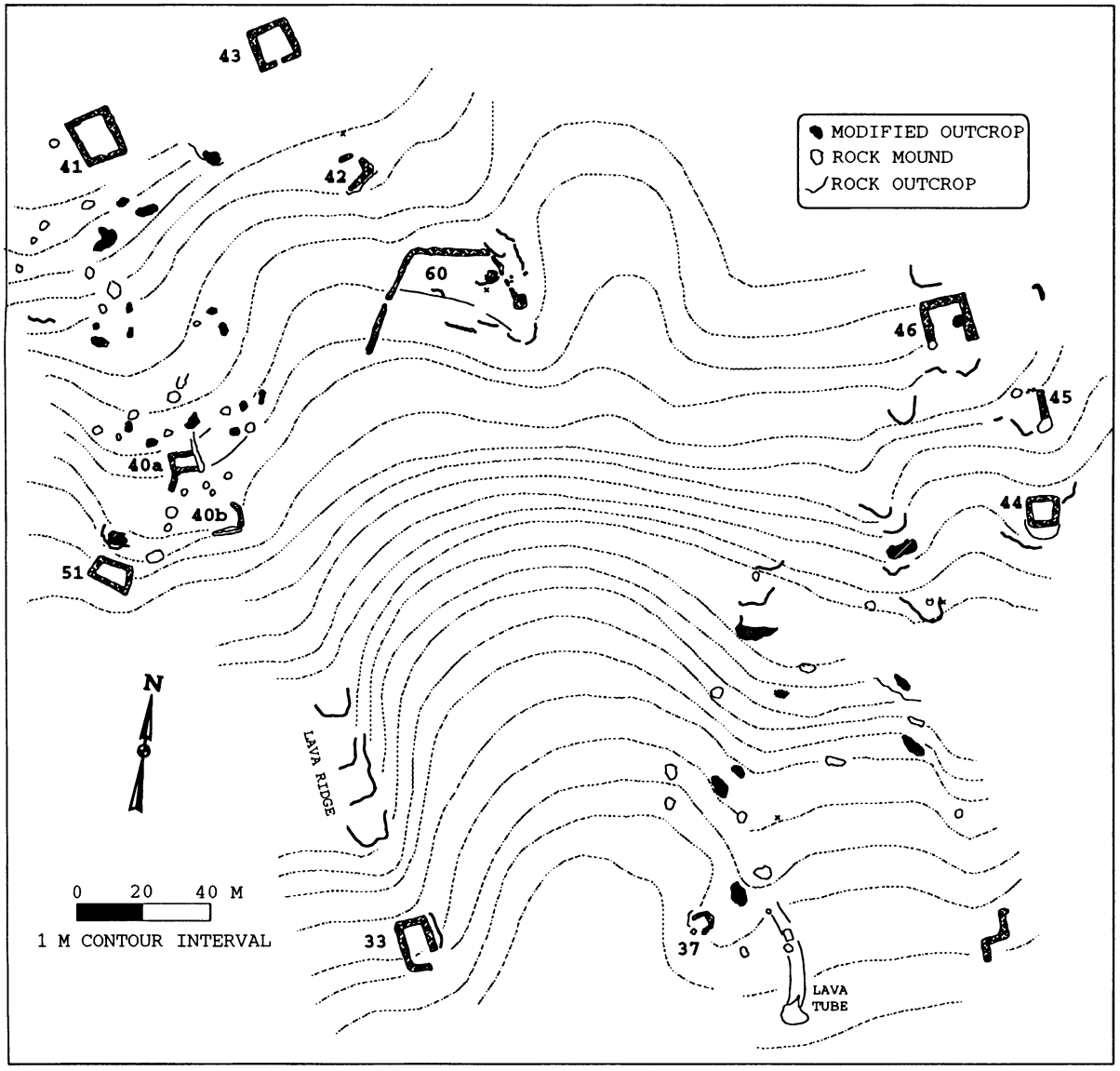

Figure 2.5 Map of residential features and agricultural mounds situated around a small swale in the upland zone of Kīpapa Ahupua'a.

Three major problems beset settlement-pattern analysis of residential structures: (1) chronology; (2) feature-use duration; and (3) function. Chronology is essentially the problem of establishing whether a series of features on the landscape were contemporary in their construction and use-lives. Feature-use duration is the problem of determining the use-life of a particular feature, and whether that use-life was continuous or temporary (intermittent). Function refers to the problem of ascertaining specific activities performed within or adjacent to a feature, a complex issue given the ethnohistoric record of contact-period Hawaiian society in which the built environment was highly influenced by the *kapu* system. These are problems that we are beginning to address through detailed testing and excavation of residential structures (see Chapter 4).

Ritual Features *(Heiau)*

Religious or ritual sites (*heiau*) in Hawai'i are typically identified either through traditional or ethnohistoric sources, or by identification of architectural features thought to be characteristic of such sites (Kirch 1985:257-65). In Kahikinui, only a few sites were identified by Walker's Native Hawaiian guides in 1930 as being *heiau*; two of these lie within

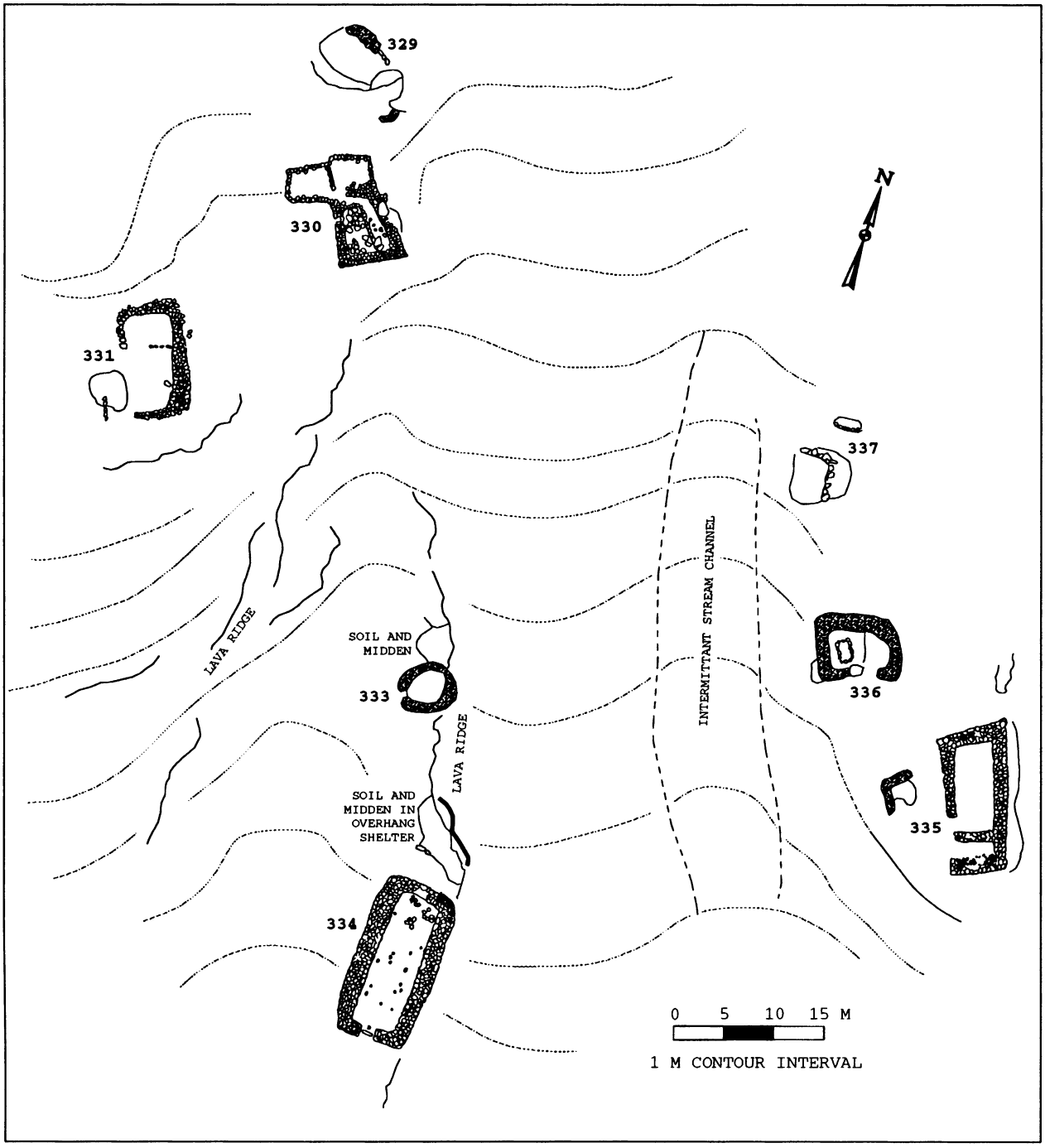

Figure 2.6 Map of a residential cluster (*kauhale*) in Nakaohu Ahupua'a.

our Kīpapa-Nakaohu survey area (see also Chapter 5, this volume). On architectural criteria as well as size, however, at least another 15 structures within the Kīpapa-Nakaohu area probably functioned as ritual sites. These range from a large, architecturally-complex structure (ca. 1600 m^2 in area) near the eastern boundary of Nakaohu Ahupua'a which may well have been a district-level *heiau*, through intermediate-sized walled structures (ca. 200-800 m^2) often of "notched" form (see Kolb 1994, and Chapter 5), down to small structures (ca. 75-150 m^2) that were probably either household shrines (*mua*) or—on the coast—fishing shrines (*ko'a*).

The mid-to-large sized *heiau* structures are all concentrated in the upland zone of dense site distribution (approximately 340-800 m elevation). With only a few exceptions, these are all stone-walled enclosures, usually having a six-sided ("notched") plan which has been noted by other archaeologists as typical of Maui Island *heiau* (Kolb 1994); the exceptions are terraced sites and a few four-sided enclosures (Figure 2.7). Notably, all *heiau* sites exhibit a preferred orientation to the east, with the highest and best-constructed walls and facings at their eastern ends. Such an eastwards orientation was also noted by Weisler and Kirch (1985) as typical of ritual sites in Kawela Ahupua'a on Moloka'i, and may represent a widely shared cultural ideology. Almost without exception, all ritual sites in Kīpapa-Nakaohu also have offerings of branch coral placed on them, or buried within wall fill; these coral offerings are exclusively of branch (not brain or block type) coral that was clearly gathered live from the sea. In the upland sites, these offerings usually consist of single branches, but on the coastal fishing shrines (*ko'a*) they are more numerous and include whole coral heads.

Figure 2.8 is a plan map of a notched *heiau* (Site 1) situated in the Kīpapa uplands. It can be seen that the temple is oriented east-west, and has two courts offset to create a "notched" plan. The eastern court has high, well-built walls, especially on the eastern side. The western court is less well defined, and gaps on the north and west may represent entrances. A pit in the center of the western court was possibly

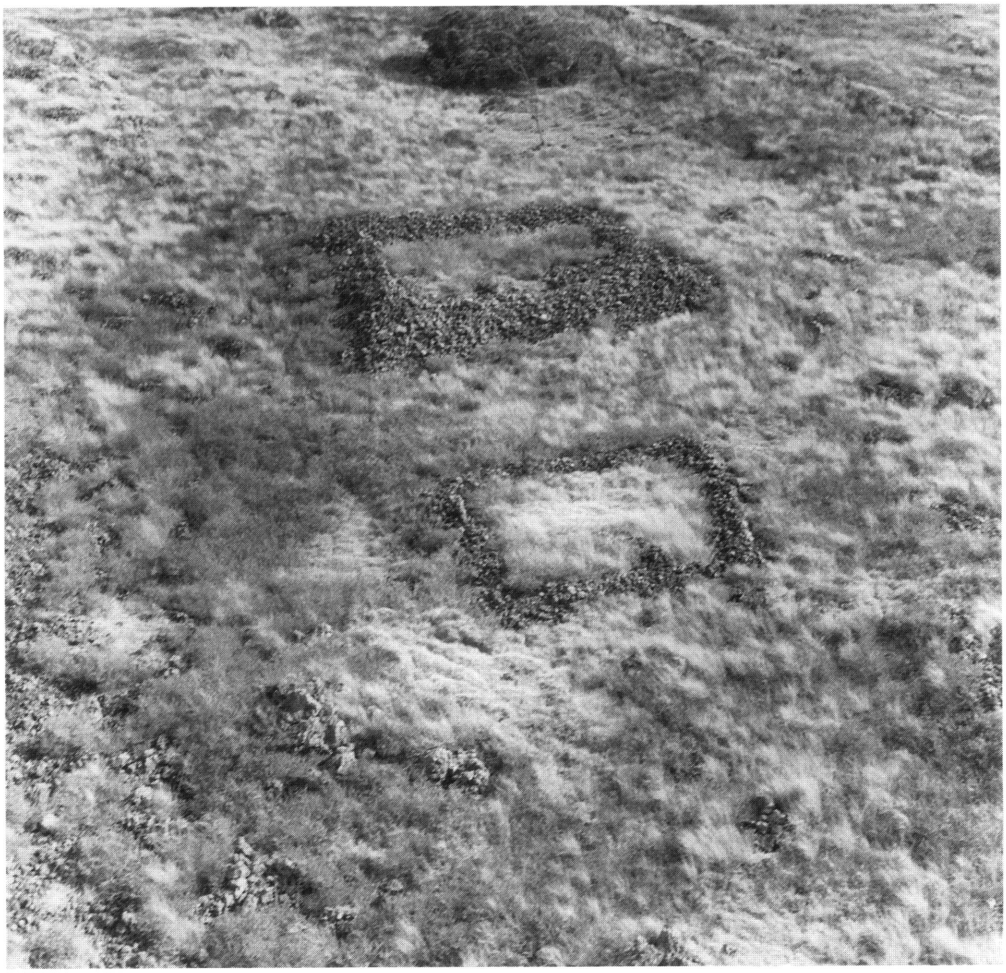

Figure 2.7 Aerial photograph of a large stone enclosure in Nakaohu Ahupua'a, probably an intermediate-level *heiau*.

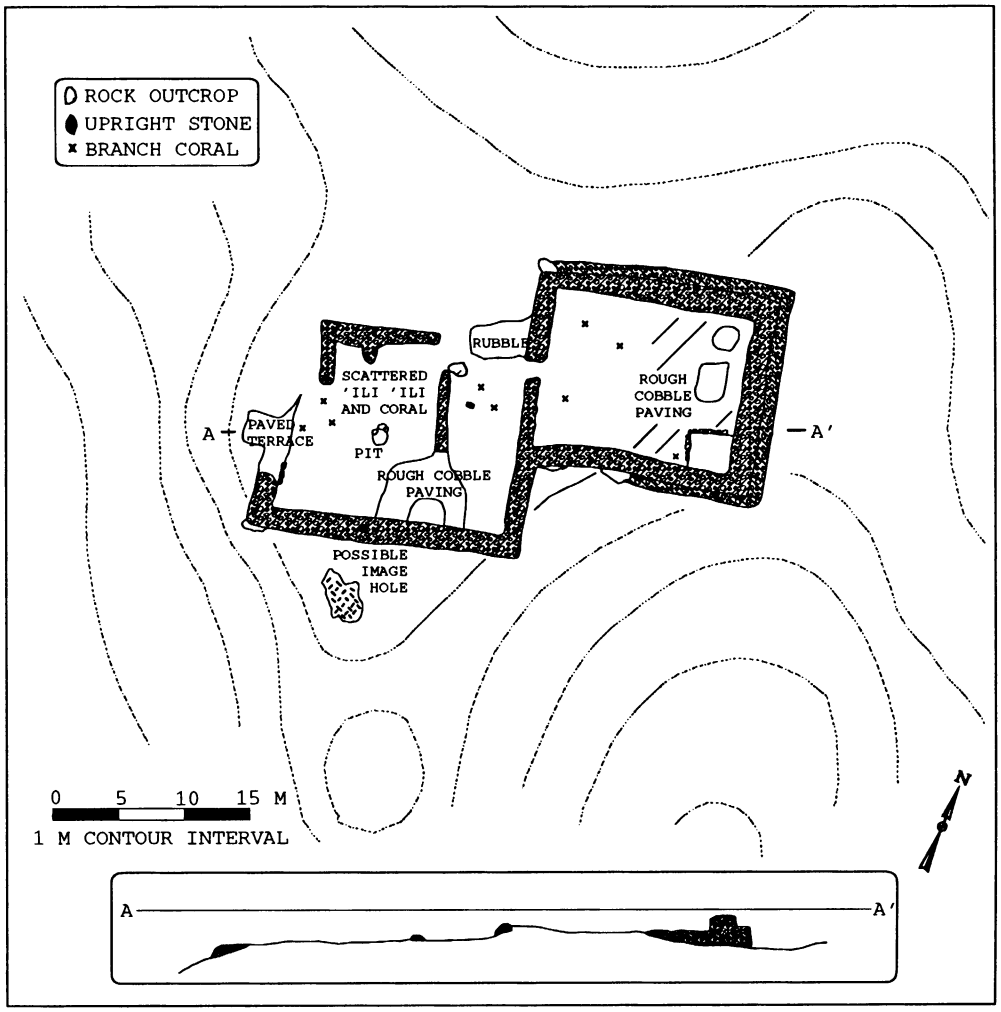

Figure 2.8 Plan of Site 1, a notched *heiau* in Kīpapa Ahupa'a.

an *imu* for the cooking of sacrificial offerings.

The distribution of *heiau* sites in the upland settlement zone is of particular interest. A number of smaller-sized notched enclosures are closely associated with clusters of residential features (linear, L-, and C-shaped structures) and may well have functioned as residential shrines or men's eating houses (*mua*). The intermediate-sized structures, however, are typically somewhat isolated from these residential clusters, suggesting that they may have been associated with stricter ritual prohibitions (*kapu*). Moreover, in Nakaohu Ahupua'a, some six of these structures form a distinct *mauka-makai* cluster stretched out along a high aa lava ridge in the middle of the survey area, immediately west of one of the most extensive tracts of deeply-weathered (and in part, ash-covered), arable soil. The ongoing survey of Kīpapa Ahupua'a suggests a similar *mauka-makai* alignment of *heiau*. One possibility is that these intermediate-level *heiau* were each associated with individual *'ili*-level subdivisions of their respective *ahupua'a*.

In the coastal zone are located a number of fishing shrines (*ko'a*), marked by the presence of large branch coral heads as offerings. The plan of one such shrine, in Nakaohu Ahupua'a, is shown in Figure 2.9. The *ko'a* has a well-defined entryway, leading to a small courtyard carefully paved with flat slabs of pahoehoe lava. Along the eastern side of the court is a raised bench or altar on which were placed several large coral heads and a number of flaked cobbles of water-rolled beach stone. The altar is built up against a prominent aa lava boulder with unique reddish coloration, which may have been the *ku'ula* stone for this *ko'a*. This site also incorporates two adjacent low stone platforms on the north side; the function of

these is not clear, although these might contain burials.

Post-Contact Structures

The sites described above are all thought to date to the pre-contact period. However, we know from historical records that Kahikinui continued to be occupied into the post-contact era, and had a Native Hawaiian population in residence as late as the 1860s. Thus we should expect some of the sites recorded during our survey to date to this post-contact time period. Indeed, there are a number of sites which display distinctive architectural traits that we believe are post-contact innovations. In particular, with the introduction of cattle, goats, and other ungulates it became necessary for the Native Hawaiian people to construct high stone walls to support their thatched houses, so that the *pili* grass thatch was not literally eaten from around them. Such rectangular, high-walled house enclosures have been identified in several places within Kīpapa-Nakaohu. One cluster of such sites lies just northeast of St. Ynez Church, and may well represent a hamlet or village occupied by the Catholic inhabitants of Kahikinui (see Chapter 1). One such high-walled enclosure, part of a *kauhale* complex at Nakaohu Kai, was test excavated by our team in 1996 (see Chapter 4). Our excavations yielded a wide range of post-contact artifacts such as beads, ceramics, and metal, and confirmed that this site was of post-contact age.

A unique high-walled rectangular enclosure (Site 323) is situated in Nakaohu Ahupua'a, between the coastline and the Hoapili Trail (Figure 2.10). The enclosure was constructed of pahoehoe slabs in a style quite different from other sites, and stands by itself isolated on a pahoehoe plateau. It is not part of a *kauhale* complex, and the absence of residential midden suggests that the structure had a special function. We believe that it may have been a school house, perhaps one of the schools ordered to be established throughout the islands by Kuhina Nui Ka'ahumanu in the 1820s (Kirch and Sahlins 1992), or by Governor Hoapili of Maui. Later land

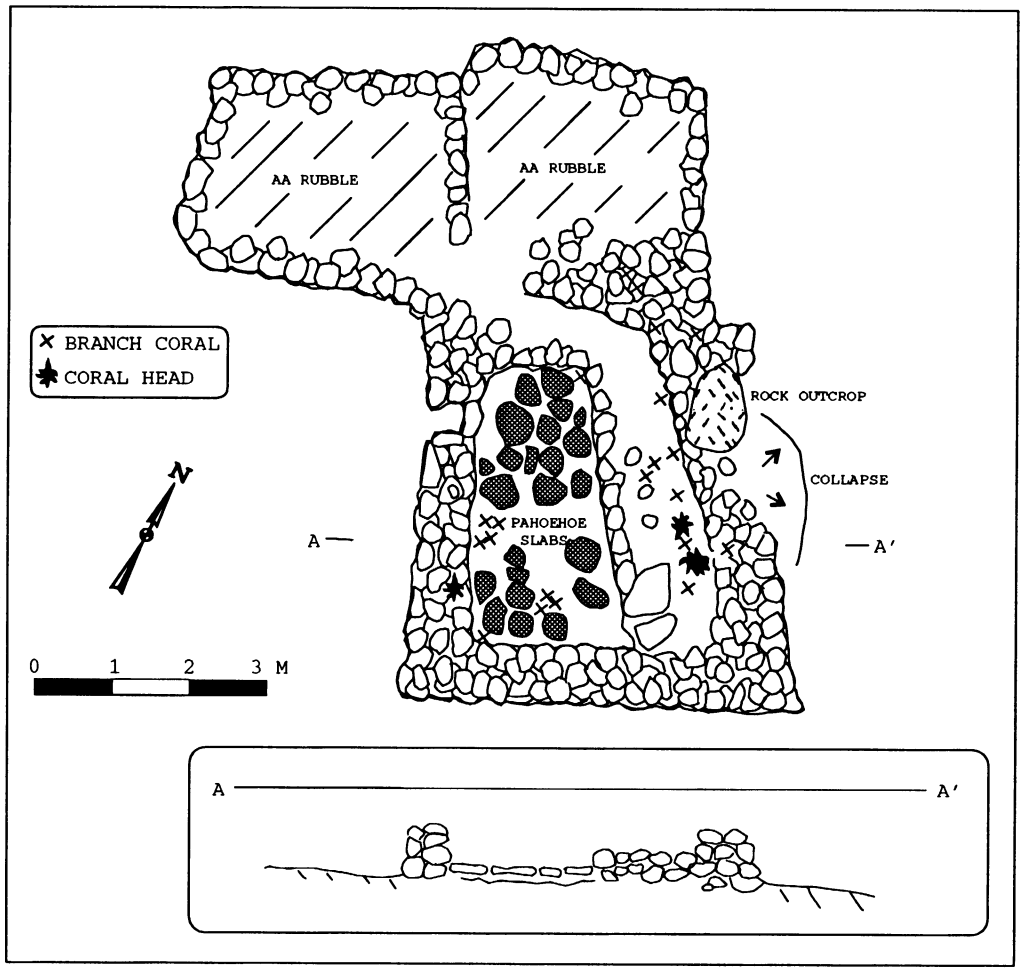

Figure 2.9 Plan of Site 330, a fishing shrine or *ko'a* in Nakaohu Ahupua'a.

grant documents do indicate the presence of a *hale kula* or school house somewhere in the Kīpapa-Nakaohu area (H. McEldowney, pers. comm., 1997).

Conclusion

In this chapter I have tried to give a summary account of some of the main findings of our intensive survey of the two *ahupua'a* of Kīpapa and Nakaohu. As the survey itself is still being completed, and there is much analysis of data yet to undertake, any attempt at definitive conclusions would be premature. Nonetheless, the overall settlement and land use patterns for two of the major *ahupua'a* of Kahikinui are now becoming clear. It is certain that there were major coastal and upland zones of settlement and land use, correlated with fishing and agriculture respectively. The upland settlement zone is the most dense, and the large number of sites there speaks to a substantial Native Hawaiian population in the pre-contact era. The social and political organization within each *ahupua'a* is a topic that we intend to address during our data analysis phase, and the distributions of agricultural, residential, and ritual structures should provide important evidence in this regard. Tentatively, it appears that settlement was carefully geared to microenvironmental variations, with the areas of best soil development reserved for agricultural production. Also, the distribution of intermediate and smaller-sized *heiau* suggests a pattern of land division by *'ili*. Within each *'ili*, the land holders resided in clusters of functionally-differentiated habitation structures, these forming *kauhale* clusters (see Chapter 4 for further discussion). Changes in these patterns of settlement doubtless occurred after contact, and an analysis of the distribution of post-contact architecture should help to clarify the nature of change brought on by the integration of Kahikinui and Maui with the greater world system.

Although it has taken many more years than originally envisioned by Peter Chapman in 1966, the compre-

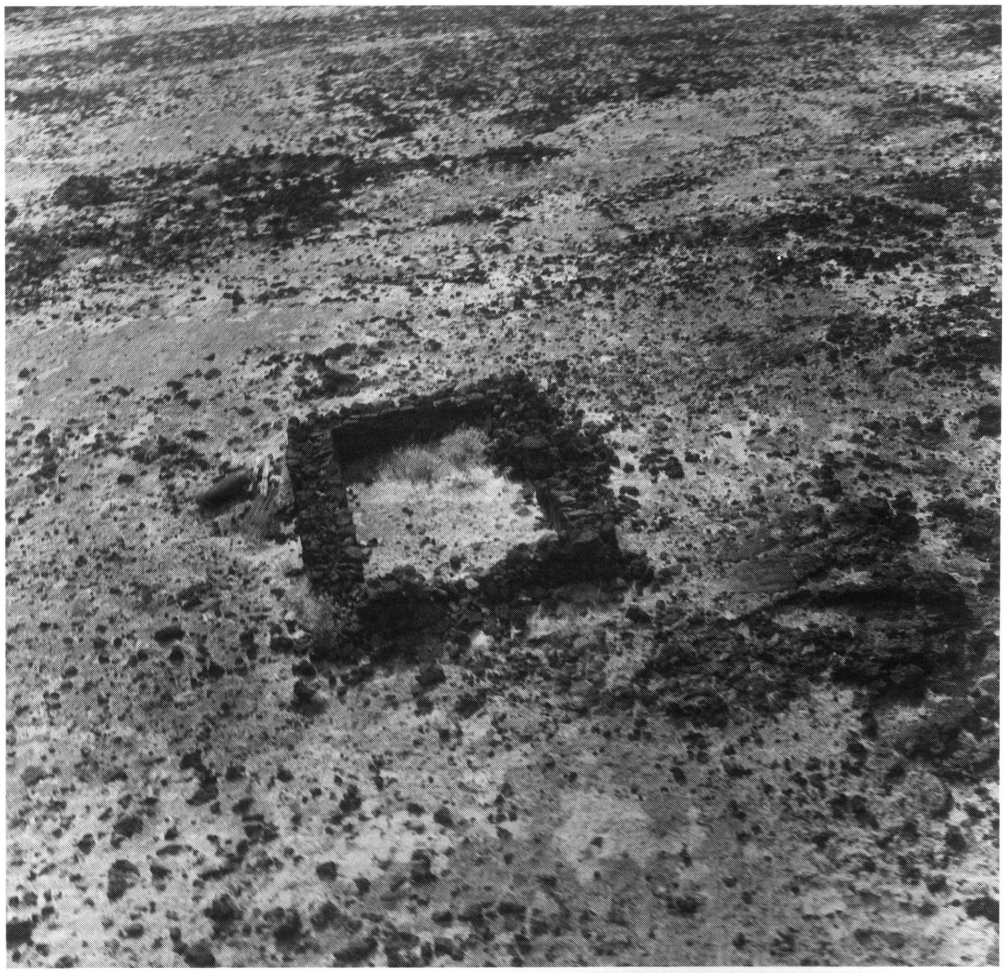

Figure 2.10 Aerial photo of a high-walled rectangular enclosure (Site 323) in the coastal section of Nakaohu Ahupua'a.

hensive archaeological survey of two complete *ahupua'a* within the *moku* of Kahikinui is now nearly completed. The extraordinary database resulting from this survey will provide the basis for the most complete study yet possible of ancient Hawaiian land use and settlement patterns in a leeward area. Notably, this has been made possible because of the collaboration and cooperation between several organizations, including the SHPD and DHHL agencies of the State of Hawai'i, the University of California at Berkeley research team, and Ka 'Ohana O Kahikinui.

Acknowledgments

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