PACIFIC COOPERATIVE STUDIES UNIT
UNIVERSITY OF HAWAI`I AT MĀNOA
Dr. David C. Duffy, Unit Leader
Department of Botany
3190 Maile Way, St. John #408
Honolulu, Hawai'i 96822

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ETHNOGRAPHIC ASSESSMENT AND OVERVIEW NATIONAL PARK OF AMERICAN SAMOA

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Jocelyn Linnekin[1], Terry Hunt, Leslie Lang and Timothy McCormick

[1] Email: JOCELYN.LINNEKIN@uconn.edu. Department of Anthropology, University of Connecticut Beach Hall Room 445, U-2176 354 Mansfield Road Storrs, Connecticut 06269-2176

Ethnographic Assessment and Overview
The National Park of American Samoa

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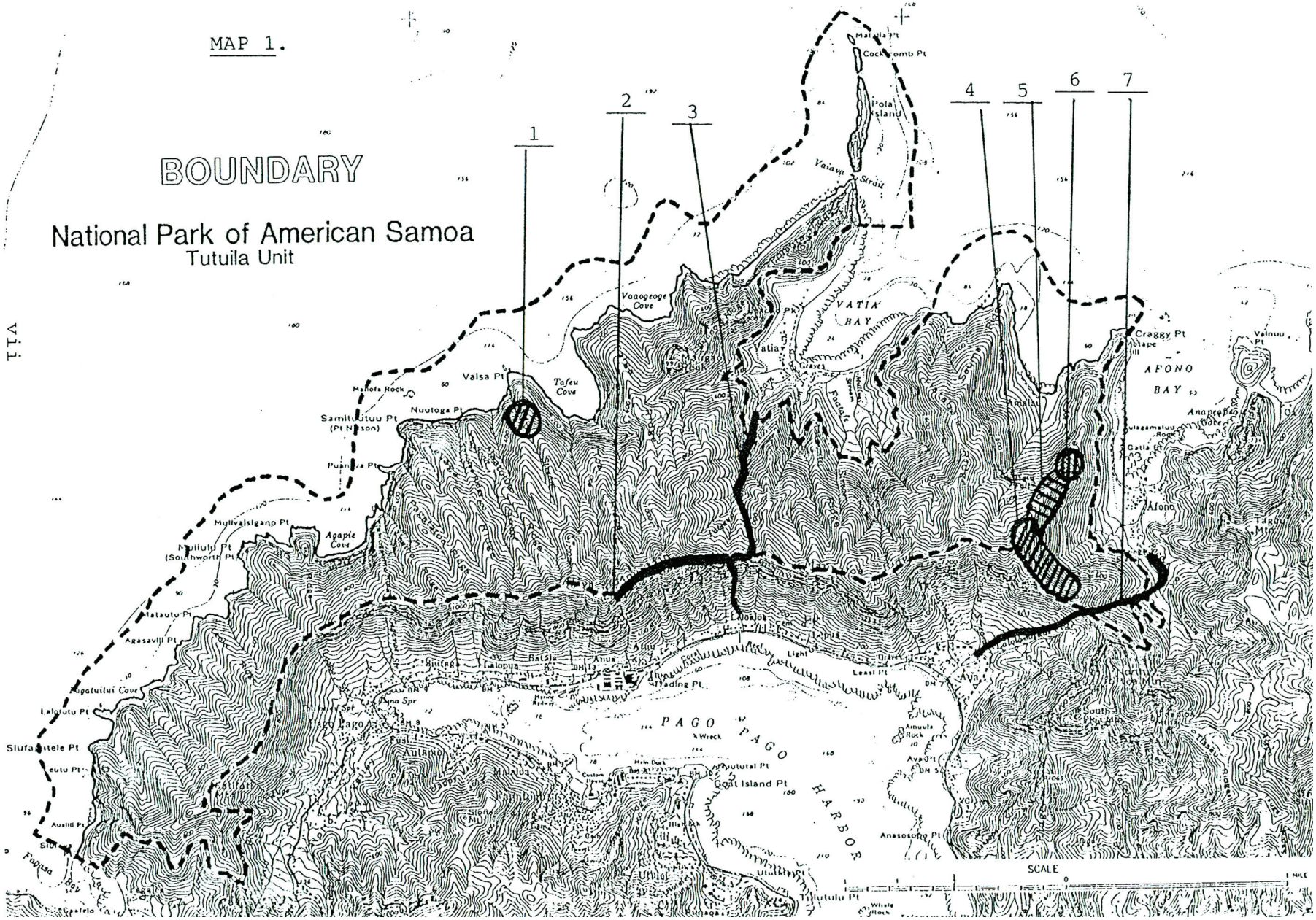
Preface: Study Issues

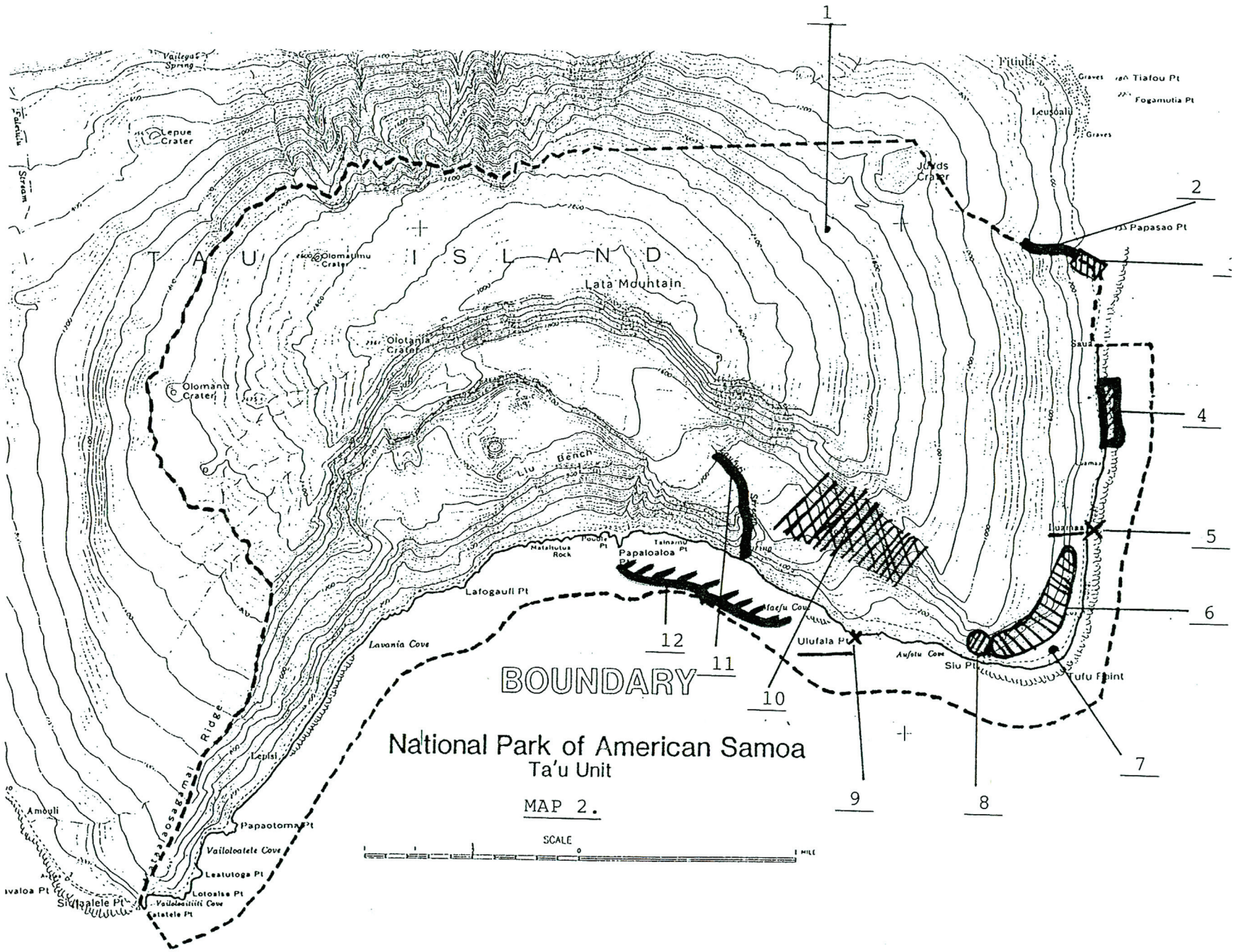
The Ethnographic Assessment and Overview of the National Park of American Samoa was commissioned to document the ethnohistorical background and cultural context of Park localities, as well as modern resource use within the Park, as a guide to policy making. The investigation has focused on the historical and cultural significance of Park areas and on how Samoans today utilize lands, forests, reefs, and offshore fisheries lying within the Park boundary. A detailed discussion of our research methodology is presented in Chapter III. After discussing the environmental, archaeological, and ethnohistorical contexts of the National Park of American Samoa, the report addresses agriculture, marine resource use, medicinal plants, and culturally significant sites. Quantitative analyses of systematic interview data on these topics are presented in Chapter VIII. The report concludes with a summary of findings, a discussion of how local residents perceive the Park, and with suggestions for future research.

In order to maintain the anonymity and confidentiality of our informants, we do not name particular individuals in this report. However, we wish to thank collectively all of the residents of the villages participating in the Park for their hospitality, kindness, and cooperation during our study. We particularly thank the Park Service staff in Pago Pago--Superintendent Christopher Stein and Chief Park Ranger Leota Vaea Ainu'u--for their unflagging assistance and support.

Field work for this report was conducted in the early 1990s and the draft report completed in 1995.

MAP 1.


BOUNDARY
National Park of American Samoa
Tutuila Unit
1
2
3
4
5
6
7
Vaoaeoge Cove
VATIA BAY
Vatia
Craggy Pt
AFONO BAY
Afono
Valsa Pt
Tafeu Cove
Nuutoga Pt
Agapie Cove
Agasavili Pt
Lalofutu Pt
Pago Pago
PAGO PAGO HARBOR
Goat Island Pt
Anasosono Pt
Tutuila Pt
SCALE


T A U I S L A N D
Lata Mountain
Lepue Crater
Olomanu Crater
Olomastimu Crater
Olotania Crater
Jeads Crater
Fitiuta
Leusoalii
Tiafou Pt
Fogamutia Pt
Papasao Pt
Sauma Ridge
Liu Bench
Papaloaloa Pt
Lafogauli Pt
Lavania Cove
Ulufala Pt
Aufatu Cove
Siu Pt
Tufu Point
Lepisi
Papaotoma Pt
Vailoloatele Cove
Leatuloga Pt
Lotoalse Pt
Siufaatele Pt
Amouli
BOUNDARY
National Park of American Samoa
Ta'u Unit
MAP 2.
SCALE
1
2
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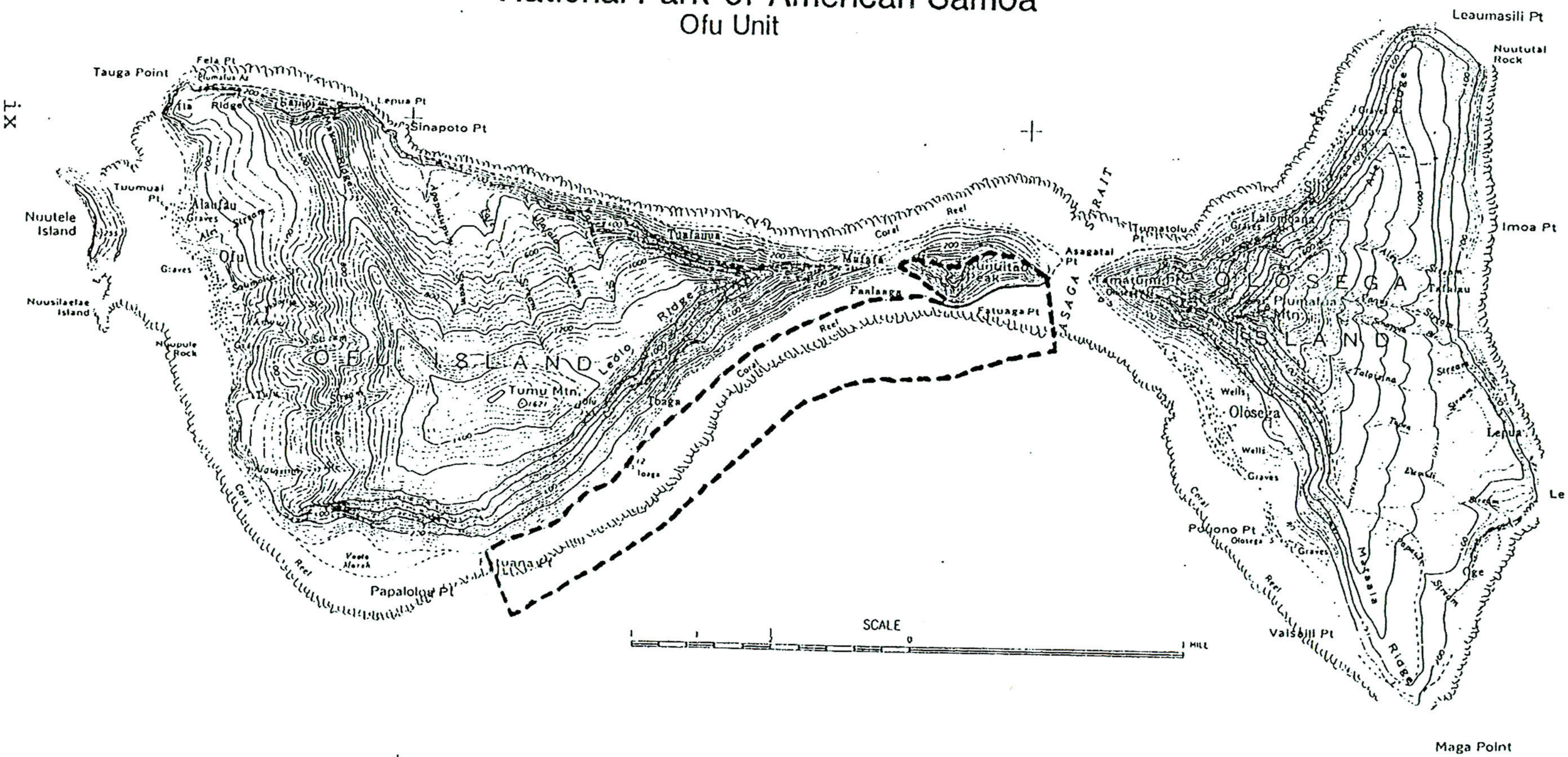
11
12

MAP 3.

BOUNDARY

National Park of American Samoa
Ofu Unit



Key to Maps

Map 1. Tutuila Unit.

1 Purported site of the village of Vatia in pre-Christian times. There are said to be a number of graves in this area, dating from 1800 or earlier.
2 Television tower.
3 Footpath from Pato Pago to Vatia. An adjoining path runs along the ridge to the TV tower.
4 Flat area used by Afono people as a refuge during attacks.
5 Area along Olo Ridge referred to as Asifelefele. There are graves in this area.
6 Two caves at an outcropping where someone from Afono used to stand watch to warn of attacks from the sea.
7 Footpath from Pago Pago to Afono.

Map 2. Ta'u Unit.

1 Papalaina. A woman lived here in the late 1950s.
2 The stream that marks the Park boundary on the mountain side of the road is the stream that Pava floated down on his way to meet Tagaloa for the first 'ava ceremony.
3 Unmarked burials. Skeletons were discovered when the stone path through Saua was being built, ca. 1950. Some were reburied here by one person who was interviewed. The skeletons are reputed to be people killed in four battles with Ta'u, ca. 1817.
4 The 'sacred sand,' oneone le tanumia, from the creation legend.
5 Luama'a, site of the two rocks in the creation legend.
6 Area of large ta'amu plantations.
7 A well, on the mountain side of the road.
8 Cleared area where someone lived for about six years. Skeletons were discovered here and reburied in one corner of the clearing.
9 Ulufala Point, where the first Tagaloa and the first Tui Manu'a lived. A legend tells of all the people of the Pacific gathering here in their boats.
10 Former taro plantations and old village site.
11 Laufuti Stream, once popular for fishing and swimming, but less frequented since the hurricanes destroyed the access road.
12 Area described as the best fishing grounds.

Map 3. Ofu Unit.

No specific land sites were recorded in this Unit.

I. The Environmental Context

The Samoan Archipelago comprises six major islands. The islands vary in their geomorphology as a consequence of relative age, secondary volcanism, erosion from rainfall, and the forces of the sea. The Samoan environment also varies considerably in terms of soil, vegetation, and marine resources. Adding to this mosaic are complex human-induced changes that have, over three millennia of occupation, transformed much of the Samoan environment into a productive economic landscape.

Climate and Vegetation.

Samoa lies within the humid tropics. At 14^{o}S latitude, the islands are in a zone where temperature and humidity are nearly constant and rainfall abundant. Average temperatures vary from only 25.7 to 26.2^{o} C, with humidity between 80 and 86 percent. The total annual average rainfall (recorded from Tutuila Airport) is 3100 mm (Nakamura 1984: Table 1). Seasonality is expressed primarily in the pattern of rainfall. From June to September drier conditions prevail with monthly rainfall averaging about 175 mm. A wetter season, from October through May, has monthly averages of about 350 mm. Variability in rainfall occurs with extended dry seasons. Droughts can significantly affect agricultural production. The wet season can bring torrential rains and damaging floods--some associated with tropical storms and hurricanes (Nakamura 1984:3).

The hotter, wetter season from October to March brings the risk of tropical storms and cyclones. Coulter (1941:12) notes "Samoa suffers hurricanes at regular intervals during the hotter season." Visher (1925:27, Table 6) indicates an annual frequency of two to three hurricanes in the area of Samoa, some hitting the islands directly and bringing devastation to crops, houses, and human life. These regular, natural catastrophes have helped to shape the environmental history of the islands. The torrential rains cause landslides, and storm surge can reshape the shoreline and configuration of the coastal terrace in a matter of hours.

The volcanic origin of the Samoan landforms yields predominantly undifferentiated parent material for soil formation. The basic parent materials are derived from volcanic rocks. Volcanic ash and cinders from eruptions are also common sedimentary parent materials. Colluvium and alluvium form parent materials for many soils as well. A limited number of soils have formed in organic material and coral sand--in geologically young coastal terraces. Many Samoan soils are young, reflecting both geologic age of the islands and the dynamic geomorphology that frequently exposes new surfaces (Nakamura 1984:57-58). Large areas of Samoa have well drained, well watered, fertile soils. The steep slopes of the mountain ridges are a primary limiting

factor on the availability of arable land.

Samoan flora is typical of the well watered, tropical, island environments of the region. Yuncker (1945:4), for Manu`a, lists 421 taxa, including mosses, pteridophytes, and flowering plants, in his botanical survey of the three islands. Many species found in undisturbed habitats are endemic to Samoa. However, large portions of the Samoan landscape have been modified at one time of another by human activity. These anthropogenic landscapes represent areas of natural vegetation transformed into economic ones.

Whistler (1981) made a comprehensive study of Samoan vegetation, classifying zones to describe general plant distributions. The littoral vegetation includes several taxa that are native and adventive. This zone is subject the effects of sea spray and occasional storm conditions. The plants include coconut, pandanus, creeping vines, grasses, and succulent herbs. Wetland vegetation includes freshwater coastal marshes and saltwater mangrove forests. Wetland vegetation has become rare because these areas come under agricultural use or have been cleared to open coastal land and waterways. Tropical rainforest covered the vast majority of Samoa before humans modified the landscape for agricultural purposes. These rainforests include the coastal, ridge, lowland, montane, and cloud zones, governed by conditions of altitude, moisture, and soil drainage.

Vegetation surveys show one of the largest zones is that classified as "disturbed" or anthropogenic. This zone consists of land that is currently under swidden (slash and burn) cultivation, or has been abandoned and is slowly reverting through successional stages to natural vegetation patterns (Whistler 1981). Hurricanes have also played an important role in disturbing the vegetation in Samoa (National Parks Service Draft 1988: 16).

In sum, vegetation patterns in much of Samoa reveal its three millennia of human land use. The vegetation of the lower elevations and coastal terrace of the islands are dominantly anthropogenic, reflecting "transported landscapes" of the adventive root-tuber and tree crop complex of Oceania. Vegetation in these zones is comprised of a mosaic of coconut stands, breadfruit and banana orchards, and aroid gardens interspersed with secondary growth. On the higher, steeper slopes of the main islands, rainforest vegetation persists.

The vertebrate terrestrial fauna of Samoa is restricted, but is somewhat richer in invertebrates (landsnails and insects). The only indigenous mammal is the fruit bat, *Pteropus samoensis*, found in abundance and once commonly taken for food throughout Samoa. The Pacific rat (*Rattus exulans*), the domestic pig (*Sus*

scrofa), and dog (*Canis familiaris*) were introduced prehistorically by Polynesians. Several other animals were introduced in historic (i.e., post-European contact) times, including cattle, horses, cats, goats, and rats.

The avian fauna in Samoa includes native landbirds and nesting seabirds (Watling 1982). In the higher elevation forests of the main islands are found the lupe or Pacific Pigeon (*Ducula Pacifica*) and the manutagi or Crimson-Crowned Fruit Dove (*Ptilinopus porphyraceus*); both have been occasionally taken for food. White-Collared Kingfishers or ti`otala (*Halcyon chloris*), Banded Rails or ve`a (*Gallirallus philippensis*), the Polynesian Starling, mitivao (*Aplonis tabuensis*), and the iao or Wattled Honeyeater (*Foulehaio carunculata*) are relatively common in the coastal bush and gardens of Samoa.

A variety of seabirds and some migratory birds also nest in the archipelago. These include the tava`e, White-Tailed Tropic bird (*Phaethon lepturus*) and the seasonal migrant, tuli or Golden Plover (*Pluvialis dominica fulva*). However, as Steadman (1993) has shown at least for Manu`a, the contemporary avifauna of Samoa is a significantly reduced remnant of a richer pre-human bird life.

The only other vertebrates in Samoa are reptiles in the families *Geckonidae* and *Scincidae*. These include 15 species of amphibians and reptiles, as reported for the Island of Tutuila (National Parks Service Draft 1988:19).

Finally, the islands of Samoa have a rich and varied marine environment providing an important source of dietary protein to its human populations. Much of the coastline of the Samoan Islands is surrounded by fringing reef, providing micro-habitats for abundant fish, shellfish, and other food resources exploited by the residents. A diverse array of shellfish inhabit the reefs. The reefs are also home to spiny lobsters (*Panulirus* sp.), sea urchins (echinoderms), sea slugs (holothurians), octopus, and several edible seaweeds. These are important seafoods throughout Samoa. Approximately 800 taxa of inshore fishes occur in Samoan waters (Jordan and Seale 1906) and comprise a significant part of the traditional Samoan diet. As discussed further below, among the fish commonly taken are jacks (*Caranx* spp.), parrot fish (*Scarus* spp.), wrasses (*Labridae*), and acanthurids. The open sea beyond the reef provides rich pelagic resources, such as the prized tuna (*Scombridae*). Marine turtles (*Chelonia mydas* and *Eretmochelys imbricata*) are seen in Samoan waters today, but undoubtedly were once more common.

The National Park Environments.

The National Park of American Samoa includes areas on three islands, Tutuila, Ofu, and Ta`u. The park areas on Tutuila and Ta`u include a comparable range of landforms, vegetation zones, marine environments, and traditional Samoan land use. The Ofu unit is primarily reef, but includes a narrow strip of coastal land.

1. Tutuila Unit. Tutuila, third in size after Savai`i and `Upolu (Western Samoa), is a high volcanic island with an area of about 142 square kilometers. It is long and narrow with a high ridge running down the center of the island. Tutuila is very rugged, with numerous peaks, and ridges of an old volcanic caldera. The highest peak on the island rises 653 meters above sea level, with only 34% of the island comprising less than 30 degree slope. The north coast of the island is more rugged, the valleys smaller, and the bays narrower and fewer in number than along the south coast. The rugged topography of Tutuila with its small area of flat land is reflected in the ancient settlement pattern, with many archaeological terraces and specialized sites (e.g., star mounds) on ridges and steep slopes.

National Park lands on Tutuila extend along the north-central coast, from the central ridgeline (Maugaloa) to the reef edge from near Afono to Fagasa. This land is largely forested, steep (much of the area has a greater than 30 degree slope), and at present under little cultivation. The soils of this area are well-drained and derived from parent materials of volcanic rock and ash. Coastal lands have soils developed in calcareous sands and other biogenic sediments (coral and shell). Much of the steep upper slopes are prone to landslides, especially where vegetation has been removed or lost in catastrophic events such as hurricanes. Periodic landslides transform slope contours and vegetation patterns.

Vegetation in the upland areas is primarily climax montane rainforest. The lower and gentler slopes are in lowland rainforest, but have seen centuries of forest clearance for traditional Samoan cultivation. This zone has been described as disturbed forest (Atlas 1981). The littoral zone includes coconut, pandanus, creeping vines, grasses, succulent herbs, and a variety of economic and ornamental plants, many of them of recent introduction. As detailed below, a variety of these plants have medicinal value and are used by Samoans. Thus, contemporary vegetation across the National Park in this area is a mosaic of anthropogenic and native (including climax) floral elements.

Animals in the park lands on Tutuila include a variety of seabirds, domestic and feral animals (e.g., pigs, dogs), a

variety of native birds, and the flying fox. Undisturbed coastal and upland forest zones are important habitats for these animals.

2. Ofu and Ta`u Units (Manu`a). The Manu`a Islands of Ofu, Olosega, and Ta`u lie approximately 100 km to the east of Tutuila. The three islands are closely adjacent and form an intervisible cluster. These are the smallest and geologically youngest of the Samoan Islands. Their topography is steep and coastal lands are narrow. Coastlines are predominantly rocky with a limited number of fringing reefs. Slopes are unstable with erosional fans and scree slopes common where the narrow coastal plain meets the steep volcanic slopes (Hunt and Kirch 1988:156). The narrow coastal plains--the locations for human settlement--are geomorphically unstable with mass wasting from steep slopes and removal and redeposition of sediments by high energy surf during tropical storms and hurricanes (Hunt and Kirch 1988:156). These are significant factors in the evolution of landforms, vegetation patterns, and ancient and contemporary human settlement in the Manu`a Islands.

The Island of Ofu is small (3.4 km^2), but reaches an elevation of 638 meters. The island is steep and dramatically beautiful; only about nine percent of the island has slopes less than 30 degrees. The National Park unit on Ofu extends along the southern coast, including a strip of coastal land (the seaward side of the road), the southern portion of Sunuitao Peak, and the reef. Much of the Park area is locally known as To`aga. The coastal strip is comprised of a geologically-recent sandy substrate, and some volcanic rock and its derived soil. Vegetation is typical of the littoral zone, including coconut, pandanus, creeping vines, grasses, succulent herbs, and some economic and ornamental plants. A significant variety of these plants are used for medicinal purposes by villagers from Ofu and Olosega, as detailed below. The contemporary vegetation of the coastal lands in the Ofu unit is a mixture of anthropogenic and native strand floral elements.

Animals in the park lands on Ofu include a variety of seabirds, domestic and feral animals (e.g., pigs, dogs), a variety of native land and seabirds, rats, and the flying fox. Birds commonly seen in National Park unit on Ofu are White-collared Kingfishers, ti`otala (*Halcyon chloris manuae*, an endemic subspecies to Manu`a), the Banded Rail, ve`a (*Gallirallus philippensis*), the Wattled Honeycreeper, iao (*Foulehaio carunculata*), and the Polynesian Starling, mitivao (*Aplonis tabuensis*) (Kirch 1993). Seabirds are also common residents of the Ofu unit, including the graceful tava`e, White-Tailed Tropic bird (*Phaethon lepturus*) and the seasonal migrant, tuli or Golden Plover (*Pluvialis dominica fulva*).

The marine component of the Ofu unit comprises a vital fringing reef, rich in marine resources and used for traditional Samoan gathering and fishing. A diversity of shellfish inhabit the reef. Bivalves such as *Periglypta reticulata*, *Tridacna maxima*, *Hippopus hippopus*, and *Asaphis violascens*, and gastropods such as *Trochus maculatus*, *Turbo setosus*, *Nerita* spp., *Cypraea* spp., *Drupa* spp., *Thais armigera*, and *Conus* spp. are abundant (Kirch 1993). Many of these shellfish taxa have been important sources of protein, as shown by the analysis of the excavated archaeological faunal remains from To`aga, adjacent to the National Park area of Ofu Island (Nagaoka 1993). Spiny lobsters (*Panulirus* sp.), sea slugs (holothurians), sea urchins (echinoderms), octopus, and many edible seaweeds are also significant resources on the reef at To`aga. Numerous taxa of inshore fishes inhabit the reef area as well. Among the fish commonly caught by villagers are jacks (*Caranx* spp.), parrot fish (*Scarus* spp.), wrasses (*Labridae*), and acanthurids (Kirch 1993).

The Island of Ta`u is the largest (28.5 $km^2$), of the Manu`a Group, and its broad mountain (Lata) reaches an elevation of 965 meters. Ta`u is geologically the youngest island in Manu`a, as well as in Samoa as a whole. The island has comparatively broad slopes, with about 41 percent of the island's land sloping less than 30 degrees. The National Park unit on Ta`u covers a substantial southeastern portion of the island (from Fatulele Point to Saua on the coast), including interior lands (Lata Mountain), the ancient caldera (formed in part by Liu Bench), southeastern shorelines and coastal flats, and near offshore marine environments.

The coastal lands (at Saua and Luama`a) have a geologically-recent sandy substrate, with some volcanic rock and its derived soil. The coastal geomorphology has been shaped by recent sea level changes and by catastrophic events, such as high surf associated with tropical storms and hurricanes. Large coral slabs form a deposit over much of the coastal lands near Saua, attesting to a dynamic geomorphic history over the recent past.

The Ta`u unit is covered largely in rainforest, but at present is under some traditional cultivation (eastern coastal lands). The soils are well-drained and derived from parent materials of volcanic rock and ash. Coastal lands have excessively well drained soils derived from calcareous (beach) sand and biogenic detritus (coral and shell).

Vegetation in the Ta`u unit is primarily climax rainforest. The zones for this rainforest range from cloud forest (Lata Mountain), lowland and montane vegetation (on the steeper slopes), and disturbed forest zones (Liu Bench, where centuries of agriculture has altered the vegetation). Coastal lands today include traditional Samoan cultivation (Saua and Luama`a areas),

and littoral vegetation including natural and anthropogenic elements.

As elsewhere in Samoa, animals in the park lands on Ta`u include nesting seabirds, domestic and feral animals (especially pigs), a diversity of native landbirds, and the flying fox. The vast interior forested interior of Ta`u undoubtedly provides a critical habitat for nesting seabirds and native landbirds. Although not as well documented, we would expect birds similar to those observed on Ofu (Kirch 1993) to be found on Ta`u.

II. Archaeology and Samoan Prehistory

Archaeological research in Samoa has documented a rich and varied record of human occupation dating to approximately 3,000 years ago. Work in the archipelago began as early as the 1920s (e.g., Buck 1930), and has since included several large projects in both Western and American Samoa. Archaeological work has covered the full temporal sequence, a diversity of environmental settings, and a variety of sites (i.e., in structural forms and depositional environments). Archaeological field research has also focused on a range of historical, natural science, and anthropological problems. In short, for archaeology Samoa is among the better studied archipelagos in the South Pacific.

Early Settlement.

Evidence for early human occupation in Samoa comes from the Mulifanua Site (Ferry Berth Site) about 800 meters off western `Upolu Island (Leach and Green 1989), the `Aoa Valley on eastern Tutuila (Clark and Herdrich 1989, 1993), and the To`aga Site situated on a relatively narrow coastal flat on Ofu Island in the Manu`a Group (Kirch and Hunt, eds., 1993). These sites have yielded early ceramics, including decorated Lapita pottery from Mulifanua, and Polynesian plainware. Each site dates to approximately 3,000 years ago. Excavation of the deeply stratified To`aga Site on Ofu provides a wealth of paleoenvironmental information in association with early human settlement in Samoa (Kirch and Hunt 1993). Research at `Aoa by Clark and Herdrich (1989) has produced comparable dates and Polynesian plainware pottery. Several sites on `Upolu, Manono, and Apolima islands in Western Samoa also date to this early (ca. 3,000 to 2,000 years ago) Polynesian plainware period.

Evidence from several plainware ceramic sites shows that ceramic production in Samoa ended sometime in the first few centuries A.D. This decline and disappearance is perhaps best documented from the stratified deposits of To`aga (although timing of ceramic change, or its disappearance was likely variable). The causes of ceramic decline and abandonment remain unclear. Change in material use and technology may provide part of the answer (Hunt and Erkelens 1993). Regardless of the reasons for the disappearance of pottery in Samoa, it makes aceramic (or post-ceramic) sites/deposits from the early Christian era difficult to find in archaeological field surveys. Without pottery, these sites loose much of their archaeological visibility. This is a problem that engendered the term "Dark Ages" for prehistory in Samoa and Tonga because of its poor representation in archaeological studies (Davidson 1979).

Later Inland Settlement.

Evidence for first extensive inland settlements falls within the latter part of the Polynesian Plainware period. Several early inland settlement sites are known from `Upolu, and Savai`i in Western Samoa, and on Tutuila. Large inland settlements are found in the Mt. Olo region of `Upolu. Holmer (1980:102) documents a sequence of increasing intensity of use in the area from 1650 to 500 B.P. At this time, there was construction of platforms associated with dwelling structures and earth ovens (Holmer 1980:102). Fortifications, such as Lu-41 in the Luatuanu'u area, are present on `Upolu as early as 1,250 years ago. Substantial settlements containing residential structures and earthen mounds are present in the Vailele, `Upolu area by 850 years ago.

The expansion of settlements across much of the habitable landscape of the Samoan Islands suggests continued population growth. Settlement pattern was dispersed, rather than nucleated, and appears to have been associated with agricultural activities. Coastal settlement continued, but was not the locus of more densely populated occupations. As in other parts of Polynesia, this dispersed pattern probably evolved with mechanisms for food sharing from inland and coastal zones.

Late Prehistoric Period.

The archaeological record for the late prehistoric and early historic periods of Samoa is dominated by the construction of large mound and settlement complexes. Large settlements in Western Samoa, dating from 300 to 100 years ago at Ologogo and Sapapali'i, consist of house platforms, pathways, mounds and terraced hills (Buist 1969:42). Green and Davidson (1974:224) argue that there is widespread settlement in all zones of the Falefa Valley of `Upolu from 500 to 120 years ago. These settlements contain mounds serving as house platforms and more specialized mounds (star mounds) associated with the activities of higher ranking individuals (Green and Davidson 1974:224; see also Herdrich 1991; Herdrich and Clark 1993).

Holmer (1980) present evidence for the development of complex "residential wards" in the Mt. Olo settlement of northwestern `Upolu. Most radiocarbon dates for Mt. Olo fall between 600 and 350 years ago. The settlement consists of a concentration of house platforms, raised pathways, star mounds, large earth-ovens and possible cook house structures. From about 500 years ago an increase in use occurred with the construction of complete residential wards and religious structures (Holmer 1980:102). At approximately 350 -200 years ago, the Mt. Olo area was abandoned and reverted to bush vegetation (Holmer 1980:102).

Clark and Herdrich (1993) suggest that a similar sequence occurs in the 'Aoa Valley on Tutuila. The evidence shows that numerous star mounds were built on prominent points along ridges surrounding the valley in the latter centuries of the prehistoric period (Clark 1989:173; Herdrich and Clark 1993). These mounds are associated with terraces, platforms and residential sites on the lower slopes of the valley. As in the Mt. Olo case, star mound use was abandoned sometime in the early historic period (Clark 1989:173; Herdrich and Clark 1993). Abandonment of many large settlements seems to be a common theme in many parts of the Samoan archipelago.

European Contact and the Historical Period.

Dramatic shifts in Samoan population distributions and settlement appear to have taken place in the early historic period, between 1791 and 1830 (Davidson 1969:48). The available historical, traditional, and archaeological evidence suggests a period of rapid population decline and shift in settlement from inland to coastal locations prior to 1830. The settlement change can also be described as shifting from dispersed to nucleated. Davidson (1969:55) suggests that given the amount of unoccupied land after 1840, evidence for the abandonment of two inland areas (Vaigafa and Afolau, `Upolu) between 1800 and 1830, and the traditional evidence for relatively recent occupancy of several others, all suggest that the missionaries saw only the end of a substantial movement from inland to coastal locations. This striking change in settlement pattern may well have been induced by dramatic population loss in epidemics of European-introduced disease. While several accounts refer to warfare in Samoa, its effectiveness in reducing population size can be questioned (Davidson 1969:76).

The introduction of European diseases with contact is the likely cause of population decline and related settlement shifts in Samoa. Pirie (1964:26) noted that depopulation may have resulted from European disease before the missionary period. Although, Pirie (1964) believes that compared to populations on other islands after 1830, Samoans were little affected by European disease. He speculates that early exposure to European diseases, through limited contact, may have allowed a portion of the Samoan population to develop a certain level of immunity (Pirie 1964:26). This argument does not seem plausible given the facts of epidemiology in virgin soil (non-immune) populations.

Archaeology in the National Park Units.

A review of archaeological field studies and the outlines of Samoan prehistory suggests the kinds of archaeology one should expect in the National Park lands of American Samoa. To our knowledge, no archaeology has been undertaken in the Park lands

on Tutuila. Work by Clark and Herdrich (1989, 1993) at `Aoa on the northeastern coast of Tutuila should prove useful in deriving expectations for Park lands. On Ofu, extensive archaeological work has been done at To`aga, but almost entirely on the inland side of the road outside of the park boundaries (Kirch and Hunt, eds. 1993). However, the information reported in Kirch and Hunt's (1993) monograph provides a natural history of shoreline evolution, and a cultural history of near off-shore resource use. For Ta`u Island, Hunt and Kirch (1987, 1988) report an archaeological survey, including lands within the Park.

1. Tutuila Unit. As mentioned, we know of no archaeological work reported for the Tutuila Unit of the National Park. Clark and Herdrich's (1993) `Aoa Valley work, and to a lesser extent the many studies in Western Samoa, allow us to generalize about the kind of archaeological site distributions one might anticipate. Clark and Herdrich focused on "how prehistoric were distributed over the landscape, how that pattern of distribution changed over time, and the systemic relationships between different human populations, and between those populations and their environmental surroundings" (Clark and Herdrich 1993:147).

Recent work on Tutuila (Clark and Herdrich 1993) and on Ofu (Kirch and Hunt 1993) document dramatic shoreline and sea level changes in Samoa. As a consequence, today's coastal lands are young (often less than 2,000 to 3,000 years old), and reflect coastal progradation in balance with island subsidence. These prograding coastal zones often hold buried deposits of cultural material that date to as much as 3,000 years old. There is, also, the potential for offshore marine archaeology comparable to the underwater finds at Mulifanua, `Upolu. These early cultural deposits might be found on Tutuila if island subsidence has been as rapid as that known for `Upolu. Such a possibility remains to be fully investigated.

Clark and Herdrich (1993:172) show that for eastern Tutuila, "prehistoric settlement was restricted largely to the lowlands in the many small valleys and coastal plains, or in the uplands on a few broad ridge tops." They suggest that settlements began on the coast, then later spread inland as populations grew. Thus, interior occupations should be relatively later than coastal ones. The upper valley areas have probably always been an area of very sparse population; instead these zones were under agricultural production. Dispersed settlement of prehistoric times changed to nucleated, coastal settlement in the historic period, as Davidson (1969) has documented. Thus, a dispersed distribution of domestic sites can be anticipated for the interior slopes of the Park lands of Tutuila.

Clark and Herdrich's (1993) work shows that the most common site in the uplands is the star mound (tia `ave). They suggest

that these specialized mounds were used for the chiefly sport of pigeon-snaring, and other ritual activities (see Herdrich 1991). Many of these sites are situated along ridge lines, and may well occur in Park lands.

Defensive features and fortifications have been well documented for Western Samoa. On Tutuila fortified complexes are known for Tataga-matau, near Leone, and on the eastern mountains of Le`aeno and Olomoana. Not surprisingly, these sites are most often situated on steep, high ridges or mountain peaks.

In the early 1830s, Williams (1984), for example, wrote that

> Samoan villages had forts, or `olo, which were generally on high mountains: "to this they remove their property, wives and children erecting temporary huts of cocoa nutt (sic.) leaves inside." Wilkes (1845:151) later described `olo as "usually on the top of some high rock, or almost inaccessible mountain, where a small force could protect itself from a larger one" (Clark and Herdrich 1993:175).

Fortified complexes or smaller defensive features (e.g., star mounds surrounded by a defensive ditch) may exist on the Maugaloa Ridge or on `Alava Mountain in Park lands.

Finally, recent work has documented basalt quarry activities and adze making at Tataga-matau, near Leone on western Tutuila (Leach and Witter 1987, 1990). While quarries of comparable size, age, and complexity are unlikely to be found in the Park, Tataga-matau's discovery should alert us the potential for basalt quarry sites in Samoa.

Intensive archaeological survey of Park lands on Tutuila is needed to document the presence of sites in the coastal zone, on the interior slopes, and on ridge and mountain top areas. Archaeological field survey is the first step to understanding prehistoric and historic settlement and land use patterns. Excavations, a second step in field research, may reveal buried deposits and provide evidence of material culture (artifact change), paleoenvironmental change, and chronology.

2. Ta'u Unit. Survey of lands now within the Park on Ta`u have been by reported by Hunt and Kirch (1987, 1988). The highest density of archaeological remains in the Ta`u Unit is at Saua, along the coastal lands of the east coast. These coastal lands, from just south of Fitiuta Village to Tufu Point and Si`u (southeastern corner of Ta`u), contain a extensive complex of archaeological remains found in clusters, and as individual features. Structural forms and features include free standing stone walls, earthen terraces, stone alignments (round-ended house foundations), stone wall enclosures, pebble (`ili`ili)

paved areas, shell midden (ancient food refuse), and hearths and earth ovens (umu). Of special interest are the elaborate constructed wells (Vai O Saua, Tatatoto, Vai O Tufu, and Vai Sa`asa`a) cared for today by Fitiuta Villagers. Also of note is the raised stone constructed footpath that runs north-south, or parallel to the shoreline in Saua. It is preserved in sections near the present road (on the seaward side), and is similar to the footpath that runs through Fitiuta Village. Human bones, accidently uncovered in the area (usually with road maintenance), have also been reported (Hunt and Kirch 1987).

A large portion of the coastal land has a ground surface covered with massive coral slab boulders and underlying beach sand, deriving from a high energy deposit that likely occurred with a hurricane or tropical storm. This is a zone where surface archaeological features are not found on the surface (Hunt and Kirch 1987).

An interview conducted by Epi Suafo`a (in Samoan) with Chief Tupuola (aged 70) revealed that the coral slab boulder rubble that covers so much of the eastern coastal flats of Ta`u may be of relatively recent origin. Tupuola described the devastating hurricane of 1916 as depositing the beachrock over large areas of the coastal flat (reaching all the way inland to the steep cliffs) that were once sandy and occupied by a substantial settlement with numerous people (Hunt and Kirch 1987:16).

This catastrophic event would have altered or destroyed surface archaeology, but probably left buried deposits largely undisturbed. No test excavations have been conducted on the coastal lands at Saua, but they may yield evidence for a long prehistory similar to that documented for Ofu.

Other lands on the coastal flat are presently under cultivation by Fitiuta Villagers. These lands, according to Tupuola, were not ravaged by the 1916 storm (Hunt and Kirch 1987:16).

The interior lands of the Li`u Bench, above Ta`u's south coast was surveyed by Hunt and Kirch (1987). They report a domestic habitation complex along the flanks of the broad flats of Li`u Bench. The sites in this complex included round-end stone alignments and pebble paving (suggesting house foundations), graves, and grindstones (for production of ground stone tools such as basalt adzes). Above the habitation remains on the Li`u Bench, Hunt and Kirch (1987) located a small cave with evidence of a buried cultural deposit--potentially dating to early periods of Samoan prehistory. Other interior lands, especially those of higher elevations were not systematically surveyed. These interior zones, like Tutuila, probably never saw

high density settlement, but could have fortifications, star mounds or other mound sites of special function (e.g., Palapala Mound, above Ta`u Village, see Hunt and Kirch 1987:27), dispersed habitation sites, agricultural features, graves, or trails. Additional survey and excavations are needed to learn more about ancient settlement and use of these interior lands of Ta`u.

3. Ofu Unit. The Ofu Park Unit is almost entirely reef and the adjacent coastal lands at To`aga. Intensive archaeological research (Hunt and Kirch 1987; Kirch and Hunt 1993) has been done over three field seasons at To`aga. The archaeology shows that the area has been occupied by people for about 3,000 years. The first use of the To`aga area occurred when the coastal flat was much narrower, and close to the imposing cliff of Le`olo Ridge. Coastal progradation over the past 2,000 to 3,000 years (as an approximate meter higher stand of the sea level fell to present levels) extended the flat coastal lands to their present position (see Kirch, Chapter 4 in Kirch and Hunt 1993). This research also shows that lands at the seaward extent of the coastal flat are youngest, and contain little, if any, buried deposits of any significant age. Indeed, it is likely that no prehistoric remains will be found in coastal deposits on the seaward side of the Ofu road in the Park lands.

Archaeological research on human use of the marine resources of the To`aga reef over the past 3,000 years suggests remarkable stability (see Nagaoka 1993). Fish and shellfish remains show that the composition of what was taken in fishing and collecting, and presumably what the reef had to offer, remained unchanged. Hunt and Kirch (in press) suggest that this marine resource stability can be explained by the high productivity of continuous coral reef growth stimulated by, but held in equilibrium with, island subsidence. A healthy reef is the foundation of a rich (high biomass) marine ecosystem, and one that could support continued human exploitation.

No marine archaeology has been undertaken in the Ofu Park unit. Given our understanding of the coastal changes and the presence of buried archaeological deposits on land (dating to about 3,000 years ago), it is unlikely that sunken archaeological materials, comparable to those at Mulifanua, will be found. Artifacts relating to fishing, however, might be found in a marine archaeological survey. This kind of marine archaeology has been largely neglected in the Pacific, yet would likely yield valuable information on fishing strategies.

III. Research Methodology

Documentary Phase.

The documentary phase of the research was conducted primarily in the Pacific Collection of the University of Hawaii's Hamilton Library. We also obtained reports and recent material pertaining to Park areas from the National Park Service office in Pago Pago and from the American Samoa Department of Marine and Wildlife. However, the University of Hawaii Library probably houses the most complete collection of materials on American Samoa in the world. A bibliographic search turned up numerous journal articles and technical reports, as well as the more familiar published works. As far as possible, the team concentrated on sources specifically relevant to the American Samoa Park areas. However, some background notes were taken from general Samoan ethnography to set the context and to clarify local cultural practices and resource use.

The documentary sources fall into two major categories: ethnohistorical writings and twentieth-century ethnography. The ethnohistorical literature on Samoa is heavily weighted toward the larger western isles, which in historic times have contained approximately 80 percent of the Samoan population. The first missionary contacts occurred on Savai'i and missionary efforts remained concentrated in the west. Apia became the commercial and diplomatic center of the chain, and nineteenth-century political struggles--notably, the dynastic wars and the kingship dispute--were focused on Upolu and Savai'i. The four high chiefly titles that constituted the Tafa'ifa, the ceremonial ruler of all Samoa, were all based in the west. After the division of the chain in 1900 global attention continued to focus on Western Samoa because of political events such as the Mau rebellion against New Zealand.

The anthropological literature too has been weighted toward Western Samoa because of its apparently more "traditional" lifestyle. The most authoritative ethnographies of American Samoa were authored by Margaret Mead, who spent six months in Manu'a in 1926, living mostly in Fitiuta, and Lowell Holmes, who also worked on Ta'u in the 1950s and '60s. In addition, non-anthropologists have produced a number of journal articles and technical reports on the flora and fauna of American Samoa. These span the twentieth century and are useful for documenting changes in animal populations and in local resource use and classification.

Field Research.

A month of fieldwork was conducted in American Samoa,

primarily by graduate assistants Leslie Lang and Timothy McCormick. Professors Linnekin and Hunt joined them for the last week of the research. Field assistants were recruited locally on an as-needed basis. Three to four days of fieldwork were scheduled in each village having lands within the Park. The Tutuila villages were surveyed first, then Ta'u, and finally Ofu and Olosega. In both the documentary and field research, our major data categories were: marine resources, land use and agriculture, foraging (including medicinal plants), forest resources (including bush fauna and hunting), and culturally significant sites. Survey-type questionnaires were distributed before or during the researchers' visits in all of the villages except Fitiuta and Faleasao. The surveys employed a "freelist" technique (described further below) to elicit the crops, fish, animals, and gathered plants found within Park areas (see sample surveys in Appendix 1). With the surveys, which were distributed through local matai or a field assistant, we aimed to reach as many people as possible. These were followed by structured interviews with a smaller number of people in their homes. Unfortunately, no surveys were returned from Pago Pago, Fagasa, or Afono; the data for those villages were obtained during on-site interviews.

Informants were recruited by seeking referrals from Park Service personnel or local matai, by networking, and at times by happenstance. Thus the field data reflect a "convenience sample" rather than a random sample of the target population. We asked respondents to refer us particularly to neighbors and relatives who use Park areas. We actively sought to obtain data from a range of informants--men and women, older and younger people, titled and untitled--in order to cover the varied uses of Park areas and to document different perspectives within the communities. We also asked informants to refer us to locally recognized experts in specific activities, such as reef fishing and medicinal plant use. However, the pool of respondents is still weighted toward male matai. There also may be an overrepresentation of informants from the Church of Latter Day Saints, because one of our most helpful contacts belongs to that denomination and tended to introduce us to fellow church members. While on Olosega, the research team also walked out to the site of Sili village in order to interview the last family remaining there. Table 1 shows the distribution of our informants (persons interviewed) by Unit, village, and gender. Table 2 gives a breakdown of surveys returned to us, by village, topic, and gender. Self-identification and specification of gender were voluntary on the surveys. There is therefore some overlap between these two pools of informants.

The initial structured questioning often led to more free-form discussion with the same informant. In other words, structured and semi-structured questioning were often combined in

the same interview, since it was seldom possible to schedule more than one meeting with each informant. Wherever possible, the students made visits to the Park areas and conducted follow-up interviews on particular places and Samoan practices within them. This was not always possible, however, because of the remote, wilderness quality of most Park lands in American Samoa. Samoans themselves no longer frequent many areas that were used in former times. In some localities, notably in the vicinity of Faleasao, the Park begins at such a high elevation that it is effectively inaccessible to nearby residents.

The field surveys and ethnographic interviews used some of the methods of "cultural domain analysis." This is a "cognitive" approach in contemporary anthropology; it includes a set of methods for investigating what people know and to what extent that knowledge is shared by members of a community. Cultural domain analysis is ideal for investigating local knowledge on particular areas of activity or 'domains,' such as fish, crops, and plants. The first step is usually a 'freelist' task, where one asks informants simply to "list all the X that you can think of." One can then ask subsidiary questions about items on the list. Taking cues from the documentary research findings and Samoan ethnography, our surveys and structured interviews were organized around the 'domains' of fish and shellfish, agriculture and the bush, animals and birds, and medicinal plants. After eliciting an initial list of, for example, "the different kinds of fish you catch on the reef," the researchers posed follow-up questions such as: "which ones you catch the most?" and "which one are the best to eat?"

The freelisting technique is very efficient for capturing the sorts of survey data that were requested in the Work Plan for this study. Normally the freelist is the basis for a series of other elicitation techniques; one can ask informants to rate, rank, and sort into categories the items on the list, according to various criteria. These further steps allow one to investigate local distinctions and classifications, and to compare informants' knowledge of a given cultural domain. Given the time constraints of this study it was not possible for us to follow up with these other methods. However, several revealing analyses can be applied to the freelist data alone, and these will be presented below.

Limitations of the Research.

The canons of ethnographic fieldwork stress the importance of residing in one place for an extended period. Given the funds allotted and the specifications of the Work Plan, the time available for our fieldwork was very short--a few days in each village. Lining up informants, traveling between households, and waiting for respondents makes ethnographic interviewing a time-

consuming process. While in the villages, the researchers often found their productive time further curtailed by local events such as Bingo games, and by Sunday church activities. The graduate assistants nevertheless maintained a very full work schedule, using nights and Sundays to type up interview data. But the time constraint largely precluded follow-up interviews, which would have helped to clarify local classifications and distinctions among freelist items. Freelist data can be used as the basis for a series of cognitive questionnaires, but it was not possible to take the analysis further in the present study.

We were uncertain beforehand whether it would be possible to administer a written survey, given the considerable logistical support this would demand from National Park Service personnel and/or field assistants. When it became evident that a survey was feasible, the graduate assistants composed the forms in Pago Pago, in English, using their interview schedules as a guide. In retrospect it would have been preferable to compose a bilingual form, Samoan on one side and English on the other, but our students do not know Samoan and were under a time constraint. Although surveys were distributed in all four villages on Tutuila, they were returned only from Vatia, apparently because of transport and communication problems. Regrettably, the graduate assistants were unable to distribute surveys on the island of Ta'u for similar, logistical reasons.

We had hoped to be able to recruit local field assistants to translate when interviewing non-English speakers and to aid in data collection. National Park Service personnel were very helpful on Tutuila, and we recruited a superb field assistant on Ofu. However, we were unable to find an assistant who was available for more than a couple of days on Ta'u, and this impacted data collection. Unforeseen contingencies added to the difficulties on Ta'u. The graduate assistants could not secure a reliable vehicle and driver, and the road between Fitiuta and Faleasao was closed every day except for a couple of hours at set times. Only three interviews were conducted with Faleasao people and almost no useful data were obtained. However, Faleasao's Park land appears to be the least accessible of any of the Park Units. Though limited, our interviewing indicates that there is little to no present-day use of Park areas by Faleasao residents. Even though surveys were not used, Fitiuta was well covered through interviews. The graduate assistants spoke to someone from nearly every household on the side of Fitiuta that has land rights in the Park.

Since the graduate assistants do not speak Samoan, their interviews on Tutuila and Ta'u were conducted in English or assisted by an interpreter. They found that sometimes their translators would influence others' responses or interject their own answers. This underscores the importance--but also the

difficulty--of finding an ideal field assistant. During the last week the students were joined by Linnekin, who speaks some Samoan, and by Hunt. Subsequent interviews on Ofu and Olosega were conducted partly in English, partly in Samoan, and were facilitated by a reliable local assistant.

We noted above the gender and, to some extent, age biases in our sample of respondents. We found that wives tended to defer to their husbands when both were present during an interview. Younger and untitled people similarly tended to defer to older matai when the latter were present. The gender division of labor is also such that men tended to respond to questions about agriculture and fishing, two major areas of interest to us, while women appeared to be the experts on reef gathering. Women outnumbered men, however, as informants on the domain of medicinal plants. This is an area of special expertise that, if not skewed toward women, is at least more balanced between male and female practitioners.

Lastly, we wish to emphasize that our techniques were ethnographic, rather than botanical or zoological; our data reflect local residents' perceptions. What people view as the 'most important' species in an area may not always be the most numerous. A period of residence and participant observation in the villages would be necessary to determine the relationship between perceived significance and actual frequencies. The following report describes in detail how Samoans see the productive resources and cultural significance of areas lying within the National Park.

Table 1. Informants by Village and Gender.

PARK UNIT: VILLAGE	MALE	FEMALE	TOTAL
Tutuila: Pago Pago	3	1	4
Tutuila: Fagasa	6	1	7
Tutuila: Vatia	11	4	15
Tutuila: Afono	6	1	7
Ta`u: Fitiuta	9	9	18
Ta`u: Faleasao	2	1	3
Ofu: Ofu	5	6	11
Olosega: Olosega	2	2	4
TOTAL	44	24	69

Table 2. Surveys by Village, Topic and Gender.

VILLAGE SURVEY	MALE	FEMALE	UNKNOWN	TOTAL
VATIA				
Fish	1	1	1	3
Medicinal plants	3	0	2	5
Animals/ Birds	1	1	1	3
Crops	2	0	0	2
OFU				
Fish	3	3	0	6
Medicinal plants	2	5	0	7
Animals/ Birds	2	3	0	5
Crops	2	4	0	6
OLOSEGA				
Fish	2	1	0	3
Medicinal plants	1	1	0	2
Animals/ Birds	2	1	0	3
Crops	2	1	0	3
TOTAL	23	21	4	48

IV. Ethnohistory

The word 'ethnohistory' refers to the reconstruction of past lifeways. Ethnohistory also investigates how indigenous cultures changed during the early period of contact with the West. For several reasons, it is difficult to reconstruct the ethnohistory of the precise areas and locations now lying within the National Park of American Samoa. As noted above, the ethnohistorical literature is more informative for the Western isles than for Eastern Samoa. Early Western visitors were often imprecise on Samoan place names, and in any case were not likely to visit the remote lands that make up most of the National Park. We will begin with Samoan oral traditions relating to the mythical origins of Eastern Samoa. Most of these were recorded in the nineteenth century by missionaries and folklorists. We then provide some brief historical background on Tutuila and Manu'a, for larger political events and administrative changes have affected settlement patterns and resource use in the areas that now comprise the Park. This is a selective historical overview, however; no attempt is made to cover the history of the archipelago as a whole, nor do we give a comprehensive history of Pago Pago Bay and its environs. We will then review nineteenth- and early twentieth-century accounts that appear to pertain specifically to areas that now lie within the Park.

Incidentally, we presume that the reader of this report is familiar with basic Samoan social institutions, and we do not undertake to explain the meanings of such common terms as matai, 'aumaga, taupou, and the like. Where our research has uncovered special customs and variations occurring in National Park areas, we so note those details.

Myths and Legends Relevant to the National Park.

According to oral traditions of Manu'a the Creator god, Tagaloalagi, created Ta'u island first. When he struck the newly formed island a piece fell away; this was the island of Ofu. Tagaloa went on to create Fiji, Tonga, and rest of the Samoan islands (Kramer 1994: 536). According to a legend published by Fraser (1892: 180), after the creation Tagaloa said, "Always show respect to Manu'a; if any one do not, he will be overtaken by calamity; but let each one do as he likes with his own lands." The name Ofu is said to commemorate the clothing of the child of Tagaloa's daughter, Faleilelagi (Kramer 1994: 506; Turner 1884: 226). The god Fuailagi created Olosega later by digging up land on Ta'u belonging to a chief named Niuleamoa (Turner 1884: 225). Niuleamoa pushed the land into the sea as a floating island, and took his followers in search of a resting place. The island floated to Tonga and then returned to Samoa, where it came to rest between Ta'u and Ofu. From this vantage point Niuleamoa

could fight with the people on either side of him. The Ofu chief Sega went to visit the new island and later married a woman named Olo, who had been traveling with Niulemoa. They joined their names and called the island Olosega. In another story Olosega is said to mean literally 'parrot fort' or the refuge of parrots, from some parrots who flew ashore there from a Fijian canoe (Turner 1884: 226).

Turner relates other accounts explaining place names of Eastern Samoa and is an earlier source than Kramer, who cites Turner frequently. One legend says that the rocks and the earth married and had a child which was born covered with wounds, 'manu'a,' whence the name of the eastern islands (1884: 223). A great warrior named Fitiaumua 'Fiji the foremost' came from the east, conquered the western isles, and then lived at Manu'a: "All Samoa took tribute to him, and hence the place was called the 'Great Manu'a'" [Manu'a-tele] (1884: 224). The people of Pulotu, in the west, were waging war with the people of Papatea, in the east. When the Pulotu people went to attack Papatea, two Papateans--a man named Tutu and his wife Ila--escaped to the island that now bears their names (1884: 223). In another version, Tutu and Ila bore a daughter named Salaia or Sagaia. Their dying request was that their names be remembered, and after their deaths their daughter named the island after them (1884: 226).

Many legends of Manu'a center around Tagaloa and the exploits of his semi-divine family, whose earthly home was at Lefaga, near Fitiuta. The versions recorded by ethnohistorical observers tend to intertwine and overlap, and it is difficult to disentangle the myths as if they were separate narratives. Interpretation is complicated by the fact that Tagaloa is both the name of the creator god, identified with the Sun, and of his earthly offspring who was born at Saua, near Fitiuta (see Map 2), and who established the foundations of Manu'an political structure. The name of the island and village of Ta'u is attributed to the god Tagaloa's daughter Faleilelagi 'house roofed by the heavens,' referring to an ancient time when people had no houses. Faleilelagi had a daughter who could not speak, and named the island after that child, who could only make the unintelligible sound 'u' (Turner 1884: 224). Referring to the missionary Pratt as his source, Kramer (1994: 506) recounts that Faleilelagi married Faia and one of their children was named Faleasao or Tausao 'hard to reach,' referring to the Analuma caves along the steep cliffs.

The village of Fitiuta 'inland Fiji' was once named Aga'e 'breathing hard,' from the hard breathing when it was born as the child of the rocks and the earth (Turner 1884: 224). Kramer (1994: 510) states that Fitiuta was formerly divided into two sections, Aga'euta and Aga'etai. The latter was deserted in

Kramer's time, and he identifies Fitiuta's sections (probably pitonu'u) as Maia and Usoali'i. People in Fitiuta today continue to use these section names. Another daughter of Tagaloa, Moiuuolepai, married the king of Fiji but he treated her badly and sent her "to the backwoods of Fiji" (Turner 1884: 224). Her brother Taeotagaloa went to Fiji and turned her barren place of exile into a yam and banana plantation. When the king of Fiji heard of this, he reconciled with her because he wanted the yams, and named the fertile place Fitiuta. When Taeotagaloa returned to Manu'a he changed the village's name to Fitiuta (see also Kramer 1994: 510, 569). This tala fa'aanamua, like many Samoan origin tales, explains the source of a Samoan proverb, "Do you call them friends who are but friendly to the yam?" On the other side of the island, at Luma, is a place where souls of the departed were said to have begun their journey to Pulotu, the netherworld. To'aga, the coastal strip on the south side of Ofu (see Map 3), was reputed to be the home of malevolent spirits and has been the site of ghostly happenings even in modern times (Holmes 1974: 64).

Tagaloa brought the first Samoan fale to Ta'u. Called the Fale'ula or 'red house', it was originally the "abode of the gods on earth" (Kramer 1994: 528) but later the house of the Tui Manu'a. In the myths the Fale'ula is literally a house; later the name applied more figuratively to the family dynasty of the Tui Manu'a. Many legends recount aspects of Tagaloa's creative work--how he founded the Tui Manu'a line of sacred high chiefs and celebrated the first 'ava ceremony (see Kramer 1994: 555-57). Versions of the story of the first 'ava ceremony were told to us by Fitiuta residents, who also recounted the legend of the brother and sister Lua and Ui (Kramer 1994: 551-52; but see also 555-57). The sister allowed the Sun god (Tagaloa) to impregnate her in order to stop him from killing people. The two then swam away, taking with them the shell trumpet and a sultana bird. They swam to the reef at Saua, but Lua died before reaching the shore and sank with the shell. In Kramer's version, Ui reached the shore with the bird and gave birth to a boy, Tagaloa-a-Ui. The golden plover (tuli) came and gave the boy the names of its limbs. The miti came and sucked 'miti' the boy's nose to give it breath.

In interviews, informants mentioned the brother's death, the birth at Saua, the tuli, the miti, and two landmark rocks offshore called Lua and Ma'a (literally 'two rocks'; see Map 2). The Luama'a do not appear in Kramer's narrative, which continues with the tale of the first 'ava ceremony. Nevertheless, the story of Tagaloa's birth at Luama'a was told to us by several informants, and is very significant to modern Fititua villagers. In the version most frequently related, neither sibling reached the beach. The farther rock, about fifty yards offshore, is the brother, called Puai'ilama. The closer rock, about fifteen yards

out, is the sister, Sina (slide 1). We were told that the fetus floated on to the beach at a place called 'oneone le tanumia, a patch of sand that remains uncovered by rocks because it is sacred (see Map 2).

Tagaloa's founding of the Fale'ula, which Kramer (1994: 528) describes as 'the royal house of the Tui Manu'a,' involves several locations within the National Park. The Fale'ula came down from heaven, arrived at Fatufatumealuga, and was then carried to Folauga; Kramer identifies those two place names as "rest places on the Ta'u mountain." For many years people tried to move the house but could not. Pili, Tagaloa's son by the daughter of the Tui Manu'a, came to Laufuti in a ship, brought the ship's mast up the mountain, and brought the house down. The Fale'ula was later brought to Lefaga, near Fitiuta but outside the Park, and became the house of the Tui Manu'a (Kramer 1994: 536).

Samoan oral history relates that the Tui Manu'a was senior to the chiefly lines of other islands. Whether his position was one of actual political rule or only ceremonial precedence, this special authority was interrupted by the Tongan conquest, ca. 1200-1400 A.D., which Samoans call a time of pologa 'bondage.' It is said that Ta'u alone remained apart from Tongan rule. After the expulsion of the Tongans, certain chiefly titles of Upolu and Savai'i rose in prominence to eclipse the Tui Manu'a in Samoan political affairs; Tui A'ana, Tui Atua, Gato'aitele, and Tamasoali'i became the four components of the Tafa'ifa, the ceremonial headship of all Samoa. In the nineteenth century the Malietoa and Tupua families emerged as the political powers and produced the active contenders for the European-influenced 'kingship.'

The European Contact Period.

At the time of European contact Tutuila was subordinate to the Atua District of Upolu. As a result, many chiefly titles of Eastern Samoa are offshoots of Upolu titles. The highest titles of Manu'a, however, are believed to be very ancient. Because of Manu'a's place in Samoan legendary history and because of the special status of the Tui Manu'a, certain special political customs are observed there. The tulafale 'talking chiefs, orators' are locally referred to as to'oto'o, the word for the orator's staff of office. The Fale Tolu 'House of Three,' the Tui Manu'a's talking chiefs, were so powerful that they effectively selected the Tui Manu'a. A special vocabulary is also observed, whereby polite synonyms are used in the place of common words for animals and objects associated with the Tui Manu'a (see Kramer 1994: 518). The person and possessions of the Tui Manu'a were considered sacred and he was hedged with various personal taboos. The Tui Manu'a resided in Luma, a pitonu'u or

subdivision of Ta'u Village. Nearly as high in status was the high chief Tufele, whose homeland was at Fitiuta. The fa'alupega or honorific greeting for Manu'a cites the other major titles: the Tui Olosega; Misa, high chief of Ofu; Laolagi, the high chief of Sili on Olosega; the Vaimegalo, referring to high chiefs Sotoa of Luma and Lefiti of Siufaga; and the To'oto'o, referring to the 'House of Three.'

At the time of Western contact Tutuila was divided into two political groupings, the eastern district, comprising the 'counties' of Sua ma Vaifanua, and the western, called Fofo ma Aitulagi. The National Park lands on Tutuila fall into Sua ma Vaifanua. Lei'ato, which Kramer considered the senior title in Tutuila, resided at Fagaitua and was chief over Sua ma Vaifanua, which included Pago Pago, Vatia, and Afono villages. However, the high chief Mauga was the principal authority in the Pago Pago Bay area during the mid-nineteenth century. He was an active intermediary and negotiator and is prominently featured in ethnohistorical accounts. Mauga was the first listed signer of the Deed of Cession to the United States, followed by Lei'ato, Faumuina of Aunu'u, Pere of Lauli'i, and, fourthly, Masani (Masani'ai), one of the high talking chiefs of Vatia, followed by other chiefs of Sua ma Vaifanua and Fofo ma Aitulagi.

The Dutch explorer Jacob Roggeveen, believed to be the first European to visit Samoa, made brief contact with Manu'ans when he passed by the islands in 1722. Roggeveen's (Sharp 1970) account is very sparse. There were a few exchanges with people off Ta'u, and the high chief of Ofu sought to trade with the foreigners, gesturing to a blue necklace worn by a girl in his party. Europeans did not touch at Samoa again until 1768, when the Frenchman de Bougainville (1967[1772]) bartered for supplies with the people of Ofu and Olosega. It was Bougainville who dubbed Samoa "the Navigator Islands," by which they were known well into the nineteenth century. The ill-fated French explorer La Perouse (1969[1799]) is believed to be the first European to disembark at Samoa. In 1787 he passed by the north coast of Ta'u, bartered with the people of Olosega, and anchored at Fagasa Bay, on the north shore of Tutuila. Fagasa lies just west of the National Park boundary (see Map 1). The next village to the west, A'asu, was the site of an unfortunate encounter that gave Samoans a warlike reputation among Europeans. A watering party led by the expedition's second-in-command was attacked and eleven Frenchmen were killed. Tutuilans told later visitors that a party from Atua District in Upolu was responsible for the killings (see Murray 1876: 105-107), but it is said that the event deterred European shippers from stopping at Samoa for decades.

In 1791 the British ship Pandora, in pursuit of the Bounty mutineers, conducted some barter exchanges with the people of Tutuila (Edwards and Hamilton 1915). The ship was attacked off

Upolu, however, and the incident reinforced European opinion that Samoa was a place to be avoided. The era of frequent Western visits began in 1830 with John Williams' conversion of the Savai'i chief Malietoa Vai'inupo. The indigenous Samoan religion was relatively decentralized in comparison with, for example, the Hawaiian religion. There were no monumental temples and no powerful priesthood such as found in Hawaii and Tahiti. Aside from a few major gods such as Tagaloa, there were many minor deities associated with particular families, individuals, villages, and places. Worship was conducted by chiefs and heads of families rather than by full-time priests. Many scholars believe that Christianity succeeded in Samoa in part because the native religion was not centralized and was not the conceptual foundation of matai authority (see Gilson 1970).

Williams was affiliated with the London Missionary Society, and in the decades to follow the L.M.S. sent more missionaries to Samoa than any other Christian organization. Ta'u had been exposed to Christianity even before Williams came to Samoa, however. In the 1820s a Tahitian convert named Hura was shipwrecked on the island and began to instruct the people in Christianity with the aid of a fragmentary Tahitian Bible. John Williams met Hura on Ta'u in October 1832 during his return visit to Samoa (Williams 1984[1832]: 217). At the time Williams estimated the population of Ta'u at two to three thousand people, and reported that the Ofu people had nearly all been destroyed in battles with "Orosegna." The formal missionization of Tutuila and Manu'a began in earnest in 1836, when an L.M.S. ship brought Rev. A. W. Murray, among others. Murray remained on Tutuila until 1849, and then served on Manono and in Apia. He celebrated his last sabbath on Tutuila around 1857 but continued to work in Western Samoa. Murray's *Forty Years Mission Work* (1876) is a valuable ethnohistorical account of Eastern Samoa in the 1830s and '40s. Murray resided at Leone and Pago Pago, however, and it is likely that he rarely ventured into the areas that now lie within the National Park.

In 1837 Murray (1876: 71-72) sent two teachers--a Rarotongan and a Tahitian--to found the first formal mission in Manu'a. According to Murray, there was considerable shipping traffic at Pago Pago even during his first year in residence; at times there were six whalers in the bay at one time, "having crews averaging thirty, and all of the baser sort" (1876: 43). Murray worked to suppress night dancing, introduced the practice of family prayer, and in 1838 performed the first Christian marriage on Tutuila. He presided over the "Great Awakening" revival on Tutuila between 1839 and 1842 (1876: 125). Murray's account of early contributions to the mission yields some insight into Samoan productive activities in the 1830s and '40s. The first missionary collection on Tutuila, in May 1840, brought in two thousand pounds of arrowroot (presumably from the masoa plant),

52 pieces of siapo, and twelve fine mats (1876: 154). In the 1840s little money was in circulation in Samoa, and the missionaries therefore solicited donations of coconut oil and arrowroot, which they then sold to traders. In the 1840s coconut oil became the preferred contribution; thousands of gallons were collected through the 1850s, when monetary donations became the norm.

In the 1860s copra began to be an important cash crop for Samoans, and was to remain an economic mainstay of the Samoan Islands for the next century. The trading companies found early on that it was less wasteful and more profitable to collect the dried meat rather than the oil. Captain Wakeman, who visited Tutuila in 1871, reported that a coconut tree would yield a dollar's worth of copra per year for its owner (Wakeman 1878: 348). The copra was supposed to be dried for three days in the sun to prevent spoilage. Traders in the villages weighed the copra and paid the Samoans accordingly. The meat was then shipped to Hamburg or another major port and processed into oil, which was much in demand in Europe for soap and cosmetics. The remaining pulp was made into sweets or cattle feed. For many decades, copra was Samoa's only export.

When the American government took over Eastern Samoa, taxes were assessed and paid in copra, which the government then marketed. In fact, individual Samoans were forbidden to sell copra unless their taxes were paid. In 1903 the fono asked the government to assume the task of marketing all surplus copra, thus eliminating the local trader's role (Crose 1916: 19-20). Market demand and prices have fluctuated throughout the history of the copra trade, however, and profitability has never been assured. Commenting on the government's copra marketing on Tutuila in 1905, the Apia newspaper *Samoanische Zeitung* noted, "There is not a trader on the island that wants to buy any copra and it would be a good thing if this fact was made known to the natives" (Nov. 4, 1905, p.8).

In 1838 the Tutuila chiefs and Captain Bethune of the *Conway* agreed upon the first written code of commercial port regulations for Pago Pago (Murray 1876: 77-78). In 1839 Commander Wilkes of the United States Exploring Expedition visited Manu'a and Tutuila, and was welcomed with great ceremony by the Tui Manu'a (Wilkes 1845, 2: 67). Wilkes reported that settlement on Tutuila was concentrated along the coastline, especially around the southwest end. The hills were too high and rugged to pass over, he claimed, so that inter-village travel was largely by sea (1845, 2: 90). Like John Williams, Wilkes (1845, 2: 89) reported that Ofu had few residents due to past wars with Olosega. He described Olosega as a strip of land about 500 yards wide, covered with breadfruit and coconut "in great profusion and sufficient abundance for all the wants of the natives" (1845, 2:

88). At the time the Tui Manu'a was living on Olosega, a "place of safety," because Ta'u had become "unsettled in consequence of the wars of the Christian and Devil's parties" (Ibid.). Wilkes described Ta'u as "covered with a luxuriant vegetation," with "many cocoa-nut groves on its north-west side," near the island's "principal settlement" and anchorage (1845, 2: 87).

The first systematic ethnographic research on Samoa was conducted by the German scholar Augustin Kramer in the late 1890s. Kramer was a careful and thorough researcher, and his collection of genealogies and oral traditions is a priceless resource for Samoan ethnohistory. Kramer spent six days in Manu'a and recorded a significant amount of material. He apparently spent less time on Tutuila, and his information for that island is less detailed. Kramer's ethnographic material will be referred to below in the context of other discussions, but we note here his description of Samoan settlement patterns. According to Kramer, Samoan villages in the 1890s were always located close to shore, either in small bays or "somewhat elevated" on hillsides. He saw sites apparently of old inland villages, but these were vacated. Kramer lists several place names that lie within the National Park on Ta'u, but notes that most of these are simply location names, not villages. The list includes Fitiuta, Saua, Aufotu, Maefu, Laufuti, Taisamasama, Solotagata, and Lavagia (Kramer 1994: 506).

In 1900, after decades of colonial wrangling and factional warfare, the Samoan Islands were divided between Germany and the United States. Eastern Samoa came under the administration of the Department of the Navy as the U.S. Naval Station, Tutuila. For the United States, the chief attraction was the superb harbor of Pago Pago Bay, where the U.S. had already established a coaling station. The first commandant, Cdr. B. F. Tilley, made a diplomatic voyage to Manu'a, which had remained largely isolated from the nineteenth-century political conflicts. Accompanied by high chiefs of Tutuila, Tilley arrived at Ta'u in 1900. Tui Manu'a Eliasara refused to sign the Deed of Cession and insisted on the autonomy of Manu'a. In the nineteenth century the Manu'ans had emphasized their independence by flying their own flag, which was designed to symbolize the three islands of the group. The Tui Manu'a recognized overall U. S. authority before Tilley left, but he still would not cede sovereignty over his own subject lands.

Manu'a's distinctive political customs became the center of controversy early in the American administration. Cdr. Tilley created three district governorships, to be held by Mauga, Tuitele, and the Tui Manu'a. The Tui Manu'a, however, was of much higher customary standing than the other two titles, and was surrounded with special personal privileges and honors. In Manu'a the word ipu was reserved solely for the 'ava cup of the

Tui Manu'a, and could not be used to refer to anyone else's cup. In 1901 Mauga Moi Moi, on a visit to Ofu, refused the 'ava cup presented to him because the server avoided using the word ipu. In the absence of the High Chief Misa, the lesser Ofu chiefs attempted a compromise by summoning Mauga's cup with the words, "O le ipu o le Kovana" 'the Governor's cup.' These were the words previously used for the cup of Commandant Tilley when he had visited Manu'a.

When the Tui Manu'a heard of the incident, he was outraged. He sent policemen from Ta'u to arrest the three Ofu chiefs who were responsible for the decision and ordered very severe punishment: the banishment of their families, destruction of all their property, and effective execution of the three by setting them adrift on the ocean. Edwin Gurr, Tilley's secretary of native affairs, persuaded the Tui Manu'a to desist and bring the matter to the new government's court system. Thus an issue of Samoan custom came to be adjudicated in a Western-style courtroom. The majority ruling was that the defendants were not guilty, for they had not observed the high ceremony associated with the Tui Manu'a's cup on this occasion. The judges also recommended that the word ipu should be usable by other chiefs who were not from Manu'a.

The Tui Manu'a's orator and several other chiefs appealed, and assemblies were held in Olosega to discuss how the sanctity of the word ipu could be preserved. In 1902 the case was re-heard aboard a ship off the island of Ta'u and the original finding was upheld. Several chiefs of Manu'a publicly defied the order and were brought to trial in Pago Pago later in the year. Although the defendants were convicted and fined, the chiefs and people of Manu'a did not press the matter further and remained obedient to American law. In 1905 the Tui Manu'a at last signed a formal cession of the islands to the United States; the Deed of Cession was also signed by chiefs Tufele of Fitiuta, Misa of Ofu, the Tui Olosega, and Asoau of Faleasao. Some years after the cession of Manu'a, the Navy Department at last allowed the governor to refer to the station more accurately as "American Samoa."

Tui Manu'a Elisara died in 1909, and for fifteen years there was no Tui Manu'a. The District Governor position passed to Tufele Timiali, and after him to his successor Tufele Fa'atoia. In 1924 the Faletolu named an 'afakasi, Chris Young, to the Tui Manu'a title. American officials were worried that the Manu'ans were restoring a "king" who would cause trouble for the administration. Governor Kellogg opposed the bestowal and forced Young to reside in Tutuila. In Western Samoa, this was the period of the Mau rebellion against New Zealand and there were some anti-government meetings and protests in American Samoa. Mau activity in American Samoa peaked around 1930, the year a

fact-finding commission appointed by Congress held hearings in Hawaii and Samoa. After wide-ranging testimony by Samoans, officials, and scholars, the commission recommended an organic act to define American Samoa's relationship to the United States, and citizenship for American Samoans. These measures were not granted until after World War II, however. In 1951 the Department of the Interior took over the administration of American Samoa. With the closing of the Naval Station, approximately ten percent of the population of American Samoa--for the most part Navy personnel and their relatives--migrated to Hawaii with the assistance of the federal government.

Before turning to ethnohistorical descriptions of present-day Park areas, we note other events and population changes that have significantly impacted Tutuila and Manu'a during this century. Cyclones Ofa and Val in 1990 and 1991 were only the most recent Pacific storms to devastate American Samoa. Gray (1960: 186-87) describes the terrible hurricane of 1915, which hit Manu'a particularly hard and washed away the village of Sili, on Olosega. Sili recovered, only to be struck again by Ofa and Val. Only one family now lives there full-time. After 1900 the birth rate in American Samoa increased while the death rate declined dramatically, resulting in a tripling of the population between 1900 and 1950 (Gray 1960: 247). Gray reports an increase in hillside gardening, with resultant erosion, and declines in fishing yields by mid-century.

In Tutuila and Manu'a today it is possible to see many cleared former cultivation areas on what seem to be impossibly steep slopes. Most of these are no longer in productive use, but informants in their '40s and '50s can remember their parents and grandparents working these areas. On Olosega, a resident told us that his father climbed a rope up a nearly-vertical slope to reach a small, somewhat less steep cultivation plot. Though inhabitants of Tutuila and Manu'a have practiced hillside gardening since ancient times because of the islands' topography, it may be that some of the very steep clearings we see today exemplify relatively recent "agricultural intensification" in response to twentieth-century population growth. Emigration to Hawaii and elsewhere in the U.S. has helped to reduce the population density of American Samoa. This and the decline of the subsistence economy in recent decades have resulted in the abandonment of many hillside gardens within a generation.

Western Ethnohistorical and Ethnographic Reports.

In this section we summarize Western ethnohistorical reports pertaining to our primary topics of interest: agriculture and gathered plants, bush flora and fauna, marine resource use, and culturally significant sites within current National Park areas. The ethnohistorical record is a continuum from early postcontact

times to the present. While there is change over time, there is also continuity in many Samoan cultural practices, particularly in the use of natural resources. This continuity is apparent when one compares twentieth-century ethnographic accounts with earlier descriptions. We will therefore consider the early reports here in comparison with later observations by anthropologists such as Mead (working in the 1920s) and Holmes (working primarily in the 1950s and '60s). The work of non-anthropologists such as Coulter on land use (ca. 1940) and Setchell on ethnobotany (based on fieldwork in 1920) will also be considered.

1. Agriculture and Plant Resources. The earliest attempt at a scientific description of Samoan agriculture was probably that of Wilkes, who arrived in Samoa in 1839 as commander of the United States Exploring Expedition. He reported that the Samoans' principal foods were pork, fish, breadfruit, coconuts, bananas, and especially taro (1845, 1: 91). Samoans of all ages, male and female, also enjoyed drinking 'ava. It should be noted that Wilkes' (Ibid.: 104) description was intended to apply to Samoa as a whole; he does not provide data on variations that may have existed between the different islands. Wilkes reported that the cultivated areas tended to lie close to villages, and therefore not far from the coasts. To clear the land, the Samoans burned the bark from the trees, allowed them to dry, and then cut them down to use as fuel.

Among the major productive trees were twenty varieties of breadfruit, the "vi-apple," coconut, and wild orange. Wilkes gives detailed information on the construction of Samoan houses, both residences and chiefly meeting houses. He mentions the use of breadfruit wood for house timbers, thatch of sugar cane or pandanus, and sennit for lashing the house together (1845, 1: 113). Fale built with these materials were common in Western Samoa until perhaps the past two decades; Western construction materials prevailed somewhat earlier in American Samoa. After cylones Ofa and Val, however, very few Samoan houses were rebuilt by the old methods.

Other cultivated plants and trees noted by Wilkes were ti (*Cordyline*), bananas, taro, paper-mulberry, the arrowroot plant (masoa), coffee, sweet potato, pineapple, yams, papaya, and tobacco. At the time of Wilkes' visit limes, lemons, and sweet oranges had also been introduced. Wild-growing and semi-cultivated plants noted by Wilkes include bamboo, wild sugar cane, wild nutmeg (*myristica*), pandanus, and several species of palm. In the forests were tree ferns and an enormous species of banyan. "Many of the flowers seen on the ground," Wilkes commented (Ibid.: 104), "were unknown to our botanist, as were several fruits."

Although less botanically precise, the missionary Turner provided somewhat more revealing data on the Samoan diet and food cycle. According to Turner (1884: 107), Samoan families relied on breadfruit for about half the year, and on taro the other half. Bananas and coconut were abundant throughout the year. Turner described the making of masi, fermented breadfruit: families placed surplus breadfruit in a pit lined with banana and coconut leaves and covered with stones. The masi would keep for years, and the older it was, the more it was prized. Masi was baked in cakes during a taro shortage or when breadfruit was not in season. In 1926 Margaret Mead was told that only Ta'u, the Tui Manu'a's home village, had no masi pit, because villagers there received tribute from the island's other communities (1930: 69). Turner noted that serious famine was rare in Samoa because of other preserved foods and wild-growing items such as yams. Indeed, at most times families had more than enough of the staple foods and often sold yams, taro, bananas, pigs, and chickens to ships (1884: 171).

In 1956 R. F. Watters of the University of London completed a dissertation reconstructing Samoan agricultural practices from nineteenth-century sources. Watters later published several articles on this research (1958a, 1958b, 1958c, 1960a, 1960b). In addition to the ethnohistorical literature, Watters used contemporary descriptions by Coulter and others to reconstruct Samoan agriculture in some detail. Drawing on Wilkes, he identified the five staple crops as taro, yams, breadfruit, coconuts, and bananas (Watters 1958a: 44). Watters (1956: 203) estimated that taro occupied about 70 percent of Samoan plantations, sometimes interplanted with yams or other cultigens. Taro and yams were grown by a typical Pacific Island form of shifting cultivation, also known as slash-and-burn horticulture. At the end of the rainy season clearings were made in the forest by cutting and burning. Later the soil, fertilized by the ashes, was turned with digging sticks and sprouting pieces of taro and yams were planted at the beginning of the next rainy season. A garden would be used for two to three years before "declining yields and increasing weeds forced the cultivators to abandon the garden to the regenerating forest" (1958a: 44). The fallow period lasted from five to twenty years, with ten years the usual minimum (1956: 208). Watters (1958a: 46) concluded that Samoan cultivation practices were relatively easy on the land.

Drawing on Coulter, Watters argued that Samoans preferred steep nearby slopes to flat land further away for their gardens. But he also reasoned that larger settlements would have been forced to utilize the steep slopes or develop plantations further inland (1956: 199). Fruit trees were generally planted near homes, but coconuts were everywhere in Samoa (1956: 197). They grow well at any elevation, and Watters reported that Samoans

sometimes planted them in "inaccessible spots to mark the successful achievement of a steep, rarely-attempted ascent" (1956: 217). This claim was corroborated by one of our Tutuila informants, who gave this explanation for the coconut trees growing on top of the Polas within the National Park.

Setchell (1978[1924]), an ethnobotanist, visited Tutuila for two months in 1920 and authored an extensive report on plant use. He reported coconut, breadfruit, bananas, and taro as the most common cultivated plants, with more limited occurrence of yam, ta'amu, 'ava, and tobacco (1978: 199). The clearing method was slash-and-burn, as described by Watters. Setchell found yam growing only high in the mountains. Tobacco plantations "were strictly tabu" (1978: 197). Sweet potatoes were not cultivated much, and they too seemed "subject to a very particular tabu at least during the growing season." Setchell (1978: 197) refers to a taro plantation at 300 meters on the slope above Vatia toward Pago Pago Bay, and to other plantations along the Vatia trail.

According to Setchell (1978: 198), nearly every village had some kapok (*Ceiba pentandra*) trees, for by 1920 stuffed pillows were replacing the indigenous bamboo headrests. Some villages were also growing cotton trees (*Gossypium brasiliense*). He describes sugar canes--tolo (*Saccharumu officinarum*)--and fiso (*Miscanthus japonicus*) as important crops. The fiso, also referred to as 'ofe (cultivated bamboo), was used for house thatch, and construction might be delayed until enough had been collected. In past times fiso had been used to make knives, flutes, house screens, and other objects that were being made of cultivated bamboo at the time of his visit.

Margaret Mead, who spent six months at Fitiuta in 1926, provides detailed information on the gender division of labor. In her more technical work *Social Organization of Manu'a*, she reports a pattern that is typically Polynesian: heavy outdoor work done by men and lighter, more detailed work done by women. In agriculture, men clear the land and plant; women weed and do light harvesting (Mead 1930: 67). Men work with wood; they also pick breadfruit and husk and cut ripe coconut. However, women are familiar with gardening tasks and are fully capable of managing a plantation if necessary. In the popularly written book *Coming of Age in Samoa*, Mead (1928: 49) writes that women do "heavy routine agricultural work," namely weeding, transplanting, gathering and transporting food. Women plant and care for cloth and mat-making plants such as hibiscus and fala, and also cultivate sugar cane (1928: 84); this is logical since sugar cane leaves were often used for roof thatch, and preparing the lau 'leaves' for thatching is customarily women's work.

In the 1920s on Ta'u the 'aumaga had the duty of planting the village taro gardens, while the taupou was in charge of the

paper mulberry plantations (1930: 14). This division of responsibilities among the young people of the village illustrates the common Polynesian pattern whereby men are primarily responsible for agriculture and women produce cloth and mats (see also 1928: 31-32). Mead reports teenaged girls making long journeys inland to gather high-quality hibiscus bark for weaving (1928: 31). Old men make sennit from coconut husk fiber by rolling it on their thighs when they are seated for an extended period (1928: 48), such as at a meeting of chiefs.

Like other ethnographers, Mead describes the making and ceremonial exchange of fine mats ('ie toga) and tapa cloth (siapo). These cultural valuables continue to be a necessary part of fa'aSamoa public exchanges, and Mead identifies several ritual occasions when they should be presented. Samoan ceremonial exchange shows significant continuity over time, from early ethnohistorical accounts through Holmes' observations of the 1950s and '60s. Mead's account of the production and importance of Samoan cloth wealth accords well with general Samoan ethnography, and for that reason we will not recapitulate her descriptions in this report. As will be discussed further below, we obtained very little information about siapo from our modern respondents, and less than we had expected about fala and mat making. To some extent this may reflect the limited fieldwork time and the preponderance of male informants, but it seems clear that cloth and mat making have declined in recent decades. Informants knew of no u'a (*Broussonetia papyrifera*) growing, and said that women had stopped cultivating it.

Mead (1930: 103-4) gives a detailed account of growing and preparing kava ('ava). Her description reads in part:

> [Kava is grown] as a regular part of a plantation. Four small pieces of root about 7 or 8 inches long are planted together in wet ground. They are planted and gathered by men; no incantations or charms are used. When the kava is being dried in the sun and after it is store in the house, care is taken that it is not handled carelessly or touched by children.

Kava could be processed by either boys or girls. In Mead's time the kava was pounded rather than chewed, and she believed this shift to reflect missionary influence. Large, flat stones near the house were used as mortars and a small boulder or piece of iron was used as a pestle. The pounded root was collected in a breadfruit leaf. 'Ava was then and still is an essential part of Samoan political ceremonies; on Ta'u in the 1920s it was also believed that kava was an abortifacient if chewed in large quantities (1930: 87).

Samoans on Ta'u were growing tobacco at the time of Mead's

fieldwork, but they much preferred imported tobacco (1928: 268). Copra was an important commercial crop. The cut copra was stored in sheds in each village until the government ship arrived. Work in the copra sheds and transporting the copra were communal village tasks (1928: 271).

Mead wrote that "Fitiuta plantations are believed to be the best in Manu'a; the village has a great reputation for a plentiful food supply" (1930: 198). Nevertheless, in the 1920s Manu'an practices still reflected the islands' geographical isolation and vulnerability to natural disasters. Mead reports a number of ritual and customary measures that served to regulate resource use, especially during famines. Breadfruit exploitation was regulated by feasts for each season; no one could eat 'ulu until the village fono held the breadfruit feast (1930: 16). When a bad storm hit the islands, a tapu of the land ('namu le ele'ele') might be declared and prohibitions imposed on coconut, taro, pigs, and/or other resources. The village might even impose very specific prohibitions, such as forbidding a family to prepare palusami (which requires many coconuts) more than once every 7 to 10 days (1930: 16). During the famine spring of 1926, two types of communal ti ovens were made. In one type, all families contributed and shared baked ti roots. In the other, household food baskets were baked together but taken by each family afterwards (1930: 70).

Mead also records customary measures to protect householders' gardens and crops from trespass. Pigs straying onto cultivated lands could be killed on sight, and the owner called to remove the dead animal (Mead 1930: 72). Ta'u informants told Mead of tapui, charms or ritual sanctions, to protect their trees and plots: 1) "A coconut shell or bottle filled with water hung to a tree with a fastening of tapa or cloth" threatens boils for anyone who might disturb the tree; 2) "A woven coconut leaf basket with a piece of stick pushed through it" promises that the trespasser will be speared by a swordfish; 3) "A husked whole coconut" warns of "boils on the buttocks" to any transgressor. On Manu'a our research team saw coconut trees with palm fronds or old lavalavas tied around them. These bindings, which function today as "private property" signs, are historically related to the tapui of times past.

In 1937 John Wesley Coulter conducted research on land use in Tutuila and Ta'u. His technical monograph (Coulter 1941) provides valuable details on crops and cultivation practices, and bridges the time gap between the ethnographic research of Mead and Holmes. Coulter (1941: 26) reported that Samoan taro typically matures in seven to eight months. Taro land was used for about two years, or for three taro crops, before being left to fallow. Ta'amu grew wild in the forests and was cultivated for emergency food or after hurricanes (1941: 21). In comparison

with similar earlier reports and ethnographies, our 1995 research suggests that ta'amu has increased in importance as a cultigen very recently as a result of the taro blight in Samoa. Coulter identified native oranges (moli Samoa [*Citrus hystix*]) growing in lowland forests; in 1937 Samoans still used them for shampoo (1941: 21). He reported that kava was propagated by slips and usually grown in dry, deep soil to enable the roots to develop fully (1941: 21, 27). Cassava (*Manihot esculenta*) and fala were planted in patches near houses (1941: 22). The fala and paogo varieties of pandanus were used for floor and sleeping mats, while fine mats were made from lau 'ie (1941: 20). Coulter also noted that the land devoted to ufi cultivation had recently increased on Ta'u (1941: 21).

Coulter (1941: 28) reported that the common weeds were vao palagi (*Cenchrus echinatus*) along trails, fue saina (*Mikania micrantha*) in lowland areas, and vailima (*Paspalum conjugatum*). Taro land was only weeded when the crop was young; after that the weeds were left to prevent erosion and keep the soil moist (1941: 26). Samoans also used a mulch to control weeds and conserve moisture around the plants (1941: 23).

In his monograph based on fieldwork on Ta'u in the 1950s, Lowell Holmes (1957b: 313) describes the gender division of labor with great specificity. His lists accord well with nineteenth-century descriptions as well as with modern ethnographies on villages in Western Samoa. This degree of consensus indicates an integral Samoan pattern, and suggests significant continuity over time in the allocation of tasks. According to Holmes, men's tasks include: house and canoe building; making palm-leaf roof thatch and sennit; carving tapa boards and beaters; building and repairing fences; making food-carrying baskets; making fish traps, tackle, and nets; fishing with poles, nets, traps, or spears; fishing from canoes or boats; hunting pigeons; feeding, slaughtering, dressing, and cooking pigs; gathering wood, making the fire, and preparing food for cooking in the umu; picking breadfruit; clearing land and other heavy agricultural work; husking coconuts; carrying loads from the plantation; making Samoan oil; cutting hair; making herbal medicines; serving as spirit mediums and circumcisers.

Holmes' (1957b: 313) list of women's customary tasks include: caring for children; tidying the house; making sugar-cane roof thatch; washing and ironing clothes; making and dying tapa; weaving mats and house blinds; preparing dyes; sewing; washing cooking utensils; making mosquito nets; assisting in community fishing; reef gathering and inshore fishing; feeding chickens; preparing and cooking food; weeding the yard; picking breadfruit; wringing kava in the role of taupou; clearing underbrush and performing "light" agricultural work; drying copra; carrying loads from the plantation; making Samoan oil;

preparing flower garlands and making dancing skirts; watching a corpse before burial; hair dressing; making herbal medicines, caring for the sick, and serving as spirit mediums. Holmes' list indicates an apparent overlap in the allocation of cooking tasks. In rural Western Samoa, however, the division of labor in cooking is such that men prepare and cook the umu foods--pig, palusami, and the staple vegetables such as breadfruit and taro--while women prepare and cook fried and Western-style foods, typically over kerosene stoves. Our field research corroborates Holmes' finding that both men and women can be medicinal specialists.

In his published ethnography, which reflects follow-up research in the 1960s, Holmes describes the method of clearing agricultural land near Ta'u village and Fitiuta:

> Land is cleared by men using axes to fell the large trees and bushes and bush knives to remove the high grass, ferns, and other scrub vegetation. The plot is then left for a week or more so that the leaves will drop from the trees and the trunks and branches may be more easily cut up for burning. These sections of trees as well as brush are disposed of in controlled bonfires, but land is never burned over. (1974: 43)

Holmes describes coconut as "unquestionably the most useful" of all Samoan agricultural products (1974: 43). The raw kernel and the meat--mature or green--were eaten as snacks. Coconut cream, expressed from the grated meat, remains an essential ingredient in such well-known Samoan dishes as palusami, talo (or any other food) fa'alifu, fai'ai, and miti. The milk of the green nut is a readily available cool drink, and is made into vaisalo, a much prized hot drink and digestible food for invalids. On Manu'a the wood was used for house components, canoes, cricket bats, fuel, and other items. The leaves were made into a variety of woven articles: floor mats, baskets, house blinds (pola), sandals, fans, food serving platters (laulau), and roof thatch, although sugar cane leaves were preferred for the latter. The coconut husk was used to make sennit for house and canoe lashings; sennit twine was the indigenous fastening material before the introduction of iron nails, and continues to be used when Samoans wish to construct a house in the traditional style. Cleaned coconut shells were used for cups, utensils, and craft items, and for bonito hooks.

During the 1950s taro was the preferred food on Manu'a (Holmes 1974: 45). Bananas, usually cooked while green, were another favorite food. Breadfruit, according to Holmes, was eaten more often but was not valued as highly as taro. Holmes (1974: 45) describes breadfruit being buried in masi pits "as insurance against possible future crop failure or other natural disaster." Breadfruit wood was the preferred material for house

construction, but if enough were not available asi wood could be used for the posts and poumuli for the beams (1974: 55). By the 1950s a variety of Western vegetables had been introduced to Manu'a--tomatoes, cabbage, corn, beans, carrots--but were not widely grown (Holmes 1957a: 200).

Farrell's (1965) report on land use in American Samoa contains statistics that substantiate Holmes' observations and our own findings about the most important crops. Farrell noted that commercial agriculture had little potential because of the islands' topography. In the mid-1960s most of the cropland was devoted to subsistence agriculture; he estimated only a few hundred acres planted in commercial crops (1965: 325). Taro was typically grown "in exceptionally small patches" and occupied "no more than five per cent of crop area" (1965: 324); taro is extremely productive per acre, however, and Farrell's statistic may understate the dietary importance of taro for Samoans. Farrell reported that 85 percent of cultivated land was devoted to intermixed coconuts, bananas, breadfruit, and cocoa:

> Only thirteen per cent of the crop area is pure stands of coconut, but if coconut combinations were reduced to a single-crop equivalent they would occupy forty per cent of the land actually in crops. Bananas if calculated the same way would occupy nearly a third of the land in crops. (1965: 324)

In the 1950s copra and cocoa were being grown on Ta'u as cash crops (Holmes 1957b: 306). Government agricultural officials had introduced cocoa to Manu'a in 1951 (1957a: 200), but copra continued to provide most of the cash income through the 1960s (1974: 43). In 1967-68, Manu'a produced 81 percent of the copra purchased by the Copra Board (Hatakeyama 1969: 357). By the 1960s Tutuilans had found other ways to make money, but on Manu'a copra was the only source of income other than schools and temporary construction work (Ibid.). In his recent monograph, updated after a visit in 1988, Holmes reports that the total cultivated land in Manu'a is less than 400 acres, all used for subsistence planting. Copra is no longer profitable, and Manu'ans have largely given up commercial agriculture (1992: 114).

Our research turned up very little ethnohistorical data on medicinal plants and remedies. This is not surprising, for a number of reasons. Short-term foreign visitors would not normally be exposed to this domain of specialized knowledge. If, as is true today, many of the healers were women, the predominantly male observers would be even less likely to investigate and value such activity. Westerners, especially missionaries, also tended to look down on native curing practices and considered them to be unworthy of documentation. Wilkes

(1845, 2: 105-6), however, did report the childhood illness ilamea, as sores particularly affecting the face and head. The treatment was to rub the child with coconut husks, removing the scabs, and then apply a soft preparation of breadfruit. If the breadfruit were out of season, "a decoction of the husk of the coconut is used in its place." Twentieth-century ethnobotanical reports and articles on medicinal plants will be cited below, in the discussion of our interviews on the subject.

2. Marine Resources. The ethnohistorical record offers much less information about Samoan marine species and fishing activities than about agriculture. The material is less detailed and little can be located specifically within National Park areas, except for the ethnographies of Mead and Holmes. We know from the sources that Samoans conducted both inshore and deep-sea fishing. Fish were the most important protein source, and were eaten daily with the vegetable staples; pig was and is a ceremonial food rather than daily fare. Unlike other Polynesian peoples, the Samoans did not dry fish and preferred to cook it fresh (Watters 1958a: 48). Wilkes (1845, 2: 92) reported that the Samoans much enjoyed fishing, and he described net fishing and fish drives. He also noted that mullet was the most frequently caught fish (1845, 2: 93).

Other European observers, such as the missionaries Turner and Stair, were more interested in legends surrounding particular species than in contemporary subsistence fishing. The missionary writers documented various pagan beliefs and taboos. Turner (1884: 19) describes village temples dedicated to deities, and containing objects "treated with superstitious veneration," such as conch shells, stones, and coconut-shell cups. In pre-Christian times certain species were identified with deities; Turner (1884: 35, 40, 50) cites the eel, turtle, sperm whale teeth, and cockle shells as examples of godly embodiments. The octopus ('o le Fe'e) was a war god, according to Turner (1884: 28-29), and was the focus of a number of pre-European legends. Stair (1896: 38) writes that 'Sa-le-fe'e' was the Samoan equivalent of Hell: a "dread place of punishment" and "the much dreaded regions below."

Wilkes (1845, 2: 91) was told of 'aitu embodied in marine species. A chief informed Wilkes that before he converted to Christianity he worshipped an eel, which he fed in a stream near his village. Since the introduction of Christianity, the chief related, all such eels had been caught and destroyed, but in prior times anyone disturbing an eel would have been killed. As late as the 1920s, Margaret Mead (1930: 160) was told that 'o le Fofoa, an Ofu village god, was embodied in the conch shell. She quotes Kramer's account of the people of Olosega worshipping a "poison-toothed eel," which sometimes came up on land (1930: 157). The eels (pusi) were carried on a litter and pigs were

offered to them. Mead was told that the eel was considered an embodiment of the god, that when it came on land it represented "war and misfortune," and that the eel was tapu to the people of Olosega. Mead credits Turner for details of the ancient sanction, whereby anyone who cooked or ate the eel would have "his scalp clubbed and his eyes burned out."

Our modern Tutuila informants related a legend regarding dolphins at Fagasa and the Samoan mythic heroine Sina. Kramer (1994: 482) records a more complete version of the story. Sina came from the east with the traveling party of Li'ava'a. She was the chief's daughter and was sent to get water for kava. When the party put out to sea the chief called for Sina to chew the kava, only to discover that she had been left behind. The chief told the crew to return to the place where she had been left. They took provisions of nonu and banana and changed into dolphins while swimming. Sina stood on the shore waving a white fan. The people of Fagasa came and took the dolphins ashore, and the dolphins cried as they saw the people take sticks to kill them. When they were cut open they were filled with nonu and bananas. Kramer's version says that if dolphins are caught "nowadays," they are held in a rock pond for three months and eaten as needed. Kramer was told that they still come to shore once a year: "And just as once Sina stood at the shore with her white fan so it is still today." In the version told to us by several residents, the crew (as dolphins) chased atule into the bay to provide food for Sina and the village, and they continue to do this once a year.

Nineteenth-century Western observers were fascinated by the annual palolo rising (Wilkes 1845, 2: 93), and visitors described this event more than any other marine activity. Kramer (1942: 313, 725-37) describes palolo scooping "with a piece of European mosquito netting" as well as with the older method using woven baskets. Kramer's (1994: 484-85) account of the timing of the palolo intersects with information provided to our research team by modern informants. As in other areas, Kramer provides more details. A legend, for example, seems to mark the palolo worm as conceptually different from fish and other marine species: on the day the fish and the birds are at war, the fish who will fight are chosen but the palolo are never included. The fish say to the palolo: "Since you are of no use for war, you are of great use for the people." The six-stanza 'Song of the War of the Fishes and the Birds' (Kramer 1994: 495) mentions other species relevant to the present study; among the fish are the ume, tifitifiapata, and mutu, and the 'birds' include the pe'a, manumea, lupe, and fiaui.

The cycle of the palolo was particularly important to the Samoans as a calendrical basis for calculating the year according to lunar months: "They know the day and the month; they know it

to be Taumafamua and Toetaumafa. Even today the people of our generation calculate this" (Kramer 1994: 484). One term for the eighth night after a full moon is masina salefu, because lefu foam appears as a first sign of the palolo. The ninth night after the full moon is masina motusaga, the "second palolo day." These terms were discussed by one of our Fitiuta informants in the context of the palolo.

Kramer (1942: 741) lists marine animals with their Samoan and scientific names. He also gives the most detailed descriptions available for a number of Samoan fishing activities: spear fishing (315), basket and net fishing (318), using futu and 'ava as poisons (317), fishing for shark with the rattle and noose (357), and 'o le se'e, where women would glide through shallow water to herd the fish. Kramer (1942: 313) describes the method of reef gathering that our research team witnessed on the Ofu reef: women would carry a split stick, a piece of wood, and a fish basket. They poked the wood into holes in the reef, looking for cuttlefish, sugale, ofaofa, and other fish, and then used the stick to dig out their prey.

In Polynesia, men typically do deep-sea fishing and net fishing while women forage on the reef and fish in shallow water; it is rare for a woman to go out in a fishing boat. The Samoan gender division of labor appears to follow the Polynesian pattern. On Ta'u in the 1920s, Margaret Mead (1928: 49) noted that older girls and women do reef fishing for octopus, sea eggs, jellyfish, crabs, and small fish. During Mead's time men still made their own nets and hooks, and wove their own eel traps (1928: 269). Mead (1930: 67) describes the gender division of labor in fishing and marine gathering as follows: men make fishing tackle, lau fala fishing baskets, eel traps, and rope for lassoing sharks. They fish beyond the reef, while women fish within the reef (except for eel fishing). Women help in the communal village fish traps, and both sexes participate in torch fishing. Children gather small land crabs but women usually catch the "great coconut crab."

On Ofu and Olosega during the 1920s, the malauli, ulua, and the turtle were i'a sa, or fish reserved for chiefs only (Mead 1930: 206, 210). Mead (1930: 15-16) reports that a chief could declare the reef and all species in it as tapu, though the decision would be announced as the decision of the village. Such a taboo, called namu le tai, did not affect deep-sea fishing, and appears to be a customary means of conserving inshore marine resources.

Holmes' (1974) descriptions of marine resource activities and the gender division of labor accord well with Mead's account, even though their observations are thirty to forty years apart. According to Holmes, men do ocean fishing while reef gathering--

of crab, lobster, crayfish, squid, and octopus--is conducted "almost entirely by women" (1974: 47). In his updated ethnography, Holmes reports that there is no selling of fish to people outside Manu'a, though local fishermen sometimes sell to local residents (Holmes 1992: 115).

Stokes (1921: 230-1) provides early twentieth-century data on methods of fish poisoning using the seed of the futu plant (*Barringtonia asiatica*). His source was E. J. Mooklar, a chemist who lived on Tutuila from 1901 to 1912. The kernel of the futu was pounded with a stone mortar or grated and thrown into tidal pools. Within minutes the fish were floating on the surface; they were scooped up quickly because it was thought that they would recover if left for any time. People could eat the poisoned fish with no ill effects. Stokes briefly mentions other fish poisons noted in the literature: *Tephrosia piscatoria*, the 'ava sa (Brown 1910: 337) and an unidentified beach vine (Churchill n.d.: 122), which is probably fue o'ona (*Derris trifoliata*). On the basis of his 1920 visit, Setchell (1978: 213) stated that the futu kernel was grated with *Fungia* coral. The gratings were scattered in the water and pressed into balls which were pushed into holes where the fish were likely to hide. When the stunned fish came out of their holes, they were caught by hand or with a net. Although this method was used particularly in shallow pools at low tide, divers also used poison in deep water.

In his list of fishing techniques Holmes (1957: 309) also documents the use of the *Derris trifoliata* root and *Barringtonia asiatica* kernel as fish poisons. During the time of his fieldwork Samoans sometimes used dynamite on the reef to kill a shoal of fish, or during a fish drive, even though it was illegal. Cox (1979: 398) provides more detailed data on fish poisoning, based on observations in Western Samoa in 1978 and 1979. Cox saw futu widely used in tidal pools to kill small fish such as manini (*Acanthurus*), lo (*Siganus*), tu'u'u (*Chromis*), and the genera *Abudefduf* and *Pomacenturus* (which is also called tu'u'u). The futu seed was grated with a lava rock and allowed to run into the pool. The fish would leap out of the water and the fishermen would beat them. Cox's informant told him that, even though the fish were edible, he only used fish caught in this way as bait for atu outside the reef. Futu was only used in tidal pools; at other locations 'avasa was the preferred poison. The roots were pounded at a large rock or piece of coral and the lumps wrapped in fu'afu'a (*Kleinhovia hospital* L.) leaves or lau fatu or lau pata (*Macarnga harveyana* Muell.). Several fishermen surrounded the rock and pounded the water with sticks to drive the fish under the rock. One or two men would dive and shake the poison packet under the rock. After about five minutes the dead fish rose to the surface and were gathered in baskets.

3. Significant Sites. Since most of the National Park lands are remote and have historically been difficult to access, the foreign-authored ethnohistorical literature contains almost no references to sites that can be definitively located within the Park. Samoan legendary material pertaining to culturally significant sites was discussed above in the context of pre-European mythic history. Even by Samoan standards, the Fitiuta side of the Ta'u Unit has historically been difficult to reach. Mead (1930: 198) characterized Fitiuta as the most isolated village in Manu'a because of its "dangerous reef and an unsatisfactory channel." Moreover, many Ta'u people told her that they had never made the journey across the island because the trail was "such a troublesome trail." There is no record in Manu'a of some of the burial methods reported for Western Samoa, such as platform burial, the separate interment of chiefs' skulls, and mummification (Mead 1930). These practices might have been associated with tia or burial mounds.

Holmes (1974: 1) identifies Saua as the place where Tagaloa created the first humans and sent them out to Polynesia, and where he crowned the first Tui Manu'a. Mead (1930: 161) was told of several osoga, "leaping off places for the soul," whence souls leapt to swim across the ocean from this world to the next: one for Ofu and Olosega, "but two in Fitiuta, one for each division of the village." Holmes (1974: 52) recorded a detailed version of Tagaloa building the first Samoan fale on top of Mount Lata (see above for the Kramer version). Since it does pertain to locations within the Park, and mentions species found on the reef at To'aga, we will cite his account in detail:

> [The first fale] was built by Tagaloa-Lagi in his heaven on top of the highest mountain on Ta'u island. The family of Tagaloa felt the need for such a shelter, for up to that time people lived only in caves or in the trees. At first they could not decide if they wanted to build a house first or a boat. They settled on a boat but realized that the trees overhead would provide insufficient protection... They finally solved this problem by deciding to build a house first and then build the boat inside the house. Bonito boats are to this day build inside houses... a group of people were instructed to form a circle, thus providing the posts. Others were directed to climb on their shoulders to in order to form the parts of the roof. Tagaloa-Lagi saw that the shape was good but that the house needed more support. The god then brought three fish from the sea, the Falala (filefish), the Fe'e (octopus), and the Lupota (crevally), to serve as center posts... Tagaloa-Lagi saw that the house was now strong and well-shaped but decided that the house should be made of wood rather than people. He called to all the people to come down and go out and find

a kind of wood from which to make the house. Of all the varieties of wood they brought in, only the breadfruit was judged suitable.

V. Agriculture and Domestically Useful Plants

In this chapter we review cultivation within the National Park, as well as the gathering of domestically useful plant products and woods. Medicinal plants are discussed in a separate section. We proceed by Park Unit, noting details pertinent to particular villages where appropriate, and concluding with a summary of Park-wide cultivation and gathering patterns. The following discussion is based on structured interviews. It should be read in conjunction with the analysis of the freelist data, presented below.

Tutuila Unit.

In ancient times, we were told, the village of Pago Pago was located in the uplands for reasons of defense. By the time of Western contact, most of the families had moved down to the Bay area but continued to plant on the mountainsides above. Middle-aged informants from Pago Pago recalled that in their parents' and grandparents' time there were large taro plantations in the uplands that now lie within the National Park, and every cultivated area had a name. For centuries the typical method of clearing has been "slash-and-burn," though some farmers use chain saws today. Many families have claims in the National Park, and they view these claims as important even if they are not presently cultivating the land. We were told that, nowadays, only a few Pago Pago families cultivate land within the Park. Since we did not interview representatives of all the families owning land within the Park, however, we cannot give a precise figure. A Fagasa informant cited emigration from American Samoa as one reason why many of the upland gardens are not presently cultivated; with so many young people away, families lack the labor force to work the land. The prevalence of destructive wild pigs was mentioned as another reason.

According to local residents, the uplands belonging to Afono, Pago Pago, Fagasa, and Vatia all have the same plant varieties and soil type. Samoans assert that, at present, Pago Pago is the most dependent on Western foods and has the least subsistence use of land of any village in Samoa. The Pago Pago portion of the Park was described as the least disturbed of the three Tutuila village areas, because for many years it has been little used or traveled. It is important to note, however, that the Samoan food trees do not necessarily need regular care to remain productive. One informant likened the upland plots to "a supermarket," a food source always available in times of trouble. Even plantations that are visited infrequently can yield food when needed. One Fagasa informant told us that he intended to go up to his plantation in the near future to collect breadfruit,

even though he had not been there since 1992. Families who are not actively cultivating still return to the uplands periodically to gather bananas and coconuts.

Older Samoans are very familiar with the trails that lead up into the National Park areas. Taro was the dominant cultivated crop before "the disease." Bananas are now the most common crop in the Park areas, along with ta'amu, breadfruit, and coconuts (slide 2). Samoans recognize and cultivate several different varieties of bananas; specifically mentioned to us were soa'a, fa'i Samoa, sulasula, fa'i palagi, misiluki, and pata. In previous times it was common for the villagers to keep sleeping shelters or "shacks" in the uplands, and they would spend a few days at a time there, even cooking food in an umu. A respected chief told us that the entire village used to sleep in the upland plantations from Thursday to Saturday, and that this was their main food source. After a hurricane, the village council would order the young men to clear an area and plant taro, the fastest crop to mature. Such planted areas would be used for ten to fifteen years before being abandoned. In previous times some of the taro was sold at the market in Fagatogo, but most was used by the family or given to other villagers. Current practice continues this pattern. A very small proportion of foods grown in the uplands enters the market; most is for home consumption.

At least two Pago Pago families currently maintain and actively use structures in the Park. One structure is very comfortable, with a modern bathroom, septic tank, and catchment tank. The owner built it after Hurricane Ofa and goes up to the Park areas every day after work. He has planted citrus trees there, and he conveyed to us his desire to introduce three head of cattle into his plantation area, because of the good grass and plentiful water. Another informant, from Vatia, built a cabin with a flush toilet near his upland "nursery" before the area became Park land. He has occasionally rented out the cabin to visitors, but notes that there is little tourism in American Samoa.

Several varieties of useful trees grow in the National Park forest lands. Ifilele (*Inisia* sp.) or ironwood is common, especially near the coast and from Vatia to Fagasa. The ifilele and poumuli were used for building houses (fale). Woods mentioned as useful for canoes (paopao) include breadfruit ('ulu), ma'anunu, mamalu, moso'oi, and vaevae. Fau, moso'oi, and 'ulu are used for cricket bats. Previously used for shields and spears, ifilele is still prized for kava bowls and craft items. We were told that about twenty years ago a party from another village on the Bay went into the uplands belonging to Pago Pago to cut trees for touristic carvings. For three days they felled trees and threw the logs down into the water, but when they came down they could not find the wood. Some believe that the ancient

villagers of Pago Pago carried away the logs cut by the trespassers.

Other trees found in the National Park are ma'ali and tamanu, both used for canoes; laga'ali, used for house rafters; fau, used for cordage and for bonito boat planking; atone, the Samoan nutmeg; tufaso; tavai; toi, which was used for firewood; and lopa, the seeds of which are used for garlands (ula) and snacks. Fragrant plants for garlands, such as the laumaile, laga'ali, and moso'oi, are still gathered in the National Park, primarily by women. Importantly, pigeons (lupe) and other native birds feed on the moso'oi, atone, and tavai. Flowers and ferns such as laugasese are also collected from the Park areas for decorating houses on special occasions. Some families also gather firewood in the bush; ala'a, asi, faso, fu'afu'a, fau, futu, ifi, ifilele, mama'alava, moso'oi, tavai, and toi were mentioned as sources of firewood for the umu. Banana leaves for the umu are also gathered in National Park areas, as is bamboo for fishing rods.

We received inconsistent reports on the occurrence of fala plants within the National Park. Though the pandanus tree grows to a considerable height, Samoan women usually gather the lau fala for mat making while the plants are relatively young and low to the ground. For convenience, they also prefer to grow and utilize fala plants near their homes. In prior times, when the local population was larger and more dependent on handmade mats and cloth, it is likely that there was much more fala grown in the uplands than presently. Lau paogo, a broad, coarser type of fala used for floor mats, also grew in the Park, as did the siapo (bark cloth) plant (u'a). We were told that few Tutuila women are involved in making mats and siapo any longer.

Our information on herbicide use is based only on verbal reports, and the reports are somewhat contradictory. To determine the actual frequency, periodicity, and type of herbicide use in Park lands would require an extended period of residence and on-site observation. Since the cultivated areas are remote and reachable only on foot, and since the use of chemicals is known to be either prohibited or discouraged, accurate data are going to be difficult to ascertain. Vatia has had a sa (prohibition) on pesticide use for the past four to five years. However, one informant asserted that the use of "poisons" is common in bush plantations, even above watersheds and catchment areas. Most farmers told us that a bush knife and hand weeding were their primary means of tending their gardens.

The most serious animal pest in the upland plantations is the wild pig. Rats eat the ta'amu, bats eat mangoes and bananas, and manuali'i eat bananas. Pigs and manuali'i may be shot when discovered. The most dangerous insects are the greens worms

anufe and saga. Both ruin taro by eating the leaves, stalks, and roots. In previous times Samoans controlled the worms by bringing chickens, who relish these insects, to the plantation. Other control methods were to cover the soil between the taro plants with banana leaves, or to build a small smoky fire. A small white fruit fly, the "piercing moth," attacks tomatoes. A new banana pest has appeared recently, a worm that eats the corm of the root. Though a chemical treatment can be obtained in Western Samoa, we were told that the Territory's agricultural office has nothing available locally to combat this pest.

Ta'u Unit.

Fitiuta villagers make much more use of Park lands than Faleasao residents. In fact, we could not document any cultivation of Park lands by Faleasao villagers. There is arable, accessible land south of Fitiuta village and that area is still heavily used for plantations (slide 3), while the Park near Faleasao is for the most part wild, remote, and difficult to reach. Some Fitiuta residents formerly tended plantations in Luatele (Judd's Crater; see Map 2) and had small fale there. Inside the crater they grew taro, several varieties of banana, ta'amu, sugar cane, breadfruit, and pineapple. We were told that there is a break in the Luatele crater wall that allows entry, but this is not true of the small crater, Lualaitiiti, which has never been used for plantations. The road to Luatele was destroyed by hurricane Tusi and it is now reachable only by foot; the hike takes approximately an hour and a half.

Informants could remember people living up on the mountainside above Saua and tending plantations at higher elevations at least until the late 1950s. No one now farms "on top of the mountain," we were told, because of wild pigs and "laziness." Until the taro disease, there were many plantations at Liu, but people have since moved their gardens to the roadside near Saua. New plantations are still being cleared between Luama'a and Si'u (see Map 2), although some informants are under the impression that they should stop farming in areas that are now part of the Park. As elsewhere in Samoa, taro was formerly the preferred crop but ta'amu is now frequently grown in its place.

Plantation land is cleared by slash-and-burn methods. When taro was the primary crop, a new area would be cleared for planting every six to seven months. The taro matures in about six months; at harvest time, the young shoots would be used to plant the new ma'umaga (taro plantation). In turn, when the second plantation matured the farmer might again plant in the first garden. Informants described clearing methods in some detail. First, trees and brush are cut down with axes and knives

and piled around the largest trees. The piles are then burned, killing the big trees. At least some farmers use a system of crop rotation and shifting cultivation: taro is planted for three to four years, then ta'amu, then bananas and coconut. The tree crops are planted last in the cycle, "when you find another good place for ta'amu and taro," because the trees create too much shade and thereafter the land cannot be used for taro gardens.

Another variant of the shifting cultivation technique was described as follows: the big trees are felled and then left to dry for six months, after which the land is cleared and taro planted. After the first taro harvest, "you can tell if the land is good." If it is, the farmer plants a polili (the second planting). After that, bananas and coconuts are planted. If a hurricane ruins the coconuts, the land can be cleared and taro planted again. Alternately, the old coconut trees can be cut down to return the land to taro.

Samoan subsistence gardens do not require daily care. Some Fitiuta villagers go to their plantations only twice a week to harvest; weeding may be done as infrequently as every other month. The cultivated banana varieties include fa'i Samoa, fa'i palagi, fa'i fuamaualuga, soa'a, and paka. Along with the cultivated bananas, coconut, taro, and ta'amu, papayas and ufi may be found growing semi-wild. Fala is grown in a few plantations. Several informants mentioned lautalotalo as a food crop, describing it as another kind of taro. Most Fitiuta villagers appear to depend heavily on Samoan subsistence production for their staple foods. It is customary for families to go to their plantations at least on Saturday, in order to harvest Samoan foods for the weekly to'ona'i. Most of the planters also regularly give part of their harvest to the Congregational minister, a long-established custom in Samoa.

No one knew where to find u'a (the bark cloth plant) growing. We were told that siapo is no longer made in Fitiuta. Many women make floor mats and sleeping mats, but only four or five still make fine mats (slide 4). Stands of fala plants may be seen behind several houses in the village. Fala is also planted alongside the road through Saua (alide 5). One informant recalled her grandmother's u'a plantation; although she and her mother were taught how to make siapo, they do not produce it any longer. The methods of processing and decoration described to us are virtually the same as documented in the general Samoan ethnography, and have much in common with Hawaiian methods of kapa cloth production. Shells were used to scrape the bark. Masoa was rubbed on pieces to join them together, and when the cloth was dry it was decorated with upeti, or with the paogo fruit used as a brush. Some older men in Fitiuta still make sennit twine from coconut fiber (slide 6).

An informant described the taloloa first fruits ceremony, which was last performed in Fitiuta in 1963 for the dedication of the previous Congregational church. A taloloa is a special communal planting done for special occasions such as a church dedication, and it is planned so that the taro will be mature by the day of the event. First, the young men of the village clear the land and divide it by straight lines to make fata. They make the ta (felling of the large trees) and then clear the smaller growth. A food offering called an umufono is left in the bush, "for the God of the bush." The first food must be eaten in the bush, not brought back to the village. At harvest time, the young men take one hundred taro corms from each fata and divide them among the village, the minister, and the guests. Each family provides other food for the event. We were told that the rationale behind the taloloa is to ensure that everyone works together, without competing, and contributes the same amount. When the current Congregational church was dedicated, families gave foods from their own plantations.

Most of the weeding and cleaning of Fitiuta plantations is done by hand. Before the lega (the taro blight), the Department of Agriculture formerly sprayed the taro gardens to kill the anufe worm, which fed on taro leaves. Without spraying, anufe were controlled by picking them off and burning them. We were told that people approved of the spraying, but Fitiuta banned the use of herbicides and pesticides before hurricane Tusi (1987). Mice will damage ta'amu, but farmers can control this pest if they promptly remove cuttings and plant rubbish from the gardens. Birds and coconut crabs are nuisances that attack bananas, but the Fitiuta planters we interviewed did not advocate artificial measures to control them. There is also a disease that stunts the bananas and causes the fruit to fall before it is mature. Wild pigs are not a problem in the lower plantations, but they are common further up the mountain.

Ofu Unit.

The arable land within the Ofu Unit of the National Park consists of a narrow sandy strand between the road and the beach. The strand is wider and better for cultivation nearer to the village. It narrows and becomes more sandy as one travels toward Fa'ala'aga. Not surprisingly, fishing and marine gathering overshadow agriculture as subsistence activities within this Unit of the Park. The soil quality and small size of the Ofu vegetation strand limit the extent to which food crops can be grown there. Taro, for example, could not be grown in this area. Nevertheless, the strand is heavily planted in coconut trees, fala plants (both lau fala and lau 'ie), and, closer to Ofu village, bananas (slide 7). This area is also an important source of wild-growing medicinal plants, discussed further below. Many Ofu families have active plantations at To'aga, but these

are on the mountain side of the road, outside the Park boundary.

Residents do collect woods for the umu from the National Park land: milo, which is also used for cricket bats, fau, talie, and maota, which is also used to make canoes. We found many masoa (arrowroot) plants growing semi-wild on Park land, though nowadays Samoans generally use store-bought starch products instead. There is apparently no u'a growing on Park land, and we did not find any women who make siapo any longer. Formerly u'a grew on the mountain side of the road at To'aga, and informants could remember processing the fiber and making siapo with their grandmothers. Ofu women do continue to make fine mats as well as sleeping and floor mats, and they grow fala for this purpose on the beach side of the road, within the Park.

Summary.

The National Park of American Samoa supports a characteristically Samoan set of food crops and domestically useful plants and woods. Throughout the Park, the methods of clearing and planting are based on simple technology and hand labor. On Tutuila, most of the Park consists of uplands that are no longer extensively used for plantations. Tutuila residents are also generally less reliant on subsistence production than their counterparts on Ta'u and Ofu. However, Tutuila residents continue to maintain some upland plantations as a "bank" and a storehouse to be tapped during emergencies or times of special need. Fitiuta village in the Ta'u Unit is heavily involved in subsistence agriculture on Park land, with many active plantations. Because of the narrowness and sandy soil of the Ofu Park land, the range of cultigens found there is more limited and subsistence cultivation is not extensive.

VI. Marine Resources

Samoans utilize a tremendous variety of marine species within the National Park, from ocean fish to limpets. Though there is deep-water access in a few areas, notably on Tutuila, most of the creatures taken in the Park are inshore, reef species. Here as elsewhere in Polynesia, there is a marked gender division of labor in fishing and marine gathering. Women do not fish from boats, but are the specialists in reef gathering, particularly of octopus. Deep-water fishing is categorically men's work. When men and women do fish on the reef, they usually employ different methods. Women use a stick or short spear and carry a bag for their catch. Men are more likely to fish with a net or a pole, and to dive using goggles and a spear propelled by a rubber sling.

On Tutuila, Pago Pago villagers appear to utilize Park marine resources less often than the people of Afono, Fagasa, and Vatia. This is not surprising, given the boundaries of the Park. The area from the Pola islands toward Afono is the most heavily used fishing ground. On Ta'u, Fitiuta villagers regard the reef and sea areas within the Park as the best local fishing grounds. There is apparently little to no use of marine resources in the Park by Faleasao residents. On Ofu, the reef at To'aga is rich in fish and shellfish and is heavily utilized by local residents, many of whom send a portion of their catch to relatives on Tutuila.

Tutuila Unit.

Several Tutuila informants remarked that nowadays few young people are interested in learning how to fish. Adults generally commented that they go fishing less frequently now than in previous years; work was often cited as a reason. Many indigenous methods are also falling into disuse. Even net fishing is not as frequent on Tutuila as formerly. A high-ranking chief lamented the loss of traditional fishing methods during his lifetime. Trolling for octopus with cowrie-shell lures is now rarely practiced, in part, he asserted, because men are no longer building canoes. Frozen octopus from Asia is also available in town. In fishing as in other subsistence pursuits, purchased foods are steadily supplanting home-produced and gathered foods in American Samoa. This trend is more advanced on Tutuila than on Ta'u and Ofu.

For most Tutuila residents, fishing and reef gathering are more recreational activities than subsistence pursuits. Nevertheless, they are a source of low-fat protein in the diet and are considered culturally significant activities by Samoans. Some informants explicitly linked fishing and diving to physical

fitness and health. Many view these activities as an important part of Samoan tradition. One teacher from Vatia takes her students on weekly field trips to collect shellfish, which she uses to teach language, both Samoan and English. Marine species mentioned include alogo, filoa, gatala, papa, pone, malauli, mala'i, savane, ula (lobsters), pa'a (crabs), faisua (giant clam), and fe'e (octopus), as well as sea urchins and sea cucumbers (see freelist data below for complete itemization).

Samoans use a variety of fishing methods to take marine species from Park areas. Men still dive from canoes (paopao), although boats are preferred if the family can afford one (slide 8). We were told that a "Samoan spear" is used to fish during the day, and a three-pronged "Hawaiian spear" at night. The Samoan spear is long (ca. 7 feet), thick, and heavy enough to stop a good-sized moving fish. The Hawaiian spear is used at night with a flashlight, when the fish are less active. Both types are used with a rubber sling. For bottom fishing, a weighted string with hooks several inches apart is dropped from a boat. Deep-water fish such as masimasi, marlin, and tuna are caught by trawling from a motorboat. Informants knew of 'enu fishtraps, but stated that they are no longer used on Tutuila. Within the memory of adult informants, sharks were caught by a method called lepamalie. Several young men dragged a dead animal behind a boat as bait, snared the shark with a noose and a hook, and then clubbed it to death. Three or four sharks would be caught at a time. The village council waited in assembly during this dangerous business. According to our informants, sharks have not been snared locally in this fashion for twenty to thirty years.

We were told that most of the fish caught locally are consumed at home or given to relatives and neighbors, but several informants reported selling their catch in the village or in Pago Pago town. One Vatia resident reported that he "makes his living" by fishing, but this is unusual. Many villagers offer a prayer before fishing or diving, and some observe the custom of presenting the largest fish to the minister (faife'au). Deep-water fishing from a boat may bring in enough aku or other large species to sell in town, but most of this activity probably takes place outside the Park boundary. One informant reported that, on infrequent occasions, he catches and sells $500-600 worth of tuna.

We received variable reports on whether there are fewer fish nowadays than previously. A Pago Pago resident told us that commercial fishing resulted in a "total wipe-out" of marine life in the coastal areas of Afono, Fagasa, and Vatia during the mid-to-late 1970s and into the 1980s. Many local residents blame Tongans for over-exploitation and for using chlorine bleach to poison the fish. Several informants said that there are fewer

fish now and fishermen must go farther out to catch them. Others claimed that the fish supply today is about the same as in earlier times, but the fish are smaller in size. Informants claim that Tongans and other outsiders still come to the north shore to fish commercially, but only at night. North-shore residents are concerned about the local impact of commercial fishing, and some hope that the Park Service will police the activity more effectively than the Department of Marine Wildlife has in the past.

According to a Fagasa resident, currently the only village fishing restriction is on atule (mackeral). Atule must only be caught by the village as a group, not by individual fishermen. However, this informant stated that the last time the village caught atule communally was about ten years ago. When the atule appeared, the entire village mobilized immediately. Men cut coconut fronds, jumped into their canoes, and attempted to circle the fish while the rest of the village took to the water. Were the atule to reappear today, this informant asserted, people would still know what to do and would automatically know their roles. 'Anae and ume were also caught by this communal method; indeed, there was a sa on individuals catching these school fish. The atule are particularly significant to the people of Fagasa because of the legend of Sina and the dolphins, summarized above. Fagasa villagers view the dolphins as their "friends," and believe that dolphins chase the atule into the bay. According to informants, dolphins are still seen, but less often than before. The communal fishing surround also seems to have lapsed. We were told, often regretfully, that people nowadays catch atule and 'anae individually with nets, with no fear of punishment.

In this report we usually discuss bird species in the context of the forests and "bush" wildlife. However, the fua'o seabirds that frequent the Pola islands are intimately associated with the coast at Vatia, and it seems appropriate to discuss them with marine activities. Vatia is famous for hunting and eating the fua'o. The village considers the bird sacred, and its racing longboat (fautasi) was called the Fua'o. The feathers were used for mats, titi skirts, and headdresses. A knowledgeable informant told us that the term fua'o actually refers to three different birds. The fua'o that nest on the Pola are manufolau or manu'ula, which have red feet and claws and fly far from land. Fishermen use these birds to locate schools of fish. The second type of fua'o is called ta'i'o. It has black feet and is similar to a seagull, but is so wild that it will not come near fishermen. The third type is atafa. The ta'i'o and atafa are aggressive, "killer" birds who do not normally live in the Pola, but will chase away the manufolau if they go there.

In the past, on special occasions the Vatia village matai would send the 'aumaga to climb the Pola for fua'o, which nest

and sleep in small pua'avai trees at the top of the ridge. The Pola were reached by boat--a difficult and dangerous passage that could take up to three hours--and the young men climbed the steep cliffs. The birds were snared with thin loops made from the midrib of the coconut leaflet (alava) and attached to a fishing pole. The "fua'o hitting stick" is used by Afono people to catch the birds from boats. The stick is called the la'au ta fua'o, and we were shown one (slide 9) made from olasina gathered on Park land. One of our informants claimed to be the youngest person ever to have climbed the Pola, a feat he performed when ten or twelve years old. His paternal uncle planted the two coconut trees on the top of the ridge. Three hunters could catch thirty to fifty fua'o at a time. In previous eras, individual hunting of the birds was prohibited and anyone not from Vatia could be killed for climbing the Pola to hunt the fua'o. We were told that there are fewer fua'o today than before the cyclones. They are not hunted on Polatai since hurricanes damaged the trail. Polauta is easier to climb but has far fewer birds. Individual fishermen sometimes catch fua'o today simply by hitting them with their canoe paddles.

An Afono resident told us that his village is allowed to hunt the birds, but not with guns. He reported that he sells the freshly caught fua'o to other villagers for two dollars each, or three dollars if cooked. October is said to be the optimal time of year to take the fua'o because they are lololo 'fat' then. The birds are frequently served on White Sunday. People who take the birds at other times are considered "greedy." An Afono informant told us that Vatia villagers use guns today while only the Afono people know how to use the fua'o stick. Informants described large communal hunting expeditions to the Pola, the last one having taken place around 1968. As many as ten boats would set out for the Pola around three in the morning, and would wait offshore. When the birds began to leave their nests at dawn, the men would cry like the fua'o, luring them down where they would be hit with the sticks or caught with the snares. As each bird was pulled into the boat, a man would kill it by biting its head. Typically such an expedition would catch hundreds of fua'o. The birds were then cooked and distributed to the village.

Tutuila villagers are generally aware of the prohibitions against using chlorine bleach, dynamite, or fish poisons such as futu or 'ava niu kini. Although local people previously took coral rocks and sand from the beaches for their building needs, today there is widespread recognition that such practices cause erosion. There is still some taking of sand, but coastal residents and village matai now discourage or forbid these activities. Volcanic cinder is now readily available for purchase, and is said to be better for mixing cement than beach sand.

The crown-of-thorns starfish (lalomea) caused widespread destruction of reefs throughout Samoa in the 1970s. Several informants recalled damage to local reefs during that period, but reported that the lalomea is no longer a problem. We were told a proverb that refers to the characteristics of this pest: "E fofo e le lalomea le lalomea." 'The lalomea heals itself.' If you step on this starfish, you will get poison and thorns in your foot. But if you then turn the lalomea over and press it against the wound, it will suck out all of the poison and the thorns. Matai quote this proverb to make the point that if people make trouble, they must resolve it themselves.

Ta'u Unit.

The Park area is an excellent fishing and reef foraging ground, and is regularly used by local residents. Informants explained that they tend to alternate between the Saua coastline (within the Park) and the other side of the village (toward Faleasao), depending on weather and sea conditions. Saua tends to be calm from October to March, and was described as "the best" place to fish and gather because the reef there is large; when the Saua side is rough, residents utilize the other fishing ground. Fishing methods include the full range documented for contemporary Samoa and for other villages participating in the Park: pole fishing, diving with a speargun or slingshot spear, walking the reef with a stick or a three-pointed spear (tao), and throwing nets (slide 10). Locally caught fish are an important low-fat protein source for many Fitiuta residents; there appears to be an abundance of fish available for the taking, and some people sell fish to neighbors and/or to the market in Pago Pago. The predominant fish species are detailed in the freelist data, discussed below. The favorite fish for eating are the gatala, 'anae, and malau. As elsewhere in Samoa, the annual palolo run is an eagerly anticipated event.

For the most part, spear diving, pole fishing, and throwing nets are methods employed by men. Women walk the reef, probing the holes for fe'e and gathering shellfish, sea cucumbers, and sea urchins (slide 11). The alili shellfish is particularly prized, and is best gathered at night. Men, women, and children collect this species. We were told that it is possible to gather three to four buckets of alili at a time. Matapisu is also a favorite food, and is scraped off the rocks with a knife. Usually eaten raw, the alili and matapisu are preserved in bottles of salt water and kept in the refrigerator (slide 12). Some men also forage for shellfish, especially for the alili. One informant said that he sells a bottle of alili for ten dollars, a larger bottle for twenty, and a quart bottle for forty dollars.

The Park area is a significant source of diversity in the diet for Fitiuta villagers; informants recognize local marine resources as a freely available alternative to store-bought foods. A meal of 'ama'ama crabs can, for example, be quickly gathered at night with a flashlight. Coconut crabs are also abundant in the Park area, and are hunted at night, when there is no moon (slide 13).

Purportedly, some have used chlorine bleach as a fish poison in the past, but virtually all of our informants condemned this practice. Used indiscriminately, the bleach destroys the tissue of the fish and gives it a foul taste. If the use of bleach is evident, stores in Pago Pago will refuse to buy the catch. Here as elsewhere, Tongans from outside tend to be blamed for employing such destructive practices.

Fitiuta residents take coral from the beach for use around their houses, and sand is used to mix cement. We received no reports of dynamiting the reef or the taking of live coral. Informants were generally aware of practices that harm the reef.

Ofu Unit.

The reef at To'aga (slide 14) is very heavily used for marine gathering and fishing, largely by people from Ofu. Although an older informant claimed that Olosega people do not have the right to fish on the reef, others said that anyone is allowed to fish anywhere, without asking permission. Ofu villagers see a working automobile as a necessity for fishing at To'aga, given the distance from the village. But if the family car is inoperative people catch rides with friends. During our stay on the island we often saw men and women on the reef during the day (slide 15); at night we witnessed groups of young men returning to Ofu with fish in the back of their pick-up trucks. Edible marine species are extraordinarily varied and abundant in the Ofu Unit of the National Park. Several informants mentioned sending or taking fish from Ofu to relatives in Pago Pago, and it is common to see large coolers containing fish loaded on the planes bound for Tutuila. The Tutuila relatives send back pisupo, chicken, and other store-bought goods in return. Marine resources from Ofu are thus an important component in Samoan in-kind reciprocities with family and friends.

Many people fish and gather often enough so that they always have fresh seafood in the diet. Some residents preserve their surplus in deep freezers for family use. Others sell their catch to other Ofu villagers, or to middlemen who take the fish to Pago Pago to sell. However, in the past the village council has prohibited commercial fishing; the prevailing ethic is that the local marine foods should be shared and given rather than sold. The importance of marine resources from the Park as a source of

food for local residents should not be underestimated, particularly in light of the scarcity of jobs in Manu'a and the structure of the age pyramid. Permanent residents of Ofu and Olosega tend to be either very old or very young. Many Ofu families depend materially on indigenous subsistence activities, certainly more so than is the norm on Tutuila. One informant stated: "A lot of people hardly ever go buy food from the store. They get their food from the ocean."

As Ofu informants described, the gender of division of labor in fishing and marine gathering conforms to a long-established Samoan, and more broadly, Polynesian, pattern. Women (and fa'afafine) gather figota 'shellfish'; men do not. Men fish by snorkeling, diving with a spear, or angling with a rod; women take fish that dig under the sand. Men use nets while women do not. Men hunted turtles; women did not. Both men and women use the 'enu fish basket (slide 16) to catch small school fish, notably the i'a sina (goatfish). The use of the large 'enu fish traps distinguishes Manu'a from Tutuila, where these baskets are rarely used at present. To'aga is an ideal site for using 'enu because it has a sandy bottom. We were told that there are people in Ofu, Olosega, and Ta'u who still know how to make 'enu from sennit and 'ie'ie, a woody vine. Each family has its own 'enu. To trap fish, the basket is buried in the sand, baited with crushed hermit crabs, and left for an hour or two.

Men fish on the reef with rods, upega (nets), and with spears while diving. Young men do most of the diving; older men and matai tend to fish with poles while walking on the reef. Malau was frequently mentioned as a favorite eating fish, as was laea. There are different names for the different sizes of ulua, and malauli (a mid-sized ulua) is particularly prized. Most of the frequently mentioned fish and shellfish are available at all times of year, but some marine species are seasonal, notably the palolo, lo, i'a sina, pala i'a (the small pone), sesema, and atule. Some informants observe the practice of giving the best fish of the catch to the pastor, and several reported that they usually offer a prayer before going fishing.

Parties of women and fa'afafine go out to To'aga virtually on a daily basis to collect shellfish (figota), as well as octopus, seaweed, and small types of fish (slide 17). The category figota is not equivalent to the English word 'shellfish'; it does not, for example, include crabs and lobsters. One woman defined figota as "anything you put in a jar," including sea slugs, alili, and faisua. The technology of women's reef gathering consists of a stick or spear (tao), which is poked into the sand and under rocks. Bags and bottles are brought along to hold the catch. The ofaofa and vana sea urchins are stored in jars and refrigerated for later consumption. Many younger women take along cooked bananas and eat some of their

catch raw, while out on the reef, but others--older women particularly--believe that it is bad luck to eat while fishing.

When atule (mackeral), i'a sina, or other school fish are running, it is forbidden for individuals to go out and net the fish with upega. The village undertakes a communal surround using a lau made of coconut leaves. The lau may bring in up to 11,000 fish, which are brought to the malae and counted by the 'aumaga and the matai, and then distributed to all. The atule are expected to come once a year, around June, but in recent years their appearance has become less predictable. They last appeared in Ofu in 1991 or '92, and we were told that the last lau at To'aga was held in the 1950s. Lau surrounds are still held elsewhere on Ofu, outside the Park boundary.

The palolo swarm in the National Park area in October or November. The whole village goes out at one or two in the morning. Men, women, and children carry flashlights and stay out for hours, until the palolo stop rising. The worms are scooped out of the water and into buckets (paelo) with home-made strainers, fashioned from a stick of fau bent into a circle and covered with screening or mosquito netting. Alternately, people simply hold both ends of a window screen. The process of scooping is called ka. The palolo are well strained as they are collected because the more water, the more diluted they are, and the poorer the quality. The Ofu people fill plastic bags, tie them, and freeze the palolo for home use. They also fill coolers with palolo and send them to Pago Pago to be sold; during the season vendors stand along the roadside on Tutuila, offering a handful in foil for ten dollars. There is also, however, an ethic that the palolo is "a gift from God" and should not be sold. Some families receive five or ten dollars from their Tutuila connections for the palolo, but this recompense is considered a gift rather than a payment. The quantity of palolo varies from year to year, and during some years, the palolo are less plentiful at To'aga and more abundant in other locations, such as near the airport.

Sea turtles are also common inside the Park boundary, and they lay their eggs in the sand. Residents are aware that taking the turtles is illegal, but people do sometimes eat the eggs, either raw or roasted in the sand. Fishermen have seen lalomea, but they do not believe that they are a problem at present.

Informants asserted that no one has used chlorine bleach to catch fish at To'aga. In the past 'ava niu kini was used as a poison but the chiefs have now forbidden it because it kills the young fish. Residents are aware that there is a sa on taking fish that are too small (less than a hand's length). We received conflicting reports on the use of dynamite. Residents know that this practice is forbidden and that it destroys the reef, and

most deny that it goes on any longer. However, we were also told that people dynamite the reef at To'aga once or twice a year when the atule or mullet are running. There was a sand mining operation at the Olosega end of the Ofu road, and the area is remote enough from the villages to enable such activities to go largely unseen. The dynamite can be obtained from construction workers and thrown into the sea, killing large quantities of fish. A matai reported that two men were caught dynamiting at To'aga earlier in the year and were given a warning in court, but not fined; according to this informant, the fine is in any case only $25.

We were told that villagers continue to take sand from within the Park at To'aga to put around their houses and to mix cement. 'Ili'ili (smooth coral pebbles) are also taken from the beach and mixed with cement. While visiting the reef, we met a woman who showed us a large spider shell which she intended to sell. This is the sort of activity that, in our opinion, merits some attention by Park officials. In other parts of Samoa such shells are commonly marketed to tourists. Obviously, if local residents began gathering such shells in quantity, in anticipation of tourist demand and/or to sell in Pago Pago, the species would be depleted.

Visitors to the Ofu Unit should be forewarned that the reef has dangerous currents and channels (aua), and that the entire To'aga area has legendary and spiritual significance for Samoans and should be respected accordingly. Many mysterious happenings have been recorded there, involving papalagi as well as Samoans, and local residents feel strongly that decorum must be observed when visiting the area. Although men do go fishing at To'aga at night, they do not do so alone. Whether day or night, no one should make loud noises or behave in an arrogant, mocking manner while at To'aga. As elsewhere in Samoa, women should not dress scantily even while bathing; a lavalava tied around the waist while swimming would be a sufficient and culturally appropriate cover-up. We were also cautioned that women should not wear their hair long at To'aga, again out of deference to legendary mysteries.

Summary.

The National Park of American Samoa includes very rich fishing and marine gathering grounds. Food species abound, and the Park is heavily utilized by Samoans for fishing and marine foraging. The methods, division of labor, and preferred species do not significantly differ from one island to another. The gender division of labor follows the customary Polynesian pattern; men dive and perform deep-sea fishing, while women do most of the inshore gathering of reef species. The use of the 'enu fish trap is a distinctive indigenous technique now largely

restricted to the island of Ofu. Though rubber slings and modern casting rods are used today, these methods are adaptations of older technologies and do not significantly change the scale of marine exploitation. We uncovered no evidence that Samoans are overusing or depleting local marine resources. On Tutuila, fishing and marine gathering are primarily recreational activities, but on Ta'u and Ofu, residents rely heavily on local marine resources for their daily food. Ta'u and Ofu residents also commonly send coolers of locally caught fish to their relatives in Tutuila as part of a cycle of in-kind reciprocities. Although some surplus fish and shellfish from the Park are sold by individuals to neighbors and/or to merchants in Pago Pago, there is no large-scale commercial exploitation of marine resources within the Park.

VII. Medicinal Plants

During our field research the use of medicinal plants emerged as an important domain of cultural knowledge and activity. Most of the following detailed material was gathered during our stay on Ofu; medicinal plants are gathered on Park land by many practitioners residing in Ofu village and herbal treatments are utilized by most of the population. Villagers who are participating in the National Park currently use plant-based medicinal preparations in the treatment of a variety of illnesses. Samoan medicine is dynamic, and current treatments include not only those handed down from previous generations, but also treatments developed to meet contemporary health needs. We begin by discussing the Ofu Unit, and conclude with briefer accounts for Ta'u and Tutuila.

Ofu Unit.

The narrow strip of land that comprises the shore portion of this unit of the Park is extremely important as a source of medicinal plants for the villages of Ofu and Olosega. Plants preparations are used both by the general population to treat common minor ailments, and by specialists. Health specialists include fofo (massage healers), fofogau (bone setters), fa`atosaga (midwives), taulasea (herbalists), and taula`aitu (spirit healers) (Cox 1991: 160). All of these use at least some plant preparations. These specialists have a few conditions which they have the power to cure. The effectiveness of a treatment is not considered to lie in the medicinal preparation or in the treatment procedure alone. For a treatment to be effective, it must be performed by someone who is capable of healing because the power to do so has been passed down to them, usually from someone in their family. Particular families have the fofo for particular conditions. One woman described a treatment that she had watched her grandmother use a number of times. After her grandmother had died, a man came to her and requested that she treat him, since he knew that the fofo was in her family. She performed the treatment as she had seen her grandmother do, and it worked. In contrast, another healer, who treats infants and pregnant women, described learning her medicinal preparations not from a relative, but from a man who visited from another island. A healer will only perform his or her own treatment and will not perform others, but is often is able to recognize what the particular condition is, and which healer the person needs to visit.

Samoan medicine continues to be important and is used for illnesses which are considered indigenous, or for which western medicine is not effective. The infant and childhood illnesses known as mumu, ila, and pala, some of which do not appear to have

a biomedical diagnosis (Whistler 1992: 60), are widely treated by traditional healers. Generally, mumu describes inflammations and swellings (Whistler 1992: 61), ila encompasses diarrhea, birthmarks and various rashes (McCuddin 1974: iv), and pala describes mouth infections (Whistler 1992: 61) or intestinal inflammations (McCuddin 1974: iv). Plant preparations are also frequently used to treat women after childbirth (failelegau), and to treat irregular menstruation. One description of the use of futu (*Barringtonia asiatica*) appeared to describe it being used as an abortifacient. Ma`i `aitu, illnesses thought to be caused by spirits, are also widely treated by specialists employing plant based preparations. A number of preparations are also used to treat chronic conditions such as backaches, diabetes (ma'i suka), and high blood pressure (toto maualuga). Table 3 summarizes the detailed data we collected on medicinal plants, their preparation, and uses.

In addition to specialized treatments, there are a range of medicinal preparations that do not require special curing power, and that people use for themselves, or their children. Many people report using the commonly known preparations, such as ma`anunu (*Tarenna sambucina*) for headaches, or fue fue sina (*Vigna marina*) for cuts, but visit a specialist for other preparations.

Healers use a variety of plants parts-- leaves, roots, rhizomes, stems, inner and outer bark scrapings, young shoots, and fruit. Leaves such as nonu (*Morinda citrifolia*) and ti (*Cordyline* sp.) are often used whole, massaged onto the body. Preparation methods often include chopping or grinding plant materials, then mixing with water and squeezing through clean fabric to extract the juice. Infusions are most often made with fresh water, but some are made with sea water. Water is usually used room temperature, but some preparations are made with boiling water. Plant preparations are often administered as combinations of several plants, or with several procedures being performed during a single treatment. Preparations are taken internally, applied topically, or dripped into the eyes or ears. In addition, plants material might be burned, with the smoke or ash being directed toward the wound. One treatment for eye injuries involved burning coconut husks, then flicking the ashes towards, but without touching the patient. Similarly, a treatment for mumu on a child's buttocks included lighting a hollow `ulu (*Artocarpus altilis*) branch, then blowing through it and directing the smoke towards the mumu. Whistler describes this treatment as being used for what is apparently anal thrush (Whistler 1992: 126). The taulasea who described this smoke treatment to us, uses it in conjunction with juices extracted from the root of ti vao (wild *Cordyline* sp.), and the inner skin of mamae (*Musa* sp.) (slide 18).

Vai tua ula (slide 19) is prepared from ma`anunu (*Tarenna sambucina*). It was the only preparation that was mentioned as being dried and kept until needed. All other preparations described employ fresh plant materials. This makes knowledge of the location of medicinal plants, and access to them important. Plants that are regularly used as medicine are often planted in the village, but people continue to go to the bush (and into Park areas specifically) to collect plants to be transplanted closer to the village, or when particularly health plant parts are needed.

The specialties appear to follow the typical gender division described by Whistler (1992: 60). Except for fofogau and some taula`aitu, healers are mostly women, and female healers appear to employ a more extensive pharmacopeia. However, of the two very knowledgeable healers who discussed passing their knowledge on, one is teaching her son, and the other has taught both her daughters and her sons.

The patient will often give a healer a gift in appreciation for the treatment. Gifts of food were mentioned most often. Most expressly stated that payment for treatment is not made. One healer stated that a patient might offer twenty-five or thirty dollars, but that she would not accept money. Healing power is often characterized as a gift from God that would be lost if the healer sold it rather that shared with the village. One person explained it in the following way: the patient might offer a gift of money in an amount proportional to the seriousness of the illness. The healer refuses it, demonstrating that the treatment is not being sold, but that the he or she only wishes to help. The patient insists on giving the gift, and the transfer of the gift is analogous to a transfer of the ma`i. By giving the healer money, the patient is 'giving away' the illness.

In the To`aga area, the beach side of the road (i.e., the area inside the National Park boundary) was mentioned particularly as the source for the healthiest medicinal plants (slide 20). People regularly gather plants from this area to use in medicinal preparations. Medicinal plants that are regularly used are also gathered and planted in the village to provide convenient access. However, when medicinal plants growing in the village are sick, or the leaves worm eaten, they are not effective for medicinal preparations, and one goes to the To`aga area to collect "good" plants.

At least six different people in Ofu were referred to as healers with various specialties. These individuals are widely recognized as healers. In addition to their particular specialties, these individual seemed to have more knowledge than the average person about the less specialized treatments that do

not rely on special healing powers. Two of these healers are male fofogau (treating aches, sprains, and broken bones). This is done primarily through massage, with some topical use of plant preparation, though a preparation of fisoa (*Colubrina asiatica*) was mentioned as being drunk specifically for aches. Some of the aches treated by one of these individuals are attributed to spirits, and a number of plant based preparations are used to treat these. Another man is a specialists in treating ma`i `aitu. He reportedly uses a variety of plant-based preparations, and collects these at To`aga.

One woman specializes in treating headaches, and uses ti and nonu leaves. She also uses a number of plants from To`aga for diabetes, rashes, and toothaches. Another woman specializes in treating infants and children with a wide range of plant based preparations. This healer named thirty-two plants that she uses. Many of these are from To`aga. The depth of her knowledge is perhaps even more impressive when one realizes that this is probably not a complete list. In addition to the many infants she treats in Ofu and Olosega (two to four daily, by her own estimate), she also has a considerable number of patients on Tutuila, where she spends much of her time. She brings medicinal plants with her when she goes to Tutuila, and sometimes has them send to her from Ofu.

Ta'u Unit.

Faleasao land was described as too remote for the collection of medicinal plants. In Fitiuta, medicinal plants are gathered from a variety of areas, including from the Saua area and other areas inside the Park boundaries. There were many references to the use of the widely known medicinal plants, such as ma`anunu, and fue fue sina. Specialized preparations were described to treat children, to treat women during pregnancy and after childbirth, and to treat ma`i aitu.

Tutuila Unit.

On Tutuila much more than in Manu`a, plant preparations were described in terms of Western medicine--headache preparations were described as "like Tylenol" and treatments for cuts were described as "antiseptics." There appears to be considerably less reliance on plant preparation on Tutuila as compared to Manu`a. People interviewed knew the common preparations (such as ma`anunu) but had generally not used them recently. It is possible that this impression is biased by having spoken to relatively few women in the Tutuila villages. Several men described plants medicines as a speciality of some women in their villages, but they could not name specific healers. It was their perception that plant medicines were used primarily for babies. One woman who actively treats infants in a Tutuila village made a

point of saying that she always advises mother to bring the babies she treats to the hospital. This contrasted to the situation on Ofu, where several people said that babies are bought to the dispensary only when they have a condition that the healer does not treat, and that the dispensary nurse sends infants to the traditional healer.

One person described a preparation that she was currently using. The preparation is made from a plant which this individual called pua same. This was described as a new medicine. Approximately five years before, a man who had prayed for his ill daughter dreamt of using this plant as a medicine. It is good for chronic back pain, diabetes, kidney infections, bowel problems, and high blood pressure. No botanical identification was found for this plant, and its use was not reported elsewhere.

One woman knows medicinal preparations that were passed down in her family for four generations. She used to use these medicines to treat family and neighbors, but stopped after she received some medical training about fifteen years ago. She believes that the traditional preparations are effective, but is now concerned about the non-sterile traditional preparations, and the possibility of bacterial contamination.

Summary.

Medicinal plant knowledge is a Samoan cultural resource of major significance. This expertise is particularly concentrated on the island of Ofu, where local residents commonly seek treatment from herbal specialists. Medicinal plants are also taken from Park land by Fitiuta villagers on Ta'u. Herbal medicines are much less in evidence on Tutuila. On Ofu, the continuing practice and transmission of this specialized knowledge depends, at least in part, on minimal disturbance to the sandy strand lying between the road and the beach. The area where medicinal plants are gathered lies partly within the National Park. Park Service policy on use and development of this land should take into account the continuing cultural importance of the medicinal plants found there.

Table 3. Medicinal Use of Plants

plant	part used	preparation	application	use
aoa	roots	infusion made with boiling water	drunk	stomachache
asi Toga		mix with chalk	drunk	T.B. (mamapala)
ateate	bark	(used with pu`a bark)		diarrhea
ateate	leaves	chopped, pounded, and squeezed for juice	drunk	itching, swelling, stomach pain, and bladder ailments; diabetes, high blood pressure
`ava	young leaves	chopped, pounded, and squeezed for juice	drunk; rubbed on body	body aches
`ava`ava aitu (tu)	leaves; small branches	infusion made with boiling water	drunk	headache, pain, often used for failelegau
`ava`ava aitu (sosolo); fue magoni	leaves	chopped, pounded and squeezed for juice	drunk	ma`iaitu and saua[1]
`ava pui	root	ground and mixed with water	drunk	stomachache; cough
esi	fruit		eaten	stomachache
fala	root	inner skin is scraped and an infusion is made with boiling water	drunk	flu, fever

[1] A ma`iaitu in children.

fala`aina	fruit	juice of the fruit is mixed with mati root	drunk	skin infections
fatifati	leaves	chopped, pounded, and squeezed for juice	drunk	saua and ma`iaitu in older people
fau				eye ailments
fetau	leaves	soaked in ocean water, and squeezed for juice	topical	sores on children
fisoa	leaves	chopped, pounded and squeezed for juice	topical; drunk	backache, sprains and bone pain; ma`i gau
fuefue saina	leaves	squeezed for juice	topical	cuts
fuefue sina	leaves	chopped, pounded, and squeezed for juice	drunk; squeezed on wounds	mumu, saua; many other aliments
fue from around the `ulu tree (no other name known.)	leaves			ila, fever, chills
fue magoni	leaves	chopped, pounded and squeezed for juice	drunk	ma`iaitu and saua
fue sosolo	leaves	chopped, pounded and squeezed for juice	drunk	ma`iaitu and saua
futu	leaves	chopped, and infused in boiling water	drunk	failelegau, regulate menstruation
gatae				nifo
ifi	inner	bark	drunk	stomach

	bark	scrapings mixed with water		illnesses, diarrhea
la`au pa`epa`e	leaves			mumu, saua, boils, stomachache, fever, hemorrhoids, red eyes
lau tasi (lau auta)	leaves	chopped, pounded and squeezed for juice	drunk	ila; ma`iaitu and saua
ma`anunu (used to make the preparation known as vai tua ula)	bark	bark scrapings are dried in the sun, then mixed with fresh water as needed	drunk	headache; body aches
magamaga	leaves	chopped, pounded and squeezed for juice	drunk	fever, stomachache
mago	leaves	chopped and infused in boiling water	drunk	toothache
mago	inner bark	infusion made with bark scrapings and boiling water	drunk	sore throat
malili				skin discoloration in children
mamae	inner skin	squeezed for juice, which is mixed with ti roots juice	drunk; rubbed on body. used in conjunction with ti root and `ulu smoke	ila, mumu
matalafi	leaves	chopped, pounded, and squeezed for	drunk; topical; dripped into	diabetes, high blood pressure;

		juice	eyes and ears	headaches; mumu; ma`iaitu and saua
mati	root	juice is extracted	drunk with pineapple juice	skin infections
milo	bark	infusion made with bark scrapings and boiling water	drunk	pala; upset stomach
moegalo			used with ripe coconut	laguia[2]
moli	inner bark	infusion made with bark scrapings and boiling water	drunk	flu, fever; child's cough and sore throat
moso`oi	bark	scrapings are chopped, pounded and squeezed for juice	drunk	lower abdominal pain, to regulate menstruation
namulega	leaves	chopped, pounded and squeezed for juice	drunk	flu
niu	husk	chopped, pounded and squeezed for juice	drunk	child's cough and sore throat
niu	husk	burned for ash	ashes flicked toward the patient	eye injuries
nonu	leaves	chopped, pounded and squeezed for juice	drunk	ma`iaitu
nonu	leaves	moistened	massaged on head and forehead	headache; fever

[2] no further description of this illness; no information found in the literature.

nonu	leaves	heated	topical	abscess
nonu	fruit	left in a jar to ferment (one to several weeks)	drunk	diabetes, high blood pressure
`o`a	inner bark	scrapings mixed with water	drunk	stomach illnesses, diarrhea; as an expectorant for treatment of pala
pu`a	bark	(used with ateate)		diarrhea
puasame	branches (stripped of leaves)	infusion made with boiling water	drunk	back pain; diabetes, high blood pressure, stomachache, kidney infections
pulu	leaves	chopped, pounded and squeezed for juice	drunk; topical	nifo and tui[3]
suni	leaves	chopped, pounded and squeezed for juice	drunk	child's upset stomach
tagitagi	leaves			swollen legs and feet
talafalu	bark	bark scrapings are mixed with water and squeezed to extract juice	drunk used with ma`anunu and to`ito`i	backache
talie	bark	infusion made with bark	drunk	pala

[3] The nifo referred to here is the ma`iaitu. Tui was described as a very strong ma`iaitu.

		scrapings and boiling water;		
talie	inner bark	healer chews the bark scraping	the juice is spat into the child's mouth	phlegmatic sore throat
talie				eye ailments
ti	leaves	moistened	massaged on head and forehead	headache
ti	young leaves	chewed by healer to extract the juice	drunk	tui
ti vao	roots	juice is extracted	used with lau mamae and `ulu smoke	ila and seizure
togo and taliga	leaves	chopped, pounded, and squeezed for juice	drunk; topical	mumu; fever, chills; ma`iaitu; sores and bites
to`ito`i				rash caused by `utu[4]
to`ito`i	bark	bark scrapings are mixed with water and squeezed to extract juice	drunk used with ma`anunu and talafalu	backache
`ulu	small hollow branch	branch is dried and used like a straw. One end is lit, and blowing through it, the smoke ->	is blown toward the child's mumu. This is used in conjunction with ti root and mamae.	mumu, ila
`ulu	roots			intestinal

[4] According to Milner, `utu refers to lice, or a kind of fungal infection.

				ailment in children
vi	bark	infusion made with boiling water	drunk	child's sore throat
vi vao	leaves	crushed for juice	topical	cuts

VIII. Analysis of Freelist Data

Using surveys and structured interviews, the research team elicited items in four major categories for the three Park Units: cultivated crops and semi-cultivated plants; medicinal plants; fish and marine species; and fauna (animals and birds). This section presents computer-based analyses of the twelve "freelist" data sets, as well as an analysis of the combined data for the Park as a whole. The approach underlying this methodology is called "consensus theory." It presumes that agreement or "consensus" on a particular area of expertise indicates shared cultural knowledge. The responses show differences in resource use between the Park Units, but also commonalities in Samoan cultural practices within the Park. Although the number of respondents in each set is relatively small (from nine to twenty), the results show striking agreement or 'consensus' on the most important species found within the Park. Significantly, although the freelists show some differences between the three Park Units, overall there is marked agreement about key Samoan productive resources; the consensus, in other words, points to Samoan cultural knowledge that spans the different islands.

For the villages of Vatia, Ofu, and Olosega, the data sets combine responses from written surveys and structured interviews. No surveys were distributed on Ta'u. Surveys were distributed to Pago Pago, Afono, and Fagasa, but they were not returned to us. For those villages the freelists reflect interview data. Because of the difficulties described above, we collected no freelist data at all from Faleasao. The Ta'u data were obtained through interviews with Fitiuta villagers. In the very few cases where an informant completed a survey and was also interviewed, we chose the list that was more detailed. When seeking information on a topic, we used a networking and referral approach to target individuals known to have expertise in that domain of activity. In other words, we did not ask all informants to complete the same set of forms nor did we ask every informant the same set of questions; someone who was given a survey on fishing might not be given one on agriculture, unless they took an active part in both. With specialists in medicinal plants, most of them women, we focused our interviews on that domain of knowledge.

Before entering the data into the computer, names of species had to be standardized, cross-checked against lists of known Samoan species, and their scientific names ascertained. Synonyms, alternate spellings, and pronunciation differences had to be resolved, and we hasten to add that Samoan readers may yet find some equivalencies or misspellings in the following lists that we have missed. On the other hand, in some instances we did not combine similar-sounding items in order to preserve possible local distinctions, such as '<u>moli</u>', '<u>moli ai suka</u>', and '<u>moli</u>

aina,' in the list of crops and plants. Because of the limited time available for fieldwork in each village, we were seldom able to do follow-up interviews which would have enabled us to determine whether such items should be equated. In the following tables the vast majority of items are recorded in their Samoan names, but we used the word most frequently given by our informants. For example, we used the word 'banana' rather than 'fa'i' because most informants used the English word, as they did for 'coconut.'

Respondents are identified only by code numbers in the tables and figures that follow. Normally when collecting freelist data, the researcher tries to ensure that answers come from a single individual, without help from others. We endeavored to do this during interviews within the bounds of politeness, but it was not always possible. We also had no way to guarantee that individuals filled in the surveys unassisted, unless the survey was completed in the presence of the interviewers. Even during interviews, family members and friends would sometimes call out answers, or the respondent would ask another household member for assistance. Where we knew that others had assisted the respondent, codes were added to that individual's I.D. number to indicate the fact. However, our interviewing experiences lead us to believe that most respondents had no or minimal assistance. In a few cases, surveys listed marine species or birds in the precise order and spelling found on common Fish and Wildlife Department posters. Such posters hang in many Samoan homes that we visited, and where we found a near-perfect correspondence we excluded that survey from the analysis.

Crops and Cultivated Plants.

1. Tutuila Unit. Freelists were elicited from fourteen respondents, twelve men and two women. Six individuals were from Vatia, four from Pago Pago, and four from Fagasa. Table 4 lists the food crops and useful plants reported growing within this Park Unit. This tabulation is the output of the ANTHROPAC computer program, which was used to analyze the freelist data. In the first segment of the table the items are listed in order of descending frequency, according to the number of respondents in the sample who named that plant. One of the goals of this study was to identify the most important plants and species found within the National Park. The freelist results give several indicators of 'importance.' "Resp Pct" is the percentage of respondents who mentioned that plant. But the order in which items are named is also an index of 'importance.' When asked to list things, people typically name the most common and/or significant items first. "Avg Rank" is the item's average rank order in the lists; if this figure is relatively low, then people tended to name that item early on. However, if an item is named

by only one individual but is listed first, its average rank will be misleadingly high (as in the case of mago on this list). A somewhat better indicator is "Salience," which is an index of how often an item is listed first by respondents. As the table shows, banana was named by every single respondent from the Tutuila Unit. It also has the lowest average rank, and the highest salience of any crop. Individually and in combination, these measures indicate that Tutuila respondents consider banana a very important crop within the Park.

Coconut was the second most frequently reported cultigen in the Tutuila Unit, mentioned by 79 percent of the informants. Coconut also has the second-highest salience figure and a relatively low average rank. The major food crops growing in this Unit thus appear to be banana, coconut, 'ulu, and taro, followed by ta'amu. Typically a freelist contains a large number of items named by only one respondent, as in puasami etc. on this list. Some of these items may be idiosyncratic, or errors, or may not belong to the cultural domain that is being investigated. Nonu, for example, appears on this list, but is far more frequent in the list of medicinal plants. Moso'oi is a fragrant flower used for garlands, and kapisi 'cabbage' is an introduced vegetable. Others, however, may simply be less common in the area and/or of lesser importance. Interestingly, Samoans rarely named introduced vegetables in the initial freelist, though they often reported them when answering the follow-up questions. This suggests that our informants perceived 'crops' to mean the cultivated plants that Polynesians have relied on for centuries. Western introduced vegetables are either not perceived to be part of the same category, or are not believed to be as important as the Polynesian plants.

Table 5, "Correlation of each respondent with group," displays an indicator of how much people know, and to what extent the knowledge is shared by the respondents. Each person's answers are correlated with the group's frequency list, as a way of measuring whether someone's answers are typical or aberrant: does the respondent mention the popular items and omit the unpopular ones? This index is useful for identifying 'outliers,' individuals whose answers differ significantly from the group norm. It is then up to the analyst to determine why they are outliers. They may not be from the area, may not have any knowledge of this particular subject, or may be unusual in some other respect; they may also have misunderstood the question, or their answers might have been recorded incorrectly. Overall, the list of correlation coefficients indicates how much agreement or consensus there is within the group about this set of items. For our purposes, this is the most significant aspect of the respondents' correlation figures. According to the underlying theory, a high degree of agreement on a topic points to valid, shared cultural knowledge.

In the present case, there is only one markedly low score: informant 1VM40 with a correlation of 0.06. The figures for the other respondents are relatively high and quite comparable to one another, suggesting that we can be reasonably confident about the cultural validity of the results. These correlations are intended only as a rough measure, and should not be compared too precisely. Very low or negative correlations demand our attention and the overall variability in the numbers is significant, but an informant with a coefficient of 0.55 does not necessarily "know less" than someone with 0.77.

The freelist data can also be run through a 'cluster analysis.' The computer program groups respondents whose answers are similar to one another and then displays the groupings in a cluster diagram; those with the highest correlation are plotted first. Not only are respondents clustered together on the basis of similar answers, but the clusters are also diagrammed as closer or further apart depending on correspondences in the answers. Cluster analysis is particularly useful for testing hypotheses about social divisions and variations in the distribution of knowledge. For example, if there is a gender differentiation in knowledge, men's and women's answers would be expected to form two clusters with a gap between them. In the present case, we expected to find a gender patterning in cultural knowledge, as well as smaller clusterings by Park Unit and by village. As will be shown, in general the data did not support these hypotheses.

Figure 1 shows the output of a cluster analysis of the Tutuila freelist data on crops and cultivated plants. The column headings are respondents' identification codes. The second letter, 'P,' 'F,' or 'V,' is a village code, and the third letter, 'M' or 'F,' indicates gender. The two respondents with the most similar answers were men from Fagasa and Pago Pago (as shown in the adjacent columns numbered 9 and 5). As the diagram shows, the Tutuila answers do not cluster by village. Since most of our Tutuila informants were male it would be unwarranted to make inferences about gender patterning. However, it is worth noting that the two female respondents (columns numbered 4 and 10) are more closely associated with male informants than with each other. Although we can tentatively say that our hypotheses about the clusters were not borne out in this example, without further research we cannot explain the clusters that do occur. A group of informants will always show variations in cultural knowledge and perceptions. One would have to investigate further the backgrounds, biographies, social standing, and other characteristics of the respondents in order to formulate other hypotheses.

2. Ta'u Unit. Of all the villages participating in the Park, Fitiuta appears to have the most extensive use of Park

lands for plantations. Table N lists the crops and cultivated plants reported by eleven Fitiuta residents, seven men (one of whom was helped by his wife during the interview) and four women. The respondents listed 20 different items growing in the Park, 13 of which were mentioned by at least two informants. Banana and ta'amu were listed by every informant, and banana has the highest salience score. Taro, ufi, and coconut were listed by all but two respondents, and taro has the second highest salience score. In other words, those who mentioned taro tended to list it first; taro also has the lowest average rank value, corroborating the fact that informants tended to name it early in their lists. Ta'amu has the third highest scores for both salience and average rank. As in many other areas of Samoa since the taro blight struck, subsistence cultivators have been encouraged to plant bananas and ta'amu as substitutes for taro.

'Ulu is the sixth most frequently listed crop grown on Park lands. This ranking seems to understate the importance of breadfruit as a food in Samoa, particularly when compared with an item such as ufi. However, it should be remembered that this study focuses on resource use specifically within National Park areas. Samoans often prefer to plant breadfruit trees near their homes; 'ulu is less likely to be grown in bush plantations such as those found on Park lands near Fitiuta.

Table 7 lists correlations for each respondent vis-a-vis the group. These figures suggest a very high level of agreement about this domain among Fitiuta informants; the lowest index is 0.47, with a range from 0.60 to 0.86. The impression of consensus is strengthened by Figure 2, which shows a cluster diagram generated from the Fitiuta freelist data. Although two clusters are evident, the overall shape of the graph resembles a normal curve rather than, for example, a bimodal distribution. This suggests that individuals vary in their knowledge of the subject, some knowing more than others, but there are no major opposing segments of opinion. As in the Tutuila data, women appear in both clusters, but there is some tendency for women's responses to cluster together; the adjacent columns 5, 7, and 9 represent the answers of three women in their 40s and 50s.

3. Ofu Unit. Freelists were obtained from 15 residents of Ofu and Olosega (8 from Ofu, 6 from Olosega, 1 uncertain). The nine men and six women named 39 different crops and cultivated items, with 21 items listed by at least two informants (Table 8). The Ofu and Olosega list of cultigens is therefore the most varied of the three Units. The cultivated areas in the Ofu Unit are located on a narrow sandy strand lying between the road and the beach. The vegetation and soil conditions thus differ from the Fitiuta plantations and even from plantation areas lying further inland on Ofu. All but one respondent mentioned coconut trees growing on Park lands, and coconut also had the highest

index of salience and the highest average rank. Banana and ufi were the second most frequently listed items, followed by 'ulu and ta'amu. But banana, 'ulu, and ta'amu had higher figures for salience than ufi. Although ufi was mentioned by 73 percent of the informants, it was seldom named first.

Table 9 shows respondents' correlations with the group. Although there is more variation here than in the Tutuila and Ta'u samples, there are no very low or negative coefficients and thus no clear 'outliers.' There is simply more variability in the answers from Ofu and Olosega, with more informants naming items that do not appear on any other lists, such as fetila, maukeni, and different types of moli. Further research would be needed to determine whether such items reflect misperceptions, uncommon plants, or local distinctions in classification.

Figure 3 is a cluster diagram for the Ofu and Olosega freelist data. There is one major cluster of agreement with deviations successively graphed to the left, and one small cluster of three respondents, grouped on the right. Once again, the answers do not cluster by gender or by village. It is important to note that 'outliers'--those whose answers are anomalous--tend to be placed at the extreme left and right of the cluster diagram; such groupings are not as significant as the clusters in the middle of the graph. The three informants in the right-hand cluster are grouped together in part because they gave unusually sparse answers. One listed only coconut, one listed coconut and lau fala, and the third named coconut, lau fala, lau 'ie, and masoa. Although they all agreed on coconut as a major item, their lists were extremely short and thus were aberrant when compared with those of other informants. As this example illustrates, it is advisable to review the original list data before inferring reasons for the clusters found by the computer analysis.

4. Composite Analysis (All Units). Table 10 shows the results of an analysis of the list data from all three Park Units. The 40 respondents provided a combined list of 53 different crops and cultivated plants, with 30 items named by at least two informants. Table 11 alphabetically lists plants mentioned by at least two informants, by village within Park Unit; this tabulation is a presence/absence summary of reported crops and cultigens. Table 12 lists domestically useful woods gathered in Park areas, in a similar format. Park-wide, 90 percent of our informants listed banana, which also had the highest salience index and the lowest average rank. Coconut was named by 85 percent of the respondents, and had the second-highest salience index and the second-lowest average rank. Banana and coconut thus appear as the two most important crops currently grown on Park lands, by all three measures of 'importance.' Ta'amu and 'ulu fall in a second tier of important

cultigens, listed by 63 percent of our respondents. Ufi and taro were named somewhat less often, by 58 percent of informants. Although sixth in frequency, taro ranked third by the measures of salience and average rank; in these two measures of 'importance,' taro was the third-highest crop, behind banana and coconut. Manioka and papaya fall next in order of frequency, named by 35 and 33 percent of informants. There is, however, a significant gap between the top six crops and the latter two. To summarize, the freelist data indicate that the most important agricultural items growing in the Park today are banana, coconut, ta'amu, 'ulu, ufi, and taro.

Figure 4 is a cluster diagram based on the composite agricultural freelist. This analysis investigates whether respondents of the same gender, Park Unit, and/or village tended to list the same items. While clusters are evident--at least three significant sub-groupings at the 0.6239 level--the diagram shows a broad base of agreement, which is also suggested by the respondents' correlations (Table 13). Moreover, respondents do not consistently cluster by gender, Park Unit, or village. Some of those whose answers are very highly correlated are, for example: a Vatia man and a Pago Pago woman (columns numbered 3 and 4), two men from Vatia and Fitiuta (columns 12 and 17), a Fitiuta woman and a Vatia man (columns 13 and 21), and a man and woman from Fitiuta (columns 22 and 24). The results suggest that Samoan cultural knowledge and practices relating to agriculture are widely shared by men and women of the different islands; in other words, the analysis points to a cultural 'consensus' that transcends differences of gender and geography. The data also corroborate Lowell Holmes' characterization of agricultural knowledge:

> Everyone in Samoan society is first and foremost an agriculturalist. Even traditional specialists, like tattooers, housebuilders, canoe builders, and master fishermen spend part of their time on their agricultural lands. There are no agricultural experts, although some people are recognized as being more successful than others. (1974: 45)

Medicinal Plants.

Overall, there is much greater variability in the lists and much less consensus among informants for the domain of medicinal plants. This is to be expected. While there is widespread agreement on the most important Samoan agricultural crops among both men and women, medicinal plants are an area of special expertise. Cross-culturally, such knowledge is often esoteric rather than widely shared. Some individuals may appear as 'outliers' in formal analyses not because they know less, but because they know much more than the average informant. Through

interviews we discovered that knowledge of the different fofo or treatment methods is usually passed down in a family as a type of intellectual property. This custom accentuates the degree to which medicinal knowledge is specialized rather than shared.

1. Tutuila Unit. Freelists of medicinal plants growing on Park lands were collected from 16 informants, mostly from Vatia village. The sample was composed of ten men, five women, and one of unknown gender (a survey respondent). The cumulative list (Table 14) includes 68 items, 25 of which were named by at least two informants. The most frequently cited plant was ma'anunu, named by 50 percent of the respondents. Ma'anunu also has the highest salience index and a low average rank. In comparison with the agricultural data, however, the numbers highlight the dramatic differences between this domain and that of cultivated crops. While ma'anunu appears as the most important medicinal plant cited by Tutuila informants, followed by nonu and ti, the consensus is much weaker than the near-unanimous agreement found on the major food crops. The third tier of important medicinal plants cited by Tutuila respondents includes 'ava'ava 'aitu, fuefue sina, moli, mago (an introduced fruit tree), and matalafi.

The correlations of each respondent with the group (Table 15) are also much more mixed than for the agricultural freelists, with some very low and negative coefficients. Figure 5 shows a cluster diagram generated from the medicinal plant data. Again, clusters by gender and/or village did not materialize. The respondents whose answers are most alike (columns numbered 13 and 10, and 14 and 9) are of different gender and different villages. Individuals who had very low correlation coefficients in Table 15 appear in this diagram as lying outside the main clusters (see columns 6, 12, and 7).

2. Ta'u Unit. Lists of medicinal plants found in Park areas were elicited in Fitiuta village from four men, five women, and two couples whose answers were recorded as joint responses. The informants named 33 different items, 14 of which were mentioned at least twice. As shown in Table 16, ma'anunu was mentioned most often, with fuefue sina, matalafi, and nonu forming a second tier of important medicinal plants. Ma'anunu also has the highest salience index and the lowest average rank among the top items. In the next group are tua ula, vi, and lau magamaga, which do not appear at all on the list of plants from Tutuila. Tavai and lau taliga also appear on the Fitiuta lists but were not mentioned by anyone in Tutuila.

The respondents' correlations with the group (Table 17) show two 'outliers' with very low or negative coefficients, 2TM40141 and 2TF40146. The latter named only two items; the former named none of the top-listed plants and several that were idiosyncratic. These individuals also appear at the lefthand,

low-agreement end of the cluster diagram (Figure 6). The diagram does not indicate a marked clustering by gender in the distribution of medicinal plant knowledge. Here again, the shape of the graph suggests a domain of knowledge about which some know much and others know relatively little.

3. Ofu Unit. Medicinal plant freelists were collected from 17 respondents, ten women and seven men, most of whom (13) reside in Ofu village. Informants named 53 different plants found on Park lands, 30 of which were mentioned by at least two people. As shown in Table 18, the most frequently cited item was fuefue sina, with nonu second, and ateate and ma'anunu third. Ma'anunu has the highest figure for salience and the lowest average rank, meaning that informants tended to name it early in their lists. In salience and average rank, fuefue sina is second to ma'anunu. Lau taliga, niu, o'a, and ti also appear as important medicinal plants.

The respondents' correlations with the group (Table 19) show much greater consensus on medicinal plants among Ofu and Olosega respondents than was found in the other two Park Units. There are no markedly low figures, and the coefficients seem roughly comparable to one another. However, the cluster analysis (Figure 7) shows more pronounced clustering of responses than was apparent for the other two Units. In our Ofu and Olosega interviews, we were particularly impressed by the depth and detail of medicinal plant knowledge in this area. We met a number of respected fofo and learned of their specialties. The cluster diagram may reflect these areas of specialization, for the different practitioners tend to rely on certain plants and treatment methods as taught to them by their mentors. Furthermore, the use of certain remedies is restricted to those who possess the right through gift or inheritance. To employ a particular fofo treatment without the owner's permission is to risk illness or spiritual harm. Further research would be needed to pursue this possible explanation for the clusters shown in the diagram.

4. Composite Analysis (All Units). Table 20 shows the freelist results for the medicinal plant data from all three Park Units. The 44 respondents named 94 different items, 52 of which were mentioned at least twice. Table 21 alphabetically lists the medicinal plants named by at least two informants, by village within Park Unit. In comparison with cultivated crops, the number of different known medicinal plants is notable, as is the much greater variability in informants' individual lists. The most frequently mentioned plant, ma'anunu, was named by only 52 percent of informants. Ma'anunu also scores as 'most important' in terms of salience and average rank. The next two items in the frequency list are nonu and fuefue sina. Overall, these appear as the three most important medicinal plants found within the

Park. The second tier includes six plants named by between 20 and 30 percent of respondents: ateate, matalafi, ti, o'a, niu, and lau taliga. These are followed by literally dozens of other medicinal plants, each of which was mentioned by a small subset of informants. Given the individually specialized nature of medicinal plant knowledge, we did not run a cluster analysis on the medicinal plant freelists.

Fish and Marine Species.

1. Tutuila Unit. Lists of fish and marine species were obtained from 20 Tutuila residents--16 men, three women, and one survey respondent of unknown gender. They named 87 different items, 35 of which were mentioned by at least two informants (Table 22). We expected to find greater variability in this domain than in the lists of crops. Fish are not 'planted' and people have little control over the distribution of marine species. The relative frequency of the different species is largely a function of local environmental conditions and the nature of the available fishing grounds. The two most frequently named fish, alogo and pone, were named by 50 percent of the Tutuila resondents. Alogo has a higher salience and lower average rank than pone, i.e., informants tended to list it before pone. Malau ranks third in frequency; fe'e, though named less often, has comparable scores for salience and average rank. Gatala, malauli, and papa were listed by 35 percent of the informants. After these six species, many others were named by smaller subsets of respondents.

Table 23 lists the respondents' correlations with the group. The figures suggest that fishing knowledge is more specialized than agricultural knowledge, but less so than medicinal plant expertise. The women informants from Tutuila tend to appear as outliers vis-a-vis the largely male sample for this domain. This could mean that men tend to participate more in fishing in these areas than do women, but further research would be required to investigate this point. As an alternative to cluster analysis, the marine freelists for Tutuila were used as the basis for a multidimensional scaling plot. Multidimensional scaling (MDS) is a way of graphically representing how informants' responses compare to one another. Respondents are shown as points in two-dimensional space; the MDS program plots the points according to how similar the informants' answers are to one another. The resultant MDS plot shows the distribution of cultural knowledge about a particular domain. In this case, as shown in Figure 8, the Tutuila lists of marine resources form a so-called 'fried egg' pattern, with a core of respondents who give very similar answers, a few informants aligned in a ring further away from the normative center, and then a few outliers, such as the one at the far right of the plot. This is the typical pattern for many realms of cultural knowledge and activity. As the respondents

are plotted, the program may superimpose individuals' code numbers on one another, so the center of the 'egg' appears rather cluttered. This plot indicates that our informants (most of them men) largely share similar perceptions about marine species in the Tutuila Unit; a few give answers that are somewhat but not radically different, and a small number give anomalous answers, possibly because they do not know much about this particular domain.

2. Ta'u Unit. Lists of marine species were collected from ten Fitiuta residents, six men and four women, yielding a master list of 48 different items, 28 of which were named at least twice (Table 24). In comparison with the Tutuila Unit, there was more agreement on the most important species among the Fitiuta respondents. Fe'e and alili were named by nine out of ten people; gatala and matapisu are the next most frequently mentioned species, and malau, 'ama'ama, ume, and ula were named by at least half of the respondents. The order of species is more mixed if we consider the two other measures of 'importance'--salience and average rank. Gatala and malau have the lowest average ranks. Matapisu and fe'e have the highest salience scores among the most frequently named species.

The respondents' correlations with the group are given in Table 25. As indicated by the relatively high figures, there is a greater consensus about local marine species among our Ta'u informants than was found in the Tutuila group. In part this may reflect the fact that the data represent only one village. The cluster diagram (Figure 9) graphically makes the point that there is considerable agreement about this subject among the Fitiuta informants.

3. Ofu Unit. Lists of marine species were collected from 19 respondents in this Unit, 14 from Ofu and 5 from Olosega. The group included eleven men and eight women. The final list is the largest of the three Park Units, including 98 different species, 49 of which were mentioned by at least two informants. The 'importance' figures are given in Table 26, which shows a level of agreement that is more similar to that of Ta'u than Tutuila. In other words, the Tutuila responses are more diverse and less internally congruent than the answers from Ta'u, Ofu, and Olosega. This is to be expected given the greater availability of wage employment on Tutuila; in general Tutuila villagers appear less involved in subsistence fishing and gathering than their counterparts in Manu'a. Several Manu'a informants told us that they frequently send local fish and shellfish in coolers to their relatives on Tutuila.

Similarly, the respondents' correlations with the group (Table 27) show no extremely low or negative scores, another indicator of a high degree of consensus within the group. Figure

10 is a multidimensional scaling plot of the Ofu and Olosega freelist data, again showing a 'fried egg' pattern of responses, with most informants clustered around a core of agreement, an outer ring comprising a few informants, and one clear 'outlier' at the far left.

4. Combined Data (All Units). When the data from all three Units are combined, the master list (Table 28) contains a remarkably high number of fish and marine species--137 different items, with 79 named by at least two informants; 61 were named by at least three informants. Table 29 provides a presence/absence summary of reported species by village within Park Unit; the table lists in alphabetical order all marine species mentioned by at least two informants. Taxonomically and possibly biologically, marine life is by far the most diverse resource area investigated by our team. Overall, fe'e, gatala, and malau are the species most frequently listed as found within the Park. Pone, alogo, and alili form a second tier in terms of frequency. Other important species, mentioned by at least 25 percent of the informants, are laea, fuga, manini, ula, malauli, and faisua. The top five species also have the highest salience scores. Malau has the lowest average rank, but the top five species have similar scores on this measure. On the basis of these three indicators of 'importance,' we can say that the five most important species found within the Park are: fe'e, gatala, malau, pone, and alogo. Alili ranks sixth, and there is a significant gap in the scores between these six and the rest of the items in the list.

We ran the combined lists through a cluster analysis to see whether responses would cluster by gender or Park Unit. Figure 11 shows the results. Congruent with our other findings on this point, the diagram does not support a hypothesis of gender, village, or Park Unit clustering. Although there are some small clusters by gender and/or Unit, there is no consistent pattern. The two informants whose responses are most highly correlated (columns numbered 35 and 14 on the righthand side of the diagram) are men from Ofu and Afono. Very similar answers were given by two men from Vatia and Ofu (columns 17 and 41) and by men from Pago Pago and Ofu (columns numbered 5 and 47 on the righthand side). There is some tendency for answers from the Ta'u Unit to cluster together (in the middle of the diagram), and there is particularly a grouping of Fitiuta women (columns 27, 28, and 29). However, a man from Fagasa (column 6) also appears in this cluster of similar answers. We expected that perceptions of marine species would tend to show more local specialization, but the analysis does not bear out this hypothesis.

Animals and Birds.

Table 30 lists the faunal species mentioned by at least two

informants, by village within Park Unit. This table constitutes a presence/absence list of animals and birds reportedly found within the National Park.

1. Tutuila Unit. Lists of animals and birds found within the Park were collected from 15 respondents; seven were from Vatia and two each from Afono, Fagasa, and Pago Pago. The sample includes twelve men, two women, and one survey respondent of unknown gender. The respondents named 38 different fauna, 22 of which were listed by at least two people. As shown in Table 31, all of the Tutuila informants listed lupe, which also has the highest salience score. The pe'a is next in order of frequency, with the second-highest salience score. The next tier of important species is composed of fuia, pig, iao, and manutagi. The pig has the lowest average rank of the top six species, indicating that informants tended to name it early in their lists. The fua'o was named by more than half of the informants, as would be expected given its frequenting of the Pola; the manuali'i and tava'e were mentioned almost as frequently. The gogo, manusina, and lulu were listed by at least 25 percent of the Tutuila respondents. As shown in Table 32, the respondents' correlations with the group, there is a high degree of consensus on the important animal and bird species found within the Tutuila Unit. The lowest score is 0.33, and most of the scores are greater than 0.60.

2. Ta'u Unit. Lists of animals and birds were elicited from nine Fitiuta residents, seven men and two women. They named 22 fauna, 16 of which were mentioned by at least two informants. Table 33 summarizes the freelists, showing that the lupe and pe'a are the most frequently identified species in both the Ta'u and Tutuila Units. The fuia, iao, and miti form the next tier in order of frequency, with the manutagi, gogo, and ve'a named by a third of the respondents. Given the small number of informants on this topic, we did not apply further computer analyses to the Ta'u fauna lists.

3. Ofu Unit. Lists were collected from twelve informants, eight from Ofu and four from Olosega, comprising eight men and four women. The master list includes 39 items, 27 of which were named at least twice. In the Ofu Unit the pe'a and fuia are the fauna cited most often, as shown in Table 34. In salience and average rank too, they are comparable in 'importance.' The next tier of species is composed of the iao, cat, lupe, and ve'a, followed by the pig and manusina. The lupe appears less prominently in the Ofu and Olosega lists than in the other two Units. The ve'a is named more often, however, corroborating our own observations that it is indeed very common in and around the Ofu Unit. It is notable that the introduced cat is mentioned by 58 percent of the Ofu and Olosega informants, but not by any of the Tutuila or Ta'u residents. We do not know whether this

represents a difference in perception, or an indicator that feral cats are more commonly seen in the Ofu Unit. Park Management might well consider investigating this point further, since feral cats are usually a threat to indigenous birds.

4. Combined Data (All Units). Overall, as shown in Table 35, the lupe and pe'a are the fauna most often mentioned as living within the Park. The fuia ranks third in frequency and salience, followed by the iao, pig, and manutagi. Other species mentioned by at least 25 percent of informants are the manuali'i, tava'e, fua'o, ve'a, manusina, gogo, and lulu.

Summary of the Freelist Results.

Analysis reveals a characteristically Polynesian complex of agricultural crops being grown in bush plantations on Park lands. The most important cultigens growing within the Park are banana, coconut, ta'amu, ufi, and taro, in that order. The complex of important crops is largely the same for all three Park Units.

Researchers discovered an extraordinary wealth of medicinal plant knowledge among informants, and Park lands are a very important gathering range for these plants. Ma'anunu, nonu, and fuefue sina appear as the three most prominent plants found within the Park. However, this is an area of highly specialized knowledge and expertise; informants identified 91 different medicinal plants as growing within the Park.

The same marine species tended to be named by informants in each Park Unit. The fe'e, gatala, and malau are the three most important fish caught within the Park, followed by pone, alogo, and alili.

The lupe and pe'a are the predominant fauna found in Park lands, according to our informants' perceptions, followed by the fuia and iao. Feral pig was listed by at least half of the informants from the Tutuila and Ofu Units. Of possible concern is the frequent mention of feral cats in the Ofu Unit.

Table 4. Crops and Cultivated Plants, Tutuila

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	BANANA	14	100	1.857	0.743
2	COCONUT	11	79	2.364	0.476
3	`ULU	9	64	3.778	0.284
4	TARO	8	57	2.750	0.406
5	TA`AMU	5	36	4.000	0.162
6	UFI	3	21	4.667	0.106
7	PAPAYA	3	21	4.333	0.111
8	PINEAPPLE	3	21	8.667	0.008
9	TIPOLO	3	21	5.667	0.041
10	MANIOKA	2	14	3.500	0.090
11	`AUTE	2	14	2.000	0.121
12	OFE	2	14	10.000	0.047
13	`UMALA	2	14	6.500	0.031
14	MOLI	2	14	4.500	0.068
15	PUASAMI	1	7	8.000	0.044
16	PULU	1	7	16.000	0.012
17	PUA	1	7	7.000	0.048
18	FAU	1	7	10.000	0.036
19	FU`AFU`A	1	7	19.000	0.000
20	LILI	1	7	4.000	0.060
21	FUE SOSOLO	1	7	17.000	0.008
22	LAGA`ALI	1	7	18.000	0.004
23	KAPISI	1	7	7.000	0.024
24	KUKAMA	1	7	8.000	0.016
25	GATAE	1	7	9.000	0.040
26	PI	1	7	10.000	0.000
27	MOSO`OI	1	7	11.000	0.032
28	NONU	1	7	12.000	0.028
29	TALIE	1	7	13.000	0.024
30	KOKO	1	7	5.000	0.000
31	FUTU	1	7	15.000	0.016
32	MAGO	1	7	3.000	0.051
33	`AVA	1	7	7.000	0.010

Table 5. Crops, Tutuila: Correlation of each respondent with group

		CORR
1	1VM40	0.06
2	1VM70	0.40
3	1VM50101	0.75
4	1PF60102	0.77
5	1PM80103	0.87
6	1PM40105	0.73
7	1PM50107	0.53
8	1FM60109	0.84
9	1FM50301	0.87
10	1FF30112	0.67
11	1FM20113	0.62
12	1VM80307	0.69
13	1VM70123	0.76
14	1VM60135	0.55

Figure 1. Cluster Analysis, Crops and Cultigens, Tutuila

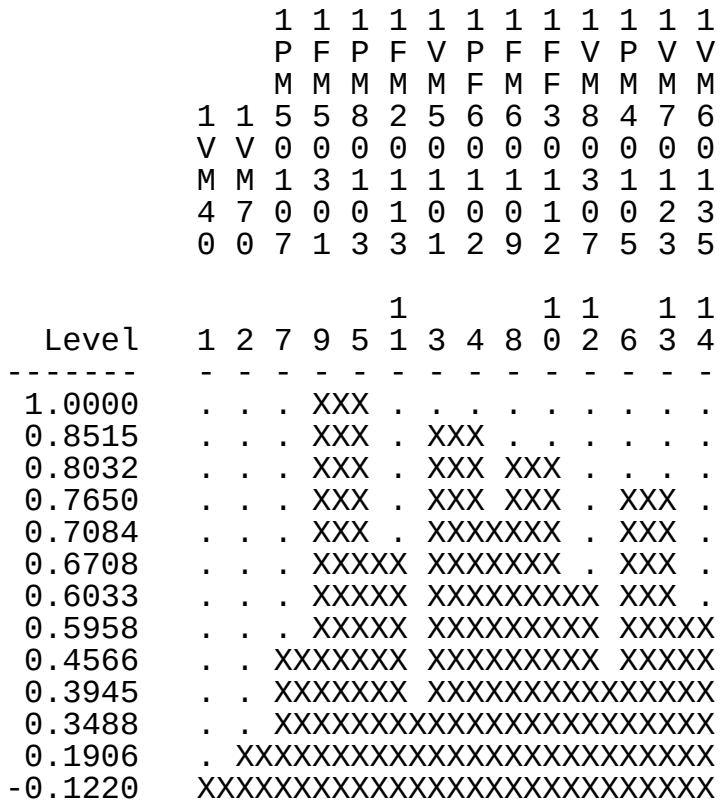


Table 6. Crops and Cultivated Plants, Ta'u Unit (Fitiuta)

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	BANANA	11	100	2.364	0.770
2	TA`AMU	11	100	3.364	0.632
3	UFI	9	82	5.000	0.317
4	TARO	9	82	1.556	0.740
5	COCONUT	9	82	4.111	0.415
6	`ULU	6	55	4.833	0.211
7	MANIOKA	5	45	6.400	0.161
8	PAPAYA	4	36	7.750	0.067
9	LAUTALOTALO	3	27	6.000	0.092
10	PINEAPPLE	2	18	5.500	0.018
11	LAU FALA	2	18	9.000	0.000
12	MOLI	2	18	6.500	0.013
13	KOKO	2	18	5.000	0.095
14	`AVA	1	9	6.000	0.040
15	TOLO	1	9	4.000	0.036
16	LAUTA`ATA`A	1	9	10.000	0.009
17	PUMPKIN	1	9	8.000	0.027
18	KUKAMA	1	9	6.000	0.045
19	KAPISI	1	9	7.000	0.036
20	TIPOLO	1	9	8.000	0.000

Table 7. Crops, Ta'u: Correlation of each respondent with group.

		CORR
1	2TM60137	0.72
2	2TM60139	0.47
3	2TM40141	0.82
4	2TM60143	0.47
5	2TF40144	0.86
6	2TM60145	0.74
7	2TF40146	0.80
8	2TM30147	0.78
9	2TF50150	0.60
10	2TF60152 (F30)	0.66
11	2TM50309	0.71

Figure 2. Cluster Analysis, Crops and Cultigens, Ta'u

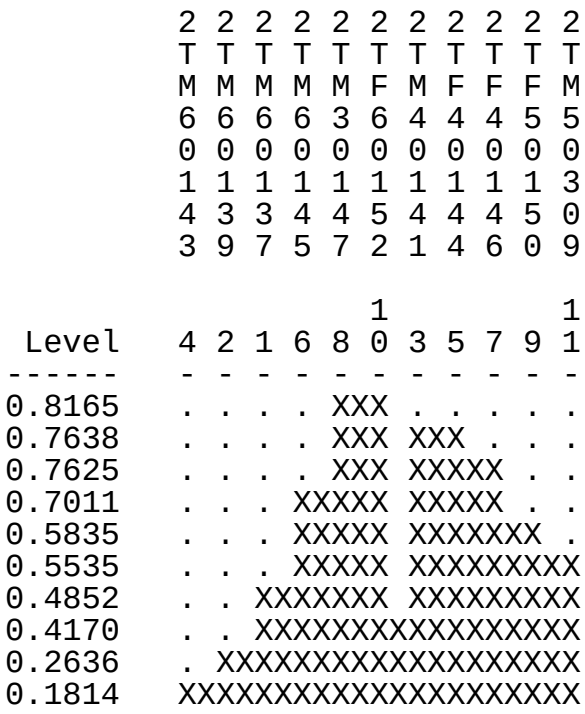


Table 8. Crops and Cultivated Plants, Ofu Unit.

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	COCONUT	14	93	2.714	0.738
2	BANANA	11	73	3.182	0.545
3	UFI	11	73	6.091	0.273
4	`ULU	10	67	4.600	0.427
5	TA`AMU	9	60	5.222	0.368
6	MANIOKA	7	47	7.000	0.188
7	PAPAYA	6	40	6.000	0.218
8	TARO	6	40	6.667	0.242
9	MASOA	4	27	6.250	0.037
10	MAGO	4	27	8.000	0.131
11	LAUTALOTALO	3	20	6.333	0.081
12	`UMALA	3	20	7.000	0.102
13	LAU FALA	3	20	3.667	0.044
14	TIPOLO	3	20	10.000	0.066
15	TOLO	3	20	8.667	0.106
16	NONU	2	13	5.500	0.057
17	KUAVA	2	13	6.000	0.093
18	PI	2	13	18.500	0.004
19	KUKAMA	2	13	10.000	0.064
20	TOMATO	2	13	12.500	0.045
21	VI	2	13	7.000	0.087
22	MOLI AINA	1	7	12.000	0.026
23	FETILA	1	7	18.000	0.004
24	PUA	1	7	16.000	0.011
25	MOLI	1	7	1.000	0.067
26	MOLI AI SUKA	1	7	13.000	0.022
27	`AVA PUI	1	7	19.000	0.000
28	`AUTE	1	7	15.000	0.015
29	MELENI	1	7	9.000	0.040
30	MOSO`OI	1	7	17.000	0.007
31	MAUKENI	1	7	11.000	0.033
32	TALO PALAGI	1	7	20.000	0.003
33	PINEAPPLE	1	7	8.000	0.015
34	LOPA	1	7	11.000	0.025
35	KAPISI	1	7	13.000	0.017
36	SANA	1	7	14.000	0.013
37	KOKO	1	7	17.000	0.000
38	UMALA	1	7	5.000	0.029
39	LAU I`E	1	7	3.000	0.022

Table 9. Crops, Ofu: Correlation of each respondent with group

		CORR
1	2FF50	0.79
2	3FF20	0.87
3	3FM50	0.81
4	3M60	0.64
5	3FF30	0.73
6	3FF40	0.37
7	3LM50	0.70
8	3LF30	0.48
9	3LM10	0.41
10	3FM60167	0.60
11	3FM20209	0.82
12	3FM30311	0.52
13	3LF50174	0.73
14	3LM50177	0.22
15	3LM40181	0.36

Figure 3. Cluster Analysis, Crops and Cultigens, Ofu Unit

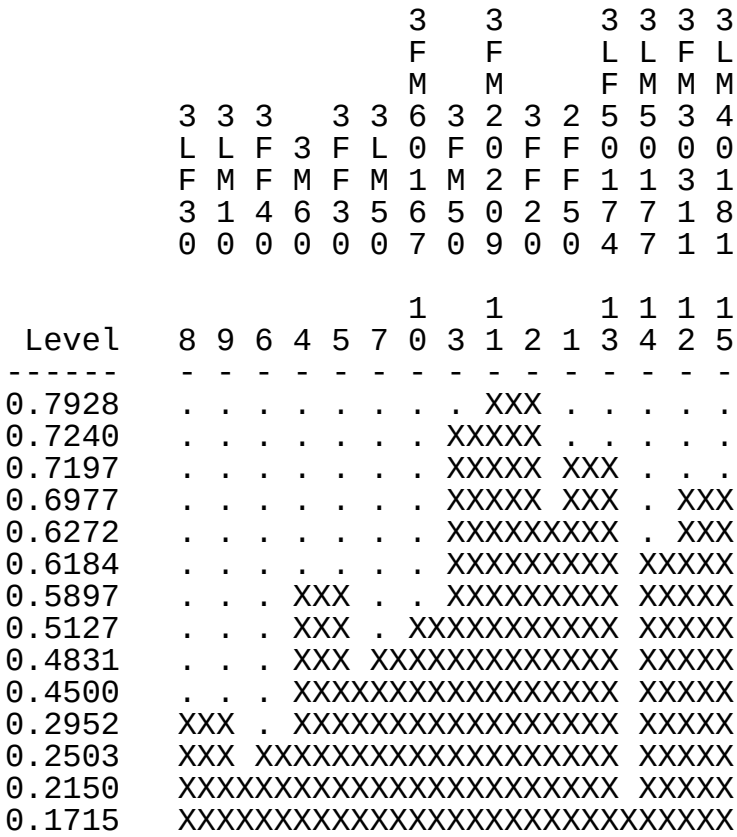


Table 10. Crops and Cultivated Plants, All Units Combined

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	BANANA	36	90	2.417	0.676
2	COCONUT	34	85	2.971	0.557
3	TA`AMU	25	63	4.160	0.368
4	`ULU	25	63	4.360	0.318
5	UFI	23	58	5.478	0.227
6	TARO	23	58	3.304	0.436
7	MANIOKA	14	35	6.286	0.146
8	PAPAYA	13	33	6.154	0.139
9	TIPOLO	7	18	7.857	0.039
10	LAUTALOTALO	6	15	6.167	0.056
11	PINEAPPLE	6	15	7.500	0.013
12	MAGO	5	13	7.000	0.067
13	LAU FALA	5	13	5.800	0.017
14	MOLI	5	13	4.600	0.052
15	`UMALA	5	13	6.800	0.049
16	KOKO	4	10	8.000	0.026
17	TOLO	4	10	7.500	0.050
18	MASOA	4	10	6.250	0.014
19	KUKAMA	4	10	8.500	0.042
20	PI	3	8	15.667	0.002
21	NONU	3	8	7.667	0.031
22	KAPISI	3	8	9.000	0.025
23	`AUTE	3	8	6.333	0.048
24	PUA	2	5	11.500	0.021
25	TOMATO	2	5	12.500	0.017
26	VI	2	5	7.000	0.033
27	OFE	2	5	10.000	0.016
28	KUAVA	2	5	6.000	0.035
29	`AVA	2	5	6.500	0.015
30	MOSO`OI	2	5	14.000	0.014
31	FUE SOSOLO	1	3	17.000	0.003
32	FAU	1	3	10.000	0.013
33	LILI	1	3	4.000	0.021
34	GATAE	1	3	9.000	0.014
35	PULU	1	3	16.000	0.004
36	LAUTA`ATA`A	1	3	10.000	0.002
37	FUTU	1	3	15.000	0.006
38	PUMPKIN	1	3	8.000	0.007
39	TALIE	1	3	13.000	0.008
40	MOLI AINA	1	3	12.000	0.010
41	MOLI AI SUKA	1	3	13.000	0.008
42	FETILA	1	3	18.000	0.001
43	`AVA PUI	1	3	19.000	0.000
44	LAGA`ALI	1	3	18.000	0.001
45	FU`AFU`A	1	3	19.000	0.000
46	MELENI	1	3	9.000	0.015
47	PUASAMI	1	3	8.000	0.015

48	MAUKENI	1	3	11.000	0.013
49	TALO PALAGI	1	3	20.000	0.001
50	LOPA	1	3	11.000	0.009
51	SANA	1	3	14.000	0.005
52	UMALA	1	3	5.000	0.011
53	LAU I`E	1	3	3.000	0.008

Table 11. Crops and Cultigens, by Village and Unit

	TUTUILA			TA`U	OFU	
Samoan name	Pago Pago	Fagasa	Vatia	Fitiuta	Ofu	Olosega
`aute			X		X	
`ava			X	X		
esi	X		X	X	X	X
fa`i	X	X	X	X	X	X
kapisi			X	X		X
koko		X		X		X
ku`ava						X
kukama			X	X		X
lau fala				X	X	X
lautalotalo				X	X	X
mago			X		X	X
manioka		X	X	X	X	X
masoa				X	X	X
moli		X	X	X	X	X
moso`oi			X		X	
niu	X	X	X	X	X	X
nonu			X		X	X
`ofe	X		X			
pi			X			X
(pineapple)	X		X	X		X
pua			X		X	
ta`amu	X	X	X	X	X	X
talo	X	X	X	X	X	X
tipolo	X	X		X	X	X
tolo				X	X	X
(tomato)				X		X
ufi	X	X	X	X	X	X

Samoan name	Pago Pago	Faga sa	Vatia	Fiti uta	Ofu	Olo sega
`ulu	X	X	X	X	X	X
`umala			X		X	X
vi						X

Table 12. Woods Gathered on Park Land, by Village and Unit

	TUTUILA			TA`U	OFU
Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fituta	Olosega
asi		X		X	X	
fau	X	X	X	X	X	
ifilele	X		X	X		
laga`ali	X	X				X
lau fala	X					
lau maile		X	X			
ma`ali	X	X				
moso`oi	X	X	X	X		X
poumuli				X		
tamanu	X	X		X		
tavai			X	X	X	
toi		X	X	X	X	

Gathered in the Park areas (for umu, fale, ula, etc.)
Items mentioned more than once.

Figure 4. Cluster Analysis, Crops and Cultigens, All Units.

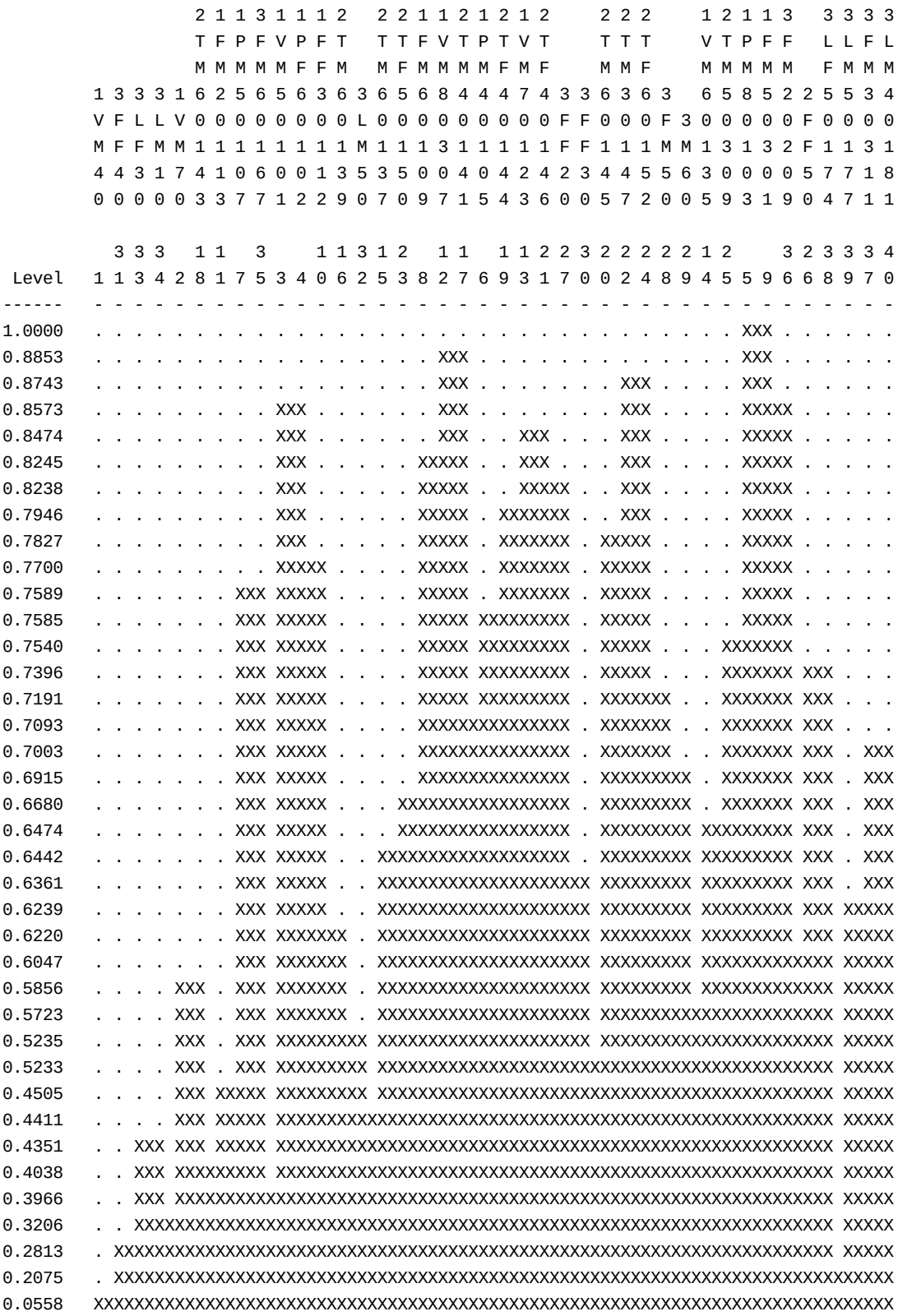


Table 13. Crops and Cultigens, All Units: Correlation of each respondent with group

		CORR
1	1VM40	0.11
2	1VM70	0.48
3	1VM50101	0.73
4	1PF60102	0.65
5	1PM80103	0.75
6	1PM40105	0.77
7	1PM50107	0.49
8	1FM60109	0.73
9	1FM50301	0.75
10	1FF30112	0.56
11	1FM20113	0.61
12	1VM80307	0.71
13	1VM70123	0.82
14	1VM60135	0.68
15	2TM60137	0.81
16	2TM60139	0.60
17	2TM40141	0.80
18	2TM60143	0.63
19	2TF40144	0.84
20	2TM60145	0.74
21	2TF40146	0.79
22	2TM30147	0.84
23	2TF50150	0.70
24	2TF60152 (F30)	0.76
25	2TM50309	0.80
26	2FF50	0.74
27	3FF20	0.93
28	3FM50	0.79
29	3M60	0.61
30	3FF30	0.74
31	3FF40	0.41
32	3LM50	0.72
33	3LF30	0.51
34	3LM10	0.50
35	3FM60167	0.64
36	3FM20209	0.80
37	3FM30311	0.46
38	3LF50174	0.73
39	3LM50177	0.18
40	3LM40181	0.32

Table 14. Medicinal Plants, Tutuila Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	MA`ANUNU	8	50	3.250	0.351
2	TI	6	38	7.667	0.239
3	NONU	6	38	8.833	0.202
4	`AVA`AVA AITU	4	25	9.500	0.108
5	FUEFUE SINA	4	25	5.750	0.102
6	MOLI	4	25	11.500	0.083
7	MAGO	4	25	7.750	0.169
8	MATALAFI	4	25	2.250	0.217
9	NIU	3	19	4.333	0.114
10	ATEATE	3	19	7.000	0.097
11	KUAVA	3	19	12.333	0.094
12	ESI	3	19	7.667	0.100
13	FETAU	3	19	6.333	0.076
14	PUA SAME	3	19	14.000	0.133
15	MILO	3	19	8.000	0.080
16	AOA	3	19	12.000	0.068
17	O`A	2	13	13.000	0.092
18	`AVA	2	13	4.500	0.023
19	VAVAE	2	13	16.500	0.042
20	ALOALO	2	13	6.500	0.076
21	TALIE	2	13	7.000	0.070
22	FUEFUE SAINA	2	13	3.000	0.119
23	TIPOLO	2	13	19.500	0.031
24	GATAE	2	13	27.000	0.028
25	FAU	2	13	5.000	0.105
26	FUE MANOGI	1	6	12.000	0.047
27	`AVA`AVA AITU TU	1	6	10.000	0.050
28	ALOALO VAO	1	6	3.000	0.060
29	FA`I	1	6	28.000	0.025
30	LAU TOGO	1	6	14.000	0.044
31	VAOMAGESO	1	6	31.000	0.021
32	VI	1	6	16.000	0.042
33	`AVA PUI VAO	1	6	35.000	0.015
34	LOGO	1	6	36.000	0.014
35	FUALOLE	1	6	27.000	0.026
36	ALOALO TAI	1	6	2.000	0.061
37	MOEGALO	1	6	39.000	0.010
38	FUE LAU `ULU	1	6	32.000	0.019
39	IFIIFI	1	6	33.000	0.018
40	FILIMOTO	1	6	7.000	0.054
41	LAU MAFIAFIA	1	6	43.000	0.004
42	LA`AU LAFA	1	6	44.000	0.003
43	MASAME	1	6	18.000	0.039
44	LEGA	1	6	46.000	0.000
45	MAUTOFU	1	6	30.000	0.022
46	SEASEA	1	6	3.000	0.053
47	POLOFEU	1	6	41.000	0.007

48	TO`ITO`I	1	6	7.000	0.034
49	TALAFALU	1	6	8.000	0.029
50	PINEAPPLE	1	6	9.000	0.024
51	MATI	1	6	10.000	0.019
52	PU`A	1	6	11.000	0.014
53	PATE	1	6	38.000	0.011
54	FISOA	1	6	1.000	0.063
55	A`ATASI	1	6	29.000	0.024
56	NONU FI`AFI`A	1	6	22.000	0.033
57	LAU FATIFATI	1	6	42.000	0.006
58	SUNI	1	6	13.000	0.009
59	IFI	1	6	3.000	0.054
60	OFE	1	6	5.000	0.045
61	`ULU	1	6	8.000	0.031
62	FU`AFU`A	1	6	11.000	0.018
63	MOSO`OI	1	6	13.000	0.009
64	LAUME	1	6	3.000	0.021
65	LAU FALA	1	6	1.000	0.063
66	LAMA	1	6	34.000	0.017
67	LAUTASI	1	6	1.000	0.063
68	NAMULEGA	1	6	9.000	0.000

Table 15. Medicinals, Tutuila: Correlation of each respondent with group.

		CORR
1	1VM30001	0.18
2	1VM30002	0.44
3	1VM30003	0.62
4	1VM70	0.61
5	1VX00	0.19
6	1PM40105	0.12
7	1PM50107	0.01
8	1FF30112	0.13
9	1FM20113	0.36
10	1FM40303	0.53
11	1AM70117	0.43
12	1VF60124	-0.07
13	1VF50126	0.51
14	1VF50128	0.33
15	1VM30129	0.66
16	1VF20206	0.10

Figure 5. Cluster Analysis, Medicinal Plants, Tutuila

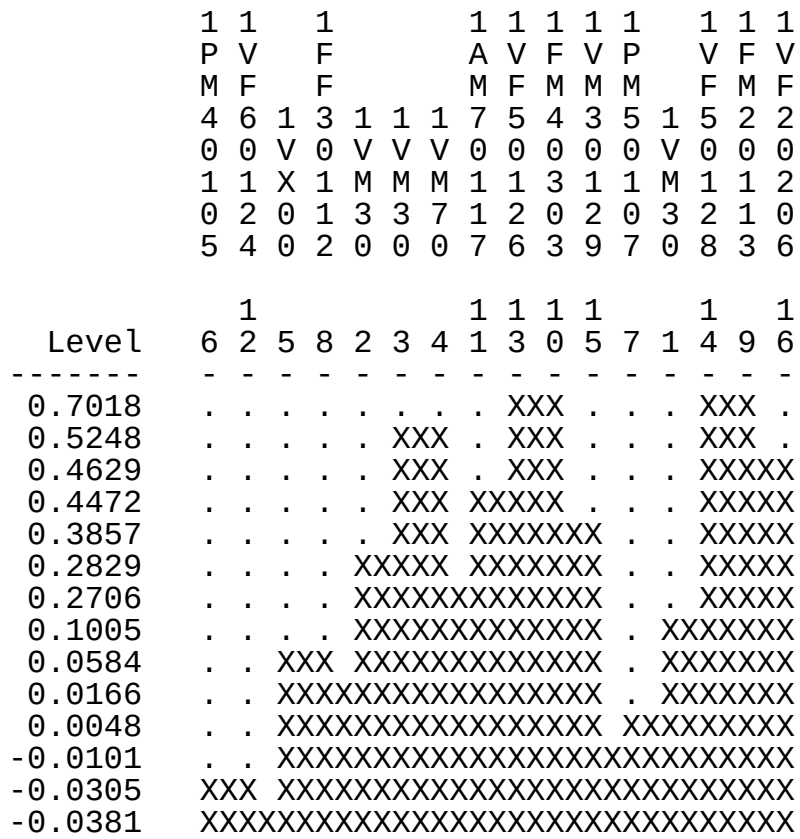


Table 16. Medicinal Plants, Ta'u (Fitiuta)

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	MA`ANUNU	6	55	3.167	0.333
2	FUEFUE SINA	5	45	5.600	0.072
3	MATALAFI	5	45	3.800	0.141
4	NONU	5	45	3.200	0.283
5	MAGO	3	27	4.000	0.156
6	O`A	3	27	3.667	0.192
7	TUA ULA	3	27	1.000	0.273
8	VI	3	27	2.000	0.234
9	LAU MAGAMAGA	3	27	6.667	0.040
10	TAVAI	2	18	3.500	0.121
11	MASAME	2	18	5.500	0.071
12	LAU TALIGA	2	18	2.500	0.143
13	LAU TOGO	2	18	6.000	0.081
14	SUNI	2	18	6.000	0.039
15	TALIE	1	9	2.000	0.076
16	LAUGASESE	1	9	5.000	0.030
17	FAU	1	9	6.000	0.015
18	LAMA	1	9	7.000	0.030
19	TALAFALU	1	9	6.000	0.040
20	MOLI SAMOA	1	9	4.000	0.045
21	A`ATASI	1	9	3.000	0.071
22	LAGA`ALI	1	9	6.000	0.015
23	MAOTA	1	9	4.000	0.045
24	MOSO`OI	1	9	10.000	0.000
25	TOI	1	9	2.000	0.076
26	VI VAO	1	9	2.000	0.000
27	FUEFUE SAINA	1	9	3.000	0.055
28	FUE MANOGI	1	9	4.000	0.036
29	MILO	1	9	2.000	0.078
30	ATEATE	1	9	7.000	0.000
31	FA`I	1	9	6.000	0.026
32	FUTU	1	9	3.000	0.030
33	NIU	1	9	2.000	0.061

Table 17. Medicinals, Ta'u: Correlation of each respondent with group:

		CORR
1	2TM60137	0.22
2	2TM40141	-0.20
3	2TM60143	0.49
4	2TF40141 (M70;F70)	0.52
5	2TF40146	0.01
6	2TM30147 (F30)	0.72
7	2TF50150	0.51
8	2TF60152	0.21
9	2TF50156	0.33
10	2TF30162	0.40
11	2TM50309	0.59

Figure 6. Cluster Analysis, Medicinal Plants, Ta'u (Fitiuta).

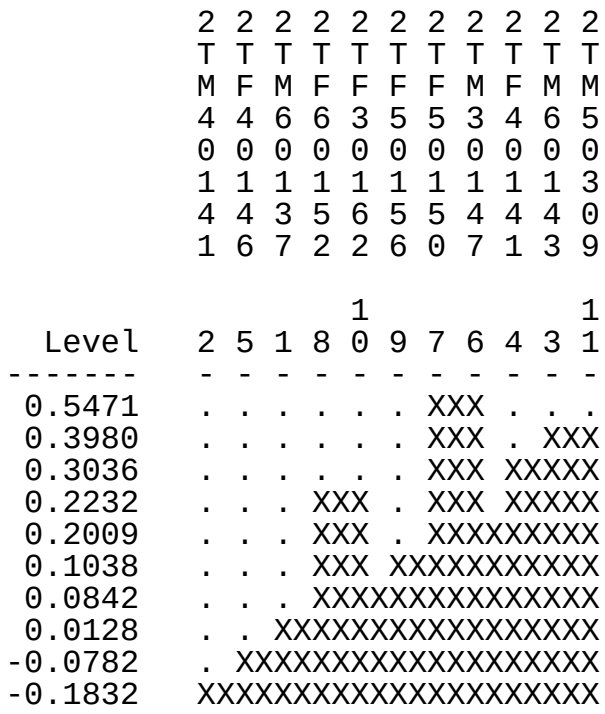


Table 18. Medicinal Plants, Ofu Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	FUEFUE SINA	11	65	4.273	0.358
2	NONU	10	59	5.800	0.268
3	MA`ANUNU	9	53	2.778	0.465
4	ATEATE	9	53	5.889	0.313
5	LAU TALIGA	8	47	5.125	0.230
6	NIU	7	41	6.857	0.154
7	O`A	6	35	4.500	0.227
8	TI	6	35	8.000	0.138
9	MILO	4	24	4.500	0.154
10	FISOA	4	24	6.250	0.086
11	LAU MAGAMAGA	4	24	6.750	0.100
12	TO`ITO`I	4	24	5.250	0.124
13	FA`I	4	24	9.000	0.083
14	LAU TOGO	4	24	8.000	0.052
15	ALOALO TAI	3	18	16.333	0.022
16	TAUSUNI	3	18	3.667	0.095
17	GATAE	3	18	12.333	0.078
18	MATALAFI	3	18	3.333	0.163
19	TALIE	3	18	5.333	0.093
20	SUNI	2	12	7.000	0.039
21	`ULU	2	12	7.000	0.064
22	MOEGALO	2	12	3.500	0.108
23	A`ATASI	2	12	3.000	0.098
24	ALOALO VAO	2	12	19.500	0.014
25	KUAVA	2	12	7.500	0.051
26	NONU FI`AFI`A	2	12	17.500	0.029
27	MOLI	2	12	16.000	0.043
28	PU`A	2	12	11.000	0.043
29	MAGO	2	12	16.000	0.037
30	PULU	2	12	4.000	0.074
31	LAU PA`EPA`E	1	6	22.000	0.018
32	LAU TAGITAGI SAMOA	1	6	16.000	0.029
33	PAPAKA	1	6	25.000	0.012
34	MOSO`OI	1	6	19.000	0.024
35	FUE SOSOLO	1	6	21.000	0.020
36	LAU FATIFATI	1	6	9.000	0.043
37	TIPOLO	1	6	24.000	0.014
38	AGO	1	6	7.000	0.024
39	LAU TASI	1	6	17.000	0.027
40	FETAU	1	6	11.000	0.000
41	IFI	1	6	2.000	0.057
42	PUA MANOGI	1	6	3.000	0.048
43	TOLO	1	6	4.000	0.043
44	NAMULEGA	1	6	18.000	0.025
45	VI	1	6	3.000	0.044
46	MASAME	1	6	6.000	0.034
47	FIU	1	6	7.000	0.029

48	POUMULI	1	6	11.000	0.010
49	ALOE	1	6	1.000	0.059
50	FUEFUE SAINA	1	6	3.000	0.029
51	FUE `ULU	1	6	4.000	0.037
52	FAU	1	6	13.000	0.035
53	LAU TOGO TOGO	1	6	8.000	0.007

Table 19. Medicinals, Ofu: Correlation of each respondent with group

		CORR
1	3FF50	0.24
2	3FF20	0.42
3	3FM50	0.74
4	3FM60	0.58
5	3FF30	0.40
6	3FF60	0.40
7	3FF40	0.56
8	3LF30	0.45
9	3LM10	0.20
10	3FF50168	0.38
11	3FF60176	0.33
12	3FM70179	0.22
13	3FF80182	0.48
14	3FM20211	0.44
15	3FM30311	0.51
16	3LF50174	0.60
17	3LM50177	0.67

Figure 7. Cluster Analysis, Medicinal Plants, Ofu Unit

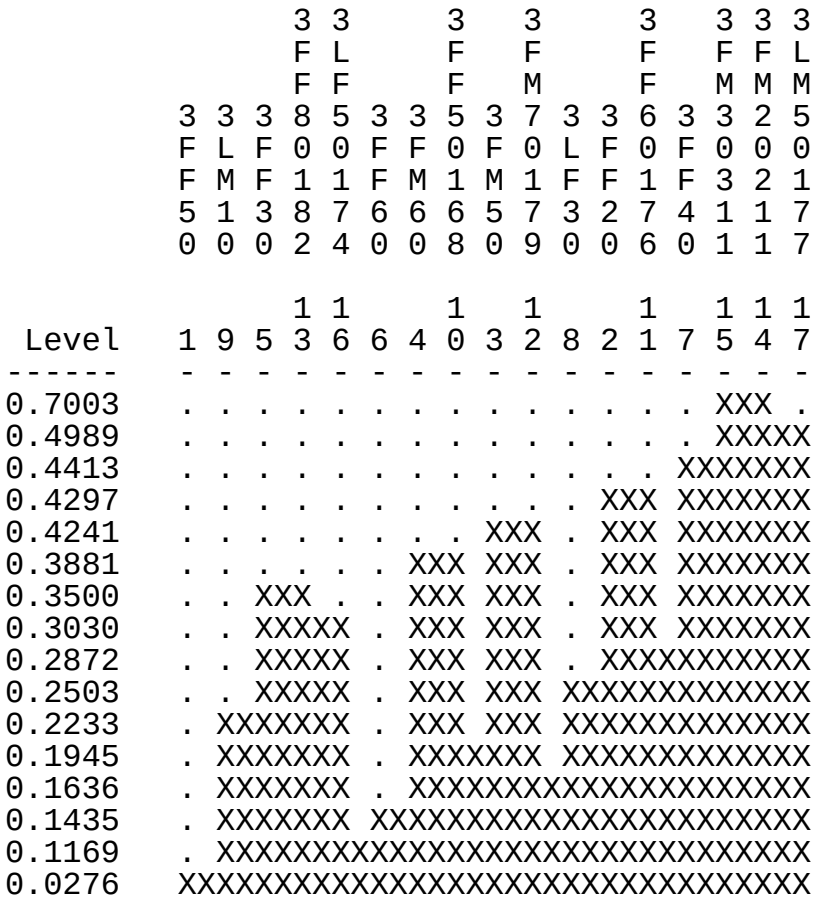


Table 20. Medicinal Plants, All Units Combined

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	MA`ANUNU	23	52	3.043	0.391
2	NONU	21	48	6.048	0.248
3	FUEFUE SINA	20	45	4.900	0.193
4	ATEATE	13	30	6.231	0.156
5	MATALAFI	12	27	3.167	0.177
6	TI	12	27	7.833	0.140
7	O`A	11	25	5.818	0.169
8	NIU	11	25	5.727	0.116
9	LAU TALIGA	10	23	4.600	0.125
10	MAGO	9	20	8.333	0.115
11	MILO	8	18	5.500	0.108
12	LAU MAGAMAGA	7	16	6.714	0.049
13	LAU TOGO	7	16	8.286	0.057
14	MOLI	6	14	13.000	0.047
15	FA`I	6	14	11.667	0.048
16	TALIE	6	14	5.333	0.080
17	SUNI	5	11	7.800	0.028
18	VI	5	11	5.000	0.091
19	TO`ITO`I	5	11	5.600	0.060
20	GATAE	5	11	18.200	0.041
21	KUAVA	5	11	10.400	0.054
22	FISOA	5	11	5.200	0.056
23	MASAME	4	9	8.750	0.045
24	ALOALO TAI	4	9	12.750	0.031
25	FAU	4	9	7.250	0.055
26	`AVA`AVA AITU	4	9	9.500	0.039
27	FUEFUE SAINA	4	9	3.000	0.068
28	A`ATASI	4	9	9.500	0.064
29	FETAU	4	9	7.500	0.028
30	ALOALO VAO	3	7	14.000	0.027
31	MOSO`OI	3	7	14.000	0.012
32	ESI	3	7	7.667	0.036
33	TAUSUNI	3	7	3.667	0.037
34	MOEGALO	3	7	15.333	0.045
35	TIPOLO	3	7	21.000	0.016
36	PUA SAME	3	7	14.000	0.048
37	NONU FI`AFI`A	3	7	19.000	0.023
38	AOA	3	7	12.000	0.025
39	`ULU	3	7	7.333	0.036
40	TUA ULA	3	7	1.000	0.068
41	PU`A	3	7	11.000	0.022
42	ALOALO	2	5	6.500	0.028
43	LAMA	2	5	20.500	0.014
44	LAU FATIFATI	2	5	25.500	0.019
45	TAVAI	2	5	3.500	0.030
46	NAMULEGA	2	5	13.500	0.010
47	`AVA	2	5	4.500	0.009

48	VAVAE	2	5	16.500	0.015
49	TALAFALU	2	5	7.000	0.021
50	PULU	2	5	4.000	0.028
51	IFI	2	5	2.500	0.041
52	FUE MANOGI	2	5	8.000	0.026
53	LAU TASI	1	2	17.000	0.011
54	LAU TAGITAGI SAMOA	1	2	16.000	0.011
55	FUE `ULU	1	2	4.000	0.014
56	FILIMOTO	1	2	7.000	0.020
57	FUE SOSOLO	1	2	21.000	0.008
58	LAU PA`EPA`E	1	2	22.000	0.007
59	POUMULI	1	2	11.000	0.004
60	ALOE	1	2	1.000	0.023
61	AGO	1	2	7.000	0.009
62	MAUTOFU	1	2	30.000	0.008
63	VAOMAGESO	1	2	31.000	0.008
64	FUE LAU `ULU	1	2	32.000	0.007
65	IFIIFI	1	2	33.000	0.007
66	TOLO	1	2	4.000	0.017
67	`AVA PUI VAO	1	2	35.000	0.006
68	LOGO	1	2	36.000	0.005
69	PAPAKA	1	2	25.000	0.005
70	FIU	1	2	7.000	0.011
71	POLOFEU	1	2	41.000	0.003
72	LAU MAFIAFIA	1	2	43.000	0.002
73	LA`AU LAFA	1	2	44.000	0.001
74	LEGA	1	2	46.000	0.000
75	SEASEA	1	2	3.000	0.019
76	LAU TOGO TOGO	1	2	8.000	0.003
77	PINEAPPLE	1	2	9.000	0.009
78	MATI	1	2	10.000	0.007
79	`AVA`AVA AITU TU	1	2	10.000	0.018
80	OFE	1	2	5.000	0.016
81	FU`AFU`A	1	2	11.000	0.006
82	LAUME	1	2	3.000	0.008
83	LAU FALA	1	2	1.000	0.023
84	FUALOLE	1	2	27.000	0.010
85	LAUTASI	1	2	1.000	0.023
86	MOLI SAMOA	1	2	4.000	0.011
87	LAGA`ALI	1	2	6.000	0.004
88	TOI	1	2	2.000	0.019
89	PUA MANOGI	1	2	3.000	0.019
90	MAOTA	1	2	4.000	0.011
91	LAUGASESE	1	2	5.000	0.008
92	PATE	1	2	38.000	0.004
93	VI VAO	1	2	2.000	0.000
94	FUTU	1	2	3.000	0.008

Table 21. Medicinal Plants, by Village and Unit

	TUTUILA				TA`U	OFU	
Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Ofu	Olosega
a`atasi				X	X	X	X
aloalo; aloalo tai; aloalo vao				X		X	
aoa	X			X			
ateate				X	X	X	X
`ava		X		X			
`ava`ava aitu; fue magoni	X			X	X		
esi				X			
fa`i				X	X	X	X
fau				X	X	X	
fetau				X		X	
fisoa				X		X	X
fuefue saina	X			X	X	X	X
fuefue sina				X	X	X	X
gatae				X		X	
ifi				X		X	
ku`ava				X		X	X
lama				X	X		
lau fatifati				X		X	
lau magamaga					X	X	X
lau taliga					X	X	X
lau tasi				X		X	
lau togo				X	X	X	X
ma`anunu		X	X	X	X	X	X
mago				X	X	X	
masame				X	X		X

Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Ofu	Olosega
matalafi		X		X	X	X	
milo				X	X	X	
moegalo				X		X	
moli			X	X	X	X	
moso`oi				X	X	X	
namulega				X		X	
niu			X	X	X	X	X
nonu; nonu vao; nonu atogi				X	X	X	X
nonu fi`afi`a; nonu ai				X		X	X
o`a	X			X	X	X	X
pua same/ pua sami				X			
pulu						X	
pua				X		X	
suni; fue selela				X	X	X	X
talafalu				X	X		
talie				X	X	X	
tausuni						X	
tavai					X		
ti			X	X		X	X
tipolo				X		X	
to`ito`i				X		X	
tua ula					X		
`ulu				X		X	
vavae				X			
vi				X	X	X	

Table 22. Fish and Marine Species, Tutuila Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	PONE	10	50	3.700	0.335
2	ALOGO	10	50	2.600	0.412
3	MALAU	8	40	3.500	0.221
4	GATALA	7	35	7.000	0.166
5	MALAULI	7	35	6.571	0.180
6	PAPA	7	35	7.000	0.223
7	FE`E	6	30	3.667	0.269
8	FILOA	5	25	3.000	0.204
9	FUGA	5	25	4.200	0.112
10	ALILI	5	25	2.600	0.152
11	MALIE	5	25	5.800	0.143
12	ATULE	5	25	14.000	0.017
13	LAEA	5	25	7.400	0.091
14	I`A SINA	4	20	18.000	0.026
15	ULA	4	20	2.500	0.167
16	PA`A	4	20	4.000	0.108
17	SAVANE	3	15	5.667	0.070
18	SUGALE	3	15	8.333	0.082
19	LOLI	3	15	3.667	0.055
20	ANAE	3	15	11.667	0.047
21	MANINI	3	15	4.000	0.093
22	LUPO	3	15	10.333	0.073
23	SUMU	2	10	4.000	0.093
24	ULUA	2	10	10.000	0.046
25	`AVA`AVA	2	10	20.500	0.055
26	ASOAMA	2	10	6.500	0.028
27	TUNA	2	10	3.000	0.071
28	SHRIMP	2	10	5.000	0.017
29	MU	2	10	23.500	0.024
30	MATULAU	2	10	11.500	0.008
31	TIFITIFI	2	10	6.000	0.064
32	LAUMEI	2	10	8.000	0.040
33	MATAPISU	2	10	2.500	0.062
34	LALAFUTU	2	10	19.000	0.052
35	TAGI	2	10	17.000	0.049
36	FAI	1	5	15.000	0.034
37	TAFALA	1	5	28.000	0.019
38	MALA`I	1	5	37.000	0.008
39	I`A USI	1	5	19.000	0.029
40	MANIFI	1	5	41.000	0.003
41	SA`ULELE	1	5	42.000	0.002
42	TAOTO	1	5	43.000	0.001
43	NUUFE`E	1	5	44.000	0.000
44	TANIFA	1	5	30.000	0.016
45	ISE	1	5	25.000	0.022
46	ATAATA ULI	1	5	5.000	0.033
47	TAMALAU	1	5	6.000	0.029
48	MATAPULA	1	5	7.000	0.025

49	MOANA ULI	1	5	8.000	0.021
50	SAPATU	1	5	10.000	0.013
51	A`U	1	5	31.000	0.015
52	GATALA ULI	1	5	12.000	0.004
53	LO	1	5	33.000	0.013
54	SOFE	1	5	23.000	0.024
55	UMELEI	1	5	24.000	0.023
56	SUE	1	5	14.000	0.035
57	FAISUA	1	5	6.000	0.008
58	UGA	1	5	7.000	0.000
59	SAFOLE	1	5	39.000	0.006
60	MOAMOA	1	5	17.000	0.031
61	TAUTU	1	5	26.000	0.021
62	`ALI`AO	1	5	4.000	0.000
63	ALOAMA	1	5	20.000	0.028
64	SEGASEGA	1	5	21.000	0.027
65	TU`U`U	1	5	22.000	0.026
66	`ATA`ATA	1	5	6.000	0.000
67	MUTUMUTU	1	5	5.000	0.028
68	PAPA`A	1	5	9.000	0.006
69	MATA`ELE	1	5	2.000	0.045
70	UTU	1	5	7.000	0.023
71	TALAIA	1	5	1.000	0.050
72	MASIMASI	1	5	9.000	0.028
73	BONITO	1	5	10.000	0.025
74	ATU	1	5	11.000	0.022
75	YELLOWFIN	1	5	12.000	0.019
76	MARLIN	1	5	13.000	0.017
77	TAIVA	1	5	36.000	0.009
78	NOFU	1	5	6.000	0.029
79	PUSI	1	5	10.000	0.013
80	GROUPER	1	5	5.000	0.010
81	PIPI	1	5	1.000	0.050
82	TUITUI	1	5	6.000	0.025
83	`AMA`AMA	1	5	7.000	0.020
84	VANA	1	5	8.000	0.015
85	PULE	1	5	9.000	0.010
86	GETI	1	5	10.000	0.005
87	OFAOFA	1	5	11.000	0.000

Table 23. Marine Species, Tutuila: Correlation of each respondent with group

		CORR
1	1VF50	0.22
2	1VX00	0.03
3	1VM30	0.09
4	1PM40105	0.31
5	1PM50107	0.54
6	1FM50111	0.14
7	1FM50301	0.64
8	1FM40303	0.56
9	1FM20113	0.19
10	1AM40115	0.45
11	1AM70117	0.26
12	1AM40119	0.57
13	1AF40306	0.24
14	1AM30201	0.75
15	1AM40203	0.25
16	1VM40205	0.51
17	1VM20207	0.62
18	1VM80307	0.47
19	1VM30121	0.61
20	1VF50126	-0.07

Figure 8. Multidimensional Scaling Plot, Marine Species, Tutuila

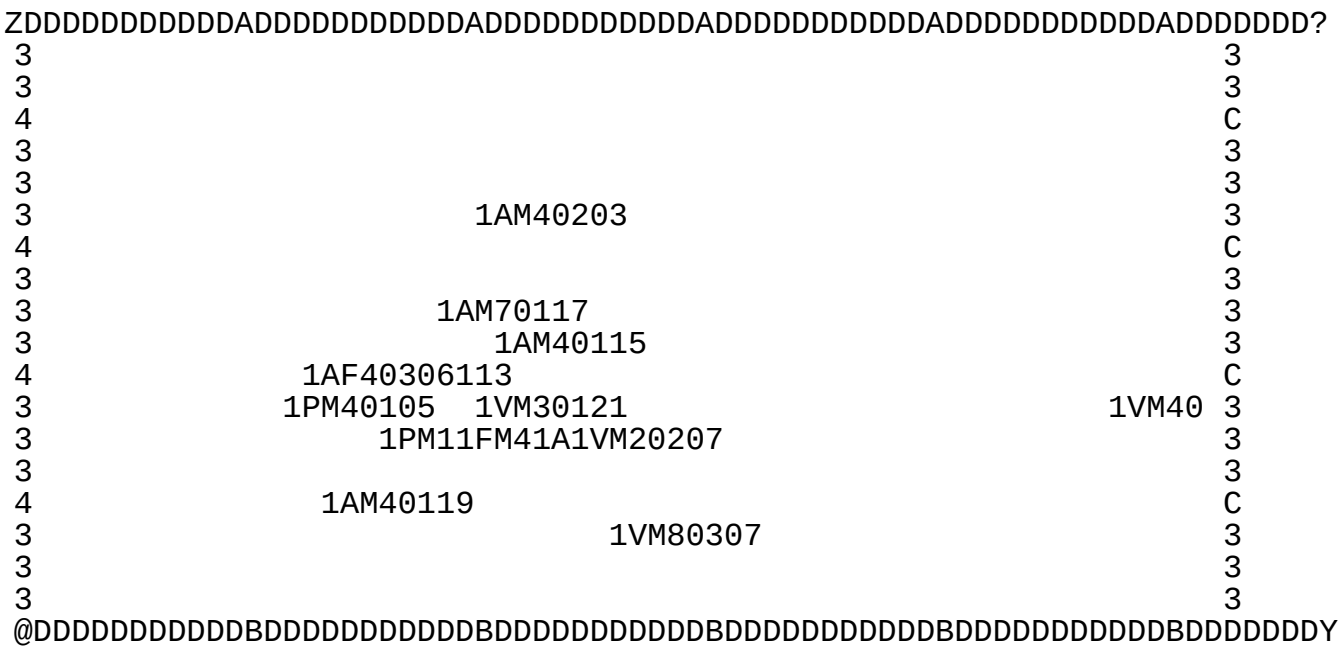


Table 24. Fish and Marine Species, Ta'u Unit (Fitiuta)

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	FE`E	9	90	7.667	0.271
2	ALILI	9	90	8.000	0.426
3	GATALA	8	80	3.750	0.603
4	MATAPISU	7	70	10.714	0.225
5	MALAU	6	60	3.667	0.463
6	`AMA`AMA	6	60	10.833	0.152
7	UME	5	50	5.000	0.367
8	ULA	5	50	6.000	0.212
9	MAONO	4	40	6.750	0.225
10	MANINI	4	40	4.000	0.289
11	ALOGO	4	40	5.250	0.290
12	PULE	4	40	10.250	0.147
13	ANAE	3	30	7.000	0.170
14	FAISUA	3	30	9.667	0.102
15	LAEA	3	30	9.000	0.157
16	PONE	3	30	3.333	0.243
17	`ALI`AO	3	30	16.000	0.049
18	MAMAO	2	20	9.500	0.013
19	SAFOLE	2	20	7.000	0.120
20	I`A USI	2	20	8.000	0.123
21	MATA`ELE	2	20	13.000	0.074
22	PA`A	2	20	6.000	0.100
23	SAVANE	2	20	11.500	0.085
24	TU`U`U	2	20	9.000	0.090
25	PUSI	2	20	10.000	0.063
26	UU	2	20	7.000	0.140
27	MALAULI	2	20	1.500	0.194
28	UMELEI	2	20	5.500	0.131
29	ULUTU`I	1	10	4.000	0.075
30	PALAGI	1	10	3.000	0.090
31	OPIHI	1	10	12.000	0.045
32	VANA	1	10	9.000	0.000
33	PAPATA	1	10	21.000	0.000
34	PAPA	1	10	10.000	0.044
35	TAPULA`A	1	10	17.000	0.020
36	PAPATU	1	10	15.000	0.013
37	PALOLO	1	10	17.000	0.000
38	FUGA	1	10	4.000	0.081
39	LAPE	1	10	7.000	0.071
40	MUTUMUTU	1	10	10.000	0.057
41	FUAFUA	1	10	9.000	0.060
42	MATAPULA	1	10	14.000	0.038
43	FILOA	1	10	15.000	0.033
44	FAUSI	1	10	16.000	0.029
45	PALU	1	10	4.000	0.070
46	SISI	1	10	16.000	0.025
47	PAUMALO	1	10	2.000	0.089
48	ATU	1	10	7.000	0.040

Table 25. Marine Species, Ta'u: Correlation of each respondent with group

		CORR
1	2TM60137 (F60;F20)	0.44
2	2TM60139	0.33
3	2TM40141	0.49
4	2TM60143	0.35
5	2TF40144 (M70;F70)	0.49
6	2TM60145	0.63
7	2TA30147 (+ F30)	0.60
8	2TF50150	0.62
9	2TF60152 (F30)	0.79
10	2TM50309	0.51

Figure 9. Cluster Analysis, Marine Species, Ta'u (Fitiuta)

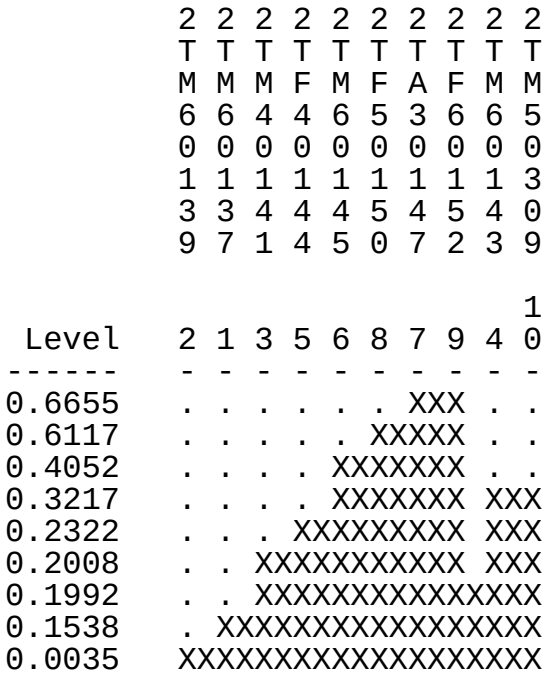


Table 26. Fish and Marine Species, Ofu Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	MALAU	15	79	5.133	0.563
2	FE`E	15	79	5.333	0.521
3	GATALA	15	79	5.933	0.482
4	PONE	14	74	6.786	0.517
5	ALOGO	12	63	8.333	0.396
6	LAEA	12	63	6.750	0.419
7	FUGA	11	58	6.091	0.413
8	ALILI	11	58	9.364	0.321
9	MANINI	10	53	7.300	0.343
10	PUSI	9	47	5.556	0.310
11	FAISUA	9	47	7.556	0.340
12	MASINA	8	42	12.000	0.197
13	VANA	8	42	9.500	0.263
14	MALAULI	7	37	9.857	0.227
15	OFAOFA	7	37	12.571	0.170
16	ULA	7	37	13.000	0.170
17	PA`A	6	32	11.333	0.157
18	SUMU	6	32	12.167	0.136
19	MALIE	5	26	6.800	0.148
20	I`A SINA	5	26	12.000	0.106
21	TIFITIFI	5	26	9.600	0.131
22	ANAE	5	26	14.200	0.107
23	MALALI	4	21	10.500	0.106
24	`AMA`AMA	4	21	20.500	0.047
25	MUTU	4	21	15.250	0.083
26	MAONO	3	16	14.000	0.064
27	SISI	3	16	20.667	0.009
28	`ALI`AO	3	16	16.000	0.031
29	PALAGI	3	16	15.333	0.052
30	TAUTU	3	16	10.667	0.079
31	LIMU	3	16	7.667	0.081
32	TUITUI	3	16	8.667	0.106
33	SUE	3	16	14.000	0.081
34	LUPO	3	16	14.667	0.049
35	UME	2	11	7.500	0.062
36	SAFOLE	2	11	18.500	0.028
37	LAUMEI	2	11	14.500	0.025
38	MATAPISU	2	11	13.000	0.012
39	LOLI	2	11	14.000	0.050
40	ISE	2	11	9.000	0.049
41	SAVANE	2	11	13.500	0.018
42	FILOA	2	11	12.000	0.043
43	SEA	2	11	10.500	0.032
44	PALA`IA	2	11	7.500	0.063
45	PALOLO	2	11	12.000	0.044
46	ATU	2	11	15.500	0.038
47	MALA`I	2	11	18.500	0.015
48	MUTUMUTU	2	11	22.000	0.010

49	ATULE	2	11	30.000	0.004
50	MAMAO	1	5	28.000	0.007
51	MALAU PU`U	1	5	12.000	0.033
52	I`A USI	1	5	24.000	0.012
53	ULUTU`I	1	5	25.000	0.011
54	UMELEI	1	5	16.000	0.009
55	MELEI	1	5	18.000	0.000
56	MATULAU	1	5	22.000	0.016
57	ULUMANE	1	5	27.000	0.008
58	MALAU FATU	1	5	11.000	0.035
59	FOAFOA	1	5	17.000	0.026
60	ASOAMA	1	5	21.000	0.020
61	FAAMAAU	1	5	17.000	0.025
62	SAPATU	1	5	23.000	0.016
63	VETE	1	5	23.000	0.014
64	FUAFUA	1	5	26.000	0.012
65	ASIASI	1	5	27.000	0.010
66	TAGI	1	5	28.000	0.008
67	SA`ULA	1	5	29.000	0.007
68	TU`U`U	1	5	30.000	0.005
69	MU MATA VAIVAI	1	5	31.000	0.000
70	PALA MALAU	1	5	10.000	0.016
71	ANAE AFA	1	5	13.000	0.004
72	SHELLS	1	5	3.000	0.032
73	LAPE	1	5	10.000	0.026
74	FUGAFUGA	1	5	25.000	0.012
75	NIMU	1	5	26.000	0.010
76	PAPATU	1	5	18.000	0.003
77	PIPI	1	5	19.000	0.000
78	LALAFI	1	5	26.000	0.009
79	`ULUTUNU	1	5	31.000	0.002
80	UU	1	5	10.000	0.010
81	SOGELAU	1	5	8.000	0.019
82	PAPATA	1	5	13.000	0.008
83	`UI	1	5	5.000	0.035
84	PAPA	1	5	6.000	0.031
85	MAUA`E	1	5	11.000	0.009
86	MUMU	1	5	12.000	0.004
87	`AVA`AVA	1	5	13.000	0.000
88	TULAIGA	1	5	4.000	0.033
89	FAI	1	5	9.000	0.000
90	TAIVA	1	5	6.000	0.020
91	MU	1	5	8.000	0.007
92	`ATA`ATA	1	5	9.000	0.000
93	MANUMANU	1	5	7.000	0.042
94	PA KAO KAO	1	5	9.000	0.039
95	LO	1	5	12.000	0.032
96	KUNANE	1	5	22.000	0.013
97	SESEMA	1	5	23.000	0.011
98	MANASE	1	5	26.000	0.006

Table 27. Marine Species, Ofu Unit: Correlation of each respondent with group

		CORR
1	3FF50	0.62
2	3FF20	0.67
3	3FM50	0.41
4	3FM60	0.35
5	3FM40	0.73
6	3FF40	0.55
7	3LM10	0.52
8	3LM50	0.51
9	3LF30	0.54
10	3FF30166	0.31
11	3FM60167	0.63
12	3FF50168	0.52
13	3FF60176 (M70)	0.56
14	3FM70179	0.26
15	3FM20209	0.46
16	3FM20211	0.38
17	3FM30311	0.69
18	3LF50174	0.63
19	3LM50177	0.63

Figure 10. Multidimensional Scaling Plot, Marine Species, Ofu Unit

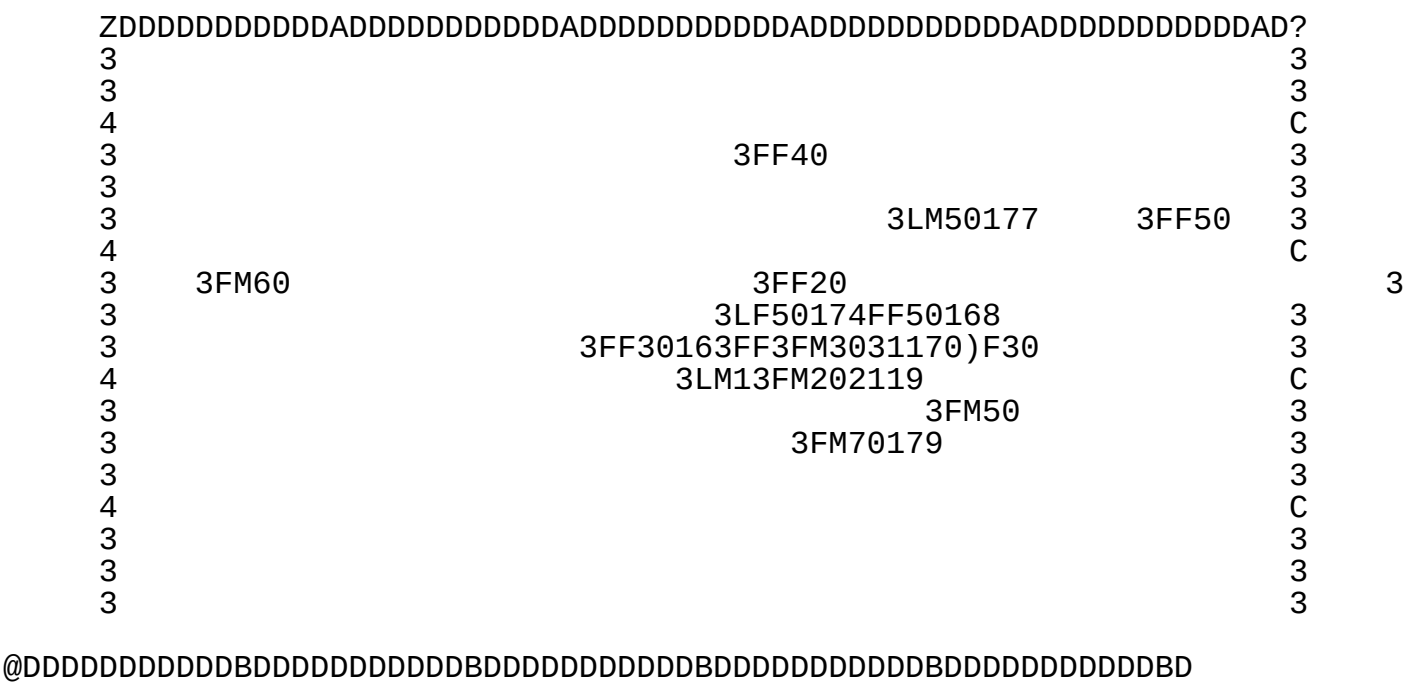


Table 28. Fish and Marine Species, All Units Combined

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	FE`E	30	61	5.700	0.367
2	GATALA	30	61	5.600	0.378
3	MALAU	29	59	4.379	0.403
4	PONE	27	55	5.259	0.387
5	ALOGO	26	53	5.654	0.381
6	ALILI	25	51	7.520	0.274
7	LAEA	20	41	7.250	0.231
8	FUGA	17	35	5.412	0.222
9	MANINI	17	35	5.941	0.230
10	ULA	16	33	8.188	0.177
11	MALAULI	16	33	7.375	0.201
12	FAISUA	13	27	7.923	0.156
13	PA`A	12	24	8.000	0.125
14	PUSI	12	24	6.667	0.138
15	MATAPISU	11	22	9.636	0.076
16	ANAE	11	22	11.545	0.096
17	`AMA`AMA	11	22	14.000	0.057
18	MALIE	10	20	6.300	0.116
19	VANA	10	20	9.300	0.108
20	I`A SINA	9	18	14.667	0.052
21	PAPA	9	18	7.222	0.112
22	OFAOFA	8	16	12.375	0.066
23	MASINA	8	16	12.000	0.076
24	SUMU	8	16	10.125	0.091
25	FILOA	8	16	6.750	0.107
26	TIFITIFI	7	14	8.571	0.077
27	`ALI`AO	7	14	14.286	0.022
28	ATULE	7	14	18.571	0.008
29	MAONO	7	14	9.857	0.071
30	UME	7	14	5.714	0.099
31	SAVANE	7	14	9.571	0.053
32	LUPO	6	12	12.500	0.048
33	SAFOLE	5	10	18.000	0.038
34	PULE	5	10	10.000	0.034
35	LOLI	5	10	7.800	0.042
36	UMELEI	4	8	12.750	0.040
37	ATU	4	8	12.250	0.032
38	TAUTU	4	8	14.500	0.039
39	SUE	4	8	14.000	0.046
40	TUITUI	4	8	8.000	0.051
41	TU`U`U	4	8	17.500	0.031
42	MALALI	4	8	10.500	0.041
43	MUTUMUTU	4	8	14.750	0.027
44	LAUMEI	4	8	11.250	0.026
45	PALAGI	4	8	12.250	0.039
46	MUTU	4	8	15.250	0.032
47	I`A USI	4	8	14.750	0.042
48	SISI	4	8	19.500	0.009

49	MATULAU	3	6	15.000	0.010
50	ISE	3	6	14.333	0.028
51	MAMAO	3	6	15.667	0.005
52	PALOLO	3	6	13.667	0.017
53	MATA`ELE	3	6	9.333	0.034
54	TAGI	3	6	20.667	0.023
55	MU	3	6	18.333	0.012
56	`AVA`AVA	3	6	18.000	0.022
57	ASOAMA	3	6	11.333	0.019
58	MALA`I	3	6	24.667	0.009
59	LIMU	3	6	7.667	0.031
60	UU	3	6	8.000	0.032
61	SUGALE	3	6	8.333	0.034
62	TAIVA	2	4	21.000	0.011
63	`ATA`ATA	2	4	7.500	0.000
64	PIPI	2	4	10.000	0.020
65	FUAFUA	2	4	17.500	0.017
66	MATAPULA	2	4	10.500	0.018
67	LALAFUTU	2	4	19.000	0.021
68	SAPATU	2	4	16.500	0.011
69	FAI	2	4	12.000	0.014
70	PAPATA	2	4	17.000	0.003
71	ULUTU`I	2	4	14.500	0.019
72	TUNA	2	4	3.000	0.029
73	SHRIMP	2	4	5.000	0.007
74	ULUA	2	4	10.000	0.019
75	LO	2	4	22.500	0.018
76	PALA`IA	2	4	7.500	0.024
77	LAPE	2	4	8.500	0.025
78	SEA	2	4	10.500	0.012
79	PAPATU	2	4	16.500	0.004
80	SA`ULELE	1	2	42.000	0.001
81	GROUPER	1	2	5.000	0.004
82	MANIFI	1	2	41.000	0.001
83	TAMALAU	1	2	6.000	0.012
84	PAPA`A	1	2	9.000	0.002
85	GATALA ULI	1	2	12.000	0.002
86	NOFU	1	2	6.000	0.012
87	ATAATA ULI	1	2	5.000	0.014
88	ALOAMA	1	2	20.000	0.011
89	SEGASEGA	1	2	21.000	0.011
90	BONITO	1	2	10.000	0.010
91	YELLOWFIN	1	2	12.000	0.008
92	TAOTO	1	2	43.000	0.000
93	MOAMOA	1	2	17.000	0.013
94	GETI	1	2	10.000	0.002
95	UTU	1	2	7.000	0.009
96	TAPULA`A	1	2	17.000	0.004
97	TANIFA	1	2	30.000	0.007
98	A`U	1	2	31.000	0.006
99	SOFE	1	2	23.000	0.010
100	UGA	1	2	7.000	0.000

101	MARLIN	1	2	13.000	0.007
102	FAUSI	1	2	16.000	0.006
103	TAFALA	1	2	28.000	0.008
104	PAUMALO	1	2	2.000	0.018
105	TALAIA	1	2	1.000	0.020
106	MASIMASI	1	2	9.000	0.011
107	FUGAFUGA	1	2	25.000	0.005
108	NIMU	1	2	26.000	0.004
109	ULUMANE	1	2	27.000	0.003
110	`ULUTUNU	1	2	31.000	0.001
111	PALU	1	2	4.000	0.014
112	MELEI	1	2	18.000	0.000
113	MANUMANU	1	2	7.000	0.016
114	PA KAO KAO	1	2	9.000	0.015
115	MALAU FATU	1	2	11.000	0.014
116	MALAU PU`U	1	2	12.000	0.013
117	MOANA ULI	1	2	8.000	0.009
118	VETE	1	2	23.000	0.005
119	LALAFI	1	2	26.000	0.003
120	MU MATA VAIVAI	1	2	31.000	0.000
121	FOAFOA	1	2	17.000	0.010
122	ASIASI	1	2	27.000	0.004
123	SA`ULA	1	2	29.000	0.003
124	PALA MALAU	1	2	10.000	0.006
125	ANAE AFA	1	2	13.000	0.002
126	SHELLS	1	2	3.000	0.012
127	OPIHI	1	2	12.000	0.009
128	NUUFE`E	1	2	44.000	0.000
129	SOGELAU	1	2	8.000	0.007
130	`UI	1	2	5.000	0.014
131	MAUA`E	1	2	11.000	0.003
132	MUMU	1	2	12.000	0.002
133	TULAIGA	1	2	4.000	0.013
134	FAAMAAU	1	2	17.000	0.010
135	KUNANE	1	2	22.000	0.005
136	SESEMA	1	2	23.000	0.004
137	MANASE	1	2	26.000	0.002

Table 29. Marine Species, by Village and Unit

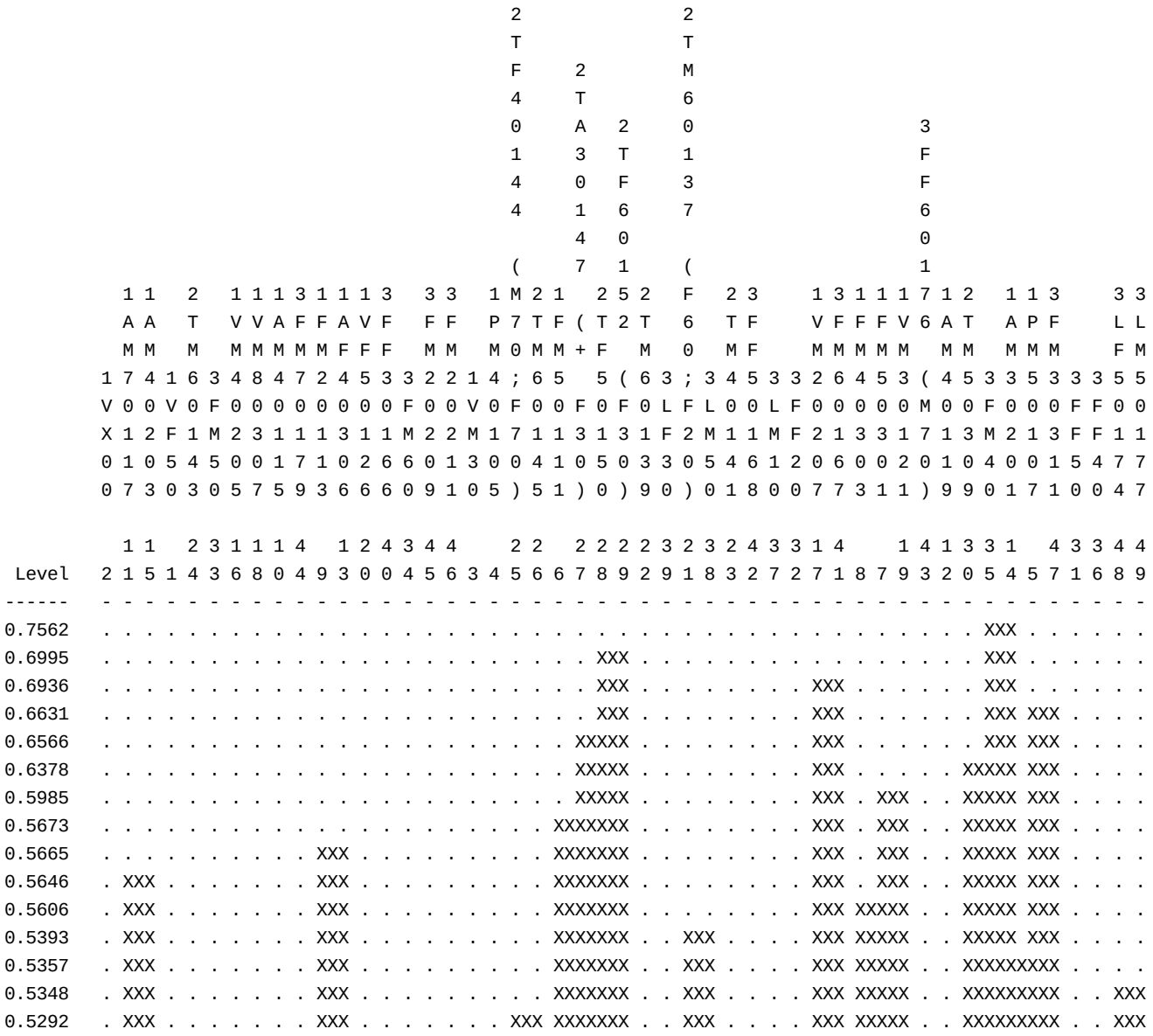
	TUTUILA				TA`U	OFU	
Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Ofu	Olosega
`ali`ao			X		X	X	X
alili	X	X	X	X	X	X	X
alogo	X	X	X	X	X	X	X
`ama`ama				X	X	X	X
anae		X		X	X	X	X
asoama		X				X	
`ata`ata		X		X		X	
atu			X	X	X		X
atule			X	X		X	X
`ava`ava				X		X	
fai				X		X	
faisua				X	X	X	X
fe`e		X	X	X	X	X	X
filoa		X		X	X	X	
fuafua					X	X	
fuga	X	X	X	X	X	X	
gatala		X	X	X	X	X	X
i`a sina				X		X	X
i`a usi				X	X	X	
ise				X		X	X
laea	X	X	X	X	X	X	X
lalafutu				X			
lape					X		X
laumei		X		X		X	
limu						X	X
lo				X			X
loli		X	X	X		X	

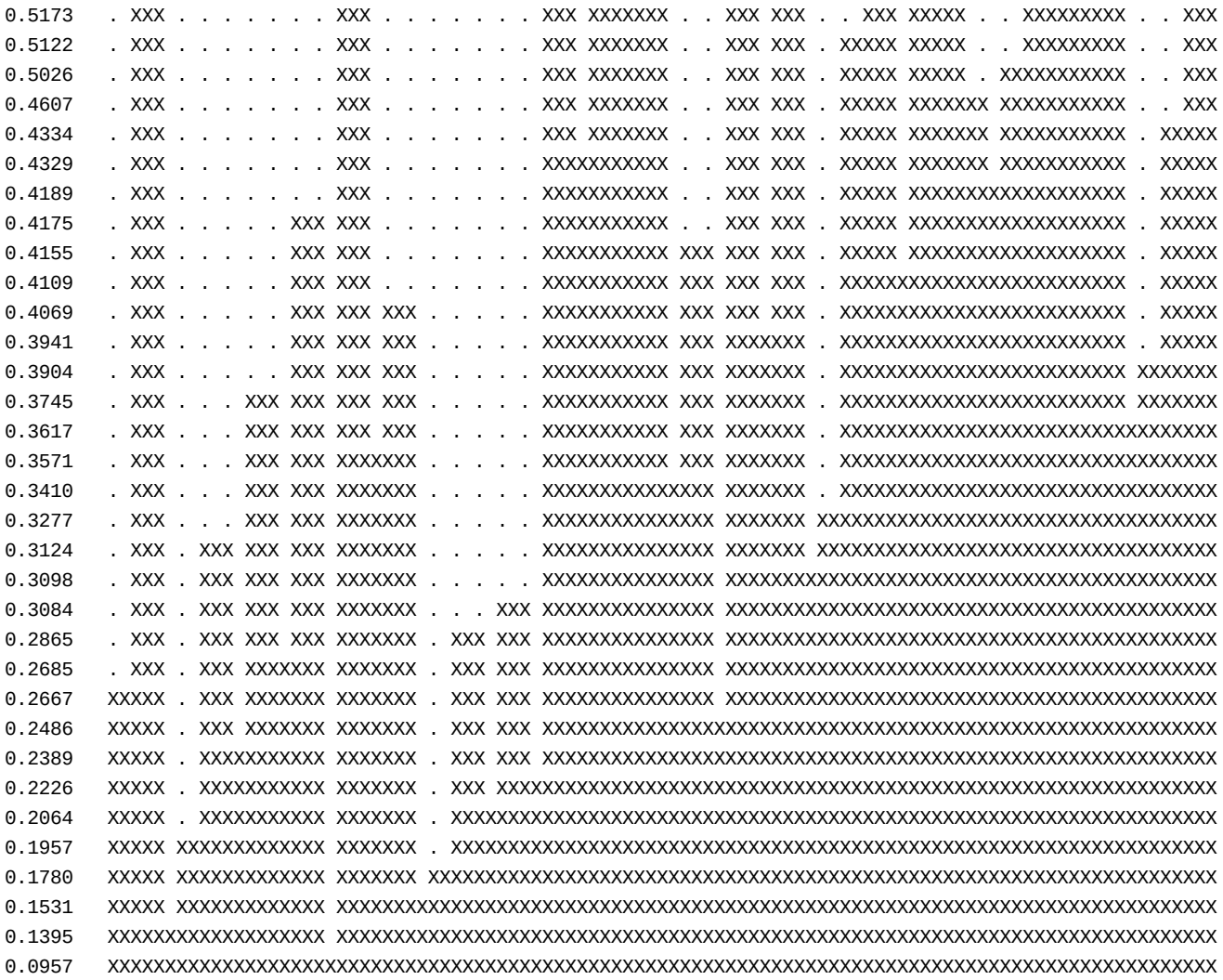
Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Ofu	Olosega
lupo				X		X	X
mala`i						X	
malali						X	
malau	X	X	X	X	X	X	X
malauli		X	X	X	X	X	X
malie	X	X		X		X	X
mamao					X	X	
manini		X		X	X	X	X
maono					X	X	
masina						X	X
mata`ele		X			X		
matapisu			X	X	X	X	X
matapula				X	X		
matulau		X				X	
mu						X	
mutu		X			X	X	X
ofaofa				X		X	X
pa`a	X	X		X	X	X	X
palagi					X	X	
pala`ia							X
palolo					X	X	X
papa		X		X	X	X	
papata					X	X	
papatu					X		X
pipi				X			X
pone	X	X	X	X	X	X	X
pule				X	X		
pusi				X	X	X	X
safole				X	X	X	X

Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Ofu	Olosega
sapatu					X	X	
savane		X		X	X	X	X
sea						X	X
sisi	X				X	X	X
sue				X		X	X
sugale				X			
sumu		X		X		X	X
tagi		X		X		X	
taiva						X	
tautu				X		X	
tifitifi				X		X	
tuitui				X		X	X
tu`u`u				X	X	X	
ula	X	X		X	X	X	X
ulua				X			
ulutu`i					X	X	
ume				X	X	X	X
vana				X	X	X	X

items mentioned more than once

Figure 11. Cluster Analysis, Marine Species, All Units.

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0.4109
0.4069
0.3941
0.3904
0.3745
0.3617
0.3571
0.3410
0.3277
0.3124
0.3098
0.3084
0.2865
0.2685
0.2667
0.2486
0.2389
0.2226
0.2064
0.1957
0.1780
0.1531
0.1395
0.0957

Table 30. Animals and Birds, by Village and Unit

	TUTUILA					TA`U	OFU	
Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fituta	Faleasao	Ofu	Olosega
aleva	X						X	
atafa				X				
avi`i							X	
(cat)							X	X
(dog)				X			X	X
fua`o	X	X	X	X	X		X	X
fuia	X	X	X	X	X		X	X
gogo		X		X	X			X
iao	X	X	X	X	X		X	X
`isumu				X			X	X
lulu	X		X	X	X		X	X
lupe	X	X	X	X	X	X	X	X
manu`ainiu				X	X		X	
manuali`i	X	X	X	X	X	X	X	X
manuma				X	X			
manusina			X	X	X		X	X
manutagi	X	X		X	X		X	X
matu`u				X	X		X	X
miti		X			X		X	
moa	X			X				X
pe`a	X	X	X	X	X	X	X	X
pe`ape`a	X			X			X	X
pua`a	X	X	X	X	X	X	X	X
sega			X	X	X		X	X
tai`o				X	X			
tava`e		X	X	X	X		X	X
ti`otala				X	X			X

Samoan name	Pago Pago	Afono	Fagasa	Vatia	Fitiuta	Faleasao	Ofu	Olosega
tolai				X				
toloa								X
tuli				X	X		X	X
tuna	X	X		X				
uga	X				X		X	
uu	X	X		X	X	X	X	
ve`a	X	X		X	X		X	X

animals mentioned more than once

Table 31. Animals and Birds, Tutuila Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	LUPE	15	100	3.400	0.678
2	PE`A	13	87	4.154	0.509
3	FUIA	10	67	5.400	0.337
4	PIG	9	60	2.333	0.489
5	IAO	9	60	4.222	0.400
6	MANUTAGI	9	60	5.556	0.330
7	FUA`O	8	53	4.375	0.263
8	MANUALI`I	7	47	9.714	0.070
9	TAVA`E	7	47	7.714	0.182
10	GOGO	5	33	8.600	0.142
11	MANUSINA	4	27	6.500	0.139
12	LULU	4	27	8.250	0.135
13	UU	3	20	5.000	0.060
14	PE`APE`A	3	20	14.333	0.039
15	TI`OTALA	2	13	20.000	0.009
16	TULI	2	13	12.000	0.058
17	VE`A	2	13	16.000	0.029
18	MANUMA	2	13	17.000	0.014
19	MOA	2	13	11.500	0.047
20	ATAFA	2	13	14.000	0.044
21	SEGA	2	13	4.000	0.071
22	TUNA	2	13	7.000	0.008
23	SEGA VAO	1	7	5.000	0.056
24	VE`AVE`A ALAGI	1	7	17.000	0.024
25	SESEGAMAU`U	1	7	26.000	0.000
26	PATO	1	7	18.000	0.021
27	SEGA U`U	1	7	4.000	0.059
28	TOLAI	1	7	25.000	0.003
29	SHRIMP	1	7	5.000	0.013
30	MANUITI	1	7	22.000	0.011
31	BLACKBIRD	1	7	1.000	0.067
32	MOA AIVAO	1	7	3.000	0.055
33	ALEVA	1	7	5.000	0.042
34	MANU PALAGI	1	7	6.000	0.036
35	MANULUA	1	7	8.000	0.024
36	MITI	1	7	4.000	0.042
37	DOG	1	7	2.000	0.061
38	MATU`U	1	7	13.000	0.017

Table 32. Fauna, Tutuila Unit: Correlation of each respondent with group

		CORR
1	1VF20	0.33
2	1VX00	0.80
3	1VM30	0.73
4	1PM40105	0.41
5	1PM50107	0.51
6	1AM70117	0.74
7	1AM50305	0.62
8	1FF30112	0.56
9	1FM20113	0.67
10	1FM50301	0.69
11	1FM40303	0.66
12	1VM40121	0.63
13	1VM70123	0.53
14	1VM60135	0.69
15	1VM40205	0.79

Table 33. Animals and Birds, Ta'u Unit (Fitiuta)

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	LUPE	7	78	2.571	0.541
2	PE`A	6	67	2.667	0.370
3	FUIA	5	56	3.600	0.367
4	IAO	5	56	2.400	0.416
5	MITI	4	44	6.000	0.161
6	MANUTAGI	3	33	6.333	0.183
7	GOGO	3	33	7.333	0.162
8	VE`A	3	33	11.000	0.043
9	MANUALI`I	2	22	3.000	0.056
10	TULI	2	22	9.000	0.057
11	TI`OTALA	2	22	10.000	0.041
12	FUA`O	2	22	9.500	0.071
13	TAI`O	2	22	13.000	0.009
14	PIG	2	22	1.000	0.222
15	UU	2	22	2.500	0.111
16	SEGA	2	22	4.500	0.152
17	MATU`U	1	11	9.000	0.037
18	`AENO CRAB	1	11	2.000	0.000
19	MANUSINA	1	11	6.000	0.068
20	TAVA`E	1	11	5.000	0.077
21	LULU	1	11	4.000	0.078
22	MANUMA	1	11	14.000	0.000

Table 34. Animals and Birds, Ofu Unit

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	PE`A	9	75	3.778	0.520
2	FUIA	8	67	3.500	0.512
3	IAO	7	58	4.429	0.377
4	CAT	7	58	6.429	0.296
5	LUPE	7	58	4.429	0.405
6	VE`A	7	58	6.286	0.322
7	PIG	6	50	5.667	0.309
8	MANUSINA	6	50	8.000	0.152
9	DOG	5	42	7.000	0.181
10	LULU	5	42	7.000	0.170
11	TAVA`E	5	42	9.400	0.081
12	MANUALI`I	5	42	4.600	0.264
13	MANUTAGI	4	33	7.750	0.109
14	SEGA	4	33	5.000	0.212
15	TULI	3	25	3.333	0.185
16	FUA`O	3	25	8.000	0.140
17	MOA	3	25	3.333	0.133
18	UU	3	25	8.000	0.112
19	UGA	2	17	8.500	0.093
20	ISUMU	2	17	13.500	0.055
21	PE`APE`A	2	17	11.000	0.037
22	GOGO	2	17	10.000	0.074
23	PILI	2	17	12.500	0.064
24	AVI`I	2	17	9.500	0.079
25	MATU`U	2	17	6.500	0.095
26	TI`OTALA	2	17	6.500	0.111
27	MANUAINIU	2	17	11.000	0.042
28	ALEIAO (`ALI`AO?)	1	8	10.000	0.000
29	SEGA VAO	1	8	11.000	0.000
30	TOLOA	1	8	10.000	0.008
31	LAUMEI	1	8	7.000	0.028
32	`AMA`AMA	1	8	9.000	0.009
33	MOGAMOGA	1	8	17.000	0.017
34	LOATA	1	8	18.000	0.012
35	LOI	1	8	19.000	0.008
36	PI	1	8	20.000	0.004
37	ATUALOA	1	8	21.000	0.000
38	MITI	1	8	5.000	0.046
39	ALEVA	1	8	7.000	0.028

Table 35. Animals and Birds, All Units Combined

	ITEM	FREQUENCY	RESP PCT	AVG RANK	SALIENCE
1	LUPE	29	81	3.448	0.553
2	PE`A	28	78	3.714	0.478
3	FUIA	23	64	4.348	0.403
4	IAO	21	58	3.857	0.396
5	PIG	17	47	3.353	0.362
6	MANUTAGI	16	44	6.250	0.220
7	MANUALI`I	14	39	6.929	0.131
8	TAVA`E	13	36	8.154	0.122
9	FUA`O	13	36	6.000	0.174
10	VE`A	12	33	9.083	0.130
11	MANUSINA	11	31	7.273	0.126
12	GOGO	10	28	8.500	0.124
13	LULU	10	28	7.200	0.132
14	UU	8	22	5.500	0.090
15	SEGA	8	22	4.625	0.139
16	CAT	7	19	6.429	0.099
17	TULI	7	19	7.429	0.100
18	TI`OTALA	6	17	12.167	0.051
19	DOG	6	17	6.167	0.085
20	MITI	6	17	5.500	0.073
21	PE`APE`A	5	14	13.000	0.029
22	MOA	5	14	6.600	0.064
23	MATU`U	4	11	8.750	0.048
24	MANUMA	3	8	16.000	0.006
25	TUNA	2	6	7.000	0.003
26	ATAFA	2	6	14.000	0.018
27	ALEVA	2	6	6.000	0.027
28	UGA	2	6	8.500	0.031
29	ISUMU	2	6	13.500	0.018
30	SEGA VAO	2	6	8.000	0.023
31	MANUAINIU	2	6	11.000	0.014
32	AVI`I	2	6	9.500	0.026
33	TAI`O	2	6	13.000	0.002
34	PILI	2	6	12.500	0.021
35	BLACKBIRD	1	3	1.000	0.028
36	SEGA U`U	1	3	4.000	0.024
37	TOLAI	1	3	25.000	0.001
38	SESEGAMAU`U	1	3	26.000	0.000
39	MANUITI	1	3	22.000	0.004
40	MANU PALAGI	1	3	6.000	0.015
41	MANULUA	1	3	8.000	0.010
42	SHRIMP	1	3	5.000	0.006
43	VE`AVE`A ALAGI	1	3	17.000	0.010
44	PATO	1	3	18.000	0.009
45	MOA AIVAO	1	3	3.000	0.023
46	`AENO CRAB	1	3	2.000	0.000
47	LAUMEI	1	3	7.000	0.009
48	`AMA`AMA	1	3	9.000	0.003

49	ALEIAO (`ALI`AO?)	1	3	10.000	0.000
50	TOLOA	1	3	10.000	0.003
51	MOGAMOGA	1	3	17.000	0.006
52	LOATA	1	3	18.000	0.004
53	LOI	1	3	19.000	0.003
54	PI	1	3	20.000	0.001
55	ATUALOA	1	3	21.000	0.000

IX. Sites, Trails, and Cultural Landmarks

In this chapter we summarize interview material about culturally significant sites, features, and natural resources within the National Park. Our focus here is on particular locations; more general legendary and ethnographic material pertaining to Park lands was presented earlier, in the 'Ethnohistory' chapter.

Settlement Sites.

According to our informants, the village of Pago Pago was previously located high on the mountain (within Park land). This was during the times of conflict between chiefs within Samoa, and between rulers of Samoa with those of Fiji, Tahiti, and Tonga, when people were reluctant to live by the shore because others could arrive by boat and make trouble. One person told us that when the Samoan islands were discovered by Westerners in 1772, people already inhabited the present area known as Pago Pago and only two or three families still lived in the old high village. Another informant asserted that people from Pago lived in the mountain location until the late 1800s.

One elderly woman reported that her parents and others of that generation went up to the old village regularly when she was a child and slept there overnight in fale o'o (small houses). They collected sisivao (small snails) to make into garlands, and fau bark for what she called "hula skirts," among other things. One informant was shown what he called "the proper border" between Pago Pago and Vatia by his ancestor and has passed that information on to his sons. He claims that this is privileged information, and that other people in the village do not know where the border lies. There are presently at least two structures on Park land in Pago Pago, both belonging to families who farm the land there and occasionally use the small structures for sleeping. We were not told of any structures in Fagasa or Afono Park land. Local residents believe that one should maintain quiet and decorum in upland locations (now within the Park). They do not throw coconuts or shout, or otherwise made loud noises in the bush, out of respect for the ancestors.

The village of Fagasa was also previously located at the top of the mountain; one Fagasa resident estimated that this was about 200 years ago, in the time of his great-great-great-grandfather. The Park land belonging to Fagasa is less frequented now than in previous times. One informant asserted that the Fagasa/Pago Pago boundary is in dispute because many Fagasa families have used the coastline and planted crops beyond the official village boundary. We were told that the original village of Vatia was located at Vaisa, at the boundary between Afono and Fagasa. When Christianity arrived in Samoa in 1830

people began to relocate to the present site of Vatia. Vatia has its own song, which tells how the people took the trail over the mountain to Pago Pago and climbed the Pola to get food. One informant learned from his father that before 1700, Afono people moved up onto the mountain (within Park land) to escape an enemy. He indicated a flat area where that village was located (see Map 1). Afono's Park land is very steep and difficult of access; we were told that the Park area is off-limits to villagers now, and that the village is working with the government to keep people from going up there.

In approximately 1958-60, one informant in Fitiuta lived with his grandmother in a fale near Luatele. He walked down the mountain to school and then returned each day. The rock foundation from that fale remains. Another woman lived at Papalaina (see Map 2) within Park land when she was young, and at least one other man lived on the mountain at that time. None of our informants knew of people having lived at Luatele, nor has anyone heard of anyone living at Saua. Two informants told us it is said that there was a village near Ma'efu Cove long ago, perhaps a hundred or more years ago. One informant said that he has heard the village of Fitiuta was previously located elsewhere, perhaps at Solotagata.

In Fitiuta, people previously built stone walls to keep feral pigs on the ocean side and away from the plantations. Many sections of this wall remain. In years past, the only pigs in the mountains were a very few which had escaped, and people hunted them with dogs. Now that the wall is not maintained the pigs have proliferated in the bush.

We were told that Ofu village was previously located at To`aga. One informant estimated that in 1940-50 ten to twenty families still resided at To`aga. Another resident lived there from about 1955-56 until 1968, and then again in 1970. For most of that time, he reported, no other families lived there. He has heard that people lived at Fa`ala`aga and Muli`ulu before about 1950. Many Ofu informants stressed the importance of women wearing their hair up--especially at night, the inappropriateness of wearing bright red clothing, and the importance of not yelling or making other loud noises. These respectful behaviors are considered important in the entire area--reef, bush, mountain, and the vicinity of the road.

Sacred and Legendary Sites.

No specifically religious sites were reported within Pago Pago Park land. However, many sites in this area have legendary and/or quasi-religious significance. There are graves at the site of the old village of Pago Pago, as well as old building foundations and four-foot rock walls made of rocks carried from the shore. The graves are also marked with rocks. Some are very

long, and informants speculated that these might be of chiefs or of a taupou buried in a bonito boat. One resident tends three graves on Pago Pago Park land, all belonging to his ancestors (a great-great-grandfather, great-grandfather, and a third person thought to be a brother of one of those men). He described his great-great-grandfather's grave as perhaps twenty feet long. We were told by several informants that in the past Samoans were much bigger, hence the exceptional length of ancient graves. There are also many such graves on Fagasa Park land. One informant hypothesized that might be pigeon-snaring mounds rather than graves. Another resident countered that there are probably no pigeon mounds on Fagasa land, because they are usually found in much flatter areas where they are needed to get near the birds. In Afono's Park land there are graves in the Asifelefele area and at Vaisa, the original site of the village. One person speculated that the graves date from 1800 or earlier. In Vatia's Park land there are graves at Levaga, near the mountain top where people used to live, and there are mounds reputed to be old house foundations.

Some people avoid the uplands now lying within the Park because of reports of spirits. Tuiatua is the 'aitu traditionally associated with the Pago Pago Park area. Twice, just before the highest Pago Pago chief died, there was a tremendous rumbling noise from the Park area. It sounded like an earthquake but was not accompanied by tremors. According to one informant's older relatives, this sort of omen has also happened in the past. It is also said that when the manuali`i bird cries there it is a bad omen. One man who regularly tends his family's graves there said he has not seen or heard anything unusual, and he attributed this to his great-grandparents' protection. He reported that people go there now and cut down coconuts with a bushknife, and this was not done in his great-grandfather's time: he was taught as a child to climb the tree and carry the coconut down. He theorized that people may be molested by spirits in such locations because of this sort of modern transgression.

People in Fagasa are very familiar with the story of the mumu and atule as one explanation of the dolphins returning with schools of mackerel each year. One person said the dolphins return when there is an abundance of mackerel because they feed on the fish; others attribute the occurrence to the legend. The numbers of dolphins and mackerel have greatly diminished over the years. This is variously attributed to overfishing, the fact that people sell the mackerel, even though it is prohibited, or, according to one person, because the matai ran out to the ocean and told the mackerel not to come.

A big, flat rock called Ma`a-tu`u-laumeau (lit., "Gathering Leaf Rock") stands near the footpath between Afono and Vatia. In old times, travelers would pick nearby leaves of any tree and put them on the rock, and say something roughly translating to "Let

the road behind become longer and the road ahead shorter." This would hasten the journey.

On Ta'u, most of the Park land is virtually inacessible today, but there are many impressive geological and natural features within the Park boundary. There are three volcanic craters on Faleasao Park land: Olomatimu is at the peak of the mountain and gets the first rain, according to one person. Olomanu is the place where birds stay safely. Olotania is the other crater, but we were unable to document an explanation for the name.

Luatele (Judd's Crater) on Fitiuta used to be reachable by car in about 30 minutes, but since Hurricane Tusi, it has only been accessible by a difficult one to two-hour hike. There is a small opening in the crater, and in the past there were plantations inside. The plantations there were all destroyed by the hurricane, although 'ava still grows and is harvested there. In the past people kept fale there to stay in while tending their plantations. The smaller crater, Luala`itiiti, has many pe`a living in its trees--"hundreds," according to one informant. There is no way to go inside this crater.

The people of Fitiuta are very familiar with the stories about the two rocks at Luama`a, the creation of Tagaloa Ui at Oneone Sa, and the first kava ceremony at Saua. We were also told about Taisamasama, where Malietoa and Tuimanu'a held a kava ceremony and dipped the 'ava, which accounts for the fact that everything underwater is yellow. In the 1980s a man had cleared an area as a small park (located .1 mile from Si'u Point) and lived there on the mountain side of the road in a small shack for six years. He came across graves there and reburied the bones in the same place. The burials are said to date from the time of the fighting between Ta`u and Fitiuta. Solotagata is known as the place where Ta`u and Fitiuta last fought, and where Fitiutans above killed the Ta`u people by pushing them down the cliff as they tried to climb up. The large rocks below are said to represent the Ta`u people who died: one can see the position they were in when they fell.

There is a grave along the road past Fitiuta going toward Saua (located 2.5 miles from Si`u Point). This grave, of the chief Moaali`itele who died 50-60 years ago, is well tended and was recently cemented. It is surrounded with coral rocks and recent plantings. A lean-to structure behind the grave is where a family member stayed while he worked on the grave about a month before our visit. One man has marked many old graves in the Saua area. Many bones were found under a Pu`a tree next to the stream (1.3 miles from Si`u Point) when people cemented the stream. There are still many bones there, and likely some were cemented over before they were discovered.

When the road through Saua to Si`u Point was made, six burials were found about three feet down, each with a rock marking where the head was. These rocks are approximately 18 inches long with rounded holes near the tip. The villager who found them reburied the bones in the same area and buried the rocks with them. All but one of the rocks were later taken. He also built a wall to mark the graves. This is at 1.75 miles from Si`u Point on the mountain side of the road. This informant has marked well over 100 graves between Saua and Si`u Point. He often marked them with rocks which unfortunately were later moved by fisherman looking for hermit crabs. There are many graves at Liu, both above and before Ma'efu.

On Ofu, the Tui Olosega owns Sunu`itao Peak and down, having won it from the Tui Ofu long ago in battle. During that battle many heads were cut off and they are said to lie there there. No one told us of trails, caves or graves in that area, but there are said to be many bones remaining from that battle.

Trails.

One trail from Pago Pago goes into Pago Pago's Park land from Satala. During World War II, U.S. Marines used the mountain ridge as a trail. According to one informant, there are still telephone wires and ammunition there, especially between the TV tower and the ridge that goes down toward Vatia. In one area along the ridge there are rocks placed in a circle, the significance of which is unknown. Informants recounted legends about people disappearing while traveling along the trails, and these occurrences were usually attributed to 'aitu.

Another trail, no longer used, ran from Pago above Leloaloa to Vatia (see Map 1). It was a steep and difficult hike and might take a young person one and a half to two hours. As late as 1964, according to one person, the only way to travel between Pago Pago and Afono or Vatia was to hike over the mountain. Children would stay in Pago Pago for school during the week and then hike back to their homes on Friday afternoons. The trail over the mountain from Leloaloa to Vatia had cement steps about a thousand feet up. A couple of missionaries reportedly died there a few years back. Trails also ran through the Fagasa Park land, although the names are not now commonly known.

One informant told us that the Vatia trail was used as late as 1977. This person lived in Pago from Sunday to Friday to attend school, and then hiked home to Vatia over the trail on Friday afternoons. The fastest runners would carry the perishables obtained in Pago Pago; they would run down into Vatia with ice cream. At one point the U.S. government provided a boat which would pick up school children in the north shore villages and bring them to Pago Pago on Monday mornings and return them on Fridays.

Another trail from Vatia to Pago Pago was called Alasopo and was a steep and difficult climb. A villager familiar with the trail might take an hour and a half to make the hike, and others as much as 3-4 hours. People were no longer using the trail by World War II. There was a bad road accessible by 4-wheel drive only. One man who had the only 4-wheel drive vehicle drove the road two or three times a day and took passengers for two dollars. The trip took about an hour. We were told that it was actually quicker to take the trail. When the road was repaired in 1984-85 it was closed between 8am and 4pm and people again relied on the foot trail.

An Alao-'aitu ("ghost road") starts at Vaisa (at the boundary of Afono and Fagasa) and extends to Savai`i. According to one informant, this was used by Western Samoans during the war with Tonga: those who fought and died in Vaisa would then return home by following the well-carved road starting at the mountain and continuing along the ocean floor to Western Samoa.

On Ta'u below Fitiuta, an old rock footpath approximately six feet wide runs along the ocean side of the present road (slide 21). This is the former path and was used before the present road was built, around 1950. Also near Fitiuta, a narrow rock foot trail runs from Si'u Point and beyond to Ma'efu. People still use this trail to fish or tend their plantations beyond Si'u Point.

Caves.

In Pago Pago's Park land here are two caves (names unknown) near to each other with small bats living inside, according to one informant. (Marine Wildlife Services staff speculate that these are more likely the pe`ape`a swiflet.) There is also a cave near Vaisa Point, and bigger caves at Agapie Cove. In Fagasa there are caves at Fagatuitui Cove and at Matauta Point. We were told that Vatia has many caves, although we were not given names, locations, or specific histories.

Afono has many caves. Two small caves in the village's Park land are located at the big rock on Olo Ridge (slide 22). One is on the Afono side of the rock, and the other on the opposite side. This site was important in the past as an outlook, where someone would watch for enemies and alert the village to attacks from the ocean. Insect-eating bats live in another cave in Afono. The cave is visible at about 50 yards from the road and opens into a big pool. It is about 20 feet tall, goes about 50 feet back, and one has to duck to walk through it. Previously there were trees in front; now, since the hurricane, it is beachfront. A different cave, near Sliding Rock, Vaitoge, was also mentioned as harboring small insect-eating bats.

Water Resources.

There are streams on Park land belonging to Pago Pago and Vatia. Vaiula Stream lies within the Park, near the top of the mountain at Afono. One informant used to catch tuna (fresh-water eels) in that stream. On Fagasa land there are tufu (pools or springs of fresh water situated toward the seashore and sometimes brackish) that arose, according to legend, when Sina dropped her niu full of water. Fagasa also has many wells. According to one informant, there are no wells on Pago Pago Park land. We were told Vatia has many caves, although we were not given names, locations, or specific details. There are several waterfalls on Park land belonging to Fagasa and Vatia, including a small waterfall called Nu`ugaogao on Park land (location not noted). A waterfall about halfway between Vatia and Afono can be seen from the road.

Across from Vaisa`asa`a well at Fitiuta, on the ocean side in the area called Futu, there is fresh water when the tide goes out, and people bathe there (.6 miles from Si`u Point). Before Hurricane Tusi, people in Fitiuta could drive to the two streams Auvaitele and Laufuti to swim; now the road is blocked and one must walk. It is still a good swimming site where the water is very cold (see map). Mulitaisala stream in Fitiuta marks the beginning of the Park (2.1 miles from the end of the road at Saua). This is the river Pava floated down, according to legend; it marks the border between Saua and Fitiuta. If one stands at the end of the river facing the ocean, Pava's house was on the rise at left. On the right are low rocks which used to be Pava's swimming hole. Now the stream only flows during heavy rains now.

Vaito`a stream is just after Luama`a (toward Si`u). The Vaisa`asa`a well is at Saua, and is said to have been used by Tagaloa and his family. There is a well at Tufu, known simply as Tufu well. A well at Vaito`a on the mountain side of the road is known as Vaito`a or Tatatoto. One account says that this is where the baby Tagaloa was first bathed. Tagaloa simply pointed and told his followers to dig there for water, according to one story. Another well is found at 1.5 miles from Si`u Point. The Laufuti Falls are perhaps the most breathtaking physical feature found on the Fitiuta side of the Park. At present these are visible from the air or the sea, but are nearly inaccessible by foot. The coastal trail has fallen into disuse in recent years and is very rough.

On Ofu there is a well at To`aga, next to the Tuiofu's burial site. A former resident of To`aga reported that, years ago, the well was used for drinking, bathing, and cleaning dishes, and was kept clean. Although the well is situated at the foot of the mountain and is not on Park land, the complex is a notable site in the area and visitors to the Park may well be told about it. However, it is important to note that it is sa

for anyone not related to Misa to go to the well without permission from the family. It is particularly important for persons in the vicinity of the well to respect local custom regarding behavior in this area and to conduct themselves with reserve and decorum.

X. Conclusions

Summary of Findings.

The Samoan Islands lie within the humid tropics and support a characteristically Polynesian range of plants and fauna. Arable land in American Samoa is limited by the dramatic mountainous topography, and in the past Samoans in the eastern islands cultivated lands on some precipitous slopes. The Islands are subject to periodic cyclones, which have changed the landscape and affected patterns of human settlement. Archaeological work is lacking for the Tutuila Unit, but excavation has revealed one of the oldest continuous settlements in Samoa at To'aga, on Ofu. An archaeological survey has been conducted on Ta'u, including some Park lands.

The ethnohistorical literature on Samoa covers the western isles more extensively and in greater detail than Tutuila and Manu'a. However, Eastern Samoa figures prominently in pre-European creation myths. Tagaloa the creator god is said to have established his earthly dynasty near Fitiuta, at the easternmost point in the Samoan archipelago. Because of his relationship to the Tagaloa line, the Tui Manu'a title claimed precedence over all others in Samoa, and has historically been surrounded with special customs and taboos.

Tutuila, Ofu, Olosega, and Ta'u saw visits by the earliest Western visitors, Roggeveen and Bougainville. At the time of European contact Tutuila was politically subordinate to Upolu's Atua District. The Tutuila Unit lands were part of a district called Sua ma Vaifanua. Chief Mauga of Pago Pago was an important political player in early transactions with westerners. The Tui Manu'a asserted separate sovereignty for Manu'a until the American colonial period.

In this century the lifeways and customs of Manu'a were extensively studied and documented by the anthropologists Margaret Mead and Lowell Holmes. Tutuila has received relatively little attention from anthropologists in comparison to Manu'a.

The National Park supports agricultural crops and domestically useful plants and woods that are found throughout the Samoan chain. Before the blight, taro was probably the primary food crop grown on Park lands. Banana and coconut are the two most important crops currently grown in the Park, with ta'amu and breadfruit of secondary importance. Tutuila Park lands are less extensively cultivated at present than Park lands on Ta'u and Ofu. Fitiuta Park lands are intensively cultivated for subsistence crops. The narrow strand of Park land on Ofu supports a more limited range of food crops, but is a source of a number of gathered medicinal plants. Medicinal plant knowledge and treatment is an important cultural resource connected to the

Park, especially on Ofu.

Marine resources are abundant within the National Park, in both variety and quantity. Park reefs and offshore fisheries are heavily utilized by local residents. In preferred species, techniques, and the gender division of labor, there is significant cultural commonality across the three Park Units. Ta'u and Ofu residents rely heavily on marine resources for their daily food; some locally caught species enter into gift exchanges with relatives on Tutuila. Some surplus fish and shellfish are also sold to neighbors and/or buyers in Pago Pago. Given the minor and individualistic scale of this commercial activity, we suggest that Park management carefully consider the extent to which it should be regulated. However, we recommend that current Park policy should be clearly communicated and enforced where scarce species, such as certain exotic shells, are involved.

The lupe and pe'a are the most frequently mentioned animals found within the Park. Feral pigs were cited as more numerous now than previously, and were identified as a destructive nuisance in bush plantations. Of possible concern is the frequent mention of feral cats in the Ofu Unit. Informants discussed past hunting activity, but residents are well aware that this is now prohibited.

Local Perceptions of the Park.

Virtually everyone we interviewed is aware of the National Park, and most respondents feel positively about the Park's presence and the terms of the lease agreement. There are, however, some common misconceptions about the Park and its impacts on local resource use. Several residents asked us when the National Park was "going to start." Many people do not understand that the Park is already present in their area. We did not probe these perceptions in depth, but some respondents evidently expect the Park to bring more tourist traffic. Others expect employment opportunities to materialize and/or Park personnel to be on the scene full-time. Presumably, when Park Service signs or other tangible indicators are put in place, the Park will seem more "real" to local residents. There is also some confusion about where the Park is located. This is understandable since the boundaries are not marked at present.

Most of our informants seem to understand that traditional uses of Park lands and fisheries will continue under the agreement. However, a significant minority expressed uncertainty and concern on this point and further public education is needed. One matai reportedly instructed his relatives not to plant in Park lands, telling them that they are no longer "allowed" to go there and utilize bush resources. Most villagers are not worried about the Park's impact on fishing and reef gathering but, again, a minority expressed fear that such activities may be forbidden

by the Park Service in future, or that an influx of visitors will ruin local marine habitats. Since Park personnel are unlikely to be a significant local presence in the near future, we suggest that the Park Service consider developing a continuing public information program aimed at the participating villages. Relying on village councils, matai, and visiting officials to convey Park policies may not be adequate to dispel misconceptions and allay concerns.

Local residents have other concerns about visitor traffic in the Park: specifically, they worry that visitors may not respect Samoan customs and sensibilities. Informants mentioned such issues as women wearing scanty attire while bathing, women wearing their hear long on Ofu, and anyone making inappropriate loud noises in bush areas such as To'aga.

Residents do, however, appreciate the economic benefits that the Park has brought and is likely to bring in future. Everyone knows that the Park has resulted in the payout of considerable sums of money to local people, and several informants look forward eagerly to future payouts. Some residents are disgruntled about the specifics of the distribution in their village. The people in Faleasao were unhappy that they had not yet received their money. In Vatia, some informants were displeased with the division of the funds; though villagers have undifferentiated access rights in the Park, only households with specific land claims within Park boundaries received money. Other households received nothing, resulting in caused some internal dissension. In Fitiuta, even though only part of the village has land within the Park boundaries, the money was distributed to all of the families in the village; this was perceived as a more equitable arrangement.

Recommendations for Further Research.

To our knowledge, no archaeological work has been done in the Tutuila Unit of the National Park of American Samoa. Archaeological survey of Park lands on Tutuila is needed to document the presence of coastal, interior, and upland sites. Subsequent excavations in selected areas would reveal changes in material culture, settlement, and environment over time. The Park also offers many opportunities for underwater archaeology, which likely would discover some of the oldest habitation sites in American Samoa.

We feel that our ethnohistorical research on the lands of the National Park of American Samoa is adequate for the purposes of an assessment of cultural significance and resource use. But in many ways the ethnographic research conducted for this study falls short of the ideal in anthropology. This report has been based largely on interviews with a small number of local residents over a relatively short period of time. Only a few

days were spent in each village, and our pool of respondents must be characterized as a "convenience sample." We necessarily had to rely on informants' retrospective accounts, which are not considered reliable as documentation of actual practice. A more thorough and accurate account of current use of Park lands and resources would require an extended period of residence in the affected villages, allowing for day-to-day participant observation and systematic data collection over a longer period of time.

In particular, agricultural practices and marine resource use could be documented more fully and accurately by an ecologically-oriented ethnographer with an extended period of research. Our findings revealed cultural continuity in Samoan cultivation practices, fishing, and marine foraging within the Park. A longer period of participant observation and ecological research would document precisely the range of species found and the frequency with which they are taken over the course of the year, rather than relying on verbal reports.

The domain of medicinal plants and traditional healing proved to be an unexpectedly rich area of cultural knowledge and practice. Particularly in Manu'a, this easily merits an extended, long-term study that could be the basis of a dissertation-length report. We felt that we had barely "scratched the surface" of our informants' knowledge on this subject, and we hope that further research can be conducted here in the not-too-distant future. Herbal medicine in Manu'a would be an excellent dissertation topic for a medical anthropology student, or could be the subject of a tightly focused, shorter-term study by an experienced researcher.

American Samoa in general, and Ofu and Ta'u in particular, have encountered relatively little tourist traffic to date. As the Park attracts more visitors, local attitudes will undoubtedly change in some direction. We recommend that periodic on-site assessments be undertaken to gauge the impact of tourism on local resources and residents' perceptions. This seems particularly important if Park personnel will not be on the scene full-time. With periodic short-term research, tensions and potential problems could be identified before they become acute.

Lastly, the freelist technique employed in this study is designed to be the first step in a series of systematic cognitive methods. These methods allow researchers to investigate local categories and distinctions--such as in food crops, edible fish, and ethnobotanical lore--and also to document attitudes more systematically. Future research could begin with the freelist data collected here, and explore Samoan knowledge and ways of classifying the species utilized. Further survey-type research employing these techniques would also be a valuable means of gauging changes in local sentiment toward the Park over time.

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Forsyth, Cynthia. 1983. *Samoan Art of Healing: Description and classification of the current practices of the Taulasea and Fofo*. Dissertation, Psychology, U. S. International University. Ann Arbor: University Microfilms International.
Useful for its appendices on Samoan medicines and plants used.

Fowler, H.W. 1932. *Fishes obtained at Samoa in 1929*. Honolulu: Bernice P. Bishop Museum.
This manuscript summarizes information collected by Dr. Erling Christophersen [q.v.] in 1929--162 specimens and 66 species collected at Upolu, Savai`i and Pago Pago harbor. Taxonomic names only are given. This information is technical with no ethnographic observations.

Fraser, John. 1896. Folk song and myths from Samoa. *Journal of the Poynesian Society* 5:171-83.

1897. Folk song and myths from Samoa. *Journal of the Poynesian Society* 6:19-36, 67-76, 107-22.
Fraser's creation myth and other stories were collected by the LMS missionary and etymologist Pratt, who visited Manu`a in 1839. Fraser was not so much interested in the ethnographic context and specific cultural meaning of these tales, as in their possible relationship to other non-Western creation stories. As with any early non-Western oral traditions, these are difficult to interpret and evaluate without substantial cultural knowledge, not possessed by most foreigners.

Fraser, John, T. Powell, and G. Pratt. 1892. The Samoan story of creation-- a 'tala.' *Journal of the Polynesian Society* 1:164-189. The Samoan creation story in both Samoan and English, based on oral traditions recorded by LMS missionaries. Fraser's introduction calls this version the one from which others were derived.

Gilson, Richard P. 1970. *Samoa 1830-1900: The Politics of a Multi-Cultural Community*. Melbourne: Oxford University Press.
Gilson's is the authoritative history for pre-colonial Samoa. Though largely focused on Western Samoa, it also covers events in Tutuila and Manu'a. Particularly excellent are the insightful, culturally sensitive accounts of mission history, chiefly dynastic conflicts, the kingship dispute, and Western "Great Power" rivalries.

Goo, F.C., and A.H. Banner. 1963. *A Preliminary Compilation of Samoan Animal and Plant Names*. Honolulu: Hawai`i Marine Laboratory, U.H.
A secondary source, drawn from publications (most of which appear elsewhere in this bibliography.)

Goodman, Richard A. 1971. Some 'aitu beliefs of modern Samoans. *Journal of the Polynesian Society* 80:463-79.
The article is based on research in Western Samoa, but includes some interesting material on medicinal plants used to treat ma`i 'aitu. The data are useful for comparison with herbal knowledge and practice in American Samoa.

Gray, J.A.C. 1960. *Amerika Samoa. A History of American Samoa and its United States Naval Administration*. Annapolis, Md.: U. S. Naval Institute. Reprint edition, 1980, New York: Arno.
The author was the last senior medical officer stationed in American Samoa. He served there from 1949 to 1951. Some of Gray's material on legendary and Western Samoan history is flawed, but his treatment of events in American Samoa is careful, apparently authoritative, and accessibly written. This is an important and valuable book for researchers because it is the only published history available on American Samoa, 1900-1951.

Green, R.C., and J.M. Davidson. 1974. A radiocarbon and stratigraphic sequence for Samoa. In *Archaeology in Western Samoa*, Vol. I. R.C. Green and J.M. Davidson, eds. Pp. 212-224. Auckland: Auckland Institute and Museum Bulletin 7.
The authors summarize the chronological conclusions from their extensive archaeological field work in Western Samoa.

Green, R.C., and J.M. Davidson. 1974. A radiocarbon and

stratigraphic sequence for Samoa. In *Archaeology in Western Samoa*, Vol. II. R.C. Green and J.M. Davidson, eds. Pp. 212-224. Auckland: Auckland Institute and Museum, Bulletin 7.
The authors synthesis results for their large project in Western Samoa. This paper focuses on chronology and settlement pattern change.

Hatakeyama, T.G. 1969. *The copra industry of the Manua Islands and Swains Island of American Samoa*. Oleagineux: Revue internationale des corps gras 24(6, June 1969):357-360.
The author argues for the economic benefits if copra production in Manu`a were to be increased. Mentions that there have only been two commercial plantations in American Samoa, both on Tutuila, and that copra production in Manu`a has always been by individual producers.

Herdrich, David J. 1991. Towards an understanding of Samoan star mounds. *Journal of the Polynesian Society* 100(4):381-435.
In this paper the author reviews ethnohistoric and archaeological evidence for star mound function and variability.

Herdrich, David J. and Jeffrey T. Clark. 1993. Samoan Tia `ave and Social Structure: Methodological and Theoretical Considerations. In *The Evolution and Organization of Prehistoric Society in Polynesia*. M.W. Graves and R.C. Green, eds. Pp. 52-63. Auckland: New Zealand Archaeological Association Monograph 19. This paper is a survey of a special class of sites in Samoa known as "star mounds." The authors report field research on eastern Tutuila and discuss the structural characterisitics, distribution, and function of these sites.

Hill, Harry B. 1978. *The use of nearshore marine life as a food resource by American Samoans*. M.A. Thesis. Honolulu: Pacific Islands Study Center.
Hill describes the extent and patterns of reef subsistence fishing in the Pago Pago Bay area, between Faga`itua and Malaloa (ie., not in Park area.)

Holmer, Richard N. 1980. Mt. Olo Settlement Pattern Interpretation. In *Archaeological Excavations in Western Samoa*. J.D. Jennings and R.N. Holmer, eds. Pp. 93-103. Honolulu: Bishop Museum Press.
This chapter describes the extensive structural remains at Mt. Olo on `Upolu Island. The author interprets the remains at the level of individual structures, household units, residential wards, and communities. A chronology of occupation is proposed.

Holmes, Lowell D. 1957. Ta`u: Stability and change in a Samoan village. reprint no.7. *Journal of the Polynesian Society* 66(3, September):301-338.
Most of this material also appears in Samoan Village.

Holmes, Lowell D. 1957. *The restudy of Manu`an culture: a problem in methodology* [microform]. Doctoral dissertation. no. 23, 514. Ann Arbor: University Microfilms.
Holmes' research was cast as a "restudy" of Margaret Mead's earlier work. The important data on resource use is published in Samoan Village.

Holmes, Lowell D. 1961. The Samoan kava ceremony. *Science of Man* 1(2):46-51, 57.

Holmes, Lowell D. 1976. The function of kava in modern Samoan culture. In *Ethnopharmachological Search for Psychoactive Drugs*. Daniel H. Efron, et al., ed. Pp. 107-118. Washington: National Institue of Mental Health.
The above articles elaborate material on kava collected during his research visits to American Samoa.

Holmes, Lowell D. 1974. *Samoan Village*. New York: Holt, Rinehart and Winston, Inc.
An extremely detailed, accessibly written ethnography of village life in American Samoa. Resource use is treated in depth. The ethnography is based on fieldwork in 1954 (eleven months) and 1962-63 (fifteen months). The principle focus is on Manu`a (Fitiuta and Ta`u Village) with some data from Tutuila.

Holmes, Lowell D., and Ellen R. Holmes. 1992. *Samoan Village: Then and Now*. 2nd edition. Fort Worth: Harcourt Brace Jovanovich. This is the revised edition of Samoan Village, with data on change collected on subsequent visits, the last in 1988.

Hunt, D. 1923. *Samoan medicines and practices*. U.S. Naval Medical Bulletin 19(2):145-152.
This includes a comment on the difficulty of securing lists of medicines (quoted in Whistler, p. 60).

Hunt, T.L., and C. Erkelens. 1993. The To`aga ceramics. In *The To`aga Site: Three millennia of Polynesian occupation in the Manu`a Islands, American Samoa*. P.V. Kirch and T.L. Hunt, eds. Pp. 123-149. Berkeley: Contributions of the University of California Archaeological Research Facility.
This chapter describes the analysis of archaeological ceramics from the To`aga site.

Hunt, T.L., and P.V. Kirch. 1987. *An archaeological*

reconnaissance of the Manu`a Islands, American Samoa. Report on file. Pago Pago: Historic Preservation Office, Coastal Zone Management Office, Government of American Samoa.
This report describes the findings of initial archaeological reconnaissance in the Manu`a Islands.

Hunt, T.L., and P.V. Kirch. 1988. An archaeological survey of the Manu`a Islands, American Samoa. *Journal of the Polynesian Society* 97:153-183. This paper describes the results of archaeological survey in the Manu`a Islands.

Hunt, T.L., and P.V. Kirch. In press. Natural and human-induced palaeoenvironmental change on Ofu Island, Samoa. In *Historical Ecology in the Pacific Islands: Prehistoric Environmental and Landscape Change*. P.V. Kirch and T.L. Hunt, eds. New Haven: Yale University Press.
Hunt and Kirch describe the natural and human-induced environmental changes for Ofu Island's 3,000 year prehistory.

Jennings, Jesse D., and Richard N. Holmer. 1980. Archaeological Excavations in Western Samoa. *Pacific Anthropological Records*, vol. 32. Honolulu: Bishop Museum.
Report of archaeological field research on western `Upolu and Manono Islands. Much of the work focuses on late prehistoric settlement pattern.

Jordan, D.S. and A. Seale. 1906. *The fishes of Samoa: Description of the species found in the archipelago, with a provisional checklist to the fishes of Oceania*. Bulletin of the Bureau of Fisheries 25 (December 15):173-455.
Includes a section by W.E. Safford "Glossary of principal words composing native names of Samoan fishes." Based mainly on a trip between February and May, 1888. Scientific identifications by Jordan and Seale include 1704 species. Many have Samoan names recorded. Includes color illustrations.

Kirch, P.V. 1993. Ofu Island and the To`aga Site: Dynamics of the natural and cultural landscape. In *The To`aga Site: Three millennia of Polynesian occupation in the Manu`a Islands, American Samoa*. P.V. Kirch and T.L. Hunt, eds. Pp. 9-22. Berkeley: Contributions of the University of California Archaeological Research Facility.
Kirch gives an overview of the natural history, resources, and human use of Ofu Island, with special emphasis on To`aga.

Kirch, P.V., and T.L. Hunt (editors). 1993. *The To`aga Site: Three millennia of Polynesian occupation in the Manu`a Islands, American Samoa*. P.V. Kirch and T.L. Hunt, eds.

Berkeley: Contributions of the University of California Archaeological Research Facility.
This collection describes the results of survey, excavations, and anlayses of archaeological materials from To`aga, Ofu Island, Manu`a.

Kramer, Augustin. 1942. *The Samoa Islands: An outline of a monograph with particular consideration of German Samoa*, Vol. 2. Translation, mimeo. Wellington, New Zealand. Originally published 1902, Stuttgart.

Kramer, Augustin. 1994. *The Samoan Islands: An outline of a monograph with particular consideration of German Samoa, Vol. 1*. Theodore Verhaaren, trans. Honolulu: University of Hawai`i Press.
Kramer's two-volume compendium based on research in the 1890s is a priceless resource on Samoan history and culture. Though based primarily on work in Western Samoa, the ethnographic material is also relevant for American Samoa. Kramer spent six days on Manu'a and documented village and political structure in detail. He apparently spent less time on Tutuila and material for that island is somewhat less complete. Kramer's work is considered so authoritative that it has been used as a legal document in the Lands and Titles court. For decades the only available English edition was a mimeographed translation (1942) printed in limited numbers by the New Zealand colonial administration. The new Verhaaren translation (1994) at last makes this work widely available. Volume 1 covers the genealogies, oral traditions, and political structure of Samoa. Volume 2, also due to be published by the University of Hawaii Press, covers material culture.

La Perouse, Jean F. G. de. 1969[1799]. *A Voyage Round the World, Performed In the Years 1785, 1786, 1787, and 1788*, by the Boussole and Astrolabe. 2 volumes. London: G. G. and J. Robinson et al. Reprint ed., New York: Da Capo Press.
His visit in December 1787 to the north shore of Tutuila (Fagasa and A'asu) and the "massacre" on December 11 are documented in Volume 2, pages 121-66.

Leach, H.M. and R.C. Green. 1989. New information for the Ferry Berth Site, Mulifanua, Western Samoa. *Journal of the Polynesian Society* 98:319-329.
The authors present evidence for the chronology and geologic context of the submerged Lapita site on Upolu Island.

Leach, H.M. and D.C. Witter. 1987. Tataga-Matau 'rediscovered.' *New Zealand Journal of Archaeology* 9:33-54.
Leach and Witter describe recent archaeological work at the Tataga-matau basalt adze quarry site on western Tutuila.

Leach, H.M. and D.C. Witter. 1990. Further investigations at the Tataga-matau site, American Samoa. *New Zealand Journal of Archaeology* 12:51-83.
The authors provide results from archaeological survey of the Tataga-matau basalt adze quarry on western Tutuila.

Lloyd, C.G. and W.H. Aiken. 1934. *Flora of Samoa*. Bull. of the Lloyd Library & Museum of Botany, Pharmacy, and Materia Medica 33((Bot. Ser. 4)):1-43.
Based on a five month trip in 1904/05 to Upolu only, this monograph lists descriptions, botanical identification, some uses, and a few Samoan names.

MacPherson, Cluny and La`avasa. 1990. *Samoan Medical Belief and Practice*. Auckland: Auckland University Press.
Pages 208-21 covers the various parts of plants that are used in medicinal preparation, such as bark scrapings, roots, leaves, the `aile stage of the coconut, mature coconuts, flowers, ferns, vines. Also described are salt and fresh water preparations, as well as the use of smoke.

Martin, Marie Tisdale. 1961. *Samoan Interlude*. London: Peter Davies.
Anecdotal, impressionistic account of life in American Samoa. The author's husband was an M.D. on Tutuila for two years in the late 1950's. This work is mainly a stereotypic view of "South Pacific natives".

Mayr, Ernst. 1945. *Birds of the Southwest Pacific. A field guide to the birds of the area between Samoa, New Caledonia, and Micronesia*. New York: Macmillan.
Species indentification. Includes local names (with non-standard spellings.)

McCuddin, Charles R. 1974. *Samoan medicinal plants and their usage*. Study report, Office of Comprehensive Health Planning, Charles R. McCuddin, Director, Department of Medical Services, Government of American Samoa, September, 1974.
Very detailed description of plant medicines, medicine preparations, plant habitats, and illnesses.

Mead, Margaret. 1928. *Coming of Age in Samoa*. New York: William Morrow and Company.
Based on six months residence at Fitiuta in 1926, this is Mead's popularly written account of her fieldwork in Manu'a. Though focusing on adolescence, it includes many useful cultural observations and details on people's daily work activities.

Mead, Margaret. 1969. *Social Organization of Manu'a*. Bulletin No. 76. Honolulu: Bernice P. Bishop Museum.
Still a classic, Mead's carefully constructed technical monograph contains valuable data on village social structure and the chiefly lines of Manu'a. With her discussion of ceremonial exchanges and the brother/sister relationship, Mead presaged the structural and gender concerns of 1970s+ anthropology.

Methodist Church in Samoa. 1985. *O le Tusi Fa'alupega o Samoa Atoa*. Apia, Western Samoa: Methodist Printing Press.
This is the latest edition of the official ceremonial greetings (fa'alupega) for all islands, districts, and villages in the Samoan archipelago. These must be used by orators in any public ceremonial context where representatives of different localities are gathered together. Also listed are the major titles for every village, the names of the chiefs' kava cups, and the ceremonial names of other important personages such as the head of the 'aumaga and the taupou.

Milner, George B. 1966. *Samoan Dictionary: Samoan-English, English-Samoan*. London: Oxford University Press.
Milner's is considered the authoritative full-length dictionary of modern Samoan. It is based on fieldwork in Western Samoa from February 1955 to January 1956, and in American Samoa from November 1955 to January 1956, with a follow-up visit to both Samoas in 1959.

Moore, Reuel S. and Joseph R. Farrington. 1931. *The American Samoan Commission's visit to Samoa, September-October 1930*. Washington: Government Printing Office.
Includes descriptions of their ceremonial welcome by Samoans, and some data on conditions in the colony. However, the observations are not systematic or culturally informed, and the report is not as ethnographically useful as it might have been.

Murray, A. W. 1876. *Forty Years' Mission Work in Polynesia and New Guinea, from 1835-1875*. London: James Nisbet and Co.
Murray was the first LMS missionary in Tutuila, serving in Samoa from 1836 to 1870. The book is almost entirely about Samoa and is particularly useful for accounts of mission history, early harbor commerce at Pago Pago, and the "Great Awakening" revival on Tutuila between 1839 and 1842.

Muse, C., and S. Muse. 1982. *The Birds and Birdlore of Samoa. O manu ma tala`aga o manu o Samoa*. Walla Walla, Wash.: Pioneer Press.
This was written as a guide for bird watchers. The Muses' research included six months of intensive field work in

Western and American Samoa in 1979. Species identification and Samoan names are also based on Ashmole 1963 and Pratt 1893. Legends are from Stuebel and Herman, Tala o le Vavau and E. Schultz Samoan Proverbial Expressions.

Nagaoka, L. 1993. Faunal assemblages from the To`aga Site. In *The To`aga Site: Three millennia of Polynesian occupation in the Manu`a Islands, American Samoa*. P.V. Kirch and T.L. Hunt, eds. Pp. 189-216. Berkeley: Contributions of the University of California Archaeological Research Facility.
Nagaoka reports the analysis of faunal remains recovered from archaeological excavations at To`aga. She provides evidence for subsistence stability in marine resources taken from the reef at To`aga for the island's 3,000 year prehistory.

Nakamura, S. 1984. *Soil Survey of American Samoa*. Washington DC: Soil Conservation Service, U.S. Department of Agriculture.
This is the soil survey for American Samoa. It provides detailed maps of descriptions of soil types as well as information on slope, land use, and agricultural potential.

Natland, J.H. 1980. The progression of volcanism in the Samoan liner volcanic chain. *American Journal of Science* 280-A:709-735.
Natland reports recent evidence for the geological history of the Samoan chain.

Nelson, R.E. 1964. *A Look at the Forests of American Samoa*. Berkeley: Pacific Southwest Forest and Range Experimental Station.

Nelson, R.E. and T. Annastas. 1966. *Forestry views of American Samoa*. Unasylva 20(4):23-7.
The above two articles are the same. They include a table listing forest trees by Samoan name, with botanical identifications.

Osborn, L.W. 1989. *Agricultural products in Samoa*. Report dated February 17, 1889 in Samoa. United States Consular Reports 57 (212, May 1898):65-68.
This is useful ethnohistorically as an indicator of the important cultigens of the era.

Parham, B.E.V. 1972. *Plants of Samoa. A guide to their local and scientific names with authorities; with notes on their uses, domestic, traditional and economic*. Information Series - No. 85. Wellington.
Includes detailed notes of use, distribution, and habitat. The author was Director of Agriculture, Forestry, and Fisheries in Western Samoa from 1956 to 1964. Plants are

listed by the Samoan name. Botanical identifications that have been published elsewhere, as well as some of Parham's own identifications, are given. Many Samoan names have several different botanical identifications, and Whistler (1984) faults the work for doing little to address identifications in the literature that are clearly errors.

Park, Chai Bin. 1979. *Population of American Samoa*. ESCAP/SPC Country monograph series, no. No.7.1. UN Economic and Social Commission for Asia and the Pacific, Bangkok; South Pacific Commission, Noumea.
The title is self-explanatory: gives demographic data.

Pereira, Janet Aileen. 1983. *A Check List of Selected Materials on Samoa. Bibliography. Western Samoa*: Samoan History Writing Project, University of the South Pacific Extension Centre.
The most relevant sources appear elsewhere in this list.

Phillips, Charles. 1890. *Samoa, Past and Present: A Narrative of Missionary work in the South Seas*. London: John Snow.
Contains a small amount of very general ethnographic detail, all covered in more detail in other sources.

Pirie, P. 1964. *Geography of Population in Western Samoa*. Unpublished Ph.D. thesis. Canberra: Australian National University.
Pirie outlines historical changes in Western Samoa's population, with implications for loss with the introduction of European disease.

Powell, T. 1877. On the nature and mode of use of the vegetable poisons employed by the Samoan Islanders. *Journal of the Proceedings of the Linnean Society, Botany* 16:55-60.
This is useful for making comparisons over time. There appears to be signficant continuity with modern knowledge and practices.

Pritchard, Mary J. 1984. *Siapo: Bark Cloth Art of Samoa*. Special Publication no.1. American Samoa Council on Culture, Arts and Humanities.
Pritchard gives detailed information on all aspects of processing and manufacture, with excellent photos.

Rensch, Karl H. 1994. *Fish Names of Western Polynesia. Futuna, Niue, Samoa, Tokelau, Tonga, Tuvalu, Uvea, Outliers*. Mawson ACT, Australia: Archipelago Press. Also published by Pacific Islands Development Program, E-W Center.
A useful comparative reference, but more detailed material on Samoan fish identifications can be found in sources focusing specifically on Samoa.

Safford, W.E. 1906. *Glossary of principal words composing native names of Samoan fishes*. U.S. Department of Commerce and Labor Bulletin.
The glossary appears in a section entitled "Fishes of Samoa" in Jordan and Seale [q.v.], pp. 175-455. There are some discrepancies between identification in the main text, and in this section by Safford.

Schultz, Erich. 1949. *Proverbial expressions of the Samoans*. JPS 58:139-84.

Schultz, Erich. 1950. *Proverbial expressions of the Samoans.* JPS 59:35-62, 112-34.

Schultz, Erich. 1985. *Samoan Proverbial Expressions. Alaga`upu fa`a Samoa*. Brother Herman, trans. Suva: Polynesian Press.
Collected, translated and explained by Dr. E. Schultz. Translated into English by Brother Herman.
Originally published in JPS vol. 58, 59 [q.v.], the 1985 books brings together Schultz's collection of Samoan proverbs, drawn partly from ethnohistorical works but primarily from interviews with ca. thirty Samoan informants. The proverbs are a requisite component of Samoan ceremonial oratory; they are related to the legendary origins of some chiefly titles and many cite natural species found throughout the Samoas. Without an index, however, it is difficult to locate sayings mentioning particular plants and animals.

Setchell, William Albert. 1978, Part 3. *Ethnobotany of the Samoans. In American Samoa*. reprint of 1924 Carnegie Institution of Washington edition. Pp. 191-224. New York: AMS.
This includes extensive description of plant use on Tutuila. The data was collected during two months in 1920. The work includes Samoan names of plants, uses, associated beliefs and botanical identification. Part One of the same book details the vegetation of Tutuila.

Sharp, Andrew ed. 1970. *The Journal of Jacob Roggeveen*. London: Oxford.
Roggeveen explored the South Pacific from 1721 to 1722. He is believed to be the first European to stop at Samoa, but the account is very brief.

Sloan, Donald. 1940. *Polynesian paradise, an elaborate travel journal, based on ethnological facts*. London: Robert Hale.
Description of the author's experiences in, and the social life and customs of Manu`a. This account is clearly sensationalized, and was also published by the Book League

of America, New York, with the title The Shadow Catcher.

Stair, John B. 1896. Jottings on the mythology and spirit lore of old Samoa. *Journal of the Polynesian Society* 5:33-57.
A small amount of very general ethnographic detail, all covered in more detail in other sources.

Steadman, D.W. 1993. Bird bones from the To`aga Site: Prehistoric loss of seabirds and megapodes. In *The To`aga Site: Three millennia of Polynesian occupation in the Manu`a Islands, American Samoa*. P.V. Kirch and T.L. Hunt, eds. Pp. 217-228. Berkeley: Contributions of the University of California Archaeological Research Facility.
Steadman reports on bird bones recovered from archaeological excavations on Ofu Island. He shows the loss of some seabirds and megapodes associated with the past 3,000 years of human settlement on the island.

Stearns, H.T. 1968. *Geology of the Samoan Islands*. Geological Society of America Bulletin 55:1279-1332.
Stearns describes the geological history of the Samoan Islands.

Stice, G. and F. McCoy. 1968. The geology of the Manua Islands, Samoa. *Pacific Science* 22:427-457.
The authors describe the geological history of the Manu`a Islands.

Stokes, J.G. 1921. *Fish poisoning in Samoa.* B.P. Bishop Museum Occasional Papers 7(10):229-33.
This is part of an article entitled "Fish Poisoning in the Hawaiian Islands, with notes on the Custom in Southern Polynesia." The Samoa section is based on interviews with chemist Mr. E. J. Mooklar, who lived in Tutuila from 1901-1912 and witnessed fish poisoning there frequently. The use of futu (*Barringtonia asiatica*) is described in detail. Information on other poisons is also included.

Stuebel, Oscar. 1987. *Tala O le Vavau. The Myths, Legends and Customs of Old Samoa*. Auckland: Polynesian Press.
"Adapted from the collections of C. Stuebel and Brother Herman," this is an illustrated reprint of a classic collection of Samoan folklore, first published in Pago Pago in 1955 by the Association of the Marist Brothers' Old Boys. Samoan and English texts are given on facing pages. Although the paperback reprint cites "C. Stuebel," the collection is attributed to German consul Oscar Stuebel, who served in Western Samoa between 1884 and 1894. Brother Herman's English translation was published in Wellington in 1976. Brother Herman taught at the Leone Boys School and did valuable work in collecting and translating Samoan oral

traditions.

Turner, George. 1861. *Nineteen Years in Polynesia: Missionary Life, Travels, and Researches in the Islands of the Pacific. London: John Snow*. Samoa section reprinted 1986, Apia, Western Samoa: Western Samoa Historical and Cultural Trust.

Turner, George. 1884. *Samoa, a Hundred Years Ago and Long Before*. London: Macmillan. Reprint edition 1989, Suva, Fiji: Institute of Pacific Studies, University of the South Pacific.
Turner was one of the best-known London Missionary Society missionaries in Samoa, and founded the Samoan Mission Seminary at Malua in 1844. He resided primarily in Western Samoa, but the cultural and legendary material--collected in the early postcontact period by a long-term resident and participant--is relevant to the entire archipelago. These works are essential for any student of Samoan ethnohistory. The 1861 book traces Samoa's early postcontact history and the founding of the LMS mission, and gives an overview of Samoan culture and customs. The 1884 work elaborates on the cultural material, overlapping somewhat with the earlier account, and includes more myths and legends.

Uhe, George. 1974. Medicinal plants of Samoa: a preliminary survey of the use of plants for the medicinal purposes in the Samoan islands. *Economic Botany* 28:1-30.
This article contains some obvious errors, and other sources (e.g., Whistler) seem more reliable.

University of Hawaii Cartographic Laboratory. 1981. *A Coastal Zone Management Atlas of American Samoa*. Honolulu: Coastal Zone Management, America Samoa Government, Department of Geography, University of Hawaii.
A detailed atlas with maps and chapters on the natural and cultural environment of American Samoa.

Visher, S.S. 1925. *Tropical Cyclones of the Pacific*. Honolulu: Bernice P. Bishop Museum Bulletin 20.
Visher reports the patterns and frequencies of tropical storms for the Pacific.

Wakeman, Edgar. 1878. *The Log of an Ancient Mariner*. San Francisco: A. L. Bancroft & Co.
Wakeman's account of Samoa in 1871 (pages 342-58) includes some useful economic observations on the copra trade in Tutuila.

Watling, D. 1982. *Birds of Fiji, Tonga, and Samoa*. Wellington: Millwood Press.
This is an illustrated overview of the birdlife in Fiji,

Tonga, and Samoa, providing color illustrations with English and scientific names. Supplemental index by local names. Mostly a secondary source (at least for Samoa).

Watters, R.F. 1956. *The Geography of Samoa, About 1840: A Study in Historical Geography*. Ph.D. dissertation, University of London.
Watters uses modern descriptions by Coulter and others, as well as ethnohistorical sources such as Wilkes, to reconstruct Samoan agriculture in the nineteenth century. This source is valuable for its logical deductions regarding fallow practices and long-term impacts on the land.

Watters, R.F. 1958a. *Culture and environment in old Samoa. In Studies of Man and Environment in the Western Pacific*. Pp. 41-70. Wellington: Department of Geography, Victoria University.
Broad overview of culture, physical environment, agriculture and population pressure, forest and sea resources, crafts, social structure, religion, ceremonial.

Watters, R.F. 1958b. Cultivation in Old Samoa. *Economic Geography* 34:338-91.
Same as Watters 1958a.

Watters, R.F. 1958c. Settlement in old Samoa, 1840. *New Zealand Geographer* 14:1-18.
This article is largely taken from his dissertation.

Watters, R.F. 1960a. The nature of shifting cultivation. *Pacific Viewpoint* 1(1):59-99.

Watters, R.F. 1960b. Some forms of shifting cultivation in the South-west Pacific. *Journal of Tropical Geography* 14 (July):35-40.
The above two articles present arguments and data drawn largely from his 1956 dissertation, adding some comparative discussion.

Whistler, W.A. 1981. *Vegetation and soils. In A Coastal Zone Management Atlas of American Samoa*. Plate 4. Honolulu: Coastal Zone Management, American Samoa Government, Department of Geography, Univeristy of Hawaii.
Whistler provides a synthetic overview of vegetation patterns for American Samoa.

Whistler, W.A. 1984. Annotated list of Samoan plant names. *Economic Botany* 38(4):464-89.
Good reference. Corrects errors in Parham.

Whistler, W.A. 1992. *Polynesian Herbal Medicine*. Lawai, Kauai,

Hawaii: National Tropical Botanical Garden.
Discusses the use of 59 different plants in Samoan medicine. Samoan data based partly on interviews with healers in Samoa.

Wilkes, Charles. 1845. *Narrative of the United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, and 1842*. 5 volumes. Philadephia: Lea & Blanchard. Reprinted 1970, Upper Saddle River, N.J.: Gregg Press.
This is a valuable, detailed account of Samoa from the U.S. Navy's first scientific expedition to the islands. Volume I includes general economic and cultural data for Samoa. Volume II, pp. 60-154, includes his visit to Tutuila and Manu'a in 1839. Wilkes met with the Tui Manu'a on Olosega. He appears to have received much of his information on Tutuila from missionary A. W. Murray [q.v.].

Williams, John. 1837. *A Narrative of Missionary Enterprises in the South Sea Islands*. New York: D. Appleton & Co.

Williams, John. 1888. *Missionary Enterprises in the South-Sea Islands*. Philadelphia: Presbyterian Board of Publication.
This is a later American edition of the above.

Williams, John. 1984. *The Samoan Journals of John Williams 1830 and 1832*. Richard M. Moyle, ed. Canberra: Australian National University Press.
The famed London Missionary Society representative (and later martyr) inaugurated the period of frequent contact with the West when he visited Samoa in 1830 and converted the Savai'i chief Malietoa Vai'inupo to Christianity. Williams visited Ta'u in 1832. The 1837 and 1888 works were published for a popular audience, to win support (notably financial) for foreign missions. Moyle's edition includes Williams' unelaborated journals, written during the actual encounters. Moyle notes several exaggerations and inconsistencies between the 'on-the-scene' journals and the later published book. Williams was in Samoa for a total of thirty days on the two trips. Nevertheless, the journals report the earliest extensive contacts between Samoans and Westerners, and document a turning point in Samoan history.

Yunker, T.G. 1945. *Plants of the Manua Islands*. Bulletin 184. Honolulu: Bernice P. Bishop Museum.
Based on fieldwork in 1939, and on the work of Christophersen and Setchell. Gives very specific locations of plants.

APPENDICES

Appendix 1. Sample Survey Forms.

Ethnographic Survey of Land Inside the National Park of American Samoa

All answers are confidential. You may include your name if you would like, but you do not have to.

Village:_____ Your age:_____

check: Male___ Female___

(your name IF YOU WOULD LIKE _____)

PLEASE ANSWER FOR AREAS INSIDE THE NATIONAL PARK ONLY.

What are the different things that you grow on land inside the National Park area. Please list all the <u>crops</u> that you can think of.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

a) Which ones do people grow the most there?

_____

b) Which are the most important ones for food?

_____

c) Which ones can you sell?

_____

d) Other than food crops, what are the most important plants that grow there?

_____

e) Which of these plants are used to build houses or canoes?

_____

Ethnographic Survey of Land Inside the National Park of American Samoa

All answers are confidential. You may include your name if you would like, but you do not have to.

Village:_____ Your age:_____

check: Male___ Female___

(your name IF YOU WOULD LIKE _____)

PLEASE ANSWER FOR AREAS INSIDE THE NATIONAL PARK ONLY.

Please name all of the plants that grow in the National Park that can be used for <u>medicines</u>. List all of the plants that you can think of.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

a) Which ones grow the most? _____

_____

b) Which ones make the best medicines? _____

_____

Ethnographic Survey of Land Inside the National Park of American Samoa

All answers are confidential. You may include your name if you would like, but you do not have to.

Village:_____ Your age:_____

check: Male___ Female___

(your name IF YOU WOULD LIKE _____)

PLEASE ANSWER FOR AREAS INSIDE THE NATIONAL PARK ONLY.

Please name all of the different kinds of <u>fish / shellfish</u> that you catch inside the Park area. List all the ones you can think of.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

a) Which ones do you catch the most? _____

_____

b) Which ones are the best to eat? _____

_____

c) Which ones can you sell? _____

_____

Ethnographic Survey of Land Inside the National Park of American Samoa

All answers are confidential. You may include your name if you would like, but you do not have to.

Village:_____ Your age:_____

check: Male___ Female___

(your name IF YOU WOULD LIKE _____)

PLEASE ANSWER FOR AREAS INSIDE THE NATIONAL PARK ONLY.

What <u>animals / birds</u> live in your village's land inside the National Park. Please name all of the animals you can think of.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

a) Which ones do people hunt? _____

_____

b) Which ones do people eat? _____

_____

c) Which ones do harm to crops and things you have planted? _____

_____

d) Which ones can you sell? _____

_____

Appendix 2. Samoan and Taxonomic Names:
Crops and Cultigens

`aute	garden hibiscus	*Hibiscus rosa-sinensis* L.
	coral hibiscus	*H. schizopetalus* Mast.
	Rose of Sharon	*H. syriacus* L.
`ava	kava	*Piper methysticum* Forester
`ava pui	wild ginger	*Zingiber zerumbet* L.
esi	papaya	*Carica papaya* L.
fa`i	banana	*Musa* spp.
fau	beach hibiscus	*Pariti tiliaceus* L.
fetila	nd	
fu`afu`a	guest tree	*Kleinhovia hospita* L.
*canoe floats		
fue sosolo	bush taro vine	*Rhaphidophora graeffei* Engl.
*fish traps		
futu		*Barringtonia asiatica* L.
gatae		*Erythrina* spp.
hibiscus	see `aute; fau	
kapisi	cabbage	*Brassica* spp.
koko	cocoa	*Theobroma cacao* L.
kopa	nd	
ku`ava	guava	*Psidium guajava/littorale*
kukama	cucumber (Milner)	
laga`ali	garland tree	*Aglaia samoensis* Gray
lau fala		*Scripodendron costatum* Kurz.
		Pandanus samoensis Warb.
		P. turritus Martelli
		P. tectoris Parkinson
lau i`e		*Pandanus odoratissimus* L.
		Freycinetia samoensis Warb.
lau talotalo	lily	*Crinum asiatica* L.
*decorative, ceremonial, fishing		*Anthrophyum plantagineum* Cav.
lau talotalo samasama	nd (yellow lily? TM)	
lau ta`ata`a	Crow's foot grass	*Eleusine indica* L.
*no use listed; "weed"		
lili	lily (Milner)	
mago	mango	*Mangifera indica* L.
manioka	cassava/manioc/tapioca	*Manihota esculeta* Crantz
ma-soa-	Polynesian arrowroot	*Tacca leontopetaloides* L.
maukeni	nd	
meleni	watermelon	*Citrullus vulgaris* Schrad.
moli	citrus fruit	*Citrus* and *Fortunella* spp.
moli `aina	common sweet orange	*Citrus sinensis* L.
moli ai suka	pomelo	*C. gradis* (Whistler,

1984)

moso`oi	ylang-ylang	*Canaga odorata* Lam.
niu	coconut	*Cocos nucifera* L.
nonu	Indian mulberry	*Morinda citrifolia* L.
nonu vao	rose or mountain apple	*Syzygium malaccense* L.
`ofe	Samoan bamboo	*Schizostachyum glaucifolium* Ruprecht
pi-	bean, pea (Milner)	
pineapple	fala `aina (Milner)	
pua		
pua sami/pua same	no data	
pulu		
	(pulutai) beach spurge (medicinal)	*Euphorbia atoto* Forst.
	(pulu vao) rubber (cricket balls)	*Castillo elastica* Cervantes
pumpkin		
sana	corn	*Zea mays* L.
talie	country almond	*Terminalia catappa* L. *T. littoralis* Seem.
talo palagi	no data	
tapioka	manioka	*Manihota esculeta* Crantz
ta`amu		*Alocasia macrorrhiza* L.
talo	taro	*Colocasia esculenta* L.
tipolo		
(moli tipolo)	lime	*C. aurantifolia* Christm.
(moli apatupatu)	citron	*C. medica* L.
tolo	sugar cane	*Saccharum officinarum* L.
tomato		
ufi	yam	*Dioscorea* spp.
`ulu	breadfruit	*Artocarpus altilis* Parkinson
`umala	sweet potato	*Ipomoea batatas* L.
vi	Polynesian plum	*Spondias dulcis* Forst.

Identifications from Parham unless otherwise noted.
* Uses given by Parham indicated when not obvious.

Appendix 3. Samoan and Taxonomic Names:
Marine Species

`ali`ao	*Trochus* sp. M	mollusk
alili	*Turbo* sp. M	mollusk
aloama	a fish M	
alogo	*Hepatus lineatus* JS	
	Acanthurus sp. M (when full grown)	
`ama`ama	*Grapsus* sp. M	crab
`anae	*Liza caeruleomaculata* JS ; *Velamugil* sp. M	
`anae afa	nd	
asi asi	=*faisua* when small M	mollusk
aso ama	nd	
`ata`ata	*Epinephelus* sp.; *Cephalopholis* sp.; *Leiurus* sp. S	
`ata `ata uli	*Leiuranus semicinctus* JS; a dark `ata`ata S	
atu	*Megalaspis cordyla* S	
atule	*Trachurops crumenophthalma* JS	
a`u	*Strongylura* sp. M	
`ava`ava	*Terapon jarbua* JS	
bonito	atu S	
faamaau	nd	
fai	*Himantura fai* S	sting ray
fai pe`a	nd	
fa-isua	*Tridacna* sp. M	mollusk
fausi	nd	
fe`e	octopus M	
filoa	*Lethrinus* sp.; *Lethrinella* sp. when fully grown (i.e., about two ft long.) M	
foafoa	*Cypraea* sp. M	conch
fuafua	nd	
fuga	*Callyodon* spp. JS	
	Scarus sp. M	
fugafuga	*Holothuria* sp. M	sea slug
	also = fuga M	
gatala	*Epinephelus merra* JS	
	Epinephelus sp.; *Cephalopholis* sp. S (general term for many spotted fish, esp. sea bass. S)	
gatala aleva	*Anyperodon leucogrammicus* JS	
gatala moana	*C. argus* JS	
gatala uli	*C. argus* JS; *C. leopardus* S	
geti	*Stichopus* sp. M used to prepare sea	sea slug
grouper		
i`a sina	*Mulloides samoensis* JS	
i`a usi	nd (Usiusi= *Scarus* sp. when 6 inches. (SEE FUGA)	
ise	*Belone platyura* JS	
kunane/tunane	nd	
laea	*Callyodon* spp. JS (SEE FUGA)	
	Scarus sp. when 2 ft (SEE FUGA) M	
lalafi	*Cheilinus diagrammus* JS	
la-la-futu	*Caranx plumbeus* JS* ; *C. armatus* S	
lape	a shellfish P	

laumei	*Chelonia imbricata* P	turtle
	C. virgata P	
limu	"General name given to mosses, lichens, algae, and seaweeds." M	
lo	*Siganus* spp. S	
loli	*Holothuria* sp. M	sea cucumber
lupo	*Caranx* spp. JS	
	C.ignoblis; *C. sexfasciatus* S	
	Zebrasoma veliferum JS (not in S as lupo.)	
(lupa=	*Zebrasoma veliferum* S)	
mala`i	*Lutianus gibbus* JS	
malali	nd	
malau	*Holocentrus* spp. JS	
	Myripristis spp. JS	
fatu	nd	
pu`u	*Holocentrus* sp. P	
malauli	*Caranx melampygus* JS	
malie	sharks S	
mama`o	*Muelleria* sp. M	sea slug
manase	a fish P	
manifi	*Hepatus triostegus* JS	
	Pempheris oualensis JS	
	Holocetris spinifer S	
	Pseudupeneus sp. S	
manini	*Chaetodon citrinellus* JS*	
	Hepatus triostegus S	
	Acanthurus sp. M (when full grown)	
manumanu	nd (mamanu= *Scarus* sp. when 1.5-2 ft (SEE FUGA) M)	
maono	*Acanthurus* sp. M	
marlin		
masina	nd	
matapisu	*Acmaea* sp. M	mollusk
matapula	*Priacanthus cruentatus* S	
mata`ele	*Epinephelus* sp. M	
matu-lau	*Pseudupeneus* sp. M	
maua`e	nd	
melei	nd	
moamoa	*Lactoria cornuta* JS	
moana	*Hepatus guttatus* JS	
moana uli	nd	
mu-	some *Lethrinus* sp. when about six inches long. M	
mu mata vaivai	nd	
mu-mu-	= mu M	
(mu-mu- moana = *Monotaxis grandoculis* S)		
mutu	*Holotrachys lima* JS	
(mutu uli= *Megaprotodon trifasciatus* JS)		
	Abudefduf sp. M	
mutumutu	nd	
nimu	nd (=limu?)	
nofu	*Synanceja verrucosa* JS	
	Scorpaenopsis gibbosa JS	

nuufe`e nd [squid? TM]
ofaofa *Metalia* sp. M sea urchin
opihi (Hawaiian: *Cellona* sp. Pukui & Elbert. No clear correspondence to a Samoan mollusc. TM)
pa kao kao nd
pala malau nd (=malau?) (pa-la= fish, not identified M)
palagi *Ctenochaetus striatus* JS
pala`ia "called moamoa when young; logouli when changing to the adult stage." S
palolo *Palolo viridis* P
Eunice sp. M sea annelid
palu *Aphareus* sp. M
papa *Epinephelus* sp. M
papata *Paribacus* sp. M a crayfish
papatu nd (patu= *Purpura* sp.; *Vasum* sp.; M mollusks)
pa`a "name give to crabs in general. " M
parrot fish =fuga (which includes laea, usiusi, mamanu) M
pa`umalo- *Monacanthus* sp. M
pipi *Abudefduf metallicus* JS (and M)
Asaphis sp. M edible mollusk
pone *Hepatus* sp. S surgeon fish
Acanthurus sp. M
pule *Cypraea ovula* P
Cypraea sp.; *Ovula* sp. M mollusks
pusi *Muraena* sp. P
Echidna spp. S
Gymnothorax spp. JS
Leptocephalus marginatus JS
safole *Kuhlia taeniura* JS
sapatu *Sphyraena obtusata* JS*
sa`ulele a kind of fish M
savane *Lutjanus* sp. M (when about 1 foot long.)
sa`ula swordfish and sawfish M
sea sea cucumber, and the dish prepared from it M. SEE GETI
segasega *Myripristis sanguineus* JS*
Holocentrus ruber S
sesema nd (sesama= Portuguese man-o-war. Pratt)
shrimp (freshwater= mosimosi M)
sisi general term for snails M
sofe a fish P
sogelau a fish P
sue *Tetraodon* sp. JS
sugale *Cheilinus diagrammus* JS
Gomphosus tricolor JS
Thalassoma fuscum JS
[plus other identifications when sugale is modified. All in JS.]
sumu *Balistes* spp. JS trigger fish
tafala nd
tagi- kind of fish M

taiva	*Scolopsis trilineata* JS	
	Lutianus monostigma JS	snapper
talaia	nd	
ta-malau	*Holocentrus* spp. M (when fully grown)	
tanifa	"A kind of large man-eating shark." M	
ta`oto	*Parapercis tetracanthus* JS	
	Valenciennea violifera JS	
	Zenarchopterus vaisiganus JS	
tapula`a	*Turbo* sp. M	mollusk
tautu	*Diodon hystrix* P	
(tauta=	*Diodon hystrix* JS)	
tifitifi	*Zanclus canescens* JS	(butterfly fish and
	Chaetodon spp. JS	fish resembling them S.)
tuitui	*Echinometra* sp. M	urchin
tulaiga	nd	
tuna	*Anguilla* sp. JS	
tu`u`u	*Abudefduf dicki* JS	
	Abudefduf leucopomus JS	
	Caracanthus maculatus JS	
	Pomacentrus melanopterus JS	
	Pomacentrus nigricans JS	
uga	hermit crabs in general M	
`ui	nd	
ula	"Name given to several crustaceans (including lobsters and prawns)." M	
ulutu`i	*Cirrhites* sp. M	
ulua	*Caranx forsteri* JS	
ulumane	nd	
`ulutunu	large *Holothuria* P	
ume	*Acanthurus lituratus* JS	
	Acanthurus unicornis JS	
	Hepatus matoides JS	
umelei	a type of ume (identified by JS with all three of above names. TM]	
utu	a fish P	
u-u-	*Birgus* sp. M	coconut crab
`u`u	*Modiala* sp. M	mollusk
vana	*Echinus* sp. P	
	Diadema sp. M	urchin
vete	*Mulloides suriflamma* JS	
	Upeneus vittatus JS	
yellowfin		

All are fish unless otherwise indicated.

JS: Jordan & Seale as cited in Goo & Banner.
JS*: Identifications that do not agree with Safford, otherwise all J&S identifications are also listed by Safford.
M: Milner
P: Pratt as cited in Goo & Banner. Noted when identifications were not listed elsewhere.

S: Safford. Only noted when they were not also listed by J&S.

nd: No data. Alternate possibilities listed in parentheses.

Appendix 4. Samoan and Taxonomic Names:
Medicinal Plants

a`atasi	*Nasturtium sarmentosum* Sol.Schulz (CRUCIFERAE) (P,GAS)
	Euphorbia atoto Forst. (EUPHORBIACEAE) (P) (*ulutai P)
	Rorippa sarmentosa DC. Macbr. (BRASSICACEAE) (W)
Ago	*Curcuma longa* L.(ZINGIBERACEAE)(W,P)
aloalo	*Premna serratifolia* L. (VERBENACEAE)(W)
	Premna taitensis Schauer (VERBENACEAE) (Pm,GAS)
aloalo tai	*Clerodendrum inerme* L. (VERBENACEAE) (W,Pm,GAS)
aloalo vao	*Mussaendra raiateensis* Moore (RUBIACEAE)(W,Pm,GAS) (*fua i tausaga, lau paepae Pm)
	Citronella samoensis C. (ICACINACEAE)(P)
aoa	*Ficus prolixa* Forester (MORACEAE) (W)
	Ficus obliqua Forester (MORACEAE) (W,GAS)
`aoa	*Ficus godeffroyi* Warb. (MORACEAE) (P)
(a-oa/a-oa fafine	*Ficus aoa* Warb. (MORACEAE) (P)
`aoa tane	*Ficus graeffi* Warb. (MORACEAE) (P)) (Milner: a-oa)
asi	*Syzygium inophylloides* Muell (W*)
ateate	*Wollastonia biflora* L. DC. (ASTERACEAE) (W)
	Wedelia biflora L. DC. (COMPOSITAE)(P,GAS, W*)
`ava	*Piper methysticum* Forester (PIPERACEAE) (W,GAS,Pm)
`ava pui	*Zingiber zerumbet* L. (ZINGIBERACEAE) (W,GAS,Pm)
`ava`ava aitu	*Macropiper puberulum* Benth. (PIPERACEAE) (W)
	Piper puberulum Benth. (PIPERACEAE) (P)
	Macropiper timothianum A.C.Sm. (PIPERACEAE) (W)
	Piper graeffei Warb. (PIPERACEAE) (P)
	Piper tutuilae C.DC (PIPERACEAE) (Pm)
(Whistler: `ava`ava aitu sosolo refers to the vine like *Piper*; `ava`ava aitu tu refers to the shrub like *Micropiper*. (W*))	
`ava`ava aitu(sosolo)	*Piper graeffei* Warb. (GAS)
	Piper spp. (W*)
`ava`ava aitu(tu)	*Piper* sp. (GAS)
	Micropiper spp. (W*)
esi	*Carica papaya* L. (CARICACEAE) (W,P,GAS)
fa`i	*Musa* sp. (P)
fala`aina	*Ananas* sp. (W*)
fau	*Hibiscus tiliaceus* L. (MALVACEAE) (W)
	Pariti tiliaceus L. (MALVACEAE) (P)
fetau	*Calophyllum inophyllum* L. (CLUSIACEAE) (W,Pm,GAS)
filimoto	*Flacourtia rukam* Zoll.&Morr. (FLACOURTIACEAE) (W,P,GAS)
fisoa	*Colubrina asiatica* L. (RHAMNACEAE) (W,P,GAS)
fiu	*Zingiber officinale* Roscoe (ZINGIBERACEAE) (W)
fua lole	*Melastroma malabathricum* L. (MELASTOMATACEAE)(Pm) (*moegalo P)
	Procris pedunculata Forst (URITICACEAE) (P)

	Melastroma denticulatum (W*)
fue	General term for vines and creepers. Often reduplicated (W*)
fue lau `ulu	nd (=fue `ulu ?)
fue manogi	*Piper* sp. (GAS)
	Piper graeffei Warb. (PIPERACEAE) (W,P)
	SEE `ava`ava aitu
fue sosolo	*Rhaphidophora graeffei* Engl. (ARACEAE) (P)
	(* tuafaga)
fuefue saina	*Mikania micrantha* HBK (W,GAS,Pm) (ASTERACEAE)(W); (COMPOSITAE)(P)
fuefue sina	*Vigna marina* Burm. (FABACEAE) (W,GAS)
	Ipomoea alba L. (CONVOLVULACEAE) (P)
fue `ulu	*Pyrrosia adnascens* Forst. (POLYPODIACEAE) (P)
fu`afu`a	*Kleinhovia hospita* L. (STERCULIACEAE)(GAS,P, W*)
futu	*Barringtonia asiatica* L. (LECYTHIDACEAE)(GAS,P)
gatae	*Erythrina variegata* L (FABACEAE) (W,GAS)
	Erythrina sp. (PAPILIONACEAE) (P)
ifi	*Inocarpus fagiferous* Park. (PAPILIONACEAE) (GAS,P)
ifiifi	*Parinari glaberrima* Hassk. (ROSACEAE) (P)
	Atuna racemosa Raf. (W*)
ku`ava	*Psidium guajava* L. (MYRTACEAE) (W,GAS,P)
	Psidium littorale Raddi (P)
laauta	nd (=lau auta?)
laga`ali	*Aglaia samoensis* Gray (MELIACEAE) (P)
lama	*Aleurites moluccana* L (EUPHORIBACEAE) (W,GAS,Pm)
lau `auta	*Phymatosorus scolopendria* Brum. (fern) (W)
	(*lau magamaga W)
	Polypodium (Phymatodes) powellii Baker (POLYPODIACEAE)(P) (see end note regarding ferns)
lau fala	*Pandanus tectorius* Parkinson (PANDANACEAE) (W,P)
	P. samoensis Warb. (P); P. turritus Martelli (P)
	Scirpodendron costatum Kurz. (CYPERACEAE) (P)
lau fatifati	*Phaleria acuminata* Gray (THYMELAECEAE) (P)
	(*suni vao P)
	Geniostoma samoense Rein. (W*) (*lau mafatifati W*)
lau gase-se-	Fern? (sic) (GAS)
	"... no uniformity of opinion as to which fern species it is." (W*)
lau gasese	*Pteris tripartitia* Sw. (PTERIDACEAE) (P)
	Diplazium proliferum Kaulf. (ASPIDIACEAE) (P)
	Tectaria setchellii Maxon (ASPIDIACEAE) (P)
	(Milner: lau gase-se-)
lau mafiafia	*Antrophym plantagineum* Cav. (POLYPOIDACEAE) (GAS,P)
	Procris peduculata Forst. (URTICACEAE) (P)
	Dendrobium tokai Reichb. (ORCHIDACEAE) (P)
lau magamaga	*Microsorium scolopendria* Burm. (GAS)
	Blechnum orientale L. (BLECHNACEAE) (P)
	Pteris ensiformis Burm. (PTERIDACEAE) (P)

Phymatosorus scolopendria (W*) (see end note regarding ferns) (*lau `auta W)

lau mamae — mamae= var of *Musa* (MUSACEAE) (P)

lau tagitagi Samoa — nd (=tagitagi? *Nothopanax guilfoylei* Bull (ARALIACEAE) (P))

lau taliga — *Centella asiatica* L. (W*) (* a`atasi P)

lau tasi — =lau `auta (according to interview data) (see end note regarding ferns)

lau togo — *Geophila repens* L. (RUBIACEAE) (W)
Centella asiatica L. (W,GAS,Pm) (APIACEAE)(W); (UMBELLIFERAE) (P)
two other genera w/o medicinal uses (P)

lau togotogo — nd (= lau togo?)

laume — nd

la`au lafa — *Cassia alata* L. (GAS)

la`au fai lafa — *Cassia alata* L. (CAESALPINIACEAE)(Pm)

lau paepae — *Mussaenda raiateensis* Moore (RUBIACEAE) (Pm) (*fua i tausaga, aloalo vao Pm)

lega — name of the dye from ago (P)

mago — *Mangifera indica* L. (ANACARDIACEAE) (W,GAS,P)

ma-lili — *Terminalia richii* A. Gray (COMRETACEAE) (P,W*)
Buchanania sp. (ANACARDIAACEAE) (P)

maota — *Dysoxylum samoense* Gray (MELIACEAE) (W)
Dysoxylum maota Rein. (W*)
Dysoxylum sp. "3 spec. poss. *D. maota* Rein." (GAS)
D. moata (sic) Rein; *D. richii* Gray (P)

masame — *Glochidion ramiflorum* Forster (EUPHORBIACEAE) (W,GAS,P)
Antidesma sphaerocarpum Muell-Arg (EUPHORBIACEAE) (P)

matalafi — *Psychotria insularum* Gray (RUBIACEAE) (W,GAS)
"...the Samoan name is commonly used for many different species of the genus *Psychotria*, many of which are used medicinally." (P)

mati — *Ficus tinctoria* Forster (MORACEAE) (W,Pm)
(mati refers to all *Ficus*, except banyans which are aoa. Parham)
Ficus sp. (GAS)

mautofu — *Sida rhombifolia* L.; *S. acuta* Burm. (MALVACEAE) (P)

ma`anunu — *Tarenna sambucina* Forster (RUBIACEAE) (W,GAS,P) (*ma-nunu W)

milo — *Thespesia populnea* L. (MALVACEAE) (W,GAS,P)

moega-lo- — *Cympobogon citratus* DC.(W,Pm,GAS) (POACEAE)(W);(GRAMINEAE)(Pm)

moegalo — *Melastroma malabathricum* L. (MELASTOMATACEAE) (Pm)

moli — *Citrus* sp. and *Fortunella* sp. (RUTACEAE) (P)

moli `aina — *Citrus sinensis* L. (RUTACEAE) (W,GAS,P)

moli `ai suka — *Citrus grandis* L. (W*)

moli Samoa — *Citrus hystix* DC (Pm)

moso`oi *Cananga odorata* Lam. (ANNONACEAE) (W,P,GAS)
namulega *Vitex trifolia* L. (VERBENACEAE) (W,GAS,Pm)
niu *Cocos nucifera* L. (ARECACEAE) (W); (PALME) (P)
nonu *Morinda citrifolia* L. (RUBIACEAE) (W,GAS,Pm)
(*nonu vao, nonu atogi GAS,P)
nonu fi`afi`a *Syzygium malaccensis* L. (MYRTACEAE) (GAS,P)
(*nonu ai GAS; nonu vao, nonu`ui, nonu`ula P)
`o`a *Bischofia javanica* Bl. (W, GAS, Pm)
(EUPHORBIACEAE)(W); (BISCHOFIACEAE)(P)
`ofe *Schizostachyum glaucifolium* Rupr. (POACEAE)(W);
(GRAMINEAE)(P) (*`ofe Samoa P)
`ofe Samoa *Schizostachyum glacifolium* Rupr. (GAS)
papaka nd
pate *Coleus scutellarioides* L. (LABIATAE) (Pm)
C. blumei Benth. (W*)
polofeu- *Capiscum frutescens* L. (SOLANACEAE) (W)
Capiscum annum L. (GAS)
polo refers generally to *Capiscum* and *Solanum* species. (P)
(*polo W)
poumuli *Securinega samoana* Croizat (EUPHORBIACEAE) (P)
S. flexuosa Muell. (W*)
pu`a *Hernandia pelata* Meissn. (HERNANDIACEAE) (P)
pua manogi nd
(pua/pua Samoa = *Gardenia taitensis* DC (RUBIACEAE) (Pm))
pua sami/pua same nd
pulu general term for trees that exude a white, sticky
latex when cut-- commonly *Ficus* spp., and *Castilla*
elastica (W*)
seasea *Syzygium corynocarpum* Gray (MYRTACEAE) (W,GAS,Pm)
suni *Hoya australis* R.Br. (ASCLEPIADACEAE) (W,P)
Phaleria disperma Forst. (W*)
Ixora spp. (W*)
(*fue selela- W,GAS; `o-live vao W; fue se le la P)
(suni vao/suni tai also in Parham as:
Cestrum diurnum L. (SOLANACEAE) (edible)
C. nocturnum L. (poisonous)
Phaleria disperma Frost (THYMELAEACEAE)
P. acuminata Gray)
talafalu *Micromelum minitum* Forster (RUTACEAE) (W,GAS,Pm)
(*tamafalu P)
talie *Terminalia catappa* L. (COMBRETACEAE) (W,GAS,P)
Terminalia littoralis Seem. (COMBRETACEAE) (P)
tausuni *Messerschmida argentea* L. (BORAGINACEAE)
(GAS,P,W*)
Argusia argentea L. (W*)
tavai *Rhus taitensis* Guillem (ANACARDIACEAE) (P)
ti- *Cordyline fruticosa* L. (AGAVACEAE) (W)
ti *Cordyline terminalis* L. (AGAVACEAE) (GAS,P)
(Milner: ti-)
tipolo *Citrus aurantifolia* Chr. (RUTACEAE) (P)
C. medica L. (P)

toi	*Alphitonia ziziphoides* Spreng. (RHAMNACEAE) (GAS,Pm)
tolo	*Saccharum officinarum* L. (GRAMINEAE) (P)
to`ito`i	*Scaevola taccada* Gaertn. (GOODENIACEAE) (GAS,P)
tua ula	nd
`ulu	*Artocarpus altilis* Parkinson (MORACEAE)(W)(P)
vao mageso	*Fleurya interrupta* L. (URTICACEAE) (P) (*magisu P)
	Loportea interrupta L. (W*)
vavae	*Gossypium* sp. L. (MALVACEAE) (P)
vi-	*Spondias dulcis* Parkinson (W,GAS) Forst (P) (ANACARDIACEAE)
vi-vao	*Physalis angulata* L. (GAS,W*) (*ma-galo GAS)
	Garuga pacifica Burkill (BURSERACEAE) (P) (*magaui)
	Reynoldsia pleiosperma Gray (ARALIACEAE) (P)
	P. minima L. (SOLANACEAE) (P)
	G. floribunda Dec. (W*)
	Reynoldsia spp. (W*)

(*alternate name)

W: Whistler 1992, *Polynesian Herbal Medicine*; lists medicinal use.
W*: Whistler 1984, *Annotated list of Samoan plant names*.
P: Parham; does not mention a medicinal use.
Pm: Parham; mentions medicinal use.
GAS: Gov American Samoa, Office of Comprehensive Health; lists medicinal use.

Family names from Whistler 1992 and Parham only.

nd: no data.
- is used to represent a macro over the preceding vowel.

Whistler notes that Parham includes identification in the literature, even those that are clearly errors (1984: 465).

Whistler notes that for several of the ferns, there is no uniformity of opinion as to which fern species are identified by which name (1984:474).

Appendix 5. Samoan and Taxonomic Names: Fauna

aleiao	nd (=`ali`ao?: *Trocus* sp., a mollusk (Milner))
aleva	*Urodynamis taitensis* (Muse)
* alogo	a fish
atafa	*Fregata minor* all islands
	F. ariel ("may breed on Pola") (Muse)
* atualoa	a kind of centipede (Milner)
* `avi`i	*Ocypodo* sp. sand crab (Milner)
fua`o	*Sula* spp. one species in Manu`a only
	Sula sula on the Pola only (Muse)
fuia	*Aplonis atrifiscus* (Mayr)
gogo	*Anous* sp.; *Sterna* sp.; *Thalasseus* sp. (Muse)
gogo sina	*Sterna sumatrana* (Muse)
iao	*Foulehaio carunculata* (Mayr)
* `isumu	rat (Milner)
* laumei	turtle (Milner)
* lo-ata	a kind of black ant (Milner)
* loi	ant (Milner)
lulu	*Tyto alba* (Mayr)
lupe	*Ducula pacifica* (Mayr)
* maile	dog (Milner)
* manu`ainiu	Rhinoceros beetle (Milner)
manuali`i	*Porphyrio porphyrio* (Mayr)
	Prophyrio(sic)*porphyrio* (Muse)
manuiti	nd
manulua	immature manuma (Muse)
	female manuma (Mayr)
manuma	*Ptilinopus perousii* (Mayr)
manusina	*Gygis alba pacifica* (Muse)
manutagi	*Ptilinopus porphyraceus* (Mayr)
matu`u	*Egretta sacra* (Muse)
miti vao	*Aplonis tabuensis* (Mayr)
moa	domestic chicken (Milner)
moa ai vao	*Gallus gallus* wild chicken (Muse)
* mogamoga	cockroach (Milner)
pato	duck (Milner)
pe`a	*Pteropus* spp. (Pratt)
pe`ape`a	*Collocalia spodiopygia* (Muse)
* pi	wasp;hornet (Milner)
* pili	lizard (Milner)
* pua`a	pig (Milner)
* pusi	cat (Milner)
sega	*Vini australis* (Mayr)
segavao	*Vini australis* (Muse)
sega u`u	nd
segasega mau`u	*Myzomela cardinalis* (Muse)
	M. nigriventris (Muse)
	Erythrura cynovirens (Mayr only)
	[Milner: *Erythrura* sp. Notes that he gives Mayr's

	identification preference.]
tai`o	*Petrodromo* (4 spp.) 2 seen on Ta`u only
	Puffinus (6 spp.) 2 seen on Ta`u only
	Nesofregatta sp. on Ta`u and the Pola only. (Muse)
tava`e	*Phaethon* (3 spp.) (Muse)
ti`otala	*Halcyon chloris* (Mayr)
tolai	*Myiagra albiventris* (Muse)
	Petroica multicolor (Muse)
	Myzomela cardinalis (Mayr only; see segasega mau`u)
toloa	*Anas superciliosa* (Muse)
tuli	*Pluvialis dominica*
	Limosea lapponica (on Tau and Tutuila)
	Heteroscelus incanus
	Calidris alba (Muse)
* tuna	*Anguilla* spp. freshwater eel (Milner)
* uga	hermit crab (Milner)
* uu	*Birgus* sp. coconut crab (Milner)
ve`a	*Rallus philippensis* (Mayr)
ve`ve`a alagi	nd
* `aeno crab	a species of land crab (Pratt)
* `ama`ama	*Grapsus* sp. crab (Milner)

Muse identifications not noted when they agreed with Mayr.

Pratt's identifications noted when identifications were not listed elsewhere.

Species described as not being found in Manu`a or on Tutuila have not been noted.

* not a bird/bat
nd: no data