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Technical Report 120

FLOWERING PLANTS AND GYMNOSPERMS OF HALEAKALA NATIONAL PARK

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INTRODUCTION

This report attempts to synopsize current and past information for all flowering plant and gymnosperm species currently and formerly occurring within the boundaries of Haleakalā National Park, Maui, Hawaiian Islands. Encompassing the eroded summit and a slice of the eastern rain forest flank of Haleakalā volcano, the Park, 11,400 hectares (27,800 acres) in size ranges from sea level to 3055 m (10,023 ft) elevation. Despite its relative small size, the Park includes native alpine and subalpine herb and shrubland, grassland, and rain forest, providing literally over a few miles, the climatic variability usually associated with landscapes on the scale of thousands of miles. By the late 1980s, much of the park was protected from the damaging effects of feral goats and pigs. For reasons of economics, quantitative monitoring must be limited to relatively few species. Descriptive information contained within this and other papers may be crucial for detecting changes in distribution and abundance of species and for guiding management strategies. Haleakalā National Park, complemented by adjoining conservation lands managed by the State of Hawai'i and The Nature Conservancy of Hawai'i, serves as the core of one of the more viable conservation units in the Hawaiian Islands.

Table 1 Numbers of flowering plant and gymnosperm species found in Haleakalā National Park

CATEGORY:	Non-native	Indigenous	Hawaii Endemic	Poly. Intro	Maui endemic	Totals
Gymnosperms	19	0	0	0	0	19
Monocots	83	25	25	10	3	143
Dicots	199	32	164	11	38	406
Flowering plants	282	57	189	21	41	549
TOTAL	301	57	189	21	41	568

ECOSYSTEMS OF HALEAKALA NATIONAL PARK

Alpine (aeolian) zone

Haleakalā's alpine zone occurs above 6560 ft (2000 meters) elevation within the cinder-dominated crater (an erosional depression with relatively recent volcanic activity) and above 8530 ft (2600 meters) on the older, outside western slope of the volcano. Likely constraints on plant survival and growth within this life zone include high solar radiation, marked diurnal temperature ranges, extremes in soil moisture levels, and other factors associated with the substrate. The alpine zone on Haleakalā is sparsely vegetated (less than 25% cover, and usually less than 5%) and has low plant species diversity. The alpine zone landscape consists of rough broken lava features, cinder cones, and cinder fields. In Haleakalā crater, the alpine zone occurs adjacent to and sharply defined from relatively dense subalpine vegetation on older and more developed substrates.

The relatively few plant species of this zone comprise a subset of typical subalpine species (Dubautia menziesii, Styphelia tameiameiae) together with unique characteristic elements (Tetramolopium humile, Argyroxiphium sandwicenese subsp. macrocephalum, Silene struthioloides, Agrostis sandwicensis). The native bunchgrass Deschampsia nubigena, found in a number of native plant communities, is the most common native grass; other grasses, Agrostis sandwicensis and Trisetum glomeratum, are locally found primarily in the alpine zone.

Generally, non-native species are few, limited in cover, and largely restricted to habitats modified by man, such as on compacted cinder, surrounding buildings, and in pavement cracks in parking lots. Characteristic alien species include Hypochoeris radicata (gosmore), Oenothera stricta (evening primrose), and Bromus willdenowii (rescue grass). Bromus tectorum (cheatgrass) and Heterotheca grandiflora (telegraph plant) are invasive with natural levels of disturbance that occur in cinder flats and slopes in the crater. Based on its invasiveness in similar conditions on Hawai'i island, Verbascum thapsus (mullein) should be regarded as a serious potential weed in the alpine zone of Haleakalā.

Largely barren rocklands especially near the mountain summit and within Haleakalā crater comprise the aeolian zone (Howarth and Mull1992), known for its local endemic arthropod species that feed largely on wind-imported insects from lower elevations.

Subalpine shrublands

Subalpine shrublands of Haleakalā occur primarily on the western and northwestern flanks of the volcano extending from just below the park boundary at 6724 ft (2050 m) up to where it grades into the alpine zone at approximately 8530 ft (2600 m). Subalpine shrublands also occur on the southern cliffs, upper rim, and in older kipukas (e.g. Pu`u Mamane) of Haleakalā Crater from approximately Haupaakea to Haleakalā peak as well as in upper western Ko'olau Gap.

The most common species of the subalpine zone is the coriaceous, small leaved shrub Styphelia tameiameiae (*pukiawe*). The tallest tree-shrub of subalpine shrublands is Sophora chrysophylla (*māmane*) whose golden yellow flowers in the spring provide food for native honeycreepers that seasonally travel from nearby rain forests. Nitrogen-fixing *māmane* trees are highly preferred for browsing by ungulates. As a result, before the 1980s when feral goats were eliminated from the park's Crater district, this species occurred largely as large, older, senescent trees with foliage forming a distinctive browse line approximately 1.5 m above the ground. With protection from feral goats, *māmane* has recovered well, both vegetatively and with numerous seedlings. Vaccinium reticulatum (*'ohelo*) and Dubautia menziesii (*kūpaoa*) are common components of the subalpine zone; historically, both have been suppressed by feral goats and are recovering well in their absence. Other common and characteristic native subalpine species include the shrubs Coprosma montana (*pilo*), Coprosma ernodeoides (*kūkaenēnē*), and Geranium cuneatum subsp. tridens (*hinahina*), and Dodonaea viscosa (*'a'ali'i*) and the herbs Carex wahuensis, Deschampsia nubigena, and Gahnia gahniiformis (*'uki*). Santalum haleakalae (*'iliahi*), an uncommon tree usually found in small groves, is largely confined to the subalpine shrublands of Maui. Non-native

grasses, especially Holcus lanatus (velvetgrass), are common and persistent between native shrubs in lower elevation formerly (pre-1980s) disturbed subalpine shrublands.

In windward, wetter regions of the subalpine zone, some areas currently support little shrub growth but are dominated by non-native grasses, especially Holcus lanatus (velvetgrass), but also including other species such as Anthoxanthum odoratum (sweet vernal grass) and Dactylis glomerata (orchard grass). The processes underlying the formation of these pasture like areas that occur at Palikū, Hōlua, and the outer northwestern slopes is unclear. They may represent sites of unusually heavy disturbance, such as where horses have been habitually tethered. Alternately, they may represent areas of distinct substrates that formerly were moist, native grasslands or even areas with montane bog species which have been converted to non-native grasslands by the impacts of ungulates.

In Kaupō Gap, several otherwise distinct plant communities sometimes overlap forming unique species assemblages. Subalpine shrublands intergrade with leeward shrublands (central Kaupō <1700 m), with leeward forests (eastern and western cliffs), with rain forest (upper eastern Kaupo near Palikū), and with *koa* forest (lower eastern Kaupō). The cliffs of upper western Kaupō provide habitat for the endangered plant species Bidens micrantha (*ko'oko'olau*), Schiedea haleakalensis, and Plantago princeps (*ale*).

The most serious weeds of the subalpine zone appear to be Cortaderia jubata (Andean pampas grass), Eucalyptus globulus (blue gum), Pinus radiata (Monterey pine), Pinus pinaster (maritime pine), Pinus patula (Mexican weeping pine), and Ulex europaeus (gorse); however, all these are effectively controlled currently in the subalpine zone of the park by resource management personnel.

Subalpine grasslands

Large individual tussocks of the endemic bunchgrass species Deschampsia nubigena, with diameters of up to a meter across, dominate high elevation grasslands found only on Maui and Hawai'i island. Within the park, these Deschampsia grasslands occur most notably in the Kalapawili grasslands but also at Kuiki, in small areas within the crater and in mostly cinder substrates on the outer northwestern slopes. On the northeastern outside flank of the Crater, the Kalapawili grasslands are the highest elevation native grassland in the state and recognized as a unique Hawaiian plant community (Forehand 1970, Henrickson 1971, Vogl and Henrickson 1971, Gagne and Cuddihy 1990).

Other associated native species include Luzula hawaiiensis, Uncinia brevicaulis, Carex macloviana, Vaccinium reticulatum (in *sensu stricto* and V. berberifolium form), and Pteridium aquilinum var. decompositum (*kilau*).

Extensive rooting by feral pigs starting about 1970 promoted a progressive increase in non-native species, especially the grass Holcus lanatus, and two herbs, Hypochoeris radicata and Rumex acetosella. After about 10 years, bare ground exposed by pig rooting averaged 10-40% of total cover (Jacobi 1981). Following exclusion of pigs in the mid-1980s, the grasslands have

overwhelmingly recovered with Deschampsia, though Holcus still dominates in periodic streamcourses. Rubus argutus (blackberry), which appears able to invade the grasslands without pig-induced disturbance, is a very serious long-term weed threat.

On the northern and northeastern edges of the grasslands is a dense ecotonal zone of the small tree fern Sadleria cyatheoides (*'ama'u*) immediately above the treeline of montane *'ohi'a*-dominated rain forest. Proceeding in a westward direction along Kalapawili ridge to Hanakauhi peak, the substrate becomes rockier with less cinder, and Deschampsia becomes less common.

Leeward shrublands

In Kaupō Gap, leeward shrublands were probably extensive and mixed with stands of dryland forest trees. Beginning in the early 1800s and continuing into the mid-1980s, feral goats (Capra hircus) ranged freely through this area and degraded the native shrublands to the point that few native species survived in accessible habitats. Intensive goat browsing opened up and converted large tracts of leeward shrublands into non-native herblands. Initially, after the control of goats in 1985-1986, non-native grasses proliferated extensively in these areas, especially Sporobolus africanus (rattail) and Rhynchelytrum repens (Natal redtop). Subsequently, native shrubs such as Dodonaea viscosa (*'a'ali'i*), Styphelia tameiameiae (*pukiawe*), and Osteomeles anthyllidifolia (*ulei*) are recovering by establishing seedlings and developing young vegetative shoots from old stumps. The endemic sedge Mariscus hillebrandii, formerly rare, has very much increased and is now a relatively common herb. Other formerly rare native species which are likely to recover well and become more common are Chamaecyse celastroides (*'akoko*), Santalum ellipticum (*'iliahi*), and Bidens micrantha subsp. kaleahala (*ko'oko'olau*).

A small (0.1 ha) exclosure built in 1978 allows a preview of the longer term vegetation recovery likely to occur in this area now that goats have been excluded. After twenty years of recovery in the exclosure, native shrub species cover has increased from near zero to over 30%. Nevertheless, wildfire and invasive plant species may interfere with the recovery of native species in leeward sections of the park. The invasive grass Melinis minutiflora (molassesgrass) appeared soon after exclusion of goats and by 1988 had increased substantially in distribution and biomass. Based on the recovery and subsequent history of molassesgrass in leeward sections of Hawai'i Volcanoes National Park, it was obvious that this species was a serious potential management problem, especially when combined with the effects of wildfire. Molassesgrass has the ability to carry, fuel and subsequently quickly recover from the effects of fire displacing other species. A experimental program of control by spraying with glyphosate (tradename Roundup) from helicopter beginning in 1990 was carried out and though initially successful is still being evaluated.

With continued management and recovery, extensive native leeward shrublands may once again occur throughout the Kaupō Gap area of the park at 4000-6000 ft (1220-1830 m) elevation.

Leeward forests

Leeward forests of the Hawaiian Islands, often called dry forest or dryland forest, have been decimated to the point that only relictual stands now survive. The decimation, combined with a lack of historical documentation has left us with an unclear understanding of what pristine examples of this ecosystem might once have been like. The destruction of Hawaiian dryland forests is primarily due to the combined effects of grazing ungulates (primarily domestic cattle and feral goats on Maui), non-native plant species, and wildfire. On Maui, remaining dryland forest areas occur primarily on rough tracts of 'a'a lava where cattle are less common and wildfires have insufficient fuels to burn. East Maui has some of the more intact dryland forest remnants remaining in the state, such as at Pu'u o Kali, Kanaio, Auwahi, and lower Kahikinui.

The dryland forests of Haleakalā National Park were in times of pre-human contact probably more extensive and diverse than most imagine. Today, however, few areas of dryland forest remain within the park, mostly on cliffs and steep slopes of Kaupō Gap. One remnant stand, located along a steep ridge in eastern Kaupō Gap, contains a small but rich assemblage of dryland forest trees. Most of these tree species do not otherwise occur in the park or in nearby areas but are largely restricted to the districts of Luala'ilua and Auwahi, several miles to the west. These include Nothocestrum latifolium (*'aiea*), Pouteria sandwicensis (*`āla`a*), Melicope volcanica and Melicope hawaiiensis (*alani*), and Pleomele auwahiensis (*halapēpē*). Even more unusual is a small stand of dryland species (Zanthoxylum kauaense *a'e*, Streblus pendulinus *a'i a'i*, and Pouteria sandwicensis *`āla`a*) that occurs at the edge of native rain forest at Cable Ridge at 1700-2500 ft (520-760 m) on the brink of the southern cliffs of Kīpahulu Valley.

Dryland forests of the park are notable in several regards. First, their occurrence marks the highest elevations for many of these trees on Maui. Secondly, the relictual stands of trees in the park mark the easternmost limits of dryland forests on Haleakalā. Most of Maui's remaining dryland forests occur on Haleakalā's southwestern to southern slopes. The dryland stands in the park, though small, define the former extents of dryland forest distribution on Maui and potentially guide restoration efforts. Lastly, the park dryland forests are somewhat unique for their conserved status, protected from goats and pigs since the mid-1980s. Despite this protection, the continued survival of dryland forest trees in the park is far from assured. The greatest problems are the low number of surviving individual trees and, for many species, the complete lack of regeneration, i.e. naturally occurring seedlings and saplings. The greatest immediate threats to surviving trees are the impacts of introduced insects, especially Xylosandrus compactus (black twig borer) and Copidotermes connexus (forest termite), and wildfire.

Rain forests

Rain forests occupy the eastern half of the park, from the central Manawainui planeze through Kīpahulu Valley and up onto the northeast outer rift. At upper elevations, above approximately 4100 ft (1250 m) elevation, the dominant rain forest tree is Metrosideros polymorpha (*`ōhi`a lehua*). At middle and lower elevation rain forests of the park from 4100 ft to the lower limits of native rain forest at 1970 ft (600 m), Acacia koa (*koa*) dominates either intermixed with *`ōhi`a*

lehua or more commonly overtopping it, sometimes interlocking and forming a distinct upper canopy layer.

In terms of plant, arthropod, and bird diversity, many Hawaiian biologists regard *koa* forests as the richest of Hawaiian ecosystems. Threatened by ungulates, weeds, logging and wildfires, their extents have been dramatically reduced and most remaining examples degraded. In most *koa* sites, reproduction has been so interrupted that *koa* is nearly certain to be replaced by non-native forests or pastures within a few decades. The *koa* forests of Kīpahulu Valley stand as a strong exception. Though *koa* forests in the park present substantial management challenges, with protection from feral pigs, the clear trend is toward strong recovery of native vegetation.

Other very common tree-shrubs include Cheirodendron trigynum (*'olapa*), Hedyotis spp. (*manono*), Melicope clusiifolia and Melicope molokaiensis (*alani*), Myrsine lessertiana, and at higher elevations Myrsine emarginata (*kolea*), Coprosma ochracea and Coprosma pubens (*pilo*), and Vaccinium calycinum (*'ohelo*). Natives vines such as Stenogyne kamehamehae and Smilax melastomifolia (*hoi kuahiwi*), reduced by feral pigs, have begun to recover dramatically in the absence of pigs. In the understory, there is also a large variety of smaller shrubs, ferns, and herbs, such as Peperomia spp. (*'ala'ala wai nui*).

Three species of Clermontia,(*'ōhā, 'ōhā wai*) are the most common lobelioids in the rain forest. Of these, Clermontia tuberculata is largely confined to the upper northeastern rift, Clermontia arborescens (*'ōhā wai nui*) to upper elevations and Clermontia kakeana to lower elevations in Kīpahulu Valley.

The chief threats to the long-term conservation of rain forest are those of feral pigs and the invasion of non-native weeds. By 1991, feral pigs had largely been excluded from Kīpahulu Valley through a series of fences creating smaller management units in conjunction with an area-wide snaring program. Though initially work-intensive, these techniques have been highly successful, allowing for substantial reduction of bare ground and non-native plant cover and significant recovery of many native species, especially the dominant groundcover fern Diplazium sandwichianum (*hō'i'o* or *pohole*). Rain forests on the northeast rift and Manawainui have had their boundaries fenced, but no interior management fences constructed; reduction of feral pig populations is also proceeding in these areas.

Within Haleakalā National Park, the worst rain forest weeds (as of 1998) appear to be Clidemia hirta (Koster's curse), Hedychium gardnerianum (*kāhili* ginger), Paspalum conjugatum (Hilo grass), and Psidium cattleianum (strawberry guava). Other serious invasive and modifying rain forest weeds are Andropogon virginicus (broomsedge), Cyathea cooperi (Australian tree fern), Paspalum urvillei (vasey grass), Rhynchospora caduca, Rubus argutus (prickly Florida blackberry), Spathodea campanulata (African tulip tree), Tibouchina herbacea, and at lower elevations Syzgium jambos (rose apple) and Phyllostachys nigra (black bamboo). Miconia calvescens (velvet tree), of which one seedling was discovered and subsequently removed from the Valley, appears to possess the ability to invade relatively undisturbed Hawaiian rain forest. It poses a grave long term threat to the continued ecosytem functioning and diversity of native rain forests, including those of the Park (Medeiros et al. 1996).

Montane bogs

A series of montane bogs occur within the park on the outer northeast rift at 5380-6150 ft (1640-1875 m) elevation. An extremely wet climate combined with a nearly impervious substrate layer 0-2 m below the soil surface has created these unique open areas within otherwise dense rain forest. These bogs support a unique community of native grasses, sedges and herbs as well as dwarfed, nearly prostrate shrubs. Characteristic species include the sedges Oreobolus furcatus, Carex echinata, Carex thunbergii, and the grass Deschampsia nubigena. Argyroxiphium grayanum (greensword), Viola maviensis (*pāmakani*), Plantago pachyphylla (*manene*), and Geranium hanaense (Hāna geranium) are all notable for their rarity or absence outside the bogs, but common status within them. Feral pigs and subsequent invasion by non-native grasses have threatened this community since the late 1970s. A series of exclosure fences has now protected the bogs found within the park, and vegetation monitoring continues to assess the effects of this management. Two higher elevation bogs (Greensword and New Greensword bogs) dominated by the mat forming sedge Oreobolus were quick to recover and are now rather resistant to invasion by non-native plants after exclusion of feral pigs (Loope, Medeiros, and Gagne 1991). Bogs dominated by Carex echinata have generally been more substantially invaded by non-native plant species (Medeiros, Loope, and Gagne 1991). With protection, the amount of exposed ground (pig rootings) in these bogs declined sharply and native species recovered well but some non-native plant species, especially Holcus lanatus (velvetgrass), have been persistent. Within the last decade, two new potentially serious weeds have appeared: Tibouchina herbacea and Andropogon virginicus (broomsedge).

Strand zone

A short, narrow strip of strand vegetation lines the coast of the national park in the Kīpahulu District. On flat areas, grazing by cattle (discontinued) has degraded this community. Characteristic species include Scaevola sericea (*naupaka-kahakai*), Pandanus tectorius (*hala*), Vigna marina (*nanea*), and the dwarf mat-forming sedge Fimbristylis cymosa. On the rocky ledges and scree slopes of the mouth of 'Ohe'o gulch are the more rare Bidens hillebrandiana subsp. polycephala (*ko'oko'olau*) and small tufted grass Ischaemum byrone. This narrow zone of native plants is threatened by trampling by visitors as well as by displacement by non-native plant species such as. Casuarina (ironwood), of which there are several small trees now in the area.

SPECIES COMPILATIONS:

1. Endemic flowering plant species of the Park restricted to East Maui:

Argyroxiphium virescens*
Artemisia mauiensis
Calamagrostis expansa
Clermontia samuelii
Clermontia tuberculata
Cyanea aculeatiflora
Cyanea horrida
Cyanea longissima*
Cyanea pohaku*
Cyrtandra hashimotoi
Dubautia dolosa
Dubautia menziesii
Dubautia platyphylla
Dubautia reticulata
Geranium arboreum
Geranium hanaense
Geranium multiflorum
Labordia venosa
Lobelia grayana
Melicope balloui
Melicope ovalis
Peperomia kipahuluensis
Pipturus forbesii
Pritchardia arecina
Santalum haleakalae
Schiedea haleakalensis
Schiedea implexa*
Silene cryptopetala*
Silene degeneri*
Stenogyne haliakalae*
Stenogyne rotundifolia
Wikstroemia monticola
(* = currently believed to be extinct)

2. Flowering plant species within the Park listed by the U.S. Fish and Wildlife Service as Threatened Species:

Argyroxiphium sandwicense subsp. macrocephalum

3. Flowering plant species within the Park listed (or in process of listing) by the U.S. Fish and Wildlife Service as Endangered Species (as of May 1998):

Bidens micrantha subsp. kalealaha
Clermontia samuelii subsp. samuelii (proposed 9/97)
Cyanea copelandii subsp. haleakalaensis (proposed 9/97)
Cyanea glabra (proposed 9/97)
Cyanea hamatiflora var. hamatiflora (proposed 9/97)
Geranium arboreum
Geranium multiflorum
Ischaemum byrone
Melicope balloui
Melicope ovalis
Plantago princeps var. laxiflora
Platanthera holochila
Schiedea haleakalensis
Solanum incompletum

4. Native flowering plant species within the Park which either occur at low numbers of individuals within the Park or whose habitat or life cycle is threatened by non-native plant or animal species (FWS status: E = Endangered, T = Threatened, C = candidate for listing, SOC = "species of concern"; * = in our estimation, extirpation from Park within next 10 years would not be surprising):

*Bidens campylotheca subsp. pentamera (SOC)
*Bidens hillebrandiana subsp. polycephala
Bidens micrantha subsp. kalealaha (E)
*Calamagrostis expansa (SOC)
Claoxylon sandwicense
*Clermontia grandiflora subsp. grandiflora
*Clermontia samuelii subsp. samuelii (E)
Cyanea aculeatiflora
*Cyanea asplenifolia (C)
*Cyanea copelandii subsp. haleakalaensis (E)
*Cyanea glabra (E)
Cyanea hamatiflora var. hamatiflora (E)
Cyanea kunthiana (SOC)
Cyanea macrostegia subsp. macrostegia
Cyrtandra hashimotoi
*Dichanthelium hillebrandianum
*Dubautia reticulata
*Embelia pacifica
*Geranium arboreum (E)
Geranium hanaense (SOC)
Geranium multiflorum (E)
*Hillebrandia sandwicensis (SOC)
*Ischaemum byrone (E)
*Joinvillea ascendens subsp. ascendens (SOC)
Labordia hirtella
*Lagenifera maviensis (single population) (SOC)
*Melicope balloui (E)
*Melicope hawaiensis (two trees survive)
*Melicope ovalis (E)
*Myoporum sandwicense (four trees survive)
*Nestegis sandwicensis (six trees survive)
*Nothocestrum longifolium
*Panicum pellitum
*Phyllostegia bracteata (C)
Phyllostegia glabra
Phytolacca sandwicensis (SOC)
Pittosporum confertiflorum
*Plantago princeps var. laxiflora (E)
*Pleomele auwahiensis (12-24 surviving trees)
*Pouteria sandwicensis (10-15 trees in single population)
*Pritchardia arecina
Rubus macraei (SOC)
Rumex giganteus
*Sanicula sandwicensis (SOC)
Santalum ellipticum
*Schiedea diffusa (SOC)
*Schiedea haleakalensis (E)
Sicyos cucumerinus (SOC)
Sicyos pachycarpus
Silene struthioloides
Sisyrinchium acre
Stenogyne microphylla
Stenogyne rotundifolia
*Strongylodon ruber (SOC)
Tetraplasandra kavaiensis (SOC)
*Viola chamissoniana subsp. tracheliifolia
Viola maviensis
Wikstroemia monticola

5. Likely extinct flowering plant species formerly occurring in Haleakalā National Park (with date of last record in Park):

Argyroxiphium virescens (1959)
Cyanea longissima (1927)
Cyanea pohaku (1919)

Schiedea implexa (1910)
Silene cryptopetala (1870s)
Silene degeneri (1927)
Stenogyne haliakalae (1937)
Tetramolopium lepidotum subsp. arbusculum (1841)
Torulinium odoratum subsp. auriculatum (1919)

6. Flowering plant species apparently extirpated within Haleakalā National Park, but surviving outside the Park (with date of last record) (same legend for FWS categories as compilation 4 above):

Clermontia lindseyana (1919) (E)
Clermontia peleana (1919) (E)
Nothocestrum latifolium (1989) (SOC)
Panicum tenuifolium (1937)
Platanthera holochila (1919) (E)
Ranunculus hawaiensis (1945) (SOC)
Ranunculus mauiensis (1945) (C)
Solanum incompletum (1919) (E)

7. Alien flowering plant and gymnosperm species in the Park considered a threat to native ecosystems (listed alphabetically)

Ageratina adenophora
Andropogon virginicus
Clidemia hirta
Cortaderia jubata
Cyperus halpan
Ehrharta stipoides
Eucalyptus globulus
Ficus microcarpa
Hedychium coronarium
Hedychium gardnerianum
Holcus lanatus
Hypochoeris radicata
Juncus planifolius
Melinis minutiflora
Miconia calvescens
Paspalum conjugatum
Pennisetum clandestinum
Phyllostachys nigra
Pinus patula
Pinus pinaster
Pinus radiata
Psidium cattleianum
Psidium guajava
Rhynchelytrum repens
Rhynchospora caduca
Rubus argutus
Sacciolepis indica
Schinus terebinthifolius
Senna occidentalis
Spathodea campanulata
Sporobolus africanus
Tibouchina herbacea
Syzgium jambos
Ulex europaeus
Verbascum thapsus

SPECIES ACCOUNT LEGEND

Taxonomic treatments and distributions for flowering plants follow Wagner, Herbst, and Sohmer (1990) and for gymnosperms follow Elias (1980). Common synonyms are included in brackets below the current name. The spelling and placement of diacritical markers (glottal stops and macrons) for Hawaiian plant names follows Pukui and Elbert (1986) and place names follows Pukui, Elbert, and Mo'okini (1974).

Our standard format for individual species accounts is illustrated in Figure 1. Families, genera and species are listed alphabetically within the classes of gymnosperms, monocotyledons and dicotyledons. Common names, Hawaiian names, distribution and elevational range within the Park are provided. A short descriptive statement regarding abundance, ecology, history, and other remarks is given when deemed appropriate. Representative specimens are cited as vouchers in certain cases where documentation of the species status in the Park is otherwise lacking or is minimal. Cited herbarium specimens are housed at the Herbarium Pacificum at the B.P. Bishop Museum (BISH), and Lyon Arboretum herbarium (HLA), both in Honolulu.

To describe distributions, Haleakalā National Park can be divided into nine discrete geographical sections (Figure 2). In this report, the popular term Crater is used to describe the eroded summit of Haleakalā volcano, a term which is by geological definition is erroneously applied. Accurately stated, the "Crater" of Haleakalā refers to a highly eroded and slumping volcanic summit with secondary cinder cone formation. Area names used in this report to define distributions are as follows: CRATER, KALAPAWILI, KAUMAKANI, KAUPO GAP, KIPAHULU VALLEY, KO`OLAU GAP, MANAWAINUI, NE RIFT, and WEST SLOPE.

Previous park plant surveys are referenced in the individual species accounts by the following letter code, followed by the page number where that species is listed.

C = Stemmermann, L., P.K. Higashino, and C.W. Smith. 1981. Haleakalā National Park Crater District resources basic inventory. Conifers and flowering plants. Coop. Natl. Park Resources Studies Unit, Univ. Hawai`i, Dept. of Botany, Tech. Rept. 38. 56 pp.

HR = Harrison, B.C. 1973. Preliminary checklist: the vascular plants of Hāna and Ko`olau Forest Reserves, East Maui, Hawaii. Unpublished ms. 59 pp.

K = Lamoureux, C.H. 1968. The vascular plants of Kīpahulu Valley, Maui. Pages 23-54 in R.E. Warner (ed.), Scientific report of the Kīpahulu Valley expedition. The Nature Conservancy. Arlington, Va.

KV = Higashino, P.K., L.W. Cuddihy, S.J. Anderson, and C.P. Stone. 1988. Bryophytes and vascular plants of Kīpahulu Valley, Hāleakala National Park. Technical Rept. 65. Coop. Natl. Park Resources Studies Unit, Univ. of Hawai`i, Dept. of Botany. 63 pp. Kīpahulu

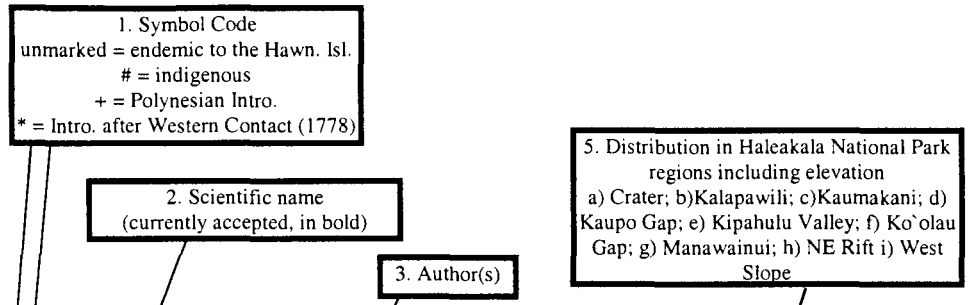
KW = Yoshinaga, A.Y. 1980. Upper Kīpahulu Valley weed survey. Coop. Natl. Park Resources Studies Unit, Univ. of Hawai`i, Dept. of Botany, Tech. Rept. 33. 17 pp.

LK = Canfield, J.E., and L. Stemmermann. 1980. Vascular plants of Kīpahulu Valley below 2000 feet. Pages 11-44 in C.W. Smith (ed.), Resources Base Inventory of Kīpahulu Valley below 2000 feet. Coop. Natl. Park Resources Studies Unit, Univ. of Hawai`i, Dept. of Botany. 175 pp.

M = Higashino, P.K., and G. Mizuno. 1976. Vegetation mapping and vascular plant checklist. Pages 41-120 in D. Peterson (ed.), The scientific report of the Manawainui Research Project. National Science Foundation-Student Originated Studies Program.

SS = Medeiros, A.C., L.L. Loope, and R.A. Holt. 1986. Status of native flowering plant species on the south slope of Haleakalā, East Maui, Hawai`i. Coop. Natl. Park Resources Studies Unit, Univ. of Hawai`i, Dept. of Botany, Tech. Rept. 59. 230 pp.

FIGURE 1. EXAMPLE SPECIES LISTINGS WITH LEGEND CODE:



CACTACEAE, Cactus Family

*__Opuntia ficus-indica__ (L.) Mill. PRICKLY PEAR, *PANINI*

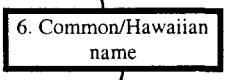
[= Opuntia megacantha Salm-Dyck sensu C25]

Crater, near La`ie cave: lower west and central Kaupō Gap.

Approximately 50 plants (0.1-1.0 m tall) occur in the La`ie flats area (6800 ft); approx. 30-50 plants occur in Kaupō Gap at 4000-4900 ft.

[Alien: presumably native to Mexico]

C25



CAMPANULACEAE (LOBELIACEAE), Lobelia Family

__Clermontia arborescens__ (Mann.) Hillebr. *HAHA, `OHA, `OHA-WAI-NUI*

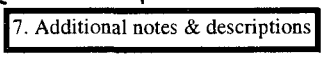
subsp. __waihiae__ (Wawra) Lammers

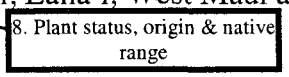
Kīpahulu Valley; Manawainui.

This is one of the most common Clermontia species of East Maui rain forests, as well as in middle to upper elevation rain forests of Kīpahulu Valley and Manawainui at 2200-6900 ft. On the adjacent NE rift, this species is apparently replaced by C. tuberculata, an East Maui local endemic. Though it extends its range down into lower elevations, it is less common than C. kakeana in lowland native rain forest sites. Flowering observed from April to September; fruiting observed from July to October.

[Endemic: Moloka`i, Lāna`i, West Maui and East Maui]

K45,KV31,M104



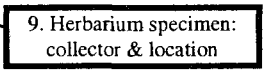


__Clermontia tuberculata__ Forbes *HAHA, `OHA, `OHA-WAI*

Kīpahulu Valley, rare along Koukouai Stream at 5200 ft; Manawainui, rare on east rim at 6000 ft; NE rift, common.

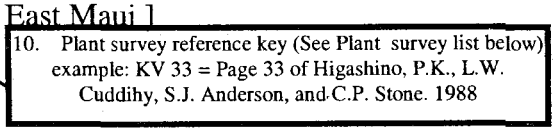
This Clermontia may be distinguished from other species of the genus by its distinctive purple flowers which are covered with purple prickles. 4800-6500 ft.

Representative specimen: A.C. Medeiros 622 (BISH)



[Endemic: East Maui]

KV33



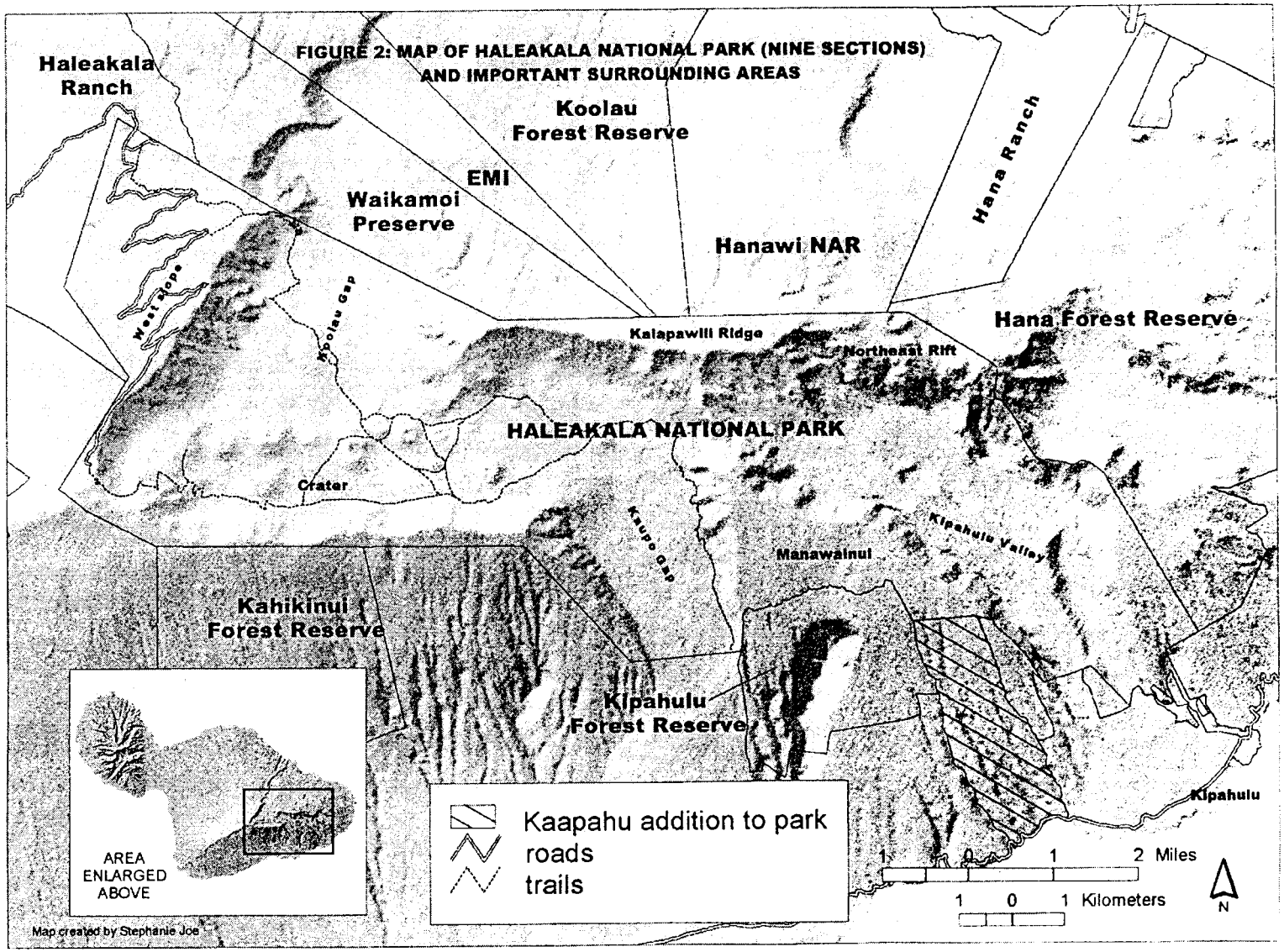


FIGURE 2. MAP OF HALEAKALA NATIONAL PARK

SPECIES ACCOUNTS

GYMNOSPERMS

CUPRESSACEAE, Cypress Family

*__Calocedrus decurrens__ (Torr.) Florin INCENSE CEDAR
[= Libocedrus decurrens Torr.]
West slope, planted at Hosmer Grove (6800 ft) and the 8500 ft grove in 1909-1911 (Park records). Planted and not reproducing in the Park.
[Alien: native to western North America]

*__Cedrus deodara__ (Lamb.) Loud. DEODAR CEDAR
West slope, planted at Hosmer Grove (6800 ft) in 1909-1911 (Park records). Planted and not reproducing in the Park.
[Alien: native to the Himalayas, Asia]
C13

*__Chamaecyparis lawsoniana__ (A. Murr.) Parl. PORT ORFORD CEDAR
West slope, planted at Hosmer Grove and research center area (6800 ft). Planted and not reproducing in the Park.
[Alien: native to SW Oregon and N California]
Representative specimen: A.C. Medeiros 489 (BISH)

*__Cupressus arizonica__ Greene ARIZONA CYPRESS
West slope, planted at Hosmer Grove (6800 ft), headquarters area (7000 ft), and the 8500 ft grove. Trees at 8500 ft and Hosmer Grove were planted in 1909-1911 (Park records). Not reproducing in the Park.
[Alien: native to southwestern U.S. and northern Mexico]
Representative specimen: A.C. Medeiros 822 (BISH)

*__Juniperus virginiana__ L. EASTERN REDCEDAR
West slope, planted at Hosmer Grove (6800 ft) and the 8500 ft grove in 1909-1911 (Park records). Not reproducing in the Park.
[Alien: native to eastern U.S.]

*__Thuja occidentalis__ L. EASTERN OR NORTHERN WHITE CEDAR
West slope, planted at Hosmer Grove and research center area (6800 ft). Not reproducing in the Park.
[Alien: native to northeastern North America]
Representative specimen: A.C. Medeiros 490 (BISH)
C13

PIN

ACEAE, Pine Family

*__Picea abies__ (L.) Karsten NORWAY SPRUCE

West slope, planted at Hosmer Grove, research center area (6800 ft) and the 8500 ft grove. Trees at 8500 ft and Hosmer Grove were planted in 1909-1911 (Park records). Not reproducing in the Park.

[Alien: native to northern and central Europe]

*__Pinus contorta__ Dougl. var. __latifolia__ Engelm. ex Watts LODGEPOLE PINE

West slope, planted at Hosmer Grove and research center area (6800 ft), headquarters area (7000 ft), and the 8500 ft grove. Trees at 8500 ft and Hosmer Grove were planted in 1909-1911 (Park records). Not reproducing in the Park.

[Alien: native to western North America]

Representative specimen: A.C. Medeiros 488 (BISH)

C13

*__Pinus coulteri__ D. Don COULTER PINE

West slope, planted at Hosmer Grove (6800 ft) in 1909-1911 (Park records). Not reproducing in the Park. This distinctive species, with needles in bundles of three, produces the heaviest cones of any species of pine worldwide.

[Alien: native to western North America (California to Baja California)]

*__Pinus jeffreyi__ Grev. and Balf. JEFFREY PINE

West slope, planted at Hosmer Grove (6800 ft) and headquarters area (7000 ft).

Trees at Hosmer Grove were planted in 1909-1911 (Park records). Sparsely reproducing west of Hosmer Grove in the Park. This species with needles in bundles of three has bark with a distinctive odor of vanilla or pineapple.

[Alien: native to western U.S. (southern Oregon to Baja California)]

*__Pinus patula__ Schlecht. and Cham. MEXICAN WEEPING PINE

West slope, planted at Hosmer Grove and research center area (6800 ft), and headquarters area (7000 ft).

This is one of three naturalized species of pine in the Park that readily establish seedlings at 6800-8000 ft, often distant from parent trees. See also P. pinaster and P. radiata. This species is readily identified by its very flexible needles in bundles of three which give the entire tree a drooping or "weeping" appearance.

[Alien: native to Mexico]

Representative specimen: A.C. Medeiros 846 (BISH)

*__Pinus pinaster__ Ait. MARITIME PINE

Kalapawili, single tree - destroyed (7600 ft); West slope, planted at Hosmer Grove and research center area (6800 ft), headquarters area (7000 ft).

This is one of three naturalized species of pine in the Park that readily establish seedlings at 6800-8000 ft, often distant from parent trees. See also P. patula and P. radiata. This species can be distinguished by its long, stout needles which occur in bundles of two.

[Alien: native to the western Mediterranean region and northern Africa]
Representative specimen: A.C. Medeiros 845 (BISH)

*__Pinus ponderosa__ Laws. PONDEROSA PINE
West slope, planted at Hosmer Grove (6800 ft) and headquarters area (7000 ft). Trees at Hosmer Grove were planted in 1909-1911 (Park records). This species with needles in bundles of two or three is not reproducing in the Park.
[Alien: native to western North America]

*__Pinus radiata__ D. Don MONTEREY PINE
Ko`olau Gap, planted at Waikau (6600 ft); West slope, planted at Hosmer Grove and research center area (6800 ft), and the 8500 ft grove.
This is one of three naturalized species of pine in the Park that readily establish seedlings at 6800-8000 ft, often distant from parent trees. See also P. patula and P. pinaster. It is an aggressive species that if uncontrolled could invade and outcompete native species in moist native shrubland. This species can be identified by its stout woody cones, broadened asymmetrically at the base
[Alien: native to three restricted sites in coastal central California as well as Santa Cruz and Santa Rosa islands]
C14

*__Pinus strobus__ L. EASTERN WHITE PINE
[= Pinus monticola Dougl. sensu C14]
West slope, planted at Hosmer Grove (6800 ft) and the 8500 ft grove in 1909-1911. Not reproducing in the Park. Found primarily at the parking lot margin and readily identified by its needles gathered in bundles of five and its stalked flexible cones.
[Alien: native to eastern North America]

*__Pinus sylvestris__ L. SCOTS PINE
West slope, planted at Hosmer Grove (6800 ft) in 1909-1911 (Park records). Not reproducing in the Park.
[Alien: native to western and northern Europe and Russia]

*__Pseudotsuga menziesii__ (Mirb.) Franco DOUGLAS-FIR
West slope, planted in NE corner of Hosmer Grove (6800 ft) in 1909-1911 (Park records). Not reproducing in the Park.
[Alien: native to western North America]
C14

TAXODIACEAE, Taxodium Family (sometimes included in Cupressaceae)

*Cryptomeria japonica (L. f.) D. Don — JAPANESE CEDAR
Kalapawili; Crater; few trees at Palikū; West slope.
On the northwest slope of the Park, planted at Hosmer Grove and research center area (6800 ft) and the 8500 ft grove. Trees at Hosmer Grove were planted in 1909-1911 (Park records). Trees at Palikū were first collected in 1937 (G.E. Olson 29 - BISH). Also reported behind Baker's Camp in the Kalapawili grassland area near fence tag number 500 (T. Lind pers. comm.) Sparsely reproducing in the Park.
[Alien: native to Japan and China]
Representative specimen: A.C. Medeiros 487 (BISH)
C14

*Cunninghamia lanceolata (Lambert) Hooker f. — CHINA FIR
or *Cunninghamia konishii Hayata
[= Araucaria bidwilii Hook. sensu C14]
West slope, planted at research center area (6800 ft).
Both species of Cunninghamia are found in Hawai`i. Cunninghamia lanceolata can be distinguished by its softer, more drooping, blunter leaves, with the white stomatal bands hardly visible on the upper sides of the leaves (Laubenfels, in litt.). Cones have never been observed and no reproduction noted of this species in the Park. Cones are rarely produced by trees of C. lanceolata in lower elevations on Maui in Kula. Planted and not reproducing in the Park.
[Alien: C. lanceolata is native to China; C. konishii is native to mountains of Taiwan]
Representative specimen: A.C. Medeiros 847 (BISH)
C14

ANGIOSPERMS

MONOCOTYLEDONS

AGAVACEAE, Agave Family

*Agave sisalana Perrine — SISAL, MALINA
Lower Kīpahulu Valley
Planted and naturalized on cliffs near pools and lower pastures, 10-200 ft.
[Alien: native to Mexico, widely cultivated]
KV18,LK20,M97

+Cordyline fruticosa (L.) A. Chev. — *TI, KI*
[= Cordyline terminalis (L.) Kunth sensu K34,KW12,LK25,KV22]
Lower Kīpahulu Valley
Planted and persistent commonly from 20-2400 ft, and rarely to 3200 ft.
[Polynesian introduction; probably native to Asia, Malesia, and northern Australia]
K34,KV22,KW12,LK25

Pleomele auwahiensis St. John *HALAPEPE*
[= Pleomele aurea (H. Mann) N. E. Brown sensu C23]
East and west Kaupō Gap.
Rare (ca. 12-24 trees), usually on steep cliff faces, in leeward mesic and dryland forest at 3600-5000 ft. No reproduction of this species known from the Park, although it is easily grown from seeds (A. Palamino pers. comm.). In 1919, C.N. Forbes remarked in his field notes that Pleomele is "rather rare" in east Kaupō Gap. All trees are old (some senescent) and there has been no successful reproduction of this species in the Park for many years. Ethnobotanically, the soft whitish or reddish wood was used for carving images (*ki'i*), has religious significance, and is one of five plants offered at *hula* alters.
[Endemic: Moloka`i and Maui]
C23,SS157

AMARYLLIDACEAE, Amaryllis Family

*__Pancratium littorale__ Jacq. SPIDER LILY
Lower Kīpahulu Valley
Planted and persistent, on cliffs near coast.
[Alien: native to tropical America]
KV18,LK20

ARACEAE, Aroid Family

+__Alocasia macrorrhiza__ (L.) Schott *`APE*
Lower Kīpahulu Valley
Persistent from Polynesian plantings as famine food, this giant herb is found in flooded, wet sites of low elevations. Neal (1965) states that the huge, heart-shaped, shiny green leaves tend to point upward.
[Polynesian introduction: widespread from India and Southeast Asia to Polynesia]
KV18,LK20,M97

+__Colocasia esculenta__ (L.) Schott TARO, *KALO*
Lower Kīpahulu Valley, 100-640 ft; cultivated at Fern Camp, 2600 ft.
The primary agricultural crop of the Hawaiians, taro was historically cultivated in plantings along streams in the lower Valley. It is persistent from Polynesian cultivation in wet sites up into low-elevation forest such as Patti's Bog (S. Anderson pers. comm.).
[Polynesian introduction: perhaps native to India, widely cultivated throughout tropics]
KV18,LK20

*__Epipremnum pinnatum__ (L.) Engl. TARO VINE
[= Scindapsus aureus (Lind. ex Andre) Engl. sensu LK20,KV18]
Lower Kīpahulu Valley
A conspicuous vine with a much-branched stem and leaves with holes or deeply lobed.
[Alien: native to Southeast Asia through Malesia and Pacific islands]
KV18,LK20

*__Philodendron__ sp.
Lower Kīpahulu Valley
Planted and not reproducing in the Park.
[Alien: probably native to tropical America]
KV18

*__Xanthosoma robustum__ Schott COMMON *`APE*
Lower Kīpahulu Valley
Commonly confused with Alocasia macrorrhiza from which it can be separated by its blue-green glaucous (vs. green) leaves (that tend to point downward) and petioles, leaf shape and flowering (vs. non-flowering in Alocasia) habit.
[Alien: native to Central America]

ARECACEAE (PALMAE), Palm Family

+__Cocos nucifera__ L. COCONUT, *NIU*
Lower Kīpahulu Valley
Trees planted and established from coast to lower pastures, 50-150 ft.
[Polynesian introduction: perhaps Malesian in origin, now widely cultivated]
KV23,LK26

*__Phoenix__ sp. DATE PALM
[as Phoenix cf. canariensis Hort. ex Chabaud sensu LK26]
Lower Kīpahulu Valley, planted, coast to lower pastures, 20-150 ft.
Planted and sparsely reproducing in the Park.
[Alien: Hawaiian populations of Phoenix palms may represent hybrids of uncertain origin (Wagner et al. 1990)]
KV23,LK26

__Pritchardia arecina__ Becc. *LOULU, HAWANE*
Kīpahulu Valley, cliffs below Kaumakani peak above Palikea Stream and low flats below Delta camp area. 3000-3600 ft.
This tall native palm (to 12 m height) is endemic to rain forest on the northern slope of East Maui at 2000-4100 ft elevation (Wagner et al. 1990). The scattered, rare populations found on the northern walls of Kīpahulu Valley (consisting of approximately 50-100 individuals) represent the easternmost distribution of this East Maui endemic. Ethnobotanically, the large stiff leaves of this genus were used to construct temporary temples (*heiau loulu*) to honor fishing gods (Abbott 1992).
[Endemic: East Maui]
KV23

BROMELIACEAE, Pineapple Family

*Ananas comosus (Stickm.) Merr. PINEAPPLE, *HALA-KAHIKI*
Kīpahulu Valley, planted and persistent.
Small remnant patches of small-fruited, fragrant pineapple remain in the lower Valley, such as at "pineapple stream" on the lower shelf. These persistent patches may represent relicts of an aborted attempt to raise pineapples in lower Kīpahulu in the 1920s.
[Alien: native to South America, widely cultivated in tropics and subtropics]
KV18,LK20

CANNACEAE, Canna Family

*Canna indica L. CANNA, *POLOKA*
Lower Kīpahulu Valley
Probably introduced after Cook's discovery (Hillebrand 1888), the black seeds are strung in leis.
[Alien: native to tropical America]
KV18,LK20

COMMELINACEAE, Spiderwort Family

*Commelina diffusa Burm. f. *HONOHONO, MAKOLOKOLO*
Kīpahulu Valley
Sprawling herb with small blue flowers, often forming thick spongy mats in open moist areas from the strand zone to disturbed lower to middle *koa* forests and in marshy areas, such as abandoned taro terraces (*lo`i*) at 10-2700 ft. Near sea level at coastal Kīpahulu, this species is infringing on native strand vegetation.
[Alien: native to Old World tropics]
KV18,KW12,LK21

COSTACEAE, Costus Family

*Costus speciosus (Koenig) Smith CREPE OR MALAY GINGER
Lower Kīpahulu Valley
Planted and persistent in disturbed lower-elevation habitats.
[Alien: native from the Himalayas to New Guinea and Australia]
LK26

CYPERACEAE, Sedge Family

Carex alligata F. Boott
[= Carex pluvia Krauss sensu M97,KV19]
Kalapawili; Kaumakani; Kīpahulu Valley; Manawainui, common in upper forest below Kuiki; NE rift; West slope.
Common, large, saw-edged, coarse sedge of bogs, drainages and wet sites in rain forest at 2500-6000 ft, rarely up to 8000 ft.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui, and Hawai`i]
C15,HR37,K33,KV19,M97,SS153

#**Carex echinata** J. A. Murray
[= Carex svenonis Skottsb. sensu HR38]
Kalapawili, northeastern grasslands at forest edge and Flat Top Bog; Manawainui, at Kuiki summit on Kīpahulu (E) side; NE rift.
Thin-leaved, wispy, tufted sedge of montane bogs and rarely in moist grassland at 5440-7300 ft.
[Indigenous: Eurasia and certain Hawaiian Islands - Kaua`i, Maui, and Hawai`i]
Representative specimen: B.H. Gagne 1029 (BISH)
HR38

#**Carex macloviana** D`Urv. ST. MALO`S SEDGE
[= var. subfusca (W. Boott) Kuek. sensu C15,HR38,M97]
Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui, at Kuiki; West slope.
Uncommon, thin-leaved, tufted sedge of moist subalpine shrubland and grassland at 4500-8800 ft.
[Indigenous: Europe, western North America, and Hawaiian islands (East Maui and Hawai`i)]
C15,HR38,KV19,M97,SS153

#**Carex meyenii** Nees
Crater, Palikū cliffs; east Kaupō; Manawainui, Kuiki; NE rift.
Uncommon, thin-leaved, sparse sedge of moist subalpine shrubland to open, mesic forest at 4800-7500 ft.
[Indigenous: Caroline Isl. and main Hawaiian Islands]
C15,SS153

Carex montis-eeka Hillebr.
NE rift, boggy sites from Flat Top Bog to the lowest bogs within the Park.
Stiff, erect, reed-like sedge of montane bogs, usually growing in tussocks with Oreobolus furcatus, 5440-7440 ft.
[Endemic: Kaua`i, Moloka`i, West Maui, and East Maui]
Representative specimen: A.C. Medeiros 245 (BISH)
HR38

*__Carex ovalis__ Goodenough
[? = unidentified sedge A.Y. Yoshinaga 302, 306 sensu KW12]
Kaumakani; Kīpahulu Valley, e.g. Ginger camp helipad, 2080-3880 ft.
Carex ovalis is naturalized in Hawai`i (Hawai`i and Maui) and New Zealand. The elevational range of this species in its native range is 1650-9200 ft (McVaugh 1983). It was first collected in Hawai`i on Hawai`i island in 1964 and on Maui in 1981 (BISH collections). This species was first collected on Kaumakani in 1988 (A.C. Medeiros 811, BISH). This species forms near monospecific stands in disturbed forest openings and is spreading in distribution, perhaps facilitated by seed transport by humans and pigs. This species has spread rapidly along the Kaumakani fenceline since ca. 1990. Wagner et al. (1990) state that C. ovalis is known only from a single Hawai`i island collection. Flowering and fruiting observed year-round (S. Anderson pers. comm.).
[Alien: native to Central America, West Indies, and South America.]
KW12 and KW supplement

#**Carex thunbergii** Steud.
[= Carex nealae Krauss sensu HR38]
NE rift, montane bogs.
Tall, slender, glaucous sedge of waterlogged areas in montane bogs, often growing with, but much less common than C. alligata. This species is rare and localized at New Bog, Greensword Bog, Mid-Camp and Big Bog at 5440-6100 ft. This species dies back periodically, all foliage turning brown; drought and freezing damage have been proposed as possible causes.
[Indigenous: eastern Asia and certain Hawaiian Islands - Maui and Hawai`i]
Representative specimen: B.H. Gagne 1030 (BISH)
HR38

Carex wahuensis C. A. Mey.
subsp. **wahuensis**
subsp. **rubiginosa** (R. Krauss) T. Koyama
Crater; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; West slope.
Tufted sedge found in diverse habitats from near sea level to the subalpine zone, 10-9000 ft.
[Endemic: main Hawaiian Islands]
C15,HR38,KV19,LK21,M97,SS154

#**Cladium jamaicense** Crantz *`UKI*
[= Cladium leptostachyum Nees and Meyen sensu KV19]
Hillebrand (1888) states "in swampy places on all islands, but by no means frequent".
[Indigenous: tropical America, Asia and Pacific islands, including Hawaiian Islands]
KV19

*__Cyperus halpan__ L.
[= Cyperus haspan sensu HR38,KW11,LK21,KV19]
Kaumakani; Kīpahulu Valley; NE rift.
An aggressive herb that in recent years has invaded and come to dominate areas of disturbed bog turf at Big and Mid-Camp Bogs on the northeast rift. At lower elevations, found in open areas in disturbed native forest and upper pastures. The first collection of this species on Maui was made in Waiho`i Valley in 1972 (B. Harrison 142, BISH) and the first collection in the Park was made in 1982 (A.C. Medeiros and B.H. Gagne 272, BISH). 80-6150 ft. Flowering and fruiting observed year-round.
[Alien: pantropical.]
HR38,KV19,KW11,LK21

*Cyperus rotundus L. NUT GRASS, *KILI`O`OPU*
West slope, 6800 ft. disturbed areas around new residences.
This species apparently imported with sand from Waikapu, West Maui in August 1994 (R. Kokubun) and being controlled locally with herbicides (S. Anderson, pers. comm.).
[Alien: unknown origin now cosmopolitan in distribution]

#Eleocharis obtusa (Willd.) Schult. *PIPI WAI*
[= var. gigantea sensu LK21]
Kīpahulu Valley
Locally common reed-like sedge of flooded sites and along muddy trails in forest, 1550-4700 ft. Flowering and fruiting observed year-round.
[Indigenous: North America and Hawaiian Islands (Kaua`i, O`ahu, Moloka`i, Maui, and Hawai`i)]
K33,KV19,KW12,LK21

#Fimbristylis cymosa R. Br.
subsp. umbellata-capitata (Hillebr.) T. Koyama
[= Fimbristylis pycnocephala Hillebr. sensu LK21,KV19]
Lower Kīpahulu Valley
Dwarf compact sedge of coastal strand zone; one of few plant species that survive in the active salt spray zone.
[Indigenous: Pacific basin and tropical America, incl. Hawaiian Islands]
KV19,LK21

#Fimbristylis dichotoma (L.) Vahl TALL FRINGE RUSH
Crater, near Halemau`u trail; Kalapawili; Kīpahulu Valley
In Kīpahulu, pastures to lower forest at 1500-2880 ft. Also reported from upper elevation grassland and shrubland sites.
[Indigenous: world tropics and subtropics - Kaua`i, O`ahu, Moloka`i, Maui, and Hawai`i]
C16,KV19,KW12,LK21

#Gahnia gahniiformis (Gaud.) Heller *`UKI*
[= Machaerina gahniaeformis (Gaud.) Kern sensu C16,HR39,KV19,M98,SS156]
Crater; Kalapawili; east Kaupō Gap; Manawainui; West slope.
Tufted sedge of moist subalpine sites. 4000-8000 ft. Future taxonomic treatments of this species may recognize the name Morelotia gahniiformis Gaud. (W. L. Wagner, herbarium specimen note, 1994).
[Indigenous: New Zealand and certain Hawaiian Islands - Moloka`i, Lāna`i, Maui, and Hawai`i]
C16,HR39,KV19,M98,SS156

*Kyllinga brevifolia Rottb. *KILI`O`OPU*
[= Cyperus brevifolius (Rottb.) Hassk. sensu C15,K33,KW11,LK21,KV19,M98]
Crater, at Palikū; East and west Kaupō Gap, 4000-6300 ft; Kaumakani; Kīpahulu Valley, 150-4400 ft; Manawainui, at 5000-5500 ft; West slope, rare roadside weed at 7100 ft.
Locally common green-flowered weedy sedge of wet, open, disturbed sites, 150-7100 ft. In

Kīpahulu, flowering and fruiting observed year-round.
[Alien: pantropical]
C15,K33,KV19,KW11,LK21,M98

*__Kyllinga nemoralis__ (Forster and Forster) Dandy ex Hutchinson and Dalziel
KYLLINGA, *KILI`O`OPU*
[= Cyperus kyllinga Endl. sensu KW11,LK21,KV19]
Kaumakani; lower to middle Kīpahulu Valley
White-flowered sedge from lower Valley pastures up into disturbed low-elevation forest and above along trails and flooded areas, 150-4200 ft.
[Alien: pantropical]
KV19,KW11,LK21

#__Machaerina angustifolia__ (Gaud.) Koyama *`UKI*
Crater; Kalapawili; Kaumakani; Kīpahulu Valley; Manawainui; NE rift.
Large, flattened sedge of open forest, stream banks and montane bogs.
[Indigenous: New Guinea, Society Isl. and main Hawaiian Islands]
C16,HR38,K34,KV19,M98,SS155

#__Machaerina mariscoides__ (Gaud.) Kern *`UKI, `AHA-NIU*
subsp. __meyenii__ (Kunth) Koyama
Kīpahulu Valley
Large, blue-green, flattened sedge of stream banks and open forest. 1200-3000 ft.
[Indigenous: Hawaiian Islands and other Pacific Isl.]
K34,KV19,LK21

#__Mariscus javanicus__ (Houtt.) Merr. and Metcalfe MARSH CYPRESS, *`AHU`AWA*
[= Cyperus javanicus Houtt. sensu LK21,KV19]
Kīpahulu Valley, coastal strand zone.
After pounding the stems until only fibers remained, early Hawaiians would then use them as strainers for `awa (Wagner et al. 1990).
[Indigenous: tropical Africa and Asia; main Hawaiian Islands]
K34,KV19,LK21

__Mariscus hillebrandii__ Gaud.
[= Cyperus kunthianus Kuek. sensu Mitchell (1945) probably based on misidentification of specimen collected by C.N. Forbes.]
Kaupō Gap, 3900-5670 ft.

This species was first recorded in the Park in lower east Kaupō Gap by C.N. Forbes in 1919 who noted seeing only a single plant (C.N. Forbes 1133M). It was next collected in 1937 with the note, "grows sparsely in wet section at lower elevation Kaupō trail 4000 ft" (G.E. Olson 59,BISH). M. hillebrandii was next recorded in the Park in 1979 in the west Kaupō goat exclosure, one year after its construction. In 1987, after the removal of feral goats from Kaupō Gap, this sedge appeared throughout much of the Dodonaea/Styphelia shrubland of the area up to 5670 ft elevation. Its quick recovery into formerly goat-infested, barren areas is thought to be from germinants of seeds stored in the soil, perhaps for decades.
[Endemic: Kaua`i, O`ahu, Lāna`i, Maui, and Hawai`i.]
Representative specimen: A.C. Medeiros 698 (BISH)
C15, Mitchell (1945)

Mariscus sandwicensis (Kukenth.) T. Koyama
Kīpahulu Valley, 2900-3500 ft.
Rare, large sedge of waterfall and steep watercourse sides in rain forest.
[Endemic: Kaua`i, O`ahu, Moloka`i, and Maui.]

Oreobolus furcatus Mann
Kalapawili; upper Kīpahulu Valley; Koolau Gap; Manawainui, at Kuiki; NE rift; West slope.
Characteristic tussock-forming sedge of montane bogs, though also found on moist, open upper elevation summits.
[Endemic: Kaua`i, O`ahu, Moloka`i, West Maui, and East Maui]
C16,HR39,K34,KV19,M98

#**Pycreus polystachyos** (Rottb.) P. Beauv.
subsp. **holosericeus** (Link) T. Koyama
subsp. **polystachyos**
[= Cyperus polystachyus Rottb. sensu KV19,LK21,SS155]
Kaumakani; Kīpahulu Valley, pastures to lower forest. 50-2200 ft.
[Indigenous: world tropics and subtropics, including Hawaiian Islands]
KV19,LK21,SS155

*__Rhynchospora caduca__ Elliott
Kaumakani; lower to middle Kīpahulu Valley
Common, invasive, tall (to 1 m) sedge in grassy openings, disturbed understory, and along trails of *koa* forests, often growing with Paspalum conjugatum. This species has spread considerably in the last decade. At lower elevations (below ca. 1000 ft), uncommon in lower riparian zone and pastures. This species was first collected on Hawai`i island in 1969 (F.R. Fosberg 51,729, BISH); first collected on West Maui in 1980 on the `Eke trail (R.W. Hobdy 946, BISH). In the Park, this species was first collected in 1975 in lower Kīpahulu Valley between the upper pasture and the gauging station (B.H. Gagne s.n., BISH) and on Kaumakani in 1988 (A.C. Medeiros s.n.). 100-4750 ft. Flowering and fruiting observed year-round.
[Alien: native to southern U.S.]
KV19

#**Rhynchospora chinensis** Nees and Meyen *KUOLOHIA*
subsp. **spiciformis** Hillebr.
[= Rhynchospora spicaeformis Hillebr. sensu HR39]
NE rift, Big Bog, in montane bog turf, 5440 ft.
R. chinensis, considered conspecific with R. rugosa (Kern 1974), can be distinguished from the latter by longer spikelets (7-8 mm versus 4-5 mm) and longer brown achenes (2-2.3 mm long).
[Indigenous: China, Japan, India, Malesia, and Hawaiian Islands]
HR39

#**Rhynchospora rugosa** (Vahl) Gale *PU`UKO`A*
subsp. **lavarum** (Gaud.) T. Koyama
[= Rhynchospora lavarum Gaud. sensu HR38,KW12,LK22,KV19]
Kīpahulu Valley; NE rift.
In Kīpahulu, from upper pastures (ca. 1500 ft) to disturbed forest at 3500 ft. Distinguished from R. chinensis subsp. spiciformis by its shorter spikelets and shorter, reddish brown achenes (ca. 1.5 mm long). In NE rift, in montane bog turf at Big and Mid-Camp Bogs, 5440 ft. 1500-5440 ft.
[Indigenous: tropical America and Hawaiian Islands]
HR38,KV19,KW12,LK22

#**Rhynchospora sclerioides** Hook. and Arnott
Kīpahulu Valley, 2600-3200 ft
Uncommon sedge of streamcourses in Acacia/ Metrosideros rain forest, 2600-3200 ft. Flowering observed in September and October; fruiting observed from October to December.
[Indigenous: Polynesia including main Hawaiian Islands]
Representative specimen: A.C. Medeiros 796

#**Schoenoplectus lacustris** (L.) Palla GREAT BULRUSH, *`AKA`AKAI*
subsp. **validus** (Vahl) T. Koyama
[= Scirpus validus Vahl sensu LK22,KV19]
Lower Kīpahulu Valley, marshy sites along Waimoku Falls trail and lower mid-Valley (Dogleg) helipad.
Perennial, cylindrical-stemmed sedge with coarse, creeping rhizomes and perianth with rough, spiny bristles.
[Indigenous: North America, South America, Pacific islands (incl. Hawaiian Islands), Australia, Malesia and southern Asia]
KV19,LK22

#**Torulinium odoratum** (L.) S. Hooper *PU`UKA`A*
subsp. **auriculatum** (Nees & Meyen ex Kunth) Koyama
[Cyperus ferax L. C. Rich var. auriculatus (Nees and Meyen) Kuek.]
Kīpahulu Valley

This species collected only once in the Park in 1919 by C.N. Forbes (Forbes 1631M, BISH) with the location note, "above the plantation in abandoned taro patches." No records are known since that time in the Park. This species may be extirpated in the Hawaiian Islands, last collected in 1939 at Ukumehame, Maui (Wagner et al. 1990).
[Indigenous: West Indies, South America, Micronesia, Polynesia, and tropical Asia.]
K33,KV19

#**Uncinia brevicaulis** Thouars
Kalapawili.
On East Maui, collected from Ko`olau Gap to Kalapawili grassland. Within the Park, this species is scattered in open, rocky areas in Kalapawili grassland. 6500-7900 ft.
[Indigenous: South America (Andean regions of Argentina and Chile), Juan Fernandez, Tristan da Cunha, and Hawaiian Islands (East Maui only).]
Representative specimen: C.N. Forbes 1047M (BISH).
Henrickson 1971.

#**Uncinia uncinata** (L. f.) Kuek.
Crater, at base of Palikū cliffs; Kīpahulu Valley; Manawainui; NE rift.
Fairly common understory (shade-tolerant) sedge of upper elevation rain forest at 3000-6500 ft. The perigynia of U. uncinata and U. brevicaulis have apical hooks that catch on socks, clothing and leg hairs.
[Indigenous: New Zealand and Hawaiian Islands]
C16,HR40,KV19,M98

DIOSCOREACEAE, Yam Family

+**Dioscorea bulbifera** L. *HOI, PI`OI*, BITTER YAM, COMMON YAM
Lower Kīpahulu Valley 60-1700 ft.
Remnant of subsistence Polynesian cultivation, this vine with heart-shaped leaves produces "tubers" that were eaten in times of low food availability.
[Polynesian introduction: native to Asia and Africa]
KV20,LK22

+**Dioscorea pentaphylla** L. *PI`IA, PI`A*, FIVE-LEAFED YAM
Lower Kīpahulu Valley.
Remnant of subsistence Polynesian cultivation, this vine has three-to five-lobed leaves and also produces "tubers" that were eaten in times of low food availability or used for pig food.
[Polynesian introduction: native from tropical Asia to eastern Polynesia]
KV20,LK22

GRAMINEAE, Grass Family (see POACEAE)

HELICONIACEAE, Heliconia Family

*Heliconia spp. FALSE BIRD OF PARADISE, LOBSTER CLAW
Lower Kīpahulu Valley, planted and persistent.
Three species of this popular ornamental plant (H. bihai, H. latispatha and H. metallica) have become naturalized in Hawai`i (Wagner et al. 1990).
[Alien]

IRIDACEAE, Iris Family

*Gladiolus sp. GLADIOLUS
West slope.
Cultivated at Park residences near headquarters at 7000 ft; planted and reproducing sparsely by underground production of bulbs.
[Alien: native to the Mediterranean region and tropical and South Africa]

Sisyrinchium acre Mann *MAU`U-HO`ULA-`ILI*
Kalapawili, open sites at forest line; upper Kīpahulu Valley, on ridge trail above Mauka camp; Ko`olau Gap, fairly common in open shrubland on lava above forest line (TNC), ca. 6000-6200 ft; west slope, at 6800 ft (stables area, research area and old dump site), 7500 ft (old water catchment) and 8800-9500 ft (scattered along rim, below Kalahaku). 6000-9500 ft.
Rare, endemic, yellow-flowered herb with broad, sporadic distribution. The sole native member of the iris family, this species is common on East Maui only in Ko`olau Gap and previously in a small area of cleared former conifer forest at 6800 ft on the northwest outer slope of the Park, adjacent to the research area. Sisyrinchium emerged in the cleared area presumably from seeds stored in the soil (perhaps for decades). The latter site has been monitored to study the dynamics of growth and reproduction of this rare herb and competition with non-native species. As of 1999, it is no longer seen in this area as both native sedges and non-native grasses and herbs have filled in the previously barren soils exposed by removal of the pines. Ethnobotanically, this plant was used in tattooing.
[Endemic: East Maui and Hawai`i]
C22,HR41,K35,KV22,SS156

*Watsonia borbonica (Pourr.) Goldblatt
West slope.
Planted, persistent, and perhaps sparingly naturalized, several patches of tall white-flowered geophyte near two Park houses (HQ10 and HQ12) near headquarters, 7000 ft.
[Alien: native to southwestern Cape district of southern Africa]

JOINVILLEACEAE, Joinvillea Family

#Joinvillea ascendens Brongn. and Gris. *`OHE*
subsp. ascendens

Kīpahulu Valley
Rare in open rain forest, and along stream courses. 2400-4200 ft. Nineteen small populations of this rare, scattered plant, which appears much like a large grass, are currently known to occur in the Park. Five populations are known from the lower level, fourteen populations are recorded for the upper level. A major threat to this rare plant seems to be its limited reproduction combined with invasion of its range by habitat modifying weeds such as Clidemia hirta, Psidium cattleianum, Hedychium gardnerianum and Sphaeropteris cooperi.
[Indigenous: Malesia, New Caledonia, Caroline Isl., western Samoa and Hawaiian Islands]
KV22

JUNCACEAE, Rush Family

*__Juncus bufonius__ L. COMMON TOAD RUSH
Crater, Palikū; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope. 4100-7800 ft.
Small herb of upper elevation disturbed areas, such as along trails and fencelines. First collected in the Park by C.N. Forbes in 1919.
[Alien: native to Eurasia, north Africa and North America]
C22,HR40

*__Juncus ensifolius__ Wikstrom
West slope, small population in small clearing on trail along west boundary fenceline east of Hosmer Grove by A.C. Medeiros in 1990. Population is located approx. 5 m uphill of fenceline, marked in 1990 with red flagging on fence. This species was first collected in Maui, east of Ukulele camp on NW Haleakalā (C.N. Forbes 901M, BISH).
[Alien: native from western U.S. to Alaska and the Aleutions. In Hawaiian Islands found on Hawai`i and Maui]

*__Juncus planifolius__ R. Br.
Kīpahulu Valley; NE rift. 3700-6100 ft.
An aggressive herb that in recent years has invaded and come to dominate disturbed bog turf at Big and Mid-Camp Bogs on the northeast rift of the Park. In addition, it is found around Palikea Camp and along Palikea Stream at 3700 feet, and along the central pali at 4500 feet. It is especially persistent in disturbed sites such as fencelines, trails and areas of high pig activity. First collected in Hawaiian Islands on Hawai`i at Kilauea in 1941 on road shoulders (G.E. Olson s.n., BISH). First collected on Maui along forestry road in Waikamoi in 1964 (M.R. Crosby & W.R. Anderson 1812, BISH).
[Alien: native to South America, New Zealand, and Australia]
Representative specimen: A.C. Medeiros 679, 680, B.H. Gagne 1032 (BISH)

*Juncus tenuis Willd.
Crater along Halemauu Trail near Palikū Cabin. 6360-8000 ft.
Perennial, unbranched rush with inflorescence forming less than 1/3 of the plant, naturalized in usually wet sites in disturbed areas. First collected in the Park by Emil Lynch in 1998.
[Alien: native to North and South America, Europe, Asia and Australia]

Luzula hawaiiensis Buch.
var. hawaiiensis
Crater, Palikū cliffs; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui, Kuiki and rain forest; NE rift; West slope. 4600-9500 ft.
Common herb of a variety of upper-elevation, high light-intensity sites in forest openings, bogs, shrublands and grasslands.
[Endemic: main Hawaiian Islands]
C22,HR40,K34,KV22,M98,SS156

LEMNACEAE, Duckweed Family

*Lemna minor L. DUCKWEED
Lower Kīpahulu Valley
Usually riparian, but also found on wet cliff faces, this moss-like plant is locally common up to 500 ft elevation.
[Alien: nearly cosmopolitan]
KV22,LK25

LILIACEAE, Lily Family

Astelia menziesiana Sm. *PA'INIU, KALUAHA*
[= Astelia degeneri Skottsb. sensu K34,K40,M98,KV22]
[= Astelia forbesii Skottsb. sensu C23,HR40,K34,KV22]
Crater, Palikū cliffs; Kīpahulu Valley; Manawainui; NE rift. 2500-7000 ft.
Silvery, pubescent, large herb found in relatively undisturbed *koa* and *`ōhi`a* rain forests. At ca. 3000-5000 ft, this species is primarily epiphytic, growing along the bryophyte-laden trunks of tall trees. At higher elevations (5000-7000 ft), though also found epiphytically, this species often occurs terrestrially, growing as a near continuous groundcover on wet, windswept ridges of undisturbed forests. Such Astelia mats are rapidly destroyed by feral pigs, as Astelia is a preferred food. Before a recent review of the genus (Wagner et al. 1990), narrow-leaved, often epiphytic, individuals of this genus on East Maui were referred to as A. degeneri and broad-leaved, often terrestrial, individuals of higher elevations were referred to as A. forbesii. In the recent treatment, both entities are merged with the widely ranging Hawaiian Island endemic, A. menziesiana. Native members of the damselfly genus Megalagrion have been known to lay eggs in the midribs of the leaves of Astelia, and naiads of certain species have also been found living in the moist leaf bases (Zimmerman 1948). Flowering observed in September; fruiting observed in October.
[Endemic: main Hawaiian Islands]
C23,HR40,K34,KV22,M98

#**Dianella sandwicensis** Hook. and Arn. *'UKI*
Crater, near Kapalaoa and Hōlua; Manawainui.
Large iris-like herb with pale to bright blue fruits, uncommon in mesic middle-elevation forest to 5500 ft, and rare in moist `a`a lava of the Crater at 6000-7050 ft. When sterile, this species resembles Machaerina angustifolia. This species flowers in spring and fruits in summer. Ethnobotanically, the berries were used in preparing a blue dye for *kapa*.
[Indigenous: Marquesas and Hawaiian Islands]
C23,M98,SS157

*__Hippeastrum puniceum__ (Lam.) Voss BARBADOS LILY
Lower Kīpahulu Valley
Red to salmon-flowered lily planted and sparsely reproducing at roadside.
[Alien: native to the tropical America]
KV18,LK20

MUSACEAE, Banana Family

+__Musa__ x __paradisiaca__ L. BANANA, *MAI`A*
Lower Kīpahulu Valley
Planted, persistent, scattered groups of banana occur in lower to middle elevation rain forest in Kīpahulu Valley at 500-2800 ft, presumably relicts of Hawaiian cultivation. The predominant variety in lower Kīpahulu is the *`iholena* cultivar with characteristic light bronze young leaves (Hobdy in Wagner et al. 1990).
[Polynesian introduction: most edible bananas are sterile triploids that probably originated in Malesia and Southeast Asia]
K35,KV22,KW12,LK25

ORCHIDACEAE, Orchid Family

__Anoectochilus sandvicensis__ Lindl.
Kīpahulu Valley; Manawainui; NE rift.
Rare, succulent, rhizomatous, native orchid of undisturbed shady understory of rain forest. 2750-5440 ft. This species increasing after removal of pigs (S. Anderson and W. Haus, pers. comm.). Flowering observed from August to September; fruiting observed in October.
[Endemic: main Hawaiian Islands]
HR41,K35,KV23,M99

*__Arundina graminifolia__ (D. Don) Hochr.. BAMBOO ORCHID
[= Arundina bambusaefolia (Roxb.) Lindl. sensu KV23]
Erect, rhizomatous orchid of disturbed sites in Kīpahulu Valley to at least 2600 ft. One plant was discovered and pulled near Fern Camp on 2/13/97.
[Alien: native to Southeast Asia, India, Malesia, and Pacific islands] KV23

*__Epidendrum ?x obrienianum__ SCARLET, BUTTERFLY, or BABY ORCHID
Kīpahulu Valley, ca. 2500 ft.

Usually terrestrial, red-flowered orchid sparsely naturalized in Hawaiian Islands First collected by B.H. Gagne in 1988 growing epiphytically on *koa* trunk along mid-Valley (Dogleg) transect 5, below fence about halfway along the line.
[Alien: cultivar hybrid]
Representative specimen: B.H. Gagne 1025 (BISH)

***Habenaria repens** Nutt.
Lower Kīpahulu Valley
A small group of plants of this species was found in a pasture east of Kalena Stream, 1000 ft. These orchids are thought to represent an escape or persistent cultivation attempt. Wagner et al. (1990) cite a Maui collection (R.W. Hobdy 1829) of Habenaria sp. from a naturalized population in a pasture in Kula. It is uncertain whether these plants also represent H. repens. Presumably planted and probably not reproducing in the Park.
[Alien: native to the southeastern U.S.]
KV23,LK25

Liparis hawaiensis Mann *`AWAPUHI-A-KANALOA*
East Kaupō Gap, understory of Myrsine forest; Kīpahulu Valley; Manawainui; NE rift.
Rare, bulb-forming, few-leaved native with inconspicuous yellow-green flowers. 2600-5500 ft. Flowering observed from April to July; fruiting observed from August to October.
[Endemic: main Hawaiian Islands]
HR41,K35,KV23,M99

***Phaius tankarvilleae** (Bankss ex L'Her.) Blume CHINESE GROUND ORCHID, NUN'S ORCHID, NUN'S HOOD
Kīpahulu V, lower shelf, near Delta and Dogleg camps.
Uncommon orchid with flowers white to cream-colored on the outside, and with purple to wine-colored interiors.
[Alien: native from southern China throughout Malesia to Australia and New Caledonia.]

Platanthera holochila (Hillebr.) Krzl.
NE rift; Ko`olau Gap (TNC).
This erect, green orchid, formerly found in the Park, was last collected there in 1920 (C.N. Forbes 1194M) near Wai`ānapanapa (6900 ft). On East Maui, a single population is now known from Ko`olau Gap within Waikamoi Preserve (TNC) at 6050 ft. This small population (3-6 plants) is protected from feral pigs by a small fenced exclosure. This population was last verified in November 1988 (flowering). Other undiscovered populations may exist in Ko`olau Gap based on historical records (Degener 1975 and J. Tavares, pers. comm.). Not currently known from the Park.
[Endemic: Kaua`i, O`ahu, Moloka`i, West Maui, and East Maui]

***Schomburgkia? sp.**
Crater, Palikū, 6800 ft.
Single clump (0.3 m x 0.6 m) epiphytic in Sophora tree behind Palikū patrol cabin near water tank. Discovered by D. Texeira in 1990. Planted and not apparently reproducing.

Representative specimen: B.H. Gagne 1006 (BISH)
[Alien: some species are native to Central America]

*__Spathoglottis plicata__ Bl. MALAYAN GROUND ORCHID
Kīpahulu Valley
Conspicuous, naturalized, purple-flowered ground orchid with plicate, or folded, leaves; of disturbed areas at lower to middle elevations, 470-2650 ft.
[Alien: native to Southeast Asia, Malesia and a few Pacific islands]
K35,KV23,KW13

PALMAE, Palm Family (see ARECACEAE)

PANDANACEAE, Screw Pine Family

#__Freycinetia arborea__ Gaud. *`IE`IE*
Kaumakani; Kīpahulu Valley; Manawainui.
Robust, mat-forming liana, apparently greatly depleted in dry-mesic to mesic forests due to browsing by feral mammals. Rat damage is often conspicuous on the red, fruiting spadices. Currently found in low to middle elevation *`ōhi`a* or *koa* forest. 600-3600 ft. The nymphs of certain native members of the damselfly genus Megalagrion have been recorded living in the moist leaf axils of Freycinetia and Astelia (Zimmerman 1948). Flowering observed from May to October; fruiting observed from September to February. Ethnobotanically, fibers from the aerial roots of this species were used in constructing fishtraps, baskets, helmets (*mahi'ole*), and images (*ki'i*); this was one of five plants offered at *hula* alters (Abbott 1992).
[Indigenous: Polynesia, Samoa, New Caledonia, and main Hawaiian Islands]
K32,KV23,M99,SS159

#__Pandanus tectorius__ Warb. *HALA, PŪHALA*
[= Pandanus odoratissimus L. sensu LK26]
Lower Kīpahulu Valley, along coast, 20-200 ft.
Small trees of the coast or moist lowland forest with rosettes of long spiny leaves. Ethnobotanically, the leaves were used for plaiting, called *lauhala* to make mats, thatching and other items. Beginning in 1984, *hala* trees were planted in the lower pastures along the trail to Waimoku and below the road.
[Indigenous: Pacific islands to Australia and New Guinea, and main Hawaiian Islands]
KV23,LK26

POACEAE (GRAMINEAE), Grass Family

*__Agropyron__ cf. __repens__ (L.) Beauv. WHEATGRASS
West slope, near abandoned dump site along Hosmer Grove road, 6800 ft elevation. Single, large, localized patch present. First collected in the Park and apparently a new state record in 1988.
Voucher: A.C. Medeiros & P.K. Higashino 819, BISH

#**Agrostis avenacea** Gmel. *HE`U-PUEO*

[= Agrostis retrofracta Willd. sensu Mitchell (1945)]

Crater; west Kaupō Gap; Kīpahulu Valley; NE rift, Mid-Camp Bog; West slope.

Wispy, annual grass of disturbed areas, usually occurring in arid areas; also small population naturalized in Mid-Camp Bog in extremely wet area. The first known collection of this species in the Park was made in 1937 (Tachikawa 44, BISH). Mitchell (1945) noted this species present only along the trail in east Kaupō Gap, indicating that it has likely spread considerably in the past 45 years. Hillebrand (1888) and Connor in Wagner et al. (1990) consider this species indigenous; however, St. John (1973) considered this species adventive. 4300-8000 ft.

[Indigenous: native to Australia and Pacific basin, including Hawaiian Islands]

C17,HR35, Mitchell (1945)

Agrostis sandwicensis Hillebr.

[= Agrostis fallax Hillebr. sensu HR36, NE rift]

Crater; NE rift, Big Bog; West slope. 5500-10,000 ft.

A recent revision by O`Connor in Wagner et al. (1990) merges two endemic perennial bunchgrasses: A. fallax (restricted to montane bog turf) and Agrostis sandwicensis sensu Hillbrand, relatively common at barren cinder areas above 9000 ft.

[Endemic: O`ahu?, West Maui, East Maui and Hawai`i]

C17,HR36,SS159

*__Agrostis stolonifera__ L. REDTOP

[?= Agrostis alba L. sensu C16]

Crater, below Palikū; east Kaupō Gap; West slope, near Hosmer Grove and below service trail at 7600 ft.

Perennial grass, superficially resembling Deschampsia nubigena, first collected in Park at Palikū in 1969 (J. Henrickson 3893, BISH) with the note, "forming solid patches with Rubus."

[Alien: native to Europe, widely naturalized]

C16

*__Aira caryophyllea__ L. SILVER HAIRGRASS

Crater; west Kaupō Gap.

Wispy, annual grass of rockland and subalpine shrubland. First collected in Park in 1948 (R.L. Wilbur & G.L. Webster 1022, BISH).

[Alien: native to Europe, widely naturalized]

C17

*__Andropogon virginicus__ L. BROOMSEDGE

Kaumakani, 3600 ft; Kaupō Gap, on Haleakalā peak ridgeline and in flats in western gap; Kī pahulu Valley; NE rift, at Mid-Camp and Big Bogs.

An aggressive perennial grass that can invade a variety of wet to dry sites. In leeward areas, it can increase the wildfire potential. In windward areas, it invades landslide scars, accelerating soil loss by encouraging further landslides and Andropogon colonization. This species was first observed in Kīpahulu Valley in mid-1979 (Canfield and Stemmermann 1980); in west Kaupō Gap at 4000 ft in 1986 (to 6220 ft in 1995); in northeast rift bogs at 5440 ft in 1986 (destroyed). In Kīpahulu Valley, this species occurs in open swampy areas and on landslides and steep areas along northern cliffs of the lower level; it appears to be spreading. In Mid-Camp and Big Bog it continues to persist despite manual control efforts and in the future may become a serious threat to the unique vegetation of these areas. 2700-6220 ft.
[Alien: native to eastern North America]
KV20,LK22

*__Anthoxanthum odoratum__ L. SWEET VERNAL GRASS
Crater; Kaupō Gap; Kīpahulu Valley; West slope.
One of the most common grasses of subalpine shrubland and grasslands and less commonly in disturbed areas (streamcourse, trails) in upper elevation rain forest. 4500-10,000 ft. When sterile, superficially similar to Holcus but distinguished by lack of pubescence and blue-green glaucous cast of the sweet smelling, crushed foliage. First collected in Park in 1937 (G.E. Olson 37, BISH) with the description note, "Halemau`u trail, near crater floor."
[Alien: native to Europe, widely naturalized in North America]
C17,KV20

*__Avena sativa__ L. CULTIVATED OAT
West slope
This annual is rare and sporadic in the stable area at 6800 ft, apparently germinated from grain used as horse feed.
Alien: native to southeastern Europe or western Asia]

*__Axonopus compressus__ (Sw.) Beauv. BROAD-LEAVED CARPETGRASS
Kīpahulu Valley 200-3900 ft.
Common non-native grass, invasive in native wet forests, especially in areas of frequent disturbance. Not listed by O`Connor in Wagner et al. (1990).
[Alien: native to America]
KV20,KW9,LK22

*__Axonopus fissifolius__ (Raddi) Kuhlm. NARROW-LEAVED CARPETGRASS
[= Axonopus affinis Chase sensu KV20]
Lower to middle Kīpahulu Valley 1500-3800 ft. Flowering observed in April and May.
Distinguished from A. compressus by its narrower leaves, glabrous nodes and grain that fills the whole spikelet (Whistler 1994).
[Alien: native to tropical and subtropical America]
KV20

*__Brachiaria mutica__ (Forssk.) Stapf CALIFORNIA GRASS
Lower Kīpahulu Valley

Common, tall (ca.1-2 m), perennial grass with long-creeping stems, hairy foliage with long-creeping stems, hairy foliage and large panicles of often zig-zag racemes; found in wet, disturbed lower elevation areas, 20-500 ft. Two isolated populations along upper Dogleg fenceline at 3100 ft were discovered and treated with herbicide in 1992 (P. Welton pers. comm.). Seed apparently accidentally introduced with fencing materials. This species can dominate vegetation along moist, low elevation watercourses.
[Alien: pantropical]
KV20,LK22

*__Bromus tectorum__ L. CHEAT GRASS
[= Bromus rigidus Roth sensu C17]
Crater, in grassy areas near Kapalaoa, Mauna Hina, and Namana o ke akua; Kaupō Gap; West slope, uncommon from lower boundary to summit. 4100-10,000 ft.
Wispy, annual grass, especially common in areas of disturbed cinder. This species first collected in the Park on "Haleakalā crater floor" in 1933 (F.R. Fosberg 9936, BISH). Mitchell (1945) cited this species as present in the Park in the Crater at the "base of Hanakauhi." Hillebrand (1888) stated that B. tectorum occurs "in abandoned wheatfields of Makawao and Kula, Maui! A common grass of Europe and northern Asia which has spread with wheat cultivation over many parts of the world." O`Connor in Wagner et al. (1990) states "it is adventive on East Maui, at least since 1871."
C17, Mitchell (1945)

*__Bromus willdenowii__ Kunth RESCUE GRASS
[= Bromus catharticus Vahl]
Crater; east Kaupō, moist sites along upper trail, 5600-6300 ft; West slope, research area and near observatory summit buildings. 5600-10,000 ft.
Tall, coarse, perennial grass, somewhat uncommon, but apparently spreading. First collected on Maui at "Waiopai Ranch", Nu`u district in 1920 (C.N. Forbes 1856M, BISH). This species may in the future be transferred back to B. catharticus Vahl (BISH herbarium note by W.D. Clayton, 1994).
[Alien: native to South America]
Representative specimen: A.C. Medeiros & L.L. Loope 409 (BISH)

__Calamagrostis expansa__ (Munro in Hillebr.) Hitchc.
Manawainui; NE rift. 5100-6900 ft.
Large, (0.5-2.0 m tall), scabrous grass of upper-elevation rain forest, especially along open-canopied ridgelines, and in turf and borders of montane bogs.
[Endemic: East Maui]
Representative specimen: A.C. Medeiros 279 (BISH)
HR36

*Chloris divarcata R. Br. STAR GRASS
Kīpahulu V., Charlie camp, in disturbed area.
A single one meter square area, probably brought in with fence material or pallets, discovered and treated with rodeo in Oct. 1993, (W. Haus, pers. comm.)
[Alien: native to New Caledonia and Australia]

*Chloris virgata Sw. FEATHER FINGERGRASS
West slope, 6900-7000 ft.
Rare, roadside weed, first collected in 1982, last seen in 1985.
[Alien: native to tropical America and Jamaica.]
Representative specimen: A.C. Medeiros 286 (BISH).

#Chrysopogon aciculatus (Retz.) Trin. GOLDEN BEARDGRASS, *MANIENIE-`ULA*
Lower Kīpahulu Valley
Degener (1938) believed this grass to be a Polynesian introduction but reports that Hitchcock believes it was a post-contact introduction.
[Indigenous: tropical Asia, Malesia, Australia and Pacific islands, and questionably indigenous to main Hawaiian Islands]
KV20,LK22

*Coix lachryma-jobi L. JOB`S TEARS, *KŪKAE-KOLEA*
Lower Kīpahulu Valley
Tall, clump-forming grass found in lower disturbed Valley up to lower *koa* forest at 2400 ft (M. Defley, pers. comm.). First reported in Kīpahulu Valley by Fagerlund (1945).
[Alien: native to Asia]
KV20,KW9,LK23,M99

*Cortaderia jubata (Lem.) Stapf ANDEAN PAMPAS GRASS
Crater, Halemau`u switchbacks and cliffs north of base of Halemau`u switchbacks, ca. 6600 ft.
The first report of this tall, invasive bunchgrass in the Park was made in November 1989 by a Park Resource Management crew from a helicopter (P.C. Connally, R.J. Nagata, T. Rodrigues). In July 1990, the single, but very large, flowering plant was dislodged from the cliff, ca. 150 ft. above the Crater floor. On a later field trip (1/15/91), seven seedlings were destroyed, an eighth seedling was beyond reach and left for a later effort with specialized gear. All seedlings were found on steep, open, rock scree within 5 m of the site of the original plant. The large rootstock (over 18 kg) of the original plant had resprouted but not rerooted. It was removed by helicopter in 1/91. Nine seedlings were destroyed in 8/94 ; two seedlings out of reach. This site should be monitored for Cortaderia seedlings in the coming years. In 1996, a 25 cm (10 inch) seedling of this species was found and removed from Haleamau`u trail and in March, 1998, two more seedlings (8 and 10 inches) were removed below the original parent plant. Several young plants were also removed from shrubland habitat above Park headquarters in 1998 during monitoring of the Argentine ant. Seeds of this weed were probably carried into the Crater by wind or humans from established populations in residential Kula.

Currently, this invasive grass has become established in several scattered stands in predominantly native montane rain forest on both East and West Maui. This species appears capable of having ecosystem-modifying effects in rain forest, sub-alpine shrublands and grasslands and should be considered among the highest priorities for control by management.
Alien: native to South America (Ecuador, Peru, Bolivia, and Argentina).
Representative specimen: B.H. Gagne 3033 (BISH)

*__Cynodon dactylon__ (L.) Pers. BERMUDA GRASS, *MANIENIE-HAOLE*
Crater, near Halemau`u trail base; east Kaupō Gap; lower Kīpahulu Valley; West slope.
Perennial mat-forming grass, mostly in disturbed sites at 20-8800 ft and (west slope) roadside weed at 6800-8800 ft.
[Alien: probably native to tropical Africa but now widely naturalized]
C17,KV20,LK23

*__Dactylis glomerata__ L. ORCHARDGRASS, COCKSFOOT
Crater, Halemau`u trail base and east side; West slope.
Common, tall, perennial grass of disturbed subalpine shrubland, 6800-10,000 ft. This species first collected on Maui in Ko`olau Gap in 1919 (C.N. Forbes 1051M, BISH).
[Alien: native to Europe]
C18

*__Danthonia pilosa__ R. Br. HAIRY OATGRASS
West slope, near Hosmer Grove (6800 ft) and service trail junction (7800 ft). Unverified reports of plants near the "Crystal Cave" area of the crater (Haus and Welton pers. comm.).
Wispy, annual grass, especially common in moist disturbed sites with developed soils at 6800-7500 ft. This species first collected on Maui on Haleakalā in 1938 (Anonymous s.n., BISH). This species may be recognized in the future as Rytidosperma pilosum (R. Br.) Connor & Edgar (BISH herbarium note by W.D. Clayton, 1994).
[Alien: native to Australia]
C18

*__Danthonia semiannularis__ (Labill.) R. Br. WALLABY GRASS
West slope, near Hosmer Grove (6800 ft) and service trail junction (7800 ft).
Wispy, annual grass in moist disturbed sites with developed soils at 6800-7500 ft. Less common than D. pilosa, superficially resembling Festuca rubra. This species first collected near the Park in 1937, noted as "common" in pasture near Pu`u-nianiau (E.Y. Hosaka 1767, BISH). This species may be recognized in the future as Rytidosperma semiannularis (Labill.) Connor & Edgar (BISH herbarium note by W.D. Clayton, 1994).
[Alien: native to Australia]
C18

__Deschampsia nubigena__ Hillebr.
[= Deschampsia australis Nees ex Steud. sensu C18,HR36,K33,KV20,LK23,M99, SS160]
[= Deschampsia sp. sensu LK23]
Crater; Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope.

This perennial bunchgrass is a common to dominant component of a variety of subalpine habitats, including shrublands, cinder fields, and grasslands. It is also a conspicuous component of vegetation of montane bogs and upper elevation forest openings. The species is less common, but present in rain forest, especially along stream courses even to low elevations. Elsewhere on East Maui, Deschampsia is found in windward stream courses down nearly to sea level. 1200-9800 ft.
[Endemic: main Hawaiian Islands]
C18,HR36,K33,KV20,LK23,M99,SS160

Dichanthelium cynodon (Reichardt) C. A. Clark and Gould
[= Panicum lamiatile St. John sensu HR37]
[= Panicum lustriale St. John sensu HR37] Kalapawili, at Flat Top Bog; NE rift, in montane bogs.
Small-leaved, rosette-forming grass, nearly ubiquitous in montane bogs of the Park at 5440-7440 ft. This grass can be a pioneer species, growing well in open areas (especially in Oreobolus stands). Dichanthelium is a segregate genus of Panicum in part separated by a C^3 versus C^4 photosynthetic pathway.
[Endemic: Kaua`i, Moloka`i and Maui]
Representative specimen: A.C. Medeiros 395 (BISH)
HR37

Dichanthelium hillebrandianum (Hitchc.) H.A. Clark and Gould
NE rift.
In the Park, this loosely-tufted grass is rare and localized only in bog turf at Big Bog, 5440 ft elevation.
[Endemic: Kaua`i, Moloka`i, West Maui, East Maui, and Hawai`i]
Representative specimen: B.H. Gagne 416 (BISH)

*__Digitaria ciliaris__ (Retz.) Koeler HENRY`S CRABGRASS
[= Digitaria adscendens (HBK.) Henr. sensu LK23,KV20]
[= Digitaria sanguinalis (L.) Heist. sensu Hawaiian botanists,LK23,KV20]
Lower Kīpahulu Valley, low elevations to 2400 ft.
As defined by O`Connor in Wagner et al. (1990), this species is extremely variable (P.J. O`Connor, pers. comm.) but can be distinguished by its "4-12 spreading racemes mostly 7-15 cm long, paired, unequally stalked lanceolate spikelets, and a scale-like lower glume" (Whistler 1994).
[Alien: native to China, Indo-China, Samoa and the Philippines]
KV20,KW,LK23

*__Digitaria insularis__ (L.) Mez ex Ekman SOURGRASS
[= Tricachne insularis (L.) Nees]
Lower Kīpahulu Valley, NE rift.
Medium-large, erect grass of disturbed areas at drier, lower elevations, unpalatable to ungulates.
[Alien: native to tropical America]
Henrickson 1971.

*__Digitaria pentzii__ Stent PANGOLA GRASS
[= Digitaria decumbens Stent sensu KV20,LK23]
Lower Kīpahulu Valley
This introduced pasture grass has not previously been collected on Maui according to O`Connor in Wagner et al. (1990). It is similar to D. ciliaris listed above.
[Alien: native to Africa]
KV20,LK23

*__Digitaria setigera__ Roth *MAU`U-KŪKAEPUA`A*, ITCHY CRABGRASS
[= Digitaria pruriens (Fisch. ex Trin.) Buse sensu KV20,LK23]
Lower Kīpahulu Valley
Whistler (1994) states that this grass "once used in native remedies in Hawai`i" can be distinguished "by its 3-20 racemes that spread very little, spikelets 2-4 mm long, and the lower glume absent or minute."
[Alien or questionably indigenous: native to tropical Asia and Pacific islands]
KV20,LK23

*__Digitaria violascens__ Link. *KŪKAIPUA`A-UKA*
Lower east and west Kaupō Gap.
Low wispy annual grass, common in disturbed, dry, rocky sites, 4000-5500 ft. This species is less common than previously (<1985) having been overtopped by non-native grasses and native shrubs due to the elimination of feral goats.
[Alien: native to China, India and Australia]
C18

*__Echinochloa colona__ (L.) Link JUNGLE-RICE
Lower Kīpahulu Valley
A tufted, annual grass "distinguished by its panicle of short, alternating branches bearing densely packed, awnless, acute-tipped spikelets in several rows" (Whistler 1994).
[Alien: native to Old World tropics]
KV20,LK23

*__Echinochloa crus-galli__ (L.) P. Beauv. BARNYARD GRASS
Lower Kīpahulu Valley
Distinguished from E. colona by its acuminate or awned spikelets (Whistler 1994).
[Alien: native to warm temperate and tropical areas worldwide]
KV20,LK23

*__Ehrharta stipoides__ Labill. MEADOW RICEGRASS, *PU`U-LEHUA*
[= Microlaena stipoides (Labill.) R. Br. sensu KV21]
Kīpahulu Valley

Aggressive, naturalized species known from at least four populations in Kīpahulu Valley: at Charlie camp, at Charlie helipad, both at ca. 4700 ft. and two populations along central Valley trail at 4200 ft (Anderson et al. 1992). 4200-4700 ft. Active management by application of foliar herbicide (2% Rodeo) has been an important factor in the suppression of this aggressive understory grass; however populations persist as of February 1998 (P. Welton, pers. comm.).
[Alien: native to Australia, New Zealand and the Philippines]
KV21

*__Eleusine indica__ (L.) Gaertn. GOOSEGRASS, *MANIENIE-ALI`I*
Lower Kīpahulu Valley, 20-470 ft.
Whistler (1994) states "this grass can be distinguished by its flattened culms, 2-7 coarse, terminal, digitate branches...and glumes that persist in the rachis."
[Alien: native to Old World, but widely naturalized]
KV20,LK23

*__Eragrostis brownei__ (Kunth) Nees in Hook. and Arn. BROWN`S LOVEGRASS
Crater; East and west Kaupō Gap; NE rift; West slope.
Low, perennial grass common along trails and in disturbed grassy sites. 4000-8500 ft. This species first collected in the Park in 1945 (H. St.John & A. Mitchell 21,215, BISH). Mitchell (1945) cites the distribution of this species in the Park as "West of Palikū, on lava plain."
[Alien: native to Australia]
C18,HR38

__Eragrostis grandis__ Hillebr.
Crater, Palikū cliffs; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Large, perennial bunchgrass, often growing pendent from steep waterfalls and wet cliff faces. 2890-6500 ft. Flowering observed from April to June. Fruiting observed from July to February.
[Endemic: main Hawaiian Islands]
C19,HR36,K33,KV21,M100,SS161

__Eragrostis variabilis__ (Gaud.) Hillebr. *`EMO-LOA*
West Kaupō Gap; Manawainui. 3900-5140 ft.
Large, perennial bunchgrass, growing in a variety of habitats from xeric and mesic shrublands to wet cliff faces. In certain, more intact areas of shrubland in Kaupō Gap, this species is a common understory component. Though depleted in the past by feral goat browsing, this species, now protected, is spreading in Kaupō Gap.
[Endemic: Hawaiian Islands]
Representative specimen: A.C. Medeiros & L.L. Loope 420 (BISH)
SS161

*__Festuca arundinacea__ Schreber TALL OR MEADOW FESCUE
[= Festuca elatior L. sensu C19]
Crater; West slope.

Medium-large, perennial pasture grass, uncommon along trails and in disturbed grassy sites in the Park. Not listed by O`Connor in Wagner et al. (1990) for Maui.
[Alien: native to Europe and temperate Asia.]
C19

*__Festuca rubra__ L. RED FESCUE
Crater; West slope. 6800-7500 ft.
Uncommon grass along trails and in disturbed grassy sites. First collected in Park in 1969 in Kalapawili grasslands (J. Henrickson & R. Vogl 3836, BISH).
[Alien: native to Europe.]
Representative specimen: A.C. Medeiros 671 (BISH)
C19

*?__Garnotia acutigluma__ (Steud.) Ohwi
[= Garnotia sandwicensis Hillebr. sensu K33,KV21]
Kīpahulu Valley
Last collected in 1967 (C.H. Lamoureux & R. DeWreede 4050), this species is described as uncommon below 2500 ft elevation (Lamoureux 1968). On East Maui, this species has also been collected in the Nahiku and Waiho`i districts (BISH collections). This species was formerly considered an Hawaiian endemic, but in a recent review (O`Connor in Wagner et al. 1990) was treated as an non-native species noting the similarity between Hawaiian and Chinese specimens cited in Gould (1972).
[Unknown if this species is non-native or indigenous. Elsewhere this species is native to Asia and Malesia; in the Hawaiian Islands, it occurs on Moloka`i, Maui and Hawai`i.]
K33,KV21

*__Gastridium ventricosum__ (Gouan) Schinz and Thell. NITGRASS
West Kaupō Gap.
Common annual grass in rocky sites of west Kaupō Gap at 3900-6400 ft. This species first collected, apparently within the current Park in 1909 (A. Faurie s.n., BISH).
[Alien: native to Europe]
C19

*__Glyceria fluitans__ (L.) R. Br.
[= Panicularia fluitans Hitchcock 1922]
This species is known in the Hawaiian Islands from a single collection made in 1916 "on wet ground in Haleakalā Crater...(Hitchcock 14,996, BISH)" (O`Connor in Wagner et al. 1990).
[Alien: native to Eurasia]

*__Holcus lanatus__ L. VELVETGRASS, YORKSHIRE FOG
Crater; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope. 2000-10,000 ft.

One of the most common non-native species in moist upland ecosystems on East Maui. This perennial, sprawling grass has invaded native shrubland, grassland, rain forest and bogs, especially in the rootings of feral pigs. This species is somewhat frost-sensitive, especially in drier sites where it shows considerable dieback after repeated frosts. The first collection of this species on Maui was made in 1919 at Ukulele camp (C.N. Forbes 739M, BISH) and at Ko`olau Gap (C.N. Forbes 1052M, BISH). Mitchell (1945) noted this species present at the Ranger Station, Pu`u-nianiau, `Ainahou, Ko`olau Gap, Hōlua, Palikū, east Kaupō Gap, and `O `ili-pu`u.

[Alien: native to Europe]

C19,HR36,K33,KV21,KW10,M100

***Hordeum vulgare** L. BARLEY, *HUA PALE*

West slope, 6800 ft., in disturbed ground in stables area. First collected in Park in 1993.

Wagner et al. (1990) state that this grass "with stout awns 60-160 mm long, leaf blades 5-16 mm wide, and the rachis not breaking apart...is a crop plant that occasionally escapes, at least on Kaua`i, O'ahu, Maui, and Hawai'i."

Representative specimen: A.C. Medeiros 2000 (BISH)

[Alien: native to temperate Old World; now widely naturalized]

Isachne distichophylla Munro ex Hillebr. *`OHE*

Kaumakani, at 3600-4000 ft; lower Kīpahulu V, along Palikea Stream, and Delta camp, 2400-3100 ft.

This perennial grass is rare within the Park and on East Maui, but more common elsewhere such as in the Ko`olau range of O`ahu. It is characteristically among low vegetation in rain forest. Flowering observed at least in September; fruiting observed from September to December.

[Endemic: main Hawaiian Islands]

KV21

Ischaemum byrone (Trin.) Hitchc. HILO ISCHAEMUM

Lower Kīpahulu Valley

Rare, sparse grass growing between rocks at the mouth of `Ohe`o Gulch near sea level. First collected in the Kīpahulu District in 1989. This species listed as Endangered by USFWS. Elsewhere on East Maui, this species is found in coastal habitats from Ha`iku to just south of Kīpahulu (Puhilele pt.), an area which was recently added to the park.

Representative specimen: B.H. Gagne 998 (BISH)

[Endemic: Moloka`i, Maui, Hawai`i]

***Lolium multiflorum** Lam. ITALIAN RYEGRASS

Crater; West slope, in lawns 6800-7000 ft.

This grass is known from the Crater by a single specimen collected near Kapalaoa sometime from 1975-1977 (Stemmermann et al. 1981); not seen in Crater since.

[Alien: native to Europe and Mediterranean region]

C19

*__Melinis minutiflora__ Beauv. MOLASSESGRASS

East and west Kaupō Gap, 4000-6100 ft; Kīpahulu Valley, e.g. scattered along mid-Valley (Dogleg) fence, Delta helipad, 600-5200 ft; Manawainui, 5000-5500 ft; West slope, rare roadside weed, 7000 ft (no longer extant).

1995 to 6000 ft west Kuiki (A. Miller, pers. comm.)

This mat-forming, fire-adapted, perennial grass is an aggressive species that presents a severe threat to native species, primarily in leeward areas, such as in Kaupō Gap and along the grass-dominated western rim of the Manawainui planeze. For this reason, it is now the focus of intensive management in the Kaupō Gap area of the Park utilizing aerial spraying of the herbicide Roundup. This species was first collected near the Park in 1976 in Manawainui (P.K. Higashino & G. Mizuno 2379, BISH). Higashino and Mizuno (1976) stated that 4800 ft was the upper elevation range of this grass in the Manawainui area. After goat browsing was curtailed in ca. 1987, molassesgrass spread explosively in both east and west Kaupō Gap, on the ridgeline below Haleakalā peak, and the western rim of the Manawainui planeze. 1300-7000 ft.

[Alien: native to Africa]

KV21,KW10,LK23,M100

*__Oplismenus hirtellus__ (L.) Beauv. BASKETGRASS, *HONOHONO-KUKUI*

Kīpahulu Valley

Fairly common, understory grass with broad leaves, and spikelets with long, usually purple bristles; of disturbed areas into lower to middle elevation forests. 50-2900 ft.

[Alien: native to tropics]

K33,KV21,KW10,M100

__Panicum fauriei__ Hitchc. var. __latius__

Lower Kīpahulu Valley

Present in a small exclosure built in 1993 in Puhilele, just south of Kīpahulu; similar to but more hairy than the Endangered P. f. var. carteri, to which this grass had previously been assigned.

[Endemic: main Hawaiian Islands except Ni`ihau]

*__Panicum maximum__ Jacq. GUINEA GRASS

Lower Kīpahulu Valley

Robust, coarse, perennial grass, with large, spreading panicles and glabrous, awnless, elliptic spikelets (Whistler 1994); common in low-elevation disturbed sites. 50-?500 ft.

[Alien: native to Africa]

KV21,LK23

__Panicum pellitum__ Trin.

[=? Panicum sp. sensu C20]

West Kaupō Gap, 3900-5000 ft.

Wispy, pubescent, annual grass, rare in rocky sites. Elsewhere on Maui, this species is much taller (0.1-0.4 m) than those individuals found at relatively high elevation in lava fields of Kaupō Gap. This species was first recorded in the Park in 1989, two years after removal of feral goats in the Kaupō Gap area. In the wet season, P. pellitum is sparsely scattered throughout leeward East Maui in sites of `a`a lava. The species is common on East Maui only along the southwest rift at Pu`u-o-kali, ca. 500-1200 ft elevation.
[Endemic: Ni`ihau, Lāna`i, Maui and Hawai`i]
C20,SS163

Panicum tenuifolium Hook. and Arn. MOUNTAIN PILI, *KONAKONA*
East Kaupō Gap; formerly Crater near Hōlua and in Ko`olau Gap.
Medium to tall, perennial, erect grass of open mesic to dry habitats. Throughout its range, this species has been highly depleted by browsing mammals. Currently, this species is known in the Park only from the eastern Kaupō/Manawainui area. Historic collections from within and near the Park include east Kaupō Gap "in shade" at 4770 ft in 1939 (G.E. Olson 64, BISH), "rocky region" in Ko`olau Gap in 1927 (O. Degener 10,724, BISH), and at Hōlua area on talus in 1939 (Anonymous s.n., BISH).
4000-4900 ft
[Endemic: O`ahu, Moloka`i, Lāna`i, Maui and Hawai`i]
SS163, Mitchell (1945)

*__Paspalum conjugatum__ Berg. HILO GRASS, *MAU`U-HILO*
Kaumakani; East Kaupō Gap; Kīpahulu Valley, 150-4700 ft; Manawainui, 5000-5500 ft
Common, invasive, perennial grass often dominating the open disturbed understory of *koa* forest at 2000-3400 ft in middle Kīpahulu Valley, extending in openings and along trails up into *`ō hi`a* forest at 4700 ft. By dominating open areas, Hilo grass appears to retard the succession of native species but still allows the establishment of such habitat modifying weeds as Clidemia hirta. Preliminary data show that this grass may decline slowly after removal of feral pigs. First known collection on Maui in 1908 on "upper ditch trail" (H.L. Lyon s.n., BISH). First collection in Park in Kīpahulu Valley at 3000 ft elevation in 1967 (C. Lamoureux and R. DeWreede 3892, BISH) with note "Common in open or disturbed areas in forest." Scattered individuals along trail in east Kaupō Gap, 4000-4300 ft, first seen and treated with herbicide in early 1994 (L. Olney, pers. comm.). Flowering observed year-round; fruiting observed year-round; peaking in October.
[Alien: native to tropical America]
K33,KV21,KW10,LK24

*__Paspalum dilatatum__ Poir. DALLIS GRASS
East Kaupō Gap to 4500 ft; Kīpahulu Valley, 3400-4100 ft; West slope, Hosmer area and roadside to 7500 ft.
Tall, coarse grass that invades disturbed openings in Kīpahulu Valley. Occasional in disturbed areas at higher elevations.
[Alien: native to South America, widely naturalized]
C20,KV21,KW10,LK24, Anderson et al. 1992

*__Paspalum scrobiculatum__ L. RICEGRASS, *MAU'U-LAIKI*
[= Paspalum orbiculare Forst. f. sensu C20,KW10,KV21,LK24,M100]
Kaupō Gap; Kīpahulu Valley, 2000-3300 ft, Manawainui, on eroded ridges; West slope, near Hosmer Grove and roadsides.
Tufted, perennial grass with orbicular to ovate-orbicular spikelets on 4-6 widely spaced, alternate racemes (Wagner et al. 1990).
[Alien: native to Old World tropics]
C20,KV21,KW10,LK24,M100

*__Paspalum urvillei__ Steud. VASEY GRASS
Kaumakani; Kīpahulu Valley 2000-3000 ft; NE rift; West slope.
Tall, coarse grass that invades disturbed openings in rain forest. Flowering observed in June and July; fruiting observed from June to October.
[Alien: native to the Americas]
C20,KV21,KW11,LK24, Anderson et al. 1992

*__Pennisetum clandestinum__ Hochst. ex Chiov. KIKUYU GRASS
Crater; east and west Kaupō Gap; lower Kīpahulu Valley; West slope.
Aggressive mat-forming perennial grass, extremely invasive in moist, open, dryland forest, such as Kaupō Gap and the western rim of the Manawainui planeze. This species is somewhat frost-sensitive, especially in drier sites here showing considerable dieback after repeated frosts. 10-10,000 ft. Anderson et al. (1992) state this species was inadvertently introduced and later destroyed at a feral pig trap at 4800 ft in Kīpahulu Valley. According to monthly narrative reports, this species was first reported in the Park as a problem species, damaging highway paving on the west slope in 1939. According to Mitchell (1945), this species was present in east Kaupō Gap along trailside, somewhere between 4500 and 6000 ft elevation. This grass is currently being adversely affected by the non-native aphid Sipha flava (yellow sugarcane aphid) which, through its feeding, causes chlorosis and deterioration of kikuyu grass health, or in severe cases, even death.
[Alien: native to tropical Africa]
C20,KV21,LK24, Mitchell (1945).

*__Pennisetum purpureum__ Schumach. NAPIER GRASS,ELEPHANT GRASS
Lower Kīpahulu Valley
Tall, locally common grass of disturbed areas in lower Kīpahulu Valley, such as near campgrounds and along access roads. This species is also starting to invade pastures. 50-400 ft.
[Alien: native to tropical Africa]
KV21,LK24

*__Phalaris tuberosa__ L. LARGE CANARYGRASS
var. __stenoptera__ (Hack.) Hitchc.
Crater, Hōlua and Palikū.

Listed as locally common at Palikū (Stemmermann et al. 1981). First Maui collection in 1939 at Makawao (E.Y. Hosaka 2449, BISH). Future taxonomic treatments may recognize Hawaiian representatives as Phalaris aquatica L. (BISH herbarium note by W.D. Clayton, 1994).
[Alien: native to the Mediterranean region]
C20

*__Phyllostachys__ cf. __nigra__ (Lodd.) Munro BLACK BAMBOO
[= Bambusa sp. sensu KV20, LK22]
Kīpahulu Valley
The bamboo of lower northern Kīpahulu Valley is apparently the same common naturalized species of East Maui that forms extensive thickets along the lower elevation northern coast. In Kīpahulu, bamboo occurs in large patches north of Palikea Stream and on the south-facing flanks of Kaumakani, 200-1700 ft. When the Kīpahulu bamboo was planted is unknown, but it may have been associated with the sugar plantation ca. 1890-1920 (M. Tanaka-Sanders, pers. comm.). The Kīpahulu bamboo was already fairly extensive by the 1940s according to long-time local residents of the area (Anna Kahaleuahi, pers. comm.).
[Alien: native to China.]
KV20,LK22

*__Poa annua__ L. ANNUAL BLUEGRASS
Crater; NE rift; West slope. 5440-8000 ft.
Poa species with longer culms (2-10 dm) and base of lemma nerves with copious, cobwebby hairs.
[Alien: native to Europe]
C21,HR37

*__Poa pratensis__ L. KENTUCKY BLUEGRASS
Crater; Kalapawili; Kīpahulu Valley; West slope. 6800-10,000 ft.
Grass with "ligule developed in area between culm and blade only; rhizomes present; sheaths open; margins overlapping" (Wagner et al. 1990).
[Alien: native to Europe, widely naturalized]
C21,KV21

*__Rhynchelytrum repens__ (Willd.) C. E. Hubb. NATAL REDTOP
East and west Kaupō Gap, 3900-6100 ft, near Haleakalā peak on ridgeline to 7640 ft; West slope, 6800-7100 ft.
Dominant grass in disturbed, rocky, lower elevations in Kaupō Gap. This species (with Sporobolus africanus) forms the bulk of the biomass and fuel loading occurring in west Kaupō Gap as a result of removal of feral goats from the Crater district. On the western slopes, this species is a rare roadside weed. Future taxonomic treatments may recognize this species as Melinis repens (Willd.) G. Zizka (BISH herbarium note by W.D. Clayton, 1994).
[Alien: native to Africa]
C21,M100

+**Saccharum officinarum** L. SUGAR CANE, *KO*
Lower Kīpahulu Valley, cultivated.
Planted and not reproducing in the Park.
[Polynesian introduction: probably native to Southeast Asia.]
KV21,LK24

*__Sacciolepis indica__ (L.) Chase GLENWOOD GRASS
Crater; Kaupō Gap; Kaumakani; Kīpahulu Valley, 640-4700 ft; Manawainui, 5000-6000 ft; NE rift. 2000-5500 ft.
Locally abundant grass of disturbed wet sites with high light intensity. This species has been one of the primary invasive species in the 5440 ft bogs on the northeast rift of the Park. First Maui collection in 1908 at "upper ditch trail", Waikamoi area (H.L. Lyon s.n., BISH). This species collected in 1920 on Ke`anae ditch road (C.N. Forbes 2560M, BISH) with note, "said to be new grass in the region. Along trail in Kailua." First collection in Park in Kīpahulu Valley in 1967 at 3000-4000 ft. (C. Lamoureux and R. DeWreede 3997, BISH). Sporadic flowering and fruiting observed year-round.
[Alien: native to Old World tropics, widely naturalized]
C21,HR37,K33,KV21,KW11,LK24,M100

*__Setaria gracilis__ Kunth PERENNIAL FOXTAIL, *MAU`U-KALEPONI*
[= Setaria geniculata (Poir.) Beauv. sensu KV21,KW,LK24]
Kīpahulu Valley 1000-3500 ft.
Grass with yellowish, cylindrical panicles with several bristles below each spikelet (Whistler 1994).
[Alien: native to Europe]
KV21,KW11,LK24

*__Sorghastrum nutans__ (L.) Nash in Small INDIAN GRASS
Kīpahulu Valley
Not listed by O`Connor in Wagner et al. (1990).
[Alien: native to North America.]
KV21

*__Sporobolus africanus__ (Poir.) Robyns and Tournay AFRICAN DROPSEED
Crater; east and west Kaupō Gap; Kīpahulu Valley; West slope.
Dominant grass in disturbed, rocky, lower elevations in Kaupō Gap. This species (with Rhynchelytrum repens) forms the bulk of the biomass and fuel loading occurring in west Kaupō Gap as a result of removal of feral goats from the Crater district. On the western slopes, this species is a rare roadside weed. First collection on Maui "above Ukulele" (NW East Maui) in 1910 (C.N. Forbes 170M, BISH); first collection in Park in Kaupō Gap in 1945 (H. St.John & A. Mitchell 21,177, BISH) with note "on dry rocky slopes, 5000 ft elev., seen from 5500-4700 ft elev. forming clumps."
[Alien: native to Africa]
C21,KV21,M100

*__Sporobolus diander__ (Retz.) Beauv. INDIAN DROPSEED
Kīpahulu Valley
Sporobolus with narrow, somewhat diffuse panicles (versus cylindrical and spike-like in S. africanus and S. indicus) and branches spreading at maturity (versus appressed to axis in S. africanus and S. indicus).
[Alien: native to India]
KV21,M101

*__Sporobolus indicus__ (L.) R. Br. WEST INDIAN DROPSEED
Crater; east Kaupō Gap; Kīpahulu Valley, 20-470 ft.
At maturity, distinguished from S. africanus by its brown (versus dark red) fruit, and slightly shorter spikelets.
[Alien: native to tropical America]
C21,KV21,LK24

*__Stenotaphrum secundatum__ (Walt.) Ktze. ST. AUGUSTINE GRASS, BUFFALO GRASS
Lower Kīpahulu Valley
Spread by runners and cuttings, this grass rarely produces seed in Hawai`i (Haselwood and Motter 1976).
[Alien: native to shores of the Old and New World tropics]
KV21,LK24

__Trisetum glomeratum__ (Kunth) Trin. in Steud. *HE`U-PUEO*, MOUNTAIN *PILI*
Crater; Kalapawili; Kaupō Gap; NE rift; West slope. 5340-9900 ft.
Fairly common grass of more barren cinder fields, subalpine shrublands and grasslands; also in wet forest around bog margins.
[Endemic: Lāna`i, Maui and Hawai`i]
C22,HR37

*__Vulpia bromoides__ (L.) S.F. Gray BROME FESCUE
[= Festuca dertonensis (All.) Aschers. and Graebn. sensu C19,HR36]
Crater; Kalapawili, rare along trail; Kaupō Gap; NE rift; West slope.
Common, annual grass throughout the Crater and adjoining areas of the Park at 4000-8900 ft.
[Alien: native to Europe, northern Africa, and Asia Minor]
C19,HR36

*__Vulpia myuros__ (L.) C.C. Gmelin RAT TAIL FESCUE
[= Festuca megalura Nutt. sensu C19,M100]
Crater; East and west Kaupō Gap; Manawainui, uncommon; West slope.
Common, annual grass on western slope, west Kaupō Gap, and in disturbed sites of the Crater. 4000-10,000 ft.
[Alien: native to Europe]
C19,M100

SMILACACEAE, Smilax Family

Smilax melastomifolia Sm. *HOI-KUAHIWI, AKA`AWA*
[= Smilax sandwicensis Kunth sensu C23,HR40,K34,LK25,M99]
Crater, Palikū cliffs; east Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Climbing liana with heart-shaped leaves, common in *koa* and *`ōhi`a* forest, and uncommon in dryland forest east of Kaupō trail; recovering in upper Kīpahulu after removal of feral pigs (P.Welton, pers. comm.). Hillebrand (1888) states that the tuberous root of this species was used by early Hawaiians as a famine food. 1500-6500 ft.
[Endemic: main Hawaiian Islands]
C23,HR40,K34,KV22,LK25,M99

ZINGIBERACEAE, Ginger Family

*__Alpinia purpurata__ (Vieill.) K. Schum. RED GINGER, *`AWAPUHI-`ULA`ULA*
Lower Kīpahulu Valley
Ornamental ginger with flower spikes consisting of numerous large, open red bracts with inconspicuous, narrow, small white flowers; planted but sparsely reproducing.
[Alien: native to certain islands of the Indian and eastern Pacific oceans]
KV23

+__Curcuma longa__ L. TUMERIC, *`OLENA*
[= Curcuma domestica Valet. sensu LK26]
Lower Kīpahulu Valley
Planted but sparsely reproducing at Hawaiian planting area near the northern boundary of the lower Kīpahulu district. Ethnobotanically, this species has medicinal and religious uses; the rhizomes produce a distinctive orange-yellow dye for *kapa* (Degener 1940).
[Polynesian introduction: probably native to India]
KV23,LK26

*__Hedychium coronarium J. Konig__ WHITE GINGER, *`AWAPUHI-KE`OKE`O*
Kīpahulu Valley (above Bravo Camp), planted and adventive.
White ginger forms extensive patches on northeast East Maui (in headlands of Hāna, just north of Waiho`i Valley) at 3000-4000 ft, dominating and displacing virtually all native species. At the fringes of this population, spread seems rapid. Thus far, it has not been noted as being aggressive in Kīpahulu Valley, but its dominance in similar habitats nearby makes early control warranted. The seeds of this species are bird dispersed, but perhaps less so than those of H. gardnerianum.
[Alien: probably native to Himalayas and southwestern China]
KV23,LK26

*__Hedychium flavescens__ Carey ex Roscoe YELLOW GINGER, *`AWAPUHI-MELEMELE*
Lower Kīpahulu Valley

Planted but sparsely reproducing up to 600 ft. Not observed to produce seeds locally (R.W. Hobdy, pers. comm.). This plant does spread by vegetative regeneration of rhizomes, however, and can displace lower tier plants in wet forest communities.
[Alien: native to northeastern India and the Himalayas]
KV23,LK26

*__Hedychium gardnerianum__ Roscoe *KAHILI* GINGER
Kīpahulu Valley
This large ginger (to 2 m tall) with bright yellow-orange bracts and bright red fruits is an habitat-modifying invader of lower to middle elevation *`ōhi`a* and *koa* forests up to 4000 ft. A naturalized and aggressive species whose showy flowers are visited by both native and non-native nectivarous birds, it has large fruits and seeds which are bird dispersed. When uncontrolled, this large herb creates a serious management problem in Kīpahulu Valley and is now the focus of intensive research studies and resources management control efforts. 2400-3800 feet elevation. Flowering observed from May to October; peaking in August; fruiting observed from June to February; peaking in December.
[Alien: native to the Himalayas and adjacent regions]
KV23

*__Phaeomeria speciosa__ (Bl.) Koord. TORCH GINGER, *`AWAPUHI-KO`OKO`O*
Kīpahulu Valley
Planted and sparsely reproducing ginger with highly ornamental, large inflorescences.
[Alien: native to Mauritius]
KV23

+__Zingiber zerumbet__ (L.) Sm. SHAMPOO GINGER, *`AWAPUHI-KUA HIWI*
Lower Kīpahulu Valley, 600-900 ft.
Luxuriant ginger with knobby, aromatic underground stems formerly used to scent tapa and with green to red flowering heads that contain a "sudsy, slimy juice...formerly used by Hawaiians for shampooing and for quenching thirst" (Neal 1965).
[Polynesian introduction: native range unknown, perhaps India]
KV23,LK26

DICOTYLEDONS

AIZOACEAE, Carpetweed Family

#**Sesuvium portulacastrum** (L.) L. *`AKULIKULI*, SEA-PURSLANE
Lower Kīpahulu Valley
Low, succulent herb of the coastal strand zone. 10-100 ft.
[Indigenous: pantropical]
KV24,LK47,SS51

AMARANTHACEAE, Amaranth Family

***Alternanthera sessilis** (L.) DC. SESSILE JOYWEED
Lower Kīpahulu Valley
Adventive weed in Hawaiian planting area.
[Alien: widespread in tropical and subtropical areas]
KV24,LK27)

***Amaranthus spinosus** L. SPINY PIGWEED, *PAKAI-KUKŪ*
Lower Kīpahulu Valley; West slope.
Common, spiny weed in lower pastures of Kīpahulu Valley, 100-800 ft; on West slope, rare on roadside at 7000 ft (present 1981-1982).
[Alien: widespread]
KV24,LK27

***Amaranthus viridis** L. *PAKAI*, SLENDER AMARANTH
West slope.
Rare roadside weed at 7000 ft, first seen in 1981, not seen since 1985.
[Alien: native to tropics]

Charpentiera ovata Gaud. *PAPALA*
"Cable ridge", southern rim of Kīpahulu Valley 1900-2200 ft. ?East Kaupō Gap; ?Manawainui.
Localized, uncommon, small tree of Metrosideros/Acacia forest. This species has also been collected just outside the Park boundary (J. Lau 1002) near 4000 ft elevation in degraded *koa* forest on the southwestern corner of the Manawainui planeze.
[Endemic: O`ahu, Moloka`i, Maui and Hawai`i islands.]

ANACARDIACEAE, Mango Family

***Mangifera indica** L. MANGO, *MANAKO*
Lower Kīpahulu Valley
Cultivated and naturalized tree in pastures and along Waimoku Falls trail, 200-800 ft.
[Alien: native to Asia, widely cultivated in tropical and subtropical areas]
KV24,LK27,M101

Rhus sandwicensis Gray *NENELEAU, NELEAU*, HAWAIIAN SUMACH
Lower Kīpahulu Valley
Single small group of trees in landslide scar in guava thicket on steep slope along trail to Waimoku Falls, ca. 700 ft. First collected in the Park by B.H. Gagne in 1990. Reported as formerly found but now displaced in area occupied by dense monospecific stand of bamboo in lower Kīpahulu (T. Lind, pers. comm.). This species also found in Hāna and Waiho`i districts (BISH collections).
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui and Hawai`i]
Representative specimen: B.H. Gagne 1000 (BISH)

*__Schinus terebinthifolius__ Raddi CHRISTMAS BERRY, *WILELAIKI*
Central and west Kaupō Gap, 3900-4400 ft; lower Kīpahulu Valley, strand zone to upper pastures.
This invasive small tree is locally common in lower central Kaupō Gap with seedlings noted beneath scattered *`ōhi`a* trees on west-central Kaupō lava flow. Its small red, globose fruits are attractive to frugivorous birds who apparently disperse the seeds. 20-4100 ft.
[Alien: native to Brazil]
C24,KV24,LK27,M101

ANNONACEAE, Custard Apple Family

*__Cananga odorata__ (Lam.) Hook.f. and Thoms. *YLANG-YLANG*
Lower Kīpahulu Valley
Planted group of small trees near old Po`onika homestead below road just south of `Ohe`o Gulch. First collected by B.H. Gagne in the Park in 1990.
[Alien: native from Burma to Australia]
Representative specimen: B.H. Gagne 1001 (BISH)

APIACEAE (UMBELLIFERAE), Carrot Family

*__Centella asiatica__ (L.) Urban ASIATIC PENNYWORT, *POHEKULA*
Kīpahulu Valley, coastal strand to above Waimoku falls; Kaumakani; Manawainui; NE rift. 20-5440 ft.
The kidney-shaped leaves of this plant are widely used throughout Polynesia in native medicines (Whistler 1992).
[Alien: native to Asia]
HR49,KV24,LK43,M101

*__Daucus carota__ L.
var. __sativa__ DC CARROT
West slope.
Cultivated in gardens at residences near headquarters, 7000 ft; not reproducing.
[Alien: native to Eurasia and Africa]

*Foeniculum vulgare Mill. SWEET FENNEL
Crater, north of Hōlua; West slope, at research center and stables area and rare weed along roadsides.
First recorded in the Park at Hōlua by Mitchell (1945).
[Alien: native to Eurasia]
C55

*Hydrocotyle verticillata Thunb. MARSH PENNYWORT *POHEPOHE*
Kīpahulu Valley, 1900-3600 ft.
Trailing herb of wet, flooded, disturbed sites in lower to medium elevation forests.
[Alien: native to North America]
K41,KV24,KW15,LK43

*Petroselinum crispum (Mill.) Hill PARSLEY
Crater, behind Hōlua cabin (apparently now destroyed).
Planted and not reproducing in the Park.
[Alien: native to southern Europe]
C55

Sanicula sandwicensis Gray
[S. haleakalae St. John]
Crater, near `O`ili-pu`u, Pu`u-māmane, Kapalaoa; Kīpahulu Valley, in upper heath scrub; NE rift, near Wai`ānapanapa; West slope. 6000-8700 ft.
Rare, scattered herb of moist subalpine shrublands to upper rain forest ecotone. Approximately 100-150 plants of this species are known from the Park. Degener (1960) reported that "in 1927 it was noticed not uncommon within and about Haleakalā while by 1959 it had become rare."
[Endemic: East Maui and Hawai`i]
C55,HR49,K42,KV24,SS54

APOCYNACEAE, Periwinkle Family

Alyxia oliviformis Gaud. *MAILE*
[= Alyxia olivaeformis Gaud. sensu C24,HR51,K43,KV24,LK27,M101,SS54-55]
East and west Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Trailing, vine-like shrub with small, glossy leaves primarily of *`ōhi`a* and *koa* forests at 1500-5000 ft. Less commonly found in dryland forests, where leaves tend to the small and rounder, designated as the *lau li`i* form by Hawaiians. Flowering observed from September to December; fruiting observed in May to July, October to January. Ethnobotanically, the stems and leaves, fragrant when stripped, are used to make *lei*; it is one of five plants offered at the *hula* alter (Abbott 1992).
[Endemic: Hawaiian Islands]
C24,HR51,K43,KV24,LK27,M101,SS54-55

*Catharanthus roseus (L.) G. Don MADAGASCAR PERIWINKLE, *KĪHAPAI*
Lower Kīpahulu Valley, planted and naturalized at roadside.
This everblooming perennial, with five-parted, rose-purple to white flowers, is believed to have medicinal properties but can be harmful to cattle (Neal 1965).
[Alien: native to Madagascar, widely cultivated]
KV24,LK27

*Plumeria rubra L. RED PLUMERIA, FRANGIPANI
Lower Kīpahulu Valley, planted trees at roadside, not reproducing in the Park.
Small tree with red flowers.
[Alien: native to tropical America]
KV24,LK27

AQUIFOLIACEAE, Holly Family

#Ilex anomala Hook. and Arn. *KAWA`U*
Crater, Palikū cliffs; east Kaupō Gap; Kīpahulu Valley; Kaumakani; Manawainui; NE rift. 1600-6500 ft.
Variable small rainforest to dryland forest tree with glossy, dark green, reticulate-veined leaves and purple fruits.
[Indigenous: Tahiti, Marquesas and Hawaiian Islands]
C24,HR46,K40,KV24,LK27,M101,SS57

ARALIACEAE, Ginseng Family

Cheirodendron trigynum (Gaud.) Heller *`OLAPA*
subsp. trigynum
[= var. confertiflorum Sherff sensu C24,K41,KV25,LK28]
[= var. mauiense Levl. sensu M102]
[= var. molokaiense Sherff sensu HR48]
[= var. oblongum Sherff sensu M102]
Crater, at Palikū; east Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Common understory tree in rain forest at 1400-6900 ft. The ovate to subglobose purple fruits are an attractive food source for both native and non-native frugivorous forest birds.
Ethnobotanically, the bark and/or leaves of this species were used to make a blue dye. Flowering and fruiting observed year-round.
[Endemic: Hawaiian Islands]
C24,H48,K41,KV25,LK28,M102,SS57

Tetraplasandra kavaiensis (Mann) Sherff *`OHE`OHE*
[= var. dipyrena (Mann) Sherff sensu HR48,KV25]
[= var. nahikuensis Sherff sensu USFWS]
Kīpahulu Valley, upper and lower levels.
Rare rain forest tree at 3000-4500 ft., distinguished from T. oahuensis by its ultimate inflorescences racemose (versus umbellate) and scurfy pubescent (versus glabrous), as well as by the greater number of dark green, shiny leaflets (11-21 versus 7-15) per leaf.

[Endemic: Kaua`i, O`ahu, Lāna`i, Maui and Hawai`i]
HR48,KV25,SS58-59

Tetraplasandra oahuensis (Gray) Harms *`OHE-MAUKA*
[= Tetraplasandra meiandra (Hillebr.) Harms sensu K41,KV25,LK28,M102]
[= var. mauiensis Sherff sensu K41,KV25,LK28]
Kīpahulu Valley; Kaumakani, common; Manawainui.
Uncommon rain forest tree, found especially along stream courses, 1650-4000 ft. Flowering observed from February to October; fruiting observed from July to February.
[Endemic: main Hawaiian Islands]
K41,KV25,LK28,M102,SS59-60

ASCLEPIADACEAE, Milkweed Family

*__Asclepias curassavica__ L. BUTTERFLY WEED, *LAU-LELE*
West Kaupō Gap, 4000 ft; lower Kīpahulu Valley, pastures.
Red to reddish-orange flowered Asclepias with uninflated fruits.
[Alien; native from Florida to South America, and West Indies]

*__Asclepias physocarpa__ (E. Mey.) Schlechter BALLOON PLANT
[= Gomphocarpus physocarpus E. Mey. sensu C25,KV25,LK28]
West Kaupō Gap, 4000 ft; lower Kīpahulu Valley
White flowered Asclepias with inflated fruits. This plant has been observed to locally dominate areas of kikuyu grass dieback on the south slope of East Maui (outside Park boundaries) and could potentially compete with native species for space and resources; also a popular alternate host plant for the larvae of the introduced Monarch butterfly (Danaus plexippus L.).
[Alien: native to southern Africa]
C25,KV25,LK28

*__Hoya ?bicarinata__ Gray WAX PLANT, *PUA-HOKŪ-HIHI*
Lower Kīpahulu Valley
Vine with showy, fragrant, star-shaped white flowers with pink centers. Planted and not reproducing in the Park.
[Alien: native to Samoa, Tonga, Fiji]

ASTERACEAE (COMPOSITAE), Sunflower Family

#__Adenostemma lavenia__ (L.) Ktze. *KAMANAMANA*
Kīpahulu Valley
Herb of flooded sites such as slow flowing streams and abandoned taro terraces (*lo`i*), especially on the lower level. 560-2400 ft. According to Hillebrand (1888), an infusion of this plant was used by Hawaiians as a remedy in fevers.
[Indigenous: China to Malesia, Australia, tropical Africa, Polynesia (including Hawaiian Islands) and Micronesia]
KV26

*__Ageratina adenophora__ (Spreng.) King and Robinson MAUI *PAMAKANI, PAMAKANI HAOLE*

[= Eupatorium adenophorum Spreng. sensu C30,HR58,K48,KV27,KW,LK30]

Crater; Kaumakani; east Kaupō Gap, common; Kīpahulu Valley, 640-5200 ft; Manawainui, 5000-5500 ft; NE rift; West slope, along roadsides and stream courses up to 8700 ft.

Despite fairly effective biocontrol (Bess and Haramoto 1972), this weed is found throughout much of the Park and is quite common locally. It is most dominant in the Park in east Kaupō Gap, forming large near monospecific thickets on rocky scree slopes. This species was first recorded in the Park by C.N. Forbes in 1919. Forbes stated in his field notes that the species in the Palikū vicinity is "rather common, especially along trail...where it is 6-8 ft tall" and in east Kaupō Gap, that it is "abundant over large areas." Fagerlund (1945) stated that Ageratina adenophora was the only common weed in Kīpahulu Valley in 1945. Prior to biocontrol, this weed was apparently much more common in the Crater district of the Park, and much concern was accorded to it in Park monthly narrative reports. 640-8700 ft. Flowering observed from February to May; fruiting observed from April to August.

[Alien: native to Mexico]

C30,HR58,K48,KV27,KW16,LK30,M103

*__Ageratina riparia__ (Regel) King and Robinson SPREADING MIST FLOWER HAMAKUA *PAMAKANI*

[= Eupatorium riparium Regel sensu C30,KV27,KW,LK30]

East and west Kaupō Gap, uncommon at 3900-4700 ft; Kīpahulu Valley, 80-2000 ft; Manawainui; West slope, at Hosmer Grove.

Though also somewhat invasive, this species is much less of a threat to native ecosystems than is A. adenophora. It is usually found at lower elevations and along stream courses.

[Alien: native to Mexico and West Indies]

C30,KV27,KW16,LK30,M103

*__Ageratum conyzoides__ L. *MAILE-HOHONO*

West Kaupō Gap; Kīpahulu Valley, 2000-3440 ft; Manawainui.

Annual herb with purple-lavender flowers and pungent leaves when crushed, found in a variety of disturbed wet to dry sites. Hillebrand (1888) described this weed as "common in the lower regions of the whole group." 2000-5320 ft.

[Alien: native to Central and South America]

KV26,KW16,LK29,M102

*__Anthemis cotula__ L. MAYWEED, FOETID CHAMOMILE

West slope, 6800 ft.

Single flowering plant collected in stables area in 1986; not observed since.

[Alien: native to Europe, sparingly naturalized on Kaua`i, Lāna`i, Maui and Hawai`i]

Representative specimen: A.C. Medeiros 771 (BISH)

__Argyroxiphium grayanum__ (Hillebr.) Deg. GREENSWORD, ASA GRAY GREENSWORD

[= Argyroxiphium forbesii St. John sensu KV26]

Kīpahulu Valley; Manawainui; NE rift; West slope (cultivated from seed at residences, 6800-7000 ft).

The bulk of the population of this species occurs on the NE rift of East Maui at 5440-6750 ft, at Lake Wai`ele`ele, two small bogs below Wai`ānapanapa, Greensword Bog, New Bog, Mid-Camp Bog, and Big Bog. The second largest population in the Park occurs below Kuiki on the east rim of the Manawainui planeze at 6100-6420 ft. The small Kīpahulu population is located in the upper southwest Valley on cliffs above upper Koukouai Stream (L. Eharis, pers. comm.) and is probably derived from the Manawainui population which is located far above it on the cliffs. Flowering has been observed to start in late May and June and continues through the summer months.

[Endemic: West Maui and East Maui]

Argyroxiphium grayanum X **Dubautia dolosa**

NE rift, Mid-Camp Bog, 5440 ft.

Spontaneous hybrid; individuals produced sporadically, rare (Carr 1985).

[Hybrid endemic: East Maui]

Representative specimen: A.C. Medeiros 275 (BISH)

Argyroxiphium grayanum X **Dubautia plantaginea**

NE rift, Mid-Camp Bog, 5440 ft.

Spontaneous hybrid; individuals produced sporadically, rare (Carr 1985).

[Hybrid endemic: East Maui]

Argyroxiphium grayanum X **Dubautia scabra**

NE rift, Mid-Camp Bog, 5440 ft.

This spontaneous intergeneric hybrid is known from only two plants in a Carex alligata swamp (Carr 1985). It was formerly being protected from feral pigs by a small exclosure fence constructed in 1988 , and is now protected, along with the other unique bog vegetation, by the parkwide boundary fence.

[Hybrid endemic: East Maui]

Representative specimen: A.C. Medeiros 387 (BISH)

Argyroxiphium sandwicense DC. *`AHINAHINA*, SILVERSWORD

subsp. **macrocephalum** (Gray) Meyrat

Crater; Kalapawili (extirpated); upper Kaupō Gap (extirpated); upper Kīpahulu Valley, on rocky, steep backwalls; West slope. 7,300-10,000 ft (cultivated plants at headquarters and residences 6,800-7,000 ft and in summit area, 9750-10,000 ft).

Distinctive, globe-shaped rosette plants covered with dense covering of silver hairs. The current estimated population in the Crater is over 60,000 individuals (Loope and Medeiros 1995). Isolated remnant west slope plants include: single plant near Ko`olau peak (TNC) at 7485 ft; two plants on roadside at 7500 ft; and small population (10-15 plants) below water catchment system, ca. 7300 ft.

[Endemic: Hawai`i and East Maui; subsp. endemic: East Maui]

C28,SS60

Argyroxiphium sandwicense subsp. **macrocephalum** X **Dubautia menziesii**
Crater; West slope.
This spontaneous intergeneric hybrid is primarily found within Haleakalā Crater, especially on Pu`u-o-Pele and Pu`u-o-Maui cinder cones. Individuals are uncommon, often flowering for several successive years before dying (Carr 1985).
[Hybrid endemic: East Maui]
Representative specimen: B.H. Gagne 1022 (BISH)

Argyroxiphium virescens Hillebr. GREENSWORD
Crater, on Palikū cliffs (extirpated); Kaupō Gap (extirpated); east Ko`olau Gap, 5500 ft (extirpated); West slope, Pu`u-nianiau 6500 ft, as well as east and northeast of Ukulele (extirpated).
This greensword species is currently known only from a single individual or individuals which may still survive within the Hanawī Natural Area Reserve (State of Hawai`i) just outside the Park`s northern boundary on the steep, southern slope of Pu`u-`alaea. The species appears like a greenish narrow-leaved silversword and grows among a population of typical silverswords. The status of this population as representing remnants of hybridization of A. virescens with typical silverswords (A. sandwicense) was confirmed in June 1989 when one of the plants flowered (Carr and Medeiros 1998).
J.F. Rock (in litt.) wrote to the Park superintendent that this species of greensword was formerly (1910-1920) abundant in gulches surrounding Pu`u-nianiau near the Park entrance, but by 1953, "had practically disappeared." The last record of this species on northwestern Haleakalā was in June 1959, when the greensword on the outer slopes was reported to be flowering (Monthly narrative reports). This species was last collected in the Park in 1945 (St. John & Mitchell 21,153) on cliffs above Palikū (Carr in Wagner et al. 1990).
[Endemic: East Maui]
Representative specimen: B.H. Gagne and A.C. Medeiros
C28,SS60

Artemisia mauiensis (Gray) Skottsb. MAUI WORMWOOD, *`AHINAHINA*
Crater, Palikū cliffs; east and west Kaupō Gap; Manawainui (below Park boundary); West slope. 4000-9000 ft.
Small, compact shrub with characteristic silver, finely-dissected foliage, distinctly scented when bruised. Often growing on steep rock dry cliffs, out of reach of feral goats which have otherwise largely denuded many such sites.
[Endemic: East Maui]
C28,M102,SS60

Artemisia mauiensis (Gray) Skottsb. MAUI WORMWOOD, *`AHINAHINA*
var. **diffusa** Skottsb.
[= Artemisia australis Less. sensu C28,SS60]
Crater, Palikū cliffs; east Kaupō Gap, in shady gulch in dryland forest, west Kaupō Gap, in deep rocky gorge at 3900-4000 ft.

Plants referred to as Artemisia mauiensis var. diffusa have larger leaf lobing, green rather than silver foliage, and more loosely disposed heads. The var. diffusa has been speculated to be a hybrid between A. mauiensis and A. australis e.g. Shultz in Wagner et al. 1990. However, A. australis is not found within the Park or in nearby areas as it is very rare on leeward East Maui. [Variety endemic: East Maui]
C28,SS60

***Bidens alba** (L.)DC
West slope, 6800-7500 ft.
Annual herb occurring in disturbed areas, such as roadsides, at upper elevations. Sometimes confused with B. pilosa, this species has more and longer, persistent white ray florets (9-15 mm long).
[Alien: native from Florida to South America and West Indies]

Bidens campylotheca Schz. Bip. *KO`OKO`OLAU*
subsp. **pentamera** (Sherff) Ganders and Nagata
[= Bidens pentamera (Sherff) Deg. and Sherff in Sherff sensu C29,HR57,KV26]
[= Bidens sp. sensu K47 (Warner et al. 10)]
Kaumakani, 3800-4000 ft; Ko`olau Gap, esp. western cliffs (TNC); Manawainui; NE rift.
Rare rain forest herb occurring along stream courses or in wet open areas with pinnate, pinnatifid or bipinnatifid leaves and large yellow flower heads with irregularly twisted or coiled, wingless achenes. 3800-4000 ft.
[Endemic: East Maui]
C29,HR57,KV26

Bidens campylotheca Schz. Bip. *KO`OKO`OLAU*
subsp. **waihoiensis** St. John
Kīpahulu Valley along Palikea Stream at 2640-4000 ft
Rare rain forest herb occurring along stream courses or in wet open areas with tripinnatifid or bipinnate leaves and large fragrant yellow flower heads with straight, undulate-winged achenes. 2640-4000 ft. Flowering and fruiting observed from December to April.
[Endemic: East Maui]

Bidens hillebrandiana (Drake) Deg. *KO`OKO`OLAU*
subsp. **polycephala** Nagata and Ganders
[= Bidens mauiensis (Gray) Sherff sensu KV26,LK29]
Lower Kīpahulu Valley
Locally rare, sprawling herb occurring just above coastal strand zone with dissected leaves and yellow flower heads. Approximately 30-40 individuals were observed in 1990, localized on black lava ledges, growing with Scaevola, Pandanus, etc. near sea level on the southern side of `Ohe`o Gulch.
[Endemic: Moloka`i, East Maui and Hawai`i; subsp. endemic: Moloka`i and Maui]
KV26,LK29

Bidens micrantha Gaud. *KO`OKO`OLAU*
subsp. **kalealaha** Nagata and Ganders
[= Bidens sp. sensu C29]
Crater, above Kapalaoa, 7600 ft; west Kaupō Gap, Waikane; West slope (cultivated at residences, 6800-7000 ft).
Sprawling small shrub of steep rock faces and cliffs with dissected leaves with ciliate margins and yellow flower heads. This species listed as Endangered by USFWS.
[Endemic: Lāna`i, West Maui, East Maui and Hawai`i; subsp. endemic: Lāna`i, West Maui and East Maui]
Representative specimen: A.C. Medeiros 569 (BISH)
C29,SS62-63

*__Bidens pilosa__ L. SPANISH NEEDLE, *KĪ-NEHE*
Crater, 6800 ft; east and west Kaupō Gap, 3900-4690 ft; lower Kīpahulu Valley, 20-1100 ft; Manawainui; West slope, 6800-7500 ft.
Annual herb occurring especially in disturbed areas. It is common in lower-elevation leeward areas and rare along trails and roadsides of upper elevations. This species first recorded in the Park by Mitchell (1945) in the Crater and east Kaupō Gap. 50-8500 ft. Sometimes confused with B. alba, this species can be distinguished by fewer or absent ray florets that are also smaller (2-8 mm long).
[Alien: native to tropical America]
C29,KV26,LK29,M102

*__Carduus pycnocephalus__ L.
West Kaupō Gap.
Annual small-headed thistle scattered throughout degraded, leeward, subalpine shrubland. 4000-4700 ft. New H. I. record, first collected in west Kaupō Gap in 1986.
[Alien: native to Europe]
Representative specimen: W.L. Wagner 5657 (BISH)

*__Centaurea melitensis__ L. YELLOW-STAR THISTLE
Crater, near Pu`u-kumu; west Kaupō Gap, Waikane.
First recorded in the Park by Mitchell (1945).
[Alien: native to Europe]
C29

*__Cirsium vulgare__ (Savi) Tenore BULL-THISTLE, *PUA KALA*
Crater; east and west Kaupō Gap; lower Kīpahulu Valley; Manawainui, 5500 ft; West slope.
This purple-flowered species was first recorded in the Park in central Crater and Kaupō Gap by C.N. Forbes in 1919.
[Alien: native to Eurasia]
C29,KV27,LK29,M102

*__Conyza bonariensis__ (L.) Cronquist HAIRY HORSEWEED
[= Erigeron bonariensis sensu C30,KV27,LK30]

Crater; Kaupō Gap; lower Kīpahulu Valley; Manawainui; NE rift; West slope.
This species can be easily distinguished from C. canadensis by its dense pubescence. In Kīpahulu, flowering observed from June to September.
[Alien: perhaps native to South America, widely naturalized]
C30,KV27,LK30,M103

*__Conyza canadensis__ (L.) Cronquist CANADA FLEABANE, *LANI WELA*
var. __canadensis__
[= Erigeron canadensis L. sensu C30,KV27]
var. pusilla (Nutt.) Cronquist
Kīpahulu Valley, 2800-4000 ft.
Glabrous to hirsute species sometimes confused with the densely pubescent C. bonariensis.
[Alien: native from southern Canada to tropical America]
C30,KV27,KW16

*__Cotula australis__ (Sieber ex Spreng.) J.D. Hook. AUSTRALIAN BRASS BUTTONS
West slope
Rare weed collected in headquarters area at 7000 ft.
[Alien: native to Australia]

*__Crassocephalum crepidioides__ (Benth.) S. Moore
Kīpahulu Valley, 200-4000 ft.
Annual herb of wet disturbed areas; superficially similar to Erechtites, but with red to reddish orange (versus yellowish to pale purple) corolla, white (versus pink to pale purple) pappus, and leaves less deeply lobed.
[Alien: native to tropical Africa]
KV27

*__Crepis capillaris__ (L.) Wallr. EUROPEAN HAWKSBEARD
[= Crepis pulchra L. sensu KV27,LK30]
Lower Kīpahulu Valley
Annual to biennial herb; may be confused with Youngia japonica; Crepis has an involucre with long, black, glandular hairs whereas Youngia has a glabrous involucre.
[Alien: native to central and southern Europe]
KV27,LK30

*__Cynara scolymus__ L. GLOBE ARTICHOKE
West slope.
Cultivated at Park residences near headquarters at 7000 ft; planted and not reproducing.
[Alien: native to the Mediterranean region and the Canary Islands]

__Dubautia dolosa__ (Deg. and Sherff) Carr *NA`ENA`E*
[= Dubautia waianapanapaensis Carr]
Upper Kīpahulu Valley; Ko`olau Gap; Manawainui; NE rift. 5200-7150 ft.

Large, rare shrub of upper elevation rain forest and, less commonly, the ecotone with subalpine shrubland and grassland. This species is most common at treeline in Ko`olau Gap (TNC) and at bog margins and along stream courses on the northeast rift.
[Endemic: East Maui]
Representative specimen: A.C. Medeiros 625 (BISH)
C32,KV27

Dubautia dolosa X **D. scabra** *NA`ENA`E*
[= Railliardia coriacea Sherff sensu C31]
[= Railliardia thyrsiflora Sherff sensu C34]
Kīpahulu Valley; NE rift.
This hybrid is most commonly seen in the ecotone between moist subalpine shrubland and upper elevation rain forest, such as in Ko`olau Gap (TNC) and on the northeast rift, near Wai`ā napanapa. Spontaneous hybrid (Carr 1985).
[Hybrid endemic: East Maui]
C31-34,KV27

Dubautia linearis (Gaud.) Keck X **D. menziesii** *NA`ENA`E*
West Kaupō Gap.
Rare shrub on vertical cliff faces below Waikane spring. (Carr 1985).
[Hybrid endemic: East Maui]
Representative specimen: A.C. Medeiros 568, 572 (BISH)
SS64

Dubautia menziesii (Gray) Keck *NA`ENA`E*
[= Railliardia menziesii Gray sensu C33]
Crater; east and west Kaupō Gap; Ko`olau Gap; Manawainui; West slope.
Common shrub of subalpine shrublands, especially on relatively barren lava and cinder fields above 9000 ft. After winter ice storms, D. menziesii often defoliates and dies back, or less commonly, is killed entirely.
[Endemic: East Maui]
C33,SS63-64

Dubautia menziesii X **D. reticulata** *NA`ENA`E*
[= Railliardia demissifolia Sherff sensu C32]
[= Railliardia montana Mann var. robustior Sherff sensu C33]
Upper Kīpahulu Valley
[Hybrid endemic: East Maui]
C32-33,KV27

Dubautia menziesii X **D. scabra** *NA`ENA`E*
[= Raillardia demissifolia var. verticillata Sherff sensu C32]
[Hybrid endemic: East Maui]
C32

Dubautia plantaginea Gaud. *NA`ENA`E*

subsp. **plantaginea**

Crater, Palikū cliffs; Kaumakani; east Kaupō Gap; Kīpahulu Valley; Ko`olau Gap; Manawainui; NE rift. 2800-6800 ft.

Relatively common shrub of mesic to wet habitat, which, as Carlquist (1980) states "reveals its derivation from plants of open habitats" by favoring "sunny ridgetops, cliffs, or somewhat disturbed places." Flowering observed from July to October; fruiting observed from September to November.

[Endemic: main Hawaiian Islands]

C29,HR57,K48,KV27,SS64

Dubautia plantaginea X **D. scabra** (Carr 1985) *NA`ENA`E*

[= Railliardia lonchophylla Sherff sensu C32]

[= Railliautia x fallax (Sherff) Sherff sensu C34]

Kīpahulu Valley; Manawainui; NE rift. 2860-5040 ft.

Relatively common, spontaneous hybrid in open disturbed sites, such as Carex alligata-dominated swampy forest openings. Flowering observed in June; fruiting observed in August and September.

[Hybrid endemic]

C32-34,KV27

Dubautia platyphylla (Gray) Keck *NA`ENA`E*

[= Railliardia platyphylla Gray sensu C33]

[= var. trillioidea Deg. and Sherff in Sherff sensu C33]

Crater; east Kaupō Gap; West slope. 7000-8500 ft.

Large lax shrub of sheltered sites in the ecotone above upper rain forest, as well as in moist, protected sites in subalpine shrublands, such as periodic stream courses. Foliage is covered with glandular hairs which when bruised give off a thick, sweet, pungent fragrance.

[Endemic: East Maui]

C33,KV27,SS64

Dubautia platyphylla X **D. scabra** *NA`ENA`E*

[= Railliardia rockii Sherff sensu C34]

Spontaneous hybrid (Carr 1985)

[Hybrid endemic: East Maui]

C34

Dubautia reticulata (Sherff) Keck *NA`ENA`E*

[= Railliardia reticulata Sherff sensu C34]

[= Railliardia montana Mann var. longifolia sensu C33]

Manawainui, rare on east side of Kuiki; West slope, population formerly located in Park above Pu`u-nianiau (extirpated).

Variably sized, but usually large (sometimes trees to 8 m) rare shrub of upper elevation rain forest and the ecotone with subalpine shrubland and grassland. The original habitat of this species appears to have once largely been the mesic and wet upper elevation forest of leeward Haleakalā. Currently, the species is most common in the Kahikinui drainages of Manawainui, Pāhihi, and Wailaulau, as well as the upper Waikamoi drainage of northwest East Maui.
[Endemic: East Maui]
C33-34,SS64-65
Representative specimen: A.C. Medeiros 799 (BISH)

Dubautia scabra (DC.) Keck *NA`ENA`E*
var. **scabra**
var. **leiophylla** (Gray) Carr
[= Railliardia scabra DC. sensu C34]
Crater, Palikū cliffs; east Kaupō Gap; Kīpahulu Valley; Kaumakani; Ko`olau Gap; Manawainui, 5000 ft; NE rift; West slope. 4730-7040 ft.
Low, creeping, narrow-leaved subshrubs of middle to upper elevation rain forest and in moist subalpine shrubland, especially on cloudswept `a`a lava. D. scabra is the only white-flowered species of the genus on Maui (the others are yellow-flowered). In the field, Dubautia hybrids are recognized by intermediate morphology and pale-yellow flowers. Flowering observed in September, October, December; fruiting observed in October, December.
[Endemic: Moloka`i, Lāna`i, West Maui, East Maui and Hawai`i; variety scabra endemic: East Maui, variety leiophylla endemic: Moloka`i, Lāna`i, Maui and Hawai`i]
C34,KV27,SS65

***Eclipta alba** (L.) Hassk. FALSE DAISY
Lower Kīpahulu Valley, pastures
Annual herb of disturbed areas.
[Alien: native to North America, South America, and Old World tropics]
KV27,LK30

***Elephantopus spicatus** Juss. ex Aubl.
Lower Kīpahulu Valley, 100-470 ft
Somewhat woody, rough-textured erect herbs spreading in the Park in lower pastures and along stream courses. First collected in the Park (Kīpahulu District) in 1982.
[Alien: native to West Indies, Central and South America]
Representative specimen: A.C. Medeiros 864 (BISH)

***Emilia fosbergii** Nicolson
Lower Kīpahulu, coastal strand zone and lower disturbed sites; NE rift, rare weed in disturbed bog turf.
Flowers are brick red or rarely lilac (vs. lavender to pale purple in E. sonchifolia).
[Alien: native range unknown, perhaps originated as a central or east African hybrid]
KV27

*Emilia sonchifolia (L.) DC. LILAC *PUALELE*
var. sonchifolia
[= Emilia javanica (Burm. f.) C. B. Robins sensu KV27]
Lower Kīpahulu Valley, in coastal strand zone and lower disturbed sites; Manawainui; NE rift, rare weed in disturbed bog turf.
This and the former species apparently hybridize freely (Wagner et al. 1990). Flowers are lavender to pale purple (vs. brick red or rarely lilac in E. fosbergii).
[Alien: native to eastern and southern Asia and western Pacific]
KV27,M103

*Erechtites hieracifolia (L.) Raf. FIREWEED
Lower Kīpahulu Valley
Annual herb with white pappus and sessile leaves.
[Alien: native from southern Canada to northern Argentina]
KV27

*Erechtites valerianifolia (Wolf) DC.
Kīpahulu Valley, 100-4700 ft; Manawainui; NE rift
This species was first recorded in the Park by C.N. Forbes in 1919. 100-5600 ft. This species is superficially similar to Crassocephalum but has more deeply lobed leaves, narrower, more numerous flower heads, and pink to pale purple corollas. Flowering and fruiting observed year-round.
[Alien: native from Mexico to Brazil and Argentina]
HR58,K48,KV27,KW16,LK30

*Galinsoga parviflora Cav. GALINSOGA
Kaupō Gap; Lower Kīpahulu Valley
Slender, white flowered annual herb.
[Alien: native to tropical America]

*Gnaphalium japonicum Thunb.
Crater; west Kaupō Gap; Kīpahulu Valley; West slope.
Erect, annual weed with flower heads in dense, globose clusters; may possibly hybridize with G. sandwicensium.
[Alien: native to Australia]
C30,HR58,KV27

*Gnaphalium purpureum L. PURPLE CUDWEED
Crater; east and west Kaupō Gap; Manawainui. 4000-9000 ft.
Erect, sparsely to moderately woolly weed distinguished from G. sandwicensium by its connate pappus bristles falling away in a ring and by the flower heads in a spike-like arrangement (Wagner et al. 1990).
[Alien: native to North America]
C30,M103

Gnaphalium sandwicensium Gaud. *`ENA`ENA*

var. **hawaiiense** (Deg. and Sherff)

West slope; NE rift. 5500-8000 ft.

var. **sandwicensium**

Crater; Kaupō Gap; West slope. 4070-10,000 ft.

Silvery, low herb of leeward and high elevation sites; within the Park, growing primarily in cinder, often somewhat disturbed, substrates. The var. sandwicensium is locally common within the Park from Sliding Sands trail to Hōlua and to shrublands east of Hōlua. The var. hawaiiense is marked by its larger size, diffuse flower heads and pungent foliage and is much less common. Recent collections on East Maui have been made from roadsides and other disturbed areas at 5000-7500 ft.

[Endemic: Hawaiian Islands]

Representative specimen of var. hawaiiense: A.C. Medeiros s.n. (BISH)

C31,SS65-66

***Heterotheca grandiflora** Nutt. TELEGRAPH PLANT

Crater; west Kaupō Gap; West slope. 4000-9100 ft.

Erect, yellow-flowered herb characteristic of disturbed areas at low elevations, or at drier leeward sites. Locally, however, this species grows at higher elevations within Haleakalā Crater in fairly level areas where cinder has been disturbed by winter flooding. In these conditions, Heterotheca can sporadically be quite common, especially in the eastern Crater. First recorded in the Park at base of the Leleiwi pali by Mitchell (1945).

[Alien: native to California, Arizona and Baja California, Mexico]

C31

***Hypochoeris radicata** L. GOSMORE, HAIRY CAT`S EAR

Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley, 3220-7000 ft; Manawainui; NE rift; West slope. 2500-10,000 ft.

Nearly ubiquitous, yellow-flowered, dandelion-like herb of a wide variety of habitats above 2500 ft. Leaves, flowers and roots of this species are much favored as food by feral pigs. This species is one of the first plants to colonize pig rootings in subalpine shrublands and grasslands. Within the rain forest, it is usually found in pig rootings, along trails, or in areas of natural disturbance, such as stream courses and landslide scars. Superficially similar to dandelion (Taraxacum) but distinguished by its usually smaller size, and less serrate, thicker, pubescent (vs. glabrous) leaves. First Maui collection in 1909 (W.T. Brigham et al. s.n., BISH).

[Alien: native to Eurasia]

C31,HR58,K48,KV27,KW17,M103

Lagenifera maviensis Mann *HOWAI`A`ULU*

[= Lagenophora viridis St. John sensu KV27]

[= Keysseria maviensis (Mann) Cabrera]

[= Keysseria lavandula St. John sensu KV27]

Manawainui, rare on east rim.

Currently, the only known population in the Park is on a ridgeline of open rain forest on the Manawainui section, east rim at 6240 ft. The only other population known on East Maui is at Waiho`i bog, ca. 4750 ft on the northeast flank above Waiho`i Valley. The Manawainui population was still extant as of mid-1993.

Formerly found in the Park in upper east Kaupō; last collected by Rock (J.F. Rock 8613) in 1910 on steep rocky walls between Palikū and upper Kaupō Gap. Also formerly known from east Ko`olau Gap; last collected by C.N. Forbes in 1919 in east Ko`olau Gap (St. John 1971). Lagenifera maviensis has not been recollected since in either of these locales.

[Endemic: West Maui, East Maui and Moloka`i]

Representative specimen: A.C. Medeiros 484 (BISH)

KV27

*__Lapsana communis__ L. NIPPLEWORT

Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope.

Annual, yellow-flowered herb first collected in Park on northwest outer slopes by C.N. Forbes in 1919.

[Alien: native to Eurasia]

C31,HR58,KV27,M103

*__Madia sativa__ Molina TARWEED

Crater; west Kaupō Gap.

Since its first collection in 1927 (O. Degener 7449,BISH), this species has been rarely collected in the Crater in cinder areas between Bottomless Pit and Palikū, 6600-7400 ft. This annual species does not appear to be spreading but only barely reproducing by seed. Madia is currently rare, last noted as a single plant in 1989 in west Kaupō Gap near Waikane at 6240 ft.

[Alien: native from Canada to southern California, Chile and Argentina]

Representative specimen: A.C. Medeiros & L.L. Loope 841 (BISH)

C31, Mitchell (1945).

*__Pluchea symphytifolia__ (Miller) Gillis SOUR BUSH

[= Pluchea odorata (L.) Cass. sensu KV27,LK30]

West Kaupō Gap, rare at 4070 ft; Kīpahulu Valley, 10-3100 ft.

Erect shrub with tomentose, aromatic leaves (when crushed).

[Alien: native to Mexico]

KV27,LK30

*__Senecio sylvaticus__ L. WOOD GROUNDSEL

Crater; Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift. 4170-10,000 ft.

First collected in the Park by C.N. Forbes in 1919. Degener (1975) describes the status of this weed in the Park in the 1930s as "extremely abundant...within Haleakalā Crater, just below the Rest House." Though not uncommon and widely distributed, this species is not currently abundant anywhere in the Crater.

[Alien: native to Eurasia]

C34,KV27,M103

*__Siegesbeckia orientalis__ L. SIEGESBECKIA
Lower Kīpahulu Valley
Yellow-flowered herb of lower disturbed areas to pastures, 100-800 ft.
[Alien: native to the Old World tropics and warm temperate regions]
KV28,LK30

*__Sonchus asper__ (L.) Hill PRICKLY SOW THISTLE
East Kaupō Gap, along trail; West slope, roadside and disturbed sites, 6800-10,000 ft.
Annual weed distinguished from S. oleraceus by the leaves of the middle and upper stems with rounded (versus acute) auricles (Wagner et al. 1990).
[Alien: native to Europe]
Representative specimen: A.C. Medeiros 290 (BISH)
C35

*__Sonchus oleraceus__ L. SOW THISTLE, *PUA-LELE*
Crater; east Kaupō Gap; Kīpahulu Valley; Kaumakani; east Ko`olau Gap; Manawainui; NE rift; West slope. 20-8000 ft.
First collected in the Park by C.N. Forbes in 1919. Morphologically intermediate individuals (apparent hybrids) between this and the former species occur in disturbed sites at 6800-7000 ft.
[Alien: native to Europe]
C35,KV28,LK30,M103

*__Synedrella nodiflora__ (L.) Gaertn. SYNEDRELLA
Lower Kīpahulu Valley
Common herb of disturbed areas from just above strand zone to pastures, 10-1000 ft.
[Alien: native to tropical America]
KV28,LK30

*__Taraxacum officinale__ W.W. Weber DANDELION
Crater; Kalapawili; lower east Kaupō Gap; lower Kīpahulu Valley, strand to pastures; West slope. 50-10,000 ft.
Yellow flowered herb, similar to Hypochoeris, but less common and generally found in moister sites.
[Alien: native to Eurasia]
C35,HR59,KV28,LK30

__Tetramolopium humile__ (Gray) Hillebr.
subsp. __haleakalae__ Lowrey
[= var. humile sensu C35]
Crater; Ko`olau Gap; West slope. 6800-9900 ft.
Low, small shrub with diffuse, delicate branches in a cushion plant growth form, characteristic of other alpine and subalpine plants. Visitation by short-tongued insects such as flies has been observed on the white rayed, 1 to 2 cm wide, Aster-like flowers. Flowering occurs in early summer, fruiting in late summer.

[Endemic: East Maui and Hawai`i, subsp. endemic: East Maui]
C35,SS70-71

Tetramolopium lepidotum (Less.) Sherff
subsp. **arbusculum** (Gray) Lowrey
[= Tetramolopium arbusculum (Gray) Sherff sensu C35]
Crater or West slope.
Erect shrub with terminal clusters of linear leaves collected only once on the "Crater of Haleakalā " in 1840 by the U.S. Exploring Expedition. The collection site is unknown and there have been no other records of this species since. The Haleakalā subspecies is presumed to be extinct.
[Endemic: O`ahu, Lāna`i and Maui, subsp. endemic: East Maui]
C35

***Tridax procumbens** L. COAT BUTTONS
Lower Kīpahulu Valley, lower `Ohe`o Gulch; West slope, roadside.
50-500 ft, 7000 ft.
Perennial, pale yellow to cream-flowered plant of dry, disturbed habitats.
[Alien: native to Mexico, Central and South America]
KV28,LK30

***Verbesina encelioides** (Cav.) B. and H. GOLDEN CROWN-BEARD
West slope, rare roadside weed, Park housing (extirpated), 6900-7300 ft, first collected in 1981.
Plants behind housing possibly brought in with sand from Waikapu, West Maui, in August 1994.
[Alien: native to Mexico and southwest United States]

***Vernonia cinerea** (L.) Less. IRONWEED
Central Kaupō Gap; Kīpahulu Valley,
Lavender-flowered weed in lower Kīpahulu of roadsides and other disturbed areas. Occasional in wet, open, disturbed clearings in *koa* forest in the upper Valley; uncommon in Kaupō Gap.
[Alien: native to tropical Asia]
KV28,LK31

***Xanthium strumarium** L. COCKLEBUR, *KIKANIA*
[= Xanthium saccharatum Wallr. sensu LK31,KV28]
Lower Kīpahulu Valley, lower pastures; West slope, rare roadside weed, first observed in 1981, not seen since.
Weed of relatively dry, disturbed habitats with large burs that stick to clothing and animal fur.
[Alien: probably native to the Americas]
KV28,LK31

***Youngia japonica** (L.) DC. ORIENTAL HAWKSBEARD
Crater; lower east Kaupō Gap; Kīpahulu Valley, 3550-6200 ft; Manawainui, 5000-6000 ft; NE rift.

Annual, yellow-flowered weed of moist, disturbed sites as well as more intact rainforests (common along streambanks). Flowering and fruiting observed year-round.
[Alien: native to Southeast Asia]
C35,HR59,K48,KV28,KW17

BEGONIACEAE, Begonia Family

Hillebrandia sandwicensis Oliver *PUA-MAKA-NUI, AKA`AKA`AWA*
East Kaupō Gap (extirpated); Kīpahulu Valley, 3700 ft; NE rift.
This rare, native begonia has been eliminated from the mesic forests of Kaupō Gap, probably by goat browsing and trampling and non-native plant invasion. It was last collected there in 1937 (G.E. Olson 87) with the note, "Found growing on very wet cave in deep shade. Kaupō trail, 3900 ft." Currently, it is still found in the Park, uncommon, but scattered along stream courses in the rain forests of Kīpahulu Valley and the northeast rift. It can also be found just outside the Park boundaries in Koolau Gap and just in moist gulches of Kahikinui.
[Endemic: Kaua`i,Maui, Moloka`i,and O`ahu]
C25, HR47, KV28, M104, SS71

BIGNONIACEAE, Bignonia Family

*__Spathodea campanulata__ Beauv. AFRICAN TULIP TREE
Kīpahulu Valley, near sea level to 2860 ft.
Tall (to 25 m height), invasive tree with wind-dispersed seeds in lower elevation disturbed forest as well as relatively intact rain forest.
[Alien: native to tropical Africa]
KV28,KW16,LK28

BORAGINACEAE, Borage Family

Heliotropium anomalum Hook. & Arnott *HINAHINA, HINAHINA KŪ KAHAKAI*
var. **argenteum** A. Gray
Lower Kīpahulu Valley, Puhilele Point
Endemic variety with closely appressed, silky pubescence; growing in Panicum fauriei var. latius exclosure near Kanekauila Heiau at Puhilele Point (P.Welton, pers. comm.).
[Endemic: Main Hawaiian Islands except Lāna`i and Kaho`olawe]

*__Heliotropium procumbens__ Mill.
West slope, 6800 ft.
Single plant collected in 1995 from disturbed ground near housing area (J. Mar pers. comm.). Apparently imported with sandy fill from a coastal Maui site.
[Alien: native from southern United States south to Central and South America and the West Indies]

BRASSICACEAE (CRUCIFERAE), Mustard Family

*__Brassica oleracea__ L.
var. __botritis__ L. CAULIFLOWER
var. __capitata__ L. HEAD CABBAGE
var. __gemmifera__ Zenker BRUSSEL SPROUTS
var. __italica__ Plenck ITALIAN BROCCOLI
West slope.
Cultivated in yards of residences near headquarters, 7000 ft; not reproducing.
[Alien: native to Europe]

*__Capsella rubella__ Reuter SHEPHERD`S PURSE
[= Capsella bursa-pastoris (L.) Medik sensu C36]
Crater; east and west Kaupō Gap; West slope, in disturbed sites and on roadsides.
Weed of often dry, disturbed sites, named for the silicles which resemble a shepherd's purse.
[Alien: native to Eurasia]
C36

*__Cardamine flexuosa__ With.
[= Cardamine konaensis St. John sensu HR49,SS71-72]
East Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift. 4790-6300 ft.
First collected in the Park by C.N. Forbes in 1919.
[Alien: native to Eurasia]
HR49,KV28,SS71-72, Mitchell (1945).

*__Coronopus didymus__ (L.) Sm. SWINE CRESS
Crater, near Palikū ranger cabin; lower Kīpahulu Valley; West slope, near residences, 6800-7000 ft, and at Red Hill Parking lot, 10,000 ft.
This finely branched herb grows in disturbed areas; the foliage has a disagreeable odor when crushed. First collected in the Park in 1937 (G.E. Olson 62, BISH) on Halemau`u trail.
[Alien: native to Eurasia]
C36,KV28,LK32

*__Descurainia sophia__ (L.) Webb FLIXWEED, TANSY MUSTARD
West slope, stable area, 6800 ft, ?summit area, 10,000 ft.
New state record. First collected on the west slope in 1978 (R. Nagata s.n.), last observed in 1986 (A.C. Medeiros 769,BISH). A collection made in 1991 (A.C. Medeiros s.n.) from a crack in pavement at Red Hill Parking lot (10,000 ft elevation) may also be this species.
[Alien: native to Eurasia]
C36

*Iberis umbellata L. CANDYTUFT
West slope. Planted at Park residence (HQ11) in the mid-1970s, persistent since then through reproduction by seed (pers. comm., K. Ardoin, 1991); perhaps sparingly naturalized at periphery of yard in subalpine shrubland.
[Alien: native to southern Europe]

*Lepidium virginicum L. WILD PEPPERGRASS
Crater; lower west Kaupō Gap; West slope. 4000-9000 ft.
Annual herb growing mostly in the Park in disturbed sites at 4000-8000 ft but also uncommon in open cinder at 8000 to 10,000 ft. First collected on Maui and in the Park in 1872 (W. Hillebrand & J. Lydgate s.n., BISH).
[Alien: native to eastern United States]
C36

*Nasturtium microphyllum (Boenn.) Reichenb. WATERCRESS, *LEKO*
Lower Kīpahulu Valley
Planted and persistent trailing herb of low elevation riparian sites.
[Alien: native to western Europe]
KV28,LK32

*Sisymbrium altissimum L. TUMBLE MUSTARD
Crater, Kapalaoa to upper west Kaupō; West slope, stables and headquarters area.
Yellow-flowered mustard with linear siliques.
[Alien: native to Eurasia]
C36

*Sisymbrium officinale (L.) Scop. HEDGE MUSTARD
Crater; Kaupō Gap; West slope.
Pale yellow-flowered mustard with subulate siliques.
[Alien: native to Europe]
C36

*Thlaspi arvense L. FIELD PENNY-CRESS, FRENCHWEED
West slope.
Herb with distinctive, flattened, round fruits collected only once in 1989 in disturbed area near research housing area, 6800 ft.
[Alien: native to Europe]
Voucher: A.C. Medeiros 821, BISH

CACTACEAE, Cactus Family

*Opuntia ficus-indica (L.) Mill. PRICKLY PEAR, *PANINI*
[= Opuntia megacantha Salm-Dyck sensu C25]
Crater, near La`ie cave: lower west and central Kaupō Gap.

Approximately 50 plants (0.1-1.0 m tall) occur in the La`ie flats area (6800 ft); approx. 30-50 plants occur in Kaupō Gap at 4000-4900 ft.
[Alien: presumably native to Mexico]
C25

CAMPANULACEAE (LOBELIACEAE), Lobelia Family

Clermontia arborescens (Mann.) Hillebr. *HAHA, `OHA, `OHA-WAI-NUI*
subsp. **waihiae** (Wawra) Lammers
Kīpahulu Valley; Manawainui.
This is one of the most common Clermontia species of East Maui rain forests, as well as in middle to upper elevation rain forests of Kīpahulu Valley and Manawainui at 2200-6900 ft. On the adjacent NE rift, this species is apparently replaced by C. tuberculata, an East Maui local endemic. Though it extends its range down into lower elevations, it is less common than C. kakeana in lowland native rain forest sites. The flowers are often visited by native nectivarous birds. Flowering observed from February to September; fruiting observed from April to October.
[Endemic: Moloka`i, Lāna`i, West Maui and East Maui]
K45,KV31,M104

Clermontia grandiflora Gaud. *HAHA, `OHA, `OHA-WAI*
subsp. **grandiflora**
?subsp. munroi (St. John) Lammers
[= Clermontia hirsutinervis St. John sensu HR54]
[= Clermontia reticulata St. John sensu HR55,K46,KV31]
Kaumakani; upper Kīpahulu Valley; Manawainui; NE rift.
This rare rain forest understory shrub is usually found in areas of slightly higher light intensity such as along streambeds. It is easily distinguished from other Clermontia as the pink-to-purple curved flowers hang upside down on a long (to 20 cm), slender peduncle and pedicels. 4000-6100 ft.
[Endemic: Moloka`i, Lāna`i, West Maui and East Maui; subsp. grandiflora endemic: Maui]
HR54-55,K46,KV31

Clermontia kakeana Meyen *HAHA, `OHA, `OHA-WAI*
[= var. orientalis St. John sensu KV32]
Kīpahulu Valley
This is the most common Clermontia species of low to middle elevation windward rain forest on East Maui. 2200-6000 ft
[Endemic: O`ahu, Moloka`i,West Maui and East Maui]
K46,KV32

Clermontia samuelii Forbes *HAHA, `OHA, `OHA-WAI*
subsp. **samuelii**
[= Clermontia gracilis St. John]
[= Clermontia rosacea St. John]

Kīpahulu Valley; Manawainui, east rim, 6150 ft; NE rift.

subsp. **hanaensis** (St. John) Lammers

[= Clermontia kipahuluensis St. John]

[= Clermontia hanaensis St. John]

Kīpahulu Valley

This rare rose, greenish-white to white-flowered Clermontia is known from no more than 200-300 individuals in the rain forest of northeastern and eastern East Maui. It is proposed for Endangered status, but the listing has been delayed by critical habitat designation 5440-6500 ft.

[Endemic: East Maui]

HR56,KV33

Clermontia tuberculata Forbes *HAHA, `OHA, `OHA-WAI*

Kīpahulu Valley, rare along Koukouai Stream at 5200 ft; Manawainui, rare on east rim at 6000 ft; NE rift, common.

This Clermontia may be distinguished from other species of the genus by its distinctive purple flowers which are covered with purple prickles. 4800-6500 ft. Flowering has been observed from April to June.

Representative specimen: A.C. Medeiros 622 (BISH)

[Endemic: East Maui]

KV33

Cyanea aculeatiflora Rock *HAHA-NUI, HAHA*

Kīpahulu Valley, 3700-4730 ft; Manawainui, 5000-6300 ft.

Plants of this species superficially appear much like slender palm trees (to 7 m in height) in growth form. The flowers are usually whitish inside, dark purple outside and covered with prickles. Often found growing with (but more common than) the superficially similar appearing C. hamatiflora in upper elevation rain forest, especially along stream course sides. C. aculeatiflora, however, can be distinguished from C. hamatiflora by its leaves with long petioles, versus short or absent petioles in C. hamatiflora. Flowering observed from April to November; fruiting observed in August and September.

[Endemic: East Maui]

HR56,K46,KV33,M104

Cyanea asplenifolia (Mann) Hillebr.

"Cable ridge", southern rim of Kīpahulu Valley. 1850-2100 ft.

This species was rediscovered by Theodore Rodrigues and Stephen Anderson in 1991 on "Cable Ridge", the southern ridge above Kīpahulu Valley. In 1991, at least 350 plants of this species were growing in the relatively open understory just off the northern side of the ridgeline under large Acacia koa trees and other smaller native trees.

Endemic: West and East Maui.

Cyanea copelandii Rock *HAHA-NUI, HAHA*

subsp. **haleakalaensis** (St. John) Lammers

[= Cyanea haleakalaensis St. John]

[= Cyanea multisplicata Levl. sensu KV33]
This uncommon shrub of the dark wet understory of *ʻōhiʻa* and *koa* forest is found along the pali on the lower level of Kīpahulu Valley at 2400-3480 ft. The latex is yellowish-tan colored and the distinctive flowers are arched, described as peach, pale yellow, to salmon in color, and constricted and barely opened at the corolla throat. Proposed for Endangered status; the listing has been delayed due to decisions concerning critical habitat designation. Flowering observed from September to November; fruiting observed from November to April.
[Endemic: East Maui and Hawaiʻi; subsp. endemic: East Maui]
Representative specimen: W.L. Wagner et al. 5912 (BISH)
KV33

Cyanea elliptica (Rock) Lammers *ʻAKU, HAHA-NUI, HAHA*
[= Cyanea angustifolia (Cham.) Hillebr. sensu K46]
Middle Kīpahulu Valley, rare on Cable ridge.
This small-flowered Cyanea is distinguished from most other members of the genus by its well branched habit, more reminiscent of another Hawaiian lobelioid genus, Clermontia.
[Endemic: Lānaʻi, West Maui and East Maui]
K46,KV33

Cyanea aff. glabra (F. Wimmer) St. John *HAHA-NUI, HAHA*
[= Cyanea scabra Hillebr. var. variabilis Rock in part sensu K47,KV33]
[= Cyanea scabra Hillebr. var. inermis Hbd. (ined.)]
[= Cyanea holophylla Hillebr. var. obovata Rock sensu K46]
Kīpahulu Valley
This species collected only once in the Park in Kīpahulu Valley in 1920 (Forbes 2598M) and apparently not since. Elsewhere on East Maui, this species has been collected along the upper ditch trail at Kailua in 1908 (H.L. Lyon 10259), at Honomanu, 3000 ft elev. in 1911 (J.F. Rock 8789 and 8797) and in Keʻanae Valley in 1911 (J.F. Rock 8797 and 8798). Specimens at the B.P.Bishop Museum have been collected flowering in January, May, September, and November and have leaf blade shapes that vary from entire to dissected nearly to the midrib; fruiting observed from April to May. Flowering in Kīpahulu Valley observed in November and December; fruiting beginning in late January; ripening in April and May.
Wagner et al. (1990) state that C. glabra is endemic to East Maui but one specimen from Honokahau, West Maui (J.F. Rock 16024 BISH, collected in 1918) is in the B.P. Bishop Museum herbarium identified as this species. Several plants observed on the banks of the Palikea and a few along the Koukouai Stream have been identified as C. glabra by the authors. Proposed for Endangered status; the listing has been delayed by critical habitat designation.
[Endemic: East Maui]
K46-47,KV33

Cyanea grimesiana Gaud. GRIMES CYANEA, *NOUI, KUE-NUI*
subsp. **grimesiana**
Lower-middle Kīpahulu Valley

This low shrub with thorny and much divided fern-like leaves occurs in low to middle elevation rain forest often in thick matted fern understory. Only collection made in Kīpahulu Valley in 1919 (Forbes 1636M and Forbes 1680aM), when C.N. Forbes collected the species "on ridge in left side of valley."
[Endemic: Moloka`i, Lāna`i, West Maui, East Maui, and Hawai`i]
K46,KV33

Cyanea hamatiflora Rock subsp. **hamatiflora** *HAHA-NUI, HAHA*
Upper-middle Kīpahulu Valley; Manawainui. 2480-4150 ft.
These large (to 8 m tall) palm-like plants, with large, strongly arched, very dark-purple flowers, grow in undisturbed sites of upper elevation rain forest, especially along sides of stream courses. Often found growing with C. aculeatiflora, which it superficially resembles, but from which sterile individuals can be distinguished by their almost sessile leaves with very short petioles, versus longer petioles in C. aculeatiflora. Proposed for Endangered status; the listing has been delayed over decisions concerning critical habitat designation. Flowering observed in January and February; fruiting observed in February and March.
[Endemic: East Maui and Hawai`i; subsp. endemic: East Maui]
K46,M104

Cyanea horrida (Rock) Deg. and Hosaka PRICKLY CYANEA, *HAHA-NUI*
Upper Kīpahulu Valley; Manawainui, east rim; NE rift. 3500-6470 ft.
Rare, scattered shrubs, with divided, sometimes thorny, leaves, often found along sides of stream courses in upper elevation rain forest.
[Endemic: East Maui]
HR55,K46,KV33

Cyanea kunthiana Hillebr. *HAHA-NUI, HAHA*
[= Cyanea bishopii Rock sensu KV33,M104]
Kīpahulu Valley; Manawainui, 5000-6100 ft; NE rift, 5400-6100 ft. 4000-6200 ft.
Uncommon small shrub with clusters of dark purple flowers, on stream courses, gullies and steep slopes in undisturbed middle to upper elevation rain forest. Flowering has been observed in May and June.
[Endemic: West Maui and East Maui]
Representative specimen: A.C. Medeiros 435 (BISH)
KV33,M104

Cyanea longissima (Rock) St. John *HAHA-NUI, HAHA*
[= Cyanea scabra Hillebr. var. variabilis Rock in part]
Possibly extinct distinctive shrub with alate petioles and clusters of white flowers formerly found in middle elevation rain forest. Last collected on East Maui in 1927 (O. Degener 18,071) and in Kīpahulu Valley in 1919 by C.N. Forbes.
[Endemic: East Maui]

Cyanea macrostegia Hillebr. *HAHA-NUI, HAHA*
subsp. **macrostegia**
[= Cyanea atra Hillebr. sensu HR56]
[= Cyanea bicolor St. John]
Kaumakani; Kīpahulu Valley; Manawainui; NE rift. 3880-6100 ft.
Variable, uncommon, rain forest shrub with large entire leaves and purple flowers.
[Endemic: Lāna`i, West Maui and East Maui]
HR56,K47,KV33

Cyanea pohaku Lammers *HAHA-NUI, HAHA*
[= Clermontia haleakalensis Rock sensu C25]
West slope.
Apparently extinct, much-branched small tree (to 4.5 m) that formerly grew in moist subalpine shrubland prior to the 1900s. This species was discovered in October 1910 (J.F. Rock 8595) near Pu`u-nianiau, but disappeared by 1919. In his 1910 field book, Rock noted, "it grows on the north-west slope of Haleakalā, at the side of Puunianiau hill [ = Pu`u-nianiau], an elevation of nearly 7000 ft." There have been no collections or sightings since 1919.
[Endemic: East Maui] C25

Lobelia gloria-montis DC. *PU`E*
[= Lobelia gaudichaudii sensu HR55]
Manawainui, on east rim, 5000-6400 ft; NE rift, 5400-6300 ft.
Tall, palm-like shrubs of wet rain forest, stream courses, and bog margins. Blooming plants, which begin to flower in late May to August, bear an erect terminal inflorescence of several hundred white flowers, then die after bearing fruit. 5000-6400 ft.
[Endemic: Moloka`i,West Maui and East Maui]
HR55,KV33

Lobelia grayana E. Wimm. *`OPELU*
Crater; Kaumakani; east and west Kaupō Gap; upper Kīpahulu Valley; Manawainui; NE rift. 4800-7400 ft.
Blue-flowered rosette plant growing along cliffs and stream courses from moist areas of subalpine shrublands to upper rain forests. Very similar to L. hillebrandii and L. hypoleuca, but with narrow leaves (0.5-1.5 cm wide), inflorescences unbranched and flowers with longer corollas (28-32 mm long) than L. hillebrandii (Wagner et al. 1990). Flowering observed from August to October; fruiting observed in December.
[Endemic: East Maui]
C25,HR55,K47,KV33,M105,SS105

Lobelia hillebrandii Rock *`OPELU*
Kīpahulu Valley; Manawainui; NE rift.

Blue-flowered rosette plant growing along cliffs and stream courses in rain forests. Very similar to L. hypoleuca and L. grayana, but with narrow leaves (0.8-1.4 cm wide), inflorescences unbranched, and flowers with shorter corollas (18-24 mm long) than L. grayana. (Wagner et al. 1990).
[Endemic: West Maui and East Maui]
K47,KV33

Lobelia hypoleuca Hillebr. *KUHI-`AI-KAMO`O-WAHIE, MO`O-WAHIE, `OPELU*
Kīpahulu Valley
Blue-flowered rosette plant growing along cliffs and stream courses in rain forests. Very similar to L. grayana and L. hillebrandii, but with broader leaves (2-10 cm wide) and inflorescences branched at the base. Flowering observed from September to November; fruiting observed in November.
[Endemic: main Hawaiian Islands]
K47

Trematolobelia macrostachys (Hook. and Arn.) A. Zahlb. *KOLI`I*
[= var. haleakalensis St. John sensu HR55]
Kaumakani; Kīpahulu Valley; Manawainui, on east rim at 5000-6200 ft; NE rift.
Rosette plants on pole-like stems of rain forests, especially on windswept ridges at 3000-6200 ft. The endemic genus, Trematolobelia, is monocarpic (flowering once then dying); when flowering, it produces a pinwheel-like cluster of 5-20 spoke-like stalks, each bearing 30-100 purple to red flowers. Flowering observed in May and June.
[Endemic: O`ahu, Moloka`i, Lāna`i, West Maui, East Maui and Hawai`i]
HR55,K47

CANNABACEAE, Hemp Family

*__Cannabis sativa__ L. HEMP
Kīpahulu Valley (destroyed); West slope (destroyed).
Formerly illegally cultivated but not naturalized in the park.
[Alien: native to central Asia]

CARICACEAE, Papaya Family

*__Carica papaya__ L. PAPAYA
Lower Kīpahulu Valley, at campground near sea level.
Planted and persistent.
[Alien: native to the Neotropics]

CARYOPHYLLACEAE, Pink Family

*__Arenaria serpyllifolia__ L. THYME-LEAVED SANDWORT
Crater; west Kaupō Gap; West slope.

Wispy, annual herb of disturbed upper elevation rocklands. Formerly, this species was very common in western Kaupō Gap, but after elimination of feral goats became much less abundant as a result of overtopping by predominantly non-native grasses.
[Alien: native to Eurasia]
C26

*__Cerastium fontanum__ Baumg. CHICKWEED, *HEHINE-HAULI*
subsp. __triviale__ (Link) Jalas
[= Cerastium vulgatum L. C26,HR43,KV28,M105]
Crater; west Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope.
Matted, short-lived perennial herb with hirsute stems and leaves.
[Alien: native to Eurasia]
C26,HR43,KV28,M105, Henrickson 1971.

*__Dianthus__ sp. CARNATION
West slope.
Planted at Park residence (HQ10) and slowly spreading through reproduction by seed into the adjacent lawn and nearby shrubland. Approximately 20 adventive seedlings in immediate area as of 1991.
Representative specimen: B.H. Gagne 3043 (BISH)
[Alien]

*__Drymaria cordata__ (L.) Willd. ex R. & S. *PIPILI*
Kīpahulu Valley, common weed in moist sites, 20-3300 ft; Manawainui.
Flowering observed from April to January; fruiting observed from April to January.
[Alien: pantropical]
K37,KV28,KW13,LK29,M105

*__Petrorhagia velutina__ (Guss.) P. Ball and Heyw. CHILDING PINK
West slope.
Rare, annual herb, currently restricted to a few roadside populations.
[Alien: native to Europe]

*__Polycarpon tetraphyllum__ (L.) L. ALLSEED
Crater; Kalapawili; Kaupō Gap; Manawainui; West slope. 3900-10,000 ft.
Common herb in a variety of dry rocky sites, especially abundant in western Kaupō Gap. Present in Makawao area, Maui.
[Alien: native to Europe]
C26

__Schiedea diffusa__ Gray
Kīpahulu Valley 2500-3890 ft; Manawainui 6300 ft; NE rift, 6470 ft.
Rare, lax undershrub of *`ōhi`a* and *koa* forest at 2500-6470 ft.
[Endemic: Moloka`i, East Maui and Hawai`i]
HR43,K37,KV28

Schiedea haleakalensis Deg. and Sherff

Crater, on vertical cliffs along inner western rim south of Hōlua cabin 7200-8000 ft; west Kaupō Gap, in the large bay near Waikane springs and on N-facing cliffs below Haleakalā peak, 5900-7600 ft.

Small, rare shrubs, growing exclusively in cracks on rocky cliffs, with thick woody rootstocks and scandent herbaceous branches. At present, 50-100 plants are known, perhaps 100-300 plants may be estimated to occur but due to the inaccessibility of their habitat, a complete survey is lacking. This species listed as Endangered by USFWS. Threats to this species include invasion of its habitat by the Argentine ant and slug herbivory.

[Endemic: East Maui]

Representative specimen: A.C. Medeiros 575, 576 (BISH)

C26,SS72-73

Schiedea implexa (Hillebr.) Sherff

Kaupō Gap

This brittle, vine-like shrub was superficially similar to S. diffusa but was apparently restricted to leeward montane sites. This species was last collected in 1910 (J.F. Rock 8643) and is presumed extinct.

[Endemic: East Maui]

SS73

Silene cryptopetala Hillebr.

Subshrub known only from type collection made in the 1870s (Lydgate s.n.) from an unspecified locale on East Maui. Not currently recorded from the Park and presumed extinct.

[Endemic: East Maui]

Silene degeneri Sherff

Ko`olau Gap; West slope.

Subshrub (ca. 0.4 m tall) with fragrant flowers known only from two collections: the type collection from "over dry, rocky embankment in Haleakalā Crater near Ko`olau Gap" (O. Degener & H. Wiebke 2310) and the second (O. Degener 2311) between Crater House [Kalahaku] and Ko`olau Gap. Last collected in 1927, this species is presumed extinct.

[Endemic: East Maui]

***Silene gallica** L. SMALL-FLOWERED CATCHFLY

Crater; East and west Kaupō Gap; West slope. 5260-8500 ft.

Annual or biennial herbaceous weed with pubescent, sessile leaves.

[Alien: native to Europe]

C26

Silene struthioloides Gray

[= Silene hawaiiensis Sherff var. kaupoana (Deg. and Sherff in Sherff) Deg. and Sherff in Sherff sensu C27]

Crater; West slope.

Uncommon, many-branched, compact shrubs, with thick woody base and taproot, usually less than 0.3 m tall, of open cinder cones and fields at 6600-9000 ft.
[Endemic: East Maui and Hawai`i]
C27, Mitchell (1945).

*Stellaria media (L.) Cyrill — COMMON CHICKWEED
West Kaupō Gap.
Slender, ciliate trailing herb with tiny, star-shaped flowers.
[Alien: native to Eurasia]

CASUARINACEAE, Casuarina Family

*Casuarina equisetifolia L. — IRONWOOD, *PAINA*
Lower Kīpahulu Valley
Several small trees in strand zone at ca. 20 ft. elevation, in Scaevola patch, just north of Kukui Bay.
[Alien: native to Australia]
KV28,LK29

CELASTRACEAE, Bittersweet Family

Perrottetia sandwicensis Gray — *OLOMEA*
East Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Common but sporadically distributed small tree, usually in groves, in *`ōhi`a* and *koa* forest at 2000-4000 ft. The ripe red fruits are eaten by native forest birds (K40). Flowering observed from January to May; fruiting observed from April to September.
[Endemic: main Hawaiian Islands]
HR46,K40,KV28,LK29,M105,SS73-74

CHENOPODIACEAE, Goosefoot Family

*Atriplex suberecta Verdoorn
West slope, in disturbed site on roadside near water purification unit at 7050 ft. This species was first collected in the Park in 1982 (A.C. Medeiros 288 BISH)
[Alien: apparently native to Australia and South Africa]

*Chenopodium ambrosioides L. — MEXICAN TEA
Crater; Kaupō Gap; West slope, rare weed along roadside.
Erect herb, often with reddish, malodorous foliage and both terminal and axillary inflorescences, usually in man-caused disturbed areas but also colonizing erosional sites in cinder in the central Crater. First collected in the Park in 1937 in the Crater west of `O`ili-pu`u (G.E. Olson 64 - BISH).
[Alien: native to Mexico, Central and South America, and West Indies]
C27, Mitchell 1945

*Chenopodium carinatum R. Br. KEELED GOOSEFOOT
Crater; West slope, disturbed sites at 6800-7200 ft. First collected in the Park in 1982 (A.C. Medeiros 287, BISH).
Malodorous weed with axillary inflorescences.
[Alien: native to Australia]
C27, Mitchell (1945)

Chenopodium oahuense (Meyen) Aellen *`AHEAHEA, `AWEOWEO*
[= var. discosperma Fosb. sensu C27]
Crater; west Kaupō Gap; West slope.
Occasional in dry forest and subalpine shrubland. Degener (1957) states "the shrub bark and seed were used by Hawaiians to color tapa."
[Endemic: Hawaiian Islands]
C27,SS74

CLUSIACEAE (GUTTIFERAE), Mangosteen Family

+Calophyllum inophyllum L. *KAMANI*, ALEXANDRIAN LAUREL
Lower Kīpahulu Valley, planted.
An important tree utilized medicinally and for calabashes by early Hawaiians.
[Probable Polynesian introduction: native to tropical Asia and Pacific islands]

COMBRETACEAE, Terminalia Family

*Terminalia catappa L. TROPICAL ALMOND, FALSE *KAMANI*
Lower Kīpahulu Valley
Tall tree forming thick groves both below and above the road from sea level to 560 ft elevation. Widely planted in Hawai`i and other tropical islands for shade and the edible seeds (Wagner et al. 1990).
[Alien: native to Malesia]
KV28,LK29

COMPOSITAE, Sunflower Family (see ASTERACEAE)

CONVOLVULACEAE, Morning-Glory Family

*Ipomoea alba L. MOON FLOWER, *KOALI-PEHU*
Lower Kīpahulu Valley
Common non-native low-elevation windward morning glory vine with large heart-shaped leaves and white flowers. Often forms thick mats of vegetation high in and between surrounding trees. This species is spreading in Kīpahulu Valley and throughout the wet windward coast of Haleakalā. 20-700 ft.
[Alien: probably native to Mexico]
KV28,LK31

+**Ipomoea batatas** (L.) Lam. SWEET POTATO, *`UALA*
Lower Kīpahulu Valley, 100-640 ft.
Planted and sparsely reproducing in the Park. An important crop with many cultural uses, Wagner et al. (1990) state that "early Hawaiians recognized about 230 cultivars of sweet potatoes; however all but about 24 have been lost."
[Polynesian introduction: pantropical but of American origin]
KV28,LK31

#**Ipomoea indica** (J. Burm.) Merr. MORNING GLORY, *KOALI-AWA*
[= Ipomoea congesta R. Br. sensu KV28,LK31]
Lower Kīpahulu Valley
Common native lowland (but not usually in strand zone) morning glory vine with heart-shaped leaves and purple flowers. 20-1450 ft.
[Indigenous: pantropical]
KV28,LK31,SS76

#**Ipomoea pes-caprae** (L.) R. Br. BEACH MORNING GLORY, *POHUEHUE*
[= Ipomoea brasiliensis (L.) Sweet sensu KV28,LK31]
Lower Kīpahulu Valley, near sea level.
Common native strand zone morning glory with distinctive bilobed leaves and purple flowers.
[Indigenous: pantropical]
KV28,LK31,SS75

CRASSULACEAE, Orpine Family

*__Crassula argentea__ L. JADE PLANT
West slope, residential area at 7000 ft.
This species was planted in the mid-1970s at a Park residence and locally is reproducing by seed in nearby undisturbed subalpine shrublands. Most plants were destroyed in 1983, but as of 1991, adventive plants of this species still occurred in shrublands west of Park house HQ11 (pers. comm. K. Ardoin, 1991).
[Alien: native to South Africa]

*__Kalanchoe pinnata__ (Lam.) Pers. AIR PLANT, *`OLIWA-KŪ-KAHAKAI*
Lower Kīpahulu Valley
Glabrous, perennial weed with distinctive sepals forming a pale yellow, cylindrical, inflated papery tube.
[Alien: native range unknown, widely naturalized in tropics and subtropics]
KV28,LK32

*__Kalanchoe tubiflora__ (Harv.) Hamet CHANDELIER PLANT
Lower Kīpahulu Valley
Glabrous perennial herb with sepals forming an orange to scarlet tube.
[Alien: native to Madagascar]
KV28,LK32

CRUCIFERAE, Mustard Family (see BRASSICACEAE)

CUCURBITACEAE, Gourd Or Squash Family

*__Momordica charantia__ L. BALSAM PEAR
Lower Kīpahulu Valley, 20-150 ft.
Fairly common, herbaceous vine with dissected leaves, yellow flowers and bright orange fruits. Grows in low elevation disturbed sites from edge of strand zone to lower pastures. Cited in Wagner et al. (1990) as var. abbreviata Ser.
[Alien: native from tropical Africa to Australia]
KV28,LK32

*__Sechium edule__ (Jacq.) Sw. *PIPINOLA*, CHAYOTE
East Kaupō Gap.
Localized, spreading vine of open mesic forests at 3900-5500 ft.
[Alien: native to tropical America]

__Sicyos cucumerinus__ Gray *ʻANUNU*
Kīpahulu Valley
Rare, short-lived (1-2 years) vine of rain forest. Flowering and fruiting observed in April, May and October.
[Endemic: Molokaʻi, Maui, Hawaiʻi]
Representative specimen: L.W. Cuddihy & G.L. Santos 2242 (BISH)
USFWS

__Sicyos pachycarpus__ Mann *KŪPALA*
[= Sicyos microcarpus Mann sensu SS78]
[= Sicyos sp. sensu C32]
East Kaupō Gap.
Occasional, annual, carpeting vine of mesic forest; conspicuous in spring months following winter rains.
[Endemic: Hawaiian Islands]
C32,SS78

EPACRIDACEAE, Epacris Family

#__Styphelia tameiameiae__ (Cham. and Schlect.) F. v. Muell. *PŪKIAWE*
[= Styphelia douglasii (Gray) F. v. Muell. ex Skottsb. sensu C37,HR50,K42,KV29,M105]
[= var. brownii (Gray) St. John sensu HR50,KV29]
Crater; Kalapawili; east and west Kaupō Gap; Kīpahulu Valley, 3500-7500 ft; Manawainui; NE rift; West slope, to near summit. 3500-9900 ft.

Styphelia is the most common shrub in the Crater District of the Park. In a recent treatment (Wagner et al. 1990), only a single native species of Styphelia is recognized. On East Maui, however, two morphological entities are apparent with few introgressive individuals. One is an extremely variable, narrow-leaved shrub found from the alpine summit to middle elevation rain forest at 3500-9900 ft. The other, formerly known as the var. brownii, is a broad-leaved low shrub found at 3500-8000 ft from middle elevation rain forest to moist subalpine shrubland, especially common in openings at Kalapawili; upper Kīpahulu Valley; Manawainui; NE rift; and the West slope.

[Indigenous: Marquesas and main Hawaiian Islands]

Representative specimen: A.C. Medeiros 389a & b, 390a & b (BISH)

C37,HR50,K42,KV29,M105,SS80

ERICACEAE, Heath Family

Vaccinium calycinum Sm. *`OHELO-KAU-LA`AU*

Crater, Palikū; Kalapawili; Kaumakani; Kīpahulu Valley; Manawainui; NE rift.

Tall shrub or small tree (to 6m) in middle to upper elevation rain forest. 3000-7200 ft. Flowering and fruiting observed year-round.

[Endemic: main Hawaiian Islands]

C37,HR49,K42,KV29,M106

Vaccinium dentatum Sm. *`OHELO*

Kīpahulu Valley; Manawainui; NE rift; West slope, along streams near Hosmer Grove.

[Endemic: main Hawaiian Islands]

Small shrub (to 0.5 m) along steep banks or along stream courses. 2890-6700 ft. Flowering and fruiting observed from April to June.

C38,HR49,KV29,M106

Vaccinium reticulatum Sm. *`OHELO*

[= Vaccinium berberidifolium (Gray) Skottsb. from Kalapawili; Kīpahulu Valley; Manawainui; NE rift; West slope. sensu C37,HR49,K42,KV29,M105,SS80-81]

[= Vaccinium pahalae Skottsb. from Kalapawili, Flat Top Bog; NE rift sensu Vogl and Henrickson (1971)]

Crater; Kalapawili; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; West slope.

Vaccinium is one of the most common shrubs in the Crater District of the Park. A recent taxonomic revision (Van der Cloet in Wagner et al. 1990) unites three seemingly well-defined morphological and ecological entities. Prior to Van der Cloet`s treatment (used in Wagner et al. 1990), V. reticulatum was characterized as an erect shrub (to 2 m) with obovate, strongly glaucous, barely serrate leaves. This shrub grows primarily in upper elevation subalpine shrublands, especially in rocky areas. An entity formerly known as Vaccinium berberidifolium is a low shrub (0.2-1 m) with dark green, ovate, unevenly serrate leaves. In montane bogs on Maui, Vaccinium occurs as a diminutive shrub (previously known as V. pahalae) with nearly round leaves with recurved margins.

The genus Vaccinium needs reevaluation on upper East Maui volcano where several seemingly well-defined species with occasional hybrids are represented. The apparent hybrids occur at

greater frequency in disturbed sites, e.g. conifer plantations, or at the ecotone of two adjacent habitats, e.g. subalpine shrubland and moist rocklands. 5000-9700 ft.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui, and Hawai`i]
C37,C38,HR49,HR50,K42,KV29,M105,SS80-81

EUPHORBIACEAE, Spurge Family

+**Aleurites moluccana** (L.) Willd. CANDLENUT, *KUKUI*
Lower Kīpahulu Valley
An important ethnobotanical plant for early Hawaiians, this tree grows mainly along stream courses at low to medium elevation; its pale young foliage makes groves of this species conspicuous from some distance.
[Polynesian introduction: native to Malesia, widely introduced throughout tropics by early man]
K39,KV29,LK32,M106

Antidesma platyphyllum Mann *HAME*
var. **platyphyllum**
Kīpahulu Valley 1400-2800 ft.
Characteristic subcanopy tree of middle elevation *koa* forest, especially on the lower level. Favored host tree of many native snails, such as Partulina. Ethnobotanically, the dark purple fruits were used to make a red dye for *kapa*. Fruiting observed from February to October.
[Endemic: main Hawaiian Islands]
K39,KV29,LK32

Chamaesyce celastroides (Boiss.) Croizat and Deg. *`AKOKO, KOKO*
var. **lorifolia** (Gray) Deg. and Deg.
[= Euphorbia celastroides Boiss. var. mauiensis Sherff sensu SS]
Kaupō Gap.
Low shrub to small tree characteristic of leeward East Maui dryland forest vegetation. Most abundant on cliffs and rock faces in west Kaupō Gap, there is a small grove of relict trees in east Kaupō Gap. In 1989, a number of scattered (recently emergent) seedlings and saplings were observed in recovering native shrubland in middle Kaupō Gap. This species may increase dramatically in Kaupō Gap as long as feral goats are excluded. Ethnobotanically, this species was used in making paint for canoes. 4000-6400 ft.
[Endemic: main Hawaiian Islands; var. endemic: Lāna`i and Maui]
Representative specimen: A.C. Medeiros & L.L. Loope 419 (BISH)
SS83-84

*Chamaesyce hirta (L.) Millsp. GARDEN SPURGE, *KOKO-KAHIKI*
[= Euphorbia hirta L. sensu LK33]
Lower Kīpahulu Valley
Low tomentose herb of disturbed sites, 50-200 ft.
[Alien: native from southern U.S. to South America, West Indies and Old World tropics]
KV30,LK33

Claoxylon sandwicense Muell.-Arg. *PO`OLA*
[= var. magnifolium Sherff sensu K40,KV29,LK32]
Kīpahulu Valley
Single population of shrubs on the south side of Pu`u-palikea, 1650-1800 ft. Ethnobotanically, the bark and leaves were used medicinally.
[Endemic: main Hawaiian Islands]
K40,KV29,LK32,SS82

*__Euphorbia heterophylla__ L. WILD SPURGE, *KALIKO*
[= Euphorbia geniculata Ortega sensu KV30,K33]
Lower Kīpahulu Valley, roadside weed.
Robust annual weed with green, white or purple-spotted floral leaves (never red); of dry, disturbed sites.
[Alien: native from southern U.S. to South America, West Indies]
KV30,K33

*__Euphorbia peplus__ L. PETTY SPURGE
Crater, in soil pockets along western and southern cliffs; West slope.
Uncommon, annual herb in disturbed sites. 6800-7000 ft.
[Alien: native to temperate Eurasia]

*__Euphorbia pulcherrima__ Willd. ex Klotzsch POINSETTIA
Lower Kīpahulu Valley
Ornamental plant prized for its bright red to white floral bracts.
KV30,LK33
[Alien: native to Mexico]

*__Manihot esculenta__ Crantz CASSAVA, TAPIOCA PLANT
Lower Kīpahulu Valley, cultivated and persistent.
Shrub, with palmately-divided leaves widely grown for the tuberous edible roots.
[Alien: native to Brazil]
KV30,LK33

*__Manihot glaziovii__ Muell.-Arg. CEARA RUBBER TREE
Lower Kīpahulu Valley, single tree at `Ohe`o Gulch bridge. This plant was presumably derived from trees of this species planted in Nahiku for the Nahiku Rubber Plantation (1904-1915). Planted and not reproducing in the Park.
[Alien: native to Brazil]
KV30,LK33

+?__Ricinus communis__ L. CASTOR BEAN, *KOLI*
East Kaupō Gap; lower Kīpahulu Valley, occasional in lower pastures.
Moderately invasive species in dryland forest in lower east Kaupō Gap. 150-4200 ft.

[Possibly Polynesian introduction or indigenous. Still considered by many sources to be an non-native species (Wagner et al. 1990), archaeological work has yielded pollen of this species in apparently undisturbed strata, consistent with its presence in pre-Western contact Polynesian Hawai`i (Bennett 1984).].
C38,KV30,LK33

FABACEAE (LEGUMINOSAE), Pea Family

Acacia koa Gray *KOA*
East Kaupō Gap; Kaumakani; Kīpahulu Valley, 470-5520 ft, upper and lower levels; Manawainui. Cultivated in headquarters area. 2000-6700 ft.
Large (to 30 m tall) sickle-leaved tree that dominates middle elevation forests of Kīpahulu Valley as well as western Manawainui and east Kaupō Gap. Second most common native forest tree in Hawai`i (to Metrosideros). In lower Kīpahulu Valley, ***koa*** saplings periodically appear in `Ohe`o Gulch as low as 80 ft elevation. Ethnobotanically, this species is most noted for its use as the primary wood used for construction of canoe hulls in the Hawaiian Islands.
[Endemic: Hawaiian Islands]
C42,K38,KV30,LK34,M106,SS84-86

*Acacia mearnsii De Wild. BLACK WATTLE
[= Acacia decurrens (Wendl.) Willd.]
West slope.
Single tree above headquarters at 7200 ft removed in mid-1980s. Periodically, seedlings of this species emerge on disturbed ground behind gas house near headquarters at 7000 ft and are removed. Abundant and still spreading in Kula area, downslope from Park, at 3000-5000 ft elevation.
[Alien: native to Australia]
Representative specimen: B.H. Gagne 1024 (BISH)

*Acacia melanoxylon R.Br. ex Aiton AUSTRALIAN BLACKWOOD
West slope, headquarters area (extirpated).
Three trees planted in early 1980s and destroyed in 1987. Larger, monotypic stands of this invasive tree occur at slightly lower elevations in The Nature Conservancy's Waikamoi Preserve bordering the northwest slopes of the park.
[Alien: native to Australia]

*Canavalia cathartica Thouars. *MAUNALOA*
Lower Kīpahulu Valley
Purple-flowered vine on cliffs near bridge and pools, and at edges of lower pastures. 80-200 ft.
[Alien: native to Old World tropics and much of Polynesia]
KV30,LK34

Canavalia aff. **hawaiiensis** O. Degener, I. Degener, & J. Sauer *`AWIKIWIKI, PUAKAUHI*
"Cable ridge", southern rim of Kīpahulu Valley, 1500 ft.
Single large plant seen in mesic to wet Metrosideros/Acacia forest. In many aspects, this plant appears most similar to C. hawaiiensis; however the pubescence of the seed pod is also apparently close to C. napnon-nativesis St. John of Kaua`i island. It may represent a new species (R.W. Hobdy, pers. comm.).
[Endemic: Lāna`i, Maui, and Hawai`i island]

*__Chamaecrista nictitans__ (L.) Moench PARTRIDGE PEA, *LAUKI*
[= Cassia leschenaultiana DC. sensu KV30,LK34,M106]
Lower Kīpahulu Valley, campgrounds, roadside and lower pastures, 20-470 ft.
Sometimes confused with sensitive plant (Mimosa pudica), the leaves of this non-prickly plant are not sensitive and are pinnately (versus bipinnately) compound.
[Alien: native to tropical America]
KV30,LK34,M106

*__Crotolaria incana__ L. FUZZY RATTLE-POD
West slope.
Rare, yellow-flowered roadside weed with pubescent seed pods at 6800-7500 ft; not seen since 1986.
[Alien: widespread through tropics and subtropics]
Representative specimen: A.C. Medeiros 294 (BISH)

*__Crotolaria pallida__ Aiton SMOOTH RATTLE-POD
[= Crotalaria mucronata Desv. sensu KV30,LK34]
Lower Kīpahulu Valley, lower pastures.
Yellow-flowered weed with mostly glabrous seed pods.
[Alien: native to Africa]
KV30,LK34

*__Desmodium incanum__ DC SPANISH CLOVER, *KA`IMI*
[= Desmodium canum (Gmel.) Schinz. and Thell. sensu KV30,LK34]
Lower Kīpahulu Valley, roadside to campground, lower pastures.
Subshrub distinguished by the alternate, trifoliolate leaves, elliptic to obovate leaflets, light-colored blotch along the midrib, racemes of small, purple to pink, pea-like flowers, and straight pod divided along one margin into 3-6 pubescent, oblong segments" (Whistler 1994).
[Alien: native to tropical and subtropical America]
KV30,LK34

*__Desmodium sandwicense__ E. Mey. SPANISH or CHILI CLOVER
[= Desmodium uncinatum (Jacq.) DC. sensu C42]
Lower east Kaupō Gap; Kīpahulu Valley
Similar to D. incanum, but with a pink to white corolla 8-10 mm long (versus 4-6 mm).
[Alien: native to South America]
C42,KV30

*__Desmodium triflorum__ (L.) DC. THREE-FLOWERED BEGGARWEED
Lower Kīpahulu Valley, 10-470 ft.
Prostrate, clover-like herb with 2-5 purple flowers in clusters opposite a leaf and with jointed pods notched along one side into 3-5 articles; at upper edge of strand zone and in lawns and disturbed areas at low elevations.
[Alien: native to Old World tropics and subtropics]
KV30,LK35

*__Erythrina variegata__ Stickm. TIGER`S CLAW
[= var. orientalis (L.) Merr. sensu KV30,LK35]
Lower Kīpahulu Valley, planted roadside tree.
Planted and not reproducing in the Park.
[Alien: native from India to southern Polynesia]
KV30,LK35

*__Indigofera suffruticosa__ Mill. INDIGO
Lower Kīpahulu Valley, common in pastures; Manawainui.
Hillebrand (1888) reported that this plant was introduced from Java by Dr. Serriere in 1836 for the manufacture of indigo.
[Alien: pantropical]
KV30,LK35,M106

*__Leucaena leucocephala__ (Lam.) de Wit *KOA-HAOLE*
Lower Kīpahulu Valley; West slope.
In lower Kīpahulu, this species is restricted to several small populations below the road. On the western slope, it is a rare roadside weed at 6800-7000 ft.
[Alien: native to tropical America]
KV30,LK35

*__Lotus subbiflorus__ Lag.
[= Lotus angustissimus L.]
Crater; West slope.
Uncommon, yellow-flowered, low-growing legume, seasonal along roadsides and along Halemau`u trail switchbacks at 6900-8000 ft.
[Alien: native to Europe]

*__Medicago lupulina__ L. BLACK MEDIC, TREFOIL
Crater, `O`ili-pu`u; West slope, disturbed sites. 6600-6800 ft.
Procumbent or ascending herb with trifoliolate leaves and yellow flowers.
[Alien: native to Europe and temperate Asia]
C42

*__Medicago sativa__ L. ALFALFA, LUCERNE
West slope.

Erect, blue-flowered herb often cultivated for fodder. Within the Park, this species is rarely seen, mostly in the stables area and along Park roadsides at 6800-8800 ft.
[Alien: native to Europe]
Representative specimen: A.C. Medeiros 295 (BISH)

*__Melilotus alba__ Medik. WHITE SWEET CLOVER
West slope, near summit and "science city", ca. 10,000 ft.
White-flowered, trifoliolate herb, widely introduced as a fodder plant and reported as being cultivated by the Hawaiian Sugar Planters' Association (Rock 1920).
[Alien: native to Europe]

*__Mimosa pudica__ L. SENSITIVE PLANT, *PUA-HILAHILA*
var. __unjuga__
Lower Kīpahulu Valley, lower pastures.
Prickly pink-flowered weed with bipinnately "sensitive" leaves that close when touched.
[Alien: pantropical]
KV30,LK35

#__Mucuna gigantea__ (Willd.) DC. *KA`E`E*
Lower Kīpahulu Valley, 200-600 ft.
White-flowered vine in trees in lower pastures and lower Waimoku Falls Trail.
[Indigenous: East Africa, India, China, Malesia and Pacific islands, incl. Hawaiian Islands]
KV30,LK35

#__Mucuna urens__ (L.) Medik. COW-ITCH PLANT, SEA BEAN, SHEEPS-EYE
"Cable ridge", southern rim of Kīpahulu Valley.
Single large sprawling liane on ridge in Metrosideros/Acacia forest. Has recently been assigned to Mucuna sloanei subsp. persericea (R. Hobdy, pers. comm.).
[?Indigenous: native to the Neotropics, perhaps indigenous to the Hawaiian Islands, namely O`ahu, Maui, and Hawai`i islands]

*__Senna occidentalis__ (L.) Link COFFEE SENNA, *`AUKO`I, MIKI PALALO*
[= Cassia occidentalis L. sensu C42,KV30]
East and central Kaupō Gap; Kīpahulu Valley; Manawainui. 150-4800 ft.
Adventive shrub of dry to mesic, middle to low elevation sites. This species is sparsely established in east and central Kaupō Gap, 3900-4800 ft. It was first recorded in the Park in lower east Kaupō Gap along the trail in 1919 (C.N. Forbes 1106M). Joel Lau (pers. comm.), however, believes this species to actually be S. septemtrionalis (see discussion under Appendix A: S. septemtrionalis).
[Alien: widespread in Old and New World tropics]
C42,KV30,M106

*__Senna pendula__ (Humb. and Bonpl. ex Willd.) Irwin and Barneby
var. __advena__ (Vogel) H. Irwin and Barneby
[= Cassia bicapsularis L. sensu KV30,LK34]

Lower Kīpahulu Valley, 20-500 ft.
Sprawling shrub with bright yellow flowers in disturbed areas and low-elevation non-native shrublands. This species appears to be increasing its range and abundance through continual reproduction and establishment by seed.
[Alien: native to tropical and subtropical America]
KV30,LK34

*__Senna septemtrionalis__ (Viv.) H.Irwin and Barneby
[= Cassia laevigata Willd.]
A small population of this species has been reported by R. Hobdy as occurring just outside the Park boundary near the old *koa* tree site in lower east Kaupō Gap. The species superficially resembles S. occidentalis which occurs in the Park in east and west Kaupō Gap. The two species can be distinguished in that S. occidentalis has flattened pods and leaflets less pointed than in S. septemtrionalis, which has cylindrical pods. It has recently been reported as occurring inside park boundaries and is spreading rapidly (P. Welton and W. Haus, pers. comm.).
[Alien: native to Mexico]

*__Senna surattensis__ (Burm.) Irwin and Barneby *KOLOMONA*
[= Cassia surattensis Burm. sensu KV30,LK34]
Lower Kīpahulu Valley
Small tree with bright yellow flowers.
[Alien: possibly native to Australia, now widespread]
KV30,LK34

__Sophora chrysophylla__ (Salisb.) Seem. *MAMANE*
[= var. chrysophylla f. haleakalaensis Chock]
Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui; West slope. 4000-9400 ft.
Sophora is one of the most common tree/shrubs of the Crater District of the Park. Heavily impacted by the browsing of feral goats, it has been increasing in abundance since the completion of the Park fence. This small tree to shrub is most commonly found in upper elevation shrubland but also less commonly in dryland and rain forests. Ethnobotanically, the durable wood was used in house construction as well as adze handles, agricultural tools, *hōlua* sled runners, *olonā* scraping boards, and superior quality firewood. The wood also had religious significance. Flowering has been observed almost year-round, with a strong peak in March; seed pods persist on the plant year-round, appearing to peak in April and May.
[Endemic: Hawaiian Islands]
C42,HR45,K38,KV30,M107,SS91-92

__Strongylodon ruber__ Vogel *KĀ-ʻŌʻIWI, NUKU-ʻŌʻIWI*
Middle Kīpahulu Valley, above Palikea Stream, 2400 ft.

Rare vine currently known in Park from single large population (30 m x 50 m area) near northern terminus of mid-Valley (Dogleg) fence. This population is represented by a 1988 collection, Wagner et al. 5898 (BISH). The species was also collected in middle elevation forest of Kī pahulu Valley in 1919 (Forbes 1684M), and in 1967 at 2300 ft in the west part of the Valley (Lamoureux & DeWreede 4063). It is possible that the single known population and the 1967 Lamoureux collection represent the same site. In the northwest West Maui mountains this species flowers prolifically in season but rarely produces seeds (H. Oppenhemier and S. Meidell, pers. comm.); the same situation is true for the Kipahulu population.
[Endemic: Kaua`i, O`ahu, Moloka`i,West Maui, East Maui and Hawai`i]
K39,KV30

*__Trifolium arvense__ L. RABBIT-FOOT CLOVER
Crater, West slope.
Uncommon yellowish-white to pale rose-flowered weed in disturbed sites, 6800-10,000 ft.
[Alien: native to Europe and Middle East]
C43

*__Trifolium dubium__ Sibth. EUROPEAN YELLOW CLOVER
Crater; Kaupō Gap; West slope.
Common low-growing, yellow-flowered herb of upland pastures and in the Park along roadsides and in disturbed areas within the Crater and surroundings.
[Alien: native to Europe]
C43

*__Trifolium pratense__ L. var. __sativum__ Schreb. RED CLOVER
West slope, stables area to old dump site, 6800 ft.
This species is somewhat frost-sensitive, especially in drier sites here showing considerable dieback after repeated frosts.
[Alien: native to Europe and western Asia]
Representative specimen: K.M. Nagata & R.J. Nagata 2568 (BISH)

*__Trifolium repens__ L. WHITE CLOVER
Crater; Kalapawili; West slope.
Most common of clover-type plants, conspicuous for its white flower clusters in lawns that are favored by honeybees. Common along trails, in lawns, and in other disturbed sites. 6200-10,000 ft.
[Alien: native to Europe, Asia and Africa, widely naturalized]
C43

*__Ulex europaeus__ L. GORSE
West slope, 6800-7300 ft.

This spiny shrub was first introduced to Maui as a cattle hedge in Olinda in 1901 (Degener 1975). It is localized within the Park but elsewhere on upper northwest East Maui is fairly widespread and aggressive (Haleakalā Ranch land including Pu`u-nianiau, TNC Waikamoi Preserve, and Olinda). Three populations are currently known in the Park: 1) scattered between Park headquarters and Park horse pasture, 6800-7000 ft, 2) on ridge below water catchment, and 3) on top of Pu`u-nianiau, just inside boundary fence.

Though not listed in Mitchell`s fairly comprehensive Park list (1945), gorse was first recorded in the Park on the outer northwest slopes in 1941 according to Park monthly narrative reports, which also noted the first attempts to control gorse in the Park. By 1950, this species was reported as well-established in at least one location on the Park`s north boundary.

[Alien: native to western Europe]

C43

*__Vicia sativa__ L. subsp. __nigra__ (L.) Ehrh. COMMON VETCH

West slope.

Uncommon, localized, viney herb of disturbed moist sites, mostly at 6800-7300 ft, but also adjacent to the Park in Science City at 10,000 ft.

[Alien: native to Europe, widely naturalized]

Representative specimen: A.C. Medeiros 202 (BISH)

#__Vigna marina__ (Burm.) Merr. BEACH PEA, *NANEA, PŪHILIHILI*

Lower Kīpahulu Valley

Common yellow-flowered vine of the coastal strand zone near sea level. One of few species growing in the active salt spray zone. Other Hawaiian names for this species are *pulihilihi, lemu o makili* (Kamakau 1964).

[Indigenous: pantropical]

KV30,LK35,SS93

FLACOURTIACEAE, Flacourtia Family

__Xylosma hawaiiense__ Seem. *MAUA*

[= var. hillebrandii (Wawra) Sleumer]

Kīpahulu Valley

Uncommon (in Park) alternate-leaved tree with reddish-purple berries; of lower to middle forest, 2000-2500 ft.

[Endemic: Hawaiian Islands]

K40,KV30,SS93-94.

GENTIANACEAE, Gentian Family

*__Centaurium erythraea__ Rafn. BITTER HERB, EUROPEAN CENTAURY

Crater; west Kaupō Gap; Manawainui; West slope.

Common pink (or rarely white) flowered herb of disturbed and rocky sites, 4000-9700 ft.

[Alien: native to Eurasia, widely naturalized]

C38

GERANIACEAE, Geranium Family

*__Erodium cicutarium__ (L.) L`Her. FILAREE, HERON`S BILL
Crater; West slope.
Uncommon weed in cinder flats and in disturbed sites, such as roadsides and along trails. Apparently spreading in cinder flats along Sliding Sands trail west of Kapalaoa cabin. First recorded in the Park within the Crater by Mitchell (1945). 6400-10,000 ft.
[Alien: native to Mediterranean region]
C38

__Geranium arboreum__ Gray RED-FLOWERED NATIVE GERANIUM, *NOHO-ANU*
?Upper Kīpahulu Valley; West slope.
Rare shrub of moist gulches at forest line. Currently, only six individuals are known from the Park. Of the 300 species of Geranium worldwide, this is the only one that is bird-pollinated. Populations of this species in the Park consist of a few individuals in gulches east of Hosmer Grove. The species is also cultivated on the West slope at two residences, 6800 ft. (one plant grown from seed collected at Kula Forest Reserve and another grown from cuttings taken from plants in a Haleakalā Ranch gulch). Most natural populations are found on the outer southwest slopes of the mountain, mostly within Kula Forest Reserve. The upper Kīpahulu population (cited in K39,KV30) has not been seen since its discovery in 1967 (Lamoureux 1968). This species listed as Endangered by USFWS.
[Endemic: East Maui]
C39,K39,KV30,SS94

__Geranium cuneatum__ Hook. *HINAHINA, NOHO-ANU*
subsp. __tridens__ (Hillebr.) Carlquist and Bissing
[var. tridens (Hillebr.) Fosb. sensu C39]
Crater; West slope.
Erect, silvery shrub of subalpine shrubland, 6800-9400 ft.
[Endemic: East Maui and Hawai`i; subsp. endemic: East Maui]
C39,SS94

__Geranium hanaense__ Medeiros and St. John HANA GERANIUM
NE rift, 5440 ft; West slope (cultivated at residences at 6800-7000 ft).
Low spreading silvery shrubs, restricted to two montane bogs (Mid-Camp and Big Bog) within the Park, 5440 ft. This species was first collected in 1973 (B. Harrison 243 BISH) (Medeiros and St. John 1988). This species though protected from feral pigs is still threatened by weeds and small population size (several hundred plants total); it warrants Endangered species status.
Representative specimens: E. Funk 207, A.C. Medeiros 206, 385, 391.
[Endemic: East Maui]

*__Geranium homeanum__ Turcz.
[= Geranium carolinianum L. sensu C39,K39]
East and west Kaupō Gap; Kīpahulu Valley; West slope.
Low herb of moist disturbed sites, 5200-7000 ft.

[Alien: native to Australia and New Zealand]
C39,K39,KV30,KW14

Geranium multiflorum Gray *HINAHINA, NOHO-ANU*
[= var. ovatifolium (Gray) Fosb. sensu K39,KV30]
[= var. canum Hillebr. sensu HR46]
Crater; Kalapawili; Kaupō Gap (extirpated); upper Kīpahulu Valley; NE rift; West slope
Variable silver-green shrubs in moist subalpine shrubland, upper forest and montane bog edges, 6170-7400 ft. J.F. Rock in his field notes from 1910 remarks that this species is common in the eastern part of Haleakalā Crater, Kaupō Gap on hills among aa lava and steep gulch walls." Currently, the species is no longer found in Kaupō Gap. Also cultivated (single plant grown from root stock collected from New Bog) on the West slope at a residence, 6800 ft. This species listed as Endangered by USFWS.
[Endemic: East Maui]
C39,HR46,K39,KV30,SS95

*__Pelargonium hortorum__ Bailey FISH GERANIUM, *LANIUMA*
West slope, cultivated in residential area, 7000 ft.
Planted and not reproducing in the Park. Common name derived from the slight fishy odor of the leaves (Neal 1965).
[Alien: native to southern Africa]
C39

GESNERIACEAE, Gloxinia Family

Cyrtandra grayi C. B. Clarke
[= Cyrtandra lysiosepala (Gray) C. B. Clarke sensu K44,KV30,SS95]
[= Cyrtandra rotata St. John sensu KV31]
Kīpahulu Valley; Manawainui
This may be the most common species of Cyrtandra of windward forests on both East and West Maui (R.W. Hobdy, pers. comm.). Within the Park, this species may hybridize with C. platyphylla and C. spathulata (Wagner et al. 1990). 2000-6000 ft.
[Endemic: West Maui, East Maui and Moloka`i]
K44,KV30,SS95

Cyrtandra hashimotoi Rock
Kīpahulu Valley; Manawainui; NE rift.
Uncommon, scattered, branched shrub of wet forests. Flowering and fruiting observed from December to February.
[Endemic: East Maui]

Cyrtandra hawaiensis C. B. Clarke
Uncommon shrub with leaves in whorls of 3-6 (but usually 4) per node; of low to high elevation wet forests, especially along the dense vegetation of fern covered gullies. 560-4200 ft.
Representative specimen: W.L. Wagner et. al. 5855 (BISH).

[Endemic: O`ahu, Moloka`i, Maui and Hawai`i]

Cyrtandra paludosa Gaud. *MOA, HAHALA*
var. **paludosa**
[= var. irrostrata St. John sensu KV30, St. John 1971]
Kīpahulu Valley
Uncommon to rare, small shrub with distinctive nearly glabrous leaves of wet forests. 3000-4700 ft. Flowering and fruiting observed from December to April.
[Endemic: Kaua`i, O`ahu, Maui and Hawai`i]
KV31

Cyrtandra paludosa x **C. spathulata**
[= Cyrtandra kipahuluensis St. John sensu KV30, St. John 1971]
Kaumakani; Kīpahulu Valley
Collections of Cyrtandra from the Park were described in 1971 as a new species, C. kipahuluensis, endemic to East Maui. A recent treatment of the genus considers the specimens to represent spontaneous hybrids between two already described species (Wagner et al. 1990).
[Hybrid endemic: East Maui]
KV30

Cyrtandra platyphylla Gray *`ILIHIA*
[= Cyrtranda mauiensis Rock sensu KV30]
[= Cyrtandra begoniaefolia Hillebr. sensu M107 `ILIHIA]
Kīpahulu Valley; Manawainui. 2900-5000 ft.
In the broad sense in which this species is currently defined, Cyrtandra platyphylla is a relatively common, small shrub of wet *`ōhi`a*, and *`ōhi`a/koa*, forest, especially on steep, fern-covered slopes. A recent review of this species (Wagner et al. 1990) united two apparently distinct entities on East Maui.
One of the species formerly recognized, C. begoniaefolia, formerly an East Maui endemic, is an easily-recognized, small shrub with dentate, unequal leaves covered with marginal pubescence. Hillebrand (1888) noted this species at `Ulupalakua, where it no longer occurs but still grows in *`ōhi`a/koa* forests from Kahikinui over to the Manawainui planeze. The other species (C. mauiensis) has thick, squarish, heart-shaped leaves thickly covered with dense clear-whitish pubescence. It is found throughout wet forests of East Maui. At Manawainui drainage (Kahikinui Forest Reserve), the two species are sympatric.
[Endemic: Maui and Hawai`i]
KV30,M107

Cyrtandra spathulata St. John
Kīpahulu Valley; Manawainui.
Somewhat common shrub with spatulate calyx lobes. Within the Park, it may hybridize with C. platyphylla, C. paludosa, and C. grayana (Wagner et al. 1990).
[Endemic: West Maui and East Maui]
KV31,M107

GOODENIACEAE, Scaevola Family

Scaevola chamissoniana Gaud. *NAUPAKA, NAUPAKA-KUAHIWI*
[= var. chamissoniana sensu HR57,K47,LK33]
[= var. bracteosa Hillebr. sensu C40]
Upper east Kaupō Gap, rare at 5600 ft; Kaumakani; Kīpahulu Valley; Manawainui; NE rift.
Pioneer shrub with fragrant white flowers; in lower to upper elevation rain forest, often colonizing disturbed sites such as landslides and sides of stream courses. 1100-6200 ft. Flowering and fruiting observed year-round.
[Endemic: Moloka`i, Lāna`i, West Maui, East Maui and Hawai`i]
C40,HR57,K47,KV31,LK33,M107,SS96

#**Scaevola sericea** Vahl *NAUPAKA, NAUPAKA-KAHAKAI*
[= Scaevola taccada (Gaertn.) Roxb. sensu KV31,LK33]
Lower Kīpahulu Valley
Dominant shrub of the coastal strand zone, extending somewhat inland on rocky cliffs and on the banks of `Ohe`o Gulch at 10-100 ft. One of few species that can grow in the active salt spray zone.
[Indigenous: tropical and subtropical coasts of Pacific and Indian Oceans]
KV31,LK33,SS97-98

GUNNERACEAE, Gunnera Family

Gunnera petaloidea Gaud. *`APE`APE, `APE*
[= Gunnera mauiensis (Krajina) St. John sensu HR48,K41,KV31]
Kīpahulu Valley; Manawainui, east rim; NE rift.
Giant herb of wet sites, especially at the base of cliffs and along stream courses, 4000-6350 ft. Colonies of blue-green algae live within the stems of *`ape`ape*, forming a symbiotic relationship by fixing nitrogen for Gunnera in nitrogen-poor conditions.
[Endemic: O`ahu, Moloka`i,West Maui, East Maui and Hawai`i]
HR48,K41,KV31

HYDRANGEACEAE, Hydrangea Family

Broussaisia arguta Gaud. *KANAWAO, PŪ`AHA-NUI*
[= var. arguta f. ternata St. John sensu C54,K37,KV41]
[= var. pellucida (Gaud.) Fosb. sensu HR44]
Crater, at Palikū cliffs; Kīpahulu Valley; Manawainui; NE rift.
2000-6500 ft.
Dioecious forest shrub, the sole species of an endemic monotypic genus, is a common component of middle to upper elevation rain forest. The fleshy red to purple berries are sometimes consumed by frugivorous forest birds. Sporadic flowering and fruiting observed year-round.
[Endemic: Hawaiian Islands]
C54,HR44,K37,KV41

LABIATAE, Mint Family (see LAMIACEAE)

LAMIACEAE (LABIATAE), Mint Family

*__Lamium amplexicaule__ L. HENBIT

West slope, headquarters area, near SW corner of main parking lot, 7000 ft. The single collection in the park was a new state record (first collected in 1981, absent by 1986).
[Alien: native to Eurasia and northern Africa]
Representative specimen: R.J. Nagata 82-4 (HLA)

*__Lavandula officinalis__ Chaix in Vill. LAVENDER
West slope, cultivated in residence area at 7000 ft. Planted and not reproducing in the Park.
[Alien: native to the Mediterranean region]

#__Lepechinia hastata__ (Gray) Epling *PAKAHA*
West Kaupō Gap; West slope.
Rare aromatic shrub of leeward and subalpine shrubland. Possibly a post-Western contact introduction. 4000-7000 ft.
[Indigenous: southern Baja California and nearby islands and East Maui]
Representative specimen: A.C. Medeiros & L.L. Loope 423 (BISH)
C40,SS98-99

*__Mentha__ x __villosa__ Hudson APPLE-MINT
[= Mentha rotundifolia (L.) Huds. sensu C40]
Crater, Palikū, near cabins 6400 ft.
Although sterile, this mint can spread through vegetative reproduction.
[Alien: sterile hybrid which originated in Europe]
Representative specimen: L. Stemmermann 1032 (BISH)
C40

__Phyllostegia ambigua__ (Gray) Hillebr.
[= Phyllostegia brevidens Gray in part]
[= Phyllostegia aff. ambigua sensu KV31]
Manawainui; NE rift. 2750-6470 ft.
Very variable, trailing vine to clump-forming mint of open rain forest, especially common around the margin of the 5440 ft bogs on the NE rift. Flowering has been observed to initiate in May and June; fruiting observed from May to July.
[Endemic: West Maui, East Maui and Hawai`i]
Representative specimen: A.C. Medeiros 631 (BISH)
KV31

__Phyllostegia bracteata__ Sherff
NE rift; West slope (extirpated).

Rare trailing liana on East Maui from Olinda to the NE rift, Kīpahulu Valley and Manawainui. A 2 m^2 patch of mint, tentatively identified as P. bracteata, is located at a clearing at 2580 feet along the Olomea Loop trail on the upper shelf of Kīpahulu. Formerly present on the northwest slope of the Park based on a 1918 collection from Pu`u-nianiau (J.F. Rock 17,146). Flowering and fruiting observed at least in April and May.
[Endemic: West Maui and East Maui]

Phyllostegia glabra (Gaud.) Benth. *ULIHI*
var. **glabra**
[= "cf." sensu M107]
Manawainui.
Glabrous, white-flowered (sometimes tinged reddish purple) mint of mesic to wet forest.
[Endemic: O`ahu, Moloka`i, Lāna`i, East Maui]
M107 (P.K. Higashino & G. Mizuno 2998, 3008)

Phyllostegia macrophylla (Gaud.) Benth. *EUE`E*
[= var. phytolaccoides Sherff sensu K43]
[= var. remyi Sherff sensu K43,KV31]
Kīpahulu Valley, 2730-4020 ft.
Large, spreading mint vine of the understories of dark, dense rain forest.
[Endemic: East Maui and Hawai`i]
K43,KV31

#**Plectranthus parviflorus** Willd. SPURFLOWER, *`ALA`ALA WAI NUI*
Lower west Kaupō Gap; lower Kīpahulu Valley
Pale blue-flowered herb of rocky sites, 1400-5000 ft.
[Indigenous: Malesia and Polynesia, including the Hawaiian Islands]
C40,KV31,LK34

*__Plectranthus scutellarioides__ (L.) R. Br. COLEUS
[= Coleus blumei Benth. sensu KV31,LK34]
Lower Kīpahulu Valley
Uncommon near housing and along roadsides. Cultivated and persistent. Planted and not reproducing in the Park.
[Alien: native to Java]
KV31,LK34

*__Prunella vulgaris__ L. SELF-HEAL
Crater, Palikū; Kalapawili; east Kaupō Gap; Kīpahulu Valley 2540-7000 ft; Manawainui, at Kuiki; NE rift; West slope.
Adventive purple-flowered herb of moist, disturbed sites, especially along stream courses, 2540-8500 ft. In Kīpahulu, sporadic flowering and fruiting observed year-round.
[Alien: native to N and Central America and temperate Europe and Asia]
C40,HR51,K43,KV31,KW15,M108

*Stachys arvensis L. STAGGERWEED
Crater, cliffs above Kapalaoa; west Kaupō Gap; West slope. 6800-8000 ft.
Low, purple-flowered herb on talus slopes and in disturbed areas. First collected in the Park in 1985.
Representative specimens: A.C. Medeiros 693, B.H. Gagne 999 (BISH)
[Alien: native to Europe and Asia]

Stenogyne haliakalae Wawra
East Kaupō Gap.
Last collection of this species in the Park was made in 1937 (G.E. Olson 74) in moist forest at 5600 ft in east Kaupō Gap. This trailing clump-forming vine was once found throughout East Maui`s leeward to mesic upper elevation forest, but is now presumed extinct. It was last seen in 1973 in Kula Forest Reserve (R.W. Hobdy, pers. comm.).
[Endemic: East Maui]
C41,SS101

Stenogyne kamehamehae Wawra
[= var. albiflora Sherff sensu K43,HR51]
Kaumakani; Kīpahulu Valley, 2400-5500 ft; Manawainui, east side, 5000-6450 ft; NE rift, 5500-6200 ft.
Clump-forming, climbing mint of rain forest. On East Maui, this species predominantly has clusters of 1.5-2 inch long white flowers. On West Maui, flowers are predominantly red and rarely pink. Flowering has been observed from January to June; fruiting observed from April to July.
[Endemic: Moloka`i and Maui]
HR51,K34,KV31

Stenogyne microphylla Benth.
[= Stenogyne crenata Gray sensu C41, SS100]
Crater; West slope.
Small-leaved clump-forming vine of the subalpine shrubland, often climbing into *māmane* (Sophora chrysophylla) trees, 7300-9050 ft.
[Endemic: East Maui and Hawai`i]
C41,SS100

Stenogyne rotundifolia Gray *PUA`A-I-NAKA*
[= var. oblonga Sherff sensu C41, SS101]
Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift.
Uncommon, clump-forming mint of the upper *`ōhi`a* rain forest, 5500-6890 ft. Flowering has been observed in May and June.
[Endemic: East Maui] C41,HR51,K43,KV31,SS101

LAURACEAE, Laurel Family

*__Persea americana__ Mill. AVOCADO
Crater; Lower Kīpahulu Valley; West slope; Kaupō Gap (tree growing at park gate).
Planted and persistent in Kīpahulu in disturbed sites at 30-600 ft. Germinants from discarded pits occasional at higher elevations.
[Alien: native to Central America]
KV31,LK34

LEGUMINOSAE, Pea Family (see FABACEAE)

LOBELIACEAE, Lobelia Family (see CAMPANULACEAE)

LOGANIACEAE, Strychnine Family

__Labordia hedyosmifolia__ Baill. *KAMAKAHALA*
[= var. centralis (Skottsb.) St. John sensu K43,KV34]
[= Labordia glabra Hillebr. var. orientalis Sherff sensu K43,KV34]
Kīpahulu Valley
Uncommon, variable shrub of *`ōhi`a* and *koa* forests of middle-elevation Kīpahulu Valley, 3050-4680 ft. Distinguished from the similar appearing L. venosa by its usually glabrous leaves with veins on the lower surface "not or moderately raised" (Wagner et al. 1990). Flowering observed from April to November; fruiting observed from September to December.
[Endemic: Moloka`i, Lāna`i, Ma, and Hawai`i]
K43,KV34

__Labordia hirtella__ Mann *KAMAKAHALA*
[= var. haleakalana Sherff]
Kīpahulu Valley; Manawainui.
Uncommon to rare small tree of mesic to leeward-montane *`ōhi`a/koa* forests from Manawainui to Waikamoi Preserve (TNC). Distinguished by the "sharply angled or winged and short hirtellous" stems (Wagner et al. 1990). 4300-5270 ft.
[Endemic: main Hawaiian Islands]

__Labordia tinifolia__ Gray *KAMAKAHALA*
"Cable ridge", southern rim of Kīpahulu Valley.
Uncommon small tree of middle elevation Metrosideros/Acacia forest.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, Maui and Hawai`i islands]

__Labordia venosa__ Sherff *KAMAKAHALA*
Kīpahulu Valley; Manawainui, central and east parts of the planeze; NE rift.

Uncommon, distinctive, low shrub of upper-elevation wet *`ōhi`a* rain forest. In its limited range, this species is most common in forests along the northeast rift at 5500-6300 ft. Distinguished from the closely related L. hedyosmifolia by its "conspicuously raised, pubescent veins of the lower leaf surface" (Wagner et al. 1990). New work questions whether these two entities differ at the specific level (T. Motley, pers. comm.). 4700-6400 ft.
[Endemic: East Maui]
HR50,KV34

LORANTHACEAE, Mistletoe Family (see VISCACEAE)

LYTHRACEAE, Loosestrife Family

*__Cuphea carthagenensis__ (Jacq.) Macbride *PŪKAMOLE*, TARWEED
Kīpahulu Valley, 80-5000 ft; Manawainui, 4000-5500 ft.
Common, glandular hispid, pink-flowered herb of wet areas. Flowering and fruiting observed year-round.
[Alien: native to South America]
K40,KV34,KW14,LK36

#?__Lythrum maritimum__ HBK. *PŪKAMOLE*
Crater; Kaupō Gap; Kīpahulu Valley; Manawainui; West slope.
Common, purple-flowered perennial.
[Questionably indigenous. Native to Peru and presumably Hawaiian Islands]
C44,HR47,KV34,KW14,M109

MAGNOLIACEAE, Magnolia Family

*__Michelia champaca__ L. ORANGE CHAMPAK, MULANG
Lower Kīpahulu Valley
Exceedingly fragrant, orange or yellow-flowered tree; planted and not reproducing in the Park.
[Alien: native to the Himalayas]
KV34,LK36

MALVACEAE, Mallow Family

*__Abutilon grandifolium__ (Willd.) Sweet HAIRY ABUTILON
Lower Kīpahulu Valley
Extremely tomentose shrub with large, heart-shaped leaves.
[Alien: native to tropical America]
KV34,LK36

#__Hibiscus furcellatus__ Desr. *`AKIOHALA, HAU-HELE*
[= Hibiscus youngianus Gaud. ex Hook. and Arn. sensu KV34,LK36]
Lower Kīpahulu Valley
Pale magenta to rose-flowered subshrub of primarily wet, disturbed areas.

[Indigenous: West Indies, Florida, Central and South America, and Hawaiian Islands]
KV34,LK36

#**Hibiscus tiliaceus** L. *HAU*
Lower Kīpahulu Valley
Common, thickly tangled-growing shrub to small tree of lowland, wet communities.
[Indigenous: world tropics and subtropics, including Hawaiian Islands]
KV34,LK36,SS107-108

*__Malva parviflora__ L. CHEESE WEED
Crater; West slope.
Adventive, lavender blue-flowered weed of roadsides and disturbed sites.
[Alien: native to Mediterranean region, Asia and India]
C44

*__Malvastrum coromandelianum__ (L.) Garcke FALSE-MALLOW
subsp. __coromandelinum__ Hill.
West slope, rare weed of disturbed sites.
[Alien: pantropical]

*__Malvaviscus penduliflorus__ DC. TURK`S CAP
[= Malvaviscus arboreus Cav.] Lower Kīpahulu Valley
Red, or sometimes white-flowered shrub that spreads vegetatively and does not produce fruits.
[Alien: probably native to Mexico]
KV34,LK36

#__Sida fallax__ Walp. *ILIMA*
[= Sida cordifolia sensu KV35, non L.]
Lower Kīpahulu Valley
Variable, yellow-flowered shrub commonly used in making *lei.*
[Indigenous: China to Pacific Islands, including Hawaiian Islands]

*__Sida rhombifolia__ L. CUBA JUTE
Lower Kīpahulu Valley; West slope, 7000 ft, rare roadside weed.
Small, erect shrub with somewhat diamond-shaped leaves and margins entire toward the base, serrate above.
[Alien: pantropical]
KV35,LK37

#?__Thespesia populnea__ (L.) Soland. ex Correa *MILO*
Lower Kīpahulu Valley, planted and persistent.
Ethnobotanically, this tree was prized for its beautifully-grained wood which added no flavor to food, hence its use in calabashes (*'umeke lā'au*) (Abbott 1992).
[Indigenous or possibly introduced by Polynesians: pantropical]
KV35,LK36

*Urena lobata L. ARAMINA
Lower Kīpahulu Valley
Pink-flowered, hairy subshrub cultivated in some countries for its fiber (Neal 1965).
[Alien: pantropical]
KV35,LK37

MELASTOMATACEAE, Melastoma Family

*Clidemia hirta (L.) D. Don KOSTER`S CURSE
Kīpahulu Valley
Apparently rapidly spreading despite control efforts in thick fern cover in Metrosideros/Acacia forest. The first record of this species in Kīpahulu Valley was made in 1988 at 2800 ft elevation (L. Cuddihy, pers. comm.). In Kīpahulu Valley, flowering has been observed year-round and peaks from June to September; fruiting observed year-round, peaking from October to January.
Representative specimen: L.W. Cuddihy & G.L. Santos 2240 (BISH)
[Alien: native to tropical America]

*Miconia calvescens DC VELVET TREE, MICONIA
Kīpahulu Valley
Single seedling discovered and destroyed in February 1994 in Australian tree fern plots at approximately 2400 feet elevation, presumably dispersed on the gear of researchers.
[Alien: native to Central and South America]

*Tibouchina herbacea (DC) Cogn.
Kaumakani; Kīpahulu Valley, Northeast rift
The first record of this species in the Park was made in 1988 in disturbed rain forest at 3400 ft elevation at Kaumakani (A.C. Medeiros 807, BISH). Since, scattered plants of this species discovered and destroyed in rain forest sections of the park at 3000-5000 feet elevation. Isolated plants or small clusters of individuals continually being found on both upper and lower shelf of the valley and in the bogs, presumably wind-dispersed from large infestations in and around Waihoi Valley. Pulled up whenever encountered.
[Alien: native to South America (southern Brazil, Uruguay, and Paraguay)]

MENISPERMACEAE, Moonseed Family

#Cocculus trilobus (Thunb.) DC. *HUEHUE*
[= Cocculus ferrandianus Gaud. sensu C44,K37,LK37]
[= Cocculus lonchophyllus Hillebr. sensu SS108]
East and west Kaupō Gap, 3900-5000 ft; Kīpahulu Valley, 1400 ft.
Sprawling, white-flowered vine with dark blue drupes and leaves lanceolate or only rarely, weakly trilobed.
[Indigenous: Southeast Asia to Malesia and Pacific region]
C44,K37,KV35,LK37,M109,SS108

MORACEAE, Mulberry Family

+**Artocarpus altilis** (Parkins. ex Z.) Fosb. BREADFRUIT, *`ULU*
Lower Kīpahulu Valley, planted and persistent.
Planted and not reproducing in the Park.
[Polynesian introduction: native to Malesia, widely cultivated in Pacific]
KV35,LK37

+**Broussonetia papyrifera** (L.) Vent. *WAUKE*, PAPER MULBERRY
Lower Kīpahulu Valley, planted and persistent.
Planted and not reproducing in the Park. Ethnobotanically, this species was the primary source of *kapa* or bark cloth , preferred over *mamaki* "because it was warmer, more flexible, and more resistant to water" (Neal 1965).
[Polynesian introduction: native to China, Japan, and questionably Southeast Asia]
KV35,LK37,SS108-109

*__Ficus microcarpa__ L. f. CHINESE BANYAN
Lower Kīpahulu Valley, 20-700 ft.
This once planted, potentially very large, tree now has its obligate fig wasp pollinator (Agaonidae) in Hawai`i and hence produces abundant seed. Seeds are dispersed by predominantly non-native birds and can become established on a variety of sites including stream courses, sea and lowland cliffs and pastures. This large weedy tree should be closely monitored and controlled when possible as it appears to be spreading rapidly and threatening lowland native ecosystems, such as the unique biota of the sea cliffs of northern East Maui.
[Alien: native to parts of southern Asia and western Pacific]
KV35,LK37

*__Ficus platypoda__ A. Cunn. ex Miq. AUSTRALIAN FIG
var. __petiolaris__ Benth.
Lower Kīpahulu Valley, planted and persistent.
[Alien: native to Australia]
KV35,LK37

#__Streblus pendulinus__ (Endl.) F.v. Muell. *A`IA`I*
Kīpahulu V
Nine trees counted in Acacia/ Metrosideros forest on southern rim of Kīpahulu Valley above Koukouai Stream, 1950-2100 ft. More common on leeward slopes of Haleakalā, especially in the Auwahi dryland forest.
[Indigenous: New Guinea to Micronesia, to Norfolk Island, eastern Australia, New Hebrides, Fiji, Rapa and the main Hawaiian Islands]

MYOPORACEAE, Myoporum Family

#__Myoporum sandwicense__ Gray *NAIO*
East Kaupō Gap.

In Park, large (to 10 m tall), rare (in the Park) trees of mesic dry forest. Four trees occur in east Kaupō Gap at 4000-5000 ft (Medeiros et al. 1986) There are two trees just outside the Park boundary on the Manawainui planeze (Higashino and Mizuno 1976). All trees are older (some senescent), and until recently, there has been no successful reproduction of this species in the Park. One natural seedling has been reported as established on the branched trunk of one of the four trees and additional seedlings from these trees are currently being reintroduced in the Kaupō restoration sites (P. Welton and W. Haus, pers. comm.). Ethnobotanically, the wood was used in housebuilding and in making canoe parts and fishing torches.
[Indigenous: Cook and Hawaiian Islands]
Representative specimen: A.C. Medeiros & L.L. Loope 417 (BISH)
C44,M109,SS109-110

MYRSINACEAE, Myrsine Family

*__Ardisia crenata__ Sims HILO HOLLY
[= Ardisia crispa (Thunb.) A. DC. sensu KV35]
Kīpahulu Valley
Small trees with revolute, crisped leaf margins; planted and not reproducing in the Park. However, this species is considered invasive in Mauritius (Strahm 1996)
[Alien: native to southern Asia]
KV35

*__Ardisia elliptica__ Thunb. SHOEBUTTON ARDISIA
[= Ardisia humilis Vahl. sensu KV35,LK39]
Lower Kīpahulu Valley
Invasive tree establishing by seed in understory of Terminalia grove, at 80-100 ft.; extremely invasive and rapidly spreading in disturbed and native lowland windward rainforests of East Maui.
[Alien: native to Sri Lanka]
KV35,LK39

__Embelia pacifica__ Hillebr. *KILIOE*
Kīpahulu Valley
Rare trailing shrub or liana with slightly raised lenticels on the stems; in *koa/`ōhi`a* forest, 2300-4900 ft.
[Endemic: Hawaiian Islands]
K42,KV35

__Myrsine emarginata__ (Rock) Hosaka *KOLEA*
Kīpahulu Valley; Manawainui.
Rain forest trees, similar to M. lessertiana, but less common, generally smaller trees with smaller leaves that are notched apically. This species occurs only in higher elevation rain forest where it is sympatric with the related M. lessertiana.
[Endemic: O`ahu, Lāna`i, and East Maui]
KV35

Myrsine lanaiensis Hillebr. *KOLEA*

East and west Kaupō Gap.

Characteristic common dryland forest tree in east Kaupō Gap. Relictual populations of this species occur on cliff faces and steep-walled periodic stream courses in west Kaupō. Establishes seedlings readily, but establishment (in areas with ungulates) is often poor.

[Endemic: Hawaiian Islands]

Representative specimen: A.C. Medeiros & L.L. Loope 414 (BISH)

C44,SS111

Myrsine lessertiana A. DC. *KOLEA*

Crater; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope. 2900-7600 ft.

Common tree with purple berries of dryland to rain forest throughout the Hawaiian Islands. Produces seedlings readily, but establishment is often poor. Ethnobotanically, the wood was used in housebuilding, canoe construction, and in making *olonā* scraping boards. The bark was used in making a red dye for *kapa*; the charcoal in making a black dye. These ethnobotanical uses are listed for this most common species but may apply to others as well.

[Endemic: Hawaiian Islands]

C44,HR50,K42,KV35,M109,SS111-112

Myrsine sandwicensis A. DC. *KOLEA-LAU-LI`I*

[= var. mauiensis Lev. sensu K42,KV35]

Kaumakani; Kīpahulu Valley; Manawainui. 4000-5700 ft.

Uncommon, small-leaved shrub or small tree.

[Endemic: O`ahu, Moloka`i, Lāna`i, West Maui, East Maui, and Hawai`i]

K42,KV351

MYRTACEAE, Myrtle Family

***Eucalyptus amygdalina** Labill. BLACK PEPPERMINT

West slope.

Planted tree, sparsely reproducing, restricted and locally common at Hosmer Grove.

[Alien: native to Tasmania]

***Eucalyptus globulus** Labill. TASMANIAN BLUE GUM, SOUTHERN BLUE GUM, BLUE GUM

Crater, at Palikū, 6400 ft (present in 1945, destroyed in 1980); West slope, at Hosmer Grove and 8500 ft grove.

Planted tall tree of a variety of mesic sites in Hawai`i. Of the Eucalyptus of the Crater District, this is the most aggressive species. It readily establishes seedlings, even at some distance from the parent tree. Young trees are capable of rapid growth and invasion of otherwise undisturbed native habitats. Trees at 8500 ft and Hosmer Grove were planted in 1909-1911 (Park records).

[Alien: native to south Victoria and east Tasmania, Australia]

C45, Mitchell (1945)

*__Eucalyptus robusta__ Sm. SWAMP MAHOGANY

Kīpahulu Valley, 2500 ft; West slope, at Hosmer Grove.

Planted, tall tree with deeply furrowed bark, of low to high elevation, usually windward sites, in Hawai`i. Swamp mahogany is the most common species of planted tree along the northern coast of East Maui. Regarding a tree in Kīpahulu Valley that he tentatively identified as E. robusta, Yoshinaga (1980) stated, "Single individual at 760 m (2500 ft) along Central Pali, reported by Becking in 1970." Trees at Hosmer Grove were planted in 1909-1911. Planted and sparsely reproducing in the Park.

[Alien: native to coastal southeastern Queensland and southern New South Wales, Australia]

C45,KV35,KW14

*__Melaleuca quinquenervia__ (Cav.) S. T. Blake PAPERBARK

[= Melaleuca leucadendra (Stickm.) L. sensu KV36,LK38]

Kaumakani (3 trees); Kīpahulu Valley, approx. 24 trees southeast of Palikea peak at ca. 2000 ft.

Identified by 5-nerved, lanceolate leaves and whitish, peeling bark.

[Alien: native to east Australia, New Guinea and New Caledonia]

KV36,LK38

__Metrosideros polymorpha__ Gaud. *`OHI`A,` OHI`A-LEHUA*

var. __glaberrima__ (H. Lev.) Dawson and Stemmermann

var. __incana__ (H. Lev.) St. John

var. __polymorpha__

var. __pumila__ (Heller) Dawson and Stemmermann

Crater, on cliffs above Hōlua, Palikū and Kapalaoa, also on lava flats from Palikū to `O`ili-pu`u Kalapawili; Kaumakani; east and west Kaupō Gap; Kīpahulu Valley, 800-7000 ft; Manawainui; NE rift; West slope, to 7300 ft.

The most common native forest tree in Hawai`i. On East Maui, occurring throughout a variety of habitats, but dominating rain forest vegetation, especially on sites with developed soils on the windward side. Ethnobotanically, the reddish wood was used in house and canoe construction and in making images (*ki'i*), *poi* boards, weapons, tool handles, and *kapa* beaters. The flowers and leaf buds were used in *lei*, the foliage had religious significance and young leaf buds were used medicinally.

[Endemic: Hawaiian Islands]

C45,HR48,KV36,LK38,M110,SS112-113

*__Psidium cattleianum__ Sabine STRAWBERRY GUAVA, *WAIAWI*

f. __cattleianum__ (red-fruited form)

f. __lucidum__ Deg. (yellow-fruited form)

Lower to middle Kīpahulu Valley, 150-4450 ft.; Manawainui, 5200 feet.

The red-fruited form is locally called *waiawi `ula`ula*, and the yellow-fruited form *waiawi*. In Kī pahulu Valley, it is the red-fruited form which is most invasive, although the yellow-fruited form is also capable of forming dense stands. The fruit fall of this species has provided a major source of food for feral pigs, which have, in the past, acted as vectors for spread of seeds of this invasive tree further up the Valley (Diong 1982). With the removal of pigs, other vectors of dispersal, such as birds, rats and mongoose, may be responsible for its continued spread in the Valley. Flowering observed year-round but peaking in April and May; fruiting observed year-round but maturing primarily from November to February.
[Alien: native to tropical America, widely cultivated and naturalized]
K41,KV36,KW14,LK38,M110

***Psidium guajava** L. GUAVA, COMMON GUAVA, *KUAWA*
Kīpahulu Valley, 80 to 4100 ft, common pasture tree; West slope, rare roadside weed at 7000 ft.
Fagerlund (1945) stated, regarding a trip through Kīpahulu Valley in that year, "Around 1,800 feet, Guava (Psidium guajava) was first noticed and it increases in abundance and size from there down to the forest edge. Guava has attained tree size with trunks 8 inches in diameter. Between about 1,500 and 1,000 feet, Guava dominates the vegetation."
[Alien: native to tropical America, widely cultivated and naturalized]
K41,KV36,KW14,LK38,M110

***Syzygium cumini** (L.) Skeels JAVA PLUM
[= Eugenia cumini (L.) Druce sensu KV36,LK38]
Lower Kīpahulu Valley
Established tree in lower Valley, 20-800 ft.; forming thick stands in other areas of the islands.
[Alien: native to India, Ceylon and Malesia]
KV36,LK38

***Syzygium jambos** (L.) Alston ROSE APPLE, *`OHI`A-LOKE*
[= Eugenia jambos (L.) Alston sensu KV36,KW,LK38]
Lower to middle Kīpahulu Valley, 440-2100 ft.
This tree forms dense, nearly monospecific stands that exclude virtually all understory vegetation. It is invading *koa* forests at 2000-2200 ft on the upper level of the Valley.
[Alien: probably native to Malesia and perhaps southeast Asia]
KV36,KW14,LK38

+Syzygium malaccense (L.) Merr. and Perry MOUNTAIN APPLE, *`OHI`A-`AI*
[= Eugenia malaccensis L. sensu KV36,LK38]
Lower Kīpahulu Valley, 400-600 ft.
Localized groves of this tree occur along wet, low-elevation, windward stream courses throughout much of rural Hawai`i. At many East Maui sites, these groves appear to be barely replacing themselves, perhaps as a result of crowding by invasive non-native tree species. The small groves of mountain apple in the Park should be monitored and managed to allow their long term survival.
[Polynesian introduction: probably native to Malesia and southeast Asia]
KV36,LK38

Syzygium sandwicensis (Gray) Nied. *`OHI`A-HA*
[= Eugenia sandwicensis Gray sensu K41,KV36,LK38]
Kīpahulu Valley
Somewhat common, red-fruited small tree of *`ōhi`a* and *koa* rain forest at 2200-3100 ft. Fruiting observed from August to October; peaking in September.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, and Maui]
K41,KV36,LK38

NYCTAGINACEAE, Four O` Clock Family

*Mirabilis jalapa L. COMMON FOUR O`CLOCK
Lower Kīpahulu Valley
Perennial herbs with variously colored, but often purplish red, 5-lobed flowers.
[Alien: native to tropical America] KV36,LK39

#Pisonia brunoniana Endl. *PAPALA-KEPAU*
East Kaupō Gap.
Uncommon tree of dryland forest in the Park. The sticky fruits (along with those of the latter species) were used by the Hawaiians in snaring birds used in featherwork. First collected in Park in 1937.
[Indigenous: Australia, New Zealand, Hawaiian and other Pacific Islands]
Representative specimen: G.E. Olson 71 (BISH)
C46,M110,SS113

#Pisonia umbellifera (J. R. and G. Forst.) Seem. *PAPALA-KEPAU*
Kīpahulu Valley
Uncommon tree of low elevation wet forest, 500-700 ft. The sticky fruits (along with those of the former species) were used by the Hawaiians in snaring birds used in featherwork.
[Indigenous: New Hebrides, north Queensland (Australia), Madagascar to the Society Islands, Pitcairn, Micronesia, and Hawaiian Islands]
K37,KV36,LK39

OLEACEAE, Olive Family

Nestegis sandwicensis (Gray) Deg., Deg. and Johnson *OLOPUA*
[= Osmanthus sandwicensis (Gray) Knobl. sensu SS114-115]
East Kaupō Gap, 4500-5000 ft.
Six trees of this species occur in the Park in relictual dryland forest; much more common in leeward, dryland forests, especially at Auwahi, where seedling production is rarely witnessed despite an abundance of fruit production. Extensive rat predation of the seeds has been observed and is one of the factors in the poor seedling production. Ethnobotanically, the wood was used in house construction and in making weapons (spears and daggers), agricultural tools (adze handles and digging sticks), firewood, and fishing lures.
[Endemic: Hawaiian Islands]
SS114-115

ONAGRACEAE, Evening Primrose Family

*__Epilobium billardierianum__ Ser. *PUKAMOLE*
subsp. __cinereum__ (Rich.) Raven and Engelhorn
[= Epilobium cinereum sensu C46,HR48,KV36]
Kaupō Gap; Kalapawili; Kīpahulu Valley; Manawainui; NE rift; West slope.
[Alien: native to Australia, New Zealand and Chatham Island]
C46,HR48,KV36

+?__Ludwigia octovalvis__ (Jacq.) Raven PRIMROSE WILLOW, *KAMOLE*
[= Ludwigia octivalvis sensu KV36]
Lower to middle Kīpahulu Valley
Herb of swampy, riparian sites, especially stream courses and old taro terraces at 550-3220 ft. Flowering and fruiting observed from April to October.
[Origin questionable, either Polynesian introduction or indigenous: pantropical]
K41,KV36,KW15,LK39

*__Ludwigia palustris__ (L.) Ell. MARSH PURSLANE
Lower Kīpahulu Valley
Weed of swampy, riparian sites, with opposite leaves and flowers without petals.
[Alien: native to North America, South America, and Eurasia south to Africa]
KV36,LK39

*__Oenothera laciniata__ Hill CUT-LEAVED EVENING PRIMROSE
Crater, Sliding Sands trail to Kapalaoa; West slope, roadside.
This species was first recorded near Kapalaoa cabin (Mitchell 1945). It occurs sporadically and very rarely in the Park, likely as a result of dispersal by horses brought in from pastures in Kula.
Representative specimen: B.H. Gagne s.n. (BISH) 1989
[Alien: native to eastern North America]

*__Oenothera stricta__ Ledeb. ex Link EVENING PRIMROSE
subsp. __stricta__
Crater; east and west Kaupō Gap; upper Ko`olau Gap; West slope. 4000-10,000 ft.
This species is the common evening primrose with its large, bright yellow flowers, very conspicuous on roadsides of the Crater District. Within the Crater, it is found most often in areas of open cinder and on cliff faces at higher elevations. This species first collected in the Park by C.N. Forbes in 1919 (C.N. Forbes 1070M, BISH)
[Alien: native to Chile and Argentina]
C46

OXALIDACEAE, Wood Sorrel Family

+?__Oxalis corniculata__ L. YELLOW WOOD SORREL, *`IHI-`AI*
[= var. corniculata sensu KV36]
East and west Kaupō Gap; Kīpahulu Valley; West slope, rare on roadsides.

Low, inconspicuous herb with yellow flowers occurring in disturbed areas and along stream beds, 20-7000 ft. First recorded in the Park in east Kaupō Gap at 5800 ft by Mitchell (1945).
[Long considered non-native, now regarded as a Polynesian introduction or indigenous: cosmopolitan]
C46,KV36,LK39

*__Oxalis corymbosa__ DC. PINK WOOD SORREL, *`IHI-PEHU*
[= Oxalis martiana Zucc. sensu KV36,LK39]
Lower to middle Kīpahulu Valley, 200-3200 ft.
Low-growing, inconspicuous herb with pink flowers.
[Alien: native to South America]
KV36,LK39

PAPAVERACEAE, Poppy Family

__Argemone glauca__ (Nutt. ex Prain) Pope var. __glauca__ PRICKLY POPPY, *PUA-KALA*
Central lower Kaupō Gap.
The white-flowered native poppy with medicinal properties and uses is rare in the Park but common elsewhere.
[Endemic: Hawaiian Islands]
SS115

PASSIFLORACEAE, Passion Flower Family

*__Passiflora edulis__ Sims *LILIKO`I*, PASSION FRUIT
Lower Kīpahulu Valley
Non-aggressive non-native passionflower vine persistent but sparsely reproducing at 40-400 ft.
[Alien: native to Brazil] KV37,LK40

*__Passiflora foetida__ L. LOVE-IN-A-MIST, *POHAPOHA*
Lower Kīpahulu Valley
Fetid smelling vine with deeply pinnately dissected stipules and floral bracts.
[Alien: native to American tropics and subtropics]
KV37,LK40

*__Passiflora pulchella__ Kunth TWO-LOBED PASSIONFLOWER
Lower Kīpahulu Valley
Herbaceous vine with 2-lobed leaves, flowers with bluish-white sepals and a yellow corona, and small, purple fruits (1-1.5 cm diameter).
[Alien: native from southern Mexico to northern South America]
KV37

*__Passiflora subpeltata__ Ortega WHITE PASSIONFLOWER
East and west Kaupō Gap, 4000-4300 ft; Kīpahulu Valley, 150-400 ft.

This seasonal vine of arid to mesic lava flows and mesic forests of the Kaupō Gap area of the Park was formerly quite uncommon. However as with many plant species of the area, since control of feral goats, this species is becoming increasingly common. The first collection on Maui was made in 1914 at Auwahi (G.C. Munro 372, BISH).
[Alien: native to Mexico, Central America and northern South America]
C47,KV37,LK40

PHYTOLACCACEAE, Pokeweed Family

Phytolacca sandwicensis Endl. *POPOLO-KŪ-MAI*
[= var. puberulenta (Deg.) St. John sensu C47]
East Kaupō Gap (extirpated?); Kīpahulu Valley; Manawainui. 3330-5990 ft.
Rare, distinctive, large herb of rain forests with purple-green, pubescent leaves, with purple stems, flowers and fruits. Flowering and fruiting observed from April to October.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui and Hawai`i]
C47,K37,KV37,SS115

PIPERACEAE, Piper Family

Peperomia cookiana C. DC. *`ALA`ALA-WAI-NUI*
[= var. cookiana sensu KV37]
[= var. flavinerva sensu KV37]
East Kaupō Gap; Kīpahulu Valley; Manawainui.
This relatively common herb with hairy internodes is found in a variety of sites from rain forests to moist subalpine shrubland.
[Endemic: Kaua`i, Moloka`i, Maui and Hawai`i]
C47,K35,KV37,M110,SS116

Peperomia eekana C. DC. *`ALA`ALA-WAI-NUI*
[= Peperomia waikamoiana Yuncker sensu M111]
Kīpahulu Valley; Manawainui. 3000-6000 ft.
Wagner et al. (1990) state that this species "is closely related to and may be conspecific with P. expallescens, which differs primarily in its larger size."
[Endemic: Maui and Moloka`i]
K35,KV37,M111

Peperomia expallescens C. DC. *`ALA`ALA-WAI-NUI*
Kīpahulu Valley; Manawainui.
Similar to P. eekana, but with larger leaves and flowering spikes and thicker and longer stems.
[Endemic: Moloka`i and Maui]
K35,KV37,M111

Peperomia globulanthera C. DC. *`ALA`ALA-WAI-NUI*
Kīpahulu Valley; Manawainui; NE rift.
Wagner et al. (1990) state that this species "appears to essentially represent a glabrous form of P. cookiana" or "a less robust species derived from the P. membranacea lineage."

[Endemic: Maui]
C47,HR41,K36,KV37,LK40,M111

Peperomia hirtipetiola C. DC. *`ALA`ALA-WAI-NUI*
Kīpahulu Valley
Tall herb (to 0.7 m) fairly common in *`ōhi`a* and *koa* forest with good-quality native understory, with sweet-smelling, peppery flowering spikes.
[Endemic: Maui and Lāna`i
Representative specimen: A.C. Medeiros and D.W. Miranda 824 (BISH)
K36,KV37

Peperomia kipahuluensis St. John and C. Lamoureux *`ALA`ALA-WAI-NUI*
Kīpahulu Valley; Manawainui; NE rift.
Distinctive, small-leaved, red-stemmed herb of wet rain forest, most common at upper elevation sites. 2100-6520 ft.
[Endemic: East Maui]
HR41,KV37

Peperomia latifolia Miq. *`ALA`ALA-WAI-NUI*
Kīpahulu Valley
Uncommon, low herb of rain forest understories, especially along wet stream courses. This species can be recognized by its distinctive, alternate "zig-zag" branching pattern.
[Endemic: Hawaiian Islands]
K36,KV37,LK40

#**Peperomia leptostachya** Hook. and Arn. *`ALA`ALA-WAI-NUI*
East and west Kaupō Gap; Kīpahulu Valley; Manawainui. 3900-6400 ft.
This species is unusual among other Hawaiian representatives of the genus in its ability to colonize xeric to mesic low to middle elevation sites, often on rough lava, while many other species exist only in wet forests. This species is extremely common in rock cracks on lava in Kaupō Gap.
[Indigenous: Australia, Micronesia, Melanesia and Polynesia; Moloka`i, Maui and Hawai`i]
C47,KV37,LK40,M111,SS116

Peperomia ligustrina Hillebr. *`ALA`ALA-WAI-NUI*
[= var. oopuolana Yuncker sensu K36,KV37]
Kīpahulu Valley; Manawainui. 2900-4570 ft.
Distinctive, small-leaved herb of wet rainforest.
[Endemic: Moloka`i, Maui and Hawai`i]
K36,KV37,M111

Peperomia macraeana C. DC. *`ALA`ALA-WAI-NUI*
[= Peperomia lilifolia C. DC. sensu HR41,K36,KV37,LK40,M111]
[= var. nudilimba (C.DC.) Yuncker sensu KV37]
Kīpahulu Valley; Manawainui; NE rift.

Extremely common understory herb of rain forests within the Park and elsewhere in Hawai`i.
[Endemic: O`ahu, Moloka`i, Lāna`i, Maui and Hawai`i]
HR41,K36,KV37-38,LK40,M111

Peperomia membranacea Hook. and Arn. *`ALA`ALA-WAI-NUI*
[= var. puukukuiana Yuncker sensu HR42]
Kīpahulu Valley; NE rift.
Closely related to P. remyi, this species differs primarily in its lack of pubescence.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui and Hawai`i]
HR42

Peperomia obovatilimba C. DC. *`ALA`ALA-WAI-NUI*
[= Peperomia erythroclada C. DC. sensu C47,K35,KV37]
Kīpahulu Valley; Manawainui; NE rift. 2900-5700 ft.
Herb with distinctive, thick floral spikes.
[Endemic: East Maui and Hawai`i (predominantly Kohala Mts.)]
Representative specimen: A.C. Medeiros and D.W. Miranda 825 (BISH)
C47,K35,KV37

Peperomia remyi C. DC. *`ALA`ALA-WAI-NUI*
[= Peperomia trichostigma C. DC. sensu M111]
Kīpahulu Valley; Manawainui.
Wagner et al. (1990) state that this species is "closely related to P. leptostachya and appears to represent a more robust derivation adapted to wet forest".
[Endemic: main Hawaiian Islands]
M111

#**Peperomia tetraphylla** (Forst. f.) Hook. and Arn. *`ALA`ALA-WAI-NUI*
[= var. parvifolia (C. DC.) Deg. and Deg. sensu C48]
Crater, Palikū; East and west Kaupō Gap; Kīpahulu Valley; Manawainui.
Like P. leptostachya, this species sometimes occurs in xeric and relatively high-elevation sites as well as in wet forests. 2650-5790 ft.
[Indigenous: pantropical and main Hawaiian Islands]
C47,C48,KV38,LK40,M111,SS117

+**Piper methysticum** Forst. f. *`AWA*
Lower Kīpahulu Valley, planted and persistent.
The fresh or dried roots of this shrub were and still are used to make *`awa*, a drink with a narcotic effect.
[Polynesian introduction: origin perhaps in eastern Malesia or the New Hebrides]

PITTOSPORACEAE, Pittosporum Family

Pittosporum confertiflorum Gray *HO`AWA*
[= var. confertiflorum sensu SS118]

Crater; Kaupō Gap; Kīpahulu Valley; Manawainui, 6500 ft; NE rift; West slope, below and north of 8500 ft Eucalyptus grove (1 tree), and at 8400-8500 ft on cliffs below Leleiwi lookout. 4100-8500 ft.
Tree with leaves densely to moderately hairy on lower surface. A new sapling was discovered by Terry Lind on the walls of the crater behind Kapalaoa Cabin in March 1998.
[Endemic: O`ahu, Lāna`i, Maui, and Hawai`i]
C48,HR44,K38,KV38,SS118

Pittosporum glabrum Hook. and Arn. *PAPAHEKILI*
[= var.tinifolium Sherff sensu K38,KV38]
[= Pittosporum insigne Hillebr. sensu K38,KV38,M112,SS118]
Middle Kīpahulu Valley, 2200-4500 ft; Manawainui, 5000 ft.
Most common, but morphologically variable tree of mesic to wet forests. Fruiting observed in May and June.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i and Maui]
K38,KV38,M112,SS118

Pittosporum terminalioides Planch. ex Gray *HO`AWA*
Manawainui
Tree with leaves densely clustered on the branch ends.
[Endemic: Lāna`i, Maui, and Hawai`i]
M112

PLANTAGINACEAE, Plantain Family

***Plantago australis** Lam. DWARF PLANTAIN
[= Plantago virginica L. sensu C49]
East Kaupō Gap. (P.K. Higashino 884 at 1933 m elevation)
[Alien: native from Arizona south to South America]
C49

***Plantago lanceolata** L. NARROW-LEAVED PLANTAIN
Kīpahulu Valley; Manawainui; West slope, at 6800-10,000 ft.
[Alien: native from Europe and north-central Asia]
C48,HR52,KV38,LK41,M112

***Plantago major** L. BROAD-LEAVED PLANTAIN, *LAUKAHI-NUNUI*
Crater, at Palikū, 6300 ft; lower Kīpahulu Valley, 20-640 ft.
[Alien: native to Europe and northern and central Asia]
C48,KV38,LK41

Plantago pachyphylla Gray *MANENE*
[var. maviensis Gray sensu HR53]
Kīpahulu Valley; Ko`olau Gap; Manawainui, upper forest line and cliffs; NE rift. 5500-6900 ft.

Robust herb, rare and scattered in moist subalpine shrubland ecotone above rain forest, locally common in montane bog turf at 5440-6100 ft.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui and Hawai`i]
C48,HR53,K44,KV38

Plantago princeps Cham. and Schlecht. *ALE*
var. **laxiflora** Gray
West Kaupō Gap; Ko`olau Gap; Kīpahulu Valley 3150-6100 ft.
Based on the numbers of historical collections of this species, it is obvious that this rare, woody plantain, 3-8 ft in height, was once common in the islands, but is now much reduced in distribution and abundance.
Three populations of this species are currently known in the Park. The first record of this species was made in 1976 (L. Stemmermann & R. Rice 1008) in upper west Kaupō Gap on vertical cliffs at ca. 5800-5900 ft. A reconnaissance trip into this area in 1991 noted at least 40-50 individuals of this species on steep cliffs in the Waikane area, upper west Kaupō Gap; a seed collection was made for the Center for Plant Conservation (pers. comm. S. Perlman, K. Marr). A second population was discovered in 1988 in rain forest of Kīpahulu Valley, a single plant in a side valley on the lower level, northwest of Palikea Stream at ca. 3150 ft. Since that discovery, more plants have been recorded and have been observed flowering from July to August. Another plant growing at approximately 3200 feet elevation beyond a pool in the Koukouai Stream (M. Defly pers. comm.) near a major kāhili ginger infestation has not been collected or witnessed by the authors. A third population occurs in east Ko`olau Gap, where a single group of plants is located on the sheer face of a periodic waterfall, south of Waikau, at ca. 6700 ft (no voucher made, observation only). This species listed as Endangered by USFWS.
This species also occurs outside the Park in the Waikamoi Preserve (TNC) in the western Ko`olau Gap along steep cliffs below `Ainahou, 4700-5600 ft (A.L. Mitchell 92 in 1945 and M. Tessene, W.H. Wagner Jr. et al. s.n. in 1965).
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui and Hawai`i; subspecies laxifolia endemic to Moloka`i, Maui and Hawai`i]
Representative specimen: L. Stemmermann & R. Rice 1008 (BISH)
C49,KV38,SS119

POLEMONIACEAE, Phlox Family

***Collomia linearis** Nutt. NARROW LEAVED COLLOMIA
West slope.
Low, annual herb restricted in Park to rocky dry stream bed, 8200 ft. First collection made in 1986 is apparently a new state record. This species is only sparsely reproducing in the Park.
[Alien: native to western North America]
Representative specimen: A.C. Medeiros and S. Jessel 802 (BISH)

***Gilia capitata** Sims BLUE FIELD GILIA
West slope, gulch below road at 8400 ft.

This lavender-flowered annual herb was first collected in the state and the Park in 1929 (O.H. Swezey s.n.), then in 1980 (R.J. Nagata s.n.) and 1982 (K.M. Nagata & R.J. Nagata 2572). Collected outside Park in Kula in 1932 (Mrs. Blanche Walker s.n.). The sole known population of this species in the state currently occurs in the Park at 8400 ft. This species is only sparsely reproducing in the Park.
[Alien: native from British Columbia to California]

POLYGALACEAE, Milkwort Family

***Polygala paniculata** L.
Lower Kīpahulu Valley, 80-100 ft.
Small, erect, white-flowered herb with roots smelling of bubble-gum; localized in disturbed area near road at `Ohe`o Gulch. First collected on Maui in 1974 (Wagner et al. 1990), and in the Park in 1990.
[Alien: native to New World tropics]
Representative specimen: A.C. Medeiros and P.D. Bednorz 604 (BISH)

POLYGONACEAE, Buckwheat Family

***Antigonon leptopus** Hook. and Arnott. MEXICAN CREEPER, MOUNTAIN ROSE
Lower Kīpahulu Valley
Few localized sprawling vine-like plants with bright pinkish-purple flowers just above road on trail to Waimoku Falls, ca. 120 ft elevation. First collected in the Park in 1990.
[Alien: native to Mexico]
Representative specimen: A.C. Medeiros 856 (BISH)

***Polygonum aviculare** L. KNOTWEED
West slope.
Rare weed of stables, roadside, and headquarters area (6800-7000 ft). This species apparently did not reproduce in the Park. First collected in 1982 (K. Nagata & R. Nagata 2567), last collected in 1984 (A.C. Medeiros and D. Texeira 298) and not observed since.
[Alien: widespread in world temperate areas]

***Polygonum capitatum** F. Ham.
West slope. Adventive, prostrate, mat-forming weed (leaves with purple v-shaped band), localized in yard of Park residence (HQ11) near headquarters, 7000 ft, reproducing sparsely by seed.
[Alien: native to Himalayas and western China]

***Polygonum convolvulus** L. BLACK BINDWEED
West slope, pasture area, 6800 ft.
New state record. One collection from horse pasture near research area made in 1981. This twining vine apparently did not reproduce in the Park. Not observed or collected since 1981.
[Alien: native to Europe and western Asia]
Representative specimen: R. Nagata s.n.

*Polygonum glabrum Willd. *KAMOLE*
Middle Kīpahulu Valley
First collected in Kīpahulu Valley by C. N. Forbes in 1919 (C.N. Forbes 1678M, BISH).
Common, white to pinkish-flowered weed in flooded sites at 2400-3100 ft. Similar to P. punctatum, but with non-ciliate, or short bristly ocrea (a stipule-like sheath around the stem).
[Alien: native to tropical and subtropical Asia, Africa, and perhaps America]
K37,KV38,KW13

*Polygonum punctatum Ell. WATER SMARTWEED
Kīpahulu Valley
Similar to P. glabrum, but with long-ciliate ocrea.
[Alien: native to North America, South America and the West Indies]
KV38

*Rumex acetosella L. SHEEP SORREL
Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley, 6500-7000 ft; Manawainui; NE rift, 5440-7000 ft; West slope. 5440-10,000 ft.
Ubiquitous, rhizomatous herb of a variety of upper elevation sites. Though thriving initially after the removal of feral goats, this species has declined markedly in at least some of these areas due to overtopping by other non-native and native plant species. This species was first recorded in the Park in 1909 (W.T. Brigham et al. s.n., BISH).
[Alien: native to Eurasia]
C49,HR43,K37,KV38,KW13,M112

*Rumex crispus L. YELLOW DOCK
West slope.
Uncommon herb at research area, near stables and old dump site at 6800 ft.
Though considered a problem species elsewhere, this weed is scarcely reproducing and does not currently appear to be aggressive on East Maui.
[Alien: native to Europe]
Representative specimen: A.C. Medeiros 772 (BISH)
C49

Rumex giganteus Ait. *PAWALE, UHAUHAKO*
[= Rumex skottsbergii Deg. and Deg. sensu SS120]
Crater; Kīpahulu; NE rift; West slope.

In the Crater District, two plants are known in barren cinder flats near Pu`u-o-Maui, and also scattered (ca. 8 plants) on southern cliffs above Kapalaoa. Formerly known from cliffs south of Hōlua cabin, and on the west slope at "West slope 8000 ft, 300 ft below road, 1/2 mile north of 1st switchback after Haleamau`u Trail. 1 plant. " (Mitchell 1945). In Kīpahulu Valley, this species is scattered but, with the removal of pigs, is increasing in wet rain forest on the lower level at 2400-4000 ft. 2400-8400 ft. This species has been collected in gullies on the north slope below Kalapawili grasslands at 6600-6900 ft elevation (Henrickson 1971 and B.Harrison-Gagne field notes). Despite its rarity in the wild, the species is easily grown from seed and is cultivated in the headquarters and research areas from seeds gathered from the single plant at the base of Pu`u-o-Maui.
[Endemic: Moloka`i, Maui and Hawai`i]
Representative specimen: A.C. Medeiros 567 (BISH)
C49,HR43,K37,KV38,SS120

PORTULACACEAE, Portulaca Family

#**Portulaca lutea** Soland. ex Forst. f. *`IHI*
Lower Kīpahulu Valley, coastal strand.
Prostrate, yellow-flowered, succulent herb of low elevation coastal sites.
[Indigenous: Pacific Islands including Hawaiian Islands]
KV38,LK41,SS121

*__Portulaca oleracea__ L. COMMON PURSLANE, *`AKULIKULI-KULA*
Lower Kīpahulu Valley, disturbed sites.
Prostrate, succulent, profusely branched weed with glossy black seeds.
[Alien: presumably native to Old World, now nearly cosmopolitan]
KV38,LK41

PRIMULACEAE, Primrose Family

*__Anagallis arvensis__ L. SCARLET PIMPERNEL
Crater; west Kaupō Gap; Manawainui; West slope.
Annual, salmon-flowered herb of rocky and disturbed sites. First recorded in the Park by Mitchell (1945).
[Alien: native to Europe]
C49,HR50

__Lysimachia hillebrandii__ Hook. ex Gray *PUA-HEKILI*
Upper Kīpahulu Valley
Sprawling subshrub which "intergrades extensively with L. remyi" (Wagner et al. 1990), but with generally wider leaves (8-45 mm) and longer corollas (10-20 mm).
[Endemic Kaua`i, O`ahu, Moloka`i, Lāna`i and Maui]
KV39

__Lysimachia remyi__ Hillebr. *KOLOKOLO-KUAHIWI*
subsp. __kipahuluensis__ (St. John) Marr, comb. nov.

[= Lysimachia kipahuluensis St. John sensu HR50,KV39,SS122-123]
Crater, Palikū cliffs, base of Halemau`u trail; Kalapawili; east and west Kaupō Gap, 4500-6300 ft; Kīpahulu Valley; Manawainui, 5500-7000 ft; NE rift; West slope.
Small subshrub of moist sites in upper elevation rain forest, subalpine shrublands and cliffs in mesic to xeric sites, 3050-7200 ft. Marr and Bohm (1997) state that "L. r. subsp. kipahuluensis and L. r. subsp. caliginis form hybrid swarms on East Maui in Kaupō Gap and near the old Waikau Cabin site in Ko`olau Gap" but that "these two species are not sympatric now, but may have been in the past. Decades of destruction of the native vegetation in Haleakalā by introduced animals has undoubtedly affected species distributions". Other than this mention of hybrid swarms, no records of L. r. subsp. Caliginis exist for the Park.
[Endemic: Moloka`i and Maui]
C49,HR50,K42,KV39,M112,SS122-123

PROTEACEAE, Protea Family

***Macadamia integrifolia** Maiden & Betche. MACADAMIA
East Kaupō Gap, single tree (single stem, 6 ft tall) east of trail, ca. 5000 ft.
Apparently planted and not reproducing in the Park, this tree was eradicated in 1998 (P. Welton and W. Haus, pers. comm.).
[Alien: native to Australia]

RANUNCULACEAE, Buttercup Family

Ranunculus hawaiensis Gray *MAKOU*
Crater; Ko`olau Gap; West slope. All known populations extirpated.
Extremely rare, large, pubescent herb of mesic to subalpine shrubland. Formerly, populations occurred in high elevation shrubland in Crater, east of `O`ili-pu`u (Mitchell 1945) and on the outer western slope (BISH collections). Rock (1913:82) noted that this species was formerly "not uncommon" at Pu`u-nianiau. After 1940, there are few collections of R. hawaiensis. Degener (1960) stated that, in 1927, this species was "relatively common in the scrub north of Hōlua Cave, while in 1959 the writers could find no specimens in that general region except for two lone plants in a tiny *kipuka*". This species is extirpated from the Park and possibly also from East Maui. However, plants that are apparently morphologically intermediate between the two native species (R. hawaiensis and R. mauiensis) have been collected from remnant populations (4-6 known plants) in badly degraded *`ōhi`a* and *koa* forest in Kahikinui near the Manawainui drainage above Luala`ilua Hills, leeward East Maui, at 5650 ft. Not currently known from the Park.
[Endemic: East Maui and Hawai`i]
C50

Ranunculus mauiensis Gray *MAKOU, `AWA-KANALOA*
Ko`olau Gap (Waikamoi TNC Preserve); NE rift (extirpated).

This rare mesic to wet forest species has declined markedly in the last century or so. In 1945, R. mauiensis was found within the Park on the northeast rift at ca. 6300 ft on a "mossy wooded hillside" (H. St. John & A. Mitchell 21,109 and St. John, in litt.). However, currently, no populations are recorded from any section of the Park.

Four small "populations" in two locales were currently known for this species on East Maui: two small populations on steep ferny slopes in west Ko`olau Gap at 5200-6000 ft (P.K. Higashino 799b 1976 collection, and A.C. Medeiros, pers. observ. in 1986 ) and two widely-separated single plants in *`ōhi`a* and *koa* forest in Kahikinui near the Manawainui drainage above Lualaʻilua Hills at 5000 ft and 5650 ft (Medeiros et al. 1986). The present day status of these plants is unknown. Not currently known from the Park.

[Endemic: Kaua`i, O(Ex), Moloka`i,West Maui, East Maui and Hawai`i]

HR43,SS123

*__Thalictrum dipterocarpum__ Franch. MEADOW RUE

West slope, cultivated, residential area, 7000 ft.

Herb with apetalous flowers, and sepals rose-violet. Planted and not reproducing in the Park.

[Alien: native to China]

ROSACEAE, Rose Family

*__Cotoneaster pannosa__ Franch.

West slope, planted near residential area (between HQ11 and HQ12), 7000 ft.

Two shrubs planted and not reproducing in the Park.

[Alien: native to China]

*__Eriobotrya japonica__ (Thunb.) Lindl. LOQUAT

Crater, at Palikū between cabins, 6300 ft; east Kaupō Gap, single large tree along trail, 4900 ft; West slope, at Hosmer Grove, 6800 ft. 4900-6800 ft.

Planted and not reproducing in the Park. Tree in Kaupō Gap treated with herbicide (M. Yager pers. comm.).

[Alien: native to Japan and China]

C50

#__Fragaria chiloensis__ (L.) Duch. *`OHELO-PAPA*

subsp. __sandwicensis__ (Decne.) Staudt

[= var. sandwicensis Deg. and Deg. sensu C50,HR44,K38,KV39]

Crater, at Palikū, 6300 ft; Kalapawili; upper Kīpahulu Valley; upper Manawainui, e.g. at treeline at Kuiki; West slope, at Hosmer Grove, 6800 ft.; cultivated in front of park residences.

Wagner et al. (1990) cite a decline of the native strawberry on Hawai`i island (and not on Maui) which they postulate may be related to the naturalization of the introduced strawberry, F. vesca, on that island and not on Maui.

[Indigenous species, endemic subspecies: Pacific coast of North America from Alaska to California, also Chile to Argentina in South America, Juan Fernandez and Hawaiian Islands; see below. Wagner et al. (1990) state that Hawaiian specimens are very similar to specimens from Juan Fernandez Islands but quite dissimilar to specimens of this species from North America.]
C50,HR44,K38,KV39,SS124

*__Fragaria chiloensis__ (L.) Duch. STRAWBERRY
var. __ananassa__ Bailey
West slope.
Cultivated at Park residences near headquarters at 7000 ft; planted and not reproducing.
[Indigenous species with non-native, cultivated subspecies: see above.]

#__Osteomeles anthyllidifolia__ (Sm.) Lindl. *`ŪLEI, ELUEHE*
Crater, from Kapalaoa and `O`ili-pu`u throughout Kaupō Gap; Lower Kīpahulu Valley, 900 ft; West slope. 900-8000 ft.
This low shrub, common elsewhere in similar habitat, is enigmatically rare on the northwest slope of the Park. Ethnobotanically, the wood was used in making fishing tools (fishing net frames, fishing spears), agricultural tools (*kapa* beaters), musical instruments, and carrying poles. The berries were used for wild food and in making a blue-purple dye for *kapa*.
[Indigenous: Cook Islands, Tonga and Hawaiian Islands]
C50,M112,SS124-125

*__Prunus cerasifera__ Ehrh. x __salicina__ Lindl. METHLEY PLUM
Crater, at Palikū, between cabins: east Kaupō Gap, two trees east of trail at ca. 5000 ft.
The Methley plums at Palikū were not listed as present by Mitchell (1945). Apparently, they were planted at Palikū and in east Kaupō Gap by John Freitas in the 1950s, and were well-established by the early 1960s (E. Grasa, T. Rodrigues, pers. comm.). These plums reproduce both by seedlings and root-suckering.
[Alien: sterile hybrid with origin in South Africa]
Representative specimen: L. Stemmermann 1031 (BISH)
C50 [with common name apparently misspelled as "Methey" plum.]

*__Prunus persica__ (L.) Batsch. PEACH
West slope.
Small trees growing along trails and roadsides, apparently originating from discarded peach pits. 6800-8400 ft.
[Alien: native to China]

*__Pyrus malus__ L. APPLE
West slope. Two groups of trees, perhaps planted, the first along roadside in a gully at 8400 ft, and the second near old water tanks on Hosmer Grove road, 6800 ft. Both trees reproducing sparsely by seed.
[Alien: native to Eurasia]

*__Rosa__ sp. ROSE
West slope, 6800 ft.
This rose was planted by J. Kjargaard in the late 1970s at the site of his former residence just northeast of the barracks. Planted and persistent; reproducing locally by rootstocks. As of 1991, the small cluster occupied several meters square with canes approx. 2 m height.
[Alien: native to temperate Eurasia]

*__Rubus argutus__ Link BLACKBERRY
[= Rubus penetrans Bailey sensu C51,HR45]
Crater, Palikū pasture; Kalapawili; lower east Kaupō; Kīpahulu Valley; West slope, two small populations, one near research center and the other at Park greenhouse, southwest of headquarters.
Blackberry is an invasive weed that spreads by rhizome and aerial runner branches as well as with bird-dispersed seed. Blackberry is capable of forming dense thickets in *koa* and *`ōhi`a* forest at 4000-7600 ft. Outside the Park on the north and northwest flanks of East Maui, large populations occur from Pu`u-`alaea westward to Waikamoi Preserve below Hosmer Grove. Henrickson (1971) described this species as "infrequent" in the Kalapawili grassland area. Blackberry was first collected in 1909 in Olinda (A. Faurie 801, BISH) and was first recorded in the Park at Palikū in 1969 (J. Henrickson & R. Vogl 3506, BISH).
[Alien: native to central and eastern United States]
C51,HR45

__Rubus hawaiensis__ Gray *`AKALA*
Crater, Palikū; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui, to 6300 ft; NE rift; West slope, near Hosmer Grove, to 7000 ft.
Endemic, clump-forming, rhizomatous raspberry common in upper elevation rain forest and forest ecotone with subalpine shrublands. Easily distinguished from the non-native blackberry by its pink-purple (vs. white) flowers and more erect, smaller thorned stems. 2400-7000 ft. Flowering and fruiting observed from April to July.
[Endemic: Kaua`i, Moloka`i, Maui and Hawai`i]
C51,HR44,K38,KV39,M113,SS125

__Rubus macraei__ Gray *`AKALA*
Kalapawili; Kīpahulu Valley; Manawainui; NE rift.
Rare, vine-like raspberry, found in upper forest and at forest line. 6100-7000 ft.
[Endemic: East Maui and Hawai`i]
HR45,K38,KV39

*__Rubus rosifolius__ Sm. THIMBLEBERRY, *`OLA`A*
[= Rubus rosaefolius C51,HR45,K38,KV39,KW13,LK41]
Kaumakani; east Kaupō Gap, 4000-5000 ft; Kīpahulu Valley, 80-5050 ft; Manawainui, 5000 ft. 80-5050 ft.

Common, thorny subshrub found in a variety of habitats but thriving especially in disturbed, well-lit wet to mesic forest understory as well as along stream sides. Fagerlund (1945) stated that in a trip down Kīpahulu Valley in that year, Rubus rosifolius appeared at 2000 ft elevation and became more abundant at lower elevations. Thimbleberry was first collected on Maui in 1910 in Ke`anae Valley (C.N. Forbes 283M, BISH). In Kīpahulu, flowering and fruiting observed year-round.
[Alien: native to Asia]
C51,HR45,K38,KV39,KW13,LK41,M113

Rubus rosifolius X R. hawaiiensis
Kīpahulu Valley
These unusual, sprawling, blackberry-like plants occur on the upper shelf of the Valley just above the mid-Valley (Dogleg) fence, as well as on the lower shelf across Opae Stream, 2900-3300 ft. They apparently represent spontaneous hybrids between the non-native thimbleberry R. rosifolius and the endemic raspberry, R. hawaiensis, both of which are found in the area. The putative hybrids are marked by intermediate flower color (pale pink vs. white in R. rosifolius and salmon in R. hawaiensis), leaf arrangement (pinnate compound with 5 leaflets vs. pinnate compound in R. rosifolius with 5-7 leaflets and palmate compound in R. hawaiensis with 3 leaflets), leaf texture, spination, and overall growth habit. Further exploration will likely result in more discoveries of this hybrid. (Morden et al. unpublished).
Representative specimen: A.C. Medeiros and D. W. Miranda 834 (BISH)

RUBIACEAE, Coffee Family

Bobea elatior Gaud. *`AHAKEA*
[= Bobea sp. (Forbes 1666M) sensu K44]
Kīpahulu Valley; Manawainui.
Tree of mesic to wet forest with translucent, yellow appearance to foliage. Ethnobotanically, the yellowish wood was used for *poi* boards, canoe rims, and ceremonial door framing.
[Endemic: main Hawaiian Islands]
K44,KV39,M113

#Canthium odoratum (G. Forster) Seem. *ALAHE`E, WALAHE`E*
Lower Kīpahulu Valley
Wagner et al. (1990) list the species as Canthium, but indicate that the correct name for this taxon is Psydrax odorata (Forst. f.) Smith & Darwin. Regarding Kīpahulu Valley, Fagerlund (1945) stated, "Alahee, (Canthium odoratum), occurs infrequently below 2,000 feet..." Ethnobotanically, the hard wood was used in making weapons, wooden adzes, fishing tools (spears), and agricultural tools.
[Indigenous: Hawai`i, Micronesia and the southern Pacific (New Hebrides and New Caledonia east to the Tuamotus)]

***Coffea arabica** L. ARABIAN COFFEE
[= Coffea sp. sensu KV39]
Lower Kīpahulu Valley, planted and persistent, 500-600 ft.

[Alien: probably native to Ethiopia]
KV39,LK41

Coprosma ernodeoides Gray *KUKAE-NENE*
[= var. mauiensis St. John sensu C51,HR53,K44,KV39]
Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui; NE rift; West slope.
Narrow-leaved, prostrate, dioecious shrub of variety of moist upper elevation sites, but also extending high into barren subalpine zone. 5000-9800 ft.
[Endemic: ?West Maui, East Maui and Hawai`i]
C51,HR53,K44,KV39,M113,SS127

Coprosma foliosa Gray *PILO*
[= Coprosma stephanocarpa Hillebr. sensu C52,K44,KV39,SS127-128]
Kaupō Gap; Kīpahulu Valley; Manawainui.
Very common, dioecious shrub of *koa* and other mesic to dryland forests, especially in east Kaupō and western Manawainui. With shorter stipules (1.5-4 mm) than C. pubens or C. ochracea, and flower peduncles 3-15 mm long (Wagner et al. 1990).
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i and M]
C52,K44,KV39,M113,SS127-128

Coprosma montana Hillebr. *PILO*
Crater; Kalapawili; Kaupō Gap; Kīpahulu Valley; Manawainui; West slope.
Common, subalpine, dioecious shrub with stiff, ascendant branches and small, rounded coriaceous leaves. 5000-9800 ft. Sporadic flowering and fruiting observed year-round, with strong flowering peak in April-May.
[Endemic: East Maui and Hawai`i]
C51,HR53,KV39,M113,SS127

Coprosma ochracea Oliver *PILO*
Kīpahulu Valley; Manawainui; NE rift. 2200-6900 ft.
Common shrub with stipules 3-8(15) mm long and flower peduncles 0-1(4) mm long (Wagner et al. 1990). Fruiting observed in October.
[Endemic: O`ahu, Moloka`i, Lāna`i, Maui and Hawai`i]
C51,HR53,KV39,M113

Coprosma pubens Gray *PILO*
[= var. pubens sensu K44,KV39,M113]
Kīpahulu Valley; Manawainui; NE rift.
Common shrub with stipules 5-11 mm long and flower peduncles (1)5-18 mm long (Wagner et al. 1990). Flowering observed from January to March; fruiting observed from March to September.
[Endemic: Moloka`i, Lāna`i, Maui, and Hawai`i]
C52,K44,KV39,LK41,M113

Gardenia remyi Mann *NANU*

Middle Kīpahulu Valley 1600-2480 ft.

Two collections are known from the Park, both from Kīpahulu Valley. The first was made in 1919 (C.N. Forbes 1705M) with the note, "Kīpahulu Stream, near intake, only one tree seen." The second was made in 1980 (R. Warshauer & H. McEldowney 2872) on USFWS transect no. 17 at 2480 ft elevation along the Koukouai Stream in *`ōhi`a* forest. One other plant is reported to exist very near the old USGS gauge in Palikea Stream (pers. Comm. R. Nagata). Ethnobotanically, the wood was used in making *kapa* anvils (*kua kuku*) (Abbott 1992).

[Endemic: Kaua`i, Moloka`i, Maui, and Hawai`i]

K44,KV39, USFWS

Hedyotis acuminata (Cham. and Schlecht.) Steud. *AU*

[= var. acuminata forma obovata Fosb. sensu K45,KV40]

[= var. acuminata forma forbesii Fosb. sensu K45,KV40]

Kīpahulu Valley

Vine-like shrub, fetid when bruised, in wet *koa* and *`ōhi`a* forests; common along stream courses. Sporadic flowering and fruiting observed year-round.

[Endemic: main Hawaiian Islands]

K45,KV40

Hedyotis centranthoides (Hook. and Arn.) Steud.

[= var. centranthoides sensu K45,KV40]

Kīpahulu Valley; Manawainui; NE rift. 2650-6500 ft.

Trailing, vine-like shrub that, within the Park, is found mainly on wet rock faces and cliffs in rain forest. Until a recent review (Wagner et al., 1990), this species was considered in the genus Gouldia. However, others familiar with the genus Hedyotis worldwide consider this synonymy overly conservative (M. Kiehn, pers. comm.). Flowering observed from June to August; fruiting observed from July to December.

[Endemic: main Hawaiian Islands]

C52,K45,KV40,SS129

Hedyotis hillebrandii (Fosb.) Wagner and Herbst *MANONO*

[= Gouldia hillebrandii Fosb. sensu C52,HR53,K45,KV39,LK41,SS128]

Kīpahulu Valley; Manawainui; NE rift. 1600-6000 ft.

Small tree of wet *koa* and *`ōhi`a* forests. Similar to H. terminalis from which it can be distinguished by its generally larger leaves and axial (vs. terminal) inflorescences. Until a recent review (Wagner et al., 1990), this species was considered in the genus Gouldia. Fruiting observed from April to January.

[Endemic: Moloka`i, Maui and Hawai`i]

C52,HR53,K45,KV39,LK41,SS128

Hedyotis schlechtendahliana Steud. var. **schlechtendahliana** *KOPA*

East Kaupō Gap, 5980 ft.

Vine undocumented from the Park save for single collection at the B.P. Bishop Museum herbarium. Perhaps this species is more common than this but poorly known due to its superficial similarity with other Hedyotis species.
Representative specimen: H. St. John and A.L. Mitchell 21185 (BISH)

Hedyotis terminalis (Hook. and Arnott) W.L. Wagner and Herbst *MANONO*
[= Gouldia terminalis (Hook. and Arn.) Hillebr. sensu C52,HR54,K45,KV39,LK41,M114,SS128-129]
[= var. cordata (Wawra) Fosberg sensu KV39]
[= var. ovata (Wawra) Fosberg sensu KV39]
Crater, Palikū; Kīpahulu Valley; Manawainui; NE rift. 640-6350 ft.
Small tree of wet *koa* and *ʻōhiʻa* forests. Similar to H. hillebrandii but with inflorescences terminal (versus lateral) or on short, leafy lateral branches (Wagner et al. 1990). Flowering and fruiting observed year-round.
[Endemic: main Hawaiian Islands]
C52,HR54,K45,KV39,LK41,M114,SS128-129

+**Morinda citrifolia** L. INDIAN MULBERRY, *NONI*
Lower Kīpahulu Valley
Large-leaved shrub of coast and lower forests at 20-400 ft. Ethnobotanically, this species is still used medicinally; the roots alone produce a yellow dye and mixed with lime a rose dye for *kapa* (Abbott 1992).
[Polynesian introduction: native from southeastern Asia to Australia]
KV40,LK42

#**Nertera granadensis** (L. f.) Druce *MAKOLE*
[= var. insularis Skottsb. sensu HR54,K45,KV40]
Kaumakani, 3600 ft; Kīpahulu Valley; Manawainui; NE rift.
Prostrate, small-leaved herb with bright orange fruits, often growing among bryophytes, on ground or epiphytically in rain forest. 3000-6200 ft. Fruiting observed from September to January.
[Indigenous: Colombia, Juan Fernandez and Hawaiian Islands, and Indonesia]
HR54,K45,KV40,M114

Psychotria hawaiiensis (Gray) Fosb. var **hawaiiensis** *KOPIKO ʻULA*
Kīpahulu Valley, 200-4000 ft.
The variety hillebrandii (Rock) Fosb. has been collected on East Maui in similar habitats to those in Kīpahulu Valley (Koʻolau Forest Reserve at 5060 ft - Higashino & Holt 9055 BISH). It likely occurs in the Park as well. Inflorescences erect, 3-4 branched with peduncles 1-7.5 cm long. Flowering observed in January and February.
[Endemic: Molokaʻi, Maui and Hawaiʻi]
Representative specimen: A.C. Medeiros 466a (BISH)
KV40

Psychotria kaduana (Cham. and Schlecht.) Fosb. *KOPIKO KEA*
Lower to middle Kīpahulu Valley 1400-3500 ft.
Inflorescences often pendent, with slender peduncles, 2-3 branched.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, West Maui and East Maui]
Representative specimen: W. Gagne 88 (BISH)

Psychotria mariniana (Cham. and Schlecht.) Fosb. *KOPIKO*
Kīpahulu Valley; Manawainui.
Tree with domatia usually conspicuous on lower leaf surface; inflorescences 2-3 branched, usually erect with stout, robust peduncles, 1.2-2 cm long. Flowering observed from February to November; fruiting observed from September to April.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, and Maui]
KV40,LK42

Psychotria mauiensis Fosb. *KOPIKO*
East Kaupō Gap, two trees at 4850 ft; Kīpahulu Valley. 2300-4850 ft.
Tree with leaf domatia not present or inconspicuous; inflorescences rarely pendent with one main axis and one or two branching nodes; peduncles 1-7.4 cm long (Wagner et al. 1990).
[Endemic: Kaua`i, Moloka`i, Lāna`i, Maui, and Hawai`i]
C52,KV40,SS130

*__Sherardia arvensis__ L. SPURWORT
East Kaupō Gap.
Reported by Mitchell (1945) as near the Park boundary along trail at 4000 ft elevation, presumably based on a collection made in 1935 (G.E. Olson 88), which noted "one plant found on grassy slope along trail." This species now occurs on the jeep road just outside the Park boundary in eastern Kaupō Gap (P. Welton, pers. comm.).
[Alien: native to Europe]
C53,Mitchell (1945)

RUTACEAE, Rue Family

*__Citrus__ sp. ORANGE, *ALANI*
Lower Kīpahulu Valley
Planted non-reproducing trees at old homesteads in lower Valley, and scattered trees on Pu`u-palikea at 1100-1700 ft. Planted and not reproducing in the Park.
KV40,LK42
[Alien]

*__Citrus__ cf. __aurantiifolia__ (Christm.) Swingle LIME
Single lime tree present at Park fence in Kaupō Gap.
[Alien: Possibly native to India and SE Asia; now widely naturalized in tropics.]

Melicope balloui (Rock) Hartley and Stone *ALANI*
[= Pelea balloui Rock sensu KV40]
Kīpahulu Valley, lower level in *`ōhi`a* and *koa* forest, ca. 2500 ft.

Uncommon tree with citrus-smelling foliage and 4-lobed, cruciate capsules. This species listed as Endangered by USFWS. Flowering observed from April to August; fruiting observed from September to April.
Representative specimen: L.W. Cuddihy 2053 (BISH)
[Endemic: East Maui]
KV40

Melicope clusiifolia (Gray) Hartley and Stone *ALANI*
[= Pelea clusiaefolia Gray sensu C53,K39,KV40,SS131]
[= var. minor St. John sensu KV40]
[= var. minor forma stenophora St. John sensu KV40]
Kaumakani; Kīpahulu Valley; Manawainui; NE rift. 2000-6500 ft.
Most common Melicope species in Hawaiian rain forests. Flowering and fruiting observed year-round.
[Endemic: main Hawaiian Islands]
C53,K39,KV40,SS131

Melicope hawaiensis (Wawra) Hartley and Stone *MANENA, ALANI*
[= Pelea hawaiensis Wawra sensu SS132-133]
East Kaupō Gap.
Three trees of this species occur in the Park: two trees in dryland forest exclosure at 4850 ft, and single tree on valley floor at 4700 ft hanging over periodic stream course. All trees are old (some senescent), and there has been no successful reproduction of this species in the Park for many years.
Representative specimen: A.C. Medeiros 211 (BISH)
[Endemic: Moloka`i, Lāna`i, West Maui, East Maui, and Hawai`i]
SS132-133

Melicope molokaiensis (Hillebr.) Hartley and Stone *ALANI*
[= Pelea molokaiensis Hillebr. sensu KV40]
Kīpahulu Valley 2400-3200 ft.
Common small tree found in the Valley, with 4-lobed cruciate capsules (21-39 mm wide) and leaves with red mid-veins; mostly on the lower level in *`ōhi`a* and *koa* forest. Flowering and fruiting observed year-round.
[Endemic: Moloka`i,West Maui, and East Maui]
KV40

Melicope orbicularis (Hillebr.) Hartley and Stone *ALANI*
[= Pelea orbicularis Hillebr. sensu C53]
Crater, cliffs above Palikū; Kaupō Gap (extirpated); Kīpahulu Valley; NE rift.
Uncommon, small tree with cruciate, 4-lobed capsules (20-25 mm wide); found primarily in montane *`ōhi`a* forest. 2800-7000 ft.
Representative specimen: O. Degener 2374, Kaupō Gap 1927.
[Endemic: West Maui and East Maui]
C53

Melicope ovalis (St. John) Hartley and Stone *ALANI*
[= Pelea ovalis St. John]
Kīpahulu Valley
Rare, pale green-leaved, small tree with cuboid to subglobose capsules; of *`ōhi`a* and *koa* forest. Bruised foliage has a distinctive odor (licorice or root beer) like that of the famed *mokihana* tree with fragrant fruits, Melicope anisata of Kaua'i island. 2800-4700 ft. This species listed as Endangered by USFWS. Flowering and fruiting observed year-round.
Representative specimen: L.W. Cuddihy & G.L. Santos 2239 (BISH)
[Endemic: East Maui]

Melicope peduncularis (H. Lev.) Hartley and Stone *ALANI*
Cable ridge, southern rim of Kīpahulu Valley.
Locally common but with restricted range, this small tree with aromatic leaves and mostly cuboid capsules on long peduncles (7-40 mm long) is found in mesic diverse Metrosideros/Acacia forest.
[Endemic: Kaua`i, O`ahu, Moloka`i, and East and West Maui]

Melicope volcanica (Gray) Hartley and Stone *ALANI*
[= Pelea anapanapaensis St. John sensu HR46,KV40, Kīpahulu Valley; Manawainui; NE rift.]
[= Pelea grandifolia (Hillebr.) St. John and Hume sensu SS131-132, east Kaupō Gap, 3 trees, 4700-5100 ft; Kīpahulu Valley; NE rift.]
[= Pelea kipahuluensis St. John sensu KV40, Kīpahulu Valley]
[= Pelea volcanica Gray]
East Kaupō Gap (extirpated); Kīpahulu Valley; Manawainui; NE rift. 2000-6200 ft.
Variable small tree of mesic dryland forest to wet rain forest with large fruits and large opposite, often recurved, leaves. Two trees of this species discovered in east Kaupō in the late 1970s were both dead by March 1989.
[Endemic: Lāna`i, East Maui,and Hawai`i]
HR46,K39,KV40,SS131-132,135

Platydesma spathulata (Gray) Stone *PILOKEA*
[= var. pallida (Hillebr.) Stone sensu K39,KV41]
Kīpahulu Valley; Manawainui. 3400-4650 ft.
Rare small tree of Kīpahulu Acacia dominated rain forest. Flowering and fruiting observed year-round.
[Endemic: Kaua`i, O`ahu, Maui, and Hawai`i]
K39,KV41,M114

Zanthoxylum kauaense Gray *A`E, HEA`E*
East Kaupō Gap, formerly within dryland forest ridge exclosure; West Kaupō Gap; "Cable Ridge", southern rim of Kīpahulu Valley

One tree of this species is known within the Park at Cable ridge at ca. 2000 feet elevation on the southeastern ridge overlooking Kīpahulu Valley. An additional tree was discovered by Robin McMillan and Anders Lyons in September 1997 at 5100 feet in West Kaupō Gap in a kipuka on the main lava flow and was identified by Patti Welton and Bill Haus in October 1997. At that time, they reported the tree as unhealthy. Formerly, another tree occurred in East Kaupō at 4850 ft (A.C. Medeiros 214). After appearances of poor health of that individual were reported in 1993, 11 young apical tips were taken from the Kaupō plant and propagation by tissue culture attempted by Gregory Koob at Lyon Arboretum in Honolulu. The material callused but failed to produce roots. The East Kaupo tree of this species has since died (P. Welton, pers. comm.). Ethnobotanically, the wood was used for *kapa* anvils (*kua kuku*), digging sticks, and spears.

[Endemic: main Hawaiian Islands]

SS136-137

SANTALACEAE, Sandalwood Family

Santalum ellipticum Gaud. COASTAL SANDALWOOD, *`ILI-AHI*

Kaupō Gap.

This dryland, green-flowered sandalwood is found in rocky sites in lower central Kaupō Gap with a few remnant populations on west Kaupō cliffs at 5900 ft. Ethnobotanically, wood of unspecified species were used in making specific canoe parts (*pola*) and for perfuming *kapa*. 4000-5900 ft.

[Endemic: main Hawaiian Islands, Laysan and Kaho`olawe]

C53,SS138-139

Santalum haleakalae Hillebr. HALEAKALA SANDALWOOD, *`ILI-AHI*

Crater, Palikū cliffs; Kaupō Gap; Ko`olau Gap; West slope.

Small, rare tree of subalpine shrubland, especially common on the northwestern outer slopes of the Park, where several hundred trees occur. This species produces vegetative root-suckers that may form substantial shrub-like growth surrounding more erect "parent" trees. Seedlings are very rare and slow-growing. Flowering and fruiting observed year-round.

[Endemic: East Maui]

C53,SS140

SAPINDACEAE, Soapberry Family

#**Dodonaea viscosa** Jacq. *`A`ALI`I*

[= Dodonaea eriocarpa Sm. sensu C54,K40,SS142]

[= Dodonaea sandwicensis Sherff sensu C54,HR46,M114]

Crater; east and west Kaupō Gap; Kīpahulu Valley; Manawainui; West slope.

Erect, large shrub to small tree, especially common in leeward xeric to mesic forests, somewhat less common and more localized in subalpine shrublands. After elimination of feral goats from the Kaupō Gap and western Manawainui areas about 1987, this species has since reproduced abundantly by seed and is on its way toward becoming dominant in the vegetation of areas formerly denuded by feral goats. Ethnobotanically, the wood was used in house construction and in making weapons, agricultural tools, and fishing tools; the leaves medicinally, and the fruit in a red dye and for *lei*. 3900-8800 ft.
[Indigenous: pantropical as well as main Hawaiian Islands and Nihoa]
C54,HR46,K40,KV41,M114,SS142

SAPOTACEAE, Sapote Family

Pouteria sandwicensis (Gray) Baehni and Deg. *AULU, `ALA`A*
[= Planchonella sandwicensis (Gray) Pierre sensu C54,K43,KV41,M114,SS144-145]
East Kaupō Gap, at 4600-5100 ft; Kīpahulu Valley, Cable Ridge, 2100 ft.
The Kīpahulu Valley record was based on a 1919 collection C.N. Forbes 1669M from the "left side" of the valley, but no modern locations were known until March 1995, when the first of four trees were discovered near Fern Camp at 2800 feet by Patti Welton and Bill Haus; approximately 10-15 trees occur in east Kaupō Gap on a single ridge at 4600-5100 ft. Seedlings are commonly seen at the Kaupō Gap site, but rodent predation on seeds may be an important factor limiting the long-term viability of this species within the Park. At least one other tree is known from Cable Ridge, at approximately 2100 feet elevation on the southern rim of Kīpahulu Valley. Ethnobotanically, the wood was used in making weapons and agricultural tools and the sap was used as bird trapping glue.
[Endemic: main Hawaiian Islands]
C54,K43,KV41,M114,SS144-145

SAXIFRAGACEAE, Saxifrage Family (see HYDRANGEACEAE)

SCROPHULARIACEAE, Figwort Family

#**Bacopa monnieri** (L.) Wettst. WATER HYSSOP
Lower Kīpahulu Valley, coastal strand and low elevation wetlands.
Perennial, mat-forming herb with white to lilac, pale blue flowers. Degener (1962) states "its wide distribution may be due not only to its minute seeds but to its brittle, leafy stems which readily float in both fresh and salt water without dying. Washed on land, such stems strike root."
[Indigenous: widespread in tropical and subtropical areas]
LK42,KV41

*__Castilleja arvensis__ Cham. and Schlecht. FIELD INDIAN PAINTBRUSH
Kīpahulu Valley, 2400-3100 ft.
Uncommon herb of disturbed wet sites on upper and lower shelves of the Valley, usually few or solitary at a site.
[Alien: native from Mexico to Brazil and Peru]
KV41,KW16

*__Parentucellia viscosa__ (L.) Caruel
Kalapawili.
Single small population discovered in 1988 in southeast corner of grassland, east of Pōhaku-pā laha on the Kīpahulu side of ridgeline fence, 8050 ft. In 1989, all plants (305 individuals) in this small population were removed and site marked with pvc stakes to allow for monitoring of future germinants; annually, between 10 to 30 plants have been removed (P. Welton and W. Haus, pers. comm.). New island record.
[Alien: native to Mediterranean region]
Representative specimen: L. Stemmermann & L. Luce 7205, B.H. Gagne 1020 (BISH)

*__Verbascum thapsus__ L. COMMON MULLEIN
West slope, 6900 and 9150 ft, destroyed.
Two individuals of this aggressive weed have been discovered along the Park roadway in recent years (B.H. Gagne, pers. comm.). The first in 1986 at 9150 ft below Kalahaku lookout and the second in 1988 at 6900 ft below headquarters. Both plants were destroyed. The seed for this weed may have been inadvertently brought by humans from Hawai`i island, where this species is rapidly increasing in sparsely vegetated sites at 4000-13,000 ft (Juvik and Juvik, in press). Early detection and control of this extremely aggressive species should be a high priority in the Park.
[Alien: native to Eurasia]

*__Veronica arvensis__ L. CORN SPEEDWELL
Crater, Kapalaoa cliffs; west Kaupō Gap; West slope, 5000-8400 ft.
[Alien: native to Eurasia]
Representative specimen: A.C. Medeiros 695 (BISH)

SOLANACEAE, Nightshade Family

*__Capsicum annuum__ L. CHILI PEPPER, *NIOI*
Lower Kīpahulu Valley, planted.
[Alien: native from southern United States to Peru]
KV41,LK43

*__Datura stramonium__ L. JIMSON-WEED, *KIKANIA*
West slope.
White (or tinged lavender)-flowered herb of disturbed sites, 6800-7000 ft. Not seen since 1983.
[Alien: native to North America]

#__Lycium sandwicense__ Gray *`OHELO-KAI, `AE`AE*
Lower Kīpahulu Valley, coastal strand zone, sea level to 30 ft elevation.
Low, glabrous shrub with succulent leaves, small pink to white flowers and edible red, subglobose fruits 6-10 mm in diameter.
[Indigenous: Rapa, Juan Fernandez and Hawaiian Islands]
KV41,LK43,SS146

*Lycopersicon pimpinellifolium (Jusl.) Mill. CURRANT TOMATO
Lower Kīpahulu Valley; West slope.
Uncommon weed of disturbed areas in lower Kīpahulu, 150 ft. First observed in 1981 on west slope as rare roadside weed at 7000 ft, but not seen since.
[Alien: native to Peru and Ecuador]

*Nicandra physalodes (L.) Gaertn. APPLE OF PERU
West slope.
One plant observed at 7000 ft in disturbed area behind headquarters during period of construction in 1980-1981 (pers. comm. R.J. Nagata).
[Alien: native to Peru]

*Nicotiana glauca Grah. TREE TOBACCO, *MAKAHALA*
West slope.
Rare weed of roadsides and disturbed sites, 6800-7500 ft. First observed in the Park in 1981, and not since. Abundant and invasive outside the Park in leeward dryland forests on lava at 700-2500 ft. Potentially invasive in western Kaupō Gap in the Park. On the leeward slopes of Haleakalā, in the Kanaio and Auwahi districts of the south slope, identified as an important alternate host plant for the larvae of the soon to be Federally listed Blackburn hawk moth (Manduca blackburni).
[Alien: native to Argentina]

Nothocestrum latifolium Gray *`AIEA*
[= Nothocestrum cf. brevifolium Gray sensu M115]
East Kaupō Gap
Formerly known from the Park from two individuals discovered in the late 1970s in a dryland forest exclosure on a ridge at 4850 ft elevation. By 1989, one of these trees had died. In 1989, the single, remaining tree (4 meter height) of this species in the Park was senescent, having fewer than 10 living leaves. When checked in mid-1993, the last remaining *`aiea* tree had died, apparently extirpating this species from the Park. This species is one of few host plants of the Endangered Hawaiian hawkmoth, Manduca blackburni.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i and Maui]
M115,SS146-147

Nothocestrum longifolium Gray *`AIEA*
[= Nothocestrum sp. sensu K43,KV41]
Kīpahulu Valley
Uncommon in *koa* forest of upper and lower levels of the Valley at 2200 ft to at least 4000 ft. Flowering observed in April, May, and October; fruiting observed in May and October..
[Endemic: main Hawaiian Islands]
K43,KV41,SS147

*Physalis peruviana L. *POHA*, CAPE GOOSEBERRY
Crater, near Hōlua, 7000 ft; east and west Kaupō Gap, 4000-5800 ft.

First recorded in the Park in east Kaupō Gap at 5800 ft by Mitchell (1945). In Kīpahulu, flowering and fruiting observed in October.
[Alien: native to Peru]
C54,M115

#?**Solanum americanum** Mill. *POPOLO*, BLACK NIGHTSHADE
[= Solanum nigrum L. sensu C54,K44,KV41,KW15,LK43]
Crater; East and west Kaupō Gap; Kīpahulu Valley, 10-3100 ft; Manawainui. 500-7500 ft.
[Questionably indigenous: This species is widely distributed in tropical and warm temperate sites. It is believed native because seeds of this species were found in archaeological sites at the Mauna Kea adze quarry that were abandoned prior to Cook`s arrival (Allen 1981).]
C54,K44,KV41,KW15,LK43, Mitchell (1945)

Solanum incompletum Dunal *POPOLO KŪ MAI*
[= Solanum forbesii St. John 1988]
[= Solanum incompletum Dunal var. mauiense Hillebr. sensu K44,KV41]
Kīpahulu Valley Specimens collected from Kīpahulu represent a thorny-stemmed shrub with irregularly lobed leaves (to approx. 15 cm long), fruits round (1.0-1.5 cm wide). Leaf undersurfaces, young stems, and outer parts of white-petaled flowers are covered with scurfy pubescence. This species was collected in Kīpahulu Valley in November (1919) in flower and fruit. It was also collected in the 1870s on the southwest and northwest slopes of Haleakalā (Hillebrand and Lydgate s.n. BISH).
The only collections of this species in the Park were made in 1919 in Kīpahulu Valley. One collection was from a "ridge on the right side of Kīpahulu", perhaps between Kaumakani and Kīpahulu Valley (Forbes 1664M BISH) and a second collection from within Kīpahulu Valley (Forbes 1697M BISH). Reported by Higashino et al. 1988 as occurring in Kīpahulu Valley from 2000 to 4000 ft, but this listing is based on Lamoureux`s (1968) reference to this species (P.K. Higashino, pers. comm.) which, in turn, is based on the 1919 Forbes collections.
[Endemic: Kaua`i, Moloka`i, Lāna`i, Maui, and Hawai`i]
K44,KV41

*__Solanum linnaeanum__ Hepper and Jaeger APPLE OF SODOM, *POPOLO-KĪKANIA*
[= Solanum sodomeum L. sensu C55,KV41,LK43]
West and central Kaupō Gap; lower Kīpahulu Valley 200-5300 ft.
Common thorny shrub of drier areas with conspicuous yellow, globose fruits.
[Alien: native to Africa]
C55,KV41,LK43

*__Solanum tuberosum__ L. POTATO, *`UALA-KAHIKI*
Crater, planted and persistent, e.g. trail to Waikau, near Palikū visitor cabin; West slope, cultivated at residences near headquarters at 7000 ft.
This species was first recorded in the Park in Kaupō Gap by C.N. Forbes in 1919, who noted that according to his guide, potatoes were planted in the Park.
[Alien: native to the Andes of Peru, Colombia, Chile]

STERCULIACEAE, Cacao Family

#?**Waltheria indica** L. *`UHALOA, `ALA`ALAPŪLOA*
West Kaupō Gap, 4000-5000 ft.
Although questionably indigenous, Neal (1965) reports that "the bitter root is used medicinally by Hawaiians" as both an aspirin and for sore throats.
[Questionably indigenous. Pantropical]
SS148

THEACEAE, Tea Family

*__Camellia japonica__ L. CAMELLIA
West slope, Park housing area, 7000 ft.
Planted and not reproducing in the Park.
[Alien: native to China and Japan]

THYMELAEACEAE, Mezereum Family

Wikstroemia monticola Skottsb. *`AKIA*
West, central and east Kaupō Gap. 3900-4400 ft.
Common, small-leaved shrub of xeric to mesic leeward sites; reaches its upper elevation limits just above the Park boundary in Kaupō Gap.
[Endemic: East Maui]
SS149

Wikstroemia oahuensis (Gray) Rock *`AKIA*
var. **oahuensis**
[= Wikstroemia elongata Gray sensu M115]
[= Wikstroemia haleakalensis Skottsb. sensu HR47,M115]
[= Wikstroemia vaccinifolia Skottsb. sensu M115]
Kaumakani; Kīpahulu Valley; Manawainui; NE rift.
Variable, uncommon, large-leaved shrub of East Maui rain forest. 2200-5500 ft. Reportedly used as a fish poison, Carlquist (1980) states " (*`akia*) was found to be definitely poisonous. This *`akia* is probably Wikstroemia oahuensis." Ethnobotanically, the bark of Hawaiian species was used in making fibers. Flowering and fruiting observed from February to November.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, and Maui]
HR47,M115

Wikstroemia uva-ursi Gray *`AKIA*
Manawainui
Prostrate or sprawling shrub with thick and firm leaves.
[Endemic: Kaua`i, O`ahu, Moloka`i, Maui]
M115

TILIACEAE, Linden Family

*__Heliocarpus popayanensis__ HBK. WHITE MOHO
Lower Kīpahulu Valley
Large tree with cordate leaves and bristly, plumose fruiting capsules.
[Alien: native from southern Mexico to northern Argentina]
KV42,LK43

*__Triumfetta semitriloba__ Jacq. BURBUSH
Lower west Kaupō Gap; Lower Kīpahulu Valley 300-4200 ft.
First plant seen in lower western Kaupō Gap in 1990 (pers. comm., B.H. Gagne).
[Alien: native to Baja California, Mexico to South America, and the West Indies]
KV42,LK43

ULMACEAE, Elm Family

*__Trema orientalis__ (L.) Blume GUNPOWDER TREE
[= Trema sp. sensu KV42]
Lower Kīpahulu Valley
Medium-sized tree with unequal-sided leaves with finely toothed edges and clusters of small (3-5 mm diameter) black fruits in the leaf axils.
[Alien: native to tropical Africa, Madagascar, southeastern Asia, Japan, Malesia, Australia (Queensland), Melanesia, Micronesia and Polynesia]
KV42

UMBELLIFERAE, Carrot Family (see APIACEAE)

URTICACEAE, Nettle Family

__Boehmeria grandis__ (Hook & Arnott) A. Heller *`AKOLEA*
Lower Kīpahulu Valley to 3000 ft.
Shiny, opposite-leaved shrub of streamsides, watercourses and wet forest. Flowering observed from July to September; fruiting observed from September to February.
[Endemic: main Hawaiian Islands]
Representative specimen:

*__Pilea microphylla__ (L.) Liebm. ROCKWEED, ARTILLERY PLANT
Lower Kīpahulu Valley
Low herb localized in the Park on rocks along lower `Ohe`o Gulch near road. First collected in the Park in 1990.
[Alien: native to southern Florida, West Indies, Mexico, Central and South America]
Representative specimen: A.C. Medeiros and P.D. Bednorz 854 (BISH)

#**Pilea peploides** (Gaud.) Hook. and Arn.
Crater, near Hōlua spring, ca. 7040 ft; Kaumakani, 3600 ft; west Kaupō Gap, Waikane, 6000 ft; Kīpahulu Valley, 640-4700 ft; Manawainui; NE rift.
Inconspicuous, but common, low herb of open stream courses, wet rock walls and waterfalls at 640-7040 ft. Fruiting observed in November.
[Indigenous: northern South America, Galapagos and Hawaiian Islands]
C55,HR42,K36,KV42,LK44,M115,SS150

Pipturus albidus (Hook. and Arn.) Gray *MAMAKI*
[= Pipturus hawaiensis Levl. var. eriocarpus (Skottsb.)Skottsb. sensu M115,SS150-151]
[= Pipturus rockii Skottsb. sensu HR42,K36,KV42]
Kaupō Gap; Kīpahulu Valley 800-5690 ft.; Manawainui
Broad-leaved shrub, often found along water courses and in wet ravines of middle to high elevation rain forest, and more rarely, in mesic forests and shrublands, with caducous or weakly persisting stipules. Ethnobotanically, this species was a source of bark cloth (*kapa*), though coarser hence inferior to that produced by *wauke* (Broussonetia papyrifera). Flowering and fruiting observed year-round.
[Endemic: main Hawaiian Islands]
HR42,K36,KV42,LK44,M115,SS150-151

Pipturus forbesii Krajina *MAMAKI*
Northwest Ko`olau Gap, 6000 ft (Mitchell 1945).
Thickly-foliaged, smaller-leaved shrub of wet forest and subalpine shrubland, with many short, leafy, lateral branches along the stem and persistent stipules, 5000-6100 ft. Flowering observed from October to April; fruiting observed from October to April.
[Endemic: East Maui]
Representative specimen: Degener, Ordonez, and Salucop 12,586 (BISH)

Touchardia latifolia Gaud. *OLONA*
Kīpahulu Valley, 800-3400 ft.
Large-leaved shrub with dense, globose clusters of flowers; of wet, protected ravines and water courses in low to middle elevation rain forest. It is the only species of a genus restricted to the Hawaiian Islands. Ethnobotanically, the bark of this species provided one of the strongest natural fibers in the world and a source of very strong, excellent quality cordage.
[Endemic: main Hawaiian Islands]
K36,KV42,LK44

Urera glabra (Hook. and Arn.) Weddell *OPUHE*
[= Urera sandvicensis Wedd. sensu HR42,K36,KV42]
Kīpahulu Valley; Manawainui. 2650-5000 ft.
Large-leaved shrub to small tree with more open, paniculate inflorescences, of wet, protected ravines and water courses in low to middle elevation rain forest. Fiber was made from this species by the Hawaiians, but not to the extent as with Touchardia.
[Endemic: main Hawaiian Islands]
HR42,K36,KV42,M116,SS151

VERBENACEAE, Verbena Family

*Lantana camara L. LANTANA, *LAKANA*
Kaupō Gap, 3900-4330 ft; Kīpahulu Valley, 20-2200 ft.
Recognized as one of the worst invaders of the tropics, numerous biocontrol insects have been released to reduce its damage, but with limited success.
[Alien: probably native to West Indies, widely naturalized in world tropics and subtropics]
C56,KV42,LK44,M116

*Stachytarpheta dichotoma (Ruiz and Pav.) Vahl *OI, OWI*
[= Stachytarpheta jamaicensis (L.) Vahl sensu C56,M116]
Kaupō Gap; Manawainui.
Sometimes woody herb distinguished from the Park's other species by its leaves which are hairy over the entire lower surface.
[Alien: native range is from Cuba and Mexico south to Peru and Argentina]

*Stachytarpheta jamaicensis (L.) Vahl JAMAICA VERVAIN, *OI, OWI*
Lower Kīpahulu Valley, 2000-2400 ft.
Sometimes woody herb with fleshy, unwrinkled, mostly glabrous leaves and stout, thick inflorescences.
[Alien: native to tropical and subtropical America]
KV42,KW15.

*Stachytarpheta urticifolia (Salisb.) Sims NETTLE-LEAVED VERVAIN, *OI, OWI*
Lower Kīpahulu Valley, 20-540 ft.
Sometimes woody herb with membranous, wrinkled, mostly glabrous leaves and slender, erect or flexuous inflorescences.
[Alien: probably native to tropical Asia]
KV42,LK44

*Verbena litoralis HBK. *HA`U OWI, OI, OWI*
Crater; Kaupō Gap; Kīpahulu Valley; Manawainui; West slope, roadside.
Sporadic non-native herb of rocky sites and disturbed areas. This species was first recorded in the Park by C.N. Forbes in 1919.
[Alien: native to Mexico, Central and South America]
C56,M116

VIOLACEAE, Violet Family

Viola chamissoniana Ging. *PAMAKANI*
subsp. tracheliifolia (Ging.) W.L. Wagner, Herbst and Sohmer
[= Viola tracheliifolia Gingins sensu C56,SS151-152]
East and west Kaupō Gap.
This rare, small shrub occurs in relictual dryland forest at 4500-5200 ft within Kaupō Gap. This species was first recorded in the Park in Kaupō Gap by C.N. Forbes in 1919 who noted it in Styphelia/Dodonaea shrubland in the central Kaupō Gap, where it no longer occurs.

In west Kaupō, one population of 14 plants of this species (field checked in 1987) is known on vertical rock walls near Waikane at 5000-5200 ft (O. Degener 17,466). Two populations are known in east Kaupō Myrsine-dominated forest. The upper population occurs just east of the trail at 4960 ft. When first seen in 1975, this population contained approximately 12 plants; when last seen in 1984, only four plants were seen (B.H. Gagne, pers. comm.). The lower population occurs among Styphelia and Dodonaea shrubs on a ridge west of the pali and east of the trail at 4600 ft within the old dryland forest exclosure. When first seen in 1979, this population contained 8-12 plants; when last seen in 1981, only six plants were seen, including some which were dead in place (R.J. Nagata, pers. comm.). Other populations may occur in the dense shrubland of east Kaupō dryland forest.

[Endemic: Kaua`i, O`ahu, Moloka`i,and Maui]

Representative specimen: Lani Stemmermann 1007, BISH

C56,SS151-152

Viola maviensis Mann MAUI VIOLET

NE rift.

As late as 1919, this species was also found on the northwest slopes (C.N. Forbes 822M, 862M) and in east Ko`olau Gap (C.N. Forbes 1026M). These populations have not been observed since, and were probably extirpated by ungulates. On East Maui, this species is currently restricted to open montane bogs and surrounding forest along the northeast rift at 4750-6200 ft. Flowering has been observed in May-June.

[Endemic: Moloka`i,West Maui, East Maui,and Hawai`i]

HR56

VISCACEAE (LORANTHACEAE), Mistletoe Family

#**Korthalsella complanata** (v. Tiegh.) Engler *HULUMOA, KAUMAHANA*

Crater, near Hōlua, Kapalaoa and `O`ili-pu`u; east Kaupō Gap; Kīpahulu Valley; Manawainui, 5000-5400 ft. 2650-6900 ft.

Parasitic mistletoe epiphyte (with flattened terminal branches) of a variety of tree species in rain forests, mesic forests, and subalpine shrublands; this is the most common species of the genus in the Park and the Islands.

[Indigenous: Henderson Island and Hawaiian Islands]

K36,KV34,LK36,M108,SS106

Korthalsella cylindrica (v. Tiegh.) Engler *HULUMOA, KAUMAHANA*

Kīpahulu Valley; Manawainui.

Parasitic mistletoe epiphyte (with round terminal branches) of Metrosideros, Diospyros, Chaemaesyce, and Sapindus (Wagner et al., 1990).

[Endemic: O`ahu, Moloka`i, Lāna`i, Maui, and Hawai`i]

HR43,KV34

Korthalsella latissima (v. Tiegh.) Danser *HULUMOA, KAUMAHANA*

Manawainui; NE rift.

Parasitic mistletoe epiphyte (with flattened terminal branches) of a variety of tree species.
Though this species is not listed as occurring on East Maui (Wagner et al., 1990), plants from these locales appear to belong to this species.
[Endemic: Kaua`i, O`ahu, Hawai`i -?East Maui]
M108

#**Korthalsella platycaula** (v. Tiegh.) Engler *HULUMOA, KAUMAHANA*
Kīpahulu Valley, 3780-4260 ft; Manawainui.
Parasitic mistletoe epiphyte (with flattened terminal branches and longer internodes) of a variety of tree species.
[Indigenous: Tahiti and Marquesas, Hawaiian and other Pacific islands]
M109

VITACEAE, Grape Family

*Vitis sp. GRAPE, GRAPEVINE
West slope
Single plant growing at roadside collected in 1988, presumably sprouted from discarded grape seed.
[Alien]
Representative specimen: B.H. Gagne s.n.

SPECIES ACCOUNTS: FOR QUESTIONABLE AND UNIDENTIFIED PLANT SPECIES OF THE PARK

GYMNOSPERMS

ARAUCARIACEAE, Araucaria Family

*Araucaria bidwilii Hook. MONKEY PUZZLE TREE
West slope.
Listed by Stemmermann et al. (1981) as present behind Research Center. However, the two usually sterile trees that resemble this species in this area have been identified as Cunninghamia lanceolata (Lamb.) Hook. The two species are very similar when sterile.
[Alien: native to coastal Queensland, southeast Australia]
C13

PINACEAE, Pine Family

*Picea glauca (Moench) Voss WHITE SPRUCE
[= *Picea canadensis (Mill) BSP sensu Mitchell (1945)]
West slope, Hosmer Grove.
Listed in planting records as two trees planted as Hosmer Grove in 1909-1911. Not listed by Kraebel (1921) as being present there, but listed by Mitchell (1945) for Hosmer Grove. Not currently known from Hosmer Grove.
Mitchell (1945)
[Alien: native to Canada and northern U.S.]

Pinus banksiana Lamb. JACK, GRAY, or SCRUB PINE
West slope, planted at Hosmer Grove (6800 ft)
Known from a specimen at the B.P. Bishop Museum herbarium collected by Robert Carpenter in 1961 and sent to Otto Degener (listed under his number series). Identification by D.J. de Laubenfels in 1990. Not currently known from Hosmer Grove (though easily confused with P. contorta).
[Alien: native to eastern North America]
Representative specimen: Degener 27743 (BISH)

*Pinus monticola Dougl. WESTERN WHITE PINE
West slope, Hosmer Grove.
Listed by Stemmermann et al. (1981) as confined to Hosmer Grove. However, identification of five-needle pines at Hosmer Grove as well as planting records (Kraebel 1921 and Mitchell 1945) suggest that the species planted and currently growing at Hosmer Grove is Pinus strobus L., similar in appearance to P. monticola.
[Alien: native to western North America]
C14

*Pinus mugo Turra MOUNTAIN or SWISS MOUNTAIN PINE
West slope, planted at Hosmer Grove (6800 ft).
Known from a specimen at the B.P. Bishop Museum herbarium collected by Robert Carpenter in 1961 and sent to Otto Degener (listed under his number series). Short-needled (two in a fascicle) pine, superficially similar to Pinus contorta. Identification by D.J. de Laubenfels in 1990. The specimen identified as P. mugo is nearly identical to that identified as P. banksiana at the B.P. Bishop Museum herbarium.
[Alien: native to Europe]
Representative specimen: Degener 27367 (BISH)

*Pinus palustris Mill. LONGLEAF PINE
West slope, Hosmer Grove.
Listed by Kraebel (1921) as present at Hosmer Grove. Not currently known from Hosmer Grove.
[Alien: native from Virginia to Florida and Texas]

*Pinus tabulaeformis CHINESE PINE
West slope, planted at Hosmer Grove (6800 ft)
Known from a specimen at the B.P. Bishop Museum herbarium collected by Robert Carpenter in 1960 and sent to Otto Degener (listed under his number series). Short needled (two in a fascicle) pine, superficially similar to Pinus contorta. Identification by D.J. de Laubenfels in 1990. The specimen identified as P. tabulaeformis is nearly identical to that identified as P. contorta at the B.P. Bishop Museum herbarium.
[Alien: native to China]
Representative specimen: Degener 26889 (BISH)

TAXODIACEAE, Taxodium Family

*Sequoia sempervirens (D. Don) Endl. COASTAL REDWOOD
Crater, Palikū.
Listed by Mitchell (1945) as occurring at Palikū and vicinity, 6400 ft. As this species does not currently grow anywhere in the Park, it has either died out at Palikū, or its listing was the result of a misidentification of Cryptomeria japonica, of which large trees currently occur at Palikū.
Mitchell (1945)
[Alien: native from southern Oregon to northern and central California]

MONOCOTYLEDONS

CYPERACEAE, Sedge Family

*Carex sp.
[?????= Carex ovalis]
Lower Kīpahulu Valley; Manawainui.
LK21,M98

*Rhynchospora sp.
[=? Rhynchospora caduca Elliott]
Lower Kīpahulu Valley
LK22

JUNCACEAE, Rush Family

*Juncus effusus or polyanthemos???
West Camp, disturbed camp area, 6300 ft el
needs specimen,
ca. 4 clumps (S. Anderson, pers. comm.)
attempted manual control since 1992
[Aliens: native to Japan and Australia respectively]

POACEAE (GRAMINEAE), Grass Family

*Digitaria sp.
Kīpahulu Valley; Manawainui
[Alien]
KW10 and supplement, M98

*Eragrostis sp.
Crater near Hōlua
First collected in Wainene by Patti Welton in 1997 and at Hōlua flats in 1998. Specimens have been sent to the Bishop Museum for identification
[Alien?]

*Festuca sp.
Kīpahulu Valley, 2000-2600 ft
Yoshinaga (1980) stated, "Common along stream banks on Lower Floor up to at least 730 m (2400 ft). Apparently restricted to riparian habitats. Possibly native..." In the supplement, Yoshinaga (1981) stated, "Tussock grass, common on open streambanks but rare elsewhere."
KW10 and supplement (A.Y. Yoshinaga 322, 332, 340)

*Paspalum sp.
Lower Kīpahulu Valley
[Alien]
LK24

*Setaria palmifolia (Konig.) Stapf PALMGRASS
[= Setaria palmaefolia (Koen.) Stapf]
Kīpahulu Valley

This species was recorded by Fagerlund (1945) as occurring in *`ōhi`a* forest of Kīpahulu Valley. Yoshinaga (1980) doubted this, adding that in years of field work, he had never seen this non-native species. Higashino et al. (1988) included S. palmifolia based on Fagerlund (1945) and the Pua`alu`u Stream survey (Kinsey and Ford 1977), and not based on new collections (P.K. Higashino, pers. comm.). Its presence within the Park has not been confirmed, although it is present and spreading in the lower Waikamoi area of northwest Haleakalā volcano, outside the Park.
[Alien: native to tropical Asia]
KV21,KW11, Fagerlund (1945)

***Sporobolus** sp.
Kīpahulu Valley
[Alien]
KV21

***Trisetum flavescens** (L.) Beauv. YELLOW OATGRASS
Ko`olau Gap
This species was tentatively identified from outside the Park at Waikau. No specimen was cited and a conclusive identification is lacking.
C22

ZINGIBERACEAE, Ginger Family

*Unidentified ginger
[Alien]
KV23,KW13 (A.Y. Yoshinaga 346)

DICOTYLEDONS

ASTERACEAE (COMPOSITAE), Sunflower Family

***Centaurea maculosa** Lam.
?Lower west Kaupō Gap.
This species is not confirmed for the Park. A photograph taken by Ron Nagata may be C. melitensis but differs in corolla color. As stated in Wagner et al. (1990), C. maculosa differs from C. melitensis in its pinkish-purple (vs. yellow) corolla.
[Alien: native to Europe]

***Chrysanthemum parthenium** (L.) Bernh. FEVERFEW
?West slope, summit area.
Nagata (1988) reports this species as escaped in the Science City area near the summit of Haleakalā, ca. 10,000 ft, southwest of the Park. Thus far it has not been collected within the Park.
[Alien: native to southeastern Europe and Caucasus]

Dubautia laxa Hook. and Arn. *NA`ENA`E*
subsp. **laxa**
Manawainui.
This species is quite common on the older Hawaiian islands in good wet forest but has not been seen on Haleakalā by the authors.
[Endemic: Kaua`i, O`ahu, Moloka`i, Lāna`i, and Maui]
M103
Representative specimen: P.K. Higashino & G. Mizuno 2073

Dubautia linearis (Gaud.) Keck *NA`ENA`E*
West Kaupō Gap
Though hybrids of this species and D. menziesii have been recorded in the Waikane area of west Kaupō Gap (see D. linearis X D. menziesii), D. linearis in the strict sense has never been collected there. As most Dubautia are relatively short-lived (< 20 years) and the pollinators are relatively short-flighted, it is likely that D. linearis either still occurs within the Park, or did so until recently.
[Endemic: Moloka`i, Lana`i, Maui and Hawai`i]

***Galinsoga quadriradiata** Ruiz. and Pav. GALINSOGA
[= Galinsoga ciliata (Raf.) Blake]
Stemmermann et al. (1981) list G. ciliata as occurring in the Park in west Kaupō Gap. This species has not been recorded in the Park in recent years. However, the more common species G. parviflora is found in both west Kaupō Gap and lower Kīpahulu Valley.
[Alien: native to Central and South America]
C30

***Senecio vulgaris** L. COMMON GROUNDSEL
Kīpahulu Valley, 6300 ft along Koukouai.
Yoshinaga (1980) stated, "Probably confined to high elevation openings." The similar appearance of this species and Senecio sylvaticus, as well as the similar habitat cited by Yoshinaga (1980), lead to the possibility of this record as a misidentification of S. sylvaticus.
[Alien: native to Eurasia]
KV28,KW17

CAMPANULACEAE (LOBELIACEAE), Lobelia Family

Clermontia lindseyana Rock *`OHĀ-WAI, HAHĀ*
Kaupō Gap.
Evidence for the occurrence of this species in the Park is a collection made in 1919 (J.F. Rock 8688) from Kaupō. It is quite probable, but not positive, that this collection was made within Park boundaries. Currently, C. lindseyana is rare in mesic forests on Hawai`i island and leeward East Maui. It is superficially similar to C. kakeana, the common lowland species of Maui, and specimens of C. lindseyana were misidentified and referred to as C. kakeana by Medeiros et al. 1986. This species listed as Endangered by USFWS.
[Endemic: East Maui and Hawai`i]. SS102-103.

Clermontia oblongifolia *`OHA-WAI, HAHA*
subsp. **mauiensis** (Rock) Lammers
Though present in similar habitat elsewhere on Maui, this species is not currently recorded from the Park. This species listed as Endangered by USFWS.
[Endemic: O`ahu, Moloka`i, Lāna`i, and Maui]

Clermontia peleana Rock *`OHA-WAI, HAHA*
[= Clermontia clermontioides (Gaud.) Heller var. barbata (Rock) St. John]
This species, found primarily from Hawai`i island, is known on East Maui from two specimens: the type (Lydgate 56) and Forbes 2531M, collected in 1920 from Halehaku (Ko`olau Gap) with note, "ridge rt. side of valley." Though present in rain forest habitat elsewhere on Maui, this species has not been recorded from the Park.
[Endemic: East Maui and Hawai`i]

Clermontia spp. *`OHA-WAI, HAHA*
Kīpahulu Valley; Manawainui.
[Endemic]
KV33,LK35,M104

Cyanea solanacea Hillebr. *POPOLO*
[= Cyanea scabra var. variabilis forma sinuata (Rock) E. Wimm. sensu K47]
Based on a recent review of the genus (Lammers in Wagner et al. 1990), this species is present in rain forest habitat on Moloka`i. However, according to this review, sterile specimens from Pu`u-kukui, West Maui, may also be referable to this species. R.W. Hobdy (who has collected this Pu`u-kukui material) believes C. solanacea may also occur on East Maui. This species has not been recorded from the Park.
[Endemic: Moloka`i,?West Maui and ?East Maui]
K47

Cyanea spp.
Kīpahulu Valley; Manawainui.
[Endemic]
K47,KV33,M104

CARYOPHYLLACEAE, Pink Family

Schiedea pubescens Hillebr.
var. **pubescens**
Kīpahulu Valley, along Koukouai Stream at 3700 ft; Manawainui, 4550 ft.
Apparently rare, vine-like undershrub of wet forests. Reported as present within the Park but not seen by the authors.
[Endemic: O`ahu, Moloka`i, Lāna`i, West Maui and East Maui]
USFWS

CHENOPODIACEAE, Goosefoot Family

*Chenopodium hircinum Schrad. Crater.
Known in the Hawaiian Islands from two collections: one from Hawai`i island and the other from Haleakalā Crater made in 1909 (Faurie 1059 BISH) (Wagner et al. 1990). There is a possibility that this collection is a misidentification of the polymorphic native species C. oahuense (A.C. Medeiros, pers. obs). Chenopodium hircinum has not been collected since in the Park.
[Alien: native to South America]

?Chenopodium hybridum L.
sensu Mitchell 1945, C27

CONVOLVULACEAE, Morning-Glory Family

Ipomoea spp.
Kaupō Gap; Kīpahulu Valley
C35,KV28,KW15 (A.Y. Yoshinaga 285),LK31

CRASSULACEAE, Orpine Family

*Echeveria secunda Booth ex Lindl. HENS-AND-CHICKENS
West slope, 7000 ft.
Planted and not reproducing in yards of two residences in the Park. All plants apparently destroyed by 1990 (M. Ing, pers. comm. 1991).
[Alien: native to Mexico]

*Kalanchoe sp.
Lower Kīpahulu Valley
[Alien]
KV28,LK32

CUCURBITACEAE, Gourd Or Squash Family

Sicyos spp.
[= Sicyocarya sp. ined. 1 St. John
USFWS-Kīpahulu Valley, central Kīpahulu ridge, 3580 ft]
[= Sicyocarya sp. ined. 2 St. John
Kīpahulu Valley, central Kīpahulu ridge, 3580 ft]
Also Crater; Kīpahulu Valley
[Endemic]
C37,K45 (C.N. Forbes 1709M),KV28, USFWS

FABACEAE (LEGUMINOSAE), Pea Family

Erythrina sandwicensis Deg. *WILIWILI*
Lower Kīpahulu Valley
Single known tree planted in small fenced exclosure above road near trail to Waimoku Falls. Though it is possible that this species formerly occurred in the Park, it is unlikely as it is more typical of dry, arid sites.
[Endemic: Hawaiian Islands]

***Indigofera** sp.
[=? Indigofera spicata Forssk.]
Lower Kīpahulu Valley
[Alien]
KV30,LK35

***Melilotus indica** (L.) All.
Status within Park unknown. West slope.
[Alien: native to Europe and Mediterranean region]
HR45

***Trifolium procumbens** L.
?West slope.
There is some history of confusion of Hawaiian specimens between the two similar species, T. procumbens and T. dubium Sibth. Such a misidentification may be the source of the name first used in Mitchell (1945), who cited its distribution as "Ranger Station."
[Alien: native to Europe]
C43, Mitchell (1945)

***Trifolium** sp. indet.
West slope.
This species is localized and uncommon in lawns in the research area at 6800 ft. It does not fit the descriptions for any other species currently listed in the state (Wagner et al. 1990). The species is similar to T. repens but differs in its leaves being pubescent above (vs. glabrous) and in the white flowers being solitary to few (vs. in globose clusters).
Representative specimens: A.C. Medeiros 796 (BISH)

GERANIACEAE, Geranium Family

***Geranium retrorsum** L'Her. ex DC.
[=? Geranium carolinianum L. sensu C39,K39]
This species resembles G. homeanum Turcz. in appearance, and both species have generally been referred to by Hawaiian botanists as G. carolinianum. It is not known if G. retrorsum, which usually occupies drier, lower elevation sites than G. homeanum, also occurs in the Park. It previously has been collected on East Maui at lower elevations outside the Park.
[Alien: native to Australia and New Zealand; naturalized on Lāna'i, Maui, and Hawai'i]

GESNERIACEAE, Gloxinia Family

Cyrtandra cf. **filipes** Hillebr.
?Manawainui
This species recorded from the Manawainui area by Higashino and Mizuno (1976). However, this species has not otherwise been collected from East Maui. Cited specimens have not been relocated and their identifications remain unconfirmed.
[Endemic: Moloka`i and West Maui]
M107 [Higashino & Mizuno 2951, 2991, 2993]

Cyrtandra cf. **grayana** Hillebr.
?Manawainui
This species recorded from the Manawainui area by Higashino and Mizuno (1976). However, this species has not otherwise been collected from East Maui. Cited specimens have not been relocated and their identifications remain unconfirmed.
[Endemic: Moloka`i, Lāna`i, and West Maui]
M107 [Higashino & Mizuno 1817]

Cyrtandra unpubl. sp.
[= Cyrtandra sp. St. John ined.]
Kīpahulu Valley, 4570 ft.
[Endemic]
USFWS 1980 collection

Cyrtandra spp.
[Endemic]
K44,KV31,LK33,M107[Higashino & Mizuno 2079, 2851, 2887, 2899, 3017.]

LAMIACEAE (LABIATAE), Mint Family

Phyllostegia mollis Benth.
Not recorded thus far in the Park but rare in comparable habitat outside the Park.
[Endemic: Oahu, Moloka`i, East Maui]

Phyllostegia unpubl. sp.
[= Phyllostegia elliptica St. John ined.]
NE rift, 6140 ft.
[Endemic]
USFWS

Stenogyne sessilis Benth.
[= var. hexanthoides Deg. and Sherff sensu C41]
Status within Park unknown.
[Endemic: Maui, Hawai`i, and extinct on Lāna`i]
C41, Mitchell (1945)

Stenogyne viridis Hillebr.
Manawainui
Known from a single collection made by Hillebrand in the 1870s in "forests of Kaanapali, W. Maui" (Weller and Sakai in Wagner et al. 1990). However, this species is listed as present in the Manawainui section of the Park (Higashino and Mizuno 1976) represented by the collection P.K. Higashino and G. Mizuno 3009. This record is possibly the result of a misidentification of that specimen which has not been located. Higashino and Mizuno (1976) stated that the flowers of their specimen are white, while Hillebrand (1888) noted that flowers of S. viridis are "pale purple (or greenish)." Stenogyne viridis resembles the East Maui endemic Stenogyne rotundifolia for which it may have been mistaken.
[Endemic: West Maui]
M108

Stenogyne sp.
Upper Kīpahulu Valley; Manawainui.
[Endemic]
KV31,M108.

LOGANIACEAE, Strychnine Family

Labordia spp. *KAMAKAHALA*
Kaupō Gap; Kīpahulu Valley
[Endemic]
C43,HR50,KV34,LK36,Mitchell (1945)

MALVACEAE, Mallow Family

#**Sida cordifolia** L. *`ILIMA*
A recent review of this genus (Bates in Wagner et al. 1990) stated that most of the `ilima in the Hawaiian Islands including coastal forms with cordate leaves are best characterized as Sida fallax Walp. However, according to this review, Sida cordifolia is also found at a few sites in Hawai`i, including "dry sites at Kaupō, East Maui." Sida cordifolia is distinguished from S. fallax by the greater (8-14 vs. 5-9) number of mericarps which are also long-awned in the fruiting capsule of the former species (Bates in Wagner et al. 1990).
[Indigenous. Pantropical]
KV35

MYRTACEAE, Myrtle Family

*__Eucalyptus camaldulensis__ Dehnh. RED GUM, RED RIVER GUM
[= Eucalyptus rostrata Schlechtend. sensu Kraebel (1921), Mitchell (1945)]
Though listed in early planting records for the Park, this species has not been recorded in recent years.
Kraebel (1921), Mitchell (1945)

*Eucalyptus rudis Endl. DESERT GUM
Listed by Mitchell (1945) as occurring in Plot I at 6500 ft on East Maui near Pu`u-nianiau. Not currently known from the Park.
[Alien: native to SW Australia]

*Eucalyptus spp.
Crater, at Hosmer Grove; Lower Kīpahulu Valley
[Alien]
C45,KV35

Metrosideros sp.
West Kaupō Gap.
These trees likely represent a form of Metrosideros polymorpha sensu lato.
[Endemic]
C45

PIPERACEAE, Pepper Family

Peperomia ellipticibacca C. DC. *`ALA`ALA-WAI-NUI*
Manawainui
A recent treatment by Wagner et al. (1990) stated that Peperomia ellipticibacca is restricted to O`ahu. This species is closely related to Peperomia expallescens C. DC. which is found in the Manawainui area and for which it could easily be mistaken.
[Endemic: O`ahu]
M111

Peperomia spp. *`ALA`ALA-WAI-NUI*
East Kaupō Gap; Manawainui.
[Endemic]
C48,M111

PITTOSPORACEAE, Pittosporum Family

Pittosporum sp. *HO`AWA*
Manawainui
M112 (no specimen cited)

PROTEACEAE, Protea Family

*Grevillea robusta A. Cunn. ex R. Br. SILK OAK, SILVER OAK
West slope, Hosmer Grove, Kaupō Gap.
Listed by Mitchell (1945) and questionably by Kraebel (1921) as planted and present at Hosmer Grove in 1921. Not currently found at Hosmer Grove. In April 1998, Bill Haus reported finding one to two meter tall saplings just above the fence at 4000-4100 feet elevation in mid Kaupō Gap.
[Alien: native to Queensland and New South Wales, Australia]

ROSACEAE, Rose Family

*Fragaria vesca L. EUROPEAN STRAWBERRY
Cited, apparently erroneously, as present at Hosmer Grove on the lower northwest slope of the Park by Lamoureux (1976). Currently, only the native strawberry, F. chiloensis, is found at Hosmer Grove. The introduced F. vesca is not listed as naturalized on Maui by Wagner et al. 1990.
[Alien: native to Eurasia and North America]

RUBIACEAE, Coffee Family

Bobea sp. `AHAKEA
Lower Kīpahulu Valley
Though the lower elevation rain forest habitat of the study area suggests that the species may be B. elatior, specimens should be examined to confirm the identification.
[Endemic]
LK41

Coprosma sp. *PILO*
East Kaupō Gap.
[Endemic]
C52

Hedyotis sp.
Kīpahulu Valley; Manawainui.
[Endemic]
KV40,LK42,M114

Psychotria sp. *KOPIKO*
Kīpahulu; Manawainui
[Endemic]
C52,K45,LK42,M114

RUTACEAE, Rue Family

Melicope haleakalae Stone (Hartley and Stone) *ALANI*
[= Pelea haleakalae Stone]
?Kīpahulu Valley; ?Manawainui; ?NE rift.
Though present in similar habitat elsewhere on Maui, this species has not been recorded from the Park. Closely related to M. clusiifolia, Melicope haleakalae is known primarily from wet forest in the Waikamoi area. This species differs from M. clusiifolia only in floral characters, specifically, the presence of larger and persistent sepals and petals (Stone et al. in Wagner et al. 1990).
[Endemic: East Maui]

Melicope nr. **oblongifolia** Gray (Hartley and Stone) *ALANI*
NE rift.
B.C. Stone identification of collection A.C. Medeiros 268 at 5500 ft., common small tree between Mid-Camp and Big Bog. In a recent treatment (Stone et al. in Wagner et al. 1990), M. oblongifolia has been reduced into synonymy under M. volcanica Gray.

Melicope spp.
[Pelea spp. sensu K39,KV40,LK42,M114]
Kīpahulu Valley; Manawainui.
[Endemic]
K39,KV40,LK42,M114

SOLANACEAE, Nightshade Family

Solanum sp.
Manawainui
The status of this citation is uncertain; the collection has not been located. The genus contains both common non-native species as well as much depleted endemic species (see Solanum incompletum in species listing).
M115 (Higashino & Mizuno s.n.)

THYMELIACEAE, Mezereum Family

Wikstroemia villosa Hillebr. *`AKIA*
Though not yet discovered within the Park, this species has been collected in the Waikamoi area, 4000-5100 ft elevation, in Acacia/Metrosideros forest similar to that in Kīpahulu and the Manawainui area.
[Endemic: East and West Maui]

Wikstroemia sp. *`AKIA*
Kīpahulu Valley
[Endemic]
K40,KV42

URTICACEAE, Nettle Family

Pipturus sp. *MAMAKI*
Lower east Kaupō Gap
[Endemic]
C55

VISCACEAE, Mistletoe Family

Korthalsella degeneri Danser *HULUMOA, KAUMAHANA*

?Manawainui

Listed in Higashino and Mizuno (1976) as occurring on an unstated host tree in the Manawainui area (Higashino & Mizuno 1844). However, a recent treatment of the genus (Wagner et al. 1990) considers this species to be an O`ahu island endemic, parasitic on Sapindus and Nestegis.

[Endemic: O`ahu]

M109

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