



MAPPING AND INVENTORY OF PLANTS AT PU`UKOHOLĀ HEIAU NATIONAL HISTORIC SITE

Inventory & Monitoring Program
Pacific Island Network

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Acronyms:

GIS	Geographic information system
GPS	Geographic positioning system
HAVO	Hawai`i Volcanoes National Park
I&M	Inventory & Monitoring Program
KAHO	Kaloko-Honokōhau National Historical Park
KALA	Kalaupapa National Historical Park
NPS	National Park Service
NPSpecies	National Park Service Biodiversity Database
PUHE	Pu`ukoholā Heiau National Historic Site
PUHO	Pu`uhonua o Hōnaunau National Historical Park
PACN	Pacific Island Network

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ABSTRACT

A small-scale vegetation map of native and culturally significant trees and shrubs planted at the visitor center complex of Pu`ukoholā Heiau National Historic Site was prepared, and specimens were collected as vouchers. The mapping was conducted in July 2001 by recording GPS coordinates of all plants of interest. These maps will be the basis of restoration planning for native plant communities and cultural landscapes. A total of 458 positions were taken for 37 plant species. The most abundant plant was milo (*Thespesia populnea*) with 113 individuals recorded. Other common species were kī (*Cordyline fruticosa*), kou (*Cordia subcordata*), coconut (*Cocos nucifera*), and hala (*Pandanus tectorius*) with between 40 and 59 individuals each. The emphasis was on recording positions of species planted by park staff, however, several naturally occurring plants, such as pa`u o hi`iaka (*Jacquemontia ovalifolia* ssp. *sandwicensis*) and kiawe (*Prosopis pallida*), were also recorded.

INTRODUCTION

PUHE is a small park of about 24 ha (60 acres) located in the driest part of the state of Hawaii (Pratt 1998; Figure 1). The park flora was surveyed by MacNeil and Hemmes (1977) and by Pratt and Abbott (1996). A large number of plant species are present in the park because they were planted as landscaping around the visitor center and continue to survive only because water is provided by sprinkler irrigation. Many of the native species currently cultivated at the park were probably components of the landscape prior to the arrival of cattle and other non-native species in modern times (Pratt 1998). One of the purposes for mapping the cultivated species is to have a precise record that will help to distinguish which species become established via intentional reintroduction versus those that recolonize on their own, or regenerate from long-dormant seeds in the soil.

Managers at the three west Hawai`i parks [Pu`uhonua o Hōnaunau National Historical Park (PUHO), Kaloko-Honokōhau National Historical Park (KAHO), and Pu`ukoholā Heiau National Historic Site (PUHE)] identified the need for highly detailed vegetation maps to document the location of individuals, groves, or small stands of selected non-native, native, and Polynesian-introduced plants to manage natural and cultural resources. The purpose of these maps was to provide specific geo-referenced information about new species as well as existing native plants or Polynesian plant communities to better record the timing and origins of plantings by park staff. Certain non-native species were also mapped to highlight plants needing to be controlled. Detailed maps of native and Polynesian introductions will be the basis of restoration planning for native plant communities and cultural landscapes.

For PUHE it was determined that previous botanical surveys (MacNeil and Hemmes 1977, Pratt and Abbott 1996) provided a comprehensive plant checklist. However, there was a need to collect voucher specimens of new park species and to replace specimens collected by MacNeil and Hemmes (1977) that could not be located and are presumed lost.

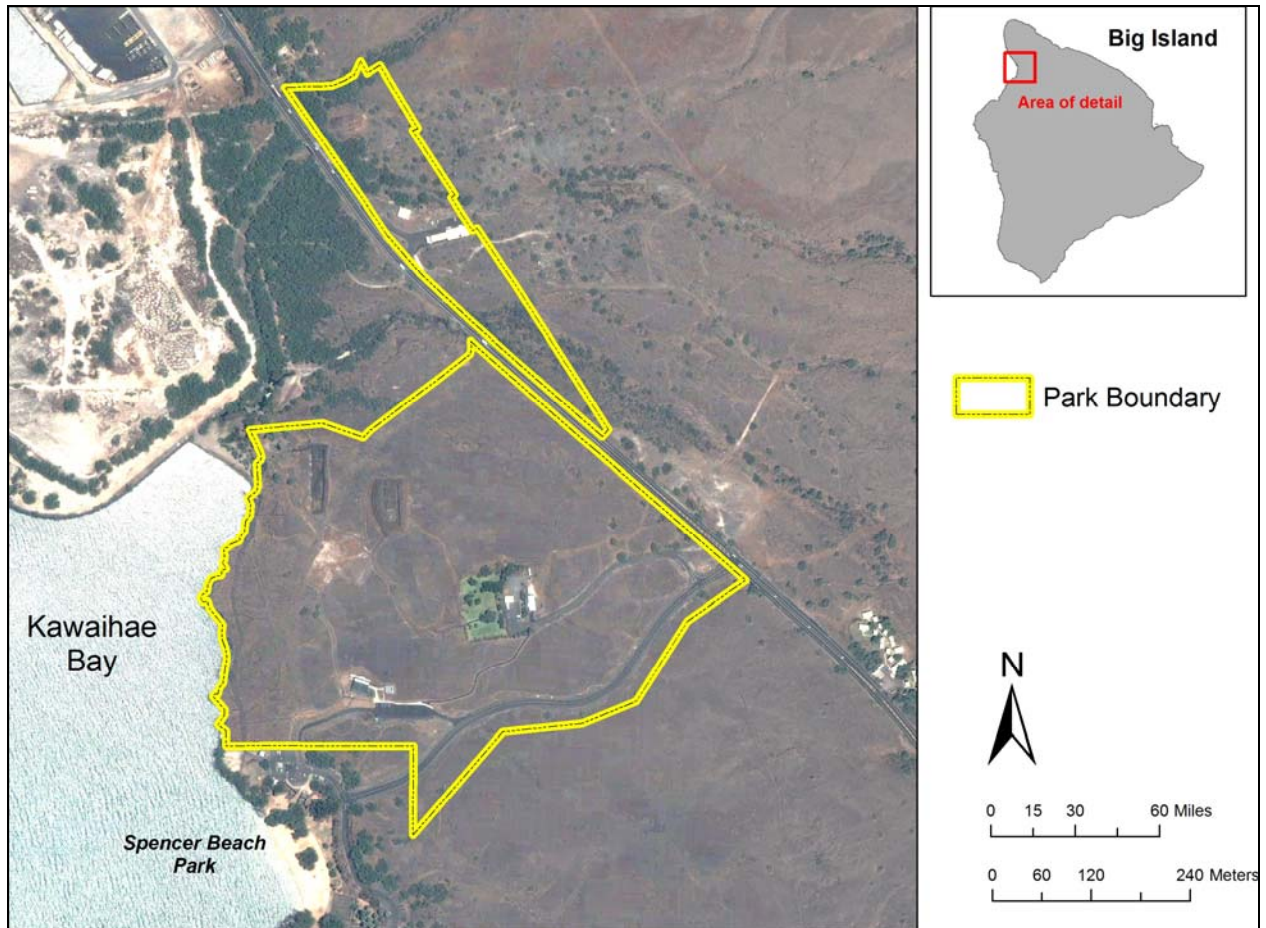


Figure 1. Location map of Pu'ukoholā Heiau National Historic Site.

METHODS

Mapping was conducted July 18, 19, 23, and 24, 2001, as part of the inventory of species at Pacific Island Network national park units. Trees and shrubs planted at the visitor center complex of PUHE were mapped with global positioning system (GPS) coordinates. Most of the plants were placed in straight lines along the edge of the visitor center lawn making it easy to track plants. Readings were collected for all planted species except lawn grasses. Position and attributes for each plant were recorded into a data dictionary in a Trimble Pro XT GPS unit using the Universal Transverse Mercator, North American Datum 1983, Zone 4N coordinate system.

Attributes such as estimated height, number of seedlings, and vigor of each plant were recorded in the Trimble unit data dictionary. The data dictionary was based on Haleakalā National Park inventory survey field forms and modified to suit our purposes. Species names were designated in the data dictionary using a six-letter taxon code based on the first three letters of the genus and the first three letters of the species. In some cases a temporary taxon code of the plant's common name was used if the species was not immediately known or the common name was easier to enter. These temporary taxon codes were changed to standard genus-species six letter acronyms in the final GISdata.

All existing planted species (not including lawn grasses) were mapped using GPS. The points were differentially corrected using Trimble Pathfinder software with base files downloaded from the KAHO website. The data were then exported from Pathfinder to ArcView GIS software. Poor satellite reception on most days prevented GPS data collection from mid-day to about 3:00 pm.

The NPSpecies database was queried to generate a species plant list and a list of plant species without vouchers. Plant specimens were collected during GPS down time when satellite reception was poor. Plants requiring specimen vouchers and new PUHE plants were collected.

All data are housed at the Pacific Island Network office at HAVO. These inventory data were entered into NPSpecies, the National Park Service Biodiversity Database. Scientific and common names are from Wagner et al. (1999).

RESULTS

A total of 458 positions were recorded for 37 plant species (Table 1). The most abundant plant was milo (*Thespesia populnea*) with 113 individuals recorded. The next most common species were kī (*Cordyline fruticosa*), kou (*Cordia subcordata*), coconut (*Cocos nucifera*), and hala (*Pandanus tectorius*) with between 40 and 59 individuals each. The emphasis was on recording positions of species planted by park staff, however, several naturally occurring plants, such as pa`u o hi`iaka (*Jacquemontia ovalifolia* ssp. *sandwicensis*) and kiawe (*Prosopis pallida*), were also recorded. Eighty-one voucher specimens were collected of 73 species (see Appendix A). A total of 18 new species not on the NPSpecies checklist for PUHE were found.

Table 1. List of plant species recorded with GPS during this survey.

Scientific name	Common names	Family	Count	Nativity (NPSpecies definitions*)	Additional information on Status
<i>Aleurites moluccana</i>	kukui, candlenut	Euphorbiaceae	4	Non-native	Polynesian introduction
<i>Aloe vera</i>	aloe	Aloeaceae	2	Non-native	
<i>Broussonetia papyrifera</i>	wauke, paper mulberry	Moraceae	3	Non-native	Polynesian introduction
<i>Calophyllum inophyllum</i>	kamani	Clusiaceae	3	Non-native	Polynesian introduction
<i>Capsicum frutescens</i>	nīoi, chili pepper	Solanaceae	3	Non-native	
<i>Clusia rosea</i>	autograph tree	Clusiaceae	1	Non-native	
<i>Cocos nucifera</i>	niu, coconut	Arecaceae	43	Non-native	Polynesian introduction
<i>Cordia subcordata</i>	kou	Boraginaceae	46	Native	indigenous
<i>Cordyline fruticosa</i>	kī, ti	Agavaceae	59	Non-native	Polynesian introduction
<i>Curcuma longa</i>	`olena, turmeric	Zingiberaceae	1	Non-native	Polynesian introduction
<i>Dodonaea viscosa</i>	`a`ali`i	Sapindaceae	2	Native	indigenous
<i>Erythrina sandwicensis</i>	wiliwili	Fabaceae	6	Native	endemic
<i>Ficus microcarpus</i>	Chinese banyan	Moraceae	3	Non-native	
<i>Gossypium tomentosum</i>	ma`o, Hawaiian cotton	Malvaceae	12	Native	endemic
<i>Heliotropium curassavicum</i>	kipukai, nena	Boraginaceae	3	Native	indigenous
<i>Heteropogon contortus</i>	pili, pili grass	Poaceae	1	Native	indigenous
<i>Hibiscus brackenridgei</i> ssp. <i>brackenridgei</i>	ma`o hau hele	Malvaceae	20	Native	endemic
<i>Jacquemontia ovalifolia</i> ssp. <i>sandwicensis</i>	pa`u o hi`iaka	Convolvulaceae	1	Native	endemic
<i>Lagenaria siceraria</i>	ipu, bottle gourd	Cucurbitaceae	7	Non-native	Polynesian introduction

Scientific name	Common names	Family	Count	Nativity (NPSpecies definitions*)	Additional information on Status
<i>Morinda citrifolia</i>	noni, Indian mulberry	Rubiaceae	21	Non-native	Polynesian introduction
<i>Moringa oleifera</i>	marungai, horseradish tree	Moringaceae	1	Non-native	
<i>Noronhia emarginata</i>	Madagascar olive	Oleaceae	4	Non-native	
<i>Ophioglossum polyphyllum</i>	pololei, pololei fern	Ophioglossaceae	2	Native	indigenous
<i>Osteomeles anthyllidifolia</i>	u`ulei	Rosaceae	2	Native	indigenous
<i>Pandanus tectorius</i>	hala, puhala, screwpine	Pandanaceae	40	Native	indigenous
<i>Passiflora edulis</i>	liliko`i, yellow passionfruit	Passifloraceae	1	Non-native	
<i>Pleomele marginata</i>	money tree	Agavaceae	3	Non-native	
<i>Pritchardia affinis</i>	loulou	Arecaceae	26	Native	endemic
<i>Prosopis pallida</i>	kiawe, mesquite	Mimosaceae	11	Non-native	
<i>Saccharum officinarum</i>	ko, sugarcane	Poaceae	1	Non-native	Polynesian introduction
<i>Samanea saman</i>	monkey pod	Fabaceae	2	Non-native	
<i>Scaevola taccada</i>	naupaka kahakai, naupaka	Goodeniaceae	7	Native	indigenous
<i>Sesbania tomentosa</i>	`ohai	Fabaceae	1	Native	endemic
<i>Sesuvium portulacastrum</i>	`akulikuli, sea purslane	Aizoaceae	1	Native	indigenous
<i>Tamarindus indica</i>	tamarind	Fabaceae	1	Non-native	
<i>Thespesia populnea</i>	milo	Malvaceae	113	Native	indigenous
<i>Wikstroemia pulcherrima</i>	`akia	Thymelaeaceae	1	Native	endemic

*NPSpecies definitions

Nativity classification for each organism in the park	
Native	The organism is native to the park (either endemic or indigenous).
Non-native	The organism is not native to the park (neither endemic nor indigenous).

Native and Polynesian-introduced species

Due to the park's mission as a historic site, not only native species but also non-native species introduced by early Polynesian settlers are of special interest to park management. Plant locations for both of these groups of species are shown in Figures 2a, 2b, and 2c.

Native species

The following seventeen native species were found in the park:

`A`ali`i (*Dodonea viscosa*)

Two `a`ali`i shrubs were recorded in the visitor center lawn. These `a`ali`i were transplanted from sprouts that came up spontaneously in the lawn, possibly from seeds dropped during lei making (Peter Amerling, personal communication, 2001).

`Akia (*Wikstroemia pulcherrima*)

One large `akia bush is growing by the visitor center. This individual was a seedling collected from HAVO during fireline construction in 1992 (Amerling 2000). This bush was flowering, allowing it to be identified to the species and is probably the same individual recorded but not identifiable to species by Pratt and Abbot in 1996.

`Akulikuli (*Sesuvium portulacastrum*)

One mature patch of `akulikuli was found near the Pelekane pond.

Hala (*Pandanus tectorius*)

A total of 40 hala trees were recorded of which 15 are dead cut stumps. Four hala plants were less than two meters tall, nine were between two and four meters tall, and 12 were greater than four meters tall. The live hala trees were large and healthy looking. Both smooth-edged and tooth-edged hala were present. Unfortunately this difference was not noticed until after positions and data had already been recorded. This may be important to determine if the plants are native or foreign varieties.

Kipukai (*Heliotropium curassavicum*)

Three patches of kipukai were found—one near Pelekane pond and two along the park trail. One patch was flowering and fruiting at the time of observation.

Kou (*Cordia subcordata*)

The positions of 46 kou plants were recorded. Three kou plant locations were not recorded because of data-collection error. A fourth kou plant location is off by at least 50 m because of moving to another position before finalizing the GPS recording process. Six of the plants were

two meters or less in height, 26 were two to four meters tall, and 14 were greater than four meters tall.

Loulu (*Pritchardia affinis*)

A total of 26 loulu were recorded. Sixteen individuals were propagated from seeds collected by Greg Herbst from Whittington Beach Park and planted in 1991 (Amerling 2000). Four plants were given to the park by Gene Gregory and planted in 1992 (Amerling 2000).

Ma`o (*Gossypium tomentosum*)

There are 12 locations recorded for ma`o. The first plant, still growing at the site, was donated to the park by Gene Gregory in 1993 (Amerling 2000). The rest are self-sown descendants of that first plant (Peter Amerling, personal communication, 2001).

Ma`o hau hele (*Hibiscus brackenridgei* ssp. *brackenridgei*)

A total of 20 ma`o hau hele were recorded. All plants are from seedlings that sprouted from original plants given to the park by Greg Herbst in 1991 (Amerling 2000).

Milo (*Thespesia populnea*)

Positions were recorded for 113 milo trees and saplings. Planting of milo trees around the visitor center started in 1986 with seedlings collected by Peter Amerling and Ben Saldua from two milo trees originally found at Pelekane Pond (Amerling 2000). The 108 plants growing around the visitor center are those original plantings or their seedlings (Amerling 2000). Of these 108 plants, 14 were less than two meters tall, 60 plants were between two and four meters tall, and 34 plants were between four and six meters tall.

Naupaka (*Scaevola taccada*)

Seven naupaka plants were recorded. Three ‘volunteer’ naupaka were found and mapped near Pelekane pond. Of the four plants recorded at the visitor center, one was transplanted from Pelekane in 1991, one was a cutting made in 1993 from the transplant (Amerling 2000), and two are probably more recent seedlings or cuttings from the 1991 or 1993 plants.

`Ohai (*Sesbania tomentosa*)

One `ohai shrub is located near the unpaved parking area. It was a gift to PUHE from Gene Gregory in 1993 (Amerling 2000).

Pa`u o hi`iaka (*Jacquemontia ovalifolia* ssp. *sandwicensis*)

Two adjacent patches of the pa`u o hi`iaka vine are located near the shoreline trail, although only one position was recorded. This native plant is rare in the park.

Pili (*Heteropogon contortus*)

One small clump of pili was observed growing by the rock wall east of the visitor center.

Pololei (*Ophioglossum polyphyllum*)

The two known sites of pololei were pointed out by Ben Saldua. Both plants were dormant for the dry season. The site east of the visitor center next to a rock wall has been known for many years. The second site near the heiau was only recently discovered by Rita Pregana and Ben Saldua in 2000 (Ben Saldua, personal communication, 2001). The location of the pololei site near the heiau may be incorrect because of a data-collection error and should be confirmed.

U`ulei (*Osteomeles anthyllidifolia*)

Two u`ulei plants were observed. One specimen located by the rock wall between the unpaved parking lot and the visitor center was a gift from Gene Gregory in 1993 (Amerling 2000). A smaller specimen on the east dripline was a gift from Buttons Lovell in 1998 (Peter Amerling, personal communication, 2001).

Wiliwili (*Erythrina sandwicensis*)

Six wiliwili trees were recorded. They all germinated from seeds given by a classmate of Daniel Kawaiaea collected from the Waikoloa area (Amerling 2000). The Amerling report (2000) refers to a healthy tree in the garden area. I did not find this plant, either because it is not visible among the tangle of other trees, or it has disappeared since 2000.

Polynesian-introduced species

Nine species which were introduced to Hawai`i by Polynesian settlers were recorded in the park:

Ipu, bottle gourd (*Lagenaria siceraria*)

The ipu is a vine that grows on the ground and over low vegetation just north of the visitor center lawn. The GPS positions (Figure 2a) represent the outer extents of the patch rather than individual plants.

Kamani (*Calophyllum inophyllum*)

Three kamani trees were recorded. Two large trees were planted in the lawn in front of the visitor center. Another small tree, in poor condition due to the drought, was on the east dripline. All were seedlings donated by Hale Makua and planted in 1992 (Amerling 2000).

Kī, ti (*Cordyline fruticosa*)

A total of 59 kī plants were mapped. The positions of several kī plants growing under dense milo and kou canopies were not recorded because of poor satellite reception. All except five of the 59 recorded plants were green kī. The remaining plants were two red kī, a pink kī, a mini green kī, and a red and green kī.

Ko, sugarcane (*Saccharum officinarum*)

One sugarcane clump remains of the several varieties planted between 1985 and 1993. The remaining clump is a multicolored variety received from Winston Morton III, plant propagator at Waimea Falls Park, O`ahu (Amerling 2000).

Kukui, candlenut (*Aleurites moluccana*)

Four kukui plants were recorded around the visitor center: two trees and two saplings. One tree originating from below the State Baseyard in Kalaoa, Kona was transplanted by Peter Amerling. The other tree was received as a gift during ceremonies and planted in 1991 (Amerling 2000). The two saplings were both less than one meter tall, and one plant was still in a pot.

Niu, coconut (*Cocos nucifera*)

A total of 43 coconut palms were recorded. Nine palms are located around the visitor center. Of these nine plants, four are less than two meters tall, four are between two and three meters tall, and one is between four and five meters tall. The height refers to the trunk height rather than the

total height including the leaves. The other 34 plants are located at the shoreline. The shoreline coconuts are a mixture of pre-existing trees and trees planted by park staff to replace trees lost to high surf events (Amerling 2000). All the coconut trees at the visitor center were given to PUHE and planted from seeds by park staff (Amerling 2000).

Noni, Indian mulberry (*Morinda citrifolia*)

A total of 21 noni were recorded. All are descended from two plants from PUHO collected by Peter Amerling and Rose Fujimori (Amerling 2000).

`Olena, turmeric (*Curcuma longa*)

One patch of `olena was recorded. The plant was a gift from Gene Gregory in 1991 (Amerling 2000).

Wauke, paper mulberry (*Broussonetia papyrifera*)

Three wauke plants were mapped, however all are part of one patch that started from a single plant received as a gift during the 1991 ceremonies (Amerling 2000).

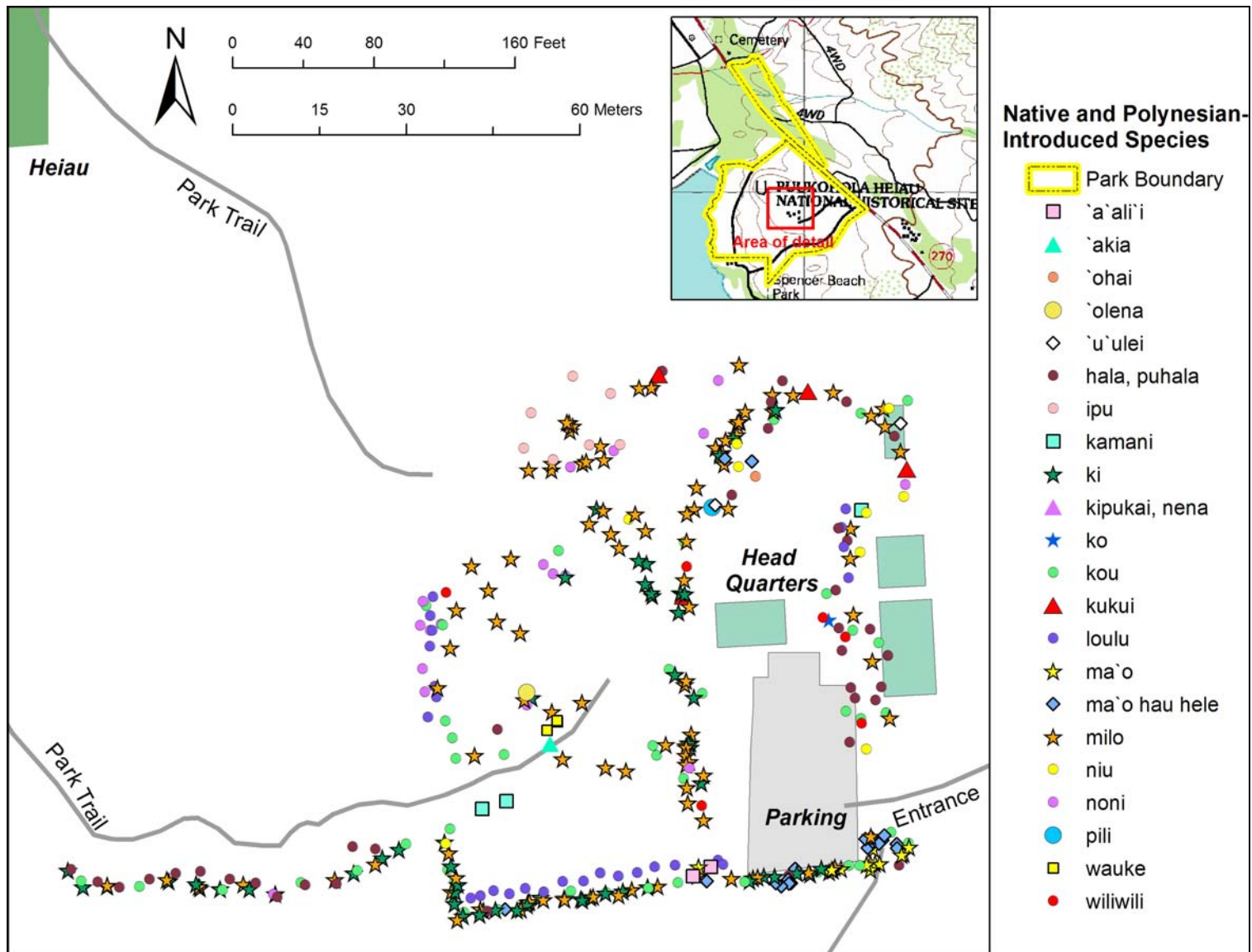


Figure 2a. Native and Polynesian-introduced plant species in the vicinity of the park headquarters at Puʻukoholā Heiau National Historic Site.

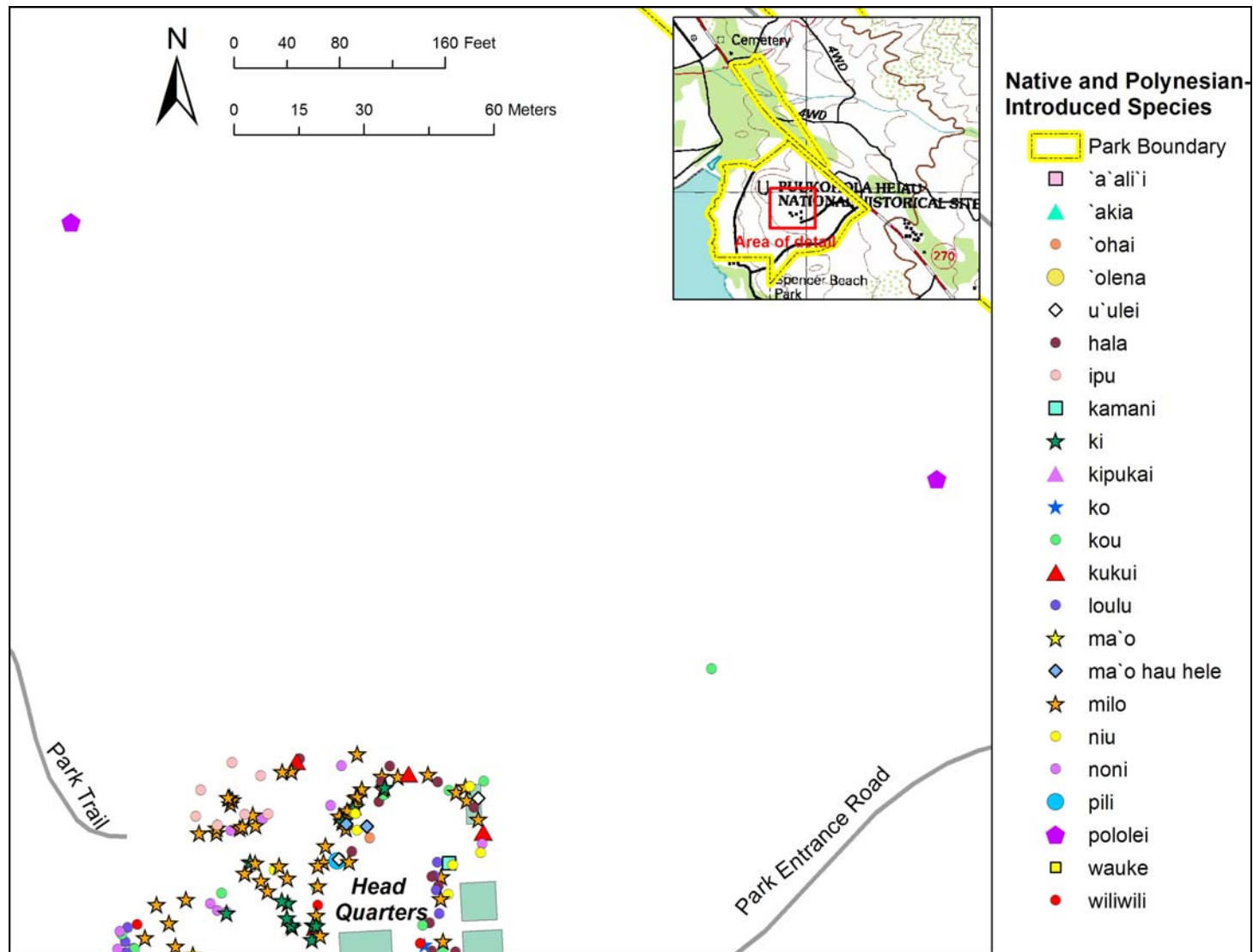


Figure 2b. Native and Polynesian-introduced plant species north of headquarters at Pu`ukoholā Heiau National Historic Site.

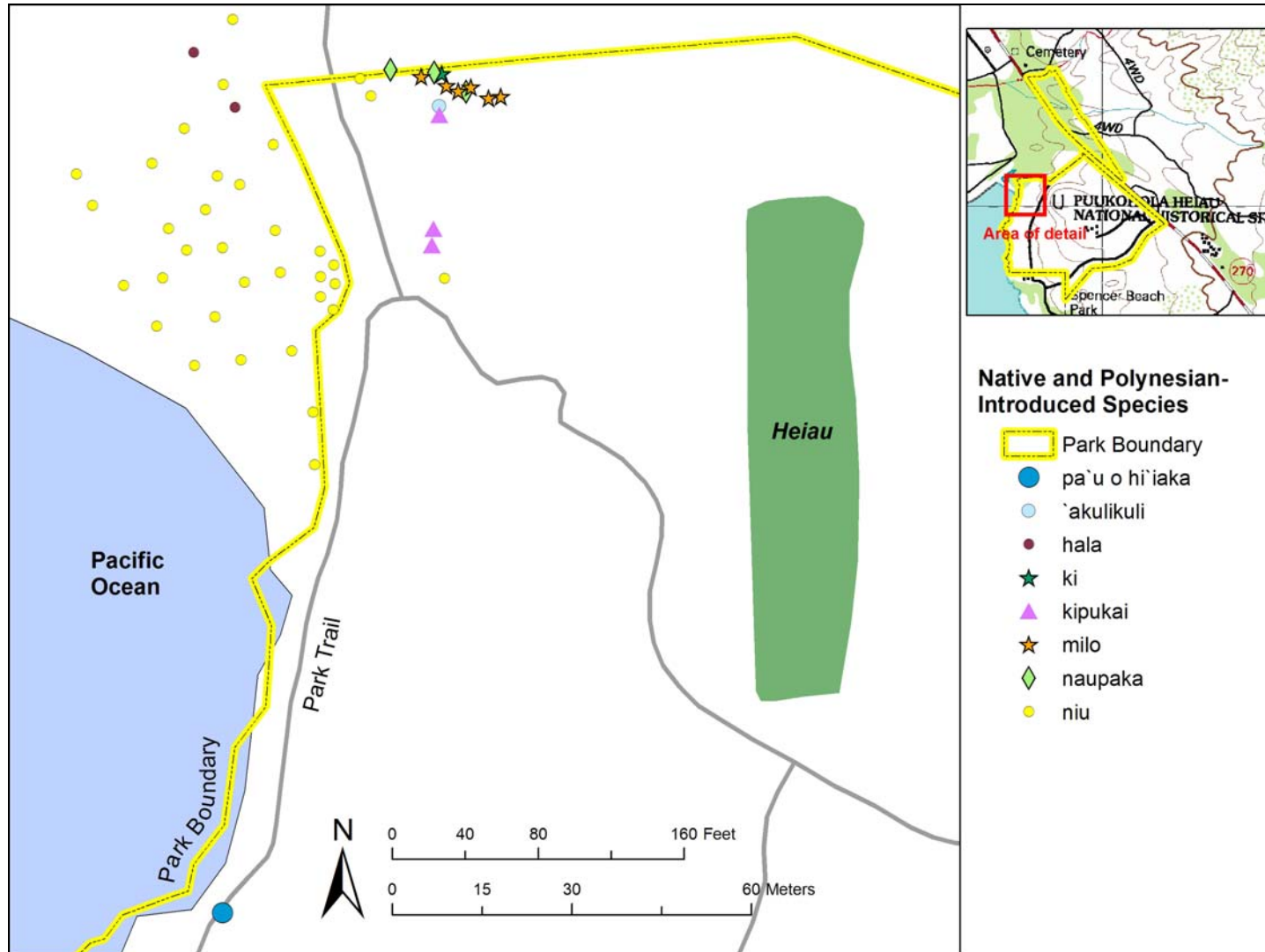


Figure 2c. Native and Polynesian-introduced plant species in the vicinity of the heiau and northwest park boundary at Pu'ukoholā Heiau National Historic Site.

Non-native plant species

Eleven non-native plant species (not including Polynesian introductions) were recorded and are detailed below. Plant locations are shown in Figures 3a and 3b.

Aloe (*Aloe vera*)

A small patch of aloe was observed growing in the corner garden area along a rock wall.

Autograph tree (*Clusia rosea*)

One cut autograph tree stump with many small resprouting shoots was recorded.

Chinese banyan (*Ficus microcarpa*)

Three Chinese banyan plants were recorded at the visitor center. Two were shoots growing from previously cut tree stumps. The other banyan was a 3–4 m tall tree growing by the garden behind the visitor center. This larger tree was scheduled to be cut down after the appropriate herbicide required to treat the stump was acquired (park staff, personal communication, 2001).

Kiawe, mesquite (*Prosopis pallida*)

The 11 kiawe were not planted, but rather, were wild trees left in place as shade trees when the visitor center was built. Only the kiawe trees within the visitor center lawn and parking complex were recorded.

Liliko'i, passionfruit (*Passiflora edulis*)

The liliko'i was observed growing at the compost garden on the kiawe behind the visitor center. This species is new for the park and was not reported by either previous botanical survey (MacNeil and Hemmes 1977, Pratt and Abbott 1996).

Madagascar olive (*Noronhia emarginata*)

Four Madagascar olive individuals were recorded. A seedling was collected in the area between the paved parking lot and the front lawn. This species resembles kamani and may have been received as a gift mixed in with kamani seedlings from Hale Makua (Peter Amerling, personal communication, 2001). This species is new for the park and was not reported by either previous botanical survey (MacNeil and Hemmes 1977, Pratt and Abbott 1996).

Marungai, horseradish tree (*Moringa oleifera*)

One marungai plant was observed along the north dripline by the unpaved parking area. This is a new species for the park and was not reported in either of the previous botanical surveys (MacNeil and Hemmes 1977, Pratt and Abbott 1996).

Money tree (*Pleomele marginata*)

Three money trees were observed in the corner garden.

Monkey pod (*Samanea saman*)

Two monkey pod trees were mapped. The monkey pod tree is a non-native plant with no historical context.

Nīoi, chili pepper (*Capsicum frutescens*)

Three chili pepper plants were observed in the garden corner near the compost pile. These plants are self-regenerating seedlings descended from plants originally planted by Don Fergerstrom from fruit collected at the Kawaihae Canoe Club in the early 1980s (Amerling 2000).

Tamarind (*Tamarindus indica*)

One tamarind plant was recorded. The plant is a cut tree stump with new shoots.

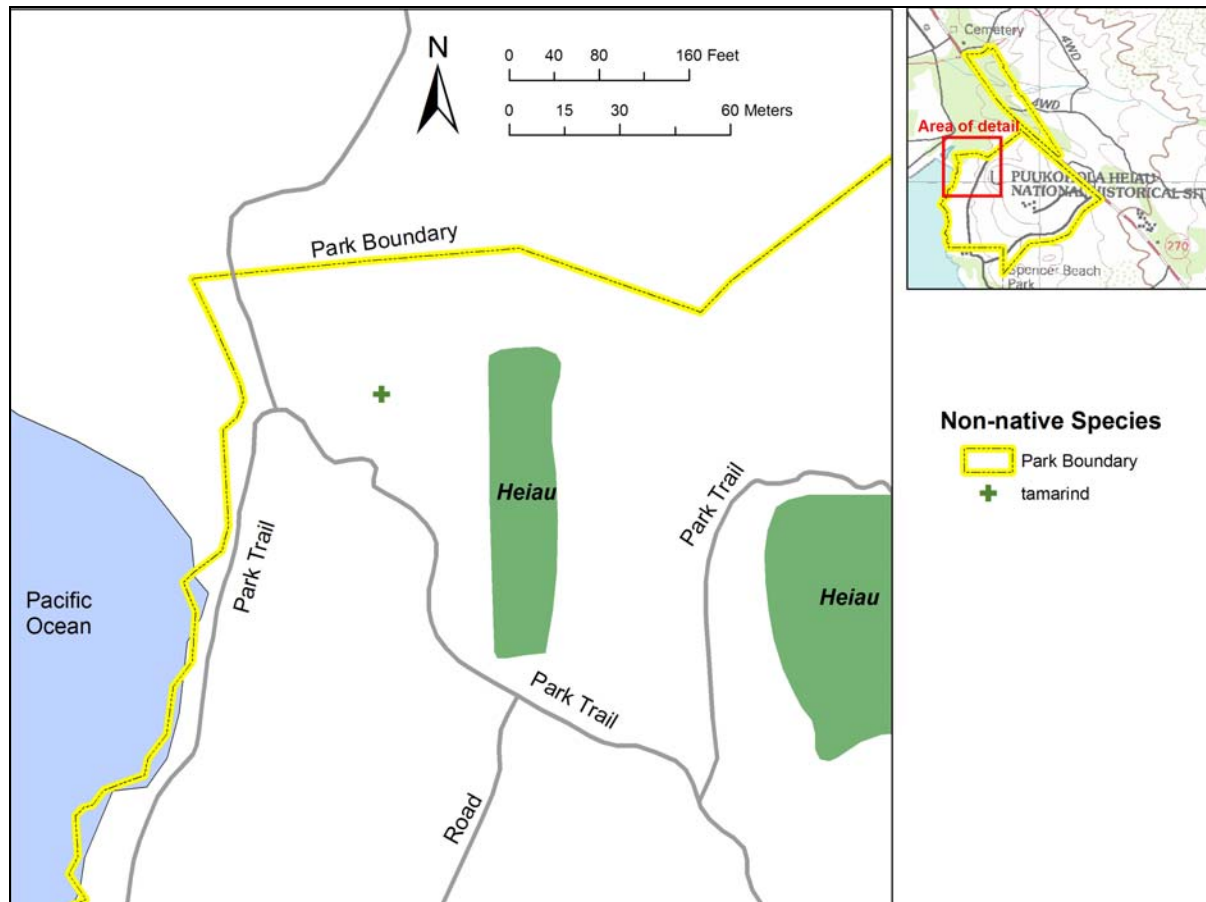


Figure 3a. Non-native plant species recorded near the heiau and northwest park boundary at Pu'ukoholā Heiau National Historic Site.

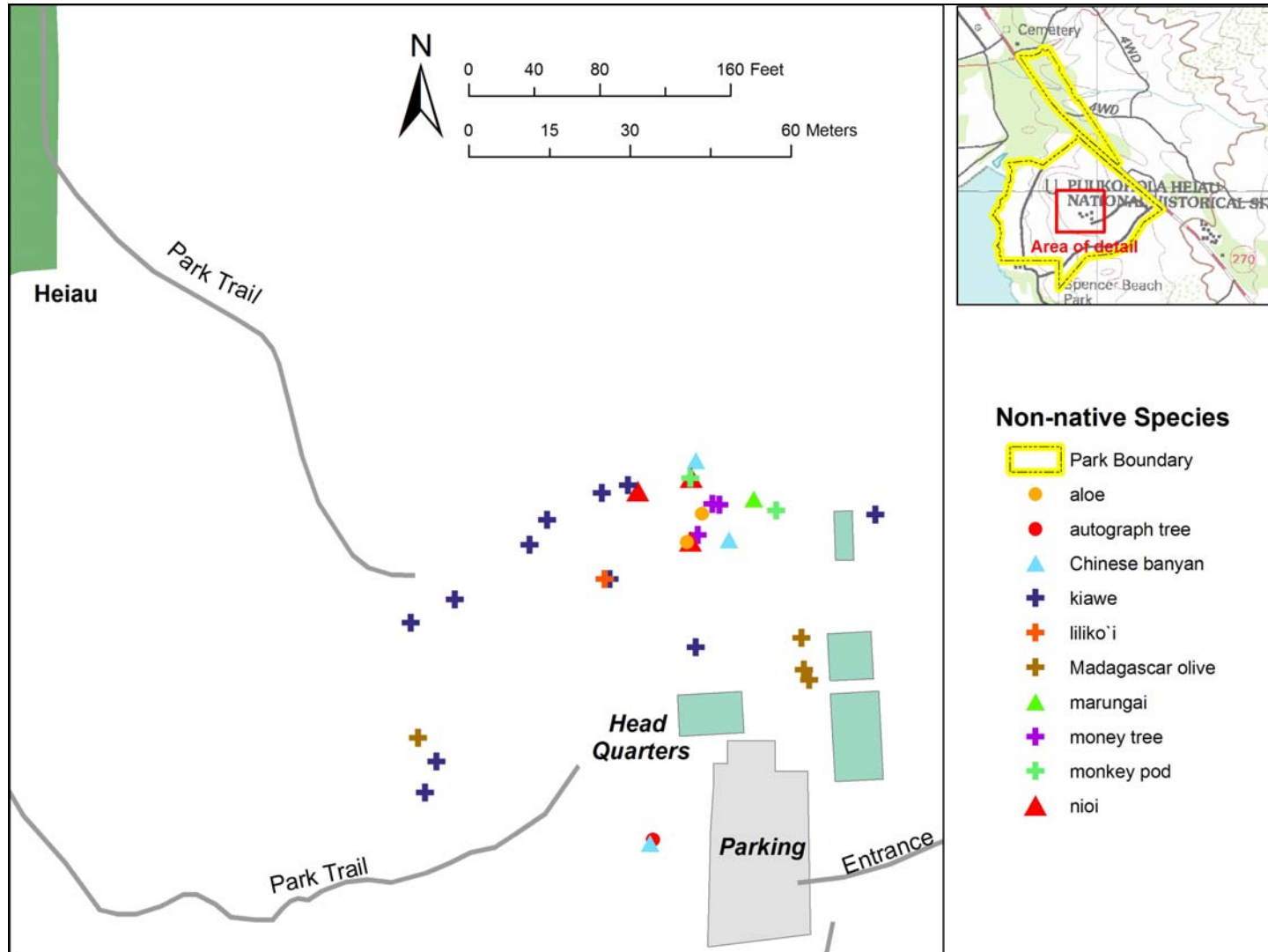


Figure 3b. Non-native plant species in the vicinity of Pu'ukoholā Heiau National Historic Site headquarters.

Vouchers

A total of 81 specimens representing at least 73 species were collected (see Appendix A). Specimens were stored in plastic bags until they were pressed and dried in the heated plant drier the next day at the HAVO research center. Location and pertinent characteristics were recorded and each specimen was assigned a collection number. After drying, the specimens were placed in a freezer before being stored in the HAVO herbarium to reduce the chances of bringing pests into the herbarium. The dried specimens were mounted on acid free herbarium paper with acid free 100% rag cotton labels at the University of Hawaii at Mānoa and sent back to the HAVO herbarium.

New species for the park checklist

The plant species checklist for PUHE is based on surveys conducted by MacNeil and Hemmes (1977) and Pratt and Abbott (1996). During the field work to map the park's plantings, 18 new planted and weed species were found. Two of these new species survived a water shortage in which eight other plantings perished. At least 10 new species were planted, but eight of these did not survive water shortages in 1996 (Amerling 2000). Nine planted species on the checklist were not seen during the survey and are apparently extinct from the park, three having also died during the 1996 water shortages (Amerling 2000). These plants are summarized in Table 2. Additionally, the availability of flowering specimens allowed two species previously recorded only by genus to now be identified to species: *Mollugo cerviana* and *Wikstroemia pulcherrima*. For a full list of species at PUHE observed in this and previous surveys see Appendix B.

Table 2. *New species records (since 1996) for Pu`ukoholā Heiau National Historic Site*

Status	Scientific Name	Common Name(s)
New record since 1996, but not found in 2001	<i>Caesalpinia kawaiensis</i>	uhiuhi
	<i>Capparis sandwichiana</i>	pua pilo
	<i>Colubrina oppositifolia</i>	kauila
	<i>Dioscorea</i> sp.	hoi, yam
	<i>Piper methysticum</i>	`awa
	<i>Pleomele aurea</i>	hala pepe
	<i>Reynoldsia sandwicensis</i>	`ohe makai
	<i>Syzigium malaccense</i>	`ōhi`a `ai
On previous checklist, not found in 2001	<i>Acacia koa</i>	koa
	<i>Ananas comosus</i>	pineapple
	<i>Carica papaya</i>	mīkana, papaya
	<i>Citrus</i> sp.	
	<i>Colocasia esculenta</i>	kalo, taro
	<i>Ipomoea batatas</i>	`uala, sweet potato
	<i>Musa</i> sp.	mai`a, banana
	<i>Spathodea campanulata</i>	African tulip tree
	<i>Tacca leontopetaloides</i>	pia, Polynesian arrowroot
Still extant in 2001	<i>Bolboschoenus maritimus</i>	kaluhā, bulrush
	<i>Centella asiatica</i>	pohe kula, Asiatic pennywort
	<i>Chamaesyce hyssopifolia</i>	spurge
	<i>Cyperus polystachyos</i>	
	<i>Digitaria ciliaris</i>	kūkaepua`a, Henry's crabgrass
	<i>Digitaria eriantha?</i>	
	<i>Digitaria violascens</i>	kūkaepua`a uka, violet crabgrass
	<i>Melilotus indica</i>	sweet clover
	<i>Mollugo cerviana</i>	threadstem carpetweed
	<i>Moringa oleifera</i>	marungai, horseradish tree
	<i>Noronhia emarginata</i>	Madagascar olive
	<i>Oenothera laciniata</i>	cut-leaved evening primrose
	<i>Osteomeles anthyllidifolia</i>	u`ulei
	<i>Pachira aquatica</i>	Malabar chestnut
	<i>Passiflora edulis</i>	liliko`i, passion fruit
	<i>Pennisetum clandestinum</i>	kikuyu grass
	<i>Plantago major</i>	laukahi, broad-leaved plantain
	<i>Sesbania tomentosa</i>	`ohai
	<i>Solanum americanum</i>	pōpolo, glossy nightshade
	<i>Wikstroemia pulcherrima</i>	`ākia

RECOMMENDATIONS

Numerous non-native plant species are targeted for control, based on the recommendations of Pratt (1998). *Ananas comosus*, *Carica papaya*, *Citrus* sp., *Spathodea campanulata*, and an unidentified shrub all seem to have since been removed from the park. PUHE was not surveyed as a whole to determine the park-wide status of all nine species on the 1998 list. Some non-invasive ornamentals should be removed because they have no historical significance.

Non-native plant species to eradicate or control park-wide

The following four species are invasive and should be eradicated from the park:

- The autograph tree is a serious weed that has already been cut down as recommended by Pratt (1998). However, new sprouts were growing on the stump and should be controlled and monitored to prevent further growth.
- Small Chinese banyan (*Ficus microcarpa*) trees are present near the visitor center, but were being cut back in August 2001.
- Marungai is a fast-growing non-native species recommended for removal.
- A previous unsuccessful attempt was made to remove the tamarind tree.

The following species are non-invasive ornamentals that should be removed because they have no historical significance.

- Chili pepper
- Money tree
- Monkey pod
- Madagascar olive. This non-native species was not observed during the previous surveys and should be removed to prevent its possible spread.

ACKNOWLEDGMENTS

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LITERATURE CITED

- Amerling, Peter. 2000. Native plants of Puukohola. Unpublished report on planted native species at PUHE.
- MacNeil, J. D. and D. E. Hemmes. 1977. Puukohola Heiau National Historic Site plant survey. Cooperative National Park Resources Studies Unit Technical Report 15. University of Hawaii at Manoa, Honolulu.
- Pratt, L. W. and L. L. Abbott. 1996. Vascular plants of Puukohola Heiau National Historic Site, island of Hawaii. Cooperative National Park Resources Studies Unit Technical Report 101. University of Hawaii at Manoa, Honolulu.
- Pratt, L. W. 1998. Vegetation management strategies for three national historical parks on Hawai'i Island. Cooperative National Park Resources Studies Unit Technical Report 121. University of Hawaii at Manoa, Honolulu.
- Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1999. Manual of the flowering plants of Hawai'i, revised edition. Bishop Museum Special Publication 97. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.

APPENDIX A: VOUCHER LIST

The following vouchers were collected during this 2001 survey. All vouchers are located in the HAVO herbarium.

Genus Species	Common Name	Family	Status
<i>Aleurites moluccana</i> (L.) Willd.	kukui, candlenut	Euphorbiaceae	Non-native (Polynesian introduction)
<i>Aloe vera</i> L.	aloe	Agavaceae	Non-native
<i>Boerhavia coccinea</i> Mill.		Nyctaginaceae	Non-native
<i>Broussonetia papyrifera</i> (L.) Vent.	paper mulberry, wauke	Moraceae	Non-native (Polynesian introduction)
<i>Bulboschoenus maritimus</i> (L.) Palla	kaluhā, bulrush	Cyperaceae	Native (indigenous)
<i>Calophyllum inophyllum</i> L.	kamani, Alexandrian laurel	Clusiaceae	Non-native (Polynesian introduction)
<i>Capsicum frutescens</i> L.	nīoi, chili pepper	Solanaceae	Non-native
<i>Cenchrus ciliaris</i> L.	buffelgrass	Poaceae	Non-native
<i>Centella asiatica</i> (L.) Urban	pohe kula, Asiatic pennywort	Apiaceae	Non-native
<i>Chamaesyce hirta</i> (L.) Millsp.	koko kahiki, hairy spurge	Euphorbiaceae	Non-native
<i>Chamaesyce hyssopifolia</i> (L.) Small	spurge	Euphorbiaceae	Non-native
<i>Chamaesyce prostrata</i> (Aiton) Small	prostrate spurge	Euphorbiaceae	Non-native
<i>Chenopodium murale</i> L.	`āheahea	Chenopodiaceae	Non-native
<i>Chloris barbata</i> (L.) Sw.	mau`u lei, swollen fingergrass	Poaceae	Non-native
<i>Clusia rosea</i> Jacq.	autograph tree	Clusiaceae	Non-native
<i>Cocos nucifera</i> L.	niu, coconut	Arecaceae	Non-native (Polynesian introduction)
<i>Conyza bonariensis</i> (L.) Cronq.	hairy horseweed	Asteraceae	Non-native
<i>Cordia subcordata</i> Lam.	kou	Boraginaceae	Native (indigenous)

Genus Species	Common Name	Family	Status
<i>Cordyline fruticosa</i> (L.) A. Chev.	kī, ti	Agavaceae	Non-native (Polynesian introduction)
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass, mānienie	Poaceae	Non-native
<i>Cyperus polystachyos</i> Rottb.		Cyperaceae	Native (indigenous)
<i>Digitaria ciliaris</i> (Retz.) Koeler	Henry's crabgrass, kūkaepua`a	Poaceae	Non-native
<i>Digitaria eriantha</i> ?		Poaceae	Non-native
<i>Digitaria violascens</i> Link.	violet crabgrass, kūkaepua`a uka	Poaceae	Non-native
<i>Dodonaea viscosa</i> Jacq.	`a`ali`i	Sapindaceae	Non-native (Polynesian introduction)
<i>Eleusine indica</i> (L.) Gaertn.	wiregrass, mānienie ali`i	Poaceae	Non-native
<i>Emilia fosbergii</i> Nicolson	pualele	Asteraceae	Non-native
<i>Eragrostis amabilis</i> (L.) Wight and Arn. ex Hook. and Arn.		Poaceae	Non-native
<i>Eragrostis cilianensis</i> (All.) Link	stinkgrass	Poaceae	Non-native
<i>Erythrina sandwicensis</i> Degener	wiliwili	Fabaceae	Native (endemic)
<i>Ficus microcarpa</i> L. fil.	Chinese banyan	Moraceae	Non-native
grass	grass	Poaceae	
<i>Hedyotis corymbosa</i> (L.) Lam.		Rubiaceae	Non-native
<i>Heliotropium curassavicum</i> L.	seaside heliotrope, kīpūkai	Boraginaceae	Native (indigenous)
<i>Heteropogon contortus</i> (L.) Beauv. ex R. and S.	pili, twisted beardgrass	Poaceae	Native (indigenous)
<i>Ipomoea pes-caprae</i> (L.) R. Br. ssp. <i>brasiliensis</i> (L.) Ooststr.	beach morning glory, pōhuehue	Convolvulaceae	Native (indigenous)
<i>Jacquemontia ovalifolia</i> (Choisy) H. Hallier ssp. <i>sandwicensis</i> (A. Gray) K. Robinson	pā`ūohi`iaka	Convolvulaceae	Native (endemic)
<i>Kyllinga brevifolia</i> Rottb.	kili`o`opu	Cyperaceae	Non-native

Genus Species	Common Name	Family	Status
<i>Kyllinga nemoralis</i> (Forster and Forster) Dandy ex Hutchinson and Dalziel	kili`o`opu	Cyperaceae	Non-native
<i>Lagenaria siceraria</i> (Molina) Standl.	bottle gourd, ipu	Cucurbitaceae	Non-native (Polynesian introduction)
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole	Fabaceae	Non-native
<i>Medicago lupulina</i> L.	black medick, nonesuch	Fabaceae	Non-native
<i>Melilotus indica</i> (L.) All.		Fabaceae	Non-native
<i>Mollugo cerviana</i> (L.) Ser.	threadstem carpetweed	Molluginaceae	Non-native
<i>Morinda citrifolia</i> L.	Indian mulberry, noni	Rubiaceae	Non-native (Polynesian introduction)
<i>Moringa oleifera</i> Lam.	horseradish tree, marungai	Moringaceae	Non-native
<i>Nephrolepis multiflora</i> (Roxb.) F. M. Jarrett ex C. V. Morton	swordfern, kupukupu	Nephrolepidaceae	Non-native
<i>Noronhia emarginata</i> (Lam.) Stadm.	Madagascar olive	Oleaceae	Non-native
<i>Oenothera laciniata</i> Hill	cut-leafed evening primrose	Onagraceae	Non-native
<i>Osteomeles anthyllidifolia</i> (Sm.) Lindl.	u`ulei	Rosaceae	Native (indigenous)
<i>Oxalis corniculata</i> L.	yellow wood sorrel, `ihi`ai	Oxalidaceae	Non-native (Polynesian introduction?)
<i>Pachira aquatica</i> Aubl.	Malabar chestnut	Sterculiaceae	Non-native
<i>Pandanus tectorius</i> S. Parkinson ex Z	hala, screwpine	Pandanaceae	Native (indigenous)
<i>Passiflora edulis</i> Sims f. ssp. <i>flavicarpa</i> Degener	liliko`i, passionfruit	Passifloraceae	Non-native
<i>Pennisetum clandestinum</i> Hochst. ex Chiov.	kikuyu grass	Poaceae	Non-native
<i>Plantago lanceolata</i> L.	narrow-leaved plantain	Plantaginaceae	Non-native
<i>Plantago major</i> L.	laukahi, common plantain	Plantaginaceae	Non-native
<i>Pleomele marginata</i> (Lam.) N.E. Br.	money tree, dracaena	Agavaceae	Non-native
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	Asteraceae	Non-native
<i>Portulaca oleracea</i> L.	pigweed, `ākulikuli kula	Portulacaceae	Non-native

Genus Species	Common Name	Family	Status
<i>Prosopis pallida</i> (Humb. and Bonpl.ex Willd.) Kunth	mesquite, kiawe	Fabaceae	Non-native
<i>Psilotum nudum</i> (L.) P. Beauv.	whisk fern, moa	Psilotaceae	Native (indigenous)
<i>Scaevola taccada</i> (Gaertn.) Roxb.	naupaka kahakai	Goodeniaceae	Indigenous
<i>Sesbania tomentosa</i> H. and A.	`ohai	Fabaceae	Native (endemic)
<i>Sesuvium portulacastrum</i> (L.) L.	`ākulikuli, sea purselane	Aizoaceae	Native (indigenous)
<i>Sida fallax</i> Walp.	`ilima	Malvaceae	Native (indigenous)
<i>Solanum americanum</i> Mill.	glossy nightshade, pōpolo	Solanaceae	Native (indigenous?)
<i>Sporobolus indicus</i> (L.) R. Br.	West Indian dropseed	Poaceae	Non-native
<i>Sporobolus virginicus</i> (L.) Kunth	seashore rushgrass, `aki`aki	Poaceae	Native (indigenous)
<i>Thespesia populnea</i> (L.) Sol. ex Correa	milo, portia tree	Malvaceae	Native (indigenous)
<i>Tournefortia argentea</i> L. fil.	tree heliotrope	Boraginaceae	Non-native
<i>Waltheria indica</i> L.	`uhaloa	Sterculiaceae	Native (indigenous)
<i>Wikstroemia pulcherrima</i> Skottsb.	`ākia	Thymelaeaceae	Native (endemic)

APPENDIX B: SPECIES CHECKLIST

Genus Species	MacNeil & Hemmes 1977	Pratt & Abbott 1996	Amerling 2000	Waite this study
<i>Abutilon grandifolium</i> (Willd.) Sweet	✓	✓	✓	
<i>Acacia koa</i> A. Gray		✓		
<i>Aleurites moluccana</i> (L.) Willd.		✓	✓	✓
<i>Aloe vera</i> L.		✓	✓	✓
<i>Alternanthera pungens</i> Kunth		✓		
<i>Amaranthus dubius</i> Mart. Ex Thell.	✓			
<i>Amaranthus lividus</i> L.		✓		
<i>Amaranthus spinosus</i> L.		✓		
<i>Ananas comosus</i> (L.) Merr.		✓		
<i>Aristida adscensionis</i> L.	✓			
<i>Atriplex johnstonii</i> Wolf	✓			
<i>Atriplex semibaccata</i> R. Br.	✓	✓		
<i>Atriplex suberecta</i> Verd.	✓	✓		
<i>Axonopus</i> sp.		✓		
<i>Batis maritima</i> L.	✓	✓		
<i>Bidens cynapiifolia</i> Kunth	✓			
<i>Boerhavia coccinea</i> Mill.		✓		✓
<i>Boerhavia</i> sp. (Syn: <i>B. diffusa</i>)	✓			
<i>Broussonetia papyrifera</i> (L.) Vent.		✓	✓	✓
<i>Bulboschoenus maritimus</i> (L.) Palla				✓
<i>Calophyllum inophyllum</i> L.		✓	✓	✓
<i>Capsicum annuum</i> L.		✓		
<i>Capsicum frutescens</i> L.		✓	✓	✓
<i>Carica papaya</i>		✓		
<i>Cenchrus ciliaris</i> L.	✓	✓	✓	✓
<i>Cenchrus echinatus</i> L.		✓		
<i>Centella asiatica</i> (L.) Urban				✓
<i>Chamaesyce hirta</i> (L.) Millsp. (syn: <i>Euphorbia hirta</i>)	✓	✓		✓
<i>Chamaesyce hypericifolia</i> (L.) Millsp. (syn: <i>Euphorbia glomerifera</i>)		✓		
<i>Chamaesyce hyssopifolia</i> (L.) Small				✓
<i>Chamaesyce prostrata</i> (Aiton) Small (syn: <i>Euphorbia prostrata</i>)		✓		✓
<i>Chenopodium murale</i> L.	✓	✓		✓
<i>Chenopodium oahuense</i> (Meyen) Aellen	✓			
<i>Chloris barbata</i> (L.) Sw. (syn: <i>C. inflata</i>)	✓	✓		✓
<i>Chloris virgata</i> Sw.	✓			
<i>Citrullus</i> sp.	✓			
<i>Citrus</i> sp.		✓		
<i>Cleome gynandra</i> (syn: <i>Gynandropsis gynandra</i>)	✓	✓		
<i>Clusia rosea</i> Jacq.		✓	✓	✓
<i>Cocos nucifera</i> L.	✓	✓	✓	✓
<i>Conyza bonariensis</i> (L.) Cronq.		✓		✓
<i>Cordia subcordata</i> Lam.		✓	✓	✓
<i>Cordyline fruticosa</i> (L.) A. Chev.		✓	✓	✓
<i>Cucumis dipsaceus</i> Ehrenb. ex Spach		✓		
<i>Curcuma longa</i>		✓	✓	✓

Genus Species	MacNeil & Hemmes 1977	Pratt & Abbott 1996	Amerling 2000	Waite this study
<i>Cynodon dactylon</i> (L.) Pers.		✓	✓	✓
<i>Cyperus polystachyos</i> Rottb.				✓
<i>Dactyloctenium aegyptium</i> (L.) Willd.		H		
<i>Datura stramonium</i> L.		H		
<i>Desmanthus virgatus</i> (L.) Willd.	✓			
<i>Desmodium sandwicense</i> E. Mey.		✓		
<i>Digitaria ciliaris</i> (Retz.) Koeler			✓	✓
<i>Digitaria eriantha</i> ?				✓
<i>Digitaria fuscescens</i> (K. Presl) Henr.		✓		
<i>Digitaria violascens</i> Link.			✓	✓
<i>Digitaria</i> sp.		✓		
<i>Dodonaea viscosa</i> Jacq.		✓	✓	✓
<i>Doryopteris decora</i> Brack.	✓			
<i>Eleusine indica</i> (L.) Gaertn.		✓	✓	✓
<i>Emilia fosbergii</i> Nicolson		✓		✓
<i>Emilia sonchifolia</i> (L.) DC	✓			
<i>Eragrostis amabilis</i> (L.) Wight and Arn. ex Hook. and Arn.				✓
<i>Eragrostis cilianensis</i> (All.) Link	✓	✓	✓	✓
<i>Eragrostis tenella</i> (L.) P. Beauv.		✓		
<i>Erythrina sandwicensis</i> Degener		✓	✓	✓
<i>Euphorbia heterophylla</i> L. (syn: <i>Euphorbia geniculata</i>)	✓	✓		
<i>Ficus microcarpa</i> L. fil.		✓		✓
<i>Gnaphalium purpureum</i> L. (syn: <i>G. peregrinum</i>)	✓			
<i>Gossypium tomentosum</i> Nutt. ex Seem.		✓	✓	
grass			✓	✓
<i>Hedyotis corymbosa</i> (L.) Lam.		✓		✓
<i>Heliotropium curassavicum</i> L.	✓	✓	✓	✓
<i>Heteropogon contortus</i> (L.) Beauv. ex R. and S.		✓	✓	✓
<i>Hibiscus brackenridgei</i> ssp. <i>brackenridgei</i>		✓	✓	✓
<i>Ipomoea batatas</i> (L.) Lam.		✓		
<i>Ipomoea indica</i> (J. Burm.) Merr. ((syn: <i>I. congesta</i>)	✓			
<i>Ipomoea pes-caprae</i> (L.) R. Br. ssp. <i>brasiliensis</i> (L.) Ooststr.	✓	✓	✓	✓
<i>Jacquemontia ovalifolia</i> (Choisy) H. Hallier	✓	✓	✓	✓
ssp. <i>sandwicensis</i> (A. Gray) K. Robinson				
<i>Kyllinga brevifolia</i> Rottb.		✓		✓
<i>Kyllinga nemoralis</i> (Forster and Forster)		✓		✓
Dandy ex Hutchinson and Dalziel				
<i>Lagenaria siceraria</i> (Molina) Standl.		✓	✓	✓
<i>Lantana camara</i> L.		✓		
<i>Leucaena leucocephala</i> (Lam.) de Wit	✓	✓	✓	✓
<i>Lycopersicon pimpinellifolium</i> (Jusl.) Mill.	✓			
<i>Medicago lupulina</i> L.		✓		✓
<i>Melilotus indica</i> (L.) All.				✓
<i>Merrimia aegyptia</i> (L.) Urb.	✓	✓		
<i>Mollugo cerviana</i> (L.) Ser.		H		✓
<i>Morinda citrifolia</i> L.		✓	✓	✓
<i>Moringa oleifera</i> Lam.			✓	✓

Genus Species	MacNeil & Hemmes 1977	Pratt & Abbott 1996	Amerling 2000	Waite this study
<i>Musa x paradisiaca</i> L.		✓		
<i>Nephrolepis multiflora</i> (Roxb.) F. M. Jarrett ex C. V. Morton		✓	✓	✓
<i>Noronhia emarginata</i> (Lam.) Stadm.			✓	✓
<i>Oenothera laciniata</i> Hill			✓	✓
<i>Ophioglossum polyphyllum</i>	✓	✓		✓
<i>Osteomeles anthyllidifolia</i> (Sm.) Lindl.			✓	✓
<i>Oxalis corniculata</i> L.		✓		✓
<i>Pachira aquatica</i> Aubl.				✓
<i>Pandanus tectorius</i> S. Parkinson ex Z		✓	✓	✓
<i>Pandanus</i> sp.		✓		
<i>Panicum maximum</i> Jacq.	✓	✓		
<i>Paspalum conjugatum</i> Bergius		✓		
<i>Passiflora edulis</i> Sims f. <i>flavicarpa</i> Degener			✓	✓
<i>Passiflora foetida</i> L.	✓	✓		
<i>Pennisetum clandestinum</i> Hochst. ex Chiov.			✓	✓
<i>Pennisetum setaceum</i> (Forssk.) Chiov.	✓	✓		
<i>Phoenix canariensis</i> Hort. ex Chabaud	✓	✓		
<i>Plantago australis</i> Lam.		✓		
<i>Plantago lanceolata</i> L.		✓		✓
<i>Plantago major</i> L.				✓
<i>Pleomele marginata</i> (Lam.) N.E. Br.		✓	✓	✓
<i>Pluchea carolinensis</i> (Jacq.) G. Don				✓
<i>Pluchea symphytifolia</i>		✓		
<i>Portulaca oleracea</i> L.	✓	✓	✓	✓
<i>Portulaca pilosa</i> L.	✓	✓		
<i>Pritchardia affinis</i>		✓	✓	✓
<i>Prosopis pallida</i> (Humb. and Bonpl. ex Willd.) Kunth	✓	✓	✓	✓
<i>Psilotum nudum</i> (L.) P. Beauv.		✓	✓	✓
<i>Rhynchelytrum repens</i> (Willd.) Hubb.	✓	✓		
<i>Ricinus communis</i> L.	✓	✓		
<i>Saccharum officinarum</i>		✓	✓	✓
<i>Samanea saman</i>		✓		✓
<i>Scaevola taccada</i> (Gaertn.) Roxb. (syn: <i>S. sericea</i>)	✓	✓	✓	✓
<i>Sesbania tomentosa</i> H. and A.			✓	✓
<i>Sesuvium portulacastrum</i> (L.) L.	✓	✓	✓	✓
<i>Setaria verticillata</i> (L.) P. Beauv.	✓	✓		
<i>Sida fallax</i> Walp.	✓	✓	✓	✓
<i>Solanum americanum</i>			✓	✓
<i>Sonchus oleraceus</i> L.	✓			
<i>Spathodea campanulata</i> P. Beauv.		✓		
<i>Spermacoce</i> sp.		✓		
<i>Sporobolus indicus</i> (L.) R. Br.		✓		✓
<i>Sporobolus virginicus</i> (L.) Kunth		✓	✓	✓
<i>Tacca leontopetaloides</i> (L.) Kuntze		✓		
<i>Tamarindus indica</i>			✓	✓
<i>Tetragonia tetragonioides</i> (Pall.) Kuntze		H		
<i>Thespesia populnea</i> (L.) Sol. ex Correa	✓	✓	✓	✓
<i>Tournefortia argentea</i> L. fil. (syn: <i>Messerschmidia argentea</i>)	✓	✓	✓	✓
<i>Tribulus cistoides</i> L.	✓			

Genus Species	MacNeil & Hemmes 1977	Pratt & Abbott 1996	Amerling 2000	Waite this study
<i>Tribulus terrestris</i> L.	✓	✓	✓	
<i>Tridax procumbens</i> L.	✓	✓		
<i>Triumfetta semitriloba</i> Jacq.		✓		
<i>Vulpia</i> sp.		✓		
<i>Waltheria indica</i> L. (syn: <i>W. americana</i>)	✓	✓	✓	✓
<i>Wikstroemia pulcherrima</i> Skottsb.		✓	✓	✓
<i>Xanthium strumarium</i> L.		H		

H = Species observed by P. Higashino in 1982, cited by Pratt & Abbott, but not seen in 1996.

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
1	priaff	ht 2m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204982.3105	2216926.4872
2	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204983.1581	2216923.1550
3	priaff	ht 2m	trunk height	0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204981.5467	2216923.2795
4	pantec	ht 4m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204981.0132	2216923.1339
5	pantec	ht 6m		0	immature fruit	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204982.5793	2216921.0140
6	norema	ht 2m		0	vegetative only	normal	Noronhia emarginata	Madagascar olive			alien	204982.7541	2216920.8403
7	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204981.9778	2216919.9715
8	cocnuc	ht 3m		0	vegetative only	normal	Cocos nucifera	coconut	Planted in 1992 from plants given by Paul Andrade, Frank Puhi, and 1992 ceremonial gifts.	niu	Polynesian introduction	204984.7554	2216919.0292
9	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204983.0824	2216918.0224
10	priaff	ht 0.5m		0	vegetative only	normal	Pritchardia affinis	loulou		loulou	endemic	204982.7425	2216914.5603
11	norema	ht 3m		0	immature fruit	normal	Noronhia emarginata	Madagascar olive			alien	204983.2634	2216914.8810
12	pantec	ht 4m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204980.5410	2216912.4591
13	norema	ht 3m		0	immature and mature fruit	vigorous	Noronhia emarginata	Madagascar olive			alien	204984.2644	2216912.9524
14	corsub	ht 3m		0	flowering	feeble	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204978.9157	2216911.8712

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
15	thepop	ht 5m		8	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204983.6434	2216908.2108
16	pantec	ht 3m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204981.0571	2216905.9028
17	sacoff	ht 2m		0	vegetative only	feeble	Saccharum officinale	sugarcane	Planted in 1992 from material donated by Winston Morton III, plant propagator at Waimea Falls Park,	ko	Polynesian introduction	204979.3477	2216907.2183
18	erysan	ht 4m		0	new shoots just starting	normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaaea and said to be picked from the Wai	wiliwili	endemic	204978.3339	2216907.7220
19	pantec	ht 5m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204986.5278	2216905.6895
20	corsub	ht 4m		1	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204983.4968	2216905.5068
21	erysan	ht 6m		0	flowers, just out of dormancy	normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaaea and said to be picked from the Wai	wiliwili	endemic	204982.2188	2216904.3139
22	pantec	ht 5m	3 trunks	0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204981.6106	2216901.9958
23	corsub	ht 1m		0	vegetative only	feeble	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204988.0019	2216903.3589
24	thepop	ht 5m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204986.9150	2216900.1964
25	pantec	ht 1m	old cut stump	0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204989.5612	2216901.0989
26	pantec	ht 2m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204988.4418	2216895.7062

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
27	pantec	ht 1m	old cut stump	0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204987.4769	2216893.3954
28	pantec	ht 4m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204983.1341	2216895.5888
29	pantec	ht 5m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204983.9146	2216893.7844
30	corsub	ht 5m		0	flowers, immature&mature fruit	vigorous	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204982.2639	2216891.4926
31	corsub	ht 5m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204984.9129	2216890.2177
32	corsub	ht 3m		0	flowering	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204989.2245	2216891.1949
33	thepop	ht 3m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204989.9521	2216890.3440
34	erysan	ht 3m		0	dried immature fruit	normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaea and said to be picked from the Wai	wiliwili	endemic	204985.0180	2216889.4008
35	pantec	ht 5m	2 trunks	0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204982.9905	2216886.1280
36	cocnuc	ht 2m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204985.8310	2216884.8920
37	scatac	ht 3m	blank Taxon code in Trimble fill	3	based on field notes: scatac	vigorous	Scaevola taccada	naupaka	Planted in 1991 by Peter Amerling as a transplant from Pelekane.	naupaka kahakai	indigenous	204991.2737	2216868.8493
38	corsub	ht 4m		1	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204993.1333	2216868.6320
39	thepop	ht 4m		3	mature fruit	normal	Thespesia populnea	milos	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204992.3491	2216866.8246

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
40	corsub	ht 5m		0	flowers, immature&mature fruit	vigorous	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204990.1112	2216870.5297
41	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204991.1145	2216868.5066
42	pantec	ht 6m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204991.5176	2216864.7934
43	gostom	ht 2m	lots of seedlings	90	immature and mature fruit	normal	Gossypium tomentosum	Hawaiian cotton	Gift from Gene Gregory in 1993.	ma`o	endemic	204987.0249	2216867.7297
44	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204986.4749	2216868.0941
45	hibbra	ht 1m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204986.1107	2216867.8180
46	hibbra	ht 2m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204988.6392	2216869.1764
47	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204986.9701	2216868.9333
48	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204986.6853	2216869.6805
49	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204985.7344	2216869.4012
50	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204988.0599	2216868.5610
51	thepop	ht 3m		3	mature fruit	normal	Thespesia populnea	milos	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204986.6669	2216869.8712
52	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204988.9819	2216869.9650
53	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204991.2002	2216867.7949
54	gostom	ht 1m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204993.2904	2216867.9470
55	gostom	ht 1m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204992.0254	2216866.6639

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
56	thepop	ht 4m		4	mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204986.6059	2216865.1301
57	gostom	ht 0.5m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204987.3875	2216865.1375
58	gostom	ht 0.5m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204988.2077	2216865.0929
59	gostom	ht 1m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204986.6024	2216864.0776
60	gostom	ht 1m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204985.9350	2216864.9760
61	corsub	ht 4m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204984.6912	2216864.7757
62	corsub	ht 5m		1	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204982.8567	2216864.7641
63	gostom	ht 2m		0	mature fruit	vigorous	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204981.5141	2216864.2350
64	thepop	ht 4m		0	mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204980.4190	2216864.5016
65	gostom	ht 2m		0	flowers and immature fruit	vigorous	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204979.3962	2216863.7128
66	gostom	ht 1m		0	vegetative only	vigorous	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204980.0548	2216863.9870
67	gostom	ht 2m		0	flowers, immature&mature fruit	vigorous	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204979.8515	2216864.0987
68	corsub	ht 6m		1	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204977.4755	2216863.6077
69	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204978.0966	2216864.3110

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
70	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204976.1225	2216863.3105
71	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milo	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milo	indigenous	204975.8858	2216863.6155
72	hibbra	ht 1m		3	vegetative only	vigorous	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204973.5148	2216864.1912
73	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204973.8625	2216863.4575
74	pantec	ht 4m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204972.3746	2216862.9913
75	hibbra	ht 2m		16	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204972.2867	2216862.3329
76	hibbra	ht 2m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204972.7924	2216861.7565
77	hibbra	ht 2m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204972.4576	2216861.6914
78	hibbra	ht 3m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204971.1095	2216861.2166
79	hibbra	ht 2m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204970.1640	2216861.7261
80	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204969.9556	2216862.8959
81	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204968.0616	2216862.9642
82	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204966.2428	2216862.6459

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
83	thepop	ht 4m		0	mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204967.0350	2216862.7240
84	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204965.5849	2216862.1420
85	corsub	ht 6m		0	flowers, immature&mature fruit	vigorous	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204964.7559	2216861.9147
86	thepop	ht 4m		0	mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204962.4413	2216862.5441
87	priaff	ht 0.5m		0	vegetative only	normal	Pritchardia affinis	loulu		loulu	endemic	204960.1201	2216865.6642
88	dodvis	ht 2m		0	vegetative only	vigorous	Dodonea viscosa	`a`ali`i	Transplanted in 1986 from sprouts found in VC lawn.	`a`ali`i	indigenous	204958.8904	2216864.5744
89	hibbra	ht 2m		0	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204958.1631	2216862.0495
90	gostom	ht 0.5m		0	vegetative only	normal	Gossypium tomentosum	Hawaiian cotton	Volunteer seedling from original plant given by Gene Gregory.	ma`o	endemic	204956.8026	2216864.5849
91	scatac	ht 1m		0	flowers and immature fruit	vigorous	Scaevola taccada	naupaka	Planted in 1993 from cutting from shrub already transplanted from Pelekane.	naupaka kahakai	indigenous	204955.9138	2216863.3946
92	thepop	ht 4m		0	no immature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204956.5559	2216863.0258
93	dodvis	ht 3m		0	vegetative only	normal	Dodonea viscosa	`a`ali`i	Transplanted in 1986 from sprouts found in VC lawn.	`a`ali`i	indigenous	204955.8555	2216862.9173
94	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204953.1334	2216861.7915
95	thepop	ht 4m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204949.7027	2216861.1848
96	corfru green	ht 1m		0	vegetative only	vigorous	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204947.9068	2216861.0570

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
97	corsub	ht 4m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204948.0477	2216860.8659
98	thepop	ht 3m		0	mature fruit	normal	Thespesia populnea	milō	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milō	indigenous	204945.2061	2216860.5988
99	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204943.6436	2216860.3656
100	thepop	ht 4m		0	mature fruit	normal	Thespesia populnea	milō	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milō	indigenous	204942.8738	2216859.6738
101	corsub	ht 4m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204940.6995	2216860.0704
102	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204940.6231	2216859.9827
103	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204938.0424	2216859.2463
104	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	milō	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milō	indigenous	204938.5149	2216859.3866
105	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204936.3658	2216859.0000
106	corfru mingr	ht 2m		0	vegetative only	normal	Cordyline fruticosa	mini green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction?	204936.6117	2216858.8090
107	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204934.5737	2216860.3465
108	corfru green	ht 2m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204933.4925	2216859.1623

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
109	thepop	ht 3m		0	mature fruit	feeble	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204933.5262	2216858.9273
110	corfru green	ht 2m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204929.3398	2216859.2433
111	thepop	ht 3m		0	mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204929.8645	2216858.8587
112	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204927.1545	2216858.4052
113	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204927.4463	2216858.5539
114	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204926.7386	2216857.7145
115	corfru green	ht 0.5m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204927.0127	2216857.9265
116	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted in 1990 from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204925.9579	2216857.1784
117	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204925.3154	2216857.0374
118	hibbra	ht 1m		0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204923.2055	2216857.2105
119	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204921.9207	2216857.1372
120	corfru green	ht 2m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204921.5714	2216857.1268

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
121	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204919.4350	2216857.0093
122	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miilo	Planted in 1990 from seedlings from original two miilo trees at Pelekane pond.	miilo	indigenous	204918.9059	2216857.2352
123	pantec	ht 0.5m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204920.1624	2216856.8278
124	corfru green	ht 1m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204918.7736	2216856.3466
125	corsub	ht 4m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204916.0627	2216856.6791
126	corfru red	ht 0.1m		0	vegetative only	feeble	Cordyline fruticosa	red ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction?	204915.8825	2216856.0548
127	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miilo	Planted in 1990 from seedlings from original two miilo trees at Pelekane pond.	miilo	indigenous	204914.9095	2216855.3885
128	corsub	ht 3m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204914.3373	2216858.2171
129	corfru green	ht 0.5m		0		dead	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204914.4729	2216858.2120
130	thepop	ht 4m		0	flowers and mature fruit	normal	Thespesia populnea	miilo	Planted in 1990 from seedlings from original two miilo trees at Pelekane pond.	miilo	indigenous	204913.9056	2216860.2492
131	corfru green	ht 0.1m		0		dead	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204914.5482	2216860.2126

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
132	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204914.4299	2216861.9508
133	corfru green	ht 0.1m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204915.0554	2216861.4770
134	thepop	ht 4m		0	flowers and mature fruit	normal	Thespesia populnea	milō	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milō	indigenous	204914.7363	2216862.6947
135	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204913.2121	2216864.1141
136	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204913.8203	2216864.6969
137	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted in 1990 from seedlings from original two milo trees at Pelekane pond.	milō	indigenous	204913.4516	2216866.9881
138	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204912.6732	2216868.8235
139	cocnuc	ht 3m		0	flowering	normal	Cocos nucifera	coconut	Planted in 1992 from plants given by Paul Andrade, Frank Puhi, and 1992 ceremonial gifts.	niu	Polynesian introduction	204912.9204	2216868.5745
140	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204913.6606	2216871.1150
141	priaff	ht 0.1m		0	vegetative only	normal	Pritchardia affinis	loulū		loulū	endemic	204917.2598	2216859.1099
142	priaff	ht 0.1m		0	vegetative only	normal	Pritchardia affinis	loulū		loulū	endemic	204918.9531	2216859.5341
143	priaff	ht 0.5m		0	vegetative only	normal	Pritchardia affinis	loulū		loulū	endemic	204921.1800	2216860.3893
144	priaff	ht 2m		0	flowering	normal	Pritchardia affinis	loulū	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulū	endemic	204923.9576	2216859.8891

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
145	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204926.6998	2216860.7804
146	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204929.9255	2216860.2347
147	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204933.1709	2216861.9831
148	priaff	ht 2m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204936.7941	2216862.0665
149	priaff	ht 0.5m		0	vegetative only	normal	Pritchardia affinis	loulou		loulou	endemic	204939.7219	2216863.4570
150	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204942.8698	2216862.9251
151	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204946.1016	2216863.5365
152	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204949.1066	2216864.5682
153	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1991 from seeds collected by Greg Herbst (HAVO) from Whittington Beach Park, Ka`u.	loulou	endemic	204952.6891	2216864.8200
154	priaff	ht 0.1m		0	vegetative only	normal	Pritchardia affinis	loulou		loulou	endemic	204960.9893	2216864.9366
155	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204904.8240	2216867.5928
156	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204905.9962	2216868.5016

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
157	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204901.8892	2216866.0646
158	thepop	ht 4m		0	flowers and mature fruit	normal	Thespesia populnea	milos	Planted in 1992 from seedlings from original two trees at Pelekane pond.	milos	indigenous	204900.7043	2216865.0290
159	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204896.9639	2216863.4863
160	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204897.5794	2216863.8725
161	thepop	ht 3m		0	mature fruit	feeble	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milos trees at Pelekane pond.	milos	indigenous	204893.6748	2216862.3164
162	corsub	ht 3m		0	flowers and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204887.8157	2216861.8125
163	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204883.3641	2216859.8742
164	morcit	ht 2m		0	flowers, immature&mature fruit	normal	Morinda citrifolia	Indian mulberry	Planted in 1992 from seed from noni transplanted from PUHO.	noni	Polynesian introduction	204883.0097	2216859.8167
165	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milos trees at Pelekane pond.	milos	indigenous	204877.8249	2216861.5394
166	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204878.8613	2216860.7330
167	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204873.8175	2216860.7586
168	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204874.2018	2216860.5585

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
169	thepop	ht 3m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204870.3263	2216860.8529
170	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204870.0832	2216861.1744
171	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204869.6189	2216861.5800
172	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204864.9021	2216862.0824
173	thepop	ht 3m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204864.5509	2216862.3579
174	corsub	ht 2m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204859.7642	2216861.1580
175	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204854.1817	2216861.2033
176	thepop	ht 2m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted in 1992 from seedlings from original two trees at Pelekane pond.	miло	indigenous	204854.2059	2216861.3616
177	corfru green	ht 1m		0		dead	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204850.0180	2216861.0973
178	corsub	ht 2m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204849.6665	2216862.0480
179	corfru green	ht 0.5m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204847.3777	2216863.9229

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
180	pantec	ht 0.5m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204847.9105	2216864.1213
181	pantec	ht 0.5m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204852.5437	2216861.9379
182	pantec	ht 0.5m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204856.2922	2216860.9798
183	pantec	ht 0.5m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204861.5449	2216862.4058
184	pantec	ht 0.1m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204866.0961	2216863.4268
185	pantec	ht 0.5m		0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204870.3835	2216863.7469
186	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204875.4565	2216862.4207
187	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204879.9223	2216861.7129
188	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204883.7090	2216859.3273
189	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204888.4987	2216861.4300
190	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204893.9501	2216861.5927
191	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204896.7452	2216868.0611

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
192	pantec			0		dead	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204900.7133	2216867.6234
193	calino	ht 6m		0	vegetative only	normal	Calophyllum inophyllum	kamani	Gift donated by Hale Makua from his home on eastern most point of Big Island. Planted in 1992.	kamani	Polynesian introduction	204919.2967	2216874.5876
194	calino	ht 6m		0	vegetative only	normal	Calophyllum inophyllum	kamani	Gift donated by Hale Makua from his home on eastern most point of Big Island. Planted in 1992.	kamani	Polynesian introduction	204923.4528	2216875.9108
195	thepop	ht 6m		0	flowers, immature&mature fruit	vigorous	Thespesia populnea	milos	Planted in 1986 by Ben Saldua and Peter Amerling from seedlings of original 2 milo trees at Pelekane	milos	indigenous	204933.2150	2216883.2483
196	thepop	ht 6m		0	flowers, immature&mature fruit	vigorous	Thespesia populnea	milos	Planted in 1986 by Ben Saldua and Peter Amerling from seedlings of original 2 milo trees at Pelekane	milos	indigenous	204940.6268	2216881.7784
197	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted in 1986 by Ben Saldua and Peter Amerling from seedlings of original 2 milo trees at Pelekane	milos	indigenous	204944.1928	2216881.1457
198	corsub	ht 6m		0	flowers, immature&mature fruit	vigorous	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204949.4894	2216883.8685
199	corsub	ht 4m	older seedling q	0	vegetative only	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204948.8134	2216885.5144
200	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted in 1986 by Ben Saldua and Peter Amerling from seedlings of original 2 milo trees at Pelekane	milos	indigenous	204951.0786	2216885.7136
201	thepop	ht 6m		0	flowers, immature&mature fruit	vigorous	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204936.5413	2216893.0036
202	wikstroemia	ht 3m		0	flowering	normal	Wikstroemia sp.	`akia	Planted by Peter Amerling who rescued it in 1992 from a fireline in HAVO below Pu`u O`o vent.	`akia	endemic	204930.9583	2216885.8792
203	bropap	ht 2m		0	vegetative only	normal	Broussonetia papyrifera	paper mulberry	Natural spread from original plant received as gift during 1991 ceremonies, possibly from Greenwells	wauke	Polynesian introduction	204930.5112	2216888.2292

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
204	thepop	ht 5m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204931.2889	2216891.4257
205	bropap	ht 2m		0	vegetative only	normal	Broussonetia papyrifera	paper mulberry	Natural spread from original plant received as gift during 1991 ceremonies, possibly from Greenwells	wauke	Polynesian introduction	204932.3210	2216889.6753
206	bropap	ht 1m		0	vegetative only	normal	Broussonetia papyrifera	paper mulberry	Natural spread from original plant received as gift during 1991 ceremonies, possibly from Greenwells	wauke	Polynesian introduction	204932.2782	2216889.8886
207	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204927.8372	2216893.8336
208	morcit	ht 2m		0	flowering	vigorous	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204926.9887	2216892.5828
209	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204926.5489	2216893.5015
210	curlon	ht 0.5m		0	vegetative only	normal	Curcuma longa	turmeric	Gift from Gene Gregory in 1991.	`olena	Polynesian introduction	204926.9699	2216894.7567
211	cocnuc	ht 6m		0	flowers and immature fruit	feeble	Cocos nucifera	coconut		niu	Polynesian introduction	204679.8684	2217080.7225
212	tamind	ht 2m	sprouts from cut stump	0	vegetative only	vigorous	Tamarindus indica	tamarind			alien	204701.3957	2217081.6442
213	cocnuc	ht 0.5m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204667.5601	2217111.3569
214	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Presumed natural seedling	miло	indigenous	204689.2621	2217111.2919
215	thepop	ht 3m		0	immature and mature fruit	normal	Thespesia populnea	miло	Presumed natural seedling	miло	indigenous	204687.2613	2217111.0032
216	scatac		dead stem looked like scatac	0		dead	Scaevola taccada	naupaka	Not planted by Park staff and presumed to be natural seedlings.	naupaka kahakai	indigenous	204683.4496	2217112.0740
217	thepop	ht 1m		0	vegetative only	dying	Thespesia populnea	miло	Presumed natural seedling	miло	indigenous	204684.2490	2217112.8794
218	thepop	ht 3m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Presumed natural seedling	miло	indigenous	204682.1907	2217112.1823
219	thepop	ht 3m		15	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Presumed natural seedling	miло	indigenous	204680.1694	2217113.1489

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
220	corfru green	ht 1m		0		dead	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204679.4291	2217115.0821
221	scatac	ht 2m		0	flowers, immature&mature fruit	normal	Scaevola taccada	naupaka	Not planted by Park staff and presumed to be natural seedlings.	naupaka kahakai	indigenous	204678.1685	2217115.3223
222	morcit	ht 1m		0	flowering	feeble	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204676.8113	2217116.0149
223	thepop	ht 3m		0	immature and mature fruit	normal	Thespesia populnea	milos	Presumed natural seedling	milos	indigenous	204676.0042	2217114.6189
224	scatac	ht 3m		0	flowers, immature&mature fruit	normal	Scaevola taccada	naupaka	Not planted by Park staff and presumed to be natural seedlings.	naupaka kahakai	indigenous	204670.8465	2217115.7446
225	cocnuc	ht 3m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204644.4156	2217124.1819
226	pantec	ht 3m		0	immature fruit	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204637.9211	2217118.6572
227	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204642.8426	2217113.2964
228	pantec	ht 5m	10 trunks	0	flowering	feeble	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204644.8213	2217109.4441
229	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204636.3450	2217105.9172
230	cocnuc	ht 5m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204630.9407	2217100.0310
231	cocnuc	ht 3m		0	flowering	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204618.2647	2217098.2642
232	cocnuc	ht 3m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204620.9625	2217093.0050
233	cocnuc	ht 6m		0	flowers, immature&mature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204641.8385	2217097.9377
234	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204651.1940	2217103.2211
235	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204645.6276	2217096.4446
236	cocnuc	ht 5m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204639.9067	2217092.2506
237	cocnuc	ht 5m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204633.6831	2217089.1141
238	cocnuc	ht 3m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204626.2097	2217079.5420
239	cocnuc	ht 4m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204632.6919	2217080.7731

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
240	cocnuc	ht 3m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204631.7502	2217072.6732
241	cocnuc	ht 0.5m		0	vegetative only	feeble	Cocos nucifera	coconut		niu	Polynesian introduction	204638.0407	2217066.1008
242	cocnuc	ht 4m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204645.8111	2217067.0574
243	cocnuc	ht 4m		0	flowering	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204641.4710	2217074.3034
244	cocnuc	ht 2m		0	vegetative only	feeble	Cocos nucifera	coconut		niu	Polynesian introduction	204636.7014	2217085.4872
245	cocnuc	ht 4m		0			Cocos nucifera	coconut		niu	Polynesian introduction	204642.7363	2217085.8874
246	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204651.5427	2217088.7757
247	cocnuc	ht 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204659.0346	2217085.2870
248	cocnuc	ht > 6m		0		feeble	Cocos nucifera	coconut		niu	Polynesian introduction	204652.4119	2217081.7474
249	cocnuc	ht 3m		0	vegetative only	feeble	Cocos nucifera	coconut		niu	Polynesian introduction	204646.4142	2217080.0471
250	cocnuc	ht 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204661.3812	2217082.9985
251	cocnuc	ht 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204661.5727	2217079.8218
252	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204659.1182	2217077.6215
253	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204659.1495	2217081.0144
254	cocnuc	ht > 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204661.2440	2217075.4773
255	cocnuc	ht 6m		0	flowers and immature fruit	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204654.3315	2217068.5868
256	cocnuc	ht 4m		0	vegetative only	vigorous	Cocos nucifera	coconut		niu	Polynesian introduction	204657.8906	2217058.2515
257	cocnuc	ht 1m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204658.1537	2217049.4304
258	corsub	ht 4m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204914.6214	2216883.2905
259	thepop	ht 3m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204917.9057	2216883.8311
260	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204922.9875	2216883.9630
261	pantec	ht > 6m	3 main trunks	0	immature fruit	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores,	hala, puhala	indigenous	204921.8921	2216888.3467

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
and Paul Andrade.													
262	corsub	ht 5m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204914.0110	2216886.8874
263	corsub	ht 4m		0	immature and mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204912.8671	2216889.8091
264	priaff	ht 2m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1992 from a gift of four loulou from Gene Gregory.	loulou	endemic	204909.8236	2216890.4515
265	priaff	ht 1m		0	vegetative only	normal	Pritchardia affinis	loulou	Planted in 1992 from a gift of four loulou from Gene Gregory.	loulou	endemic	204911.2767	2216893.9445
266	priaff	ht 0.5m		0	vegetative only	normal	Pritchardia affinis	loulou		loulou	endemic	204910.9405	2216895.7759
267	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204911.4892	2216895.5477
268	morcit	ht 0.5m		0	flowering	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204909.2770	2216894.8219
269	morcit	ht 1m		0	flowering	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204908.9024	2216898.8210
270	priaff	ht 0.5m		0	vegetative only	vigorous	Pritchardia affinis	loulou		loulou	endemic	204910.1578	2216902.7429
271	norema	ht 5m		0	flowers, immature&mature fruit	normal	Noronhia emarginata	Madagascar olive			alien	204911.3157	2216902.1779
272	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204913.7144	2216902.4453
273	thepop	ht 5m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204925.8214	2216905.0862
274	thepop	ht 5m		0	mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milou trees at Pelekane pond.	milou	indigenous	204921.8282	2216907.0696
275	morcit	ht 0.5m	growing on kiawe stump	0	vegetative only	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204910.2502	2216905.4812

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
276	morcit	ht 0.5m		0	vegetative only	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204912.1000	2216906.5647
277	corsub	ht 5m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204912.3397	2216906.4050
278	priaff	ht 0.5m		0	vegetative only	vigorous	Pritchardia affinis	loulou		loulou	endemic	204910.5300	2216905.4826
279	morcit	ht 1m	shoots from cut stump	0	flowering	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204908.4614	2216906.3694
280	priaff	ht 0.5m		0	vegetative only	vigorous	Pritchardia affinis	loulou		loulou	endemic	204910.2029	2216908.0444
281	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milou	indigenous	204914.8051	2216908.9992
282	thepop	ht 5m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milou	indigenous	204920.3384	2216912.4372
283	erysan	ht 4m		0	vegetative only	normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaaea and said to be picked from the Wai	wiliwili	endemic	204912.9599	2216912.0256
284	priaff	ht 0.1m		0	vegetative only	normal	Pritchardia affinis	loulou		loulou	endemic	204910.7194	2216911.3250
285	corsub	ht 0.5m	sapling	0	vegetative only	normal	Cordia subcordata	kou	Volunteer seedling from established planted tree.	kou	indigenous	204909.4540	2216909.7673
286	morcit	ht 1m	regrowth at cut stump	0	flowering	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204908.9738	2216910.4871
287	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milou	indigenous	204917.4126	2216916.6814
288	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milou	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milou	indigenous	204924.2301	2216917.9094
289	morcit	ht 2m		0	flowers, immature&mature fruit	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204929.8508	2216916.8466
290	morcit	ht 3m		0	flowers, immature&mature fruit	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204931.4910	2216915.2445
291	morcit	ht 4m		15	flowers, immature&mature fruit	normal	Morinda citrifolia	Indian mulberry	Planted in 1988. One of two transplanted by Peter Amerling and Rose Fujimori from lava crack behind	noni	Polynesian introduction	204933.6319	2216914.9092

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
292	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204933.6494	2216914.7418
293	corsub	ht > 6m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204932.4271	2216919.2921
294	thepop	ht 6m	5 trunks	0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204937.8146	2216923.9552
295	corfru red	ht 1m		0	vegetative only	normal	Cordyline fruticosa	red ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction?	204939.1028	2216926.5608
296	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204940.2517	2216926.2700
297	thepop	ht 4m		1	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204941.5458	2216922.2326
298	thepop	ht 4m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204943.0580	2216919.8303
299	cocnuc	ht 5m		0	flowers and immature fruit	normal	Cocos nucifera	coconut	Planted in 1992 from plants given by Paul Andrade, Frank Puhι, and 1992 ceremonial gifts.	niu	Polynesian introduction	204944.6275	2216924.6718
300	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204945.7660	2216925.6672
301	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204947.6247	2216922.7839
302	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204948.7578	2216911.5015
303	corfru red&g	ht 1m		0	vegetative only	normal	Cordyline fruticosa	red & green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction?	204948.5586	2216911.9592

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
304	corfru green	ht 0.5m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204947.5551	2216913.6110
305	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204947.7413	2216917.0501
306	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204946.3694	2216917.6271
307	thepop	ht 3m		0	flowers and immature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204927.3102	2216933.2426
308	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204931.2602	2216933.3050
309	thepop	ht 3m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204931.3594	2216934.3887
310	morcit	ht 1m		0	flowers and immature fruit	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204934.5649	2216933.7522
311	thepop	ht 3m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204936.6119	2216934.4007
312	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204937.3015	2216934.7627
313	thepop	ht 3m	bent trunk	0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204940.3546	2216935.0477
314	morcit	ht 0.5m		0	vegetative only	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204942.0132	2216936.5571
315	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204939.7324	2216937.4166

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
316	lagsic	ht 0.1m	vine	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204937.7872	2216937.5586
317	thepop	ht 1m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204934.4899	2216940.0407
318	morcit	ht 1m	tip cut	0	flowering	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204934.3269	2216940.8959
319	morcit	ht 1m		0	vegetative only	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204934.4104	2216940.8383
320	morcit	ht 0.5m		0	vegetative only	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204934.2083	2216941.1136
321	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204934.9562	2216940.8747
322	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204934.3590	2216941.4428
323	thepop	ht 1m		0	vegetative only	normal	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204933.9646	2216941.4896
324	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204927.6718	2216943.1465
325	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204926.4433	2216937.0537
326	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204934.9061	2216949.5034
327	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204941.4710	2216946.4703

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
328	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204943.1310	2216937.6120
329	lagsic	ht 0.1m	vine on ground	0	flowers, immature&mature fruit	normal	Lagenaria siceraria	bottle gourd	Descendant of seeds planted during the 1980's. Original seeds from Paul Andrade, Greenwell's, and in	ipu	Polynesian introduction	204931.4906	2216935.0274
330	capfru	ht 2m		0	immature and mature fruit	normal	Capsicum frutescens	chili pepper	Self seeded from 3 originals planted by Don Fergerstrom in the early 1980's from Kawaihae Canoe club	nioi	alien	204952.2394	2216948.1796
331	pantec	ht 6m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204950.4754	2216950.3640
332	alemol	ht > 6m		0	immature and mature fruit	normal	Aleurites moluccana	candlenut	Transplanted by Peter Amerling in 1989 from State baseyard in Kalaoa, Kona.	kukui	Polynesian introduction	204949.7806	2216949.7606
333	pantec	ht 5m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204948.8719	2216947.5360
334	thepop	ht 4m	shaded	0	vegetative only	feeble	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milos trees at Pelekane pond.	milos	indigenous	204948.5995	2216947.5614
335	thepop	ht 5m		0	mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milos trees at Pelekane pond.	milos	indigenous	204946.4669	2216947.4566
336	ficmic	ht 4m		0	vegetative only	vigorous	Ficus microcarpus	chinese banyan			alien	204963.0334	2216953.8867
337	thepop	ht 5m		0	flowers and mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milos trees at Pelekane pond.	milos	indigenous	204963.8350	2216951.5148
338	capfru	ht 1m		0	immature fruit	feeble	Capsicum frutescens	chili pepper	Self seeded from 3 originals planted by Don Fergerstrom in the early 1980's from Kawaihae Canoe club	nioi	alien	204962.2003	2216950.6582
339	samsam	ht > 6m		0	mature fruit	normal	Saman samanea	monkey pod			alien	204962.0393	2216950.5681
340	morcit	ht 2m		0	immature fruit	normal	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204960.1582	2216948.7524

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
341	morcit	ht 3m		0	immature and mature fruit	normal	Morinda citrifolia	Indian mulberry	Planted in 1988. One of two transplanted by Peter Amerling and Rose Fujimori from lava crack behind	noni	Polynesian introduction	204957.6711	2216939.5858
342	alover	ht 0.5m		0	vegetative only	normal	Aloe vera	aloe			alien	204964.2448	2216943.9618
343	plemar	ht 2m		0	vegetative only	feeble	Pleomele marginata	money tree			alien	204967.4567	2216945.6662
344	plemar	ht 2m		0	vegetative only	normal	Pleomele marginata	money tree			alien	204966.1570	2216945.8118
345	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204964.9062	2216943.3969
346	thepop	ht 4m		0	mature fruit	feeble	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204963.9405	2216941.6609
347	thepop	ht 6m		0	mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204963.4402	2216941.3388
348	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204963.7668	2216941.6686
349	thepop	ht 4m		0	mature fruit	dead	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204963.4332	2216939.3917
350	plemar	ht 3m		0	vegetative only	normal	Pleomele marginata	money tree			alien	204963.4256	2216940.0338
351	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204962.7999	2216938.8671
352	capfru	ht 2m		0	immature and mature fruit	normal	Capsicum frutescens	chili pepper	Self seeded from 3 originals planted by Don Fergerstrom in the early 1980's from Kawaihae Canoe club	nioi	alien	204962.1135	2216938.7673
353	thepop	ht 3m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204961.4820	2216938.4309
354	alover	ht 0.5m		0	vegetative only	normal	Aloe vera	aloe			alien	204961.3881	2216938.6847
355	thepop	ht 2m		0	vegetative only	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204959.7809	2216937.1335
356	thepop	ht 4m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204959.6985	2216937.1451

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
357	thepop	ht 2m		0	vegetative only	feeble	Thespesia populnea	milō	Planted or volunteer from seedlings from original two milō trees at Pelekane pond.	milō	indigenous	204960.8892	2216936.2886
358	thepop	ht 5m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milō trees at Pelekane pond.	milō	indigenous	204960.4498	2216936.1960
359	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204960.4430	2216935.8189
360	thepop	ht 3m		0	vegetative only	feeble	Thespesia populnea	milō	Planted or volunteer from seedlings from original two milō trees at Pelekane pond.	milō	indigenous	204961.2168	2216934.2910
361	thepop	ht 3m		0	vegetative only	normal	Thespesia populnea	milō	Planted or volunteer from seedlings from original two milō trees at Pelekane pond.	milō	indigenous	204956.4590	2216930.2720
362	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milō trees at Pelekane pond.	milō	indigenous	204956.0227	2216926.5120
363	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milō trees at Pelekane pond.	milō	indigenous	204954.7292	2216925.7241
364	corsub	ht 5m		0	vegetative only	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204954.3007	2216920.7489
365	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milō trees at Pelekane pond.	milō	indigenous	204954.6740	2216920.9829
366	erysan	ht 6m		0	vegetative only	normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaea and said to be picked from the Wai	wiliwili	endemic	204954.6906	2216916.5370
367	thepop	ht 5m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milō trees at Pelekane pond.	milō	indigenous	204954.3068	2216914.2525
368	alemol	ht 6m		0	flowers, immature&mature fruit	normal	Aleurites moluccana	candlenut	Plant from North Kohala planted in 1991 as a gift during ceremonies.	kukui	Polynesian introduction	204954.1842	2216911.4452

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
369	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204953.6348	2216911.9560
370	corfru pink	ht 1m		0	vegetative only	normal	Cordyline fruticosa	pink ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction?	204954.3361	2216911.7843
371	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204953.3172	2216908.6290
372	thepop	ht 4m		0	flowering	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milō	indigenous	204955.1957	2216909.6040
373	corsub	ht > 6m		4	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204951.6474	2216898.6866
374	corfru green	ht 2m		0	vegetative only	vigorous	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204952.6772	2216897.8281
375	thepop	ht 0.1m	cut stump w shoots	0	vegetative only	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milō	indigenous	204954.3867	2216896.1301
376	thepop	ht 0.5m	cut stump w shoots	0	vegetative only	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milō	indigenous	204954.6415	2216896.7818
377	corsub	ht 0.1m	cut stump w shoots	0	vegetative only	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204957.3863	2216894.5439
378	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204955.9387	2216893.8786
379	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milō	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milō	indigenous	204955.4797	2216887.5541

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
380	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204955.3494	2216885.9962
381	corfru green	ht 1m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204955.3035	2216885.2855
382	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204955.0090	2216885.9605
383	thepop	ht 4m		0	mature fruit	feeble	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204954.6041	2216885.5439
384	thepop	ht 3m		0	vegetative only	feeble	Thespesia populnea	miло	Planted or volunteer from seedlings from original two miло trees at Pelekane pond.	miло	indigenous	204954.6091	2216885.2376
385	thepop	ht 5m		0	flowers and mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204954.5911	2216883.8751
386	cluros	ht 0.5m	cut stump w shoots	0	vegetative only	normal	Clusia rosea	autograph tree			alien	204955.0805	2216883.1937
387	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204955.1478	2216882.7524
388	ficmic	ht 1m	cut stump w shoots	0	vegetative only	normal	Ficus microcarpus	chinese banyan			alien	204954.5082	2216882.4369
389	thepop	ht 4m		0	vegetative only	feeble	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204954.6022	2216882.3366
390	morcit	ht 0.5m		0	flowering	normal	Morinda citrifolia	Indian mulberry	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond. Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204955.1455	2216881.6319
391	corsub	ht > 6m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204954.1910	2216879.8612
392	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	miло	Planted between 1986 and 1992 descended from original two miло trees at Pelekane pond.	miло	indigenous	204954.7877	2216878.2644

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
393	thepop	ht 6m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204954.8964	2216875.5880
394	erysan	ht 4m		0		normal	Erythrina sandwicensis	wiliwili	Planted in 1989 from seeds given by a classmate of David Kawaiaaea and said to be picked from the Wai	wiliwili	endemic	204957.3308	2216875.1712
395	thepop	ht 5m		0	flowers and mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204957.6169	2216872.6799
396	corfru green	ht 0.1m		0	vegetative only	feeble	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204957.2537	2216879.1146
397	thepop	ht 5m		0	vegetative only	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204957.6436	2216880.4050
398	hetcon	ht 1m		0	flowers, immature&mature fruit	vigorous	Heteropogon contortus	pili grass		pili	indigenous	204959.1417	2216926.7933
399	ostant	ht 1m		0	vegetative only	normal	Osteomeles anthyllidifolia	`u`ulei	Gift in 1993 from Gene Gregory.	`u`ulei	indigenous	204959.6315	2216927.1915
400	thepop	ht 3m		0	flowering	vigorous	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204961.9203	2216926.6361
401	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204912.5785	2216891.9710
402	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204914.7191	2216897.7574
403	propal	ht 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204909.9445	2216923.6272
404	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204918.1679	2216927.9693
405	propal	ht 6m		0	flowers and immature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204932.0610	2216938.1569
406	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204935.3914	2216942.8041
407	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204945.5517	2216947.8784

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OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
408	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204950.3982	2216949.3042
409	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204947.0286	2216931.7829
410	pasedul	ht 6m	vine on kiawe	0	flowers, immature&mature fruit	vigorous	Passiflora edulis	yellow passionfr		liliko`i	alien	204946.1165	2216931.8211
411	propal	ht 6m		0	flowers and immature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204996.5583	2216943.8052
412	propal	ht > 6m		0	flowers, immature&mature fruit	normal	Prosopis pallida	mesquite		kiawe	alien	204963.0701	2216919.0791
413	cocnuc	ht 3m		0	immature fruit	normal	Cocos nucifera	coconut	Planted in 1992 from plants given by Paul Andrade, Frank Puhī, and 1992 ceremonial gifts.	niu	Polynesian introduction	204963.6747	2216933.8382
414	cocnuc	ht 3m		0	vegetative only	normal	Cocos nucifera	coconut	Planted in 1992 from plants given by Paul Andrade, Frank Puhī, and 1992 ceremonial gifts.	niu	Polynesian introduction	204963.3881	2216937.7328
415	sestom	ht 1m		0	flowers and mature fruit	normal	Sesbania tomentosa	`ohai	Planted in 1993 as a gift from Gene Gregory possibly from seed from Puu Waawaa.	`ohai	endemic	204966.6187	2216932.1090
416	hibbra	ht 2m	ht 2mx2&0.5mx3	3	mature fruit	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204966.0241	2216934.7572
417	corsub	ht 4m	ht 4m&2&0.5m	0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	205045.6120	2216971.1419
418	ophpol		none seen, dry	0			Ophioglossum polyphyllum	pololei fern	unplanted	pololei	indigenous	205097.6289	2217014.9101
419	ophpol		ben and rita saw 1 in 2000	0			Ophioglossum polyphyllum	pololei fern	unplanted	pololei	indigenous	204897.6925	2217074.3050
420	helcur	ht 0.1m	5 m by 3m patch	0	flowers, immature&mature fruit	vigorous	Heliocarpum curassavicum	seaside heliotro	unplanted	kipukai, nena	indigenous	204678.0269	2217089.1106
421	helcur	ht 0.1m	4 small patches	0	flowers, immature&mature fruit	normal	Heliocarpum curassavicum	seasideheliotrop	unplanted	kipukai, nena	indigenous	204677.7818	2217086.3473
422	sespor	ht 0.1m	1 patch	0	flowers, immature&mature fruit	normal	Sesuvium portulacastrum	sea purslane	unplanted	`akulikuli	indigenous	204679.0185	2217109.6237
423	helcur	ht 0.1m	1m sq patch	0	flowers, immature&mature fruit	normal	Heliocarpum curassavicum	seasideheliotrop	unplanted	kipukai, nena	indigenous	204679.0216	2217108.1628
424	cocnuc	ht 1m		1	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204665.6916	2217114.2585

APPENDIX C: DATA DICTIONARY

OBJECTID	TAXON_CODE	HEIGHT	HEIGHT_COM	SEEDLINGS	PHENOLOGY	VIGOR	LATIN_NAME	COMMON_NAM	HISTORY_SO	HAWAIIAN_N	STATUS	X_UTM	Y_UTM
425	jacsan	ht 0.1m	2 patches	0	flowers and fruit	normal	Jacquemontia ovalifolia ssp. sandwicensi	pa`u o hi`iaka	Seedling from plant given by Greg Herbst (HAVO) in 1991.	pa`u o hi`iaka	endemic	204642.7033	2216974.3235
426	pantec	ht 3m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204962.5313	2216928.9392
427	hibbra	ht 0.5m	volunt	0	vegetative only	normal	Hibiscus brackenridgei ssp. brackenridge	ma`o hau hele	Volunteer seedling from plant given by Greg Herbst (HAVO) in 1991.	ma`o hau hele	endemic	204961.3433	2216935.2484
428	pantec	ht 4m		0	vegetative only	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204968.8272	2216940.4556
429	ficmic	ht 1m	resprout from cut stump	0	vegetative only	normal	Ficus microcarpus	chinese banyan			alien	204969.1978	2216939.0637
430	corsub	ht 5m	ht 4m&5m	0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204969.8618	2216941.9491
431	pantec	ht 6m		0	immature fruit	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204969.5361	2216943.9222
432	thepop	ht 4m		0	vegetative only	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204969.7594	2216943.4466
433	thepop	ht 5m		0	vegetative only	dead	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204969.5385	2216946.3527
434	pantec	ht 5m		0	immature fruit	normal	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204969.3337	2216945.0687
435	pantec	ht 4m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204971.3123	2216948.6510
436	thepop	ht 4m		0	mature fruit	normal	Thespesia populnea	milos	Planted between 1986 and 1992 descended from original two milo trees at Pelekane pond.	milos	indigenous	204973.1889	2216946.2501
437	corfru green	ht 2m		0	vegetative only	normal	Cordyline fruticosa	green ti	Planted between 1989 and 1993 by Peter Amerling and Paul Andrade from gifts (of unknown origin) rece	ki	Polynesian introduction	204970.1539	2216943.7420

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438	morole	ht 3m		0	immature and mature fruit	normal	Moringa oleifera	marungai			alien	204973.8483	2216946.6729
439	alemol	ht 1m		0	vegetative only	normal	Aleurites moluccana	candlenut		kukui	Polynesian introduction	204975.7197	2216946.8873
440	samsam	ht 4m		0	vegetative only	normal	Saman samanea	monkey pod			alien	204978.0393	2216944.6079
441	thepop	ht 3m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204980.1409	2216946.7624
442	pantec	ht 2m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204982.4044	2216945.0313
443	corsub	ht 3m		0	flowers, immature&mature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204984.9256	2216943.0833
444	thepop	ht 3m		0	mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204986.6928	2216942.7087
445	thepop	ht 3m		0	mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204988.8359	2216943.9319
446	cocnuc	ht 1m		1	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204989.8192	2216943.9245
447	corsub	ht 2m		0	immature fruit	normal	Cordia subcordata	kou	From seeds gathered by Paul Andrade in 1990 from large tree growing directly mauka of Spencer Beach	kou	indigenous	204993.0178	2216945.2335
448	thepop	ht 3m		0	flowers, immature&mature fruit	normal	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204989.1097	2216940.8153
449	ostant	ht 0.5m		0	vegetative only	normal	Osteomeles anthyllidifolia	`u`ulei	Gift from Buttons Lovell circa 1998.	`u`ulei	indigenous	204991.7893	2216941.3045
450	pantec	ht 1m		0	vegetative only	vigorous	Pandanus tectorius	screwpine	Planted between 1986 and 1993, plants received from Ben Saldua, Elaine Flores, and Paul Andrade.	hala, puhala	indigenous	204990.7286	2216939.0906
451	thepop	ht 3m		0	flowers, immature&mature fruit	feeble	Thespesia populnea	milos	Planted or volunteer from seedlings from original two milo trees at Pelekane pond.	milos	indigenous	204991.7677	2216936.4910
452	scatac	ht 0.5m		0	vegetative only	feeble	Scaevola taccada	naupaka	Not planted by Park staff and presumed to be natural seedlings.	naupaka kahakai	indigenous	204992.4243	2216933.6323
453	alemol	ht 1m	still in pot	0	vegetative only	feeble	Aleurites moluccana	candlenut		kukui	Polynesian introduction	204992.8994	2216933.3969

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454	morcit	ht 1m		0	flowers, immature&mature fruit	feeble	Morinda citrifolia	Indian mulberry	Descendent from two noni originally transplanted from PUHO.	noni	Polynesian introduction	204992.6187	2216930.7537
455	cocnuc	ht 2m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204992.3113	2216928.6776
456	scatac	ht 0.5m		0	vegetative only	feeble	Scaevola taccada	naupaka	Not planted by Park staff and presumed to be natural seedlings.	naupaka kahakai	indigenous	204992.0885	2216928.1595
457	calino	ht 5m	top meter dead side growth pr	0	vegetative only	normal	Calophyllum inophyllum	kamani	Gift donated by Hale Makua from his home on eastern most point of Big Island. Planted in 1992.	kamani	Polynesian introduction	204985.0468	2216926.3078
458	cocnuc	ht 2m		0	vegetative only	normal	Cocos nucifera	coconut		niu	Polynesian introduction	204985.8620	2216925.8243

All points were recorded July 18–24, 2001.
Standard, non-project-related attribute fields were not included in this table nor were time of day and fields with no records. All fields may be viewed in the digital files included with this report.