National Park Service
Cultural Landscapes Inventory
2004

Ainahou Ranch House and Gardens

Hawaii Volcanoes National Park

Cultural Landscape Inventory:
'Ainahou Ranch House and Gardens
Hawai'i Volcanoes National Park

Hawai'i Volcanoes National Park concurs with the findings, including the Management Category and Condition Assessment assigned through completion of this Cultural Landscape Inventory for the 'Ainahou Ranch House and Gardens as listed below:

MANAGEMENT CATEGORY B: **Should be preserved and maintained**

CONDITION ASSESSMENT: **Fair**

Cindy Orlando 8.24.04

Superintendent, Hawai'i Volcanoes National Park Date

Please return this form to:
Shaun Provencher
PWR CLI Coordinator
National Park Service
1111 Jackson Street, Suite 700
Oakland, CA 94607

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
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DAN DAVIDSON
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

September 24, 2004

Ms. Cindy Orlando, Superintendent
Hawaii Volcanoes National Park
Post Office Box 52
Hawaii National Park, Hawaii 96718-0052
Attention: Shaun Provencher

LOG NO: 2004.2901
DOC NO: 0409tl08
Architecture

Dear Mr. Martin:

SUBJECT: **Section 106 Compliance**
Cultural Landscape Inventory for
Ainahou Ranch and Gardens, Hawai'i Volcanoes National Park
TMK: 9-9-001:006, Hawaii Volcanoes National Park, Island of Hawaii

Thank you for the opportunities to review and comment on the Cultural Landscape Inventory (CLI) for Ainahou Ranch and Gardens, Hawai'i Volcanoes National Park. The report identifies the following landscape characteristics that contribute to the significance of Ainahou Ranch and Gardens: natural systems and features, topography, spatial organization, cluster arrangement, land use, buildings and structures, small-scale features, circulation, archeological sites, and vegetation. In addition, the CLI also identifies the revisions to the period of significance, the site boundary and the revisions to the list of contributing and non-contributing features. We concur that CLI data is complete in regards to historic and cultural resources.

Thank you for the opportunity to comment. Should you any questions about archaeology, please feel free to call Nathan Napoka at (808) 587-0193. Should you any questions about archaeology, please feel free to call Mary Ann Maigret at (808) 327-3690. Should you have any question about architecture, please free to call Thomas Lim at (808) 692-8030.

Sincerely,

Peter T. Young
State Historic Preservation Officer

TL: sky

c: Nathan Napoka, History and Cultural Branch
Mary Ann Maigret, Archaeology Branch

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Executive Summary

General Introduction to the CLI

The Cultural Landscapes Inventory (CLI) is a comprehensive inventory of all historically significant landscapes within the National Park System. This evaluated inventory identifies and documents each landscape's location, physical development, significance, National Register of Historic Places eligibility, condition, as well as other valuable information for park management. Inventoried landscapes are listed on, or eligible for, the National Register of Historic Places, or otherwise treated as cultural resources. To automate the inventory, the Cultural Landscapes Automated Inventory Management System (CLAIMS) database was created in 1996. CLAIMS provides an analytical tool for querying information associated with the CLI.

The CLI, like the List of Classified Structures (LCS), assists the National Park Service (NPS) in its efforts to fulfill the identification and management requirements associated with Section 110(a) of the National Historic Preservation Act, NPS Management Policies (2001), and Director's Order #28: Cultural Resource Management (1998). Since launching the CLI nationwide, the NPS, in response to the Government Performance and Results Act (GPRA), is required to report on an annual performance plan that is tied to 6-year strategic plan. The NPS strategic plan has two goals related to cultural landscapes: condition (1a7) and progress on the CLI (1b2b). Because the CLI is the baseline of cultural landscapes in the National Park System, it serves as the vehicle for tracking these goals.

For these reasons, the Park Cultural Landscapes Program considers the completion of the CLI to be a servicewide priority. The information in the CLI is useful at all levels of the park service. At the national and regional levels it is used to inform planning efforts and budget decisions. At the park level, the CLI assists managers to plan, program, and prioritize funds. It is a record of cultural landscape treatment and management decisions and the physical narrative may be used to enhance interpretation programs.

Implementation of the CLI is coordinated on the Region/Support Office level. Each Region/Support Office creates a priority list for CLI work based on park planning needs, proposed development projects, lack of landscape documentation (which adversely affects the preservation or management of the resource), baseline information needs and Region/Support office priorities. This list is updated annually to respond to changing needs and priorities. Completed CLI records are uploaded at the end of the fiscal year to the National Center for Cultural Resources, Park Cultural Landscapes Program in Washington, DC. Only data officially entered into the National Center's CLI database is considered "certified data" for GPRA reporting.

The CLI is completed in a multi-level process with each level corresponding to a specific degree of effort and detail. From Level 0: Park Reconnaissance Survey through Level II: Landscape Analysis and Evaluation, additional information is collected, prior information is refined, and decisions are made regarding if and how to proceed. The relationship between Level 0, I, and II is direct and the CLI for a landscape or component landscape inventory unit is not considered finished until Level II is complete.

A number of steps are involved in completing a Level II inventory record. The process begins when the CLI team meets with park management and staff to clarify the purpose of the CLI and is followed by historical research, documentation, and fieldwork. Information is derived from two efforts: secondary sources that are usually available in the park's or regions' files, libraries, and archives and on-site landscape investigation(s). This information is entered into CLI database as text or graphics. A park report is generated from the database and becomes the vehicle for consultation with the park and the

SHPO/TPO.

Level III: Feature Inventory and Assessment is a distinct inventory level in the CLI and is optional. This level provides an opportunity to inventory and evaluate important landscape features identified at Level II as contributing to the significance of a landscape or component landscape, not listed on the LCS. This level allows for an individual landscape feature to be assessed and the costs associated with treatment recorded.

The ultimate goal of the Park Cultural Landscapes Program is a complete inventory of landscapes, component landscapes, and where appropriate, associated landscape features in the National Park System. The end result, when combined with the LCS, will be an inventory of all physical aspects of any given property.

Relationship between the CLI and a CLR

While there are some similarities, the CLI Level II is not the same as a Cultural Landscape Report (CLR). Using secondary sources, the CLI Level II provides information to establish historic significance by determining whether there are sufficient extant features to convey the property's historic appearance and function. The CLI includes the preliminary identification and analysis to define contributing features, but does not provide the more definitive detail contained within a CLR, which involves more in-depth research, using primary rather than secondary source material.

The CLR is a treatment document and presents recommendations on how to preserve, restore, or rehabilitate the significant landscape and its contributing features based on historical documentation, analysis of existing conditions, and the Secretary of the Interior's standards and guidelines as they apply to the treatment of historic landscapes. The CLI, on the other hand, records impacts to the landscape and condition (good, fair, poor) in consultation with park management. Stabilization costs associated with mitigating impacts may be recorded in the CLI and therefore the CLI may advise on simple and appropriate stabilization measures associated with these costs if that information is not provided elsewhere.

When the park decides to manage and treat an identified cultural landscape, a CLR may be necessary to work through the treatment options and set priorities. A historical landscape architect can assist the park in deciding the appropriate scope of work and an approach for accomplishing the CLR. When minor actions are necessary, a CLI Level II park report may provide sufficient documentation to support the Section 106 compliance process.

Park Information

Park Name:	Hawaii Volcanoes National Park
Administrative Unit:	Hawaii Volcanoes National Park
Park Organization Code:	8300
Park Alpha Code:	HAVO

Property Level And CLI Number

Property Level:	Component Landscape
Name:	Ainahou Ranch House and Gardens
CLI Identification Number:	975108
Parent Landscape CLI ID Number:	975039

Inventory Summary

Inventory Level: Level II

Completion Status:

Level 0

Date Data Collected - Level 0:	8/15/1999
Level 0 Recorder:	P. Nelson
Date Level 0 Entered:	8/15/1999
Level 0 Data Entry Recorder:	P. Nelson
Level 0 Site Visit:	Yes

Level I

Date Level I Data Collected:	8/18/1999
Level I Data Collection	P. Nelson
Date Level I Entered:	8/18/1999
Level I Data Entry Recorder:	L. Tamimi
Level I Site Visit:	Yes

Level II

Date Level II Data Collected:	7/28/2003
Level II Data Collection	L. Tamimi, C. Rygh
Date Level II Entered:	1/8/2004
Level II Data Entry Recorder:	L. Tamimi and Christian Rygh
Level II Site Visit:	Yes
Date of Concurrence	8/24/2004

Component Landscape Description

The 'Ainahou Ranch House and Gardens is located within Hawai'i Volcanoes National Park, approximately four miles south and down slope from Kilauea Caldera. The site was listed on the National Register of Historic Places at the state level of significance in 1995. The CLI provides an inventory of those landscape features that contribute to the significance of the site. The 13.3-acre historic site sits within a native mesic (moist but not extremely wet) forest at an elevation of 3000 feet. Within this forest, gardens that surround a unique craftsman house create an exotic setting which reflects the site's development by renowned horticulturalist, Herbert C. Shipman from 1941 to 1971. During these years, Shipman created an informal historic vernacular landscape that showcased his vast horticultural collection, which included orchids, orchards, a tree farm, and rare plants from around the globe. These plantings were all supported by an on-site rare plant nursery and an ingenious and unique rainwater catchment system.

Shipman's efforts were intended to develop not a botanic garden in a traditional sense, with specific areas dedicated to species, ecosystems, or parts of the globe, but an aesthetic horticultural showcase to display his collections and beautify the grounds of his unique home. The gardens were informally planted throughout the grounds, making use of the sloping terrain to create views to the shoreline, as well as smaller topographic lava features that were used as planters or as backdrops for orchids and other species. The palette consisted of a multitude of exotic species laid out in an informal, non-linear pattern, which in several areas incorporated or even accentuated the existing natural patterns of native trees and rock outcrops. While Shipman utilized many exotics in discrete arrangements throughout his gardens, the layout does not adhere to any formally designed plan (that is known) and does not follow the any thematic organization that might categorize the developments as botanical gardens or as a formally designed landscape. As a result, the 'Ainahou Ranch House and Gardens is a historic vernacular landscape.

The period of significance of 1941 to 1971, established in the National Register of Historic Places documentation, begins when Shipman first constructed his house as a safe haven from possible Japanese invasion during WWII. During and after the war, the ranch house was also used as a base of operations for 'Ainahou Ranch, which supplied beef to military and domestic outlets. The ensuing years saw more elaborate gardens surrounding the ranch house, and the site was used as a Nene (endangered Hawaiian goose) sanctuary (Shipman is further credited with saving the Nene from extinction). The period ends in 1971 when Shipman submitted his asking price for his improvements to the property, and terminated his lease with B.P. Bishop Estate, thereby enabling the National Park Service to acquire it from the owner. As a result of Shipman's tenure on the site, the 'Ainahou Ranch House and Gardens historic site is significant under National Register Criteria B and C.

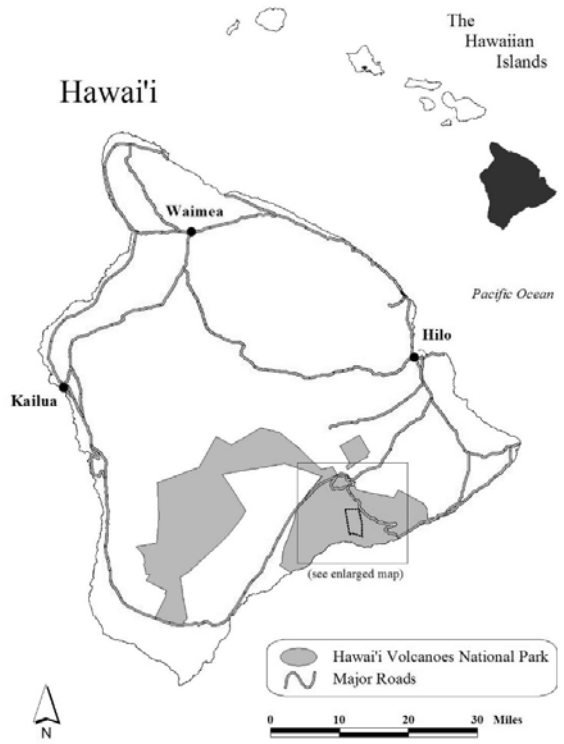
While the current variety of plant species found at the 'Ainahou Ranch House and Gardens is significantly less diverse than during the period of significance (Shipman removed many plants from 1973 to 1975, and the National Park Service has had to eradicate some of the invasive contributing species), the overall character of the site as a manicured showcase of exotics within a native mesic forest remains. This is due in part to efforts by both the National Park Service and the Friends of 'Ainahou, a volunteer organization dedicated to the upkeep of the property. As a result, the following landscape characteristics contribute to the significance of the National Register of Historic Places site: natural systems and features, topography, buildings and structures, cluster arrangement, spatial organization, vegetation, circulation, and land use. However, due to the removal of fences and the rapid encroachment of primarily invasive forest species, the small scale features and views and vistas landscape characteristics no longer contribute to the significance of the site. Overall, the site is in fair condition. As established in the National Register of

Historic Places nomination, the 'Ainahou Ranch House and Gardens retains integrity according to the seven aspects: location, design, setting, materials, workmanship, feeling, and association.

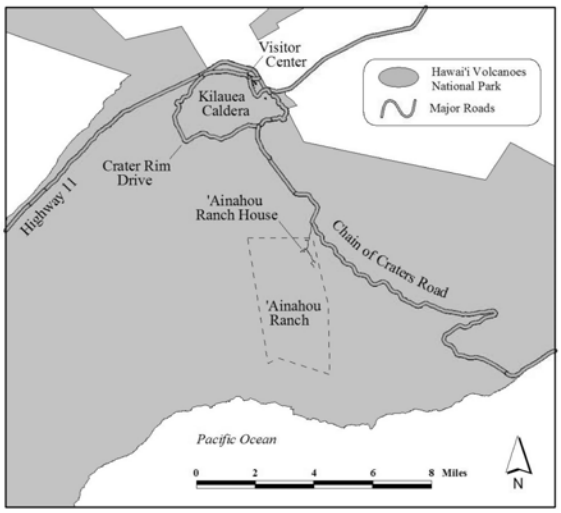
Cultural Landscapes Inventory Hierarchy Description

The 'Ainahou Ranch House and Gardens is the only component landscape of the larger 'Ainahou Ranch parent landscape. Its character as a highly developed house and garden is distinct from the surrounding vernacular ranch lands that make up the majority of the Herbert C. Shipman property. As a result, the component landscape warrants specific documentation separate from the larger ranch.

Location Map



Location Map # 1: Location of Hawai'i Island and Hawai'i Volcanoes National Park (PWR, HAVO, CLI files, 2003).



'Ainahou Ranch House Location

Location Map # 2: Locations of 'Ainahou Ranch and 'Ainahou Ranch House and Gardens within Hawai'i Volcanoes National Park (PWR, HAVO, CLI files, 2003).

Boundary Description

The landscape boundary surrounds the 'Ainahou Ranch House and includes the ranch house gardens, the plant nursery area to the west, and an irregular-shaped extension to the northeast that includes a grove of cork oaks planted by Shipman. In general, the boundary was delineated chiefly to include contributing (planted) vegetation dating from the period of significance. The 13.3 acre CLI boundary encompasses a great deal more than the National Register of Historic Places nomination, which describes the site as less than one acre and gives no verbal or map description of the site's boundaries. Contributing vegetation remains as a legacy of Shipman's enthusiasm for horticulture and is thus a particularly critical element in the cultural landscape. The boundary does not include outbuildings that are only associated with ranching and/or are far removed from the ranch house. These structures as well as other features not directly related or adjacent to the ranch house and surrounding gardens will be addressed in the parent landscape inventory. The cultural landscape boundary falls within tract number 01-114, located in Hawai'i Volcanoes National Park (see land ownership map and site map). The UTM coordinates delineating the cultural landscape boundary are listed in the boundary UTM section of part 4 of this document.

Regional Context

Physiographic Context

The 'Ainahou Ranch House and Gardens is precariously located on the slopes of the most active volcano in the world – Kilauea. Eruptions from this shield volcano are ordinarily slow and gradual in comparison with the more explosive and sudden eruptions of pyroclastic volcanoes (e.g. Mount St. Helens), although infrequent explosive eruptions have historically occurred. Since the volcanic landscapes are so young, soil deposits are scant. The Hawaiian Islands are home to one of the highest concentrations of endemic and endangered species on the planet. The 'Ainahou Ranch area was originally a vibrant mesic forest, but ranching, feral animals, and invasive plants have severely diminished the species integrity of this most vulnerable of native Hawaiian ecosystems. The National Park Service (NPS) and other local agencies and non-profit groups are currently involved in removing invasive species and re-establishing rare, threatened, and endangered species in the region.

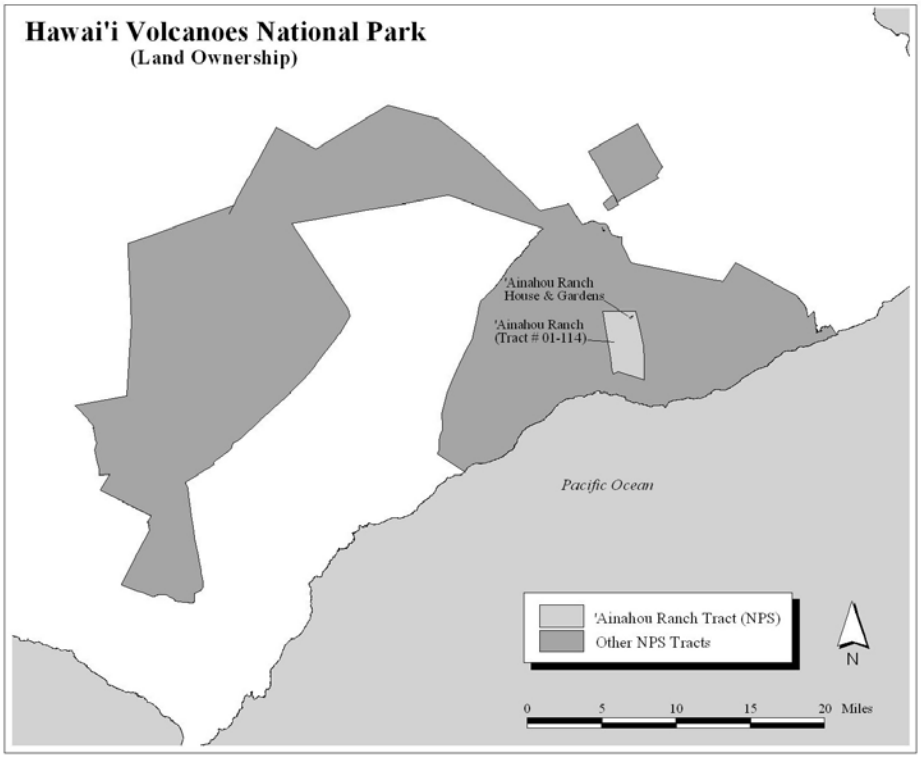
Cultural Context

'Ainahou Ranch is situated within the Keauhou ahupua'a, which reaches from the heights of Mauna Loa to the ocean and encompasses Kilauea Caldera. Archaeological evidence and a rich oral history confirm that Hawaiians had been living in the Keauhou ahupua'a for several centuries prior to Western contact. The area near the component landscape is not believed to have been an area of dense settlement, but was probably frequented by Hawaiians traveling to and from the coast within this land division. Based on current information, the bridle path and dirt road through 'Ainahou Ranch appear to follow the course of the prehistoric Keauhou Trail – an important route for native Hawaiians exchanging resources between coastal and highland ecosystems. In the late nineteenth century, the route was developed into a bridal path (lower portion) and road (upper portion) from Keauhou Landing to the vicinity of Hawai'i Volcanoes National Park headquarters. This was the primary route used to bring tourists to Kilauea Volcano (Volcano House lodging) before 1894, at which time the route from Hilo to Volcano (now Highway 11) was improved to accommodate carriages (NPS unpublished manuscript, 1999). Before this development, pulu (downy silk from tree ferns used for mattress filling) and thousands of head of cattle (from other ranches in the region) were transported to port along the Keauhou Trail.

The Big Island (Hawai'i Island) is the birthplace and stronghold of Hawai'i's ranching industry and paniolo (cowboy) culture. The first cattle were brought by Captain George Vancouver in 1793 and 1794 as a gift to Kamehameha I who turned them loose and placed a kapu (taboo) on their slaughter until 1830. By this time, a dozen cattle had proliferated into a numerous and feral population, which was wreaking havoc on native ecosystems and seemed impossible to control. Thus, Kamehameha III sent an ambassador to Mexico to bring back some vaqueros (Mexican cowboys) to teach local people to ride horses, rope cattle, and tame wild cattle (Nolan, 2001). Between 1850 and 1900 many different breeds of cattle were imported throughout the Hawaiian Islands and large-scale ranching operations emerged, particularly on the Big Island. During the period of significance, the chief industries elsewhere in the state were pineapple and sugarcane (Juvik and Juvik, 1998), but in the immediate region, soil and climate were better suited for ranching. To this day, despite the growing population pressure and changing economic currents (e.g. tourism) in Hawai'i, the Ka'u district still contains several working ranches.

Political Context

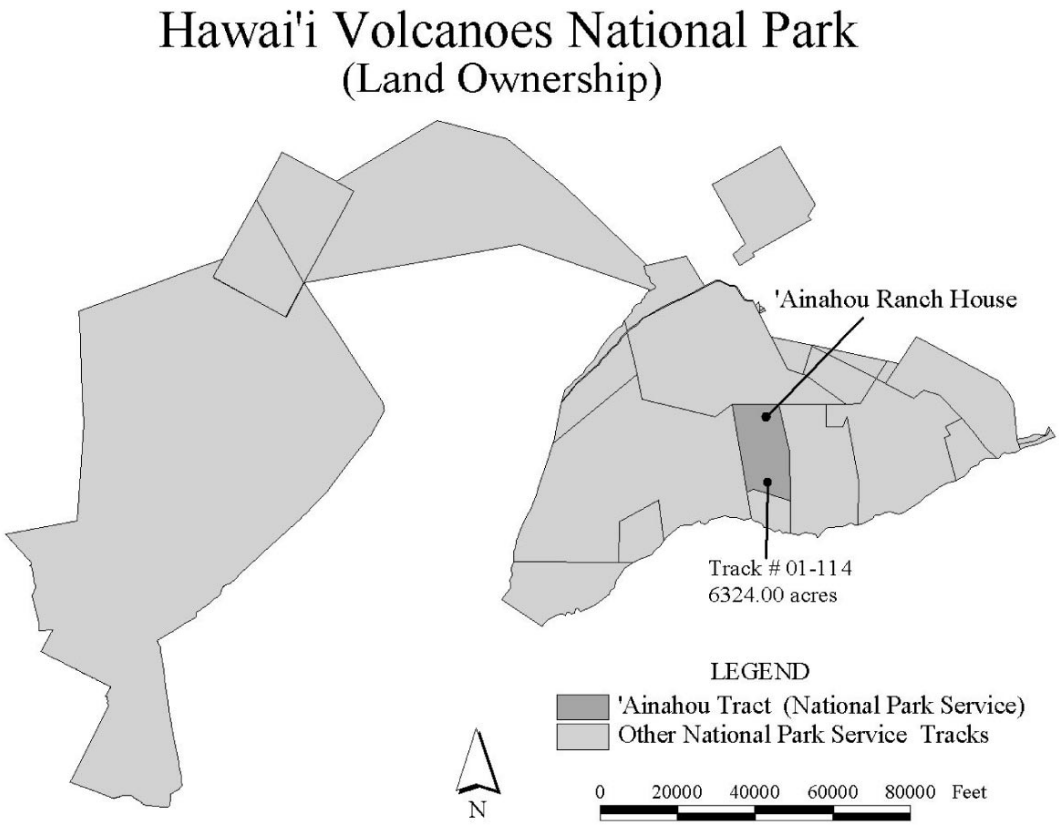
Prior to Western contact, land tenure in Hawai'i was based on a hierarchical structure of chiefs. The basic land units (ahupua'a) stretched from the mountains to the ocean, creating a radial pattern of (wedge-shaped) chiefdoms and ensuring that the commoners in each ahupua'a had access to the resources from each physiographic zone (e.g. coast, lowlands, highlands). The westernization and commercialization of Hawai'i eventually gave rise to the Great Mahele (1847-1850), by which King Kamehameha III established a private land tenure system in the Hawaiian Islands. The entire ahupua'a of Keauhou was awarded to Victoria Kamamalu, a granddaughter of Kamehameha I. Between 1866 and 1884, the ownership of Keauhou was successively inherited by members of the Kamehameha lineage upon the deaths of previous heirs until the death of Princess Bernice Pauahi, at which time her husband Charles Bishop established B.P. Bishop Estate to administer Keauhou and other properties in Princess Pauahi's inheritance (Jackson and Durst, 2001). Congress purchased the lower portion of Keauhou (all except a 6,324 acre parcel that would later be called 'Ainahou Ranch) from B.P. Bishop Estate and established Hawai'i National Park in 1916. Shipman leased the anomalous 'Ainahou parcel from 1937 until 1971, at which time the NPS was able to acquire it from B.P. Bishop Estate. Hawai'i Volcanoes National Park, as it is now called, is located in the Ka'u District of the County (and Island) of Hawai'i.



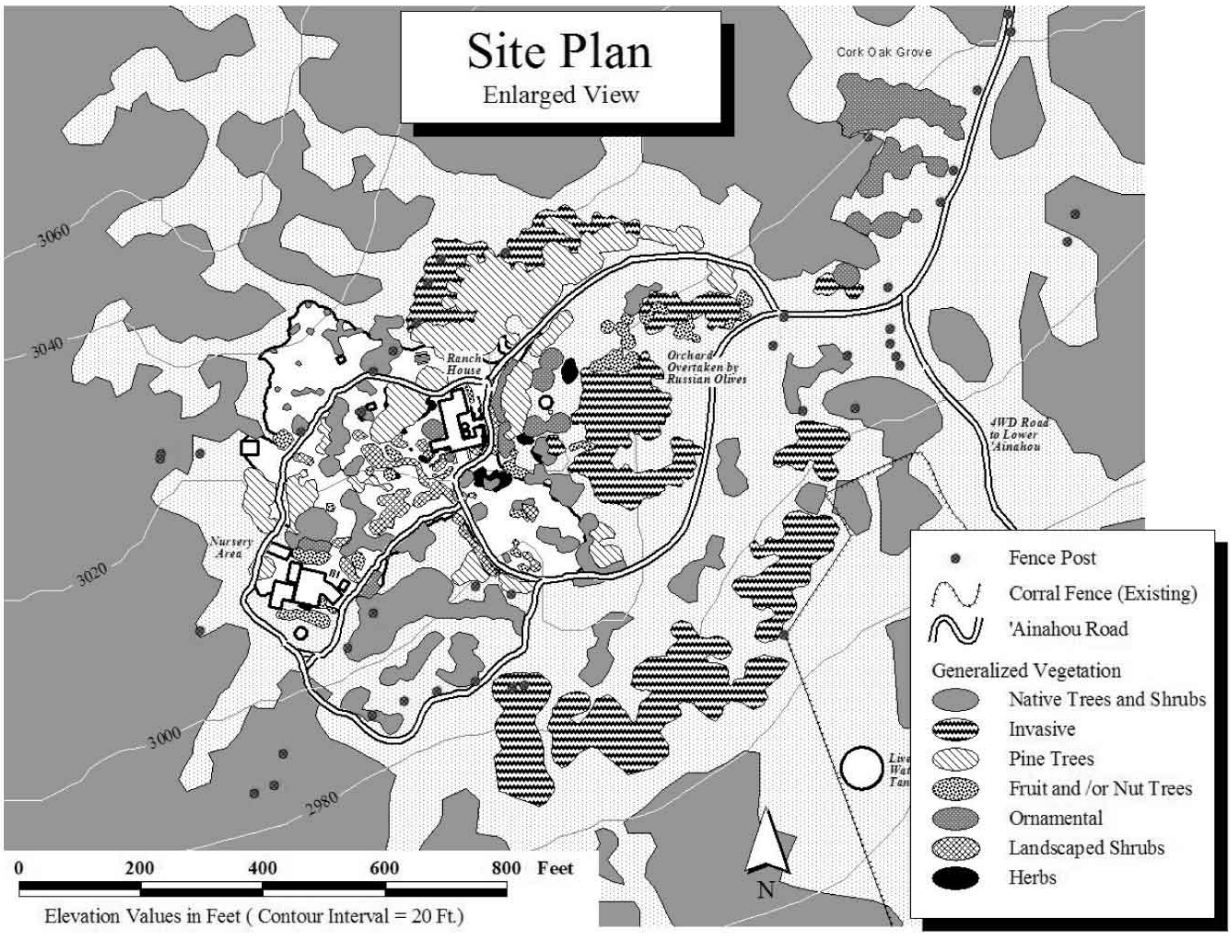
Regional Context # 1: Map showing the 'Ainahou Ranch tract acquired by the NPS in 1971.

Site Plan

Site Plan # 1: General overview (PWR, HAVO, CLI files, 2003). For full-size graphic see Appendix.



Site Plan # 2: Enlarged View of core area of the cultural landscape (PWR, HAVO, CLI files, 2003). For full-size graphic see Appendix.



Chronology

Year	Event	Description
1848 AD	Land Transfer	The 'ili'aina of Keauhou (land division containing 'Ainahou Ranch lands) in Ka'u was awarded to Victoria Kamamalu during the Great Mahele.
1863 - 1921 AD	Land Transfer	Beginning with Francis B. Swain, several people leased the Keauhou property in its entirety or just the upper tract, primarily for harvesting pulu (downy silk from tree-ferns). Ownership of Keauhou also changed hands several times during this period.
1866 - 1884 AD	Land Transfer	Keauhou was successively inherited by members of the Kamehameha lineage upon the deaths of previous heirs until the death of Princess Bernice Pauahi at which time her husband Charles Bishop established B.P. Bishop Estate to administer her land holdings.
1921 AD	Land Transfer	May K. & Arthur W. Brown leased Tract A (upper) and Tract B (lower) from Bishop Estate and established Keauhou Ranch. This was the first official stipulation of the two tracts.
1937 AD	Land Transfer	The Lease for Keauhou Ranch (tracts A & B) was transferred to Brown heirs.
1937 AD	Land Transfer	W. H. Shipman, Ltd. purchased a lease for Keauhou Ranch (tracts A & B) from B.P. Bishop Estate, and also bought the cattle and property improvements from the Brown heirs.
1941 AD	Built	Herbert C. Shipman, son of businessman William H. Shipman, built the 'Ainahou Ranch House.
1941 - 1964 AD	Ranched/Grazed	'Ainahou Ranch was used to raise cattle and supply beef to the military during World War II. Beef was also sold to Hilo, Hawai'i outlets for twenty years after World War II.

1941 - 1959 AD	Built	Shipman built glass hot houses to propagate orchids and other exotic plants. Shipman also built sheds and a water catchment system (1941-1950s) on the 'Ainahou Ranch House grounds.
1941 - 1971 AD	Established	Shipman established gardens, retaining walls and planter beds at the 'Ainahou Ranch House. He collected several exotic plants, many from abroad, and planted them in the surrounding landscape with other ornamental, fruit, and native plant species.
1942 AD	Built	Shipman had an official rain gauge installed west of the ranch house. Rainfall data was reported to the State of Hawai'i and NOAA records until Shipman's death in 1976. The NPS continues to use the site as an official weather monitoring location.
1946 AD	Built	The generator shed was built east of the ranch house to provide it with electricity.
1946 AD	Moved	Shipman moved a surviving flock of Nene from his coastal residence in Kea'au to 'Ainahou Ranch after a tsunami hit the Island of Hawai'i on April 1, 1946, devastating the local nene population.
1953 AD	Land Transfer	W. H. Shipman, Ltd. subleased Keauhou Ranch (tracts A & B) to J. J. and Maria Nobriga for cattle ranching. The ranch house was still used by Shipman for the duration of this sublease.
1954 AD	Built	Depreciation records indicate that Nene pens were constructed.
1961 AD	Land Transfer	Herbert Shipman renewed his lease for Tract B only, which he names 'Ainahou Ranch. This was the first time the lower Keauhou tract was leased independently. Shipman's water system and other improvements increased the attractiveness of this drier tract.

1971 AD	Purchased/Sold	Shipman purchased the rights to the 'Ainahou Ranch improvements from B.P. Bishop Estate and sold his leasehold interest in the property for $10 and the improvements and water rights on the property for $150,000 to the NPS.
1971 AD	Purchased/Sold	B.P. Bishop Estate sold its fee interest in the 'Ainahou Ranch (Tract B) to the NPS for $648,000. Using Endangered Species Act legislation, Congress appropriated funds designating the use of certain portions for the protection of endangered species.
1971 - 1973 AD	Removed	Shipman returned several times to remove his most prized plants from the ranch house grounds before completely relinquishing the property.
1972 AD	Built	The NPS constructed large Nene pens southeast of the 'Ainahou Ranch House and Gardens component landscape.
1973 AD	Established	NPS staff established a working nursery, in the same location where Shipman had his nursery, for the purpose of propagating native plants for re-vegetation projects.
1973 - 2003 AD	Removed	NPS staff and volunteers periodically removed invasive plant species such as Russian olive, Formosan koa, kudzu, ash, loquat, ivy and holly. Eradication work transpired in the component landscape, but mostly as part of a regional or parkwide effort.
1975 - 1979 AD	Maintained	The NPS removed vegetation overhanging the ranch house and water tanks. Gutters on the ranch house and water tanks were cleaned and painted. The NPS repaired roof and gutters where needed. The ranch house roof was also painted (late 1970s).
1976 - 1989 AD	Removed	The large redwood water tanks within the ranch house and NNW of the ranch house were removed by the NPS. The NPS also removed the sink, bath, toilet, light fixtures, generator house, dog kennel, nursery water tank, and some pipelines (late 1970s - 1980s).

1976 - 1978 AD	Rehabilitated	The NPS reclaimed the yard surrounding the ranch house from heavy weed overgrowth, and pruned and fertilized historic-period plants.
1980 - 1982 AD	Removed	Shipman's original nursery hothouses and nursery work sheds were removed by the NPS.
1984 - 1986 AD	Farmed/Harvested	NPS sold Formosan koa trees planted by Shipman. Trees were harvested from the property between 1984 and 1986.
1989 - 1990 AD	Removed	Volunteers (a troubled youth group) assisted the NPS in cleaning up debris, fire fuels, and invasive vegetation around the ranch house. The latter may have included certain historically contributing species, such as holly, azalea, and Russia olive.
1990 - 1999 AD	Altered	The NPS installed non-historical plumbing fixtures and a water pump at the ranch house (1990s). Since the historic water system was not fully functional at this time, the pump was installed as a fire precaution.
1990 - 1999 AD	Established	The NPS created a new circulation pattern (truck path) making a loop to better access the nursery area (1990s). The truck path is essentially a short-mowed grass path. Its construction did not require grading or permanent alterations to the landscape.
1993 AD	Rehabilitated	The NPS replaced V-shaped copper gutters on the ranch house with aluminum-zinc gutters.
1993 AD	Preserved	The NPS replaced the roof on the redwood water tank southwest of nursery area.
1994 AD	Preserved	The 'Ainahou Ranch House was placed on the Hawai'i State Register of Historic Places.
1995 AD	Preserved	The 'Ainahou Ranch House was placed on National Register of Historic Places.

1996 AD	Rehabilitated	The NPS began clearing invasive vegetation such as Russian olives from the ranch house grounds. In contrast to most of the previous invasive species control, stabilizing the historic resource (cultural landscape) was the focus of these efforts.
1996 AD	Altered	A small garden west of the ranch house was unofficially dedicated (by friends and co-workers) to an NPS employee who died in a tragic accident. The garden consists mostly of native species that volunteered in situ and were deliberately not removed.
1997 AD	Damaged	A large cork oak tree fell on the east side of ranch house damaging the roof and gutters. The NPS quickly rehabilitated the damaged portions of the house.
1997 AD	Preserved	The NPS replaced roof and gutters on the lua (pit toilet).
1997 AD	Preserved	The NPS replaced the roof on shed # 1.
1997 AD	Preserved	The NPS replaced roof, gutters, and east siding on shed # 2.
1998 AD	Established	The Friends of 'Ainahou volunteer organization was formally established to work with the NPS to assist in restoring the ranch house and grounds.
2001 AD	Altered	The Friends of 'Ainahou painted the ranch house exterior window frames without consulting NPS Cultural Resource managers.
2002 AD	Built	The Friends of 'Ainahou built a grape trellis in the nursery area, in the same general location as a decrepit one that was removed. The new trellis is not an accurate reconstruction of the historical one, nor were the appropriate NPS officials consulted.
2002 - 2004 AD	Preserved	The NPS replaced old 'ohi'a posts at the two main rain sheds north of the component landscape boundary.

2004 AD	Rehabilitated	The NPS replaced external support posts on the south side of the ranch house.
2004 AD	Rehabilitated	The NPS constructed a new water tank to rest on the historical water tank foundation NNW of the ranch house.

Statement Of Significance

Summary

The 'Ainahou Ranch House and Gardens is locally significant within the State of Hawai'i for its association with Herbert C. Shipman, a locally renowned horticulturalist, businessman, cattle rancher, wildlife conservationist, philanthropist, and descendant of one of the oldest missionary families in Hawai'i (Criteria B) for the period from 1941 to 1971. The house and gardens are also locally significant for this period as an exceptional representation of the Craftsman Style in the islands, which is surrounded by a unique landscape that showcased Shipman's vast horticultural collection (Criteria C). The site contains buildings, structures, circulation features, planted vegetation, and other features dating from the 1941 to 1971 period of significance, which created an extremely private and exotic retreat for one of Hawai'i's most illustrious European figures. The 'Ainahou Ranch and Gardens falls under the National Park Service's "Expressing Cultural Values" and "Transforming the Environment" thematic framework categories.

Existing Documentation

While the Ainahou Ranch House and Gardens falls within the Puna Ka'u Historic District as determined in the 1974 National Register nomination (NR # 74000294), it is not mentioned as a contributing feature. However, 'Ainahou was listed as a building on the National Register of Historic Places on February 8, 1995 with the title of "Ainahou Ranch" (NR # 94001619). This nomination determined the building to be significant (no level identified) under Criteria B and C for the period of 1941 to 1944. However, little mention is made in this nomination of the unique landscape that surrounds the house, nor is there detail regarding the full extent of Shipman's garden developments that continued until 1971. This statement will serve to update the existing National Register documentation by providing additional information needed to fully understand the site as being significant under both Criteria B and C for an expanded period of significance of 1941 to 1971 – the full period during which Herbert C. Shipman constructed his house and developed the surrounding gardens. In addition, the 'Ainahou Ranch House is also listed on the State Register of Historic Places for Hawai'i (April 16, 1994).

Criterion B

Under Criterion B, the site is locally significant for its association with Herbert C. Shipman, a locally renowned businessman, cattle rancher, wildlife conservationist, philanthropist, and descendant of one of the oldest missionary families in Hawai'i. Shipman used the site primarily as a private mountain retreat and as the site of his Nene (endangered Hawaiian goose, and State bird) breeding and conservation program, begun in 1946. Shipman's efforts were essential for saving the species, whose population was estimated at thirty in 1951, from extinction (http://pacificislands.fws.gov). Further, Shipman received national acclaim and foreign recognition for his horticultural accomplishments and was a lifetime member of the American Orchid Society, the Royal Horticultural Society of London, the Hawai'i Orchid Society, the Pacific Tropical Orchid Society, the Hawaiian Botanical Gardens Association, and the Friends of Foster Gardens (Cahill, 1996). He was also the "recipient of many awards for contributing to horticulture and conservation" (Cahill, 1996: 224), including twelve gold medals from the American Orchid Society, and the title of "Conservationist of the Century" by the Waiakea Soil and Water Conservation District.

Criterion C

The 'Ainahou Ranch House is locally significant under Criterion C as a fine example of the Craftsman Style in its own right, that when paired with the surrounding gardens, creates a unique architectural and horticultural showcase without comparison in Hawai'i.

The ranch house itself is a two-storey wooden bungalow with redwood siding, cut-lava stone foundations and a low gabled roof sheathed in corrugated metal. It incorporates signature components of the Craftsman Style such as the incorporation of Adirondack and Japanese elements such as unfinished log pillars on the exterior and a horizontal roofline supported by protruding rafters (Suzuki/Morgan, 2003). Additional specialized features such as the lanai, built-in garage, and unique rainwater catchment system mark this home as an exceptional building within Craftsman Style.

The gardens surrounding the house total over thirteen acres of native Hawaiian species and exotic horticultural specimens from around the world. In these gardens, Shipman raised orchids and landscaped the grounds with flowering beds and a wide array of fruit, nut, and ornamental trees and shrubs. Shipman's efforts were intended to develop not a botanic garden in a traditional sense, with specific areas dedicated to species, ecosystems, or parts of the globe, but an aesthetic horticultural showcase to display his collections and beautify the grounds of his unique home. The gardens were informally arranged to make use of the sloping terrain, creating views to the shoreline. He further used smaller topographic lava features as planters or as backdrops for orchids and other species. The palette consisted of a multitude of exotic species laid out in an informal, non-linear pattern, which in several areas incorporated or even accentuated the existing natural patterns of native trees and rock outcrops.

Integrity

Herbert C. Shipman originally constructed the 'Ainahou Ranch House and Gardens as a secluded retreat in the event of war, but soon expanded his efforts to include developing the grounds as a horticultural showcase and Nene sanctuary. The truly secluded house site on the south slope of the Kilauea Caldera remains in its original location. While the views Shipman established through the forest from his home to the shore have been compromised by the encroaching forest, the Craftsman Style ranch house remains with its Adirondack and Japanese-influenced features intact. Further, the extensive horticultural gardens (though diminished in diversity) also remain in their original overall configurations.

The setting for the 'Ainahou Ranch House and Gardens remains the same, surrounded by the mesic forest on the slopes of Kilauea Caldera. Although the gardens have lost some of their original plant stock, a majority of the species remains in the gardens clearly indicating the general plant palette that Shipman was working with, retaining the aspect of materials. In addition, the aspect of workmanship is also retained in the details of the house and gardens, such as the roughly hewn pillars, notched rafters, and meticulously cut lava rock paving.

The collective retention of the 'Ainahou Ranch and Gardens' location, design, setting, materials, and workmanship creates the aesthetic and historic sense of a past time and place – that of Shipman's occupation, retaining the aspect of feeling and establishes a direct association with the man who developed the site. The integrity of the gardens as defined by the National Register of Historic Places: location, design, setting, materials, workmanship, feeling, and association, still remains and contributes to the significance of this National Register of Historic Places property.

Physical History

Early History of 'Ainahou Ranch

'Ainahou Ranch is located within the 'ili'aina (land division within an ahupua'a) of Keauhou, Ka'u (an ancient land division centered on Kilauea caldera) (Jackson and Durst, 2001). A small settlement is known to have existed along the shoreline below the ranch located in the area now called Keauhou Landing. It is believed that the lava fields located between Kilauea crater and the beach did not support much agriculture. Notably, the lack of land claims and the sparse historic records for the area seem to further support the belief that only limited use and occupation of the area by native Hawaiians occurred in the ranch area prior to Western contact (Jackson, 1972).

Shortly after King Kamehameha III established a private land tenure system in the Hawaiian Islands, the entire ahupua'a of Keauhou was awarded to Victoria Kamamalu, a granddaughter of Kamehameha I. Between 1866 and 1884, the ownership of Keauhou was successively inherited by members of the Kamehameha lineage upon the deaths of previous heirs until the death of Princess Bernice Pauahi, at which time her husband Charles Bishop established B.P. Bishop Estate to administer Keauhou and other land holdings in Princess Pauahi's inheritance (Jackson and Durst, 2001).

Upland locations within the 'ili 'aina of Keauhou were used during early Western contact as a gathering place for pulu (silky down on the base of hapu'u tree-ferns used for mattress stuffing and pillows) and wild goat and cattle skins. A number of game (e.g. feral goats) and domestic animals including goats, sheep, mules, asses, cattle, horses, dogs, and pigs were present in the area as early as 1840 (Jackson, 1972). The earliest leases of the 'ili 'aina of Keauhou (beginning in 1860) were predominantly for harvesting pulu, and although the lower elevation lands (later called 'Ainahou Ranch) were included in these leases, the higher elevation portions were the main attraction. The drier climate of the lower portions of Keauhou did not support a dense concentration of hapu'u tree-ferns, nor was it as ideal for ranching as the upper portions.

The historic Keauhou Trail provided the pulu harvesting industry, residents, and tourists with access from the shore at Keauhou Landing to upper elevation areas including the early Volcano House. A portion of the Keauhou Trail later came to be used as the primary access to the 'Ainahou Ranch from Chain of Craters Road (still in use today).

In 1921, B.P. Bishop Estate leased the upper and lower portions of the Keauhou Ranch to May K. and Arthur W. Brown for ranching purposes. Provisions of the lease that specifically applied to Tract B required the Brown lessees to plant kiawe (Prosopis pallida) (Jackson, 1972). In August 1937, the lease was transferred to the Brown heirs (Jackson, 1972).

In November 1937, William H. Shipman, Ltd. purchased the Brown heirs' Keauhou Ranch lease as well as all animals, structures, and land improvements on the property. The lower portion of the property known as Tract B was comprised of approximately 8250 acres, which included the area that would later be named 'Ainahou Ranch. As part of the lease, the lessee was required to build a stock proof fence to keep goats out, plant at least $600 worth of ekoa (Leucaena glauca) and grass seed, and erect a windmill and tank to provide drinking water for stock (Jackson, 1972).

Shipman Years (1941-1971)

In 1941, Herbert C. Shipman, son of W. H. Shipman and manager of W. H. Shipman, Ltd., built the 'Ainahou Ranch House that exists on the site today (see photos, Physical History #s 1,2,3,4, and 5). His original intent in constructing the house was to establish a remote, mountain retreat for his family in the event of a military invasion of Hawai'i by Japan (Cahill, 1996). The main residential complex, including ranch house and the surrounding grounds were used by Shipman as a residential retreat amid the larger 6324 acre cattle ranching property. During World War II, 'Ainahou Ranch supplied beef to the military. After World War II, the ranch supplied meat to Hilo outlets for approximately 20 years (Jackson and Durst, 2001).

Shipman constructed an extensive water catchment and delivery system that featured rain sheds, large holding tanks, and a water transport pipe system that serviced residential, landscaping, and animal stock needs without the use of a water pump. Depreciation records for 'Ainahou tanks from 1941-1969 documents maintenance on tanks, sheds and pipes (Jackson, 1972).

The outlying buildings and the water system were probably built on the ranch house grounds after the ranch house was built in 1941, although the dates are unknown. The exact year of when some of these outlaying buildings were constructed is unknown. These structures include the lua (pit toilet), rain sheds and several water tanks, glass hot houses (no longer present) (see photo, Physical History # 6), sheds for nursery supplies and equipment, and a generator shed. The mortared stone walls in front of the ranch house were built in 1941 after the construction of the ranch house was completed. The generator shed was built in 1946 and supplied the ranch house with electricity. The lua was built sometime before 1950 (Jackson, 1972) for ranch hands and other workers and is located northwest of the ranch house.

Within the boundaries of the 13.38 acre component landscape, Shipman raised orchids and extensively landscaped the grounds with flowering beds, ornamentals, citrus orchard, a cork oak grove and several types of pine trees. Shipman received national acclaim and foreign recognition for his horticultural accomplishments and was a lifetime member of the American Orchid Society, the Royal Horticultural Society of London, The Hawai'i Orchid Society, the Pacific Tropical Orchid Society, the Hawaiian Botanical Gardens Association, and the Friends of Foster Gardens (Cahill, 1996).

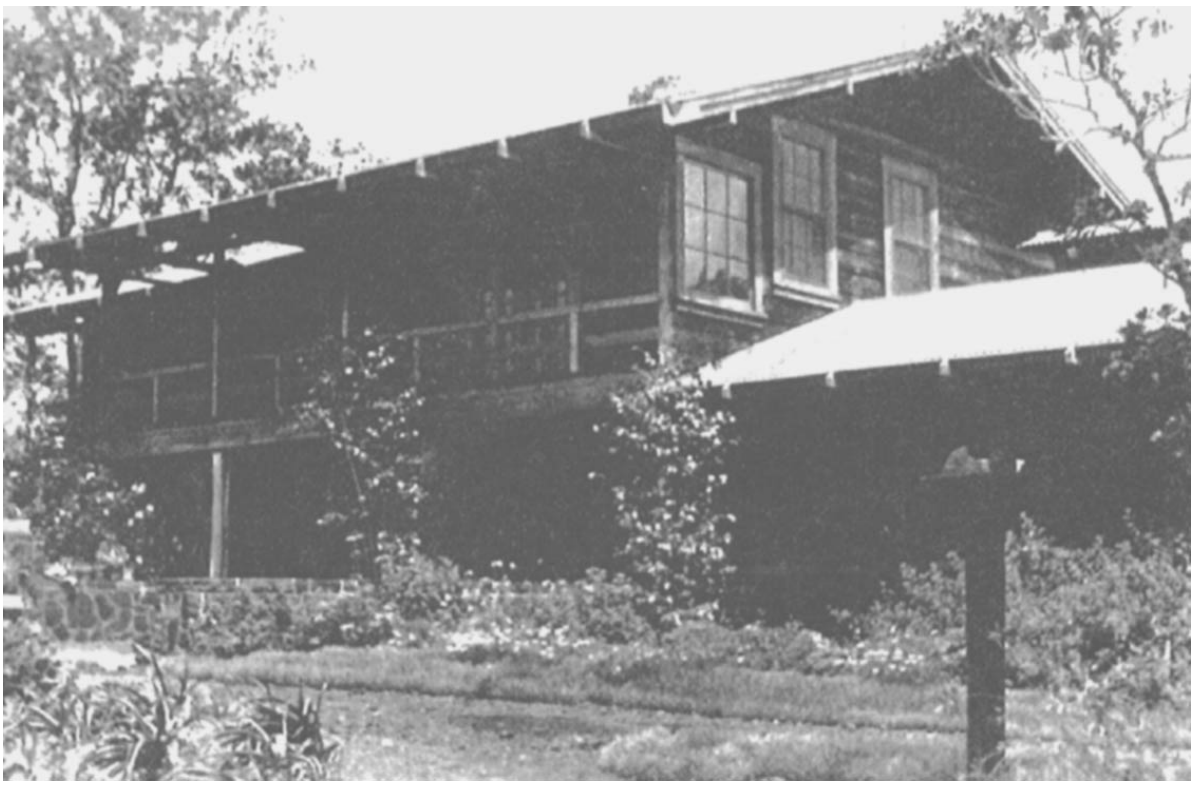
In 1946 Herbert C. Shipman established a Nene (Hawaiian goose) breeding grounds and conservation area on the site after the 1946 tsunami killed more than half of his flock of Nene at his Kea'au property (Apple, 1991). The breeding program involved the construction of enclosed pens at 'Ainahou Ranch (see photo, Physical History # 7) which are thought to have been located between the ranch house and the nursery area (Thorn, 2003). Shipman donated Nene stock to various breeding and conservation programs locally and internationally. Shipman's early Nene conservation and breeding activities that occurred at the ranch have been credited with saving the Nene from extinction (Cahill, 1996).

Shipman used the ranch house and component landscape to entertain a number of friends and guests included a number of celebrities. An 'Ainahou Ranch guest book contains the names of several hundred people who visited the ranch house complex between the years 1945 to 1965. Some of the most prominent people to have visited the ranch include: Joan Crawford, Janet Gaynor, Sir Peter Buck, Kenneth Emory and Marion Kelly. It is believed that such guests were generally daytime visitors who lodged at the nearby Volcano House hotel (Cahill, 1996).

In 1961, Shipman renewed his lease for the lower portion of the Keauhou area (Tract B) for another twenty-year term. Prompted by lava flows from Mauna Ulu which threatened to inundate the 'Ainahou Ranch House, Shipman sold his property improvements and terminated his lease in 1971.

Physical History # 1: Historical photo of the construction of the 'Ainahou Ranch House (courtesy of Samuel M. Lowrey, 1941).

Physical History # 2: Historical photo of the front view of the 'Ainahou Ranch House (courtesy of Shipman LTD, 1949).

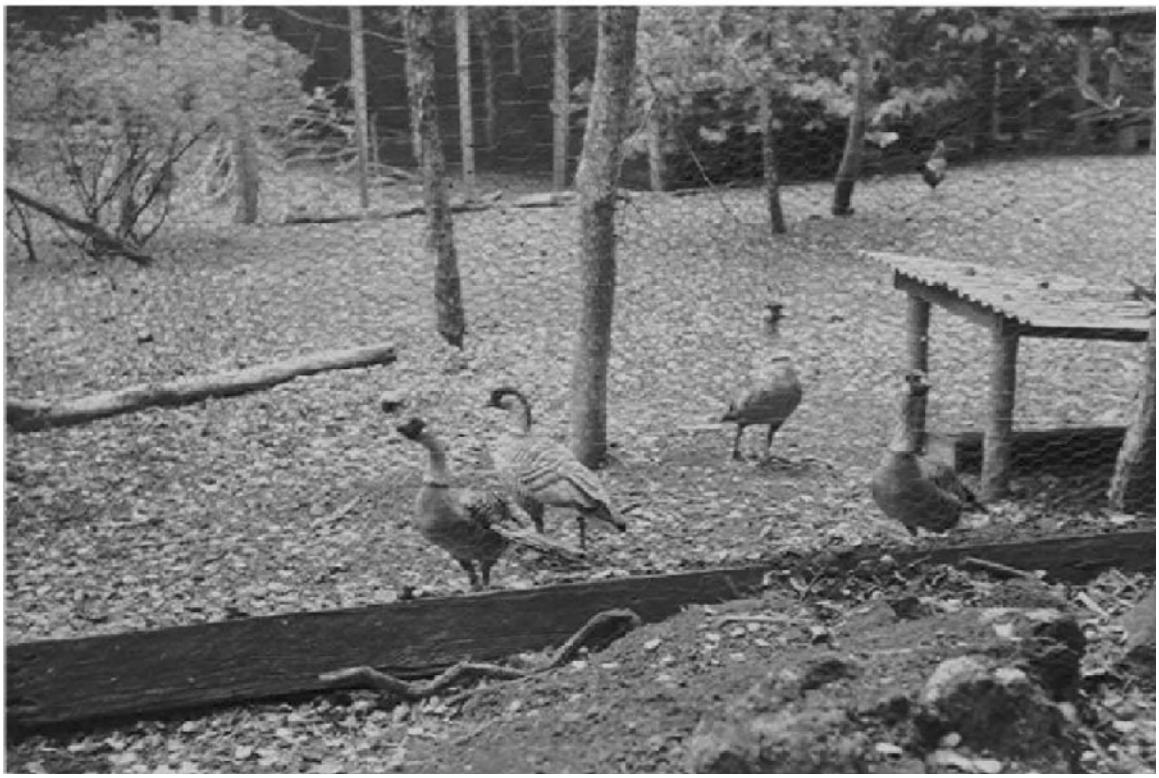


Physical History # 3: Historical photo of the 'Ainahou Ranch House with the kitchen to the right and the garage to the left (courtesy of Shipman LTD, 1949).

Physical History # 4: Historical photo of the 'Ainahou Ranch House and Gardens (courtesy of Shipman LTD, date unknown).

Physical History # 5: Historical photo of the patio on the southwest side of the ranch house (courtesy of Shipman LTD, date unknown).

Physical History # 6: Historical photo of the 'Ainahou Ranch nursery (courtesy of Shipman LTD, date unknown).



Physical History # 7: Historical photo of penned Nene at the 'Ainahou Ranch House grounds (courtesy of Shipman LTD, date unknown).

National Park Service (1972-Present)

In 1971, under the threat of an impending lava flow, Shipman sold his leasing interest in the 'Ainahou ranch property to the National Park Service (Suzuki/Morgan Architects, LTD., 2003). The NPS subsequently purchased the entire 6324 acre property from Bishop Estate in 1972 for $648,000 under the authority of the Endangered Species Act. This act mandated that a portion of the land be set aside for activities related to preserving endangered species. In 1972, NPS Nene enclosures were constructed at the ranch property's lower boundary and are still used as a Nene nesting ground.

For several years after the NPS became the owner of 'Ainahou Ranch, little use was made of the property surrounding the ranch house other than Nene conservation efforts and grazing by NPS horses. The park hired a caretaker to live at the ranch house from 1973-1975. During this time, Shipman returned to claim several of his prized plants from the site and transported them to his Kea'au property (Thorne, 2003). In 1973, the NPS established a nursery area to propagate native plants for re-vegetation projects at the park (Zimmer, personal comm., 2003). The main ranch house dwelling was rented to overnight guests quite frequently during the late 1970s, despite the fact that the site no longer had electricity or potable water.

In the 1980s, the NPS removed water tanks in the storage room and behind the ranch house as well as plumbing and lighting fixtures in the interior of the main residence. The plumbing fixtures were replaced in the 1990s by the NPS. Between 1980-82, the NPS removed Shipman's original glass hot houses and work sheds from the nursery area. Several years later, the NPS sold Formosan koa trees planted by Shipman as a joint fund-raising / invasive species control initiative. Throughout the Park Service's tenure, natural resource managers have periodically had to remove invasive species from the 'Ainahou Ranch House vicinity. Several of these were in fact trees that Shipman had unsuspectingly planted (see Vegetation section for discussion).

During the 1990s, more changes occurred in the landscape as well as to the ranch house and outlying buildings. In the 1990s, a truck path was created by the NPS behind the greenhouse which loops back to the historic driveway (see Site Plan # 1 in Appendix). The roof and v-shaped copper gutters of the main ranch house dwelling were replaced in 1993. The NPS also replaced the roof on the redwood water tank just southwest of the nursery area. In 1996, stabilization and re-roofing were also completed on two redwood water tanks. Around this time, NPS staff and volunteers also began clearing invasive vegetation such as Russian olive trees around the ranch house grounds as part of a concerted effort to improve the historic resource, in contrast to previous efforts, which were generally part of regional eradication efforts. A small memorial garden west of the ranch house was planted in memory of Russell Bickler, an NPS employee who died in a tragic accident in 1996. This memorial garden was not approved by NPS officials, and no documentation was made of previous conditions. The affected area is approximately thirty feet by forty feet, and predominantly consists of native species that volunteered in situ. Although the garden is located in close proximity to the ranch house, it is rather inconspicuous between a large mulberry tree and a dracaena hedgerow.

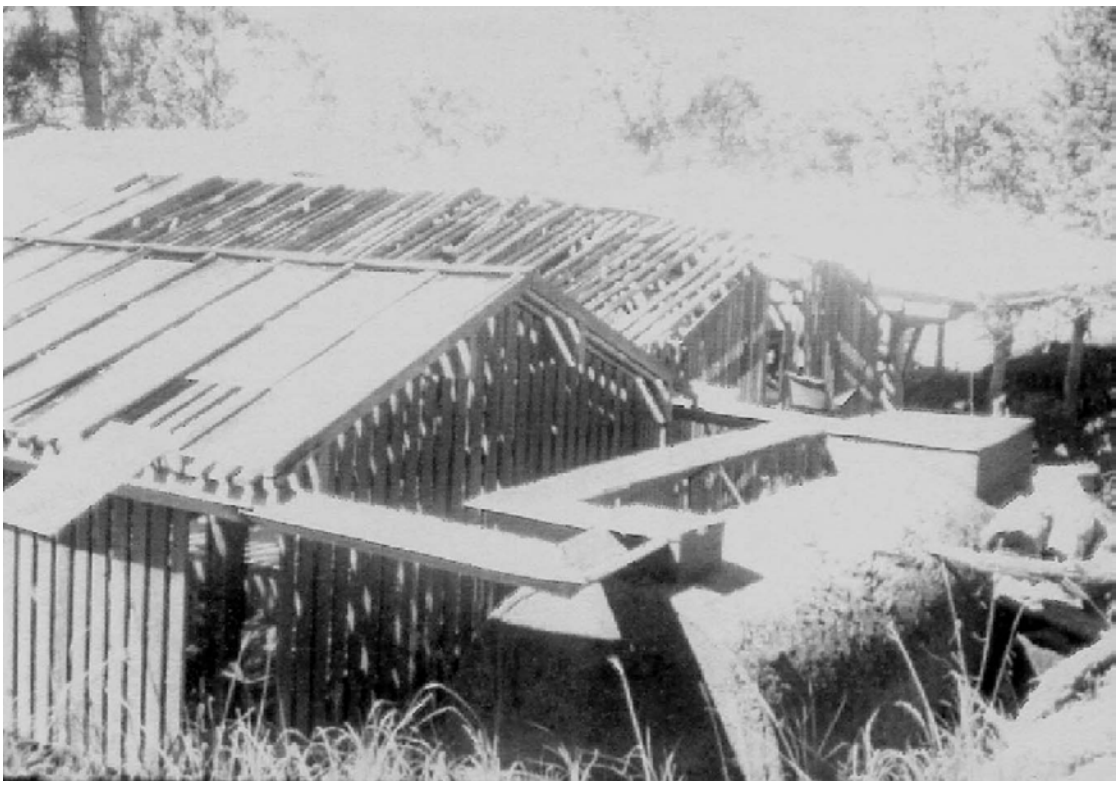
Additional rehabilitation work on the ranch house kitchen roof, potting shed, wood water tank and shed was completed in 1997. The lua (comfort station) and shed #2 roof and gutters were replaced and the roof was replaced on shed # 1. The Friends of 'Ainahou (a volunteer organization) was formally established in 1998, and began assisting the NPS in rehabilitating the 'Ainahou Ranch House and surrounding gardens. In 1999, NPS staff installed a weather station and rain gauge to monitor weather conditions at the ranch house. In 2001, the Friends of 'Ainahou painted the ranch house exterior window frames. In 2002, the group built a grape trellis in the nursery area to replace a historical one that was wasting away (this action was done without official NPS approval or documentation). In 2003, the

Friends of 'Ainahou formally changed their name to the Friends of Hawai'i Volcanoes National Park. In 2002 and later in 2004, the NPS rehabilitated the two large rain sheds north of the component landscape. Also in 2004, the NPS replaced support posts on the south side of the ranch house (the patio area), and reconstructed an operational water tank to rest on the historic water tank foundation NNW of the ranch house (within the component landscape).

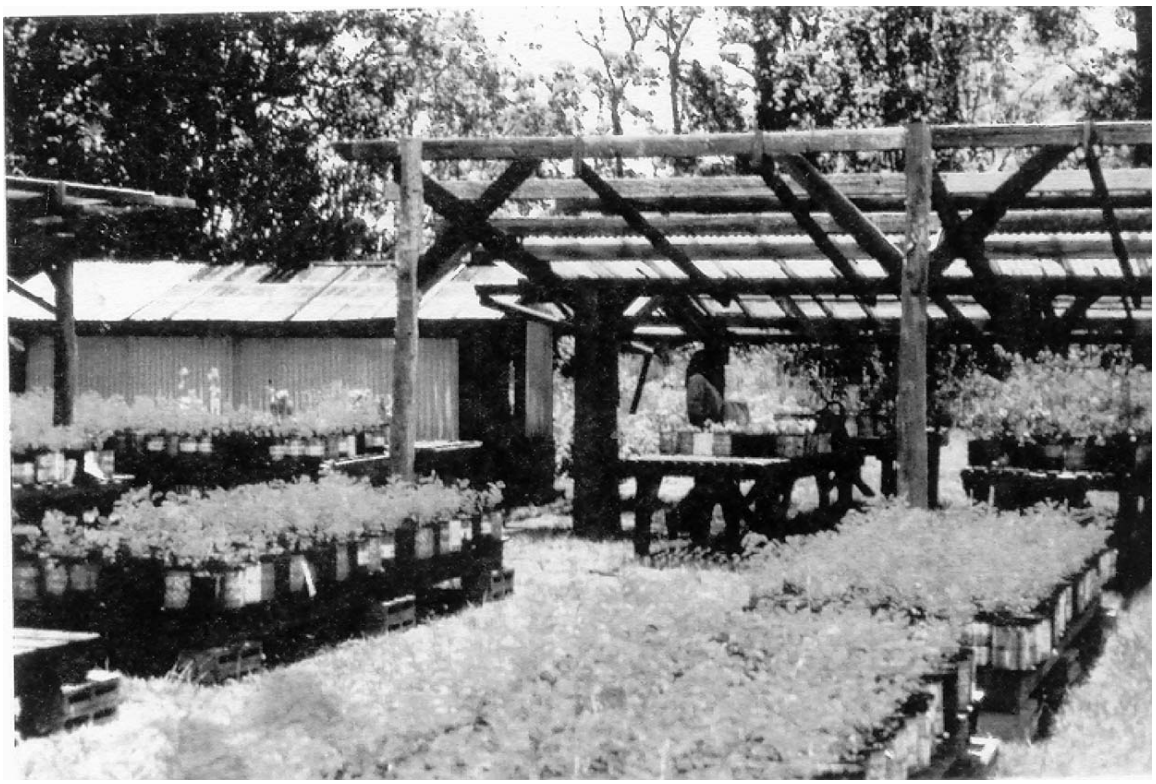
In the past, the ranch house complex was occasionally used to accommodate educational activities and overnight guests as part of the various environmental education programs conducted within the park. Currently, the Friends of Hawai'i Volcanoes National Park occasionally invite groups such as the Honolulu Garden Club for day trips to the 'Ainahou Ranch House and Gardens (McKinney, personal comm., 2003).

The removal of invasive plant species is an on-going effort by NPS staff and the Friends of Hawai'i Volcanoes National Park. Other current activities at the ranch house include Nene conservation efforts as well as the propagation of common native and rare plant species by NPS staff.

Physical History # 8: Historical photo of the generator shed located to the east of the ranch house (PWR, HAVO, CLI files, 1970s).



Physical History # 9: Historical photo of the glass hothouses in the nursery area. Note the retrieval of rainwater from the roof of the structures (PWR, HAVO, CLI Files circa 1973).



Physical History # 10: Photo of the NPS greenhouse located in the nursery area where Shipman originally had his glass hothouses (PWR, HAVO, CLI files, late 1970s).

Analysis And Evaluation

Summary

The gardens of the 'Ainahou Ranch House continue to represent Herbert C. Shipman's creation of an isolated yet elaborate sanctuary in the forest for his family and later for the Nene. His development of the site into an architectural and horticultural showcase from 1941 to 1971 is still evident in the house and gardens which continue to dominate the site today. They continue, through the retention of the majority of landscape characteristics, to evoke the qualities of the remote, yet distinguished activities of one of Hawai'i's most distinguished European citizens. Although the house is no longer used as a residence and the gardens are not as fully developed as they were in 1971, the natural systems and features, topography, buildings and structures, cluster arrangement, spatial organization, vegetation, circulation, and land use continue to contribute to the significance of the site.

Landscape Characteristics And Features

Natural Systems And Features

Natural systems and features are the natural aspects that have influenced the development of a landscape.

VOLCANISM
'Ainahou Ranch House is located approximately four miles down slope from the main caldera of the world's most active volcano. The decision to build so close to an active volcano is indicative of Shipman's character, affluence, and the situational imperatives associated with the historic period: namely, Shipman's desire to secure a safe and hidden place for his father and siblings in the event of Japanese invasion. Long-term safety was not a presiding factor in the decision to build at 'Ainahou.

Volcanic hazards probably influenced Shipman's decision to build the 'Ainahou Ranch House on a site of slightly elevated local relief. It appears that he was fortunate in choosing the general vicinity for the house as well. Despite initial appearances, building directly downhill (south) of Kilauea Caldera was actually less imprudent than building obliquely below it. This is on account of Kilauea's east and west rift zones where most of the recent major lava flows originate. The sliver of land on which 'Ainahou Ranch House is built is categorized as being 750 -1,500 years old on the current U.S.G.S. geologic map, whereas areas less than one mile to the east and west are less than 750 years old. Nearly the entire one-mile road segment joining the house area to Chain of Craters Road traverses land that is categorized as 200 – 750 years old (U.S.G.S. Wolfe and Morris, 1996). Although detailed, accurate geologic maps were probably not available in the 1940s, vegetation patterns can be recognizably different on adjacent flows that are 200 versus 1000 years old. Building the house on the edge of an old-growth 'ohi'a forest was probably intentional, but it is not known whether Shipman perceived the house site to be relatively safer from volcanic inundation on the basis of substrate age. It is believed that Shipman, the avid conservationist, chose the house site at the edge of the forest primarily to minimize aesthetic disruption to the natural surroundings (Thomas English, personal comm., 2004).

During the 1960s and early 1970s, the formation of Mauna Ulu and associated eruptions produced lava flows that threatened to inundate 'Ainahou Ranch House, which lay a mere two miles away and obliquely down slope. Mauna Ulu is a lava shield that actually formed well into the period of significance and therefore could not have directly influenced the location of the house and surrounding gardens. It is however associated with Kilauea's East Rift Zone. The Mauna Ulu eruptions became a strong incentive for Shipman to terminate his lease. In years prior, he had not allowed the NPS to buy out his lease. With

Mauna Ulu's lava flows encroaching, Shipman eventually reconsidered.

High levels of atmospheric sulfur dioxide and acid rain accompany Kilauea eruptions. It is likely that Shipman considered the high acidity of local soils when he selected plants for landscaping. For example, Shipman planted six or more species of pine trees in the component landscape, all of which still thrive today. Other contributing plants that are widely recognized for their tolerance of high acidity include: camellias, roses, lilies, date palms, and citrus trees. Whether Shipman planned the gardens surrounding the ranch house with soil acidity in mind or proceeded through trial and error, high acidity is a natural feature that has definitely influenced the development of the landscape.

Sulfur dioxide and acid rain have also increased the deterioration (corrosion) rate of metal structures and fences. These conditions may have been extreme during Mauna Ulu's eruptions, since it is upwind and very close. Furthermore, inordinate amounts of cinder and airborne particles from Mauna Ulu's eruptions are reported to have landed on the rain shed roofs and been deposited in the bottoms of the water tanks. This presumably increased maintenance demands for Shipman, although for the main reservoir tanks, cleaning was not a practical option due to structural design. Today, it is speculated that the insides of these two 50,000 gallon tanks may be filled with sediment up to a quarter or a third of their holding capacities. Buildings and structures may have been painted and/or replaced more frequently to abate the effects of acid rain, but nothing could be done to improvise at the landscape level. However, the acid rain has implications for the historic documentation of the landscape, particularly in the case of wire fence remnants, which deteriorate very rapidly under these natural conditions.

One of the longest cave systems in Hawai'i passes directly beneath 'Ainahou Ranch (although not beneath the component landscape). The cave is a remnant subterranean lava flow chamber which emptied itself after lava stopped flowing through it. "Lava tubes" of various sizes are a common occurrence in the region, and may have played a minor role in determining Shipman's house site (away from such features). Although caves do not show any tangible signs of influence on the cultural landscape, their hidden presence would have been a cause for vigilance when it was being developed.

CLIMATE

The climate at 'Ainahou Ranch House is markedly drier than that of the caldera vicinity, despite being only a few miles away and less than one-thousand feet lower in elevation. Despite being located on the windward side of the Big Island, 'Ainahou Ranch is significantly drier than other eastern Hawai'i locations of similar elevations due to its unique position in the transition zone between the windward and leeward sides of Kilauea Mountain.

Using NPS records for the rain gauge at 'Ainahou, a twenty year period (1981-2000) with continuous data was analyzed for trends. The average annual rainfall for this period was 80.2 inches. The July average was 5.5 inches and the December average was 11.1 inches. Several years revealed summertime dry spells where May, June, July, and August each had one inch or less. The 20-year modal value for July was 3.5 inches.

Although these rainfall values may seem plentiful, other environmental factors should be considered, particularly when comparing with the continental United States. Firstly, the porous substrate and thin or absent soil layers allow for quick percolation of rain water. Secondly, evapotranspiration rates are high. Thirdly, the soil deposits that are present are young and poorly developed, lacking the depth and particle stratification (e.g. clay layers) necessary for long term water retention.

The climate at 'Ainahou has significantly influenced the development of the cultural landscape. Hawaiians that lived in the area in pre-historic times depended heavily on caves for drip water collection.

Unlike them, Shipman had herds of cattle to care for as well. The development of rain sheds and an intricate water system that connected about twenty water tanks was very much influenced by local climatic conditions. The dry climate also influenced Shipman's selection of landscape plants and pasture grasses.

VEGETATION

Before the arrival of grazing ruminants, the 'Ainahou Ranch area was a virtually intact, native mesic forest / scrubland complete with several endemic understory species that are rare or extinct today. Although the cumulative effects of grazing on native Hawaiian ecosystems was poorly understood in the 1940s, the wilderness setting clearly influenced Shipman's development of the component landscape. Shipman, a respected conservationist of his time, was inclined to develop the landscape with conservation of natural vegetation in mind. Evidence of this can be seen in the integration of 'ohi'a and other native trees and shrubs into the gardens surrounding the ranch house. 'Ohi'a trees also influenced the course of fence lines in the component landscape and were incorporated in a manner that avoided or mitigated damage to the trees. Natural systems and features therefore contributes to the significance of the 'Ainahou Ranch House and Gardens.

Topography

Topography is the three dimensional configuration of the landscape surface as influenced by land use, circulation, etc.

WATER-SYSTEM
Topography plays a subtle yet important role in the 'Ainahou Ranch House and Gardens as the historic water system at 'Ainahou was gravity-fed. Therefore, there is a high-to-low topographic organization beginning with the main rain sheds, and extending down to the residential area, the nursery area, and finally the livestock water tanks (see Water System Maps in Appendix).

All tanks were interconnected by an intricate system of pipes and valves to allow maximum user discretion as to which water source to expend. These management decisions would have been heavily dependent on the relative elevations of the tanks, conserving water in the higher tanks since it could be easily delegated to other tanks and outlets below (but not vice versa). For example, the lower livestock tanks could be fed from the upper livestock tanks until emptied, at which point the nursery overflow could be enacted. If the nursery tank went dry, it could be filled from the tanks under the house, and so on. The rain shed water tanks (upslope from the component landscape) were strategically located at the highest elevation thereby having sufficient water head (height of water level above delivery point) to service any outlet or refill any other tank on the ranch. The ranch house, greenhouse, one of the sheds, and the tack house, all doubled as auxiliary rain sheds, refilling the nearest tank in the chain. Topography clearly influenced the landscape design, enabling a gravity-powered water delivery system for the people, plants, and animals at 'Ainahou Ranch (see photo, Topography # 1).

Portions of the historic water system occur within the component landscape, but several elements have been removed or altered by the NPS. The irrigation lines for the nursery area have been connected (by the NPS) directly to the line that flows from the rain shed water tanks. During the period of significance there was the option of servicing the plant nursery from the water tanks (removed) in the residential cluster, since they were elevated ten to fifteen feet higher (thereby conserving water in the more elevated rain shed tanks). The same was true for faucets in garden locations that have been removed following the period of significance (see Water System maps in Appendix). The tanks in the nursery area pressurized lines leading to cattle troughs within or near the component landscape that were not serviceable by the huge livestock water tank below the component landscape (tank # 17 on water system maps). The house water lines, particularly the upstairs baths, must have been pressurized by a line connected to the rain shed water tanks (tanks # 1 and # 2 on water system maps), which lie about fifty feet higher in elevation (outside of the component landscape). Although the NPS has removed or bypassed several of the deteriorating tanks and installed a pump for fire protection, many of the water tanks still remain in-situ as reminders of the topographic organization of the gravity fed water system at 'Ainahou.

HOUSE-SITE SELECTION
Topography seems to have influenced Shipman's house-site selection as well. The location of the house on a high spot in the terrain allowed for extensive views to the ocean and may have also been selected on the basis of ameliorating the risk of house damage in the event of a local lava flow. At the parent landscape level, the house is situated near the top of the rectangular ranch property of which the long sides stretch down slope toward the sea. This topographic orientation allowed Shipman and his guests to gaze over the pastures to the sea and the coastline in the distance.

HOUSE AND ROAD CONSTRUCTION
Mortared lava rock walls and piers were used for the foundations of the central and eastern sections of the ranch house and the large redwood water tanks within (removed by NPS). The walls and piers were

placed on existing terrain (undulating). The west wing of the house has a concrete floor on grade, although located about three feet above the garage and water tank storage area. It is not clear whether the west wing area was naturally flat or whether grading or filling took place prior to construction. The overall amount of topographic manipulation for the house's construction appears to have been relatively minor.

The undulating lava rock substrate characteristic of the area would have required some degree of grading for road construction. The current condition of the driveway suggests that the level of grading was not substantial. Also, the prevalence of rock outcrops in near proximity of the ranch house suggests that natural topography was predominantly left intact.

AESTHETIC DESIGN

Within the landscape, topography is also integrated into the informal site design. It appears that Shipman sought to integrate or even emphasize natural topography with planted vegetation. For example, the long hedgerow of dracaena follows the contour on the topside of a natural escarpment ranging from four to six feet tall. This hedgerow merges into boxwood and arborvitae as the rocky escarpment fades into a rounded hill. The dwarf date palms that line the driveway loop on the eastern side of the house separate the driveway from a steep drop in the natural terrain. In addition, several irregularly shaped lava outcrops in the southern and western lawn areas still bear plants that remain from the period of significance, both native and introduced. These decorated outcrops are visually defining features in the landscape design (see photo, Topography # 2).

Since 'Ainahou Ranch is a geologically infantile area that lacks naturally occurring soil deposits of any significant depth, it can only be assumed that soil was brought in for landscaping purposes. Early photographs from the period of significance suggest that much of the contemporary lawn area, even in the lower lying areas, was characterized by exposed bedrock. During the period of significance, much of the areas designated as the southern and western lawn today were formerly planted with flowers. No mounds of soil indicating former garden beds are visible in these areas, so it is possible that imported soil that was not enclosed or terraced using rock walls was eventually strewn about the lawn area by forces of erosion, filling small cracks and depressions that may have been visible during the period of significance.

SUMMARY

Topography was influential in the development of several different aspects of the component landscape and has not been significantly altered following the period of significance. Therefore, this characteristic contributes to the significance of the 'Ainahou Ranch House and Gardens.

Topography # 1: In Shipman's gravity-powered water system, this water tank a few feet down from the nursery area collected water from the roofs of the hothouses, and serviced the livestock facilities down slope (PWR, HAVO, CLI files, 2003).

Topography # 2: Lava outcrops are topographic features that contribute to the character of the landscape (PWR, HAVO, CLI files, 2003).

Buildings And Structures

For purposes of the CLI, buildings are defined as elements primarily built for sheltering any form of human activity, whereas structures are functional elements constructed for purposes other than sheltering human activity. The CLI references the List of Classified Structures (LCS) and records buildings and structures as features of the landscape. The LCS Program is the National Park Service's inventory for buildings and structures. It provides details that are not typically found in the CLI and should be referenced for more definitive structure information.

The 'Ainahou Ranch House and Gardens contains buildings and structures built by Herbert Shipman. They reflect his need for a mountain retreat in case of a Japanese invasion, a personal retreat for friends and family, and a place to raise his flock of Nene (Hawaiian endangered goose). The buildings and structures associated with Shipman are: the ranch house, the lua (comfort station), several sheds, the water catchment system, and stone walls. Since the end of the revised period of significance (1971), the NPS has installed several structures associated with monitoring the environment at the 'Ainahou Ranch House such as a weather station, a rain gauge, and solar panels with a generator to supply the kitchen and other parts of the house with electricity. The park has also built a greenhouse, potting benches, a grape trellis and a work area on the historical location of Shipman's greenhouses.

CONTRIBUTING

'AINAHOU RANCH HOUSE AND ASSOCIATED FEATURES
Construction of the 'Ainahou Ranch House began in 1940 and ended in July of the following year (Durst, 2001). Shipman took part in the design of the ranch house; however the original architect is unknown. The draftsman for the ranch house was Mr. Kansaku (Suzuki/Morgan Architects, LTD, 2003).

The ranch house is an example of Craftsman style in Hawai'i. It is a two story, rough sawn redwood building. The first floor layout consists of a living room, bathroom, kitchen, dining room, bunkhouse, saleroom, a water tank storage room and a covered lanai in front of the kitchen and a two car garage (see photo, Buildings and Structures # 1). The second floor layout consists of a master bedroom and master bathroom (with closet), a guest suite and guest bathroom (with closet), and a covered balcony stretching from the guest room to the master bedroom (see photo, Buildings and Structures # 2). The front façade of the house is south facing with a semi-open view to the ocean and garden from the balcony.

Two small metal water tanks once used for drinking water are nestled in on the east side of the house (see photo, Buildings and Structures # 3). The roof of the ranch house served as the rain shed for these two tanks, which were not issued separate LCS numbers due to their close association with the ranch house. The two large water storage tanks that were contained within the ranch house building are no longer present, but their concrete foundations are still intact. These foundations are also considered part of the ranch house and therefore do not have separate LCS numbers.

'AINAHOU RANCH LUA (Pit Toilet)
The lua (pit toilet) was built (date of construction is unknown) just north of the house for workers and ranch hands. The 12' x 6' structure is built of wood board and batten and contains two rooms. The metal corrugated roof covers one room with a two-hole seat and the other room with a one-hole seat. The foundation is made of stone masonry. A new corrugated roof and gutter was replaced in 1997.

'AINAHOU RANCH SHED # 1
Shed #1, also known as the jeep shed is located north of the nursery area. This 20' x 16' wood framed structure has corrugated walls on the north and east side and is open on the south and west sides. The

metal corrugated roof is held up by seven 'ohi'a posts. The construction date is unknown. The roof was replaced in 1997.

'AINAHOU RANCH SHED # 2
Shed #2, also known as the potting shed is a 12' x 20' wood board and batten shed with only its south side open. This shed is located adjacent to the nursery area. The corrugated metal roof sits on the truss roof framing. The eight supporting 'ohi'a posts lack diagonal bracing. The date of construction is unknown. The new roof, a new gutter at the rear, and new siding on the east were replaced in 1997.

'AINAHOU RANCH GREEN HOUSE RUIN
This feature has been identified as the foundation for a small water tank associated with Shipman's greenhouse (Zimmer, personal comm., 2003).

'AINAHOU RANCH ROCK WORK
The stone walls at the 'Ainahou Ranch House were built during the period of significance, after the construction of the ranch house (exact dates are unknown except for the seat wall by the driveway dating to April, 1941). These walls are either dry stacked or mortared (mosaic pattern). The masonry stone walls are constructed of local lava rock (Suzuki/Morgan Architects, LTD, 2003). The stone walls are located immediately outside of the ranch house, within the garden, and near the NPS greenhouse. The stonework at the ranch house consists of dry stacked planter beds, lava rock walkway, lava rock serpentine wall, lava rock patio/driveway, lava rock seat wall, dry stacked rock walls and mortared lava rock walls (see buildings and structures map in appendix).

Lava Rock Serpentine Walls
A free-standing, lava rock serpentine wall starts outside of the living room and meanders into the garden. The wall is made of local lava rock set in mortar. Across from this wall is another serpentine wall which constitutes the northern portion of a large planter bed. Between the two symmetrical serpentine walls, is a formal lava rock walkway (peanut-shaped) that includes a circular opening in the center of its widest pass, from which a camellia plant is growing (see photo, Buildings and Structures # 4). The height of the wall ranges from 8" to 16" and the width ranges from 10" to 16 ".

Planter Beds
Two small, mortared rock planter beds sit just outside of the living room. A large planter bed framed by a serpentine wall, a dry-laid rock wall, and the barbecue pit is located just south of the small planter beds. This feature has an irregular shape and ranges from 1'3" to 2'3" in height and is the largest enclosed planter bed on the grounds. There are also several dry-laid rock planter beds immediately to the east and west of the ranch house. These features are generally one to two rock layers high and less formal in appearance than the planter beds to the south of the house (see Buildings and Structures map in Appendix).

Lava Rock Patio/Driveway/Barbecue Pit
The lava rock patio/driveway is located on the south side of the house to access to the two car garage and provide an open patio space for grilling. The dimensions of this patio/driveway are 25' 4" x 22' 4". The barbecue pit is 12' 6" long and 3' wide. An 8' long, 3' wide wall extends from the barbecue pit towards the house (see photo, Buildings and Structures # 5).

Lava Rock Wall
A separate lava rock wall framing the other side of the patio/driveway area bears a date inscription "4-7-41". The masonry seat wall is built with local lava rock and extends the length of the patio/driveway. The wall is 1'6" high by 1'5" wide. At the bottom of the wall facing the driveway is a 5" high by 11" wide

curb made of local lava rock.

Lava Rock Stairs and Walkway
The area behind the dining room near the two small metal water tanks includes mortared lava rock stairs (3'11" deep with a 7" rise) leading to a lava stone paved walkway that provides access to the dining room, the two metal water tanks, the bunkhouse, and the salt room. The paved walkway continues to the salt room and the northeast corner of the house. Just east of the sidewalk is a mortared lava rock stone wall that runs from the stairway and extends for 29' north delineating the garden bed adjacent to the east side of the ranch house. The wall is 18" high and 5" wide for the first 15'4" and 1' wide for the remaining 13'8". A dry-laid retaining wall extends from the south corner of the stairway to the seat wall by the driveway. The height and width of this wall varies from 8" to 11" in height and 1' to 18" in width.

Nursery Dry-laid Rock Walls
Two stretches of a dry-laid retaining wall run from the nursery area towards the ranch house (see Buildings and Structures map in Appendix). The first stretch of the retaining wall is 24' long and 1' wide. The height of the wall ranges from 6" to 16". The second stretch of wall (the one that is closer to the ranch house) runs 49' long and has the same width and height as the first wall (see photo, Buildings and Structures # 6). Although the construction date of these walls is unknown, they should be considered to be contributing features until further research can be completed.

Nursery Planter Beds
Just south of the retaining walls are four dry-laid rock planter beds from which roses were grown during the period of significance. These planter beds range in diameter and are only one rock layer (about 6") high. A few stones appear to be missing from the planter beds. Although the construction date of these walls is unknown, they should be considered to be contributing features until further research can be completed.

'AINAHOU RANCH GENERATOR SHED FOUNDATION
The mortared stone foundation of Shipman's generator shed remains approximately seventy feet east of the ranch house (at the bottom of the hill). The dimensions are approximately 10' x 20' x 2'6" high. Remains of an old generator can still be seen within the structure. The wooden portions of the structure are now missing.

'AINAHOU RANCH WATER SYSTEM

'Ainahou Ranch Water Tank
This redwood water tank is 14' high and 20' in diameter and is located just east of the ranch house and can support 33,000 gallons of water (Suzuki/Morgan Architects, LTD, 2003). This tank is placed on concrete piers. Steel girts support the redwood water tank. The corrugated metal roof sits above the water tank and is supported by four 'ohi'a posts with diagonal 'ohi'a side braces. New roofing for was completed for this water tank in 1993.

'Ainahou Ranch Water Tank
This redwood water tank is located just south of the nursery area. This redwood water tank holds 13,300 gallons water and is 7' high and 18' in diameter. The tank is placed on pier foundations made with concrete and stone. Four 'ohi'a posts support the metal corrugated roof which was replaced around 1993 (Suzuki/Morgan Architects, LTD, 2003). Several 'ohi'a posts were placed as diagonal lateral bracing for the roof. Eight steel girts support the redwood water tank. Four metal valves are located on the south east side of the tank.

Other Water Tanks
The two small, metal water tanks nestled in on the east side of the ranch house are considered part of the ranch house entry. Another metal tank (#11 on the Water System maps in Appendix) appears to have been an overflow tank for the 33,000 gallon water tank listed above. The tank is rusted through and is currently leaning rather severely.

Unidentified Metal Containers
The functions of three other rusted metal containers in the vicinity of the 33,000 gallon redwood tank and the generator shed foundation are poorly understood. It is possible that they may have been associated with water storage before the water system was fully developed. It is also possible that they may have contained fuel for the generator or even grain for Shipman's livestock. One tank is rectangular, containing cross-bars within (see photo, Buildings and Structures # 7). Another feature is short and cylindrical with a removable lid (see photo, Buildings and Structures # 8). The last feature is rusted beyond recognition, but has apparently fallen off of a small, mortared rock foundation bearing the inscription "Peter" with an illegible date (probably 1941). These features should be considered contributing until more research regarding their functions can be completed.

Stone Water Tank Foundation
The large water tank foundation located approximately eighty feet NNW of the ranch house is a prominent remnant structural feature in the component landscape. The foundation consists of a rectangular stone retaining wall around the perimeter, within which several linear support walls and triangular foundations at either end are contained. The foundation design appears to have enabled a maintenance worker to crawl below the 37,000 gallon cylindrical tank to inspect or service leaks. According to historic photographs, the water tank that was mounted on this foundation had a gabled roof structure supported by 'ohi'a posts. In comparison with the other tanks remaining in the landscape, this tank-housing structure had the most formal appearance, probably due to its close proximity to the ranch house. In the summer of 2004 a new water tank was mounted on this foundation to rehabilitate the historical feature.

Other Water Tank Foundations
It is possible that there are other water tank foundations in the component landscape that remain obscured by vegetation. The foundations for water tanks numbered 12, 14, and 16 on the Water System maps (see Appendix) have not been located and in fact their locations on the maps are approximated from old water system drawings. The LCS entry entitled "'Ainahou Ranch Greenhouse Ruin" was positively identified as the foundation for a small water tank (# 13 on Water System maps) associated with the Shipman's greenhouse (Zimmer, personal comm., 2003).

Pipes and Valves
The 'Ainahou Ranch Water System was extensive and complex, and once included twenty or more interconnected tanks from the main rain shed tanks to the lower reaches of the parent landscape. While several tanks remain, many are also missing, and the vast network of pipe lines and valves is largely obscured by vegetation and/or soil. The locations of pipes and valves on the Water System maps (see Appendix) of this report are extrapolated from G. Clarke's schematic representation (1978) and the locations of visible pipe segments and a few remaining valves.

NON-CONTRIBUTING
Structures built by the NPS include a weather station to monitor temperature and humidity on the site, a solar panel/generator to supply power to the ranch house kitchen, and a rain gauge to monitor rainfall. These features are located just to the north west of the ranch house. The NPS has also established a nursery area in the same location as Shipman's glass hot houses. The NPS nursery area consists of a

(temporary) covered potting area, a fenced-in area with potting tables (open-air nursery), and a small plastic greenhouse. NPS volunteers also built a grape trellis near the plastic greenhouse replacing the historical trellis that was removed.

The NPS solar panel and generator was installed just north of the ranch house in 1998 by HELCO (Hawai'i Electric and Light Company) and NPS staff. The solar panel and generator, a donation by HELCO was intended to demonstrate the ability of solar power in a remote location such as 'Ainahou Ranch House. The solar power supplies energy to the ranch house's refrigerator, kitchen lights, and garage/storage area.

The weather station was installed in 1999 by the NPS to monitor the weather at the 'Ainahou Ranch House for fire management purposes (Ricketts, 2003).

The rain gauge was installed in 1999 by NPS staff to monitor rainfall. Originally Shipman had three rain gauges (two near the ranch house and one near the rain sheds), however the original locations of these rain gauges is unknown.

The NPS nursery area was first used by the park in 1973 to propagate native plants for re-vegetation projects at the park (Zimmer, 2003). The park utilized the same area in which Shipman had his greenhouses, and established wooden potting benches (open air nursery), temporary covered work stations, and a new greenhouse which is considerably smaller than the historical greenhouse that was removed. Today the nursery area is still used by the park to propagate native plants. The grape trellis adjacent to the nursery area was added by volunteers in 2002, but there was a historic-period trellis of similar size in this approximate location. NPS staff uses Shed # 2 to store nursery supplies and equipment.

SUMMARY

Although some changes to the buildings and structures have occurred due to neglect, removal, and the addition of non-contributing features, the majority of the historic structures remain as they were during the period of significance. Perhaps most importantly, the ranch house and surrounding hardscape and walls are intact in their original configurations, creating the same focal point of the landscape that Shipman intended. Following the period of significance the NPS installed a weather station, solar panel and generator, a rain gauge, a greenhouse, and a grape trellis, all of which are non-contributing to the historic scene. Although these structures were added at a later time, they do not compromise the overall character of the ranch house and grounds. As a result, buildings and structures is a contributing characteristic of the 'Ainahou Ranch House and Gardens.

Buildings and Structures # 1: Contemporary photo of the front view of the 'Ainahou Ranch House (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 2: Contemporary photo of the grape trellis located on the south side of the ranch house (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 3: Contemporary photo of the east side of the ranch house (looking SW)(PWR, HAVO, CLI files, 2003).

Buildings and Structures # 4: Contemporary photo of the serpentine rock wall framing the outdoor patio area (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 5: Contemporary photo of the barbecue pits built with lava rocks in a mosaic pattern (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 6: A dry-laid lava rock retaining wall located between the nursery area and the ranch house (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 7: A rusty metal container near the generator shed foundation. Historical function unknown (PWR, HAVO, CLI files, 2003).

Buildings and Structures # 8: A rusty metal container w/ lid near the generator shed foundation. Historical function unknown (PWR, HAVO, CLI files, 2003).

Characteristic Feature	Type Of Contribution	LCS Structure Name	IDLCS Number	Structure Number
'Ainahou Ranch Generator Shed Foundation	Contributing	Ainahou Ranch Generator Shed Foundation	058288	B320M
'Ainahou Ranch Greenhouse Ruin	Contributing	Ainahou Ranch Greenhouse Ruin	058279	B320D
'Ainahou Ranch House	Contributing	Ainahou Ranch House	058275	B320
'Ainahou Ranch Lua (pit toilet)	Contributing	Ainahou Ranch Lua	058276	B320A
'Ainahou Ranch Rock Work	Contributing			
'Ainahou Ranch Shed # 1	Contributing	Ainahou Ranch Shed No.1	058277	B320B
'Ainahou Ranch Shed # 2	Contributing	Ainahou Ranch Shed No. 2	058278	B320C
'Ainahou Ranch Stone Walkways	Contributing			
'Ainahou Ranch Stone Walls	Contributing	Ainahou Ranch Stone Walls	058285	B320J
'Ainahou Ranch Water System	Contributing			
'Ainahou Ranch Water Tank	Contributing	Ainahou Ranch Water Tank	058280	B320E
'Ainahou Ranch Water Tank (2)	Contributing	Ainahou Ranch Water Tank	058282	B320G
'Ainahou Ranch Water Tank Foundation	Contributing	Ainahou Ranch Water Tank Foundation	058281	B320F
Grape trellis	Non-Contributing			
NPS Greenhouse	Non-Contributing			
NPS rain gauge	Non-Contributing			
Solar panel and generator	Non-Contributing			
Weather station	Non-Contributing			

Cluster Arrangement

The cluster arrangement of a landscape refers to the location and patterns of buildings, structures, and associated spaces.

Buildings and structures within the component landscape are grouped in two clusters, one is residential, and the other is nursery related. The residential cluster includes the ranch house, lua (pit toilets), and nearby water tanks. The nursery cluster includes shed # 1, shed # 2, the nursery area, greenhouse, and nearby water tanks.

Residential Cluster
Three of the eight known water tanks in the ranch house cluster have been removed (see water system maps in Appendix). While the ranch house cluster constituted the first major delivery point in the water system, it also constituted the second major collection point. During Shipman's tenure there were several large water storage tanks in close proximity to the ranch house, including two 24,000 gallon water tanks that were located within the residential structure in a large, central room built specifically for water storage (see Water System map, Enlargement C, in Appendix). There was a utilitarian function for placing so many water tanks in close proximity to the house. If Shipman had distanced them (placed them further down slope) to make them less conspicuous, then they would not have been sufficiently elevated to service the nursery area. The two small metal tanks to the east of the house held water for human consumption collected from a portion of the house's roof, which could be kept clean more easily than the sum of all rain-catching surfaces in the broader water system. The arrangement of these two tanks, tucked in on the eastern porch, allowed three overhead pipes to fill them without causing an eye-sore in the landscape.

The lua is also associated with the residential cluster, located downwind from the house at a respectable distance. Flushable toilets were available inside the house for Shipman himself and presumably for his esteemed guests. The lua was probably included in this cluster to accommodate Shipman's employees that often stayed overnight in the bunkroom at the ranch house (see Buildings and Structures map in Appendix).

Nursery Area Cluster
The nursery area cluster consists of shed # 1, shed # 2, the nursery area, greenhouse, and nearby water tanks. Although the greenhouse has been replaced with a smaller one, and the nursery area has been enlarged, their locations were very similar during the period of significance. Shed # 2 probably contained tools and supplies related to greenhouse and nursery activities. Shed # 1 has been called "Jeep Shed" and was situated along the driveway to allow parking access for the ranch jeep. This structure may not have been directly associated with nursery activities, but appears to have been located away from the house in order to maintain a more formal aesthetic atmosphere near the residential cluster. The existing water tank and the removed water tanks (see water system maps in Appendix) associated with this cluster accumulated rainwater from the greenhouse, which doubled as a rain shed.

Summary
Generally speaking, water tanks (in both clusters) were located in close proximity to their respective rain sheds in order to allow consistent oversight and maintenance, to procure the maximum attainable water head from each water source, and to create the least amount of infrastructure and visual impacts. These concerns, along with the distinct clustering of residential and nursery related functions, are still visible on the landscape. As a result, the current cluster arrangement is much the same as it was during the period of significance. Therefore, this characteristic remains intact and contributes to the significance of the 'Ainahou Ranch House and Gardens.

Spatial Organization

Spatial organization is defined as the three dimensional organization of physical forms and visual associations in the landscape, including the articulation of ground, vertical, and overhead planes that define and create spaces.

The spatial organization of the 'Ainahou Ranch House and Gardens is heavily influenced by natural features such as topography and native vegetation, and therefore has an overall lack of linearity, symmetry, and patterning often associated with more formal landscapes. Topography played a key role in the overall spatial organization of the site with respect to water-system planning. There is clearly a high-to-low organizational pattern beginning with the main rain sheds, then the residential cluster, then the nursery area, and finally the livestock facilities. As in all gravity-powered water systems, water retrieval and storage is emphasized at the upper end of the system to ensure adequate pressurization. Shipman's complex and interconnected system of primary and supplementary water collection and storage devices indicate a high degree of utilitarian function and organizational planning in the landscape. Attention to aesthetics is also apparent in the vertical organization, which enabled the ranch house to have a view over gardens and pastures toward the ocean.

The spatial organization of the ranch house gardens is highly irregular, resulting from the integration of existing native vegetation and small-scale topographic features such as lava outcrops (see photo, Spatial Organization # 1). Throughout the component landscape there are subtle reminders that Shipman attempted to create a landscape that was complementary with the surrounding natural beauty: the ranch house is nestled at the edge of the forest and not a central feature, exotic plants and native plants are often arranged together in clusters defined by existing topography, and cattle fences were often supported by large 'ohi'a trees. With the exception of the cork oak grove, there is generally a lack of distinct sections and grid patterns in the planted exotic vegetation, making it less incongruous with the wilderness surroundings. Incorporation of lava outcrops and ubiquitous native species (particularly 'ohi'a which thrives on rock outcrops) within the component landscape accomplishes harmony and unity in the garden design, which might otherwise appear chaotic given the great variety (and lack of patterning) of exotic species. Curvilinear patterns of hedges, palms, and pine trees complement circulation patterns (see Circulation section) and natural escarpments in several instances (see photos, Spatial Organization # 2, Spatial Organization # 3). The pattern of open spaces within the component landscape is also highly asymmetrical, which helps to blend the component landscape with the natural forest surroundings (see photo, Spatial Organization # 4).

The overall spatial organization of the component landscape has not been substantially altered following the period of significance. Although the area within the driveway loop has been significantly altered by invasive vegetation, and the removal / deterioration of fences within the component landscape also detracts from its historical spatial organization, the landscape characteristic contributes to the significance of the 'Ainahou Ranch House and Gardens.

Spatial Organization # 1: From balcony looking south. Note influence of small-scale topography on aesthetics and spatial organization of vegetation (PWR, HAVO, CLI files, 2003).

Spatial Organization # 2: Hedge of arborvitae lines the driveway (hidden from view) and the shallow end of a natural escarpment (PWR, HAVO, CLI files, 1999).

Spatial Organization # 3: Row of dwarf date palms lines the driveway near the east side of the ranch house (PWR, HAVO, CLI, 2003).

Spatial Organization # 4: An open space creating an informal corridor between the ranch house and the nursery area (PWR, HAVO, CLI files, 2003).

Circulation

Circulation is defined as spaces, features, and applied material finishes which constitute systems of movement in a landscape.

Roads
The primary circulation patterns at 'Ainahou Ranch House and Gardens still remain intact. 'Ainahou Ranch Road is a roughly graded dirt and gravel road that connects Chain of Craters Road to the ranch house vicinity about one mile south-southwest. The road then meanders down slope to the south for approximately two miles where it approaches Poliokeawe Pali (cliff). The road was previously a wagon trail, but accommodated motor vehicles during the period of significance. It is not known whether or to what extent Shipman improved the road during the period of significance. A small portion of 'Ainahou Ranch Road (near its intersection with the ranch house driveway) is included in the component landscape.

The driveway consists of a short spur (ca. 200 ft.) that forks into a loop (ca. 1400 ft.), the west end of which circulates very near to the house. This driveway was added by Shipman during the period of significance. Historic photographs suggest that the northern portion of the loop (see photo, Circulation # 1) may have existed for a few years as a singular driveway before the southern portion was developed and the current loop pattern created. The driveway appears to have been graded smoother than 'Ainahou Ranch Road but still contains some bumps, particularly on the northern loop portion. The driveway is not wide enough to allow two cars to pass each other in most sections.

Walkways
Mortared lava rock walkways exist on the southern and eastern sides of the house (see Buildings & Structures map in Appendix). The walkway to the east appears the least formal of the two, and allows passage from the bunkhouse to main house via a back door to the dining room. Another segment leads to the driveway, descending a few steps. Still another segment wraps around the east side of the house to the salt room entrance on the north side. The width of the east walkway is about three feet. The width of the walkway to the south of the house is about five feet and varies between ten and fifteen feet at the west end to correspond with the serpentine walls on either side. A large camellia grows in the center of the walkway at its widest point.

The south walkway ends abruptly, emptying onto the western lawn, where the circulation patterns are rather well-defined by hedgerows and other vegetation. At this juncture, one is compelled to turn southeast, northwest, or enter through a narrow gap in the boxwood hedgerow to the western lawn area (see photo, Circulation # 2). A dracaena hedgerow veers to the west atop a five foot high natural escarpment, continuing from the northernmost boxwood. From the southernmost boxwood an arborvitae hedgerow veers to the southeast, lining the path around a prominent garden bed back towards the driveway south of the ranch house. With the exception of the gap directly across from the end of the southern rock walkway, the arborvitae-boxwood-dracaena hedgerow spans continuously for 180 feet (see Vegetation Map, Enlargement A in Appendix). Therefore, this vegetative feature is greatly influences circulation in the landscape. The stone garden beds and cluster of slash pines to the northwest of the house also help influence movement on the western side of the house, where there is a notable absence of roads and formal walkways.

Most of the peripheral footpaths from the period of significance have mostly been grown over by vegetation. One footpath, which leads from the house area to the two main rain sheds north of the landscape boundary has been consistently used by the NPS and therefore has not been overgrown. It is not certain whether the course of this path is completely unchanged, but it is believed to be very similar

if not the same path as one that was used during the period of significance. The trail traverses native forest and occurs primarily outside of the cultural landscape boundary. Presumably, there were several footpaths during the period of significance that connected various pastures and ranching facilities, but dense vegetation has concealed their locations.

NON-CONTRIBUTING
Following the period of significance, the NPS has added gravel to some of the roughest sections of 'Ainahou Ranch Road and paved a short stretch that was too steep to retain gravel. A new turn-off from Chain of Craters Road had to be excavated after lava flows (several feet thick) covered portions of 'Ainahou Ranch Road and Chain of Craters Road in the early 1970s (outside landscape boundary). The alignment of the first few hundred feet of 'Ainahou Ranch Road and the man-made rock escarpments on either side are therefore inconsistent with the historic period of significance.

The NPS has also widened the shoulder of a segment of the southern portion of the driveway loop to create a small gravel parking area (ca. 2001). This parking area is unmarked and relatively unobtrusive, and is located approximately halfway between the ranch house and the corral.

A three-pronged truck path loop extending to the west of Shipman's driveway loop was also added after the period of significance (see Site Plan). The truck path is a shortly mowed route in the grass that allows NPS work trucks to access the nursery area without having to make a U-turn. The path is not graded or otherwise developed and has a minor visual impact on the landscape. An extra leg dissects this loop, creating the shortest route between the nursery and the ranch house. This route is somewhat less apparent since the area it traverses is also mowed regularly. Based on the lack of obstructing vegetation, and the assumed connectivity between the ranch house and the greenhouse, the middle leg of this truck path was probably a frequented footpath during the period of significance. It is also possible that Shipman's original Nene pens were located in this area (Markiewicz, 1999), which would have constituted a need for pedestrian circulation. However, the contemporary use of this route for vehicular access is not consistent with the period of significance.

There are currently many temporary footpaths that are being used by NPS researchers to access bird and insect monitoring equipment that is located in various locations just beyond the landscape boundary. The monitoring equipment is not readily visible from within the cultural landscape boundary, whereas some of the access trails are. Although this peripheral area may have contained trails during the period of significance, these footpaths and their resulting circulation patterns are non-contributing.

SUMMARY
Most of the alterations to historic circulation patterns are of a temporary nature and/or are not visually obtrusive. The deterioration / removal of fence patterns within the component landscape and the concealment of footpaths by vegetation may have caused a loss of pedestrian circulation patterns (particularly ones leading out from the component landscape to various pastures etc.) that were present during the period of significance. The major pedestrian circulation patterns at the core of the component landscape remain primarily unchanged, along with Shipman's driveway loop. Therefore, circulation is a contributing landscape characteristic of the 'Ainahou Ranch House and Gardens.

Circulation # 1: Northern portion of the driveway loop, looking southwest towards the ranch house (PWR, HAVO, CLI files, 1999).

Circulation # 2: Formal walkway / patio on the south side of the ranch house gives way to multiple grass corridors through the gardens in the western lawn area, looking west (PWR, HAVO, CLI files, 2003).

Characteristic Feature	Type Of Contribution	LCS Structure Name	IDLCS Number	Structure Number
'Ainahou Ranch Road and driveway loop	Contributing			
Formal walkways (mortared stone)	Contributing			
Informal walkways (garden corridors)	Contributing			
Trail from ranch house to main rain sheds	Contributing			
Gravel parking area	Non-Contributing			
NPS temporary footpaths for eco-monitoring projects	Non-Contributing			
NPS truck path	Non-Contributing			

Vegetation

Vegetation analysis may include deciduous and evergreen trees, shrubs, vines, ground covers and herbaceous plants and plant communities, whether indigenous or introduced in the landscape.

Vegetation analysis and plant identification for this CLI were greatly assisted by the efforts of Wilhelmina Markiewicz and Linda Pratt respectively. Primary literary references for cross-referencing common names and Latin nomenclature were Neal (1965) and Wagner, Herbst, and Sohmer (1990).

Native, pastoral, and horticultural vegetation all merge within the landscape boundary, creating a diversified landscape indicative of its past and present land uses. Native tree species common to the region have been conserved both by Shipman during the period of significance and by the National Park Service in subsequent years. However, introduced pasture grasses are well-established throughout the ranch and probably limit the abundance of native understory species that would otherwise flourish in this area. The landscape immediately surrounding the ranch house is endowed with several plants that clearly indicate the area's prior use and design by an avid horticulturalist. While some of the species that Shipman planted were later deemed invasive and removed by the NPS, several exotic trees, shrubs, and herbs still remain intact where he left them. The vegetation within the landscape boundary contributes greatly to the cultural landscape.

The areas outside of the landscape boundary are relatively void of contributing species with the exception of pasture grasses and volunteers that dispersed from historic plantings. The landscape boundary was not extended to include slash pines (Pinus caribaea) and Russian olive trees (Elaeagnus angustifolia) of a younger generation that are clearly offspring from the original plantings.

Individual plants were mapped within the landscape boundary whereas vegetation outside the boundary is generalized (see vegetation maps in Appendix). The vegetation beyond the landscape boundary falls into one of two categories: 1) Open-canopy 'ohi'a forest (Metrosideros polymorpha) with an understory of native shrubs and introduced grasses 2) Overgrown pasture with native shrubs and intermittent 'ohi'a. Despite persistent management for invasive species, faya tree (Morella faya) maintains a notable presence throughout.

Native vegetation, Shipman's exotic introductions, and pasture grasses are all juxtaposed in the component landscape. Since Shipman sought to integrate irregular topographic features and existing native vegetation, there is an overall lack of linearity, symmetry, and patterning often associated with more formal landscapes. Curvilinear hedgerows complement circulation patterns in some instances. With the exception of the cork oak (Quercus suber) grove, the component landscape lacks distinct sections that can be easily characterized by one or more plant species. Therefore, the following discussion is organized categorically rather than spatially. For more detailed spatial descriptions, refer to vegetation maps in the appendix.

NATIVE SPECIES
Existing 'ohi'a trees (Metrosideros polymorpha) were integrated into the garden landscape during the period of significance and in many instances served as living fence posts for cattle fences that surrounded the ranch house grounds. Since the rocky substrate does not permit easy penetration for conventional fence posts, fence posts were instead bound to 'ohi'a trees. By not attaching the fence tension directly to the trees, Shipman seemingly attempted not to girdle and thereby destroy the 'ohi'a trees. Very old 'ohi'a trees with evidence of such use still remain in the landscape.

Other frequently occurring native plants within the landscape boundary are 'a'ali'i (Dodonaea viscosa)

and pukiawe (Styphelia tameiameia). Many 'a'ali'i and a few pukiawe appear on rock outcrops seemingly as part of the landscape design, but their stature and ubiquity suggests that they may have volunteered after the period of significance. It is likely that Shipman would not have had 'a'ali'i so prominently displayed in his garden beds, since it is very abundant in the surrounding landscape. However, the crimson color of the fruiting 'a'ali'i would have undoubtedly decorated the surrounding views in Shipman's time as well. Therefore, 'a'ali'i should be considered contributing to the landscape until further research on their presence during the period of significance can be completed. Pukiawe is a hardy, low-growing native shrub that is also abundant in the area. It is unlikely that Shipman went to great lengths to remove it from the landscape. However, it too was probably not featured prominently in the gardens surrounding the ranch house.

A large native sandalwood tree (Santalum paniculatum) (see photo, Vegetation # 1) can be found north of the slash pines bordering the driveway (see Vegetation Map, Enlargement C in Appendix). Two younger sandalwoods also line the driveway, not far from the older one, that may date to the period of significance. Another contributing native feature is the hala pepe tree (Pleomele sp.) along the east side of the ranch house (see photo, Vegetation # 2).

'Ulei shrubs (Osteomeles anthyllidifolia) occur randomly on the premises but at least three individuals occur within the landscape boundary. One of these lines the driveway to the south of the ranch house, and may possibly date to the period of significance.

A mature ho'awa tree (Pittosporum sp.) and pilo tree (Coprosma menziesii) grows in the west lawn (Vegetation Map, Enlargement A in Appendix). Another old ho'awa tree in the western lawn area died and was replaced in 1996 in conjunction with Russel Bickler's unofficial memorial. Pilo and ho'awa dating to the period of significance are considered to be contributing to the landscape.

A cluster of mamaki trees (Pipturus abidus) and two wiliwili trees (Erinthrina sandwicensis) border the southern lawn area to the east. The wiliwili trees may exist from the period of significance whereas the mamaki appear too young. Three young mamaki trees have also emerged in the beds surrounding the house and in other locations on the premises. It is not certain whether the current distribution of mamaki trees is completely naturally occurring or if parent trees were in fact planted by Shipman. Mamaki appears to be more abundant on the house grounds than in the surrounding landscape.

Several naturally occurring and planted mamane trees (Sophora chrysophylla) can be seen on the premises. The group of small mamane trees on the north lawn was planted by a volunteer group after the period of significance, but several older trees are randomly located within the component landscape. Mamane trees are extremely slow-growing. Therefore, despite their shorter appearances, it is reasonably safe to assume that some of the existing mamane trees within the landscape boundary were present during the period of significance. Mamane was certainly present in the parent landscape during the period of significance.

Other minor native plants on-site include three herbaceous ground covers known as nehe (Lipochaeta sp.), 'ilie'e (Plumbago zeylanica) and 'ihi (Portulaca lutea), and two native sedges: Cyperus polystachyos and Carex wahuensis. Some of the native herbs and a native vine called huehue (Cocculus trilobus) may have spread from the nursery area after the NPS began propagating native plants there. It is not known whether these vegetation features are contributing. The two sedges were probably present during the period of significance.

A small cluster of native and non-native vegetation to the west of the house was unofficially designated as a memorial for a deceased NPS employee. The area that some refer to as "Bickler's memorial" is the

group of plants to the north of the row of dracaena, immediately surrounding the passion fruit vine (see Vegetation Map, Enlargement A in Appendix). The mamaki, mamane, and 'a'ali'i shrubs and nehe groundcover in this circular cluster are all native species that volunteered and were not mowed. However, the ho'awa tree was planted very near the location of an old ho'awa tree that had previously died; the ho'awa tree that died was likely a remnant of the period of significance. While these native species are generally contributing, perhaps only the ho'awa existed in this location during the period of significance.

In general, Shipman is not thought to have planted many native Hawaiian plants in his gardens. With the exception of the hala pepe tree placed near the eastern door of the house in a garden bed, it is difficult to rule out the possibility that all other natives from the period of significance volunteered in-situ. However, it is apparent that he valued native vegetation and sought to integrate existing native plants with his ranching activities and garden designs. Therefore all native species, unless otherwise noted, can be considered contributing until further research can be completed.

SHIPMAN'S INTRODUCTIONS

Shipman was a horticultural enthusiast who cherished orchids and exotic plants from around the globe, and took pride in showcasing them at his homes in Kea'au and 'Ainahou. He is known to have brought plants to 'Ainahou from Kew Gardens in England and other travel destinations around the world, and to have received many plants as gifts from esteemed visitors from abroad.

Lost

Contributing plant features that were lost fall into two main categories: Plants that Shipman removed when he vacated the premises and plants that the National Park Service deemed invasive and removed after acquiring the property. A third, more ambiguous category consists of plants that died off from lack of maintenance and natural causes.

Shipman took with him nearly all the species of orchids that he cultivated at 'Ainahou Ranch and other plants that were potted and therefore easy to transport. He also dug-up favorite plants from the grounds such as holly, various camellias, magnolia, and young pine trees (Thomas English, personal comm., 2003). Fortunately, he did not take all of these rooted plants; their counterparts still thrive in the component landscape today.

Several of Shipman's plantings were later found to be invasive and were removed or controlled by the National Park Service: loquat (Eriobotria japonica), Formosan koa (Acacia confusa), white ash (Fraxinus americana), paper bark eucalyptus (Melaleuca quinquenervia), Australian blackwood (Acacia melanoxylon), black wattle (Acacia mearnsi), English ivy (Hedera helix), and Russian olive (Elaeagnus angustifolia).

Although the original Russian olive tree was cut down, its prolific offspring still plague this area of the park from both a historical and biological conservation standpoint (see Vegetation Map, Enlargements C and D in Appendix). The status of these and other invasive species in the component landscape would be far worse, were it not for the ongoing efforts by NPS volunteers to remove saplings emerging from the seed bank.

Other lost features consist of plants that may have died from lack of maintenance or being shaded out by more persistent plants such as Russian olive. More than twenty-five years passed after Shipman vacated before significant caretaking occurred on the ranch house grounds. NPS maintenance records indicate that trees were pruned and fertilized once between 1976 and 1978 and "desirable yard areas" cleared. Records also indicate that a volunteer group also helped NPS clean up debris around the ranch house in

1989. Prior to 1997, most NPS landscape work at 'Ainahou was probably conducted chiefly on account of controlling invasive species, protecting Nene geese and other native species, and decreasing fire risk and other hazards, rather than maintaining historic landscape characteristics.

Features that were lost from lack of maintenance are poorly documented. A dawn redwood tree (Metasequoia glyptostroboides) recently died just south of the house near the existing plumeria trees. There may once have been as many as ten in this general area. Apple trees were said to exist (Karl Rhoner, personal comm., 2003) and can no longer be found. Also, the grounds were home to several varieties of roses, only one of which can be found today. Several varieties of fuchsias, begonias, and geraniums were also said to exist. It remains a possibility that some of the latter items were also removed by Shipman upon vacating.

Existing (Contributing)
Much of the vegetation that Shipman planted at 'Ainahou still exists today (for locations see vegetation maps in Appendix). Six different species of pine trees, several ornamental trees, fruit and nut trees, shrubs, decorative herbs, and one cactus managed to survive unattended for over two decades, until NPS staff and volunteers reclaimed them from the weeds. Following the period of significance, National Park Service staff and volunteers also made their own contributions to the gardens that are not contributing to the landscape (discussed later).

Slash Pines (Pinus caribaea) line the northern driveway and occur prominently at several locations within the component landscape. Other pines include a row of loblolly pines (Pinus taeda), scattered Italian stone pines (Pinus pinea) (see photo, Vegetation # 3), a small group of Norfolk pines (Araucaria heterophylla), a short row of tsugi pines (Cryptomeria japonica) (see photo, Vegetation # 4), two Mexican weeping pines (Pinus patula), and two kauri pines (Agathis australis).

Fruit and nut trees scattered throughout the component landscape accentuate Shipman's love for diversity. The largest cluster of a homogenous fruit type would be four or five persimmon trees (Diospyros virginiana) near where the road forks into the northern and southern driveways. Citrus trees include: lime (Citrus aurantiifolia), rough lemon (Citrus limonica), and tangerines (Citrus nobilis deliciosa). Four avocado trees (Persea americana) line the west side of the nursery, and a handful of mature carob trees (Ceratonia siliqua) can be found to the east of the nursery area. There is also a significant number of cherimoya trees (Annona reticulate) scattered around the property. Other less abundant fruit trees include: peach (Prunus sp.), Fig (Ficus sp.), mulberry (Morus alba), kumquat (Fortunella japonica), guavasteen (Feijoa sellowiana), plum (Prunus sp.), and two loquat volunteers (Eriobotria japonica) that sprang up after NPS staff removed their parent tree(s). Three types of nut trees still thrive as well: macadamia nut (Macadamia integrifolia), kukui nut (Aleurites moluccana), and chestnut (Castanea dentata).

A large European olive tree (Olea europaea) grows in the bed on the west side of the stone patio; however, its counterpart on the east side was cut down due to the tree leaning towards the house. A European olive sapling has re-grown from the stump and is being trained to grow away from the house. It is not certain when the parent tree was removed, probably sometime in the 1970s or early 1980s.

In addition to the list of pine trees, many of Shipman's other non-utilitarian trees remain as well. A small grove of cork oaks (Quercus suber) is located on the north side of the entrance road (see Vegetation Map, Enlargement E in Appendix). A few cork oaks also line the driveway near the east side of the ranch house, the east side of the nursery area, and one very large tree is placed prominently in the backyard. The latter needs maintaining so that its branches do not interfere with the house structure, but the tree itself leans comfortably away from the house. The tree sizes in the cork oak grove are varied, but on

average much smaller than the ones near the house (see photo, Vegetation # 5); some appear to be dying.

A row of dwarf date palms (Phoenix robellinii) lines the driveway to the east of the ranch house, and a pair border the walkway to the eastern door of the house. Three elengi trees (Mimusops elengi) surround the water tank to the east of the house. An American elm (Ulmus americana) can be found north of the slash pines that line the north driveway. An ornamental pear tree (Pyrus kawakami), a California live oak (Quercus agrifolia), and two plumeria trees (Plumeria sp.) grow in the western lawn area. Also two magnolia trees (Magnolia grandiflora) grow to the southeast of the ranch house.

There are several species of Shipman's ornamental shrubs that have been well maintained by NPS volunteers and staff. There is a hedge of boxwoods (Buxus sempervirens) bordering the driveway on the east side of the house, multiple hedges of arborvitae (Thuja orientalis) to the west and southwest of the house, and a hedge of dracaena (Dracaena sp.) lining the topside of a basalt outcropping to the west of the house. Two varieties of camellia (Camellia japonica, and C. sasanqua) can be found independently and in small clusters throughout the vicinity of the ranch house. Camellias are known to be one of Shipman's favorite plants. Several camellias, possibly the rarer varieties, were taken with him when he vacated 'Ainahou Ranch House.

Other, less prevalent ornamental shrubs include white and pink azaleas (Rhododendron sp.), plumbago (Plumbago auriculata) (see photo, Vegetation # 6), English holly (Ilex aquifolium), Chinese holly (Ilex cornuta), woodbine (Lonicera periclymenum), and kokotan (Rhaphiolepis umbellata). Climbing roses (Rosa sp.) still survive on the west side of the nursery area, but many more roses and types of roses are thought to have grown in the component landscape during the period of significance.

Many of the herbaceous plants found in the component landscape today were introduced by volunteer caretakers at the 'Ainahou Ranch House grounds. A few contributing herb species still remain. Ground orchids (Epidendrum obrieniiannun) decorate one of the basalt outcroppings in the southern lawn area, and are unfortunately the only orchid variety still represented in the landscape.

Several species of Shipman's lilies are still thriving near the ranch house (see photos, Vegetation # 7 & Vegetation # 8). Neomarica (Neomarica sp.), a type of iris, is the most widespread and can be seen growing in beds surrounding the house, as well as in more remote and untended locations under 'ohi'a trees and brush. Other sorts limited to the more immediate vicinity of the house include: zephyrs (Zephyranthes rosea), crinums (Crinum asiaticum), day lilies (Hemerocallis flava), narcissus (Narcissus sp.), and aristea (Aristea gerrardii) – another type of iris. Near the water tank to the east of the house a few watsonia (Watsonia iridifolia) still survive amidst the tall grass. According to Donn Carlsmith, there was a field of watsonia in this area, and a field of Irish potatoes to the southeast of that (W. Markiewicz, 1995).

With the exception of the reference to potatoes, there is little or no indication that Shipman grew many vegetables in the component landscape (W. Markiewicz, personal comm., 2003). Rare orchids and other ornamental plants were his delight. Several varieties of begonias and fuchsias adorned the house grounds during the period of significance that are now missing. NPS volunteers planted one species of begonia (Begoniaceae sp.) that closely resembles one of the species that Shipman cultivated, but other varieties are known to have existed during the period of significance. The white geraniums (Geranium sp.) under the slash pines near the lua (outhouse) are of a contributing variety that still renews itself, but the colored ones in the planters are introduced by NPS volunteers (W. Markiewicz, personal comm., 2003). The contributing variety are labeled white geranium (WG) on the vegetation maps (see Appendix); other non-contributing varieties are generalized and labeled geranium (Ge).

The following vine species were also present during the period of significance: mustang grape (Vitis sp.), white Concord grape (Vitus sp.), English ivy (Hedera helix), and passion fruit (Passiflora edulis). The mustang grape continues to grow on the balcony railing above the patio area on the southern side of the house. Concord grapes grow on a trellis near the nursery area and on existing vegetation under the slash pines adjacent to the northern driveway. The English ivy and passion fruit have both been deemed invasive and removed by NPS. A small passion fruit vine can currently be seen emerging in the garden area west of the ranch house.

Gold fern (Pityrogramma chrysophylla) can be seen near the east entrance to the house. This fern species may remain from the period of significance, but may have volunteered in its current location during or after the period of significance. This fern commonly accompanies other potted plants and was possibly an unintentional introduction to the landscape. It should be considered a contributing feature until further research can be conducted.

Two contributing plants that do not fit easily into other categories are a spineless prickly pear (Opuntia ficus-indica) and Kalanchoe (Kalanchoe pinnata) a low-growing succulent found in two stone planters near the ranch house.

NON-CONTRIBUTING EXOTIC SPECIES

Non-contributing exotic plants in the component landscape fall into two categories: naturalized and planted. Plants of the former category were not comprehensively mapped, whereas deliberately planted aliens were. Of the naturalized species, many are highly invasive and have been targeted for removal by NPS personnel and volunteers. These plants have mostly been kept out of the landscape boundary where efforts have been focused, but they still persist in the periphery and warrant a thorough vegetation management plan. Planted aliens consist of non-invasive garden varieties, which were planted around the house by caretakers of 'Ainahou since the late 1990s.

Naturalized

Faya tree (Morella faya) is a highly invasive species that has become problematic in the parent and component landscapes at 'Ainahou, as well as in many other areas within Hawai'i Volcanoes National Park and elsewhere on the Big Island. Although its presence in Hawai'i was first recorded in 1926, it did not become widespread and problematic in Hawai'i Volcanoes National Park until recent decades, and would not have been a common landscape feature during the period of significance.

Another naturalized species, which can be seen growing in the component landscape, is the common guava (Psidium guajava). This may have been present during the period of significance but was not introduced by Shipman. Common guava was introduced to Hawai'i in the early 1800s and is now a widespread pest. It's incursion upon the component cultural landscape at 'Ainahou is minor relative to that of faya tree. Lantana (Lantana camara), cayenne vervain (Stachytarpheta australis), and Marsh Fleabane (Pluchea sp.) are other notable alien shrubs present in the landscape, which Shipman was not likely responsible for bringing. Lantana and cayenne vervain were naturalized in the Hawaiian Islands as early as the 1870s and were likely present at 'Ainahou during the period of significance. Marsh fleabane is not as widespread, and naturalized much later, and is therefore unlikely to have had a presence at 'Ainahou during Shipman's time. Alien grasses, sedges, herbs, and ferns are discussed separately in the following section.

Alien species control efforts are extensive and ongoing at Hawai'i Volcanoes National Park. Without these efforts, a host of other alien species would have a significant presence at 'Ainahou.

Planted

As previously noted, NPS employees and volunteers have introduced several non-contributing plant species to the component landscape at 'Ainahou following the period of significance. Most of the new introductions were planted in the immediate vicinity of the house by volunteers after 1996. When introducing new species to the landscape, the volunteers ensured that they were not invasive species and attempted to choose varieties that were popular garden plants during the historic period. However, it should be noted that Shipman had a reputation for importing and showcasing as many uncommon species as possible. Fortunately, most or all of the volunteers' new introductions are small herbaceous plants that could easily be removed if necessary.

The following ornamental plants have been introduced by volunteers since about 1997 and are non-contributing (see vegetation maps in Appendix): looking glass plant (Coprosma repens), violets (Viola sp.), shasta daisies (Chrysanthemum maximum), begonias (Begonia sp.), ligularias (Ligularia tussilaginea), marigold (Tagetes sp.), yarrow (Achillea sp.), calliopsis (Coreopsis sp.), geraniums (Geranium sp.), lantern hibiscus (Hibiscus schizopetalus), a native hibiscus locally named ma'o hau hele (Hibiscus schizopetalus), periwinkles (Vinca sp.), and vireya (Rhododendron sp.). The following culinary herbs were also planted by volunteers and are also non-contributing: fennel (Foeniculum sp.), rosemary (Rosmarinus officinalis), lavender (Lavandula officinalis), and lemongrass (Cymbopogon refractus).

Legularia is rumored to have grown on-site during the period of significance at an unknown location and vireya is said to have grown in numerous locations (Donn Carlsmith interview by W. Markiewicz, 1997) The volunteers were also mindful of historic conditions by planting begonias and geraniums, but little is known about the locations and varieties used by Shipman, thus these features are not considered contributing to the historic landscape.

A small pomelo (Citrus paradise) tree in the planter south of the house was also added by volunteers, and the banana trees (Musa sp.) by the nursery area were planted by NPS employees for lunch-time supplements.

Several ti plants (Coryline frutiosa) can be seen growing around the house at 'Ainahou. Ti is a naturalized Polynesian introduction that is used in landscaping, cooking, crafts, and ceremonies. The National Park Service planted some ti plants at 'Ainahou in the 1990s to provide leaves for their own ceremonious occasions. Apparently, this does not account for all of the existing ti plants on the landscape. Although a common landscape ornament in Hawai'i, Shipman probably did not decorate the component landscape with this plant feature. Shipman tended to plant rare and foreign decorative plants. Furthermore, ti plants from the period of significance would have been visibly older than the ones known to have been planted in the late 1990s. It is plausible that NPS documentation of ti plantings is not comprehensive of employees and volunteers. Ti is most likely non-contributing to the historic period.

The ti plants and hibiscus (Sida sp.) north of the dracaena hedge are non-native, non-contributing features associated with "Bickler's memorial".

A few other garden varieties were planted by NPS volunteers since the late 1990s, which subsequently died and are no longer part of existing conditions. A list of these plants is on file at the Hawai'i Volcanoes National Park Cultural Resource Office.

PASTURE GRASSES AND OTHER UBIQUITOUS GROUNDCOVERS

The native flora of the Hawaiian Islands is relatively void of grass species due to the co-evolution and symbiosis with large herbivores, which are incapable of long distance oceanic dispersal. Therefore, pasture landscapes in Hawai'i are nearly entirely composed of non-native species. Many of the delicate

native species with low-growing statures face(d) endangerment or extinction after the Western introductions of pasture grasses and livestock. Feral livestock severely damaged native ecosystems in Hawai'i Volcanoes National Park before organized efforts brought their populations under control.

Of the grass and other ubiquitous groundcover species sampled within the landscape boundary, only two sedges and three herbs were native species (listed in native species section), all of them making up a very minor fraction of the total coverage. The herb species can only be seen emerging in areas where alien grasses are controlled.

Of the long list of alien species that were sampled, we speculate that the following five may have been intentionally introduced by Shipman for fodder: pangola grass (Digitaria eriantha), molasses grass (Melinis minutiflora), kikuyu grass (Pennisetum clandestinum), Spanish clover (Desmodium sandwicense), and sweet pea (Lathyrus odoratus).

Pangola grass is a highly nutritious forage grass that tolerates poor soils and dry conditions. Shipman was the first person to introduce pangola to the Ka'u region (Fred Koehnen, personal comm., 2003). Molasses grass is perhaps even more dominant than pangola, within the landscape boundary. Because of its anomalously high concentrations at 'Ainahou Ranch, and its reputation as a hardy forage grass, it too is likely a contributing grass species.

Kikuyu grass is not as prevalent as pangola and molasses grasses. However, kikuyu is exceptionally high in protein and is known to be one of the earliest pasture grasses to be used in East Hawai'i. Kikuyu is the dominant pasture grass in the upper regions of Keauhou Ranch, which formerly included the 'Ainahou Ranch lands. Conceivably, kikuyu may have been present before Shipman purchased the lease, after which he decided to bring in pangola and other forages to improve productivity. Pangola grass is better adapted to low-fertility soils than kikuyu grass (Hawai'i Cooperative Extension Service, leaflet 102, 1966).

Spanish clover is also widespread in Hawai'i, but its high concentration in the component landscape (relative to other locations in Hawai'i Volcanoes National Park) suggests that it was planted there. Since quantity and quality of soils in this geologically infantile landscape are both lacking, it is highly probable that a knowledgeable horticulturalist like Shipman would have sought to benefit from the soil-building and nitrogen-fixing properties of this leguminous plant. Sweet pea, the other leguminous groundcover that we speculate was intentionally introduced by Shipman, is less prevalent.

Elephant grass (Pennisetum purpureum), which grows in clumps over ten feet tall, was also introduced by Shipman, more likely for its ornamental value than for fodder. Small patches of this tall grass can be seen along the roadside as one nears the ranch house grounds. No elephant grass occurs within the maintained areas of the landscape.

Bush beardgrass (Schizachryim condensatum), broomsedge (Andropogon virginicus), and scaly swordfern (Nephrolepis multiflora) have a moderate presence in the un-mowed periphery of the landscape boundary. However, due to their lack of agricultural importance and their similar concentrations elsewhere in the park, it is not very likely that Shipman hand a hand in their colonization of the area.

Groundcover species encountered that have a very minor overall presence include: Ageratum (Ageratum conyzoides), hairy horseweed (Conyza bonariensis), hairy spurge (Chamaesyce hirta), buttonweed (Spermacoce assurgens), narrow-leaved plantain (Plantago lanceolata), dayflower (Commelina diffusa), crabgrass (Digitaria sp.), smutgrass (Sporobolus africanus), yellow foxtail (Setaria gracilis), and kyllinga

(Kyllinga brevifolia).

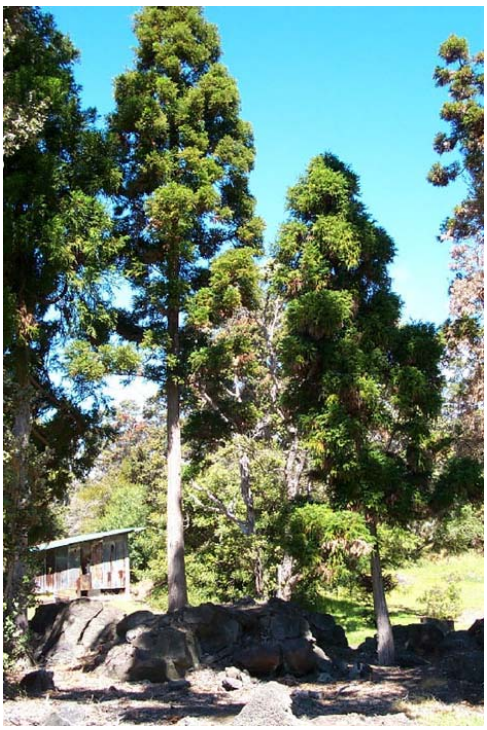
SUMMARY

The gardens surrounding the 'Ainahou Ranch House display a unique blend of native and exotic species that date to Shipman's occupation of the site. The layout of the gardens exhibits an overall lack of linearity, symmetry, and patterning often associated with more formal landscapes (see Vegetation maps in Appendix). This is partly due to the integration of existing native vegetation (notably 'ohi'a trees) and topographic features such as rock outcrops. The repetition of these natural features throughout the landscape accomplishes harmony and unity in the garden design, which might otherwise appear chaotic given the great variety (and lack of patterning) of exotic species. Exceptions to the seemingly random garden design are the curvilinear hedgerows that complement circulation features and pronounced contours in many instances, and the cork oak grove, which appears to have been planted in rows (although several are now missing creating a patchy effect). Many of Shipman's exotic trees and shrubs still remain from the period of significance. However, many of the smaller and less permanent features, such as geraniums, begonias, roses, and orchids have been lost or replaced with different plants and / or lawn. However, given the vast amount and variety of contributing trees and shrubs that remain, vegetation contributes to the significance of the 'Ainahou Ranch House and Gardens.

Vegetation # 1: Large native sandalwood north of driveway loop (PWR, HAVO, CLI files, 2003).

Vegetation # 2: Hala pepe tree fronting the east side of the ranch house (PWR, HAVO, CLI files, 2003).

Vegetation # 3: Italian stone pine with native 'ohi'a in the upper background and neomarica lillies in the foreground (PWR, HAVO, CLI files, 2003).



Vegetation # 4: Row of tsugi pines running parallel with natural rock formations (PWR, HAVO, CLI files, 2003).

Vegetation # 5: One of the Cork oaks in the grove. Tall 'ohi'a in background (PWR, HAVO, CLI files, 2003).

Vegetation # 6: Plumbago in bloom (PWR, HAVO, CLI files, 2003).

Vegetation # 7: Crinum lily in bloom (PWR, HAVO, CLI files, 2003).

Vegetation # 8: Zephyr lily in bloom (PWR, HAVO, CLI files, 2003).

Land Use

Land use is defined by the principal activities in the landscape that have formed, shaped, or organized the landscape as a result of human activity.

The historic land uses for the 'Ainahou Ranch House and Gardens included Shipman's use of the site as a mountain retreat and social center for family and friends, a base for ranching operations, a horticultural showcase, and a wildlife conservation area.

The 'Ainahou Ranch House was historically developed as a wilderness retreat. Following the period of significance the NPS has allowed several youth and educational groups to access to the 'Ainahou Ranch House to find solace or inspiration in this wilderness setting on day trips and weekend outings. The Friends of Hawai'i Volcanoes National Park also hosts educational groups and botanical societies who are interested in the history associated with 'Ainahou Ranch House and Gardens. While the house and gardens are no longer used as a residence, the contemporary use of the ranch house grounds to host wilderness outings and educational groups is compatible with the historical use of the landscape.

Since the ranch house functioned as the base of operations for a working ranch, livestock were historically part of the land use of the site. Eye-witness accounts (Zimmer & Mattos, 2003) and remaining evidence of historic-period fencing patterns indicate that livestock were historically present in the component landscape as well as the parent landscape. Features such as bull pens and birthing pens were located in close proximity to the ranch house. Although cattle are no longer present on the ranch, the NPS keeps horses in the corral (visible from the component landscape), continuing an association with the historic-period land use.

Although Shipman's cultivation of rare exotic plants (e.g. orchids) has been discontinued, the NPS now uses the nursery area to cultivate rare native plants. While the plant materials have changed, the use is consistent and continues the historic association between Shipman and rare-plant cultivation at the site.

Lastly, one of the most important historical uses of the ranch house grounds was for the conservation of the Nene (endangered Hawaiian goose). Shipman raised Nene at his coastal residence in Kea'au. He had a flock of forty-three Nene before the 1946 tidal wave (Apple, 1991). After the tidal wave, thirteen remained and were transported to the 'Ainahou Ranch House grounds for safe-keeping. Nene and turkey pens were built in 1954 (Jackson, 1997) to the south of the house (Thorne, 2003) however, the exact location of these pens is unknown.

Today, the Nene Project at Hawai'i Volcanoes National Park monitors the endangered Nene population and manages a breeding program. The NPS has observed that the Nene population in the 'Ainahou area has grown from eleven birds to approximately two-hundred (Sherry, 2003). Mongoose, rats, cats, pigs, nutritional deficiencies, and diseases have hindered the growth of the Nene population. However, the efforts of park staff have been instrumental in a steady growth in the population. Today, the Nene population at Hawai'i Volcanoes National Park is about 137, forty of which frequent the 'Ainahou Ranch House and Gardens vicinity on a regular basis (see photo, Land Use # 1) (Sherry, 2003). Management efforts to assist in the growth of the Nene population at the 'Ainahou Ranch House grounds include fencing, access restrictions during Nene breeding season, and continual monitoring of individual birds. During the breeding season, public access is prohibited if there is a display of breeding behavior such as nesting and egg-laying, or if Nene goslings are present. Otherwise, public access to the ranch house and grounds is allowed. The current use of the site for Nene conservation is appropriate and consistent with the historic-period use.

SUMMARY

Although the 'Ainahou Ranch House and Gardens no longer functions as a residence or a ranch, its current use as a wilderness destination for hosting educational groups and botanical societies, a working nursery, and a Nene sanctuary is compatible with historic period land uses. The significance of the continued use of the site as a Nene sanctuary in particular is of primary importance in Hawai'i, therefore land use contributes as a landscape characteristic to the significance of the 'Ainahou Ranch House and Gardens.

Land Use # 1: Contemporary photo of Nene feeding on grass at the 'Ainahou Ranch House grounds (PWR, HAVO, CLI files, 2003).

Small Scale Features

Small scale features are the elements that provide detail and diversity for both functional needs and aesthetic concerns in the landscape.

Small-scale features consist of fence-posts associated with cattle fences in the component landscape. These fences have been removed, but evidence of their spatial arrangement and construction techniques is found in the remaining features (see photos, Small-Scale Features # 1 & # 2). In some cases the features amount to little more than a few pieces of rusting wire attached to a living 'ohi'a tree. In other cases there is an 'ohi'a log attached to either side of a tree in a manner that would allow considerable tension to be applied without killing the tree. The locations of trees that display evidence of being used as a fence post are shown on the Site Plan (see Supplemental Information). Only a few specimens exhibit the 'ohi'a log attachments. It is not known whether such attachments were included on all trees that were used as posts. However, considering the extensive removal and deterioration of fences, it is likely that many may have been removed or fallen off after their bindings corroded.

Non-contributing
Two wooden benches, apparently constructed from local materials, can be found in proximity to the house. One is near the ornamental pear tree in the western lawn area. The other is located about halfway between the house and the lua. The seats are 'ohi'a logs split down the middle, flat side up, supported by one short 'ohi'a leg on either side. The benches are of a simple design and are rustic in appearance, but were added by volunteers in the late 1990s and are not contributing features.

The rain gauge in the western lawn area was installed by NPS in 1999 and is also a non-contributing feature (although Shipman did have multiple rain gauges at 'Ainahou that are now missing).

The fence surrounding the present nursery area and the tables within (supporting potted plants) are all non-contributing features in the component landscape. Although nearly the same area was designated as a nursery area during the period of significance, these features have been added by the NPS for propagating native plant species for ecological restoration projects. Within the nursery area there is also a temporary pavilion that provides a small, dry workspace during rainy weather.

Summary
Several non-contributing small-scale features currently exist in the component landscape, the majority of which are associated with the NPS nursery area. The general location of these features corresponds with the location of Shipman's old greenhouse, but the style and appearance of nursery accessories are significantly different (according to historic photographs). The fence post features have a unique appearance and carry important clues to the interpretation of the historic landscape in the absence of historic fences. While the small-scale features landscape characteristic no longer contributes to the significance of the 'Ainahou Ranch House and Gardens, the remaining fence posts date to the period of significance and should be treated as cultural resources.

Small-Scale Features # 1: Remnant fence post displaying use of live 'ohi'a trees (PWR, HAVO, CLI files, 2003).

Small-Scale Features # 2: Remnant conventional-type 'ohi'a fence post (PWR, HAVO, CLI files, 2003).

Characteristic Feature	Type Of Contribution	LCS Structure Name	IDLCS Number	Structure Number
'ohi'a fence posts	Contributing			
NPS nursery fence, pavilion, tables, and accessories	Non-Contributing			
NPS Rain Gauges	Non-Contributing			
Wooden benches	Non-Contributing			

Views And Vistas

Views and vistas are the prospect afforded by a range of vision in the landscape conferred by the composition of other landscape characteristics and associated features. Views are typically expansive or panoramic, while vistas are more controlled and linear.

According to Donn Carlsmith, a friend of Herbert Shipman, there were three distinct vistas from the upstairs balcony of the 'Ainahou Ranch House during the period of significance. These were defined by linear breaks through the surrounding 'ohi'a forest in southerly, southeasterly, and southwesterly directions (Interview by W. Markiewicz, 1995).

The southerly vista probably presented the most uninhibited view, since it was oriented perpendicular to the topographic gradient, and because open pasture lay in this direction. Supposedly, Keauhou Point could be seen from the balcony on a clear day. There is still a partially open vista to the south today, but it is substantially compromised by trees in the foreground, so that Keauhou Point lies obstructed from view.

Vegetation growth following the period of significance has made the angle of the southeasterly vista difficult to decipher. The vista was likely not as extensive as the southerly and southwesterly vistas, but stretched a good distance into the surrounding forest. In addition, this vista would have provided a clear line of sight between the lower portions of driveway loop and the ranch house. However, Russian olive trees growing within the driveway loop are a major impediment to this vista, as are the dense faya trees that grow between the driveway loop and the corral area.

The southwesterly vista was made possible through a narrow break in the surrounding 'ohi'a forest. During the period of significance, one could supposedly see past Hilina Pali (cliff) and peer far down the southern Ka'u coastline towards South Point. A portion of the linear gap is still discernable within the component landscape boundary, but the long-distance view has been blocked by trees a few hundred yards away.

The last few decades have seen the proliferation of faya trees (Morella faya) in Hawai'i Volcanoes National Park. This species is extremely fast-growing, particularly when compared to the slow-growing 'ohi'a trees. The park has prevented the establishment of faya trees within the component landscape, but they are quickly filling in the gaps in the otherwise sparse 'ohi'a forest that surrounds the landscape boundary. General visibility along the entrance road and in the component landscape would have been significantly less obstructed during the period of significance. In addition, further unidentified views or vistas may have existed, which are now blocked by these trees. For example, it seems likely that the corral may have been visible from the house during the period of significance, but this view is currently obstructed by a dense band of faya trees.

Three remnant vistas from the ranch house balcony are considered to be contributing because of their strong potential (if the non-contributing vegetation was removed) to revive historic integrity and provide a sense of spatial context important to the history and interpretation of the cultural landscape. The southerly vista is particularly important since it overlooks the ranch and the historic road / trail to Keauhou Landing, where cattle were historically transported by ship. However, due to the significant alteration and obscuring of views and vistas by vegetation growth, this characteristic no longer contributes to the significance of the 'Ainahou Ranch House and Gardens.

Management Information

Descriptive And Geographic Information

Historic Name(s): 'Ainahou Ranch House

Current Name(s): 'Ainahou Ranch House

Management Unit:

Tract Numbers: 01-114

State and County: Hawaii County, HI

Size (acres): 13.38

Boundary UTM

Boundary UTM(s):

Source	Type	Datum	Zone	Easting	Northing
GPS-Differentially Corrected	Point	NAD 83	5	265752	2140272
GPS-Differentially Corrected	Point	NAD 83	5	265901	2140307
GPS-Differentially Corrected	Point	NAD 83	5	265705	2140705
GPS-Differentially Corrected	Point	NAD 83	5	265859	2140507
GPS-Differentially Corrected	Point	NAD 83	5	266004	2140483
GPS-Differentially Corrected	Point	NAD 83	5	265737	2140452
GPS-Differentially Corrected	Point	NAD 83	5	265780	2140441
GPS-Differentially Corrected	Point	NAD 83	5	265707	2140285
GPS-Differentially Corrected	Point	NAD 83	5	266002	2140571
GPS-Differentially Corrected	Point	NAD 83	5	266084	2140548
GPS-Differentially Corrected	Point	NAD 83	5	266048	2140424
GPS-Differentially Corrected	Point	NAD 83	5	265952	2140407
GPS-Differentially Corrected	Point	NAD 83	5	265935	2140334
GPS-Differentially Corrected	Point	NAD 83	5	265806	2140314
GPS-Differentially Corrected	Point	NAD 83	5	265814	2140299

GPS-Differentially Corrected	Point	NAD 83	5	265794	2140316

GIS File Name: 3 files ending with_cr104.apr (see below)

GIS File Description: These are ArcView projects names for maps located at E:\Ainahou\GIS\Ainahou_Backup_25\vegmap_tablay_cr104.apr, E:\Ainahou\GIS\Site Plan\siteplan_ainahou_cr104.apr, E:\Ainahou\GIS\Structures\structures_ainahou_cr104.apr

National Register Information

National Register Documentation: Entered -- Inadequately Documented

Explanatory Narrative:

NRIS Information:

NRIS Number:	94001619
Primary Certification:	Listed In The National Register
Primary Certification Date:	2/8/1995
Name In National Register:	Ainahou Ranch
Other Names In National Register:	10-62-19429;10-62-19429

National Register Eligibility: Eligible -- SHPO Consensus Determination

Explanatory Narrative:
In addition to the existing National Register documentation, the HI SHPO concurred on the findings of this CLI on September 24, 2004.

Date of Eligibility Determination: 9/24/2004

National Register Classification: Site

Significance Level: State

Contributing/Individual: Contributing

Significance Criteria: B -- Inventory Unit is associated with the lives of persons significant in our past

C -- Inventory Unit embodies distinctive characteristics of type/period/method of construction; or represents work of master; or possesses high artistic values; or represents significant/distinguishable entity whose components lack individual distinction

Period Of Significance

Time Period: 1941 - 1971 AD

Historic Context Theme:	Transforming the Environment
Historic Context Subtheme:	Conservation of Natural Resources
Historic Context Facet:	Fish, Wildlife, And Vegetation Preservation
Historic Context Theme:	Expressing Cultural Values
Historic Context Subtheme:	Architecture
Historic Context Facet:	Bungalow (1890-1940)
Historic Context Theme:	Expressing Cultural Values
Historic Context Subtheme:	Other Expressing Cultural Values
Historic Context Facet:	Other Expressing Cultural Values -- Rare Plant Collections

Area Of Significance:

Category:	Conservation
Priority:	1
Category:	Architecture
Priority:	2
Category:	Agriculture
Priority:	3

State Register Information

State Register Documentation

Document ID Number:	50-10-62-19,429
Date Listed:	4/16/1994
Document Name:	'Ainahou Ranch House
Explanatory Narrative:	'Ainahou Ranch House was listed on the Hawai'i Register in 1994.

National Historic Landmark Information

National Historic Landmark Status: No

World Heritage Site Information

World Heritage Site Status: No

Cultural Landscape Type and Use

Cultural Landscape Type: Historic Vernacular Landscape

Current and Historic Use/Function:

Use/Function Category:	Domestic (Residential)
Use/Function:	Estate Landscape
Detailed Use/Function:	Estate Landscape
Type Of Use/Function:	Historic
Use/Function Category:	Agriculture/Subsistence
Use/Function:	Horticulture Facility
Detailed Use/Function:	Horticulture Facility
Type Of Use/Function:	Both Current And Historic
Use/Function Category:	Education
Use/Function:	Education-Other
Detailed Use/Function:	Education-Other
Type Of Use/Function:	Current
Use/Function Category:	Government
Use/Function:	Government-Other
Detailed Use/Function:	Government-Other
Type Of Use/Function:	Current

Ethnographic Information

Ethnographic Survey Conducted: No Survey Conducted

Adjacent Lands Information

Do Adjacent Lands Contribute? No

Adjacent Lands Description:

General Management Information

Management Category: Should Be Preserved And Maintained

Management Category Date: 9/15/2003

Explanatory Narrative:

The 'Ainahou Ranch House and Gardens historic landscape meets National Register criteria B and C (the ranch house was listed on the National Register in 1995). The inventory unit is also compatible with the park's legislative significance. The 2001-2005 Strategic Plan for Hawai'i Volcanoes National Park lists the following as one of the five main purposes of the park: "To protect, preserve, and study cultural resources including landscapes, features, and museum objects". Thirdly, the inventory unit continues to serve a purpose in the conservation of the endangered Hawai'i State Bird (Nene), which is very appropriate to its traditional use. Furthermore, the inventory unit is a unique and viable location for hosting educational field trips for learning about local history, horticulture, and natural heritage. The nursery area within the inventory unit is now used by the NPS for propagating rare native plants. None of these purposes or uses is inappropriate to the landscape's traditional use and function.

Condition Assessment And Impacts

The criteria for determining the condition of landscapes is consistent with the Resource Management Plan Guideline definitions (1994) and is decided with the concurrence of park management. Cultural landscape conditions are defined as follows:

Good: indicates the landscape shows no clear evidence of major negative disturbance and deterioration by natural and/or human forces. The landscape's cultural and natural values are as well preserved as can be expected under the given environmental conditions. No immediate corrective action is required to maintain its current condition.

Fair: indicates the landscape shows clear evidence of minor disturbances and deterioration by natural and/or human forces, and some degree of corrective action is needed within 3-5 years to prevent further harm to its cultural and/or natural values. If left to continue without the appropriate corrective action, the cumulative effect of the deterioration of many of the character-defining elements will cause the landscape to degrade to a poor condition.

Poor: indicates the landscape shows clear evidence of major disturbance and rapid deterioration by natural and/or human forces. Immediate corrective action is required to protect and preserve the remaining historical and natural values.

Undetermined: Not enough information available to make an evaluation.

Condition Assessment: Fair

Assessment Date: 12/10/2003

Date Recorded: 09/30/1999

Park Management Concurrence: Yes **Concurrence Date:** 8/24/2004

Level Of Impact Severity: Moderate

Explanatory Notes: The 'Ainahou Ranch House and Gardens landscape is negatively impacted by changing vegetation patterns resulting from: planting non-contributing species, deferred maintenance of existing trees, absence of grazing, and an increase in invasive species colonization pressure following the period of significance. Woody, invasive species continue to degrade historic vistas, but also threaten to encroach on remaining open-space areas and designed vegetation. Contributing tree species in close proximity to the rancl house threaten to cause damage to the building resultin from falling trees or limbs. Non-contributing plants have been planted in the garden beds around the house to fill voids created when contributing plants died. A vegetation management plan for the inventory unit is urgently needed. If some degree of corrective action is not taken in the next three to five years, significant degradation to several landscape characteristics seems inevitable. Foreseeable impacts of unmanaged vegetation include impacts to the 'Ainahou Ranch House, which is already on the National Register.

Stabilization Measures:

Stabilize vegetation resources that are a potential risk to the ranch house.

Prune or limb the cork oak trees and pine trees in close proximity to the ranch house to avoid threats to house from falling limbs and unhealthy or dying trees.

Impact:

Type of Impact: Vegetation/Invasive Plants

Internal/External: Internal

Description:

Woody, invasive plant species are continuously sprouting seedlings in the component landscape and threaten to establish in areas that were historically characterized by open space. If permitted to grow, these noxious species may further compromise historic vistas and distort historic spatial organization. Annually remove saplings of invasive species to prevent further depreciation of historic vegetation patterns. Use mechanical techniques or herbicide. Seedlings can be easily hand-pulled if management is frequent and persistent enough so that saplings are not permitted to establish extensive root systems. The species in need of the most persistent removal are Russian Olive (Elaeagnus angustifolia), faya trees (Morella faya), and Formosan koa (Acacia confusa). This work should begin as soon as possible since labor costs and impact severity increases as the plants mature. An annual estimate of this maintenance cost is included in Supplemental Information.

Type of Impact: Vegetation/Invasive Plants

Internal/External: Internal

Description:

Established stands of faya trees located immediately south of the landscape boundary are obstructing the southerly vista. Although, this important historic vista is already impaired, further growth of these relatively young (but extremely fast-growing) faya tree stands threatens to totally obstruct all visibility of the ocean and lower ranch. Although faya trees are also established elsewhere on the property, the area to the south of the house should be prioritized due to its potential to restore the most important historic vista. The area in which this treatment would yield the most cost-effective results lies south-southeast of the house and west of the corral (see Site Plan in Supplemental Information). The extent, methodology, and costs of such a treatment should be outlined in a vegetation plan as soon as possible. Such a plan should also prioritize the established stands of Russian olive trees that occur within the driveway loop and distort the historic feeling and spatial organization of this portion of the component landscape.

Type of Impact: Planting Practices

Internal/External: Internal

Description:

NPS employees and park volunteers have planted non-contributing plant varieties in prominent locations in the component landscape. For the most part, this was done with the intention of maintaining a pleasant atmosphere at a historic site. Other elements were planted for utilitarian or ceremonious reasons (see Vegetation section of text). These types of planting practices should cease immediately and non-contributing vegetation that has been planted by NPS employees and park volunteers should be removed and replaced with the species that were originally in those locations. This may be impossible to recreate with one-hundred percent accuracy, however, further research and correspondence with Shipman's relatives may yield important information as to what species of orchids, roses, etc. were growing near the house and in other prominent locations. Most if not all of the non-contributing species have already been identified. The cost and feasibility of this treatment should be outlined in a vegetation management plan as soon as possible.

Type of Impact: Pruning Practices

Internal/External: Internal

Description:

The large cork oak on the northwest side of the ranch house is overhanging the roof and threatens to cause damage if and when limbs break off. This tree also provides rats with easy access to the roof of the house and deposits debris (leaves and twigs) on the roof and in the gutters. A few other trees on the east side of the house and an 'ohi'a tree to the southwest are also in need of pruning or limbing to decrease risk of damage induced by storms. An 'ohi'a tree to the northwest of the house appears to be dead and should be removed to avoid risk of injury and damage to the ranch house.

Agreements, Legal Interest, and Access

Management Agreement: Other -- "Friends of Hawai'i Volcanoes National Park" (a volunteer group) maintain lawn and plants surrounding the ranch house.

Expiration Date: NOT APPLICABLE

Explanatory Narrative:

"Friends of 'Ainahou", today known as the "Friends of Hawai'i Volcanoes National Park" have been maintaining the lawn and planted areas around the 'Ainahou Ranch House since September 30, 1995 when the volunteer group was formally established.

NPS Legal Interest: Fee Simple

Explanatory Narrative:

'Ainahou Ranch House and Gardens falls in tract number 01-114 which is owned by the National Park Service.

Public Access: Other Restrictions

During Nene (endangered goose) breeding season, public access is denied if there is a display of breeding behavior (nesting, laying eggs, raising of gosling) on the ranch house grounds.

Unrestricted

Public access to the ranch house grounds is permitted provided that it is not Nene nesting season. There is however a locked gate throughout the year and vehicular access is only allowed with special permission.

Treatment

Approved Treatment: Undetermined

Approved Treatment Document:

Document Date:

Explanatory Narrative:

Regarding management of cultural landscapes, NPS Director's Order 28 includes the following guidelines with respect to vegetation: "maintaining and perpetuating historic plants and plant patterns..., controlling the spread of exotic historic plants into adjacent native plant communities..., and fulfilling these and other management concerns in a manner that does not threaten or disrupt other cultural features and artifacts or the surrounding environment". In order to adhere to these guidelines, the component landscape at 'Ainahou is in urgent need of a vegetation management plan. The plan should address the impacts discussed in the Condition Assessment and Impacts section of this report as well as general caretaking of contributing plants on site.

Approved Treatment Completed: No

Approved Treatment Cost

LCS Structure Approved Treatment Cost: $0

Landscape Approved Treatment Cost: $0

Cost Date:

Level of Estimate:

Cost Estimator:

Explanatory Description: The LCS has not identified ultimate approved treatment costs for the buildings and structures and no landscape treatment costs have been identified in a park document. Treatment costs for the landscape need to be assessed in a vegetation management plan.

Stabilization Costs

LCS Structure Stabilization Cost: $17,500

Landscape Stabilization Costs: $2,997

Cost Date: January 4, 2004

Level Of Estimate: C - Similar Facilities

Cost Estimator: Contractor

Explanatory Description: This structure stabilization cost estimate of $17,500 is based on the interim treatment costs listed in the LCS for structures that occur within the component landscape: Ranch house ($5000), Lua ($3000), Shed no 1 ($2,000), Shed no. 2 ($2,000), Greenhouse ruin ($500), water tank #B320E ($2,000), Water tank foundation ($1,000), Water Tank #B320G ($1,000), Stone Walls ($1,000).

The Landscape Stabilization Cost is based on a quoted estimate by Jacunski's Complete Tree Service for: pruning trees that overhang the ranch house, and limbing or felling trees in close proximity to the house, which are partially or wholly dying and threaten to cause damage to the ranch house if not removed.

Documentation Assessment and Checklist

Documentation Assessment: Good

Documentation:

Document: Other
Year Of Document: 1995
Amplifying Details: Master Plan
Adequate Documentation: No
Explanatory Narrative:
This report is outdated and does not address current planning, vegetation, or preservation needs for this park.

Document: Administrative History
Year Of Document: 1972
Amplifying Details: Jackson, Frances. An Administrative History of Hawai'i Volcanoes National Park and Haleakala National Park.
Adequate Documentation: Yes
Explanatory Narrative:
This document contains a thorough history of Hawai'i Volcanoes National Park and Haleakala National Park.

Document: Other
Year Of Document: 2003
Amplifying Details: Suzuki/Morgan Architects, LTD. Historic Structures Report for the 'Ainahou Ranch House at Hawai'i Volcanoes National Park.
Adequate Documentation: Yes
Explanatory Narrative:
This document is a thorough Historic Structures Report for the 'Ainahou Ranch House.

Document: Other
Year Of Document: 1994
Amplifying Details: Keswick, Janet and Thomas Quinlan. National Register of Historic Places Registeration Form for 'Ainahou Ranch House.
Adequate Documentation: No
Explanatory Narrative:
The nomination form describes the site, but would benefit from more detail on the garden areas.

Document:	Other
Year Of Document:	2003
Amplifying Details:	National Park Service. Preservation of 'Ainahou Ranch Rainshed.
Adequate Documentation:	Yes

Explanatory Narrative:

This document describes the process of preserving the two large rainsheds located north of the ranch house.

Document:	Other
Year Of Document:	1997
Amplifying Details:	National Park Service. Final Environmental Assessment, Rehabilitation, Maintenance, and Long-term use for 'Ainahou Ranch House.
Adequate Documentation:	Yes

Explanatory Narrative:

This document describes the rehabilitation, maintenance and long-term use for the 'Ainahou Ranch House.

Appendix

Bibliography

Citations:

Citation Author:	Apple, Russ
Citation Title:	'Ainahou Ranch: a Refuge for Nene and Humans
Year of Publication:	1991
Publisher:	Hawai'i Tribune Herald
Citation Type:	Both Graphic And Narrative
Citation Location:	HAVO CRM Library

Citation Author:	Cahill, Emmett
Citation Title:	The Shipmans of East Hawai'i.
Year of Publication:	1996
Publisher:	University of Hawai'i Press
Source Name:	Library Of Congress/Dewey Decimal
Citation Number:	CS71.S55675
Citation Type:	Both Graphic And Narrative
Citation Location:	HAVO Library

Citation Author:	National Park Service
Citation Title:	Final Environmental Assessment, Rehabilitation, Maintenance, and Long-term use for the 'Ainahou Ranch House.
Year of Publication:	1997
Publisher:	National Park Service
Citation Type:	Narrative
Citation Location:	HAVO CRM Library

Citation Author:	Higashino, Paul K., Linda W. Cuddihy, Stephen J. Anderson, and Charles P. Stone
Citation Title:	Checklist of Vascular Plants of Hawai'i Volcanoes National Park.
Year of Publication:	1988
Publisher:	Cooperative National Park Resources Studies Unit University of Hawai'i at Manoa
Citation Type:	Narrative
Citation Location:	University of Hawai'i Library

Citation Author:	Jackson, Frances
Citation Title:	An Administrative History of Hawai'i Volcanoes National Park and Haleakala National Park.
Year of Publication:	1972
Publisher:	National Park Service
Citation Type:	Narrative
Citation Location:	HAVO Library

Citation Author:	Keswick, Janet and Thomas Quinlan
Citation Title:	National Register of Historic Places Registration Form for 'Ainahou Ranch.
Year of Publication:	1994
Publisher:	National Park Service
Citation Type:	Graphic
Citation Location:	HAVO CRM Library

Citation Author:	National Park Service
Citation Title:	Preservation of ‘Ainahou Ranch Rainshed
Year of Publication:	2003
Publisher:	National Park Service
Citation Type:	Both Graphic And Narrative
Citation Location:	HAVO CRM Library

Citation Author: Neal, Marie C.
Citation Title: In Gardens of Hawai'i.
Year of Publication: 1965
Publisher: Bishop Museum Press
Citation Type: Both Graphic And Narrative
Citation Location: HAVO CRM Library

Citation Author: Suzuki/Morgan Architects
Citation Title: Historic Structures Report for the 'Ainahou Ranch House at Hawai'i Volcanoes National Park.
Year of Publication: 2003
Publisher: National Park Service
Citation Type: Both Graphic And Narrative
Citation Location: HAVO Library and CRM Library

Citation Author: United States Department of the Interior
Citation Title: Director's Order 28, Cultural Resource Management
Year of Publication: 1998
Publisher: United States Department of the Interior
Citation Type: Narrative
Citation Location: HAVO CRM Library

Citation Author: University of Hawai'i, Cooperative Extension Service
Citation Title: Leaflet 102, Conservation Series (Forage Grasses).
Year of Publication: 1966
Publisher: Cooperative Extension Service, University of Hawai'i.
Citation Type: Both Graphic And Narrative
Citation Location: Cooperative Extension Service, University of Hawai'i.

Citation Author: Wagner, W.L., D.R. Herbst, and S.H. Sohmer
Citation Title: Manual of the Flowering Plants of Hawai'i.
Year of Publication: 1990
Publisher: Bishop Museum
Source Name: Library Of Congress/Dewey Decimal
Citation Number: QK473.H4W33
Citation Type: Both Graphic And Narrative
Citation Location: HAVO CRM Library

Citation Author: Wolfe, Edward W. and Jean Morris
Citation Title: Geologic Map of the Island of Hawai'i.
Year of Publication: 1996
Publisher: United States Geological Survey, Department of the Interior
Citation Type: Graphic
Citation Location: HAVO CRM Library

Citation Author: Juvik, Sonia and James Juvik
Citation Title: Atlas of Hawai'i, Third Edition
Year of Publication: 1998
Publisher: University of Hawai'i Press
Source Name: Library Of Congress/Dewey Decimal
Citation Number: G1534.20 U51998
Citation Type: Both Graphic And Narrative
Citation Location: HAVO, CRM Library

Citation Author: Dr. James C. Nolan
Citation Title: History of Beef Cattle in Hawai'I
Year of Publication: 2001
Publisher: University of Hawai`i at Manoa
Source Name: Internet
Citation Type: Both Graphic And Narrative
Citation Location: URL http://www.hawaii.edu/ansc/History/histbeef.htm

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Supplemental Information

Title: 'Ainahou Ranch

Description: Unpublished Video
After Dark in the Park (videotaped)
presentation by Emmet Cahill, 1993
HAVO Library

Title: 'Ainahou Ranch Project

Description: Unpublished NPS report, 1978
Gar Clarke, Allen Ramos, Clinton Kahilihiwa
HAVO Library Archives

Title: 'Ainahou Water Line Diagram

Description: Clarke, Gar (1978)
NPS Unpublished Sketch
Graphic
HAVO Library

Title: (Untitled)

Description: List and Location of Identified Plants near 'Ainahou Ranch House
Markiewicz, W. and Alana McKinney, 1995
Narrative
HAVO CRM Library

Title: A History and Historic Resource Study of the Lower Portion of the 'Ili 'Aina of Keauhou District of Ka'u

Description: NPS Unpublished Report
Frances Jackson 1997, Mara Durst 2001
Graphic and Narrative
HAVO CRM Library

Title: Botanical Collection 'Ainahou

Description: Compiled List of Plant Sightings at 'Ainahou
Kageler, Dina (1984)
NPS Unpublished Report
HAVO, CRM Library

Title: Historic American Engineering Record
Hawai'i Volcanoes National Park Roads

Description: NPS Unpublished Manuscript, 1999
Both Graphic and Narrative
HAVO CRM Library

Title: Interview with Donn Carlsmith (1)

Description: Markiewicz, Wilhelmina (1995)
Narrative
HAVO CRM Library

Title: Interview with Donn Carlsmith (2)

Description: Markiewicz, Wilhelmina (1997)
Narrative
HAVO CRM Library

Title: Interview with Donn Carlsmith (3)

Description: Markiewicz, Wilhelmina (1999)
Narrative
HAVO CRM Library

Title: Personal Communication

Description: Informal interviews and / or site visits were conducted with the following individuals in 2003:

Thomas English
Fred Koehnen
Wilhelmina Markiewicz
Alana McKinney
Bob Mattos
Linda Pratt
Charlie Ricketts
Kathleen Sherry
Zoe Thorne
Chris Zimmer

Title: Photograph Collections

Description: 1940s Historic Photos courtesy of Samuel M. Lowrey

1940s Historic Photos courtesy of Shipman LTD

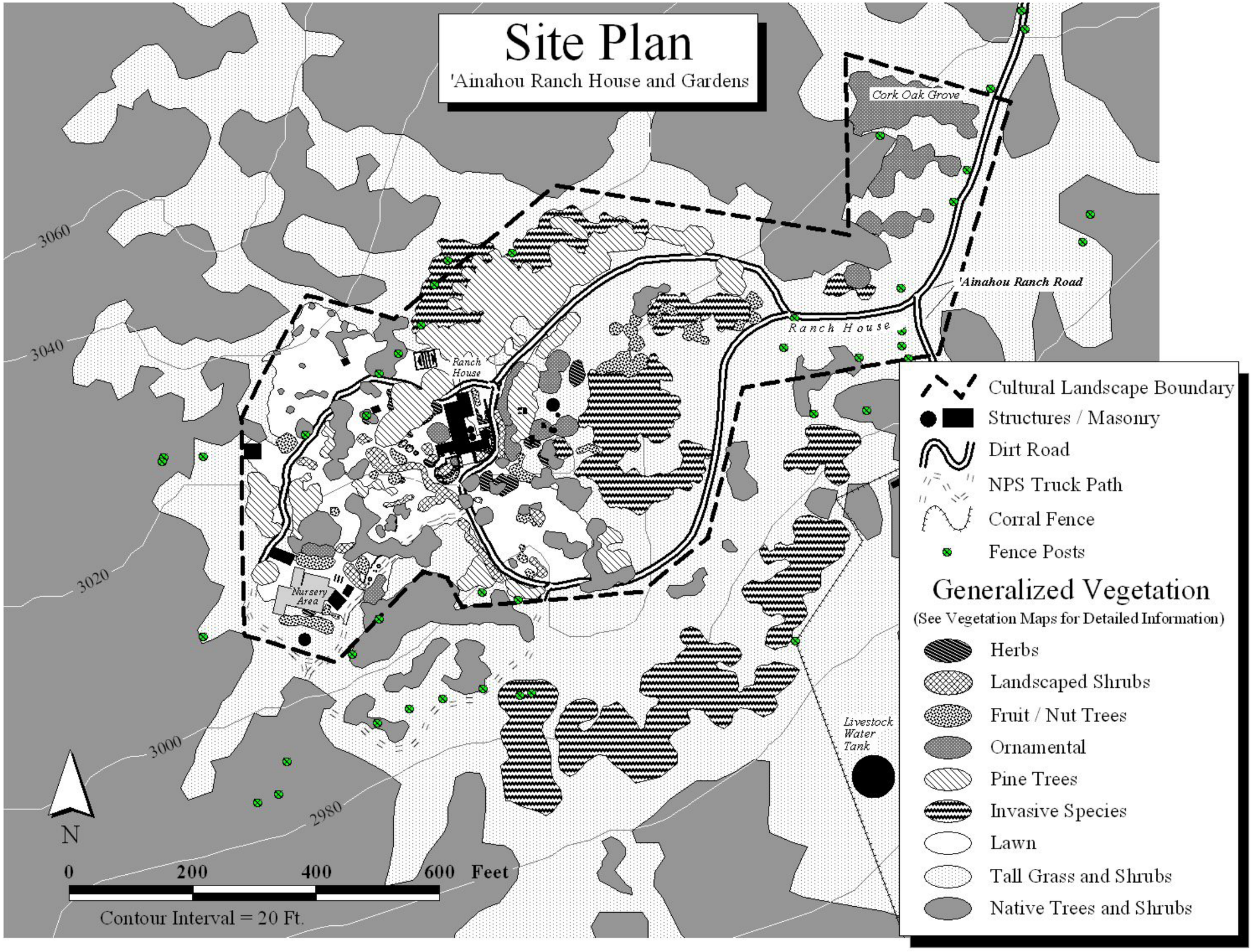
1970s, 1999, and 2003 NPS Photos, HAVO, CLI files

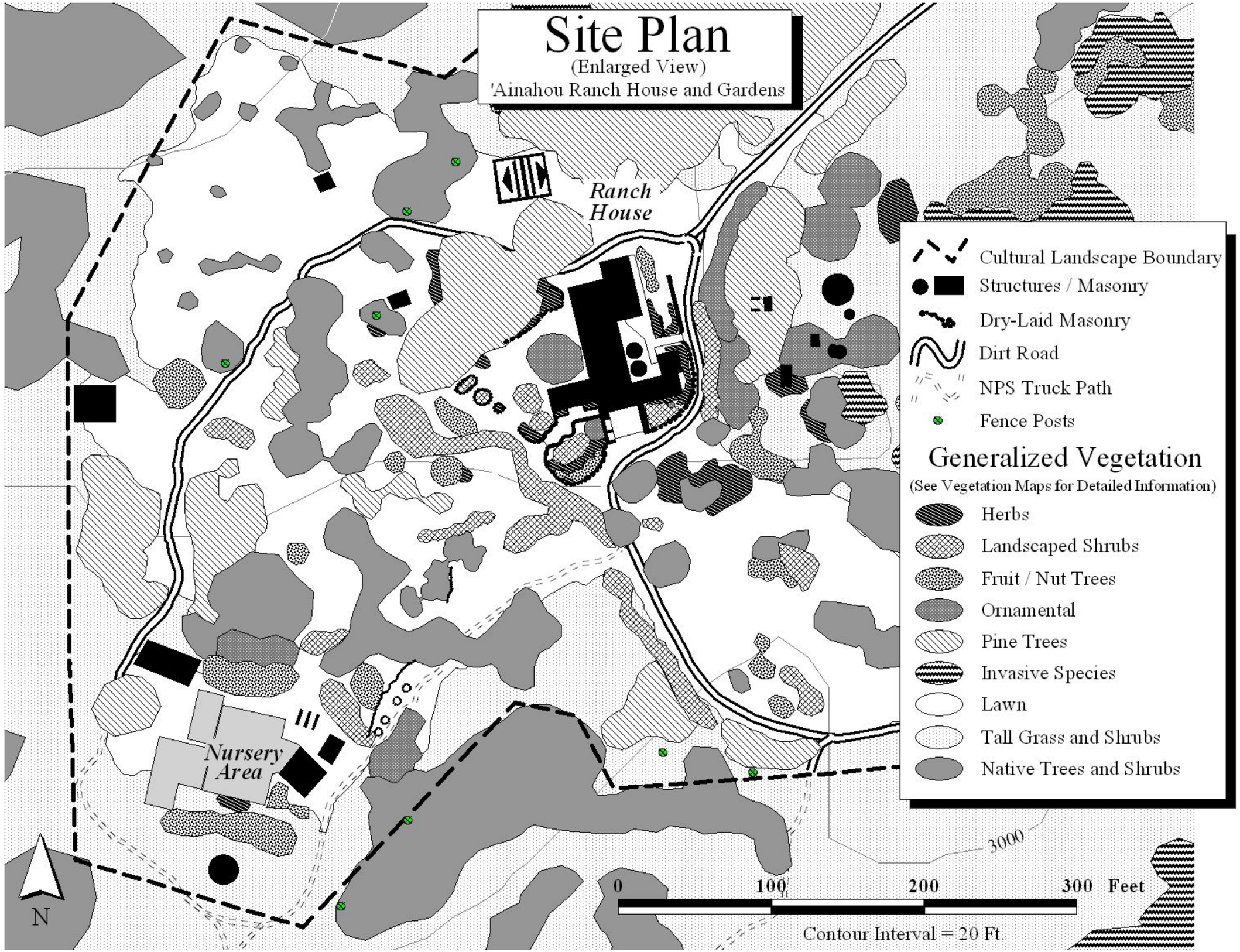
Title: Ten Year Garden Maintenance Plan, 'Ainahou Ranch, Hawai'i Volcanoes National Park

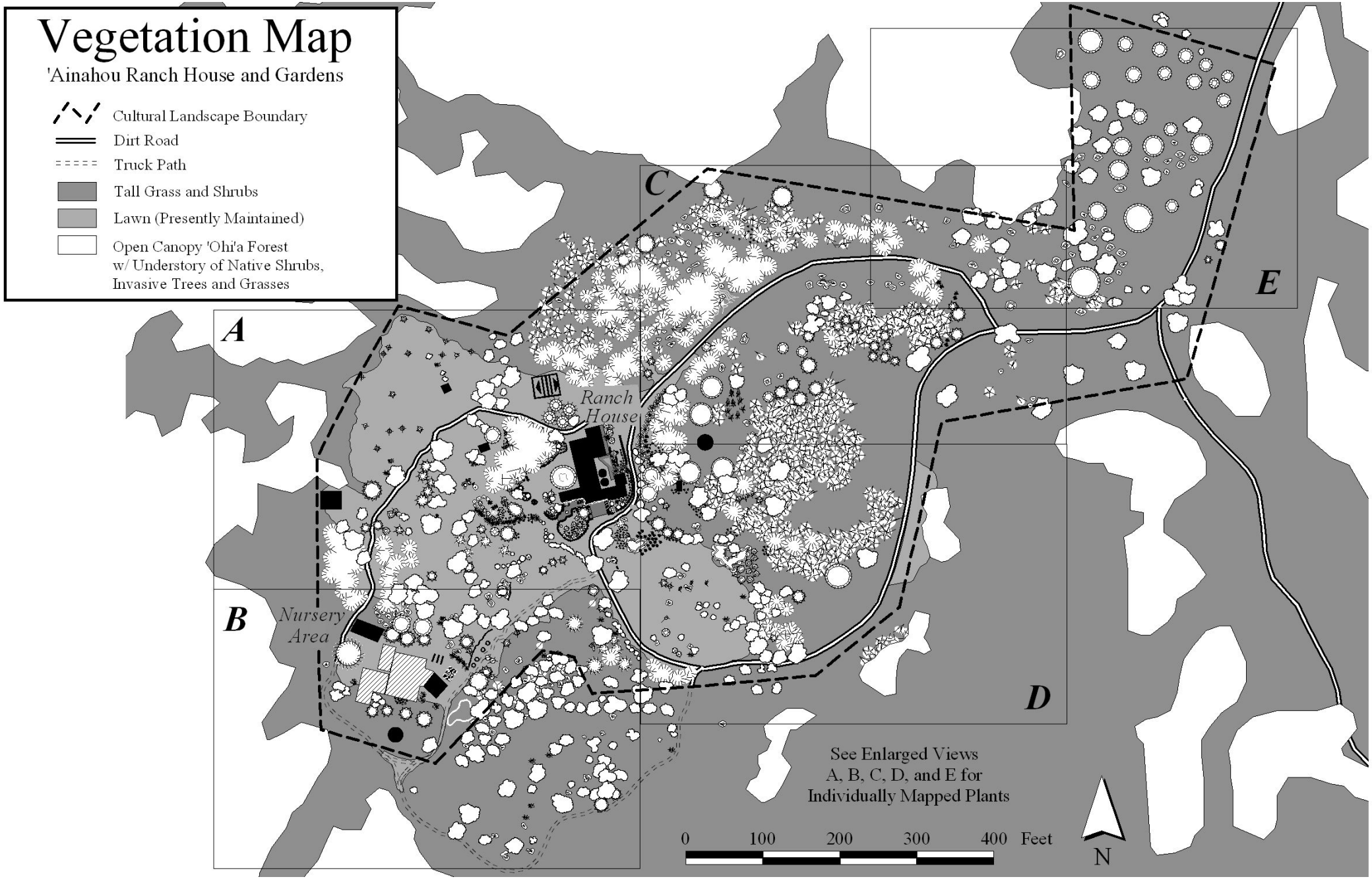
Description: Unpublished NPS report, 1997 (Narrative)
Markiewicz, McKinney, Tunison, Keswick
HAVO CRM Library

Title: University of Hawaii Botany

Description: UH Botany Web Page
University of Hawai'i, Botany Department, 2003
Both Graphic and Narrative
http://www.botany.hawaii.edu


Site Plan
'Ainahou Ranch House and Gardens
Cork Oak Grove
'Ainahou Ranch Road
Ranch House
Ranch House
Nursery Area
Livestock Water Tank
3060
3040
3020
3000
2980
N
0
200
400
600
Feet
Contour Interval = 20 Ft.
Cultural Landscape Boundary
Structures / Masonry
Dirt Road
NPS Truck Path
Corral Fence
Fence Posts
Generalized Vegetation
(See Vegetation Maps for Detailed Information)
Herbs
Landscaped Shrubs
Fruit / Nut Trees
Ornamental
Pine Trees
Invasive Species
Lawn
Tall Grass and Shrubs
Native Trees and Shrubs

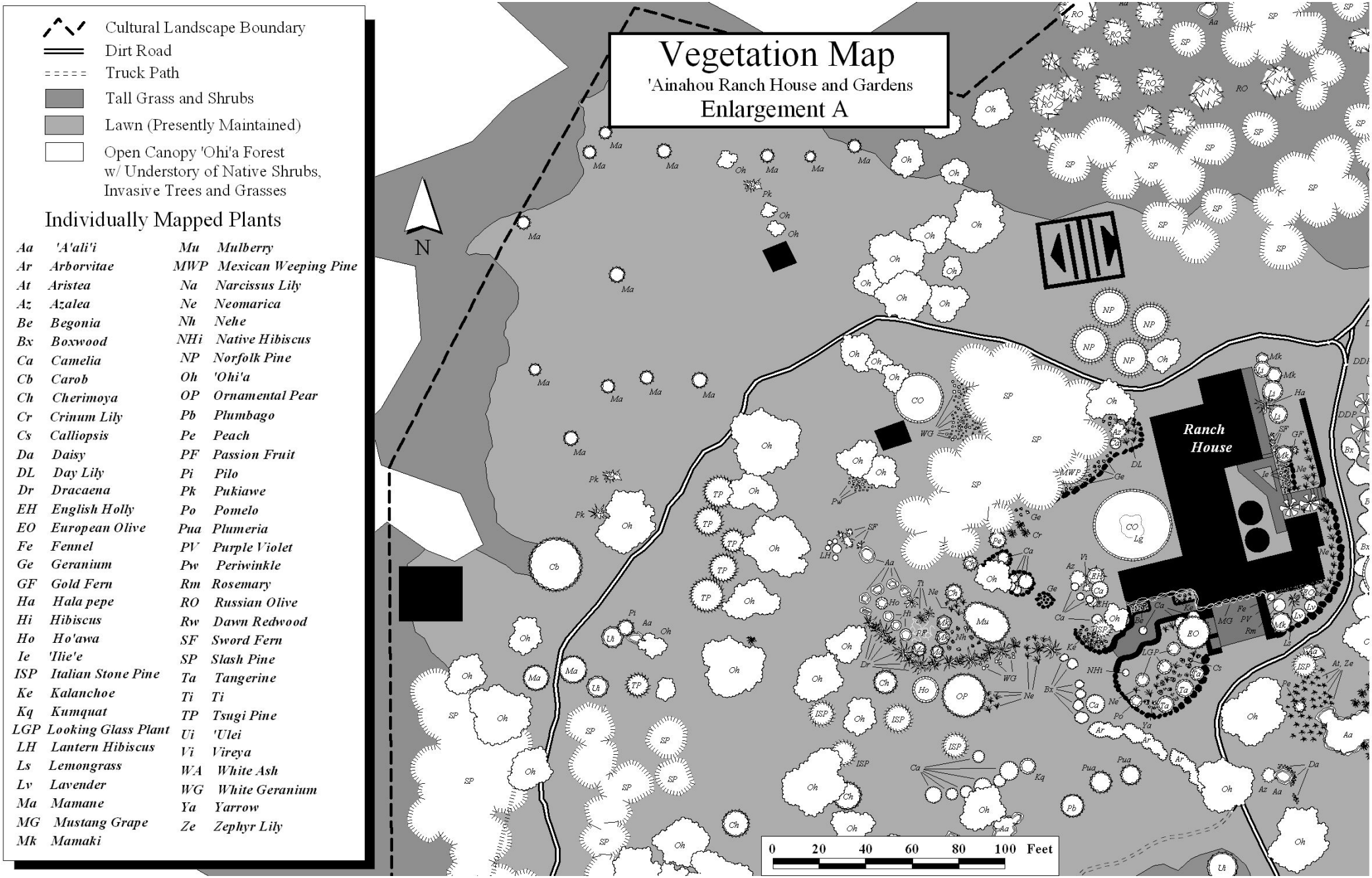

Site Plan
(Enlarged View)
'Ainahou Ranch House and Gardens
Ranch House
Nursery Area
N
3000
0
100
200
300 Feet
Contour Interval = 20 Ft.
Cultural Landscape Boundary
Structures / Masonry
Dry-Laid Masonry
Dirt Road
NPS Truck Path
Fence Posts
Generalized Vegetation
(See Vegetation Maps for Detailed Information)
Herbs
Landscaped Shrubs
Fruit / Nut Trees
Ornamental
Pine Trees
Invasive Species
Lawn
Tall Grass and Shrubs
Native Trees and Shrubs


Vegetation Map
'Ainahou Ranch House and Gardens
Cultural Landscape Boundary
Dirt Road
Truck Path
Tall Grass and Shrubs
Lawn (Presently Maintained)
Open Canopy 'Ohi'a Forest
w/ Understory of Native Shrubs,
Invasive Trees and Grasses
A
B
C
D
E
Ranch House
Nursery Area
See Enlarged Views
A, B, C, D, and E for
Individually Mapped Plants
0
100
200
300
400
Feet
N

Vegetation Map

'Ainahou Ranch House and Gardens

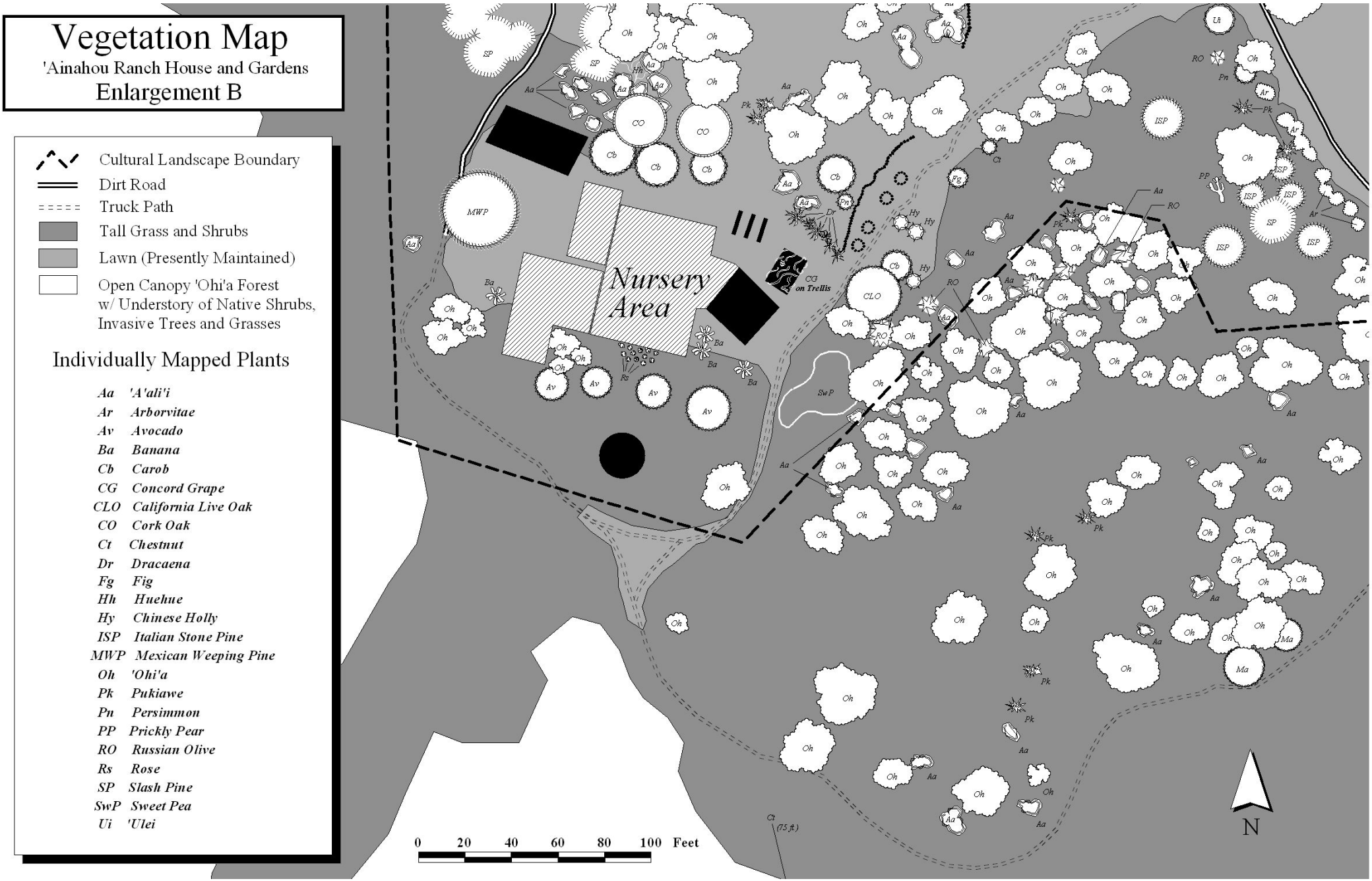
Enlargement A

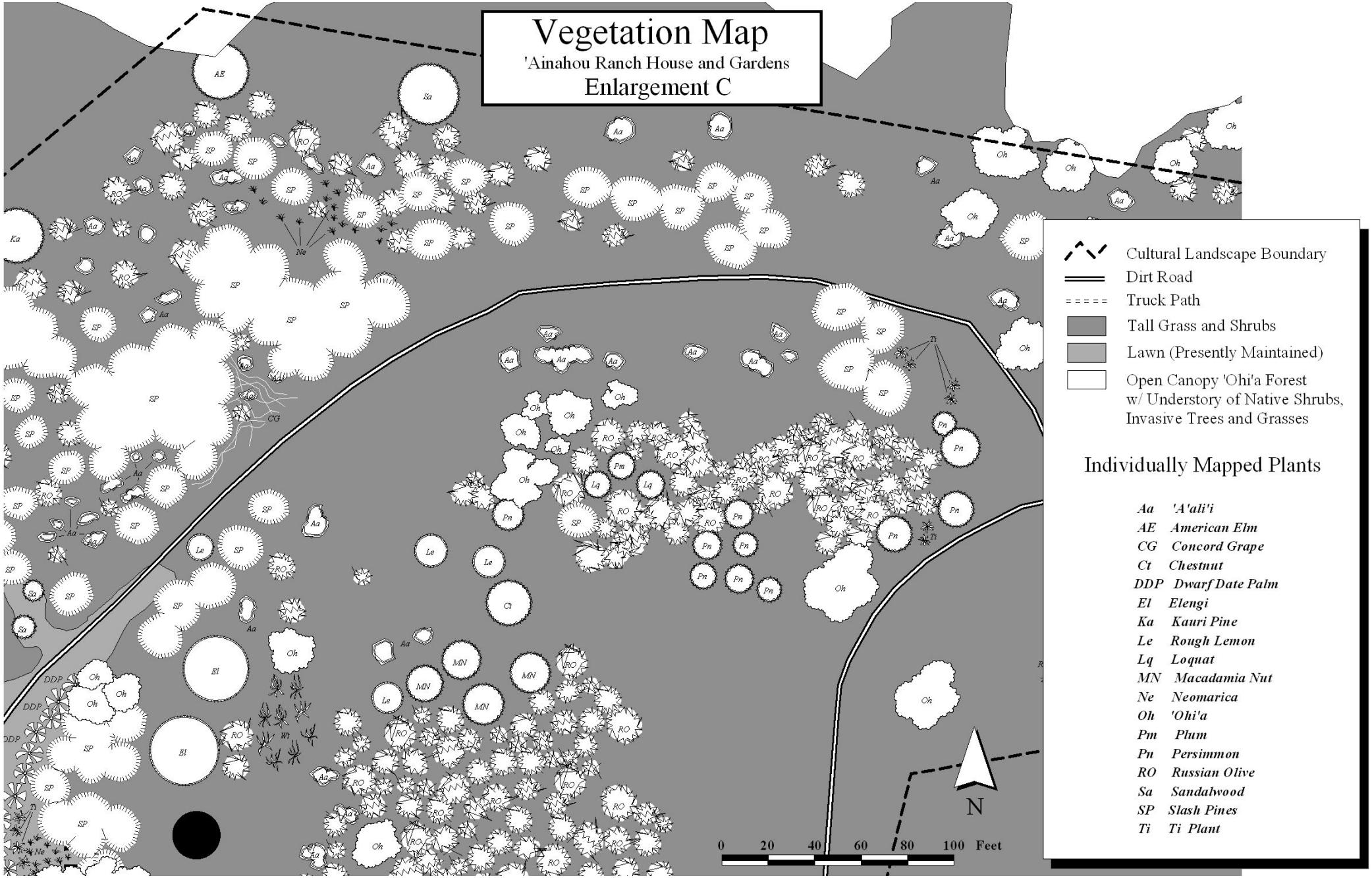


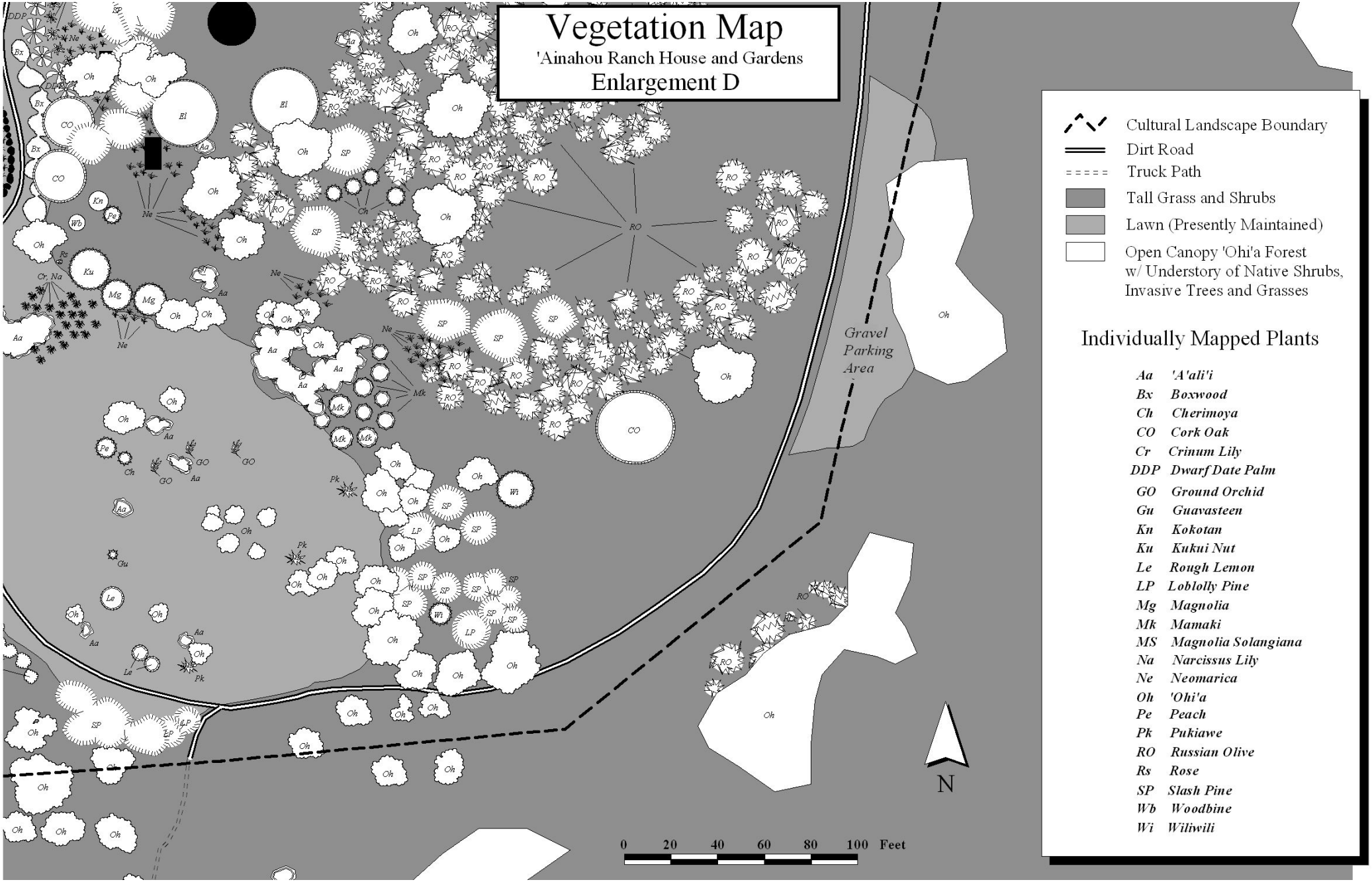
Vegetation Map

'Ainahou Ranch House and Gardens

Enlargement B



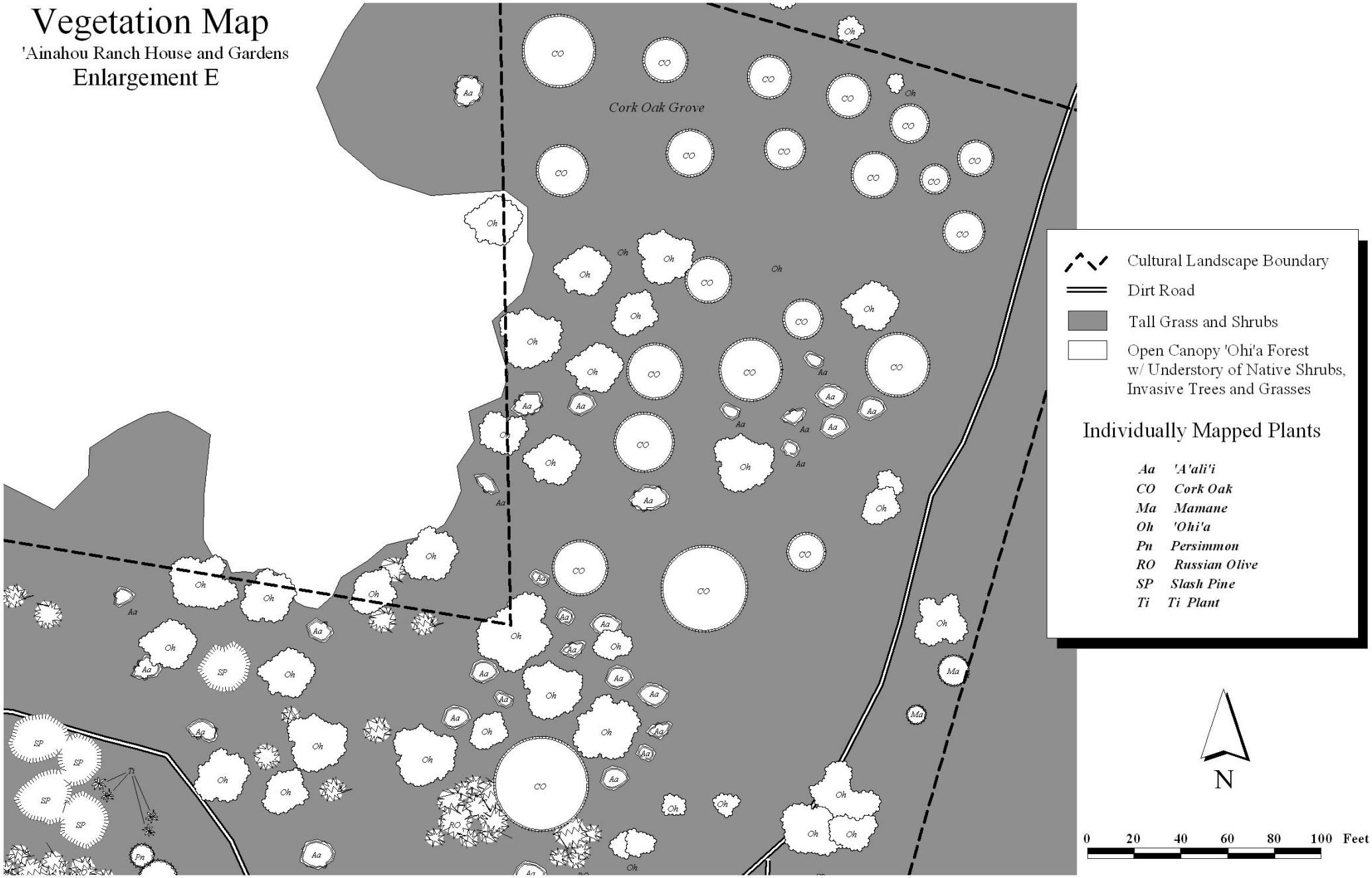

Vegetation Map
'Ainahou Ranch House and Gardens
Enlargement C
Cultural Landscape Boundary
Dirt Road
Truck Path
Tall Grass and Shrubs
Lawn (Presently Maintained)
Open Canopy 'Ohi'a Forest w/ Understory of Native Shrubs, Invasive Trees and Grasses
Individually Mapped Plants
Aa 'A'ali'i
AE American Elm
CG Concord Grape
Ct Chestnut
DDP Dwarf Date Palm
El Elengi
Ka Kauri Pine
Le Rough Lemon
Lq Loquat
MN Macadamia Nut
Ne Neomarica
Oh 'Ohi'a
Pm Plum
Pn Persimmon
RO Russian Olive
Sa Sandalwood
SP Slash Pines
Ti Ti Plant
N
0 20 40 60 80 100 Feet

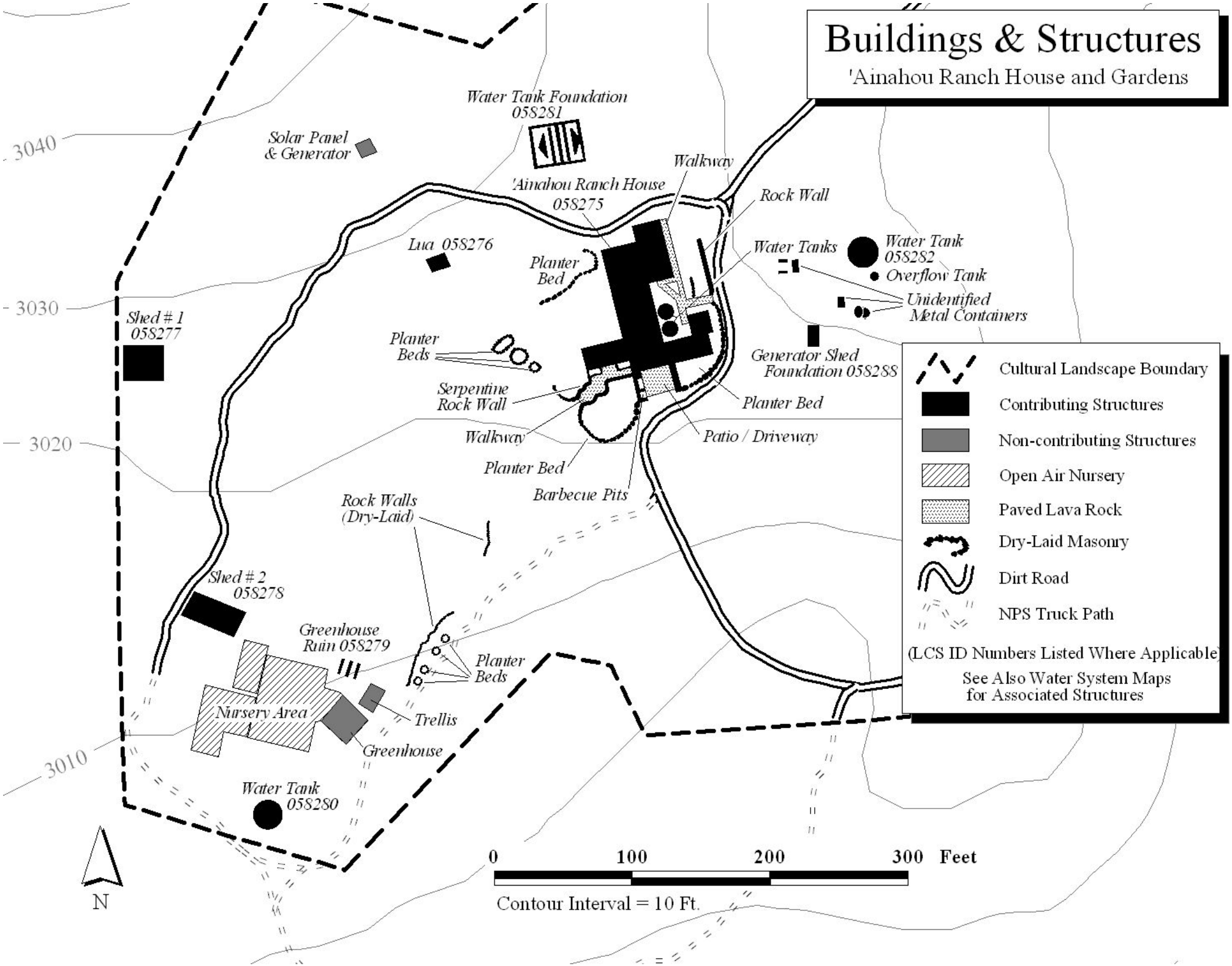

Vegetation Map
'Ainahou Ranch House and Gardens
Enlargement D
Cultural Landscape Boundary
Dirt Road
Truck Path
Tall Grass and Shrubs
Lawn (Presently Maintained)
Open Canopy 'Ohi'a Forest w/ Understory of Native Shrubs, Invasive Trees and Grasses
Individually Mapped Plants
Aa 'A'ali'i
Bx Boxwood
Ch Cherimoya
CO Cork Oak
Cr Crinum Lily
DDP Dwarf Date Palm
GO Ground Orchid
Gu Guavasteen
Kn Kokotan
Ku Kukui Nut
Le Rough Lemon
LP Loblolly Pine
Mg Magnolia
Mk Mamaki
MS Magnolia Solangiana
Na Narcissus Lily
Ne Neomarica
Oh 'Ohi'a
Pe Peach
Pk Pukiawe
RO Russian Olive
Rs Rose
SP Slash Pine
Wb Woodbine
Wi Wiliwili
Gravel Parking Area
N
0 20 40 60 80 100 Feet

Vegetation Map

'Ainahou Ranch House and Gardens

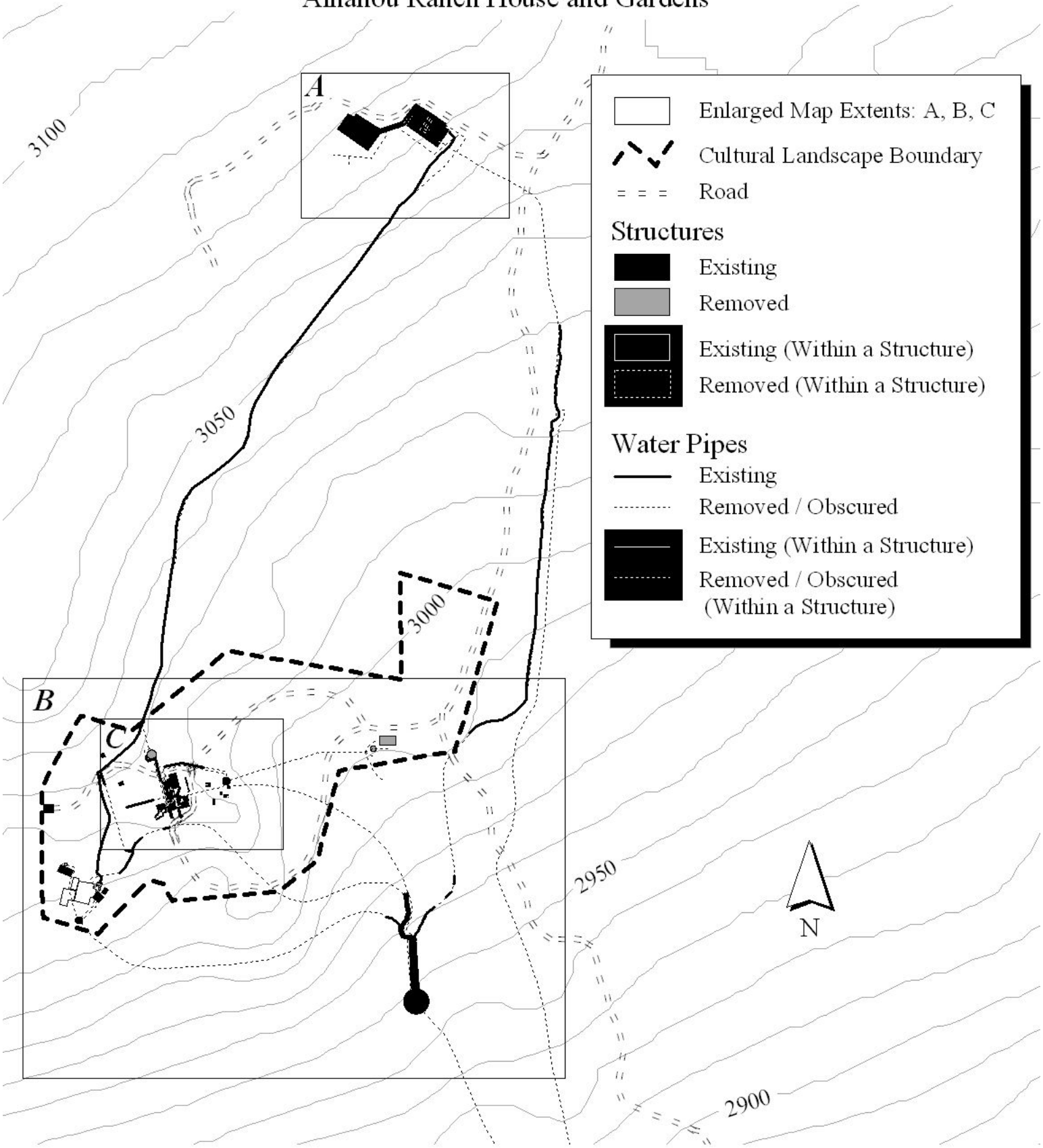
Enlargement E




Buildings & Structures
'Ainahou Ranch House and Gardens
Water Tank Foundation 058281
Solar Panel & Generator
3040
3030
3020
3010
'Ainahou Ranch House 058275
Walkway
Rock Wall
Lua 058276
Planter Bed
Water Tanks
Water Tank 058282
Overflow Tank
Unidentified Metal Containers
Shed # 1 058277
Planter Beds
Generator Shed Foundation 058288
Serpentine Rock Wall
Planter Bed
Walkway
Patio / Driveway
Planter Bed
Barbecue Pits
Rock Walls (Dry-Laid)
Shed # 2 058278
Greenhouse Ruin 058279
Planter Beds
Nursery Area
Trellis
Greenhouse
Water Tank 058280
N
0 100 200 300 Feet
Contour Interval = 10 Ft.
Cultural Landscape Boundary
Contributing Structures
Non-contributing Structures
Open Air Nursery
Paved Lava Rock
Dry-Laid Masonry
Dirt Road
NPS Truck Path
(LCS ID Numbers Listed Where Applicable)
See Also Water System Maps for Associated Structures

Water System

'Ainahou Ranch House and Gardens

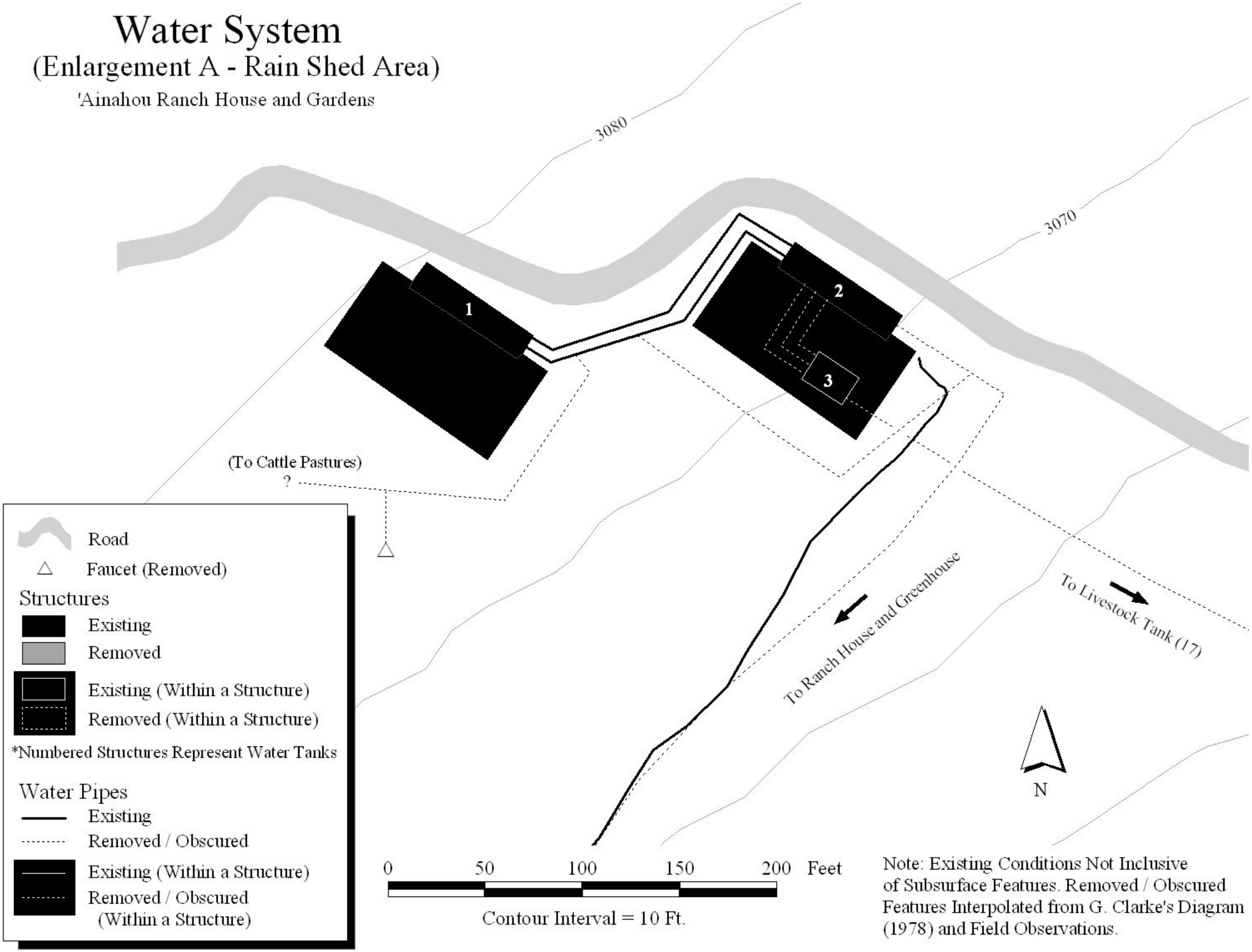


Note: Existing Conditions Not Inclusive of Subsurface Features. Removed / Obscured Features Interpolated from G. Clarke's Diagram (1978) and Field Observations.

0 400 800 1200 Feet

Contour Interval = 10 Ft.

Water System
(Enlargement A - Rain Shed Area)
'Ainahou Ranch House and Gardens

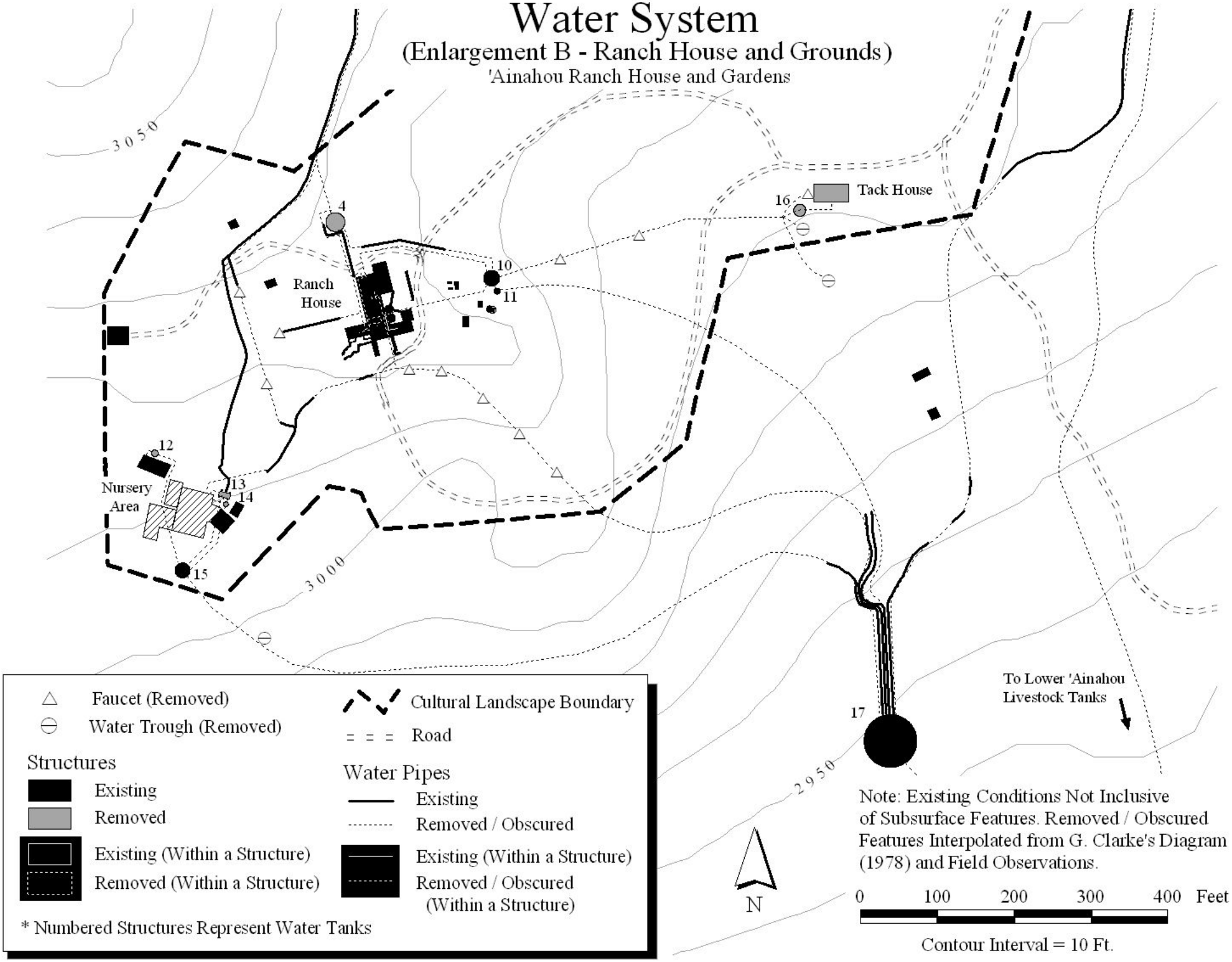


Note: Existing Conditions Not Inclusive of Subsurface Features. Removed / Obscured Features Interpolated from G. Clarke's Diagram (1978) and Field Observations.

Water System

(Enlargement B - Ranch House and Grounds)

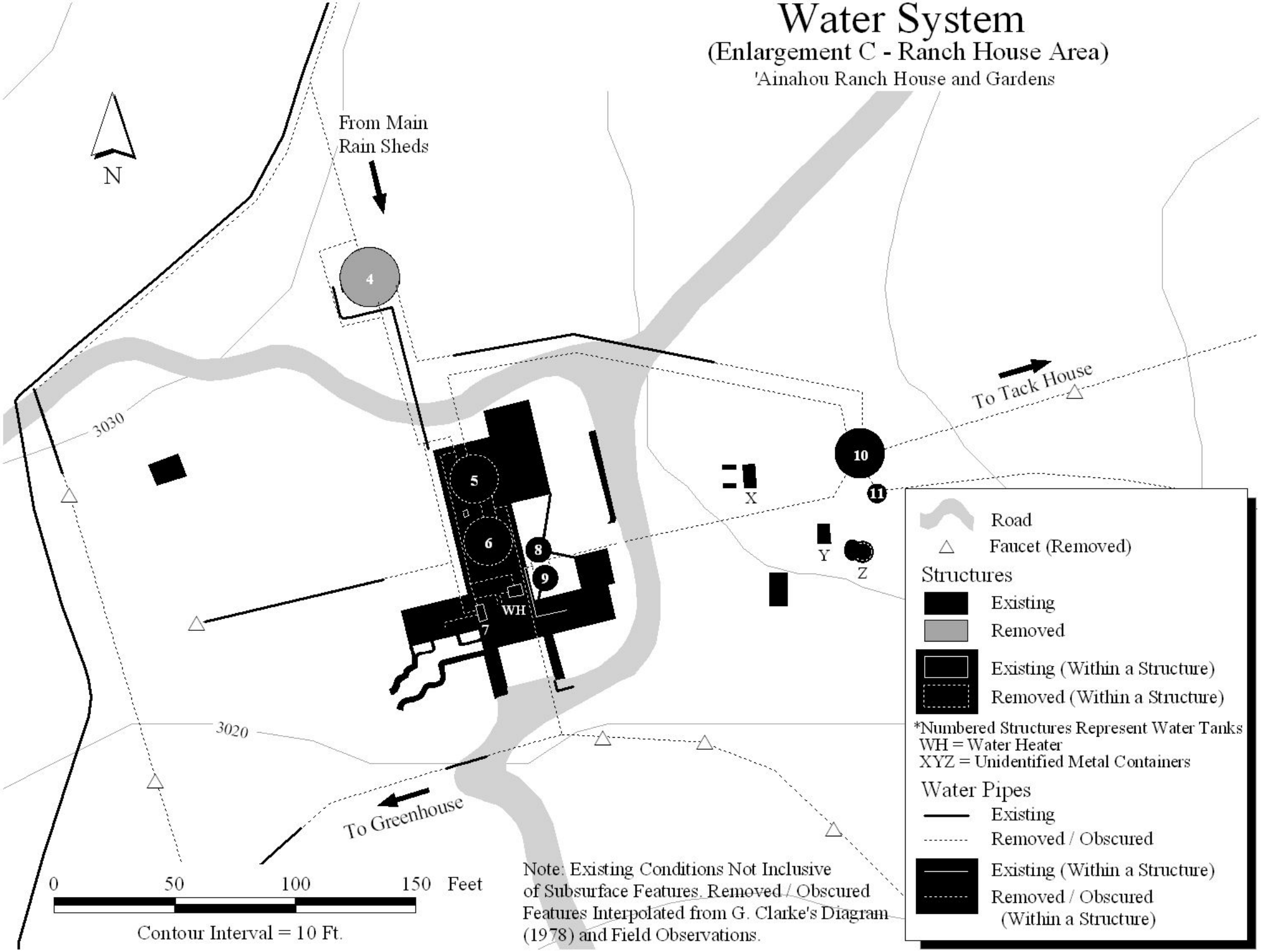
'Ainahou Ranch House and Gardens



Water System

(Enlargement C - Ranch House Area)

'Ainahou Ranch House and Gardens



Taxonomic Key to Vegetation Maps

Common Name	Map Abbreviation	Taxonomic Name
'A'ali'i	**Aa**	*Dodonaea viscosa*
American Elm	**AE**	*Ulmus americana*
Arborvitae	**Ar**	*Thuja orientalis*
Aristea	**At**	*Aristea gerrardii*
Avocado	**Av**	*Persea americana*
Azalea	**Az**	*Rhododendron sp.*
Banana	**Ba**	*Musa sp.*
Begonia	**Be**	*Begoniaceae sp.*
Boxwood	**Bx**	*Buxus sempervirens*
California Live Oak	**CLO**	*Quercus agrifolia*
Camellia	**Ca**	*Camellia japonica, Camellia sasanqua*
Carob	**Cb**	*Ceratonia siliqua*
Cherimoya	**Ch**	*Annona reticulate*
Chestnut	**Ct**	*Castanea dentata*
Chinese Holly	**Hy**	*Ilex cornuta*
Calliopsis	**Cs**	*Coreopsis sp.*
Cork Oak	**CO**	*Quercus suber*
Crinum Lily	**Cr**	*Crinum asiaticum*
Daisy	**Da**	*Chrysanthemum maximum*
Day Lily	**DL**	*Hemerocallis flava*
Dracaena	**Dr**	*Dracaena sp.*
Dwarf Date Palm	**DDP**	*Phoenix robellinii*
Elengi	**El**	*Mimusops elengi*
English Holly	**EH**	*Ilex aquifolium*
European Olive	**EO**	*Olea europaea*
Fennel	**Fe**	*Foeniculum sp.*
Fig	**Fg**	*Ficus sp.*
Geraniums	**Ge**	*Geranium sp.*
Gold Fern	**GF**	*Pityrogramma chrysophylla*
Ground Orchid	**GO**	*Epidendrum obrieniiannun*
Guavasteen	**Gu**	*Feijoa sellowiana*

Common Name	Map Abbreviation	Taxonomic Name
Hala pepe	**Ha**	*Pleomele sp.*
Hibiscus	**Hi**	*Sida sp.*
Ho'awa	**Ho**	*Pittosporum sp.*
Huehue	**Hh**	*Cocculus trilobus*
'Ilie'e	**Ie**	*Plumbago zeylanica*
Italian Stone Pine	**ISP**	*Pinus pinea*
Kalanchoe	**Ke**	*Kalanchoe pinnata*
Kauri Pine	**Ka**	*Agathis australis*
Kokotan	**Kn**	*Rhaphiolepis umbellata*
Kukui Nut	**Ku**	*Aleurites moluccana*
Kumquat	**Kq**	*Fortunella japonica*
Lantern Hibiscus	**LH**	*Hibiscus schizopetalus*
Lavender	**Lv**	*Lavandula officinalis*
Lemongrass	**Ls**	*Cymbopogon refractus*
Ligularias	**Lg**	*Ligularia tussilaginea*
Looking Glass Plant	**LGP**	*Coprosma repens*
Lime	**Li**	*Citrus aurantiifolia*
Loblolly Pine	**LP**	*Pinus taeda*
Loquat	**Lq**	*Eriobotria japonica*
Macadamia Nut	**MN**	*Macadamia integrifolia*
Magnolia	**Mg**	*Magnolia grandiflora*
Mamaki	**Mk**	*Pipturus abidus*
Mamane	**Ma**	*Sophora chrysophylla*
Mexican Weeping Pine	**MWP**	*Pinus patula*
Mulberry	**Mu**	*Morus alba*
Mustang Grape	**MG**	*Vitis mustangensis*
Narcissus Lilly	**Na**	*Narcissus sp.*
Native Hibiscus	**NHi**	*Hibiscus schizopetalus*
Nehe	**Nh**	*Lipochaeta sp.*
Neomarica	**Ne**	*Neomarica sp.*
Norfolk Pine	**NP**	*Araucaria heterophylla*
'Ohi'a	**Oh**	*Metrosideros polymorpha*
Ornamental Pear	**OP**	*Pyrus kawakami*
Passion Fruit	**PF**	*Passiflora edulis*
Peach	**Pe**	*Prunus sp.*

Common Name	Map Abbreviation	Taxonomic Name
Periwinkle	**Pw**	*Vinca sp.*
Persimmon	**Pn**	*Diospyros virginiana*
Pilo	**Pi**	*Coprosma menziesii*
Plum	**Pm**	*Prunus sp.*
Plumbago	**Pb**	*Plumbago auriculata*
Plumeria	**Pua**	*Plumeria sp.*
Pomelo	**Po**	*Citrus paradise*
Prickly Pear	**PP**	*Opuntia ficus-indica*
Pukiawe	**Pk**	*Styphelia tameiameia*
Purple Violets	**PV**	*Viola sp.*
Rose	**Rs**	*Rosa sp.*
Rosemary	**Rm**	*Rosmarinus officinalis*
Rough Lemon	**Le**	*Citrus limonica*
Russian Olive	**RO**	*Elaeagnus angustifolia*
Sandalwood	**Sa**	*Santalum paniculatum*
Slash Pines	**SP**	*Pinus caribaea*
Sword Fern	**SF**	*Nephrolepis multiflora*
Sweet Pea	**SwP**	*Lathyrus odoratus*
Tangerines	**Ta**	*Citrus nobilis deliciosa*
Ti	**Ti**	*Coryline frutiosa*
Tsugi Pine	**TP**	*Cryptomeria japonica*
'Ulei	**Ui**	*Osteomeles anthyllidifolia*
Vireya	**Vi**	*Rhododendron sp.*
Watsonia	**Wt**	*Watsonia iridifolia*
White Concord Grape	**CG**	*Vitus labrusca*
White Geraniums	**WG**	*Geranium sp.*
Wiliwili	**Wi**	*Erinthrina sandwicensis*
Woodbine	**Wb**	*Lonicera periclymenum*
Yarrow	**Ya**	*Achillea sp.*
Zephyr Lily	**Ze**	*Zephyranthes rosea*