

**Integration and Synthesis Summary for Plants, Pacific Islands**  
**Assessment Group 11 – Dicots reliant on outcrossing by biotic pollination vectors, other aspects of reproductive method unknown**

The tables below contain summaries of the information and data we used to determine the ranking (high, medium, low) for vulnerability, risk and usage indicators. Information in most of the columns was used directly in the ranking determination (green fill). Where indicated, information in other columns was not used directly in the ranking calculation, but provided additional information about the species that fed into one of the ranking metrics or was used to make the draft determination when relevant. The summary for this assessment group also includes new conservation measures<sup>1</sup> that have been incorporated into the Action since the draft biological opinion was released. The measures and our related assumptions are incorporated into our analysis (immediately above Table 3), and also factor into the rationales for our conclusions for each species, as described below.

All species in this assessment groups are dicots, a class of angiosperm flowering plant defined by having two cotyledons (embryonic seed leaves). Dicots are a hugely diverse class of flowering plants, with tens of thousands of species. Familiar dicots include plants such as daisies, roses and oak trees. The dicots in this assessment group use biotic vectors to accomplish pollination, such as insects, birds and mammals; other aspects of their reproductive mechanism are unknown. Seed dispersal for the species in this group is achieved by biotic (dispersal by animals) and/or abiotic (dispersal by wind, water or gravity) means.

**Table 1: Summarizing Data and Information for Vulnerability Ranking**

**Data Sources:** Status of the Species (SOS) accounts updated as of November 2019 (Appendix C); NA=Not Applicable; HI=Hawaii; GU=Guam; CNMI=Commonwealth of the Northern Marianas Islands

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Abutilon eremitopetalum</i>	No common name	48	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	Endemic to the windward side of the island of Lanai. (NatureServe, 2015)	70 observed, estimate of <1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Abutilon menziesii</i>	Ko`oloa`ula	1	HI	Endangered	Not Available	Not Available	9 (NatureServe, 2015)	Endemic to the islands of Oahu, Maui, Lanai, and Hawaii. (NatureServe, 2015)	400 - 450 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Abutilon sandwicense</i>	No common name	99	HI	Endangered	Not Available	Not Available	18 (USFWS, 2011)	This species is now known from Makaleha Valley east to Palikea Gulch, south to Nanakuli Valley, and Makaha-Waianae Kai Ridge on State, Federal, City/County, and privately owned land (HHP 1997). (USFWS, 1998)	~300 individuals (USFWS, 2011)	No Mention	No Mention	High
<i>Acaena exigua</i>	Liliwai	100	HI	Endangered	Not Available	Not Available	Possibly 2 (NatureServe, 2015)	Endemic to mountains of Kauai and West Maui. (NatureServe, 2015)	Unknown (NatureServe, 2015)	No Mention	No Mention	High
<i>Achyranthes mutica</i>	No common name	101	HI	Endangered	Not Available	Not Available	2 (USFWS, 2015)	Currently, this species is known only from Hawaii Island, from the Keawewal Stream area, the south slope of Puu Loa in the Kohala Mountains, and Lanikepu Gulch on private land. (USFWS, 1999)	~40 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Achyranthes splendens var. rotundata</i>	Round-leaved chaff-flower	49	HI	Endangered	Not Available	Not Available	7 (NatureServe, 2015)	It is currently known from only two small areas on the island of Oahu. (NatureServe, 2015)	Less than 2000 plants	No Mention	No Mention	High

<sup>1</sup> Additional information on these new conservation measures can be found in the Description of the Action section of this biological opinion.

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
									(NatureServe, 2015)			
<i>Alectryon macrococcus</i>	Mahoe	102	HI	Endangered	Not Available	Not Available	37 (var. <i>macrococcus</i> ) and 1 (var. <i>auwahiensis</i> ) (NatureServe, 2015)	<i>Alectryon</i> is endemic to the Hawaiian Islands, with two recognized varieties, <i>var. macrococcus</i> and <i>var. auwahiensis</i> . <i>Alectryon macrococcus</i> var. <i>macrococcus</i> is known from a number of sites on Kauai, Oahu, Molokai, and West Maui, while <i>A. macrococcus</i> var. <i>auwahiensis</i> is only known from East Maui. (USFWS, 2010)	500-1000 (var. <i>macrococcus</i> ) and 1-10 (var. <i>auwahiensis</i> ) plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens amplexens</i>	Ko`oko`olau	103	HI	Endangered	Short-term trends suggest declines of 10-30% (NatureServe, 2015)	Not Available	9 (NatureServe, 2015)	Endemic to the northern end of the Waianae Mountains of Oahu, Hawaii. Elsewhere (from near Kaena Point at least to the head of the Makua Valley) it is involved in hybrid swarms with <i>Bidens torta</i> . (NatureServe, 2015)	500 to >1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens campylothea pentamera</i>	Ko`oko`olau	50	HI	Endangered	Short-term trends suggest a decline of 10-30% (NatureServe, 2015)	Not Available	6 (NatureServe, 2015)	This taxon is endemic to the island of Maui in the Hawaiian Islands, on the eastern volcano (East Maui) as well as the western volcano (West Maui). The taxon had been recorded only from East Maui until a single occurrence was found on West Maui in 1988. (NatureServe, 2015)	300-500 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens campylothea waihoiensis</i>	Ko`oko`olau	104	HI	Endangered	Short-term trends suggest declines of 10-30% (NatureServe, 2015)	Not Available	1 (NatureServe, 2015)	Known only from the eastern slopes of Haleakala, Island of Maui, State of Hawaii. (NatureServe, 2015)	<200 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens conjuncta</i>	Ko`oko`olau	105	HI	Endangered	Short-term trends suggest a decline of 10-30% (NatureServe, 2015)	Not Available	11 (NatureServe, 2015)	<i>Bidens conjuncta</i> is endemic to the island of Maui, state of Hawaii. It has been found only on the island's western mountain mass, the West Maui Mountains. (NatureServe, 2015)	~2,200 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens hillebrandiana</i> ssp. <i>hillebrandiana</i>	kookoolau	106	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	<i>Bidens hillebrandii</i> ssp. <i>hillebrandii</i> is endemic to the island of Hawaii in the Hawaiian Islands. It is known only from the windward (eastern) coast of Kohala near the northern tip of the island. (NatureServe, 2015)	Not Available	No Mention	No Mention	High

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<i>Bidens micrantha</i> <i>ssp. ctenophylla</i>	Ko`oko`olau	51	HI	Endangered	Short-term trends suggest declines of 10-30%, whereas long-term trends unknown. (NatureServe, 2015)	Not Available	4-6 (NatureServe, 2015)	Endemic to the district of North Kona on the island of Hawaii, on the dry leeward slopes of Hualalai volcano (HBMP 2006, Ball 2007). (NatureServe, 2015)	2,000-3,100 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Bidens micrantha</i> <i>ssp. kalealaha</i>	Ko`oko`olau	52	HI	Endangered	Not Available	Not Available	7 (USFWS, 2011)	Current known from East Maui. (NatureServe, 2015)	2,252 - 2,272 plants (USFWS, 2011)	No Mention	No Mention	High
<i>Bidens wiebkei</i>	Ko`oko`olau	107	HI	Endangered	Not Available	Not Available	7 (USFWS, 2011)	Currently known in East Molokai. (NatureServe, 2015)	~500 plants (USFWS, 2011)	No Mention	No Mention	High
<i>Bonamia menziesii</i>	No common name	108	HI	Endangered	Not Available	Oahu: declining; Kauai: unknown (USFWS, 2016)	Kauai: 12+; Oahu: 12; Lanai: 3; Maui: 4 - 6; Hawaii: 1 (USFWS, 2016)	Currently, this species is extant on Kauai, Oahu, Lanai, Maui, and Hawaii. <i>Bonamia menziesii</i> is known from many occurrences on these five islands with the largest number of extant individuals located on Kauai comprising several thousand individuals (USFWS, 2016).	Kauai: > 1,000; Oahu: < 60; Lanai: ~11; Maui: 10 - 15; Hawaii: 3+ (USFWS, 2016)	No Mention	No Mention	High
<i>Canavalia molokaiensis</i>	`Awikiwiki	109	HI	Endangered	Not Available	Not Available	6 (NatureServe, 2015)	Known from Kalaupapa to Waialeia, Kaunakakai, and Kamakou in Molokai (USFWS 1992). (USFWS, 1996)	~500 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Canavalia napaliensis</i>	`Awikiwiki	2	HI	Endangered	Long-term trends are unknown, but short-term trends indicate a relatively stable population (NatureServe, 2015)	Not Available	5 (NatureServe, 2015)	Endemic to the northwestern portion of the island of Kauai in the state of Hawaii. (NatureServe, 2015)	<1000 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Canavalia pubescens</i>	`Awikiwiki	3	HI	Endangered	Long-term trends are unknown, whereas short-term	Not Available	7-10+ (NatureServe, 2015)	Recorded from the islands of Niihau, Kauai, Maui, and Lanai in the state of Hawaii. Current records (1983-1998) from Maui and Lanai. (NatureServe, 2015)	<200 plants (NatureServe, 2015)	No Mention	No Mention	High

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					trends indicate declines of 10-30% (NatureServe, 2015)							
<i>Charpentiera densiflora</i>	Papala	110	HI	Endangered	Not Available	Not Available	7 (USFWS, 2010)	<i>Charpentiera densiflora</i> occurs only on the island of Kauai in the state of Hawaii. It is narrowly endemic to the Na Pali Coast on the northwestern side of the island, in a series of valleys and gulches over a 6 km stretch. (NatureServe, 2015) It occurs in Hanakapiai, Kalalau, Limahuli, Hoolulu, and Waiahuakua valleys, and in Pohakuao, a hanging valley between Kalalau and Hanakoa (HBMP 2007) (USFWS, 2010).	~400 (USFWS, 2010)	No Mention	No Mention	High
<i>Clermontia drepanomorpha</i>	`Oha wai	111	HI	Endangered	Not Available	Not Available	1 (USFWS, 2012)	Endemic to Kohala Mountains on the island of Hawaii. (NatureServe, 2015)	~200 (USFWS, 2012)	No Mention	No Mention	High
<i>Clermontia lindseyana</i>	`Oha wai	112	HI	Endangered	Not Available	Not Available	4 or more (USFWS, 2010)	Current range: East Maui and Hawaii. (USFWS, 1996)	124 wild, 2,000 reintroduced (USFWS, 2015)	No Mention	Loss of pollinators and transport vectors (USFWS, 2010)	High
<i>Clermontia peleana</i>	`Oha wai	113	HI	Endangered	Not Available	Not Available	6 (1 wild, 5 reintroduced) (USFWS, 2015)	Its current range is in Eastern Hawaii. (NatureServe, 2015)	6 wild, 3,155 reintroduced (USFWS, 2015)	No Mention	No Mention	High
<i>Clermontia pyrularia</i>	`Oha wai	114	HI	Endangered	Not Available	Not Available	1 (USFWS, 2007)	Its current range includes Hawaii. (NatureServe, 2015)	15 wild, 136 reintroduced (USFWS, 2007)	No Mention	No Mention	High
<i>Clermontia samuelii</i>	`Oha wai	53	HI	Endangered	Not Available	Not Available	<10 (NatureServe, 2015)	Its current range includes the Hana District of East Maui. (NatureServe, 2015)	300-400 (USFWS, 2011)	No Mention	No Mention	High
<i>Colubrina oppositifolia</i>	Kauila	115	HI	Endangered	Not Available	Not Available	10-13 (USFWS, 2015)	<i>Colubrina oppositifolia</i> is known from Waianae Mountains of Oahu, Hawaii, and Maui. (NatureServe, 2015)	1,500-2,000 (USFWS, 2015)	No Mention	No Mention	High
<i>Cyanea acuminata</i>	Haha	116	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Current range: Oahu. Historically no additional range.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High

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<i>Cyanea asplenifolia</i>	Haha	117	HI	Endangered	Decline of 10-50% (NatureServe, 2015)	Not Available	8 (USFWS, 2016)	Endemic to the island of Maui in the state of Hawaii. (NatureServe, 2015)	~200 (USFWS, 2016)	No Mention	No Mention	High
<i>Cyanea calycina</i>	Haha	92	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	40 occurrences (USFWS, 2012)	<i>Cyanea calycina</i> (Haha) is found in both the Waianae and Koolau Mountains of Oahu. (USFWS, 2012)	300-350 (USFWS, 2012)	No Mention	No Mention	Medium
<i>Cyanea copelandii</i> ssp. <i>copelandii</i>	Haha	118	HI	Endangered	Not Available	Not Available	0 (USFWS, 2012)	No current range; last collected in 1957. (NatureServe, 2015).	0 (USFWS, 2012)	No Mention	No Mention	High
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>	Haha	119	HI	Endangered	Not Available	Not Available	25 (USFWS, 2011)	Currently (since 1970), this taxon is known from three populations within the East Maui Watershed Partnership in Haiku Uka, the ridge above Kuhu Valley, and Kipahulu Valley within Haleakala National Park and Hanawi Natural Area Reserve (Lammers 1999; U.S. Fish and Wildlife Service 1999b, 2002b, Warshauer 1998; Hawaii Natural Heritage Program Database 2001; Geographic Decision Systems International 2001; Medeiros et al. 1998) (USFWS, 2002).	> 300 (USFWS, 2011)	No Mention	No Mention	High
<i>Cyanea crispa</i>	Haha	120	HI	Endangered	Not Available	Not Available	5 (5-year Review, 2019)	A short-lived perennial shrub endemic to the island of Oahu (5-year Review, 2019).	16-26 in the wild (5-year Review, 2019)	No Mention	No Mention	High
<i>Cyanea dolichopoda</i>	Haha	121	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	The type specimen (and the only specimen ever collected) of <i>Cyanea dolichopoda</i> was collected in 1990 on the island of Kauai in the Hawaiian Islands. (NatureServe, 2015)	Not Available	No Mention	No Mention	High
<i>Cyanea dunbarii</i>	Haha	122	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014)	This species is current known from Mokomoko Gulch on Molokai. (NatureServe, 2015)	4 plants (USFWS, 2014)	No Mention	No Mention	High
<i>Cyanea duvalliorum</i>	Haha	54	HI	Endangered	Not Available	Not Available	2 (NatureServe, 2015)	Found only in the east Maui mountains (Lammers 2004). (USFWS, 2016a)	71 wild, 135 outplanted (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea eleleensis</i>	Haha	84	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 (NatureServe, 2015)	The type specimen was collected in Wainiha Valley, Kauai, state of Hawaii. (NatureServe, 2015)	1 - 50 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea gibsonii</i>	Haha	55	HI	Endangered	Not Available	Not Available	3 (USFWS, 2014)	This species current range is restricted to Lanai. (NatureServe, 2015)	10 wild (USFWS, 2014)	No Mention	Loss of pollinators (USFWS, 1994)	High

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<i>Cyanea glabra</i>	Haha	123	HI	Endangered	Not Available	Not Available	None known (USFWS, 2011)	On West Maui, <i>Cyanea glabra</i> occurs in both forks of Kauaula Valley (USFWS, 2011).	None known (USFWS, 2011)	No Mention	No Mention	High
<i>Cyanea hamatiflora ssp. carlsonii</i>	Haha	124	HI	Endangered	Not Available	Not Available	3 (USFWS, 2015)	This species current range is restricted to the Kona region of Hawaii. (NatureServe, 2015)	17 wild, 41 to 2,606 reintroduced (USFWS, 2015)	No Mention	No Mention	High
<i>Cyanea hamatiflora ssp. hamatiflora</i>	Haha	93	HI	Endangered	Not Available	Slightly increasing (USFWS, 2014)	Not Available	Currently known from windward slopes of Haleakala, East Maui (NatureServe, 2015).	458 - 558 (USFWS, 2014)	No Mention	No Mention	Medium
<i>Cyanea horrida</i>	Haha nui	125	HI	Endangered	Not Available	Not Available	12 (USFWS, 2016)	This species current range is restricted to East Maui. (NatureServe, 2015)	44 (USFWS, 2016)	No Mention	No Mention	High
<i>Cyanea humboldtiana</i>	Haha	56	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Currently, between 184 and 334 plants are known from seven occurrences at Kaluanui (1), Konahuanui (25), Maakua (6), Puu Keahiakahoe (100 to 200), Wailupe and Pia (50 to 100), Opaepala Midreach (1), and Poamoho trail (1) (HINHP Database 2001; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003). They are declining in number and populations are small and widely dispersed with restricted distribution (Service 1998a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea kauaulaensis</i>	No common name	57	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014; USFWS, 2015)	It occurs on leeward west Maui. Currently, <i>C. kauaulaensis</i> is known from Kauaula Valley (approximately 50 individuals) and Waikapu Valley (12 individuals) (Oppenheimer and Lorence 2012, pp. 15–16, 20) (USFWS, 2015).	62 (USFWS, 2014; USFWS, 2015)	No Mention	No Mention	High
<i>Cyanea kolekoleensis</i>	Haha	126	HI	Endangered	Not Available	Not Available	0 (NatureServe, 2015)	The current range is restricted to the Wahiawa Mountains in southern Kauai. (NatureServe, 2015)	Unknown (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea koolauensis</i>	Haha	127	HI	Endangered	Not Available	Not Available	12 small, widely scattered sub-populations (2019 5-year Review)	A short-lived perennial shrub endemic to the island of Oahu (5-year Review, 2019).	~190 (5-year Review, 2019)	No Mention	No Mention	High
<i>Cyanea kuhihewa</i>	Haha	128	HI	Endangered	Short-term trends indicate a decline of >70%	Not Available	0 (zero) (NatureServe, 2015)	Known only from the type locality in Limahuli Valley on the island of Kauai, state of Hawaii. As of 2003, there were no known extant occurrences of this species (Russell 2004). (NatureServe, 2015)	Zero, no individuals known extant (NatureServe, 2015)	No Mention	No Mention	High

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					(NatureServe, 2015)							
<i>Cyanea kunthiana</i>	Haha	129	HI	Endangered	Short-term trends indicate a decline of 10-70%, whereas long-term trends suggest a decline of 10-90% (NatureServe, 2015)	Not Available	15 occurrences (NatureServe, 2015)	<i>Cyanea kunthiana</i> is endemic to the island of Maui in the state of Hawaii. It occurs on both of Maui's main mountain masses, West Maui and East Maui. (NatureServe, 2015)	400 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea lanceolata</i>	Haha	130	HI	Endangered	Short-term trends suggest a decline of 10-30% (NatureServe, 2015)	Not Available	4 occurrences (NatureServe, 2015)	<i>Cyanea lanceolata</i> is endemic to the Koolau Mountains on Oahu. It has been recorded from the southern and central portions of the mountain range. All of the records for the species are from the leeward (southwestern) side of the range with the exception of a single historic record from the range's windward (northeastern) side. (NatureServe, 2015)	~60 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea lobata</i>	Haha	131	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014)	<i>Cyanea lobata</i> is current known from West Maui. (NatureServe, 2015)	3 individuals (USFWS, 2014)	No Mention	No Mention	High
<i>Cyanea magnicalyx</i>	Haha	58	HI	Endangered	Not Available	Not Available	3 (USFWS, 2016)	<i>Cyanea magnicalyx</i> is found in west Maui. (NatureServe, 2015)	<10 individuals (USFWS, 2016)	No Mention	No Mention	High
<i>Cyanea mannii</i>	Haha	132	HI	Endangered	Not Available	Not Available	Unknown (USFWS, 2011)	This species is current found in Molokai. (NatureServe, 2015)	~200 (USFWS, 2011)	No Mention	No Mention	High
<i>Cyanea maritae</i>	Haha	59	HI	Endangered	Not Available	Not Available	4 (USFWS, 2016)	Known only from East Maui. (NatureServe, 2015)	~50 (USFWS, 2016)	No Mention	No Mention	High
<i>Cyanea marksii</i>	Haha	133	HI	Endangered	Not Available	Not Available	Unknown (NatureServe, 2015)	<i>Cyanea marksii</i> is endemic to the island of Hawaii in the Hawaiian Islands. It is known only from the district of South Kona, which is on the western flank of Mauna Loa, an active volcano. It has been recorded only from a small portion of South Kona inland	Unknown (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea mauiensis</i>	Haha	134	HI	Endangered	Not Available	Not Available	None known (USFWS, 2016)	<i>Cyanea mauiensis</i> is endemic to the island of Maui in the state of Hawaii. The species has not been observed in about 100 years. (NatureServe, 2015)	0 (USFWS, 2016)	No Mention	No Mention	High

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<i>Cyanea mceldowneyi</i>	Haha	135	HI	Endangered	Not Available	Not Available	3 (NatureServe, 2015)	Endemic to windward East Maui. (NatureServe, 2015)	~100 wild (USFWS, 2014)	No Mention	No Mention	High
<i>Cyanea munroi</i>	Haha	136	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	Endemic to Molokai and Lanai. (NatureServe, 2015)	2 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea obtusa</i>	Haha	137	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 (USFWS, 2016)	Endemic to the island of Maui in the state of Hawaii, the species is still extant on both West Maui and East Maui. (NatureServe, 2015)	1-30 (USFWS, 2016; NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea pinnatifida</i>	Haha	138	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014)	Endemic to the Waianae Mountains of Oahu. The last known wild individual died in 2001, although the species remains in cultivation (USFWS, 2012).	~20 (USFWS, 2014)	No Mention	No Mention	High
<i>Cyanea platyphylla</i>	âˆšakuâˆšaku	139	HI	Endangered	Not Available	Not Available	2 (USFWS, 2012)	Current range: Island of Hawaii. (NatureServe, 2015)	<100	No Mention	No Mention	High
<i>Cyanea procera</i>	Haha	140	HI	Endangered	Not Available	Not Available	3 (NatureServe, 2015)	Current range in Kawela region, Kamakou Preserve and Puu Alii NAR. (NatureServe, 2015)	<10 (USFWS, 2014)	No Mention	Loss of mutualists (USFWS, 2014)	High
<i>Cyanea profuga</i>	Haha	60	HI	Endangered	Not Available	Not Available	4 (USFWS, 2016)	Endemic to Molokai (USFWS 2012). (NatureServe, 2015)	34 individuals (USFWS, 2016)	No Mention	No Mention	High
<i>Cyanea purpurellifolia</i>	No common name	141	HI	Endangered	Not Available	Not Available	5 occurrences (USFWS, 2012)	Currently known from Maakua-Kaipapau to Punaluu-Kaluanui Ridge (USFWS 2011). (NatureServe, 2015)	~20 (USFWS, 2012)	No Mention	No Mention	High
<i>Cyanea remyi</i>	Haha	61	HI	Endangered	Not Available	Not Available	3 (USFWS, 2010)	This species is endemic to Kauai. (NatureServe, 2015)	<50 (USFWS, 2010)	No Mention	No Mention	High
<i>Cyanea rivularis</i>	Haha	142	HI	Endangered	Not Available	Not Available	3 (USFWS, 2010)	Known in Kauai. (NatureServe, 2015)	19 (USFWS, 2010)	No Mention	No Mention	High
<i>Cyanea shipmanii</i>	Haha	143	HI	Endangered	Not Available	Not Available	2 (USFWS, 2009)	In 2007, the species had declined to only two extant wild individuals in Upper Waiakea Forest Reserve and Puu Kipu unit of the Kilauea Forest Reserve (Plant Extinction Prevention Program 2007, 2008; USFWS 2008). (USFWS, 2009)	2 wild (USFWS, 2009)	No Mention	No Mention	High
<i>Cyanea solanacea</i>	Popolo	144	HI	Endangered	Not Available	Not Available	4 occurrences (USFWS, 2016; NatureServe, 2015)	The current range includes Molokai. (NatureServe, 2015)	26 (USFWS, 2016; NatureServe, 2015)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Cyanea st.-johnii</i>	Haha	62	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Currently, 58 to 63 plants are known from seven occurrences, including Helemano (3 individuals), north Halawa summit ridge (15), Poamoho- Punaluu summit ridge (1), Waiawa-Waihole summit crest (4), Wailupe summit (15), Waimalu- Waihee summit Ridge (10), and Waimano (10 to 15) (HINHP Database 2001). The number of occurrences and the number of individuals of <i>C. st.-johnii</i> are declining and those that remain are small and widely dispersed with restricted distribution (U.S. Army 2003a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Cyanea stictophylla</i>	Haha	145	HI	Endangered	Not Available	Not Available	4 (USFWS, 2012)	Current range includes Island of Hawaii. (NatureServe, 2015)	45 (USFWS, 2012)	No Mention	No Mention	High
<i>Cyanea tritomantha</i>	`aku	146	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 - 20 (NatureServe, 2015)16	<i>Cyanea tritomantha</i> is endemic to the island of Hawaii in the Hawaiian Islands. It is documented in the Kohala Mountains in the north, further south along the windward (eastern) sides of Mauna Kea, Mauna Loa and Kilauea (volcanoes), as far south as the the district of Kau on the southeastern flank of Mauna Loa (NatureServe). It is known only from the island of Hawai'i (Lammers 2004, Pratt and Abbott 1997). This species was known historically from the windward slopes of Mauna Kea, Mauna Loa, Kilauea, and the Kohala Mountains, in the lowland wet, montane wet, and wet cliff ecosystems (Pratt and Abbott 1997).	< 400	No Mention	Lack of regeneration (USFWS, 2013)	High
<i>Cyanea truncata</i>	Haha	147	HI	Endangered	Not Available	Not Available	4 (1 wild, 3 reintroduced) (USFWS, 2012)	Currently found at Kahana Valley in Oahu. (USFWS, 2012)	~35 (2 wild) (USFWS, 2012)	No Mention	No Mention	High
<i>Cyrtandra crenata</i>	Ha`iwale	148	HI	Endangered	Not Available	Not Available	0 (USFWS, 2011)	No current range. (NatureServe, 2015)	0 (USFWS, 2011)	No Mention	No Mention	High
<i>Cyrtandra cyaneoides</i>	Mapele	149	HI	Endangered	Not Available	Not Available	11 (USFWS, 2010)	The current range includes Namalokama, Wainiha Valley, Makaleha Plateau, and Waioli Valley, Kauai. (NatureServe, 2015)	800 (USFWS, 2010)	No Mention	No Mention	High
<i>Cyrtandra dentata</i>	Ha`iwale	94	HI	Endangered	Decreasing before ungulate control (USFWS, 2016)	Increasing (USFWS, 2016)	5 (USFWS, 2012)	Current range includes Waianae Mountains of Oahu (NatureServe, 2015). Currently, this species is found at Kawaiiki Gulch, Opaepala Stream, Kahanahaiki, and Pahole to Kapuna to West Makaleha (USFWS, 2016).	1,753 (USFWS, 2012)	No Mention	No Mention	Medium
<i>Cyrtandra ferripilosa</i>	Haiwale	63	HI	Endangered	Not Available	Not Available	2 (USFWS, 2016)	Known only from East Maui (Wager et al. 2012). (NatureServe, 2015)	<10 (USFWS, 2016)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Cyrtandra filipes</i>	Ha`iwale	150	HI	Endangered	Short-term trends suggest declines of 10-30% and long-term trends are unknown. (NatureServe, 2015)	Not Available	5 (USFWS, 2016)	Endemic to southeastern Molokai and West Maui, state of Hawaii. Still extant on both mountain masses. (NatureServe, 2015)	~150 (USFWS, 2016)	No Mention	No Mention	High
<i>Cyrtandra giffardii</i>	Ha`iwale	151	HI	Endangered	Not Available	Not Available	11	Since 1975, 11 populations have been identified with the total number of individuals estimated to exceed 1,000 (Warren Wagner, Smithsonian Institution, pers. comm., 1995; HELP 1991). These occur near Puu Makaala, Stainback Highway, and Kilau stream in Laupahoehoe Natural Area Reserve on State owned land, and at Hawaii Volcanoes National Park. As of 1994, 55 known individuals occurred in Hawaii Volcanoes National Park on transects in the Koa Unit and 35 additional individuals were identified in another area of the Koa Unit that were not on the transects, 6 occurred on transects in the Puu Unit (2 inside an enclosure and 4 outside), and 27 individuals occurred on transects in the Ag Unit of the O'laa Tract, as well as 2 on transects in the Small Tract.	< 112 wild plants	No Mention	No Mention	High
<i>Cyrtandra gracilis</i>	No common name	152	HI	Endangered	Not Available	Not Available	1 (USFWS, 2012)	Koolau Mountains, Oahu. Apparently extirpated from Palolo Valley, Konahuanui Gulch, and Manoa Valley (Wagner et al. 1999, p. 755; HBMP 2008 cited by USFWS 2011). Discovered in Pia Valley in 2001 (NTBG Provenance Report 2002 cited by USFWS 2011). (NatureServe, 2015)	~10 (USFWS, 2012)	No Mention	No Mention	High
<i>Cyrtandra hematos</i>	Ha`iwale	153	HI	Endangered	Not Available	Not Available	1 (USFWS, 2015)	Occurs in Kapulei, Molokai (USFWS, 2015). This species occurs on State land within the Olokui Natural Area Reserve and on privately owned land within the Molokai Watershed (USFWS, 2014).	~30 (USFWS, 2015)	No Mention	Lack of regeneration (USFWS, 2015)	High
<i>Cyrtandra kaulantha</i>	Ha`iwale	154	HI	Endangered	Short-term trends indicate declines of 10-30%	Not Available	5 (USFWS, 2012)	Endemic to the Koolau Mountains on Oahu Island, Hawaii. (NatureServe, 2015)	28 wild, 12 outplanted (USFWS, 2012)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
					(USFWS, 2012)							
<i>Cyrtandra limahuliensis</i>	Ha`iwale	155	HI	Threatened	Not Available	Not Available	13 (USFWS, 2010)	Current range includes Kauai. (NatureServe, 2015)	2,746-3,024 (USFWS, 2010)	No Mention	No Mention	High
<i>Cyrtandra munroi</i>	Ha`iwale	156	HI	Endangered	Not Available	Not Available	10 (USFWS, 2011)	The current range includes Lanai and Maui. (NatureServe, 2015)	<100 (USFWS, 2011)	No Mention	Loss of pollinators (USFWS, 1994)	High
<i>Cyrtandra nanawaleensis</i>	Haiwale	64	HI	Endangered	Not Available	Not Available	5 (USFWS, 2013)	The current range is restricted to Hawaii. (USFWS, 2013)	160 (USFWS, 2013)	No Mention	No Mention	High
<i>Cyrtandra oenobarba</i>	Ha`iwale	157	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	8 (USFWS, 2010a)	Currently occurs on Kauai: populations of <i>C. oenobarba</i> in the Halelea Forest Reserve include east Mamalahoa (10 individuals), north Namolokama (15 to 200 individuals), and Hanalei Valley (scattered) on State land, and upper Lumahai Valley (50 individuals) and Wainiha (100 individuals) on private land (HBMP 2007). Populations of <i>C. oenobarba</i> in the Lihue-Koloa Forest Reserve include Wailua River (40 to 50 individuals) on State land, and Iliiliula drainage (occasional) and Wahiawa drainage (50 individuals) on private land (HBMP 2007) (USFWS, 2010b).	270 - 450 (USFWS, 2010a)	No Mention	No Mention	High
<i>Cyrtandra oxybapha</i>	Ha`iwale	158	HI	Endangered	Not Available	Not Available	2 (USFWS, 2016)	Known only from one location on West Maui and two on East Maui. (NatureServe, 2015)	137 to 250 (USFWS, 2016)	No Mention	No Mention	High
<i>Cyrtandra paliku</i>	Haiwale	159	HI	Endangered	Not Available	Not Available	1 (USFWS, 2010a)	The full range of this species is 0.1 km on Kauai, Hawaiian Islands (Wagner et al. 2001) (NatureServe, 2015).	10 (USFWS, 2010a)	No Mention	No Mention	High
<i>Cyrtandra polyantha</i>	Ha`iwale	65	HI	Endangered	Not Available	Not Available	2 (USFWS, 2009)	The current range is Koolau Mountains of Oahu. (NatureServe, 2015)	46 (USFWS, 2009)	No Mention	No Mention	High
<i>Cyrtandra sessilis</i>	Ha`iwale	160	HI	Endangered	Short-term trends suggest a relatively stable population and long-term trends are unknown (NatureServe, 2015)	Not Available	4 (USFWS, 2012)	Known only from the Pia Gulch and Waikane area of the Koolau Mountains, island of Oahu, state of Hawaii (USFWS 2006). (NatureServe, 2015)	83 (USFWS, 2012)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Cyrtandra subumbellata</i>	Ha`iwale	161	HI	Endangered	Not Available	Not Available	three	Currently, <i>C. subumbellata</i> is known from three occurrences in the north and central Koolau Mountains (U.S. Army 2003a) with a total of approximately 108 individuals: two individuals from Kahana on Waikane trail, six individuals from the south Kaukonahua drainage, and more than 100 individuals from the Punaluu Rim (U.S. Army 2003a; HINHP Database 2002; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).	108	No Mention	No Mention	High
<i>Cyrtandra tintinnabula</i>	Ha`iwale	162	HI	Endangered	Not Available	Not Available	3 (USFWS, 2012)	Endemic to northeastern portion of Island of Hawaii. (NatureServe, 2015)	>150 (USFWS, 2012)	No Mention	Loss of pollinators (USFWS, 1996)	High
<i>Cyrtandra viridiflora</i>	Ha`iwale	66	HI	Endangered	Not Available	Not Available	Nine	Historically, <i>Cyrtandra viridiflora</i> was known from scattered occurrences in the Koolau Mountains on the island of Oahu. There are approximately nine occurrences of <i>C. viridiflora</i> with a total of 69 individuals found at: Kahuku Cabin (5 individuals), Kawainui and Koloa (8), Opaepala and Helemano (45), Helemano (1), Kaukonahua-Waikakaloa (1), Kaalalea (6), Kaluanui-Maakua Ridge (1), Maakua-Kaipapau Ridge (1), and Puu Kaaumakua (1) (HINHP Database 2001). The occurrences are restricted to the northern Koolau Mountains and range from Kawainui and Koloa to Kaalalea (HINHP Database 2001, K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003). <i>Cyrtandra viridiflora</i> populations are declining, and those that remain are small and widely dispersed (U.S. Army 2003a).	69	No Mention	No Mention	High
<i>Cyrtandra wagneri</i>	Haiwale	163	HI	Endangered	Not Available	Not Available	2 (USFWS, 2013)	Known only from Hawaii Island, North Hilo District, in the Laupahoehoe Natural Area Reserve along the Kilau stream and Kaiwilahilahi stream (Lorence and Perlman 2007). (NatureServe, 2015)	~10 (USFWS, 2013)	No Mention	No Mention	High
<i>Cyrtandra waiolani</i>	No common name	164	HI	Endangered	Not Available	Not Available	0 (NatureServe, 2015)	Endemic to Koolau mountains of Oahu. (NatureServe, 2015)	0 (NatureServe, 2015)	No Mention	No Mention	High
<i>Delissea rhytidosperma</i>	No common name	165	HI	Endangered	Not Available	Not Available	1 (USFWS, 2008)	Current range: Kauai. (NatureServe, 2015)	119 (0 wild) (USFWS, 2008)	No Mention	No Mention	High
<i>Delissea undulata</i>	No common name	67	HI	Endangered	Not Available	Not Available	0 (USFWS, 2012)	Current range is restricted to western Hawaii. (NatureServe, 2015)	0 (USFWS, 2012)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Dubautia imbricata imbricata</i>	Na`ena`e	166	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	3 (USFWS, 2010a)	Historically and currently, <i>D. imbricata ssp. imbricata</i> is known only from the Wahiawa Mountains of Kauai (St. John and Carr 1981, pp. 198, 201; Carr 1999, p. 298; HBMP 2007) (USFWS, 2010b).	1,400 (USFWS, 2010a)	No Mention	No Mention	High
<i>Dubautia kalalauensis</i>	Naenae	167	HI	Endangered	30 - 70% decline (NatureServe, 2015)	Not Available	1 (USFWS, 2010a)	It is currently found in only one location along the rim of Kalalau Valley near Puu o Kila Lookout (USFWS, 2010b).	26 (USFWS, 2010a)	No Mention	No Mention	High
<i>Dubautia kenwoodii</i>	Naenae	168	HI	Endangered	Not Available	Not Available	1 (USFWS, 2010a)	<i>Dubautia kenwoodii</i> is known only from the type specimen collected on the island of Kauai in the state of Hawaii. The specimen was collected in 1991 below the rim of Kalalau Valley, on the northwestern coast of the island (NatureServe, 2015).	1 (USFWS, 2010a)	No Mention	No Mention	High
<i>Dubautia pauciflorula</i>	Na`ena`e	169	HI	Endangered	Not Available	Not Available	6 (USFWS, 2009)	Current range in Wahiawa Mountains, Kauai. (NatureServe, 2015)	~100 (USFWS, 2009)	No Mention	No Mention	High
<i>Dubautia plantaginea magnifolia</i>	Na`ena`e	68	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 (USFWS, 2010a)	Recorded from two areas on the island of Kauai, state of Hawaii (NatureServe, 2015).	100 (USFWS, 2010a)	No Mention	No Mention	High
<i>Dubautia plantaginea ssp. humilis</i>	Na`ena`e	170	HI	Endangered	Not Available	Decreasing (USFWS, 2014)	3 (USFWS, 2014)	It currently occurs in West Mau (NatureServe, 2015).	~30 (USFWS, 2014)	No Mention	No Mention	High
<i>Dubautia waialealae</i>	Na`ena`e	171	HI	Endangered	Unknown (NatureServe, 2015)	< 30% decline (NatureServe, 2015)	1 (USFWS, 2010b)	It currently occurs on the summit of Waialeale (USFWS, 2010b).	3,000 (USFWS, 2010b)	No Mention	No Mention	High
<i>Eugenia bryanii</i>	No common name	172	GU	Endangered	Decreasing (USFWS, 2015)	Not Available	Not Available	Currently, <i>E. bryanii</i> is known from 5 occurrences totaling fewer than 420 individuals (Gutierrez 2014, in litt.) (USFWS, 2015).	Not Available	No Mention	No Mention	High
<i>Eugenia koolauensis</i>	Nioi	173	HI	Endangered	Decreasing	Not Available	8	Currently, there are 172 known individuals remaining; most occur in the northern Koolau Mountains and one disjunct occurrence is in the vicinity of Papali Loop trail. Locations of occurrences include: Drum Road (1 individual), Hanaimoa (3), Palikea Gulch (2), Pahipahialua (30), Oio (50), Kaunala (59), Aimuu (1), and Kaleleiki (25) (HINHP Database 2001; K. Kawelo, pers comm, 2003; J. Lau, pers. com. 2003; Service 1996, 1998a, 1999b). <i>Eugenia koolauensis</i> occurrences are small, in decline, and are widely dispersed. There are seedlings and juveniles found at some occurrences	172	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								(HINHP Database 2001; Service 1998a; U. S. Army 2003a).				
<i>Euphorbia celastroides</i> var. <i>kaenana</i>	`Akoko	4	HI	Endangered	Not Available	Increasing (USFWS, 2016)	9 USFWS, 2016)	Current range: Kaena, Oahu (NatureServe, 2015). It is currently located within the vicinity of Kaena Point and Makua Valley on State and Federal lands (USFWS, 2016).	951 mature, 100 immature (USFWS, 2016)	No Mention	No Mention	Medium
<i>Euphorbia deppeana</i>	`Akoko	69	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	Current range: Nuuanu Pali area of Koolau Mountains, Oahu. (NatureServe, 2015)	<1000 plants (NatureServe, 2015)	No Mention	No Mention	High
<i>Euphorbia eleanoriae</i>	`Akoko	5	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	3 (NatureServe, 2015)	Endemic to the northwestern side of the island of Kauai, Hawaii. (NatureServe, 2015)	~300 (NatureServe, 2015)	No Mention	No Mention	High
<i>Euphorbia halemanui</i>	Akoko	174	HI	Endangered	Not Available	Not Available	4 (USFWS, 2010)	Its current range is Kauai. (NatureServe, 2015)	300-400 plants (USFWS, 2010)	No Mention	No Mention	High
<i>Euphorbia kuwaleana</i>	`Akoko	175	HI	Endangered	Not Available	Not Available	1 (USFWS, 2011)	The current range of <i>E. kuwaleana</i> is restricted to the Waianae Mountains, Oahu. (NatureServe, 2015)	950 to 1,250 (USFWS, 2011)	No Mention	No Mention	High
<i>Euphorbia remyi</i> var. <i>kauaiensis</i>	`Akoko	176	HI	Endangered	Short-term population trends suggest an increase of >10%, whereas long-term trends are unknown (NatureServe, 2015)	Not Available	5 (USFWS, 2010)	Endemic to the island of Kauai in the state of Hawaii. (NatureServe, 2015) Currently, <i>E. remyi</i> var. <i>kauaiensis</i> is found in Lumahai Valley, Wainiha, Wailua River, the "Blue Hole" at the head of Wailua River in the Lihue-Koloa forest reserve, and at Iliiliula (K. Wood, pers. comm. 2005a; HBMP 2007) (USFWS, 2010).	920 - 1,000+ (USFWS, 2010)	No Mention	No Mention	High
<i>Euphorbia remyi</i> var. <i>remyi</i>	`Akoko	6	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	10 (USFWS, 2010)	This taxon is endemic to the island of Kauai in the Hawaiian Islands. It is found on all sides of the island. (NatureServe, 2015) It is currently found at Pohakupili, Makaleha, Malamamaiki, Limahuli, Lumahai, Limahuli-Hanakapiai, Kalalau-Honopu, Koaie canyon, Wahiawa drainage, and Puu Kolo (Wood 1998; K. Wood, pers. comm. 2005a; HBMP 2007) (USFWS, 2010).	~350 (USFWS, 2010)	No Mention	No Mention	High
<i>Euphorbia rockii</i>	`Akoko	177	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Currently there are 12 occurrences with a total of between 755 and 867 individuals along the Koolau Mountains at Aiea Ridge trail (two to three individuals), Halawa summit trail (20), Helemano-Opaeula (300), Kaluanui (200 to 300), Kawaiiiki and Opaeula (54), north Kaukonahua Gulch (1), north	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								Kaukonahua-Kahana summit Ridge (1), Puu Kainapuaa (100), south Kaukonahua (25), summit Ridge between Aiea Ridge trail and Waimano trail (1 to 2), Waikakalau (40 to 50), and Waimano (11) (HINHP Database 2001; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).				
<i>Exocarpos luteolus</i>	Heau	178	HI	Endangered	Not Available	Not Available	8 (USFWS, 2010)	Current range in Kauai. (NatureServe, 2015)	39 (SUFWS, 2010)	No Mention	No Mention	High
<i>Exocarpos menziesii</i>	Menzies ballart	7	HI	Endangered	No information found.	Not Available	7 (USFWS, 2016)	Currently, there is 1 scattered occurrence of fewer than 20 individuals on the slopes of Hualalai and approximately 1,800 individuals in the U.S. Army's Pohakuloa Training Area (PTA) on the island of Hawaii (PEPP 2013, pp. 10, 33; Thomas 2014, in litt.; Evans 2015, in litt.). There are no known occurrences of this species on Lanai today (USFWS, 2015).	~1,800 (USFWS, 2016)	No Mention	No Mention	High
<i>Gardenia mannii</i>	Nanu	179	HI	Endangered	Decreasing	Not Available	23	Currently, there are 23 occurrences of 93 to 105 <i>G. mannii</i> individuals. However, there may be a number of unrecorded plants, particularly in the wet forests of the Koolau Mountains. The majority of the known occurrences contain fewer than five individuals. They are distributed along a 42-km (26-mi) length of the Koolau Mountains, from Kaunala Gulch and Kaunala-Waimea Ridge in the north to Palolo in the south and along a 7-km (4-mi) distance in the Waianae Mountains from north Haleauau Valley to Kaluaa Gulch. Known occurrences are: Malaekahana-Waimea Summit Area (13 individuals), Pamalu (2), upper Kawainui (2), Kawailoa trail (12), Poamoho to Helemano (22), Opaepala (11 to 22), Kaiwai-Koele (1), south Kaukonahua Gulch (2), north Haleauau Gulch (4), Hanaimoa (1 to 2), Kaipapau (1), Kaluaa and Manauna (6), Kaluanui (1), Kapakahi Gulch (3), Laie trail (2), Makaua (2), Manana to Waimano Ridge (1), Papali (1), Pia Gulch (1), Pukele (1), lower Waimano (1), upper Waimano (2), and Puu Hapapa-Waieli Gulch (1). <i>G. mannii</i> occurrences are declining, and those that remain are small and widely dispersed, which puts the species at risk of extinction from naturally occurring events and/or lack of reproductive vigor (HINHP Database 2001; K. Kawelo, U.S. Army, pers. comm. 2003; J.	~ 93 - 105	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								Lau, HINHP, pers. comm. 2003; Service 1998a; U.S. Army 2003a).				
<i>Gardenia remyi</i>	Nanu	180	HI	Endangered	Not Available	Not Available	16 (USFWS, 2016)	Found on the Hawaiian Islands of Kauai, Molokai, Maui, and Hawaii. (USFWS, 2014)	~90 (USFWS, 2016)	No Mention	Lack of pollination (USFWS, 2016)	High
<i>Geranium hanaense</i>	Nohoanu	181	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 (NatureServe, 2015)	Endemic to two adjacent bogs on Haleakala (volcano), east Maui, state of Hawaii. (NatureServe, 2015)	500 to 700 (USFWS, 2016)	No Mention	No Mention	High
<i>Geranium hillebrandii</i>	Nohoanu	182	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	4 (USFWS, 2016)	Known only from the west Maui mountains, state of Hawaii. Extent of occurrence is approximately 10 sq km (EO data in the NatureServe central database as of November 2010). (NatureServe, 2015)	>10,000 (USFWS, 2016)	No Mention	No Mention	High
<i>Geranium kauaiense</i>	Nohoanu	183	HI	Endangered	Unknown (NatureServe, 2015)	Stable (NatureServe, 2015)	3 (USFWS, 2010a)	It currently occurs in the Halehaha Bogs of the Alakai Wilderness Preserve and the Waialeale Summit Bog (Kauai) (USFWS, 2010b).	140 (USFWS, 2010a)	No Mention	No Mention	High
<i>Geranium multiflorum</i>	Nohoanu	70	HI	Endangered	Declining (USFWS, 2016)	Not Available	9 (USFWS, 2016)	Current range is East Maui at Haleakala National Park, Hanawi Natural Area Reserve, Koolau Forest Reserve, Waikamoi Preserve, and Kula Forest Reserve. (USFWS, 2011)	500 - 1,000 wild, 150 outplanted (USFWS, 2016)	No Mention	Loss of pollinators (USFWS, 2011)	High
<i>Gouania vitifolia</i>	No common name	184	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015); 2 (USFWS, 2016)	Currently, three population units for this species contain approximately 81 individuals state-wide (Table SB 18). The two population units on Oahu total approximately 79 individuals (K. Kawelo, pers. comm. 2005, 2007), and comprise 95 percent of the total state-wide numbers for this species and 98 percent of its numbers on Oahu. All population units are found on State and private lands (68 FR 35950). Since listing, trends in abundance and distribution indicate an increase in individuals at the Keaau population unit on Oahu, owing almost entirely to increased survey effort. Numbers in the Waianae Kai population unit are very low and have declined since listing. The Keaau population unit appears to have attained the numerical criterion for a stabilization unit, generally defined for perennials as 50 mature, reproducing individuals (Makua Implementation Team 2003). Plants in the Keaau population unit are located in a zone at very low risk from training-related wildfire. On the island of Hawaii, this species appears to have declined from 18 individuals in the mid-1990s to only two known individuals in 2006. Thus, <i>Gouania vitifolia</i> on Oahu	74 wild (USFWS, 2012)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								comprises about 98 percent of the state-wide population and is characterized by one population unit meeting numerical criterion for stabilization and two population units at very low numbers of individuals (USFWS, 2016). Waianae Mountains, Oahu, West Maui, and Kau District, Hawaii (NatureServe, 2015).				
<i>Haplostachys haplostachya</i>	Honohono	8	HI	Endangered	Not Available	Not Available	458	Currently, the species is only known from 458 occurrences totaling approximately 13,956 individuals on the island of Hawaii (U.S. Army 2003a). All these occurrences are located within the action area (see Figure 38 in the Transformation Biological Assessment).	approximately 13,956	No Mention	No Mention	High
<i>Hedyotis megalantha</i>	Paudedo	9	GU	Endangered	Not Available	Decreasing (USFWS, 2015)	1 (USFWS, 2015)	It currently occurs on southern Guam (USFWS, 2015).	< 1,000 (USFWS, 2015)	No Mention	No Mention	High
<i>Heritiera longipetiolata</i>	Ufa-halomtano	185	GU, CNMI	Endangered	Not Available	Not Available	10 (USFWS, 2015)	It currently occurs on Guam, Saipan, Tinian, and Rota (Marian Islands) (USFWS, 2015).	~200 (USFWS, 2015)	No Mention	No Mention	High
<i>Hesperomannia arborescens</i>	No common name	71	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Currently, <i>H. arborescens</i> is known from at least 23 occurrences totaling 192 individuals on the islands of Oahu, Molokai, and Maui; however, it is considered extinct on Lanai. Molokai has a single known occurrence with only three individuals. Maui has four known occurrences for a total of six individuals. On Oahu, the following occurrences remain extant: Maakua (22 individuals); Kaluanui- Maakua Ridge (2); Kaipapau (6); Kaluanui (2); Halawa (3); Kapakahi Gulch (1); Niu-Waimanalo summit Ridge (1); Poamoho trail (2); lower Peahinaia trail (15); lower north Kaukonahua Gulch (1); upper north Kaukonahua Gulch (4); upper Kawaihoa trail (1); lower Kawaihoa trail (2); Kawainui (42); Laie-Waimea Ridge (15); north Kaukonahua Gulch (13); and south Kaukonahua Gulch (46). However, much of the habitat for this species in the Koolau Mountains has not been surveyed, and additional occurrences may be present. In the Waianae Mountains, near Palikea Gulch, there is one known occurrence with five individuals. Occurrences of <i>H. arborescens</i> are declining, and those that remain are small, widely dispersed, and have a limited gene pool. The survival of the four remaining occurrences	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High

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								on Maui is questionable, as they are heavily impacted by pigs (HINHP Database 2001; Service 1998a; Wagner et al. 1999; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).				
<i>Hibiscadelphus giffardianus</i>	Hau kuahiwi	85	HI	Endangered	Extinct in the wild in 1930 (USFWS, 2015; see current range/distribution)	Decreasing (USFWS, 2015)	3 (USFWS, 2015)	The only known tree died in 1930 and this species is now extinct in the wild. At the time of listing, 11 reintroduced individuals were known from Kipuka Puauu (USFWS 1996) (USFWS, 2015).	433 (USFWS, 2015)	No Mention	No Mention	High
<i>Hibiscadelphus hualalaiensis</i>	Hau kuahiwi	186	HI	Endangered	Unknown (NatureServe, 2015)	Extinct in the wild since 1992 (NatureServe, 2015); slight decrease in outplanted individuals (USFWS, 2015)	1 - 5 (NatureServe, 2015)	Individuals have been reintroduced in South Kohala, North Kona, and in a Natural Area Reserve System on Hawaii Island (USFWS, 2015).	97 (USFWS, 2015)	No Mention	No Mention	High
<i>Hibiscadelphus woodii</i>	Hau kuahiwi	187	HI	Endangered	Not Available	Not Available	1 (USFWS, 2012)	Kalalau Rim, Kauai. (NatureServe, 2015)	1 (USFWS, 2012)	No Mention	No Mention	High
<i>Hibiscus arnottianus ssp. immaculatus</i>	Koki`o ke`oke`o	188	HI	Endangered	Not Available	Not Available	4 (USFWS, 2011)	Endemic to Northeast Molokai. (NatureServe, 2015)	125 (USFWS, 2011)	No Mention	Lack of pollinators (USFWS, 2011)	High
<i>Hibiscus brackenridgei</i>	(=Native yellow hibiscus) ma`o hau hele	10	HI	Endangered	Increasing (USFWS, 2016)	Not Available	1 - 5 (NatureServe, 2015)	Endemic to Waianae Mts of Oahu. Wagner et al. Cite 2 populations on Kauai, but there are no records to substantiate these (NatureServe, 2015). Currently, this subspecies occurs in five naturally occurring population units (excluding inter situ, ex situ, and experimentally reintroduced sites) totaling approximately 669 individuals (Table SB 22) (U.S. Army Garrison 2006c). These population units are found on Federal, State, and private lands (68 FR 35950). In addition, several outplantings from Makua stock are located at inter situ and ex situ sites throughout Oahu (USFWS, 2016).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High

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<i>Hibiscus clayi</i>	Clay's hibiscus	189	HI	Endangered	Not Available	Not Available	1 (USFWS, 2008)	<i>Hibiscus clayi</i> was known historically from scattered locations on the island of Kauai, including the Kokee region on the western side of the island, Moaloaa Valley to the north, Nounou Mountain in Wailua to the east, and as far south as Haiku (USFWS 1994)	20 (5 wild) (USFWS, 2008)	No Mention	No Mention	High
<i>Hibiscus waimeae</i> ssp. <i>hanneriae</i>	Koki`o ke`oke`o	190	HI	Endangered	Not Available	Not Available	3 (USFWS, 2010)	Currently known from two populations on northern Kauai (USFWS, 1998).	80-85 (USFWS, 2010)	No Mention	Lack of pollinators (USFWS, 2010)	High
<i>Isodendrion hosakae</i>	Aupaka	11	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	<i>Isodendrion hosakae</i> is limited in distribution to the South Kohala District on the island of Hawaii. The potential historical distribution of the taxon is not known, since it was only described some 50 years ago. The species is found on three cinder cones in the Waikoloa area to include Puu Papapa, Puu Nohonaohae, and an unnamed cone east-northeast of Nohonaohae (see Figure 40 in the Transformation Biological Assessment). The presence of this species was confirmed in 2002 on Nohonaohae cinder cone and Puu Papapa (U.S. Army 2003a). The Service considers the existing individuals to be in one meta-population with several sub-populations.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Isodendrion laurifolium</i>	Aupaka	191	HI	Endangered	Not Available	Decrease in population number; increase in population size (USFWS, 2013)	16 (USFWS, 2013)	Currently occurs on Oahu and Kauai (NatureServe, 2015).	219 (USFWS, 2013)	No Mention	No Mention	High
<i>Isodendrion longifolium</i>	Aupaka	192	HI	Threatened	Not Available	Not Available	7 (USFWS, 2011)	Since 2003, seven populations were observed on Kauai and no individuals were observed on Oahu (USFWS, 2011).	103+ (USFWS, 2011)	No Mention	No Mention	High
<i>Isodendrion pyriform</i>	Kula wahine noho	72	HI	Endangered	Not Available	Not Available	5 (1 wild) (USFWS, 2015)	Known from Niihau, Oahu, Molokai, Maui, Lanai and Hawaii (USFWS, 1996).	95 (5 wild, 85 outplanted) (USFWS, 2015)	No Mention	No Mention	High
<i>Kadua cookiana</i>	Awiji	193	HI	Endangered	Not Available	Not Available	2 (USFWS, 2010)	Current range is Kauai. (NatureServe, 2015)	~100 (USFWS, 2010)	No Mention	No Mention	High
<i>Kadua cordata</i> ssp. <i>Remyi</i>	Kopa	194	HI	Endangered	Not Available	Not Available	1 (inferred from	It currently occurs on Lanai (NatureServe, 2015).	2 (USFWS, 2014)	No Mention	No Mention	High

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							USFWS, 2014)					
<i>Kadua coriacea</i>	Kio`ele	195	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Historically, <i>Kadua coriacea</i> was present on the islands of Oahu, Maui, and Hawaii. It is presently known from the islands of Maui and Hawaii. At least one plant is currently known on the island of Maui (West Maui Natural Area Reserve). On the island of Hawaii, plants are known from the Kipuka Kalawamauna Endangered Plants Habitat, along Charlie Circle, and near Kipuka Alala (U.S. Army 2003a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Kadua degeneri</i>	No common name	12	HI	Endangered	Unknown	Not Available	1 - 5 (NatureServe, 2015)	Endemic to Waianae Mountains, Oahu.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Kadua fluviatilis</i>	Kampua`a	13	HI	Endangered	Decreasing (USFWS, 2016)	Decline (USFWS, 2014)	11 on the islands of Oahu (7) and Kauai (4) (USFWS, 2014) Oahu: 1; Kauai: 2 (USFWS, 2016)	Currently, this species is known on Kauai from the northern Na Pali Coast and Halelea Forest Reserve, and in the southern Haupu Mountains. On Oahu, <i>Kadua fluviatilis</i> is found in the northern Koolau Mountains, on both the windward and leeward sides, ranging from Koloa gulch to Helemano Stream (HBMP 2008).	400-900 individuals (USFWS, 2014) Oahu: 20 - 25; Kauai: 500 (USFWS, 2016)	No Mention	No Mention	High
<i>Kadua laxiflora</i>	Pilo	196	HI	Endangered	Not Available	Not Available	2 (USFWS, 2011)	Current range includes Molokai, Maui and Lanai. (NatureServe, 2015)	~10 (USFWS, 2011)	No Mention	No Mention	High
<i>Kadua parvula</i>	No common name	197	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 - 5 (NatureServe, 2015)	<i>Kadua parvula</i> is endemic to the Waianae Mountains of Oahu and has been documented from Makaleha to Nanakuli valleys. Only two occurrences of <i>K. parvula</i> were known when the species was listed in 1991 (56 FR 55770). Most of the population units were recently discovered in the last 20 years. One occurrence on Ohikilolo Ridge indicates a major decline from 100 plants when discovered in 1993 to fewer than 20 plants in 2000 (Makua Implementation Team 2003). Overall, the Ohikilolo population unit appears to be increasing in numbers since the early 1990s. Currently, there are 418 known total individuals in two population units located on Federal and State lands (Table SB 20) (U.S. Army Garrison 2005b). Both population units exceed minimum numerical criteria for stabilization	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High

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								population units (defined as 50 mature, reproducing individuals per population unit) (USFWS, 2016). Endemic to Waianea Mountains of Oahu (NatureServe, 2015).				
<i>Kadua st.-johnii</i>	No common name	198	HI	Endangered	Not Available	Not Available	4 (USFWS, 2009)	Endemic to Northwest Kauai. (NatureServe, 2015)	<50 (USFWS, 2009)	No Mention	No Mention	High
<i>Kanaloa kahoowawensis</i>	Kohe malama malama o kanaloa	199	HI	Endangered	Not Available	Stable (USFWS, 2014)	1 (USFWS, 2014)	There is one natural occurrence on Kahoolawe and captive individuals on Kauai and Maui (USFWS, 2014).	Wild: 1; captive: 4 (USFWS, 2014)	No Mention	No Mention	High
<i>Keysseria (=Lagenifera) erici</i>	No common name	200	HI	Endangered	Unknown (NatureServe, 2015)	< 30% decline (NatureServe, 2015)	3 - 4 (USFWS, 2010)	Currently, populations occur at Namolokama, Hanakapiai-Wainiha ridge, In-between Bog, and at the Kilohana bogs (including Rain Gauge Bog, T Bog, and Platanthera Bog) (Kauai) (HBMP 2007) (USFWS, 2010).	Several thousand (USFWS, 2010)	No Mention	No Mention	High
<i>Keysseria (=Lagenifera) helenae</i>	No common name	201	HI	Endangered	Unknown (NatureServe, 2015)	Stable (NatureServe, 2015)	4 (NatureServe, 2015)	Currently, this species is found at Kauluwehi Bog in the Alakai Wilderness Preserve, at Waialeale, and on Kahili-Kawaikini Ridge (Kauai) (USFWS, 2010).	300 (NatureServe, 2015)	No Mention	No Mention	High
<i>Kokia kauaiensis</i>	Koki`o	202	HI	Endangered	Declining (USFWS, 2010)	Declining (USFWS, 2010)	5 (USFWS, 2010)	<i>Kokia kauaiensis</i> is known from northwestern Kauai in Paaiki Valley; Mahanaloa-Kuia Valley junction, the western side of Kalalau Valley, and Pohakuao Valley, both within Na Pali Coast State Park; and Koaie Stream branch of Waimea Canyon, where some plants may be within the boundary of the Alakai Wilderness Preserve. (USFWS, 1996)	45-50 (USFWS, 2010)	No Mention	No Mention	High
<i>Korthalsella degeneri</i>	Hulumoa	14	HI	Endangered	Decline of >10% (NatureServe, 2015)	Unknown (NatureServe, 2015)	1 - 5 (NatureServe, 2015)	On Oahu, is known from Makaha Valley. In addition, individuals of this species may also occur in Makua Valley and at Kahanahaikiis (USFWS, 2012).	250 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Labordia helleri</i>	Kamakahala	203	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	10 (USFWS, 2010a)	The largest population extends from the Na Pali Kona Forest Reserve into Kuia Natural Area Reserve (NAR). Other populations occur at upper Mahanaloa, Limahuli, Waioli, Kaunuohua ridge, Kohua ridge, Koaie stream, Kawaiiki, southeast Puu Kolo, and Puu Kolo-Kahuamoia (Kauai) (USFWS, 2010b).	350 - 550 (USFWS, 2010)	No Mention	No Mention	High
<i>Labordia lorenciana</i>	No common name	204	HI	Endangered	Not Available	Not Available	1 (USFWS, 2015)	Kawaiiki Valley, Kauai. Additional surveys for <i>L. lorenciana</i> have not been successful; however, experts believe this species may occur in other areas (Wood et al. 2007, p. 198) (USFWS, 2015).	4 (USFWS, 2015)	No Mention	No Mention	High
<i>Labordia lydgatei</i>	Kamakahala	205	HI	Endangered	Not Available	Not Available	5 (USFWS, 2009)	Currently known at Pali Eleele, Waioli Valley, Lelewi, Lumahai Valley, and Kapalaoa on Kauai (USFWS, 2003).	29 (USFWS, 2009)	No Mention	Lack of pollinators (USFWS, 1994)	High

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<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>	Kamakahala	206	HI	Endangered	Short-term trends suggest declines of >30% (NatureServe, 2015)	Not Available	1 (USFWS, 2009)	Current range: Wahiawa Drainage of Kauai. (NatureServe, 2015)	20-30 (USFWS, 2009)	No Mention	No Mention	High
<i>Labordia triflora</i>	Kamakahala	207	HI	Endangered	Not Available	Decreasing (USFWS, 2014)	4 (USFWS, 2014)	Occurs only on the island of Molokai (USFWS 2008; USFWS, 2014).	~4 (USFWS, 2014)	No Mention	No Mention	High
<i>Lepidium arbuscula</i>	`Anaunau	208	HI	Endangered	Unknown	Not Available	10 populations (USFWS, 2016)	Endemic to Waianae Mountains, Oahu (NatureServe, 2015). Currently, approximately 900 individuals in 10 small, widely dispersed occurrences are distributed from Kuaokala in the northern Waianae Mountains to Lualualei-Nanakuli Ridge in the southern Waianae Mountains. These occurrences include Ohikilolo, Makua-Keaau Ridge, Kapuhi Gulch, and Manini Gulch, Pahoia and Halona, northwest of Puu Kaua, Halona, Lualualei-Nanakuli Ridge, Kamaileunu Ridge, and Mohiakea Gulch (Table SB 23) (USFWS, 2015).	~900 individuals (USFWS, 2016)	No Mention	No Mention	High
<i>Lepidium orbiculare</i>	No common name	209	HI	Endangered	Not Available	Not Available	1 (USFWS, 2015)	It occurs on Mt. Haupu, on the island of Kauai (USFWS, 2015).	< 50 (USFWS, 2015)	No Mention	No Mention	High
<i>Lipochaeta fauriei</i>	Nehe	210	HI	Endangered	Apparently stable (USFWS, 2010)	Apparently stable (USFWS, 2010)	10 (USFWS, 2010)	<i>Lipochaeta fauriei</i> is now known from northwest Kauai at Haelele Valley, Kalalau Valley, Kawaiiki, Koaie Canyon, Kuia Valley, Mahanaloa, Pohakuao, Poomau Canyon, and Waiialae, Wood, 2008). Perlman also reports an occurrence on Waimea Canyon Rim (Perlman 2008). (USFWS, 2010)	185-240 (USFWS, 2010)	No Mention	No Mention	High
<i>Lipochaeta lobata</i> var. <i>leptophylla</i>	Nehe	15	HI	Endangered	Not Available	Not Available	2 (USFWS, 2011)	Since 2004, known from two populations on Oahu (Mikilua and Kolekole trail) (USFWS, 2011).	~150 (USFWS, 2011)	No Mention	No Mention	High
<i>Lipochaeta micrantha</i>	Nehe	211	HI	Endangered	Stable or fluctuating (USFWS, 2012)	Stable or fluctuating (USFWS, 2012)	4-6 (USFWS, 2012)	As of 2010, <i>Lipochaeta micrantha</i> existed on the island of Kauai at the Haupu Range ( <i>L. micrantha</i> var. <i>exigua</i> , two populations) and within the State-owned Na Pali-Kona Forest Reserve at Koaie Canyon and Kawaiiki Valley ( <i>L. micrantha</i> var. <i>micrantha</i> , two to four populations). (USFWS, 2012)	250-720 individuals (USFWS, 2012)	No Mention	No Mention	High
<i>Lipochaeta venosa</i>	No common name	16	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	<i>Lipochaeta venosa</i> is a narrow endemic species found on the island of Hawaii. The taxon was first collected at the Nohonaohae cinder cone. The species was later found on Puu Holoholoku and an unnamed	1000 - 2500 individuals (NatureServe, 2015)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								puu, the Heihei cinder cone, and the 1859 Mauna Kea lava flow. Currently, the species is known from five occurrences on the Keamuku Parcel and Parker Ranch including Puu Papapa, Puu Holoholoku, Puu Heihei, Puu Nohonaohae, and an unnamed puu east-northeast of Nohonaohae (see Figure 41 in the Transformation Biological Assessment). All occurrences are on the leeward side, northwest flank of Mauna Kea (U.S. Army 2003a).				
<i>Lipochaeta waimeaensis</i>	Nehe	95	HI	Endangered	Stable (USFWS, 2010)	Increasing (USFWS, 2010)	One (USFWS, 2010)	Current range includes type locality at rim of Waimea Canyon, Kauai. (NatureServe, 2015)	180 individuals (USFWS, 2010)	No Mention	No Mention	Medium
<i>Lobelia gaudichaudii ssp. koolauensis</i>	No common name	73	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Historically, <i>Lobelia gaudichaudii ssp. koolauensis</i> was known from two occurrences in the central Koolau Mountains on Oahu. Currently, this subspecies is known from two occurrences totaling 263 individuals; one occurrence in Waiawa-Waimano containing 237 individuals, and one occurrence of 26 individuals in south Kaukonahua (HINHP Database 2001; U.S. Army 2003a; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003). Occurrences of <i>L. gaudichaudii ssp. koolauensis</i> are declining, and those that remain are small and widely dispersed (U.S. Army 2003a; 61 FR 53089).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Lobelia monostachya</i>	No common name	212	HI	Endangered	Not Available	Not Available	2 (USFWS, 2012)	Southern Koolau Mountains of Oahu. (NatureServe, 2015)	13 (USFWS, 2012)	No Mention	No Mention	High
<i>Lobelia niihauensis</i>	No common name	96	HI	Endangered	Unknown	Not Available	~40 (USFWS, 2016)	It is now known to be extant only on Kauai and Oahu. On Oahu, this species is found on Ohikilolo Ridge, Kaimokuiki-Manuwai Ridge, Kamaileunu Ridge, Mt. Kaala, Makaha-Waianae Kai, Makua, Nanakuli, South Mohiakea Gulch, east of Puu Kalena, Kahanahaiki Valley, between Puu Hapapa and Puu Kanehoa, Puu Kailio, between Kolekole Pass and Puu Hapapa, North of Palikea, Puu Kaua-Kauhiuhi-Pahoa-Halona subdistricts, and Lualualei Naval Magazine (Table SB 24) (USFWS, 2016).	350-400 individuals (USFWS, 2016)	No Mention	No Mention	Medium
<i>Lobelia oahuensis</i>	No common name	213	HI	Endangered	Not Available	Not Available	7-8 (USFWS, 2011)	Koolau Mountains, and one recent occurrence in the Waianae Mountains, Oahu. (NatureServe, 2015)	48 to 68 (USFWS, 2011)	No Mention	Loss of pollinators (USFWS, 2011)	High

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<i>Lysimachia daphnoides</i>	lehua makanoe	214	HI	Endangered	Unknown (NatureServe, 2015)	Stable (NatureServe, 2015)	3 (USFWS, 2010a)	Currently, this species is found in the Alakai Wilderness Preserve and the Na Pali Kona Forest Reserve (Kauai) (USFWS, 2010b).	200 - 300 (USFWS, 2010a)	No Mention	No Mention	High
<i>Lysimachia filifolia</i>	No common name	215	HI	Endangered	Decreasing (USFWS, 2013)	Not Available	1 - 5 (NatureServe, 2015)	<i>Lysimachia filifolia</i> currently occurs on Kauai and Oahu. On Kauai, it was rediscovered in 2008 at Kamanu Ridge at the headwaters of Waikoko Stream. On Oahu, it occurs in the Koolau mountains in Waianu and Waiahole Valleys and Uwao (Uau) Gulch. (USFWS, 2013)	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Lysimachia iniki</i>	No common name	216	HI	Endangered	Not Available	Not Available	1 (USFWS, 2010a)	<i>Lysimachia iniki</i> is known from only a single occurrence in the headwaters of the Wailua River, Kauai Island, Hawaii (NatureServe, 2015).	40 (USFWS, 2010a)	No Mention	No Mention	High
<i>Lysimachia lydgatei</i>	No common name	217	HI	Endangered	Not Available	Not Available	2 (USFWS, 2011)	Currently known from at least three mountain summits (Lihau, Halepohaku, and Helu) of leeward West Maui (USFWS, 1997).	35 (USFWS, 2011)	No Mention	No Mention	High
<i>Lysimachia maxima</i>	No common name	218	HI	Endangered	Slight decrease (USFWS, 2014)	Not Available	2 (USFWS, 2014)	Current range includes the windward side of Molokai. (USFWS, 1998)	8 wild, 18 reintroduced (26 total) (USFWS, 2014)	No Mention	No Mention	High
<i>Lysimachia pendens</i>	No common name	219	HI	Endangered	Not Available	Majority of plants destroyed 1997 - 2003 (USFWS, 2010b)	1 (USFWS, 2010a)	Known only on Kauai (NatureServe, 2015).	8 (USFWS, 2010a)	No Mention	No Mention	High
<i>Lysimachia scopulensis</i>	No common name	220	HI	Endangered	Not Available	Not Available	2 (USFWS, 2010b)	It currently occurs in Kalalau and Puu Kii (Kauai) (USFWS, 2010b).	25 - 30 (USFWS, 2010b)	No Mention	No Mention	High
<i>Lysimachia venosa</i>	No common name	221	HI	Endangered	Unknown (NatureServe, 2015)	No plants found during 2006 surveys (USFWS, 2010b; see current range/distribution)	0 (USFWS, 2010a)	It is known only from the Waialeale area of Kauai, state of Hawaii (NatureServe, 2015). While no plants were found during surveys of the summit area in 2006, there is still additional habitat to be surveyed, and species experts believe <i>L. venosa</i> still exists (S. Perlman 2007; Wood 2006, p. 11) (USFWS, 2010b).	0 (USFWS, 2010a)	No Mention	No Mention	High
<i>Maesa walkeri</i>	No common name	97	GU, CNMI	Threatened	50% decline in range	Increasing (USFWS, 2015)	5 (USFWS, 2015)	It occurs on Guam and Rota (Mariana Islands). The cumulative data indicate that <i>Maesa walkeri</i> was once relatively abundant on Guam and Rota, and has	686+ (USFWS, 2015)	No Mention	No Mention	Medium

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					(USFWS, 2015)			since declined substantially on Guam (USFWS, 2015).				
<i>Melanthera kamolensis</i>	Nehe	17	HI	Endangered	Not Available	Not Available	1 (USFWS, 2014)	Current range: over about 100 acre area in Kamole and Kepuni gulches of East Maui. (USFWS, 2014)	30-40 (USFWS, 2014)	No Mention	No Mention	High
<i>Melanthera tenuifolia</i>	Nehe	18	HI	Endangered	Increasing long-term/decreasing short-term (USFWS, 2016)	Not Available	6 (USFWS, 2016)	<i>Melanthera tenuifolia</i> is endemic to the Hawaiian Islands and it historically occurred in the northern Waianae Mountains of Oahu (68 FR 35950) (USFWS, 2016).	3254 individuals (USFWS, 2016)	No Mention	No Mention	High
<i>Melicope adscendens</i>	Alani	19	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014)	Current range includes East Maui. (NatureServe, 2015)	~20 (USFWS, 2014)	No Mention	No Mention	High
<i>Melicope balloui</i>	Alani	222	HI	Endangered	Not Available	Not Available	1-2 (USFWS, 2011)	Current range includes East Maui. (USFWS, 1997)	~50 (USFWS, 2011)	No Mention	No Mention	High
<i>Melicope christophersenii</i>	Alani	20	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	3 (USFWS, 2012)	Currently, it occurs in the Waianae summit area, with the southernmost occurrence at Puu Hapapa (U.S. Army 2006; HBMP 2008) (USFWS, 2012).	250 (USFWS, 2012)	No Mention	No Mention	High
<i>Melicope degeneri</i>	Alani	223	HI	Endangered	Unknown (NatureServe, 2015)	Presumed extinct until rediscovery in 1993 (NatureServe, 2015)	2 (USFWS, 2010a)	Range of current occurrences is about 62 square km (NatureServe, 2015). <i>Melicope degeneri</i> was thought to be extinct until it was rediscovered in Pohakuao, just beyond the northwest corner of the Hono o Na Pali NAR, in 1993 (Wood 2000, p. 6), and subsequently observed in upper Hanakoa in 1995 and along Koaie Stream in 1999 (NTBG Accession Data 1999). The Pohakuao individual has not been relocated since its discovery (Wood 2000, p. 5). One small mature individual of <i>M. degeneri</i> was found growing in Koaie Canyon's upper drainage in 1999, and was last observed there in September of 2006 (K. Wood, pers. comm. 2007b). A new population of 9 individuals was found in Wainiha Valley (USFWS, 2010b).	11 (USFWS, 2010a)	No Mention	No Mention	High
<i>Melicope haupuensis</i>	Alani	224	HI	Endangered	Not Available	Not Available	3 (USFWS, 2009)	Known on Kauai, on State-owned land within the Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve in Kalahu, Awaawapuhi Valley, and Koaie Canyon (USFWS, 2003).	30 (USFWS, 2009)	No Mention	No Mention	High
<i>Melicope hiiakae</i>	Alani	225	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	10 (USFWS, 2012)	Endemic to the Koolau Mountains on the island of Oahu, state of Hawaii. The range of the current populations is less than 400 square km. (NatureServe, 2015)	60 (USFWS, 2012)	No Mention	No Mention	High

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<i>Melicope knudsenii</i>	Alani	21	HI	Endangered	Not Available	Increasing (USFWS, 2011)	Not Available	Current range includes Kauai and East Maui (NatureServe, 2015).	8 wild, 1 reintroduced (USFWS, 2011)	No Mention	No Mention	Medium
<i>Melicope lydgatei</i>	Alani	226	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	<i>Melicope lydgatei</i> was formerly known throughout the Koolau Mountains of Oahu from Hauula to Kahana, Kipapa Gulch to Waimano, and Kalihi Valley to Wailupe Valley. Currently, two known occurrences containing between 39 and 40 individuals are known in the wild. One occurrence occurs in the Manana area and contains one or two individual plants. The other occurrence with 38 plants is along Opaepala/lower Peahinaia trail. No seedlings have been observed at these occurrences but juveniles are present (HINHP Database 2001; U.S. Army 2003a; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Melicope mucronulata</i>	Alani	227	HI	Endangered	Not Available	Not Available	2 (USFWS, 2014)	Known from only one location each on Maui and Molokai (USFWS, 1997)	5 (USFWS, 2014)	No Mention	No Mention	High
<i>Melicope munroi</i>	Alani	22	HI	Endangered	Not Available	Not Available	1 (USFWS, 2012)	Ken Wood (National Tropical Botanical Garden, pers. comm. 2010) has observed individuals of <i>M. munroi</i> from Kunoa, Hauola, and Lopa Gulches, and in the drainage emptying into Waiopae Gulch, south of Kahinahina Ridge in Lanai (USFWS, 2012).	300 - 800 (USFWS, 2012)	No Mention	No Mention	High
<i>Melicope ovalis</i>	Alani	228	HI	Endangered	Not Available	Not Available	4 (USFWS, 2011)	Current range includes East Maui. (NatureServe, 2015)	>110 (USFWS, 2011)	No Mention	No Mention	High
<i>Melicope pallida</i>	Alani	229	HI	Endangered	Not Available	Not Available	7 (USFWS, 2010)	Present in 7 valleys on northwestern Kauai (USFWS, 2010).	217 to 296 (USFWS, 2010)	No Mention	No Mention	High
<i>Melicope paniculata</i>	Alani	230	HI	Endangered	Unknown (NatureServe, 2015)	Presumed extinct until rediscovery in 1997, declining (NatureServe, 2015)	6 (USFWS, 2010a)	Currently, <i>M. paniculata</i> is known from Limahuli Valley, the north fork of the Wailua River, along Koaie Stream, and on the ridge between Hulua and Kapalaoa (Kauai) (USFWS, 2010b).	200 (USFWS, 2010a)	No Mention	No Mention	High
<i>Melicope puberula</i>	Alani	231	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	3 (USFWS, 2010a)	Currently, this species is known from the south rim of Kalalau east to the Alakai-Kilohana plateau area, and north into Hono o Na Pali NAR (HBMP 2007) (USFWS, 2010b).	900 (USFWS, 2010a)	No Mention	No Mention	High

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<i>Melicope quadrangularis</i>	Alani	232	HI	Endangered	No living individuals known (USFWS, 2010)	Not Available	None known (USFWS, 2010)	Currently known from the type locality in the Wahiawa Bog region of Kauai (USFWS, 2003).	Not Available	No Mention	No Mention	High
<i>Melicope reflexa</i>	Alani	233	HI	Endangered	Not Available	Not Available	2 (USFWS, 2011)	Endemic to Eastern Molokai (NatureServe, 2015).	<6 plants (USFWS, 2011)	No Mention	No Mention	High
<i>Melicope saint-johnii</i>	Alani	234	HI	Endangered	Not Available	Not Available	4 (USFWS, 2011)	The species is endemic to Oahu (NatureServe, 2015).	200 (USFWS, 2011)	No Mention	No Mention	High
<i>Melicope zahlbruckneri</i>	Alani	235	HI	Endangered	Not Available	Decreasing (USFWS, 2015)	3 (inferred from USFWS, 2015)	Current range includes the Island of Hawaii (NatureServe, 2015). It occurs in Kipuka Puaulu, Kipuka Ki (Big Island Plant Extinction Program 2006), and the Laupahoehoe Natural Area Reserve (USFWS, 2008). Individuals have been reintroduced into Boundary Kipuka Ahi (Hawaii Volcanoes National Park 2012) (USFWS, 2015).	25 wild, 38 reintroduced (USFWS, 2015)	No Mention	No Mention	High
<i>Mucuna sloanei</i> var. <i>persericea</i>	Sea bean	23	HI	Endangered	Not Available	Not Available	5 (USFWS, 2016)	Endemic to East Maui from Makawao to Wailua Iki (Wagner et al. 2012). (NatureServe, 2015)	~200 (USFWS, 2016)	No Mention	No Mention	High
<i>Myrsine fosbergii</i>	Kolea	24	HI	Endangered	Declining	Unknown	14 on Kauai (9) and Oahu (5)	Currently known from widely scattered populations along the Koolau summit ridge on Oahu from Schofield to Puu Kahuauli. On Kauai, this species is known from the Wahiawa Mountains and Wahiawa Drainage Basin, Kawaiula Valley, Limahuli Valley, Namolokama, Kalalau, Hanakapiai, and Mt. Haupu (HBMP 2008; Wood, in litt. 2005; 2007).	Oahu: < 30; Kauai: 55 (USFWS, 2016)	No Mention	No Mention	High
<i>Myrsine juddii</i>	Kolea	25	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	<i>Myrsine juddii</i> has been reported from only three occurrences in the central Koolau Mountains: the north Kaukonahua-Kahana summit divide, Peahinaia trail, and Puu Kainapuaa to Poamoho trail. Currently, one occurrence of approximately 3,000 <i>M. juddii</i> are known in the wild. It is located between Puu Kainapuaa and north Kaukonahua in the Koolau Mountains (U.S. Army 2003a; J. Lau, HINHP, pers. comm. 2003; K. Kawelo, U.S. Army, pers. comm. 2003).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Myrsine knudsenii</i>	Kolea	236	HI	Endangered	Not Available	Not Available	3 (USFWS, 2010a)	Currently, the species is known from Honopu, Awaawapuhi, and Nualolo (Kauai) (S. Perlman 2007; Wood et al. 2001, p. 10; Wood et al. 2002, p. 15; HBMP 2007; Wood 4907 (BISH)) (USFWS, 2010b).	30 (USFWS, 2010a)	No Mention	No Mention	High
<i>Myrsine linearifolia</i>	Kolea	237	HI	Threatened	Not Available	Declining (USFWS, 2010)	12 (USFWS, 2010)	<i>Myrsine linearifolia</i> grows in the Wahiawa Mountains, near Kapalaoa summit, south of a peak	164 - 197 wild, 17 outplants	No Mention	No Mention	High

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								off the ridge between Hanapepe valley and Wahiawa drainage (USFWS, 2010).	(USFWS, 2010)			
<i>Myrsine mezii</i>	Kolea	238	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	2 (USFWS, 2010a)	It is known from the Koaie Canyon area of western Kauai (N. Tangalin 2007b) (USFWS, 2010b).	5 (USFWS, 2010a)	No Mention	No Mention	High
<i>Myrsine vaccinioides</i>	Kolea	239	HI	Endangered	Long-term trends indicate declines of greater than 10%, whereas short-term trends suggest declines of 10-70% (NatureServe, 2015)	Not Available	4 (USFWS, 2016)	Endemic to the island of Maui (West Maui only), state of Hawaii. Total range is about 6 square km (NatureServe, 2015).	<1,000	No Mention	No Mention	High
<i>Neraudia ovata</i>	No common name	240	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	<i>Neraudia ovata</i> is known currently and historically only from the island of Hawaii. The species is found on the Kona coast from North Kona to Kau. There are only 13 individuals persisting on the island of Hawaii. There is one individual in Kaloko, North Kona; one individual in the Manuka Natural Area Reserve; 10 individuals in three locations at PTA, and one individual on State land outside of PTA (U.S. Army 2003a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Nesogenes rotensis</i>	No common name	241	CNMI	Endangered	Not Available	Not Available	2 (USFWS, 2012)	Known from a single collection at Haaniya Point (Poña Point Fishing Cliff), Palie area, Rota, Mariana Islands (USFWS, 2012).	30-40 (USFWS, 2012)	No Mention	No Mention	High
<i>Nothoestrum breviflorum</i>	`Aiea	242	HI	Endangered	Not Available	Not Available	10 (USFWS, 2012)	Current range includes the Island of Hawaii (NatureServe, 2015).	< 150 wild, 79 outplants (USFWS, 2012)	No Mention	No Mention	High
<i>Nothoestrum latifolium</i>	`Aiea	243	HI	Endangered	Unknown, but likely declining	Unknown, but likely declining; very little recruitment observed.	18 on the islands of Kauai, Lanai, Maui, Molokai, Oahu	Currently, <i>Nothoestrum latifolium</i> is known from Kalalau on Kauai, Kanepuu on Lanai, Kapunakea Preserve in the west Maui Mountains, Auwahi to Puu Mahoe in the east Maui Mountains, Puu Kolekole and Makolelau on Molokai, and several gulches in the Waianae Mountains of Oahu (HBMP 2008).	~1,600 individuals	No Mention	No Mention	High
<i>Nothoestrum peltatum</i>	`Aiea	244	HI	Endangered	Not Available	Not Available	7 (USFWS, 2009)	It currently occurs in upper Nualolo, Awaawapuhi, and northwestern Kauai (USFWS, 2009).	23 (USFWS, 2009)	No Mention	No Mention	High

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<i>Nototrichium humile</i>	Kulu`i	245	HI	Endangered	Increasing (USFWS, 2016)	Not Available	16 (USFWS, 2016)	Current range: Waianae Mountains of Oahu; also known historically from Lualailua Hills on Maui (NatureServe, 2015). The status of <i>N. humile</i> on Maui is uncertain as no reports have been documented since 1979 (68 FR 25934). When the species was listed in 1991, 11 occurrences were estimated to contain up to 3,000 individuals on Oahu. Since then, 16 population units have been identified with a total of about 1,296 individuals. These population units are found on Federal, State, and city/county lands (68 FR 35950). No information is available on the current existence or numbers of <i>N. humile</i> on Maui (USFWS, 2016).	1500-3000 (USFWS, 2016)	No Mention	No Mention	High
<i>Ochrosia haleakalae</i>	Holei	86	HI	Endangered	Not Available	Not Available	Maui: 4, Hawaii: 3 (USFWS, 2016)	<i>Ochrosia haleakalae</i> is currently known from Makawao FR and Auwahi/Kanaio on the island of Maui, and from Kohala FR (Honopue gulch), Waipio, Hilo FR (Laupahoehoe section), Hamakua FR (Kalopa gulch), and at Hawaii Volcanoes National Park on the island of Hawaii (Pratt 2005, in litt.; Agorastos 2007, pers. comm.; Medeiros 2007, in litt.; HBMP 2008; Oppenheimer 2008, in litt.).	Maui: 15, Hawaii: 151 wild, 150 outplanted (USFWS, 2016)	No Mention	No Mention	High
<i>Ochrosia kilaueaensis</i>	Holei	87	HI	Endangered	This species has not been observed in the wild since at least the 1940s (USFWS, 2012)	Possibly extinct (USFWS, 2012)	None known (NatureServe, 2015)	There are currently no known individuals in the wild (USFWS, 2012).	None known (NatureServe, 2015)	No Mention	No Mention	High
<i>Osmoxylon mariannense</i>	No common name	74	CNMI	Endangered	Not Available	Not Available	1 (USFWS, 2007)	Endemic to Rota in the Mariana Islands (USFWS 2004b).	10 (8 wild) (USFWS, 2007)	No Mention	No Mention	High
<i>Peperomia subpetiolata</i>	`Ala `ala wai nui	246	HI	Endangered	Long-term trends are unknown, whereas short-term trends suggest declines of 10-30%	Not Available	1 (NatureServe, 2015)	Restricted to the northwestern (windward) slope of Haleakala, east Maui, Hawaiian Islands (USFWS 2004). (NatureServe, 2015)	<50 (NatureServe, 2015)	No Mention	No Mention	High

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					(NatureServe, 2015)							
<i>Peucedanum sandwicense</i>	Makou	247	HI	Threatened	Stable (USFWS, 2016)	Not Available	10 (USFWS, 2016)	Current populations from Kauai and Maui; historical records from Molokai.	1000-5000 (USFWS, 2016)	No Mention	No Mention	High
<i>Phyllanthus saffordii</i>	No common name	75	Guam	Endangered	Decreasing (USFWS, 2015)	Not Available	4 (USFWS, 2015)	Currently, <i>P. saffordii</i> is known from 4 scattered occurrences on southern Guam, totaling fewer than 1,400 individuals (Gutierrez 2013, in litt.; Gawel et al. 2013, in litt.). (USFWS, 2015)	<1,400 (USFWS, 2015)	No Mention	No Mention	High
<i>Phyllostegia bracteata</i>	No common name	26	HI	Endangered	Long-term trends are unknown, whereas short-term trends suggest 10-30% (NatureServe, 2015)	Not Available	1-3 (NatureServe, 2015)	Island of Maui, state of Hawaii. Reported from both East Maui and West Maui. (NatureServe, 2015)	<100 (NatureServe, 2015)	No Mention	No Mention	High
<i>Phyllostegia brevidens</i>	No common name	27	HI	Endangered	Not Available	Not Available	0 (NatureServe, 2015)	No current range. (NatureServe, 2015)	Unknown (NatureServe, 2015)	No Mention	No Mention	High
<i>Phyllostegia floribunda</i>	No common name	28	HI	Endangered	Long-term trends are unknown, whereas short-term trends suggest declines of 10-30% (NatureServe, 2015)	High seedling mortality (USFWS, 2013)	12 (USFWS, 2013)	Found only on the island of Hawaii. Currently, there are 2 occurrences within HVNP, at Kamoamoa (1 individual) (HBMP 2010h) and near Napau Crater (4 individuals) (Pratt 2005, in litt.; Pratt 2007b, in litt.; HBMP 2010h); 1 occurrence behind the Volcano solid waste transfer station (10 to 50 individuals) (Flynn 1984, in litt.; Perlman and Wood 1993—Hawaii Plant Conservation Maps database; Pratt 2007b, in litt.; HBMP 2010h); 1 occurrence (with an unknown number individuals) in the Wao Kele O Puna NAR (HBMP 2010h); 1 occurrence with 20 individuals in a fenced enclosure in the Upper Waiakea FR (Perry 2012, in litt.); at least 1 occurrence each (with a few individuals each) in the Puu Makaala NAR, Waiakea FR, and TNC's Kona Hema Preserve (PR) (Perry 2006, in litt.; Perlman 2007, in litt.; Giffin 2009, in litt.; PEPP 2008, pp. 106–107; Perlman et al. 2008, in litt.; Pratt 2008a, in litt.; Pratt 2008b, in litt.; Agorastos 2010, in litt.); 2 occurrences (each with an unknown number of individuals) from the South Kona FR; 1 occurrence (one individual) in the Kipahoe NAR; and 1	< 100 (USFWS, 2013)	No Mention	No Mention	High

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								occurrence (with an unknown number of individuals) in the Lapauhoehoe NAR (Moriyasu 2009, in litt.; HBMP 2010h; Agorastos 2010, in litt.) (USFWS, 2013).				
<i>Phyllostegia haliakalae</i>	No common name	248	HI	Endangered	Short-term trends indicate declines of >30% (NatureServe, 2015)	Not Available	0 wild, 100 outplanted (USFWS, 2016)	No extant occurrences known. (NatureServe, 2015)	0 (USFWS, 2016)	No Mention	No Mention	High
<i>Phyllostegia helleri</i>	No common name	249	HI	Endangered	Not Available	Not Available	1 (USFWS, 2016)	This species is currently known from fewer than 10 individuals scattered in Wainiha Valley, which lies within the Wainiha Preserve, on the island of Kauai (PEPP 2014, in litt.). (USFWS, 2014)	4 (USFWS, 2016)	No Mention	No Mention	High
<i>Phyllostegia hirsuta</i>	No common name	250	HI	Endangered	Not Available	Not Available	19	Currently, between 243 and 254 individuals are known to be extant in 19 occurrences at south Halemano (4 individuals), Opaepala (2), Kawai Iki (2), south branch of north Kaukonahua (1), north Kaukonahua and Poamoho (1), Kawainui (2), north Halemano and Punaluu (1), north Mohiakea Gulch (50), Waianae Kai/Haleauau Ridge (20), central Haleauau (20), south Kaukonahua (9), Puu Hapapa (20), leeward Puu Kaua (1), Ekahanui (51), Kaluaa (30), north Huliwai (20 to 30), Makaha/Waianae Kai Ridge (2 to 3), Kaluanui (6), and Kaipapau (1) (K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).	~ 234 - 254	No Mention	No Mention	High
<i>Phyllostegia manni</i>	No common name	251	HI	Endangered	Extirpated from Maui (USFWS, 1996)	Declining (USFWS, 2011; 2016)	1 (inferred from USFWS, 2016; see current range/distribution)	Currently, it occurs on Molokai in Hanalilolilo (USFWS, 2016).	3 wild (USFWS, 2016); 18 outplants (USFWS, 2011)	No Mention	No Mention	High
<i>Phyllostegia parviflora</i>	No common name	252	HI	Endangered	Not Available	Slightly decreasing (USFWS, 2015)	3 (USFWS, 2015)	<i>P. parviflora</i> var. <i>glabriuscula</i> is known only from Hawaii Island, <i>P. parviflora</i> var. <i>parviflora</i> is found on Maui and in the Koolau Mountains of Oahu, and <i>P. parviflora</i> var. <i>lydgatei</i> is known from the Waianae Mountains of Oahu (Wagner 1999) (USFWS, 2015).	~175 wild; 6 outplanted (USFWS, 2015)	No Mention	No Mention	High
<i>Phyllostegia pilosa</i>	No common name	29	HI	Endangered	Not Available	Not Available	2 (USFWS, 2016)	It occurs west of Puu o Kakaie on east Maui (USFWS, 2016).	7 (USFWS, 2016)	No Mention	No Mention	High

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<i>Phyllostegia racemosa</i>	Kiponapona	253	HI	Endangered	Extinct in the wild (USFWS, 2012)	Not Available	1 (USFWS, 2012)	<i>Phyllostegia racemosa</i> is endemic to the Island of Hawaii. It occurs on the windward slopes of Mauna Kea and Mauna Loa (USFWS, 2012).	24 mature (USFWS, 2012)	No Mention	No Mention	High
<i>Phyllostegia renovans</i>	No common name	254	HI	Endangered	Not Available	Not Available	4 (USFWS, 2010a)	It is currently known from Limahuli Valley, Wainiha, Kalalau Valley, Lumahai Valley, Kapalaoa, and the headwaters of Kamooloa Stream (Kauai) (K. Wood 1994, p. 4; Wagner 1999, p. 275; HBMP 2007, D. Burney, NTBG, pers. comm. 2009) (USFWS, 2010b).	30 (USFWS, 2010a)	No Mention	No Mention	High
<i>Phyllostegia stachyoides</i>	No common name	255	HI	Endangered	Not Available	Not Available	Molokai: 5 (USFWS, 2016)	Current range in Molokai, Maui, Hawaii. (NatureServe, 2015)	Maui: 15, Molokai: < 30 (USFWS, 2016)	No Mention	No Mention	High
<i>Phyllostegia velutina</i>	No common name	256	HI	Endangered	Not Available	121 reintroductions since 1991 (USFWS, 2012)	3 - 4 (USFWS, 2012)	Current range includes slopes of Mauna Loa, Hawaii (NatureServe, 2015). It occurs in Puuwaawaa, Honuaula Forest Reserve, and Kulani /Keauhou area (USFWS, 2012).	> 116 (USFWS, 2012)	No Mention	No Mention	High
<i>Phyllostegia waimeae</i>	No common name	257	HI	Endangered	Not Available	Not Available	1 (USFWS, 2003)	<i>Phyllostegia waimeae</i> is currently known to occur in two locations on Kauai; Kawaiiki and the Koaie drainage above Twin Falls (USFWS, 2008).	6 (USFWS, 2003)	No Mention	No Mention	High
<i>Phyllostegia warshaueri</i>	No common name	258	HI	Endangered	Not Available	Not Available	4 - 7 (inferred from USFWS, 2012)	Current range includes Northern Island of Hawaii (NatureServe, 2015). Individuals have been reintroduced at Kohala, Laupahoehoe Natural Area Reserve, and Puuwaawaa (USFWS, 2012).	3 wild, 197 reintroduced (USFWS, 2012)	No Mention	No Mention	High
<i>Phyllostegia wawrana</i>	No common name	98	HI	Endangered	Not Available	Increasing (USFWS, 2009)	3 (USFWS, 2009)	It currently occurs in Koaie Canyon, Moaalele, Awaawapuhi Valley, and Makaleha on State-owned land within the Alakai Wilderness Preserve, Hono o Na Pali NAR, and Kokee State Park (GDSI 2000; HINHP Database 2000) (USFWS, 2003).	45 - 55 (USFWS, 2009)	No Mention	No Mention	Medium
<i>Pittosporum halophilum</i>	No common name	30	HI	Endangered	Decreasing (USFWS, 2016)	Not Available	3 (USFWS, 2016)	Known only from Molokai (USFWS 2012). This species was reported from Huelo islet, Mokapu Island, Okala Island, and Kukaiwaa peninsula (USFWS, 2016).	5 wild, 17+ outplants (USFWS, 2016)	No Mention	No Mention	High
<i>Pittosporum hawaiiense</i>	No common name	31	HI	Endangered	No information found.	Not Available	Not Available	Endemic to leeward Hawaii Island (NatureServe, 2015)	~175 (USFWS, 2013)	No Mention	Lack of regeneration and hybridization (USFWS, 2013)	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Pittosporum napaliense</i>	Ho`awa	259	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	3 (USFWS, 2010a)	Currently, this species is known from the Hono o Na Pali NAR in Waiahuakua and Hoolulu valleys, and upper Kalalau Valley in the Na Pali Coast State Park (Kauai) (HBMP 2007) (USFWS, 2010b).	160 - 200 (USFWS, 2010a)	No Mention	No Mention	High
<i>Plantago hawaiiensis</i>	Kuahiwi laukahi	260	HI	Endangered	Not Available	Not Available	5 (USFWS, 2012)	Since 1975, eight populations have been identified on Hawaii island, in North and South Hilo, Waiakea Forest Reserve, Hawaii Volcanoes National Park, Kapapala and Puu Waawaa (USFWS, 1996).	300 - 400 wild, 303 outplants (NatureServe, 2015)	No Mention	No Mention	High
<i>Plantago princeps</i>	Kuahiwi laukahi	88	HI	Endangered	Increasing (USFWS, 2016)	Not Available	9 (USFWS, 2016)	Survey data indicate <i>P. princeps</i> var. <i>princeps</i> , a woody variety, is currently the only variety extant on Oahu. <i>Plantago princeps</i> var. <i>princeps</i> has been recorded from three general areas on Oahu, including the leeward Waianae Mountains, windward Waianae Mountains, and southeastern Koolau Mountains (Kalihi, Nuuanu, and Manoa valleys) (USFWS, 2016).	354 (USFWS, 2016)	No Mention	No Mention	High
<i>Platydesma cornuta cornuta</i>	No common name	32	HI	Endangered	Long-term trends are unknown, whereas short-term trends indicate declines of 10-30% (NatureServe, 2015)	Not Available	9 (USFWS, 2012)	Endemic to the Koolau Mountains on the island of Oahu, state of Hawaii. (NatureServe, 2015)	~50 (USFWS, 2012)	No Mention	No Mention	High
<i>Platydesma remyi</i>	No common name	33	HI	Endangered	The long term population trend is unknown (NatureServe, 2015)	Declining (USFWS, 2013)	8 (USFWS, 2013)	All current occurrences are found in the Laupahoehoe NAR or in closely surrounding areas (USFWS, 2013).	< 40 wild, 29 outplanted (USFWS, 2013)	No Mention	No Mention	High
<i>Platydesma rostrata</i>	Pilo kea lau li`i	261	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	6 (USFWS, 2010a)	Currently, this species is found in the Na Pali Kona Forest Reserve on the Awaawapuhi and Honopu trails; in Halelea Forest Reserve at Lumahai; in Hono o Na Pali NAR at Pihea; in Kunia NAR on the Nualolo Trail; in Mahanaloa and Kuia valleys; and in the Lihue-Koloa Forest Reserve at Pohakupele, Hulua, Kapalaoa, and Iiiliula Valley (Kauai) (HBMP 2007) (USFWS, 2010b).	100 (USFWS, 2010a)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Polyscias bisattenuata</i>	No common name	76	HI	Endangered	Not Available	Not Available	2 (USFWS, 2010)	This species is known only from the Haupu and Kahili regions of Kauai. (USFWS, 2010)	37 (USFWS, 2010)	No Mention	No Mention	High
<i>Polyscias flynnii</i>	No common name	262	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	This species is known only from Hawaii, and specifically is known from the island of Kaua'i. (NatureServe, 2015)	3 (NatureServe, 2015)	No Mention	No Mention	High
<i>Polyscias gymnocarpa</i>	ʻOhe`ohe	263	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	<i>Polyscias gymnocarpa</i> was historically known from Punaluu, Waikakalaua Gulch, Mount Olympus, and the region between Niu and Wailupe in the Koolau Mountains of Oahu. This species was also observed in the Waianae Range at Palikea in 1954. Currently, <i>P. gymnocarpa</i> is restricted to 16 occurrences totaling at least 176 individuals in the summit regions of the Koolau Mountains (Wagner et al. 1999; K. Kawelo, pers. comm. 2003; J. Lau, pers. comm. 2003). Specifically, these occurrences are found at Paumalu and Kaunala Gulches (4 individuals), lower Peahinaia trail (2), lower Kawai Iki (8), Peahinaia trail (midreach; 1), Kawaiiloa trail (1), upper Kawai Iki (1), south Kaukonahua summit (1), Waimano to south Kaukonahua Gulch (at least 25), Waikakalaua (1), Kaipapapa to Kaluanui (at least 25), Kawalao to Waiiau (25), Aiea trail (2), Halawa-Haiku Ridge to Moanalua-Haiku Ridge (at least 25), Puu Keahiakahoe (21), Konahuanui (9), and East Honolulu-Wiliwili Nui to Kuliouou (at least 25) (Wagner et al. 1999; J. Lau, HINHP, pers. comm. 2003; K. Kawelo, U.S. Army, pers. comm. 2003).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Polyscias lydgatei</i>	No common name	264	HI	Endangered	Not Available	Not Available	2 (USFWS, 2012)	A tree in the gingseng family that grows up to 10m tall in mesic native forest of the southern Ko'olau mountains of Oahu (2019 5-year Review).	42 (8 wild, 34 outplanted) (USFWS, 2012; NatureServe, 2015)	No Mention	No Mention	High
<i>Portulaca sclerocarpa</i>	Po`e	77	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	The historic and current locations of <i>Portulaca sclerocarpa</i> are limited to the islands of Lanai and Hawaii. On the island of Lanai, plants are found on the Poopoo Islet. On the island of Hawaii, the species occurs in the Nohonaohae area, at Puu Anahulu, near Puu Keani and Lehua, and at PTA (see Figure 43 in the Transformation Biological Assessment). At PTA, the species occurs in Kipuka Kalawamauna Endangered Plant Habitat, north and west of Kipuka	1000 - 2500 individuals (NatureServe, 2015)	No Mention	No Mention	High

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								Alala, and on the 1859 Mauna Kea lava flow (U.S. Army 2003a).				
<i>Portulaca villosa</i>	Ihi	78	HI	Endangered	Not Available	Not Available	Molokai: 1, Maui: 2, Kahoolawe: 1, Hawaii: 5 (USFWS, 2016)	<i>Portulaca villosa</i> is endemic to the Hawaiian Islands. In the Northwestern Hawaiian Islands it occurs on the island of Nihoa. In the main islands, it has been documented from Kaula (a little island south of Niihau), Oahu, Molokai, Maui, Lanai, Kahoolawe, and Hawaii. It is unrecorded on Niihau and Kauai. (NatureServe, 2015) <i>Portulaca villosa</i> has been observed on the small islets of Kaula and Lehua (west of Kauai and Niihau), and on Nihoa (NWHI); however, the current status of these occurrences is unknown (USFWS, 2016).	Molokai: ~3, Maui: 26, Kahoolawe: < 15, Hawaii: 10 (USFWS, 2016)	No Mention	No Mention	High
<i>Pritchardia hardyi</i>	(=Na`ena`e) lo`ulu	79	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	2 (USFWS, 2010a)	Known only on Kauai (NatureServe, 2015).	300 (USFWS, 2010a)	No Mention	No Mention	High
<i>Pseudognaphalium (=Gnaphalium) sandwicensium var. molokaiense</i>	`Ena`ena	265	HI	Endangered	Not Available	Not Available	3 populations: Molokai (2) and Maui (1) (USFWS, 2016)	Currently this variety is found on the Hawaiian islands of Molokai and Maui (USFWS, 2016).	200 to 20,000 individuals, depending on rainfall	No Mention	No Mention	High
<i>Psychotria grandiflora</i>	Kopiko	34	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	10 (USFWS, 2010a)	Currently, populations of <i>P. grandiflora</i> are found only within Kokee State Park (USFWS, 2010b).	16 - 30 (USFWS, 2010a)	No Mention	No Mention	High
<i>Psychotria hexandra ssp. oahuensis</i>	Oahu wild coffee (=kopiko)	35	HI	Endangered	Short-term trends suggest declines of 10-30% (NatureServe, 2015)	Not Available	3 (NatureServe, 2015)	Recorded from north-central Koolau Mountains, island of Oahu, state of Hawaii. (NatureServe, 2015)	<20 (NatureServe, 2015)	No Mention	No Mention	High
<i>Psychotria hobdyi</i>	Kopiko	266	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	10 (USFWS, 2010a)	Currently, this species is known from Kawaiula Valley, the junction of Mahanaloa Valley and Kuia Valley, Mahanaloa Valley, Paaiki Valley, Poopooiki Valley, and upper Kalalau Valley (Kauai) (HBMP 2007) (USFWS, 2010b).	120 (USFWS, 2010a)	No Mention	No Mention	High
<i>Psychotria malaspiniae</i>	Aplokating-palpoan	267	GU	Endangered	Not Available	Not Available	4 (USFWS, 2015)	It currently occurs on Guam (Mariana Islands) (USFWS, 2015).	5 (USFWS, 2015)	No Mention	No Mention	High
<i>Pteralyxia kauaiensis</i>	Kaulu	89	HI	Endangered	Not Available	Declining (USFWS, 2010)	10 (USFWS, 2010)	Since 2003, it has been observed in Limahuli Valley, Mt. Kahili, Hanakapiai Valley, Mahanaloa Valley, Hipalau Valley, two locations in Kalalau Valley,	330 - 700 (USFWS, 2010)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								Koaie, Kawaiiki, and Makaha (Kauai) (USFWS, 2003).				
<i>Pteralyxia macrocarpa</i>	Kaulu	90	HI	Endangered	Unknown (NatureServe, 2015)	Unknown (NatureServe, 2015)	40 (USFWS, 2012)	On island of Oahu in the state of Hawaii, found from Kapuhi Gulch to North Palawai Gulch in the Waianae Mountains (USFWS, 2012).	291 - 347 individuals (USFWS, 2012)	No Mention	No Mention	High
<i>Ranunculus hawaiiensis</i>	Makou	268	HI	Endangered	Decreasing	Decreasing	Six: Three on State land (Mauna Kea and Kapapala Forest Reserves (FR) on the island of Hawaii); two populations on Federal land (Hawaii Volcanoes National Park and Hakalau NWR on the island of Hawaii); and one population on State land on Maui (Waikamoi Preserve).	<i>Ranunculus hawaiiensis</i> is found on the island of Hawaii on unencumbered State land adjacent to Kipahoe Natural Area Reserve (NAR), in Hawaii Volcanoes National Park Kahuku section, at Kapapala FR, and Mauna Kea FR at Puu Kanakaleonui and north Kolekole Gulch. On Maui, this species is known from one sighting on a cliff in the Waikamoi Preserve (Bio, in litt. 2008; Pratt, in litt. 2008; Oppenheimer, in litt. 2006; Agorastos, in litt. 2011).	<100	No Mention	No Mention	High
<i>Ranunculus mauianus</i>	Makou	269	HI	Endangered	Unknown	Unknown	14 on the islands of Maui, Molokai, and Kauai	Currently, <i>Ranunculus mauianus</i> is known from three islands, Kauai (Kokee State Park and Na Pali Kona); Maui, both east (Waikamoi Preserve, Makawao Forest Reserve, and Manawainui) and west (Kapunakea Preserve, West Maui Forest Reserve, and West Maui Natural Area Reserve); and Molokai (Kamakou Preserve) (Wood, in litt. 2007; HBMP 2008; Oppenheimer, in litt. 2008).	Kauai: 53, Maui: 112, Molokai: 2 (USFWS, 2016b)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Sanicula mariversa</i>	No common name	270	HI	Endangered	Unknown	Not Available	4 (USFWS, 2016)	Currently, <i>S. mariversa</i> occurs in four population units totaling approximately 224 individuals, none of which is stable (Table SB 32). These population units are found on Federal, State, and city/county lands (68 FR 35950) (USFWS, 2016).	~224 (USFWS, 2016)	No Mention	No Mention	High
<i>Sanicula purpurea</i>	No common name	80	HI	Endangered	Not Available	Not Available	13	<i>Sanicula purpurea</i> is known from Oahu and Maui. On Oahu, it occurred along the Koolau Mountain summit crest from 700 to 1,698 m (2,300 to 5,570 ft) elevation on wet, windswept slopes. Currently, on Oahu, 45 individuals are found as part of six occurrences at Helemano-Punaluu divide (10 individuals), north Kaukonahua-Punaluu Summit (8), Kaukonahua-Kahana summit (22), Waimalu-Kahaluu summit divide (1), Puu Keahiakahoe (1), and Wailupe-Waimanalo summit divide (3) (HINHP Database 2001; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003). On West Maui, 200 individuals are distributed throughout seven scattered occurrences along 2.5 km (1.6 mi) of the Puu Kukui trail and on the West Maui Natural Area Reserve in the Puu Kukui watershed. In total, there are 245 individuals of <i>S. purpurea</i> known to remain in the wild (Service 1999b; K. Kawelo, U.S. Army, pers. comm. 2003; J. Lau, HINHP, pers. comm. 2003).	245	No Mention	No Mention	High
<i>Sanicula sandwicensis</i>	No common name	36	HI	Endangered	No information found.	Not Available	Not Available	Currently, there are fewer than 20 individuals of <i>S. sandwicensis</i> on east and west Maui (MNTF 2010, in litt.; PEPP 2011, pp. 162–164). This species has not been observed on Hawaii Island since the 1990s (HBMP 2010; MNTF 2010, in litt.) (USFWS, 2015).	Maui: > 50; Hawaii: 46 mature (USFWS, 2016b)	No Mention	No Mention	High
<i>Santalum haleakalae</i> var. <i>lanaiense</i>	Lanai sandalwood (= iliahi)	37	HI	Endangered	Not Available	Not Available	26 (USFWS, 2016)	Currently, <i>S. haleakalae</i> var. <i>lanaiense</i> is known from Molokai, Lanai, and Maui (USFWS, 2016).	< 100 (USFWS, 2016)	No Mention	No Mention	High
<i>Santalum involutum</i>	No common name	271	HI	Endangered	No information found.	Not Available	Not Available	Currently, approximately 50 to 100 individuals occur in isolated forest pockets in Pohakuao and Kalalau valleys (Harbaugh et al. 2010, p. 835) (USFWS, 2015).	50 - 100 (USFWS, 2016b)	No Mention	No Mention	High
<i>Scaevola coriacea</i>	Dwarf naupaka	272	HI	Endangered	Decreasing (USFWS, 2014)	Not Available	1 - 5 (NatureServe, 2015)	Currently known from Maui. (NatureServe, 2015)	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Schenkia sebaeoides</i>	Awiiwi	81	HI	Endangered	Not Available	Not Available	17-18 (USFWS, 2010)	This species is currently known from Kauai, Oahu, Molokai, Lanai, and Maui. (NatureServe, 2015)	~6,000 plants (USFWS, 2010)	No Mention	No Mention	High

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<i>Schiedea attenuata</i>	No common name	273	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	1 - 5 (NatureServe, 2015)	Known from a single site in Kalalau Valley, island of Kauai, state of Hawaii (NatureServe, 2015). Individuals were last observed at the site of discovery in 1994 (M. Bruegmann 1994b; Wagner et al. 1994, p. 187; Wagner et al. 2005, pp. 45–47) (USFWS, 2010b).	1 - 50 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Schiedea diffusa ssp. diffusa</i>	No common name	274	HI	Endangered	Not defined	Not Available	Not Available	Currently, <i>S. diffusa ssp. diffusa</i> is known from east Maui in six occurrences (fewer than 50 individuals total), in a much smaller range, from Puu o Kalae to Keanae (spanning about 5 mi (8 km)). On Molokai, there were two occurrences totaling fewer than 10 individuals, one at west Kawela Gulch, and one on the rim of Pelekunu Valley, last observed in the 1990s (HBMP 2010) (USFWS, 2015).	Not Available	No Mention	No Mention	High
<i>Schiedea hawaiiensis</i>	Ma`oli`oli	275	HI	Endangered	Unknown	Not Available	Not Available		25-40 individuals (USFWS, 2013)	No Mention	No Mention	High
<i>Schiedea helleri</i>	No common name	276	HI	Endangered	Not Available	Not Available	2 (USFWS, 2010)	Endemic to the island of Kauai, state of Hawaii. (NatureServe, 2015)	85 to 101 (USFWS, 2010)	No Mention	No Mention	High
<i>Schiedea jacobii</i>	No common name	277	HI	Endangered	Possible extirpated in the wild unless the 2011 outplanting was successful.	Not Available	Not Available	Endemic to the island of Maui in the Hawaiian Islands. It was discovered at a location on the north flank of Haleakala in the Hanawi Natural Area Reserve (NatureServe, 2015).	Not Available	No Mention	No Mention	High
<i>Schiedea kauaiensis</i>	No common name	278	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Currently known from northwestern Kauai. (NatureServe, 2015)	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Schiedea laui</i>	No common name	279	HI	Endangered	Not Available	Not Available	1 (NatureServe, 2015)	Known only from Molokai (USFWS 2012). (NatureServe, 2015)	24 - 34 (NatureServe, 2015)	No Mention	No Mention	High
<i>Schiedea nuttallii</i>	No common name	280	HI	Endangered	Increasing (USFWS, 2016)	Not Available	2 (USFWS, 2016)	The species is now restricted to the northern Waianae Mountains; plants in the southern Waianae Mountains have not been seen since the late 1970s (Makua Implementation Team 2003). Plants are located on Federal and State lands (68 FR 35950). The Ekahanui Gulch occurrence at the privately owned Honouliuli Preserve, which was noted when	91 (USFWS, 2016)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
								the species was listed, has not been seen since 1978 (Service 1999a) (USFWS, 2016).				
<i>Schiedea salicaria</i>	No common name	38	HI	Endangered	Decreasing (NatureServe, 2015)	Not Available	1 - 5 (NatureServe, 2015)	Endemic to the southern and eastern side of West Maui, state of Hawaii. (NatureServe, 2015)	250 - 2500 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Schiedea stellarioides</i>	Laulihilihi	281	HI	Endangered	Decreasing (USFWS, 2010)	Not Available	3 (USFWS, 2010)	Current range Kauai, recently rediscovered (1991-1992); known historically from Kauai.	~200 (USFWS, 2010)	No Mention	No Mention	High
<i>Schiedea trinervis</i>	No common name	282	HI	Endangered	Increasing (USFWS, 2013)	Not Available	1 - 5 (NatureServe, 2015)	Current range: Waianae Mountains of Oahu. Historically no additional range.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Schiedea viscosa</i>	No common name	283	HI	Endangered	Not Available	Not Available	4-7 (USFWS, 2009)	This species is currently found only in Kauai. (NatureServe, 2015)	30 - 300 individuals (USFWS, 2009)	No Mention	No Mention	High
<i>Sesbania tomentosa</i>	Ohai	39	HI	Endangered	Not Available	Stable (USFWS, 2015)	~20 (USFWS, 2010)	Currently, <i>Sesbania tomentosa</i> is known from Kauai, Molokai, Maui, Kahoolawe, Nihoa, Necker, Oahu, and Hawaii (USFWS 2012a; USFWS, 2015).	> 1,600 - 2,700 (USFWS, 2015)	No Mention	Loss of pollinators (USFWS, 2010)	High
<i>Sicyos alba</i>	`Anunu	284	HI	Endangered	Decreasing (USFWS, 2012)	Not Available	1 - 5 (NatureServe, 2015)	Current range is in the Volcano region of Hawaii; also reported from Mauna Kea but needs verification. (NatureServe, 2015)	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Sicyos lanceoloideus</i>	No common name	285	HI	Endangered	Not Available	Not Available	8 (USFWS, 2016b)	Currently, <i>S. lanceoloideus</i> occurs on Kauai in the Na Pali-Kona FR, and on Oahu in in the Waianae Mountains (USFWS, 2015).	Kauai: 4; Oahu: < 35 (USFWS, 2016b)	No Mention	No Mention	High
<i>Sicyos macrophyllus</i>	`Anunu	40	HI	Endangered	Declining	Unknown	10 populations	Currently, this species occurs on the island of Hawaii at Puu Mali, Puuwaawaa (Puu Iki), Honaunau, Hakalau National Wildlife Refuge-Kona Unit, Kaohe, Kukuiope, Kipuka Maunaiu, Kipuka Ki, and Puu Huluhulu (HBMP 2008; L. Pratt, U.S.G.S. Biological Resources Discipline, pers. comm. 2008; K. Bio, Plant Extinction Prevention (PEP) Program, pers. comm. 2008).	24-26 individuals	No Mention	No Mention	High
<i>Silene alexandri</i>	No common name	41	HI	Endangered	Increasing (USFWS, 2014)	Not Available	1 - 5 (NatureServe, 2015)	Current range: central Molokai; historically no additional range.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Silene hawaiiensis</i>	No common name	42	HI	Threatened	Not Available	Not Available	Not Available	<i>Silene hawaiiensis</i> is endemic to the island of Hawaii. The species can be found on the western slopes of Mauna Kea; the Hualalai summit and	> 50	No Mention	No Mention	High

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								Humuula saddle; the northern, western, and northwestern slopes of Mauna Loa; and near the Kilauea Crater. Currently more than 50 occurrences are known in a 200-square kilometer (77-square mile) area (U.S. Army 2003a).				
<i>Silene lanceolata</i>	No common name	286	HI	Endangered	Unknown (USFWS, 2016)	Not Available	6 (USFWS, 2016)	Current range: Molokai, Oahu, and Hawaii (USFWS, 2016)	2,640 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Silene perlmanii</i>	No common name	287	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Current range: Waianae Mountains of Oahu; historically no additional range.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Solanum guamense</i>	Berenghenas halomtano	288	GU, CNMI	Endangered	Not Available	Not Available	1 (USFWS, 2015)	<i>Solanum guamense</i> (Biringenas halumtanu, birengenas halom tano), is known only from the Mariana Islands (Merrill 1914, pp. 139– 140; Stone 1970, p. 521; Costion and Lorence 2012, p. 89). (USFWS, 2015)	1 (USFWS, 2015)	No Mention	No Mention	High
<i>Solanum incompletum</i>	Popolo ku mai	289	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Currently, it is only known from the island of Hawaii at PTA (U.S. Army 2003a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Solanum nelsonii</i>	Popolo	290	HI	Endangered	Decline (NatureServe 2014)	Decline (NatureServe 2014)	Represented on 7 of the Hawaiian islands (Molokai, Hawaii, Kure, Midway, Laysan, Pearl and Hermes, and Nihoa)	The species is known from populations on the islands of Molokai and Hawaii, and the northwestern Hawaiian Islands (NWHI), Hawaii. The current populations in the NWHIs are found on Kure, Midway (Sand, Eastern, and Spit islands), Laysan, Pearl and Hermes, and Nihoa (Vanderlip, in litt. 2010).	Molokai, including Ilio Point (~47) and Moomomi Preserve (4); Hawaii (5); Kure (?); Midway (~260); Laysan (~490); Pearl and Hermes (?); and Nihoa, including (8,000 to 15,000); also represented in ex situ collections.	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Spermolepis hawaiiensis</i>	No common name	82	HI	Endangered	Unknown (USFWS, 2016)	Not Available	12 (USFWS, 2016)	Currently, a total of 12 occurrences of <i>S. hawaiiensis</i> are known on Kauai, Oahu, Molokai, Lanai, West Maui, and Hawaii (USFWS, 2016)	5,000 - 10,000 individuals (USFWS, 2016)	No Mention	No Mention	High
<i>Stenogyne angustifolia angustifolia</i>	No common name	43	HI	Endangered	Not Available	Not Available	6 - 20 (NatureServe, 2015)	Currently, an estimated 5,000 to 7,500 individuals occur only on the island of Hawaii (U.S. Army 2003a).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Stenogyne bifida</i>	No common name	291	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 - 5 (NatureServe, 2015)	Current range: Eastern Molokai; also known historically from western Molokai (NatureServe, 2015).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Stenogyne campanulata</i>	No common name	292	HI	Endangered	Unknown (NatureServe, 2015)	Not Available	1 - 5 (NatureServe, 2015)	<i>Stenogyne campanulata</i> is known only from the single population which was originally discovered on the cliffs of Kalalau to below Puu o Kila (USFWS, 1995).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Stenogyne cranwelliae</i>	No common name	293	HI	Endangered	Unknown; rediscovered in 1995 (NatureServe, 2015)	Not Available	6 (USFWS, 2013)	It currently occurs in the Kohala Mountains: roughly 1.5 sq. mi (2.5 sq. km) around the border between the Puu O Umi NAR and Kohala FR; Opaepa, in the Puu O Umi NAR; Puukapu, in the Puu O Umi NAR (6-by-6-ft (2-by-2- m) "patch" of individuals); the rim of Kawainui Gulch; along Kohakohau Stream, in the Puu O Umi NAR; and Waimanu Bog Unit in the Puu O Umi NAR (USFWS, 2013).	< 160 (USFWS, 2013)	No Mention	No Mention	High
<i>Stenogyne kaalae ssp. sherffii</i>	No common name	294	HI	Endangered	No individuals are known to exist in the wild (USFWS, 2015)	Not Available	1 outplanted (USFWS, 2014)	<i>Stenogyne kaalae ssp. sherffii</i> occurs in the Koolau Mountains of Oahu (USFWS, 2015).	76 outplants (USFWS, 2014)	No Mention	No Mention	High
<i>Stenogyne kauaulaensis</i>	No common name	295	HI	Endangered	No information found.	Declining (2020 5-year Review)	1 (2020 5-year Review)	A short-lived perennial vine that relies on vegetative reproduction more than sexual reproduction. Endemic to West Maui (2020 5-Year Review).	Only a single known individual in the wild (2020 5-year Review).	No Mention	No Mention	High
<i>Stenogyne kealiae</i>	No common name	44	HI	Endangered	Unknown (NatureServe, 2015)	Declining (NatureServe, 2015)	5 (USFWS, 2010a)	Currently, this species occurs at Honopu, Kalalau, Malamalamaiki, Pohakupili, and Wainiha (Kauai) (USFWS, 2010b).	100 - 300 (USFWS, 2010a)	No Mention	No Mention	High
<i>Tabernaemontana rotensis</i>	No common name	91	GU, CNMI	Threatened	Not Available	Increasing (USFWS, 2015)	Guam: 6; Rota: 1 (USFWS, 2015)	It currently occurs on Guam and Rota (Mariana Islands) (USFWS, 2015).	Guam: 21,000; Rota: 9 wild, 30 outplanted	No Mention	No Mention	Medium

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
									(USFWS, 2015)			
<i>Trematolobelia singularis</i>	No common name	83	HI	Endangered	Not Available	Not Available	4 (USFWS, 2013)	<i>Trematolobelia singularis</i> has been reported only from the southern Koolau Mountains of Oahu (USFWS, 1998).	112 (USFWS, 2013)	No Mention	No Mention	High
<i>Vigna o-wahuensis</i>	No common name	45	HI	Endangered	Not Available	Not Available	10	Currently, it is known from Maui, Molokai, Lanai, Kahoolawe, and Hawaii (68 FR 25934; 68 FR 1220; 68 FR 39624). At least 86 individuals are believed to occur in 10 locations (U.S. Army 2003a). Thirty plants were located on the lower south and southwestern slope of Puu Nohonaohae during botanical surveys in the early 1980s, but only a single plant was observed in 2002 (Arnett 2002b).	~86	No Mention	No Mention	High
<i>Viola chamissoniana ssp. chamissoniana</i>	Pamakani	46	HI	Endangered	Increasing (USFWS, 2016)	Not Available	8 (USFWS, 2016)	<i>Viola chamissoniana ssp. chamissoniana</i> is endemic to the island of Oahu and is known only from the Waianae Mountains. It has been recorded throughout the mountain range on both the windward and leeward sides (USFWS, 2016).	618 (USFWS, 2016)	No Mention	No Mention	High
<i>Viola lanaiensis</i>	No common name	296	HI	Endangered	Decreasing (USFWS, 2012)	Not Available	1 - 5 (NatureServe, 2015)	Current range: Lanai. Historically no additional range.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Viola oahuensis</i>	No common name	47	HI	Endangered	Not Available	Not Available	8	Only eight occurrences, with 329 individuals, are now extant. These are found between Kawainui-Koloa summit divide and Waimalu-Koolaupoko divide, specifically in the following locations: north and south Kaukonahua (22 individuals), Kamananui Gulch (1), Kawainui-Koloa Ridge (29), north Kaukonahua (5), Kawai Iki to Halemano (greater than 100), Konahuanui (22), Koolau summit between Kipapa and Manana (100), and Wailau-Kahaluu summit ridge (50) (HINHP Database 2001; J. Lau, HINHP, pers. comm. 2003; K. Kawelo, U.S. Army, pers. comm. 2003).	329	No Mention	No Mention	High
<i>Wikstroemia skottsbergiana</i>	No common name	297	HI	Endangered	Not Available	Not Available	1 (USFWS, 2015)	Currently, there is one occurrence on an undisclosed private site on the island of Kauai (Hawaii Plant Extinction Prevention Program 2012, p. 26) (USFWS, 2014).	30 (USFWS, 2015)	No Mention	No Mention	High
<i>Wikstroemia villosa</i>	No common name	298	HI	Endangered	Unknown	Not Available	1 - 5 (NatureServe, 2015)	<i>Wikstroemia villosa</i> is endemic to the island of Maui in the state of Hawaii. It was historically recorded from East and West Maui. Currently it is known only from a single location on East Maui (USFWS 2012).	1 - 50 individuals (NatureServe, 2015)	No Mention	No Mention	High

Scientific Name	Common Name	Number	Location	Status	Population Level Trends	Species Level Trends	Number of Populations	Distribution	Number of Individuals	Pesticides Listed as a Threat	Pollinator Loss Listed as a Threat	Vulnerability Ranking
<i>Xylosma crenatum</i>	No common name	299	HI	Endangered	Not found	Not Available	1 - 5 (NatureServe, 2015)	Endemic to northwest Kauai.	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Zanthoxylum dipetalum var. tomentosum</i>	A`e	300	HI	Endangered	Not Available	Not Available	1 - 5 (NatureServe, 2015)	Known historically from the island of Hawaii, Puuwaawaa region (NatureServe, 2015).	1 - 1000 individuals (NatureServe, 2015)	No Mention	No Mention	High
<i>Zanthoxylum hawaiiense</i>	A`e	301	HI	Endangered	Not Available	Not Available	43751	This species has been extirpated from Lanai but still persists on Hawaii, Molokai, Maui and Kauai. On these islands, approximately 262 to 312 individuals are found in 10 to 13 occurrences (U.S. Army 2003a).	262 - 312	No Mention	No Mention	High
<i>Zanthoxylum oahuense</i>	A`e	302	HI	Endangered	Long-term trends indicate declines of >10%, whereas short-term trends suggest declines of 10-30% (NatureServe, 2015)	Not Available	5 (USFWS, 2012)	Endemic to the Koolau Mountains of the island of Oahu, state of Hawaii. Scattered along the northern Koolau mountains.	21 to 25 (USFWS, 2012)	No Mention	No Mention	High

\*Information in this column was used to inform the ranking metrics or the draft determination when relevant.

**Table 2: Summarizing Data and Information for Risk Ranking**

**Data Sources:** SOS accounts (Appendix C); NA=Not Applicable; HI=Hawaii; GU=Guam; CNMI=Commonwealth of the Northern Marianas Islands

**Risk to Individuals and Pollinators if exposed:** The individual plants in this assessment group are estimated to experience up to a 12% decrease in dry weight if exposed to malathion on the following use sites, based on labeled application rates: orchards and vineyards, developed, nurseries, open space developed and Christmas trees. No effects are expected on other use sites.

Mortality is expected for insect pollinators and seed dispersers exposed to malathion on use sites, via spray drift, and from mosquito control applications. Because terrestrial invertebrates exhibit a range of sensitivities to malathion, insect abundance is expected to be reduced where exposure occurs, but not completely eliminated. However, some species are likely to incur greater levels of mortality than others based on their sensitivity. As plants often have unknown or specific pollinators and seed dispersers for which toxicity data is unavailable, we assume insects that pollinate or disperse the seeds of listed plants are sensitive to malathion, and that exposure will cause mortality. In field studies, reductions of common insect species following pesticide exposure are often temporary with recovery over a short period of time. However, since listed plants may be reliant on insect pollinators or seed dispersers that are limited in range or abundance, these insect species may be less likely to recover following pesticide exposure.

Some bird pollinators and seed dispersers exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird pollinators or seed dispersers. No mortality or sublethal effects are expected for mammalian pollinators or seed dispersers from malathion exposure either on use sites or from spray drift.

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Abutilon eremitopetalum</i>	No common name	48	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect, Bird	0.00	Medium
<i>Abutilon menziesii</i>	Ko`oloa`ula	1	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	3.64	High
<i>Abutilon sandwicense</i>	No common name	99	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect, Bird	29.33	Medium
<i>Acaena exigua</i>	Liliwai	100	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	0.00	High
<i>Achyranthes mutica</i>	No common name	101	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Insect, Bird, Mammal	No Mention	Abiotic, Insect	0.00	Medium
<i>Achyranthes splendens var. rotundata</i>	Round-leaved chaff-flower	49	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Insect, Bird, Mammal	Unknown	Unknown	4.08	Medium
<i>Alectryon macrococcus</i>	Mahoe	102	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	6.93	High
<i>Bidens amplexens</i>	Ko`oko`olau	103	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	20.18	Medium
<i>Bidens campylothecha pentamera</i>	Ko`oko`olau	50	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	6.35	Medium
<i>Bidens campylothecha waihoiensis</i>	Ko`oko`olau	104	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	1.98	Medium
<i>Bidens conjuncta</i>	Ko`oko`olau	105	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Bidens hillebrandiana ssp. hillebrandiana</i>	kookoolau	106	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	5.75	Medium
<i>Bidens micrantha ssp. ctenophylla</i>	Ko`oko`olau	51	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Bidens micrantha ssp. kalealaha</i>	Ko`oko`olau	52	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	unknown	Unknown	4.84	Medium
<i>Bidens wiebkei</i>	Ko`oko`olau	107	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	unknown	Unknown	10.60	Medium
<i>Bonamia menziesii</i>	No common name	108	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	5.40	High
<i>Canavalia molokaiensis</i>	`Awikiwiki	109	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	14.34	High
<i>Canavalia napaliensis</i>	`Awikiwiki	2	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.34	High
<i>Canavalia pubescens</i>	`Awikiwiki	3	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.12	High

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Charpentiera densiflora</i>	Papala	110	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Insect, Bird, Mammal	Unknown	Unknown	0.20	Medium
<i>Clermontia drepanomorpha</i>	`Oha wai	111	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect, Bird	0.00	Medium
<i>Clermontia lindseyana</i>	`Oha wai	112	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	19.02	Medium
<i>Clermontia peleana</i>	`Oha wai	113	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	14.09	Medium
<i>Clermontia pyrularia</i>	`Oha wai	114	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	17.26	Medium
<i>Clermontia samuelii</i>	`Oha wai	53	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	15.07	Medium
<i>Colubrina oppositifolia</i>	Kauila	115	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	12.25	High
<i>Cyanea acuminata</i>	Haha	116	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	18.09	Medium
<i>Cyanea asplenifolia</i>	Haha	117	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	4.44	Medium
<i>Cyanea calycina</i>	Haha	92	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	17.56	Medium
<i>Cyanea copelandii ssp. copelandii</i>	Haha	118	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	3.15	Medium
<i>Cyanea copelandii ssp. haleakalaensis</i>	Haha	119	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	8.37	Medium
<i>Cyanea crispa</i>	Haha	120	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	13.63	Medium
<i>Cyanea dolichopoda</i>	Haha	121	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea dunbarii</i>	Haha	122	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	7.70	Medium
<i>Cyanea duvalliorum</i>	Haha	54	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	7.62	Medium
<i>Cyanea eleeleensis</i>	Haha	84	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Low
<i>Cyanea gibsonii</i>	Haha	55	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	12.28	Medium
<i>Cyanea glabra</i>	Haha	123	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	13.29	Medium
<i>Cyanea hamatiflora ssp. carlsonii</i>	Haha	124	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	3.95	Medium
<i>Cyanea hamatiflora ssp. hamatiflora</i>	Haha	93	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	14.55	Medium

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Cyanea horrida</i>	Haha nui	125	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	14.51	Medium
<i>Cyanea humboldtiana</i>	Haha	56	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect, Bird	15.58	Medium
<i>Cyanea kauaulaensis</i>	No common name	57	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	6.31	Medium
<i>Cyanea kolekoleensis</i>	Haha	126	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea koolauensis</i>	Haha	127	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	16.04	Medium
<i>Cyanea kuhihewa</i>	Haha	128	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea kunthiana</i>	Haha	129	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	15.68	Medium
<i>Cyanea lanceolata</i>	Haha	130	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	16.26	Medium
<i>Cyanea lobata</i>	Haha	131	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea magnicalyx</i>	Haha	58	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	8.39	Medium
<i>Cyanea mannii</i>	Haha	132	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	5.34	Medium
<i>Cyanea maritae</i>	Haha	59	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	9.71	Medium
<i>Cyanea marksii</i>	Haha	133	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	3.86	Medium
<i>Cyanea mauiensis</i>	Haha	134	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea mceldowneyi</i>	Haha	135	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	12.64	Medium
<i>Cyanea munroi</i>	Haha	136	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	2.16	Medium
<i>Cyanea obtusa</i>	Haha	137	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	3.24	Medium
<i>Cyanea pinnatifida</i>	Haha	138	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	33.61	Medium
<i>Cyanea platyphylla</i>	â~akuâ~aku	139	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	3.59	Medium
<i>Cyanea procera</i>	Haha	140	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	9.22	Medium
<i>Cyanea profuga</i>	Haha	60	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	5.29	Medium

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Cyanea purpurellifolia</i>	No common name	141	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	15.45	Medium
<i>Cyanea remyi</i>	Haha	61	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Cyanea rivularis</i>	Haha	142	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect, Bird	0.00	Medium
<i>Cyanea shipmanii</i>	Haha	143	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	20.90	Medium
<i>Cyanea solanacea</i>	Popolo	144	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	11.99	Medium
<i>Cyanea st.-johnii</i>	Haha	62	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	7.96	Medium
<i>Cyanea stictophylla</i>	Haha	145	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	16.21	Medium
<i>Cyanea tritomantha</i>	`aku	146	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	8.84	Medium
<i>Cyanea truncata</i>	Haha	147	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	15.06	Medium
<i>Cyrtandra crenata</i>	Ha`iwale	148	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	15.25	Medium
<i>Cyrtandra cyaneoides</i>	Mapele	149	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	unknown	Insect, Bird	0.00	Medium
<i>Cyrtandra dentata</i>	Ha`iwale	94	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect, Bird	17.49	Medium
<i>Cyrtandra ferripilosa</i>	Haiwale	63	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	42.54	Medium
<i>Cyrtandra filipes</i>	Ha`iwale	150	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	4.45	Medium
<i>Cyrtandra giffardii</i>	Ha`iwale	151	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	19.60	Medium
<i>Cyrtandra gracilis</i>	No common name	152	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Cyrtandra hematos</i>	Ha`iwale	153	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	22.58	Medium
<i>Cyrtandra kaulantha</i>	Ha`iwale	154	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	6.81	Medium
<i>Cyrtandra limahuliensis</i>	Ha`iwale	155	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	unknown	Insect, Bird	0.39	Medium
<i>Cyrtandra munroi</i>	Ha`iwale	156	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Cyrtandra nanawaleensis</i>	Haiwale	64	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.78	Medium
<i>Cyrtandra oenobarba</i>	Ha`iwale	157	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Cyrtandra oxybapha</i>	Ha`iwale	158	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Cyrtandra paliku</i>	Haiwale	159	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Cyrtandra polyantha</i>	Ha`iwale	65	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	6.29	Medium
<i>Cyrtandra sessilis</i>	Ha`iwale	160	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	23.17	Medium

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<i>Cyrtandra subumbellata</i>	Ha`iwale	161	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	15.05	Medium
<i>Cyrtandra tintinnabula</i>	Ha`iwale	162	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	10.04	Medium
<i>Cyrtandra viridiflora</i>	Ha`iwale	66	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	9.12	Medium
<i>Cyrtandra wagneri</i>	Haiwale	163	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	20.35	Medium
<i>Cyrtandra waiolani</i>	No common name	164	HI	Yes (12%)	Medium	Biotic - Unknown	No Mention	Unknown	Insect, Bird	15.85	Medium
<i>Delissea rhytidosperma</i>	No common name	165	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Delissea undulata</i>	No common name	67	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect, Bird	2.48	Medium
<i>Dubautia imbricata imbricata</i>	Na`ena`e	166	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Dubautia kalalauensis</i>	Naenae	167	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Dubautia kenwoodii</i>	Naenae	168	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Dubautia pauciflorula</i>	Na`ena`e	169	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	0.00	Medium
<i>Dubautia plantaginea magnifolia</i>	Na`ena`e	68	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Dubautia plantaginea ssp. humilis</i>	Na`ena`e	170	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	7.89	Medium
<i>Dubautia waialealae</i>	Na`ena`e	171	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Eugenia bryanii</i>	No common name	172	GU	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Eugenia koolauensis</i>	Nioi	173	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	12.74	High
<i>Euphorbia celastroides var. kaenana</i>	`Akoko	4	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	16.48	High
<i>Euphorbia deppeana</i>	`Akoko	69	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	9.86	Medium
<i>Euphorbia eleanoriae</i>	`Akoko	5	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Euphorbia halemanui</i>	Akoko	174	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Euphorbia kuwaleana</i>	`Akoko	175	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	13.70	High
<i>Euphorbia remyi var. kauaiensis</i>	`Akoko	176	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High

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<i>Euphorbia remyi</i> var. <i>remyi</i>	`Akoko	6	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Euphorbia rockii</i>	`Akoko	177	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	10.45	High
<i>Exocarpos luteolus</i>	Heau	178	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Exocarpos menziesii</i>	Menzies ballart	7	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	19.43	High
<i>Gardenia mannii</i>	Nanu	179	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	14.09	High
<i>Gardenia remyi</i>	Nanu	180	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	4.01	High
<i>Geranium hanaense</i>	Nohoanu	181	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	47.45	Medium
<i>Geranium hillebrandii</i>	Nohoanu	182	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Geranium kauaiense</i>	Nohoanu	183	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Geranium multiflorum</i>	Nohoanu	70	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	29.12	Medium
<i>Gouania vitifolia</i>	No common name	184	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	10.21	High
<i>Haplostachys haplostachya</i>	Honohono	8	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	22.62	High
<i>Hedyotis megalantha</i>	Paudedo	9	GU	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	NA	High
<i>Heritiera longipetiolata</i>	Ufa-halomtano	185	GU, CNMI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird, Mammal	100.00	Medium
<i>Hesperomannia arborescens</i>	No common name	71	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown*	12.42	Medium
<i>Hibiscadelphus giffardianus</i>	Hau kuahiwi	85	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect, Bird	72.07	Low
<i>Hibiscadelphus hualalaiensis</i>	Hau kuahiwi	186	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect, Bird	0.00	Medium
<i>Hibiscadelphus woodii</i>	Hau kuahiwi	187	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Hibiscus arnottianus</i> ssp. <i>immaculatus</i>	Koki`o ke`oke`o	188	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	10.15	Medium
<i>Hibiscus brackenridgei</i>	(=Native yellow hibiscus) ma`o hau hele	10	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Yes	Insect, Bird	4.69	High
<i>Hibiscus clayi</i>	Clay's hibiscus	189	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	unknown	Insect, Bird	0.00	Medium
<i>Hibiscus waimeae</i> ssp. <i>hanneriae</i>	Koki`o ke`oke`o	190	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Isodendrion hosakae</i>	Aupaka	11	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Isodendrion laurifolium</i>	Aupaka	191	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	9.59	High
<i>Isodendrion longifolium</i>	Aupaka	192	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	6.96	High

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<i>Isodendron pyrifolium</i>	Kula wahine noho	72	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	3.31	Medium
<i>Kadua cookiana</i>	Awiwi	193	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.06	High
<i>Kadua cordata ssp. Remyi</i>	Kopa	194	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Kadua coriacea</i>	Kio`ele	195	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	36.15	High
<i>Kadua degeneri</i>	No common name	12	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	34.59	High
<i>Kadua fluviatilis</i>	Kampua`a	13	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	5.59	High
<i>Kadua laxiflora</i>	Pilo	196	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	3.99	High
<i>Kadua parvula</i>	No common name	197	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	32.42	High
<i>Kadua st.-johnii</i>	No common name	198	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Kanaloa kahoolawensis</i>	Kohe malama malama o kanaloa	199	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Keysseria (=Lagenifera) erici</i>	No common name	200	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Keysseria (=Lagenifera) helenae</i>	No common name	201	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Kokia kauaiensis</i>	Koki`o	202	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Korthalsella degeneri</i>	Hulumoa	14	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	59.44	Medium
<i>Labordia helleri</i>	Kamakahala	203	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Labordia lorenciana</i>	No common name	204	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	0.86	Medium
<i>Labordia lydgatei</i>	Kamakahala	205	HI	Yes (12%)	Medium	Biotic - Unknown	Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Labordia tinifolia var. wahiawaensis</i>	Kamakahala	206	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Labordia triflora</i>	Kamakahala	207	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	No Mention	Insect, Bird	0.00	Medium
<i>Lepidium arbuscula</i>	`Anaunau	208	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	27.25	High
<i>Lepidium orbiculare</i>	No common name	209	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	100.00	High
<i>Lipochaeta fauriei</i>	Nehe	210	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Lipochaeta lobata var. leptophylla</i>	Nehe	15	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	16.65	High
<i>Lipochaeta micrantha</i>	Nehe	211	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Lipochaeta venosa</i>	No common name	16	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	17.90	High
<i>Lipochaeta waimeaensis</i>	Nehe	95	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	8.56	Medium
<i>Lobelia gaudichaudii ssp. koolauensis</i>	No common name	73	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect, Bird	7.92	Medium

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<i>Lobelia monostachya</i>	No common name	212	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	0.00	Medium
<i>Lobelia niihauensis</i>	No common name	96	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	8.70	Medium
<i>Lobelia oahuensis</i>	No common name	213	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect, Bird	7.95	Medium
<i>Lysimachia daphnoides</i>	lehua makanoe	214	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Lysimachia filifolia</i>	No common name	215	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	8.01	High
<i>Lysimachia iniki</i>	No common name	216	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Lysimachia lydgatei</i>	No common name	217	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	0.00	High
<i>Lysimachia maxima</i>	No common name	218	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	14.72	High
<i>Lysimachia pendens</i>	No common name	219	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Lysimachia scopulensis</i>	No common name	220	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Lysimachia venosa</i>	No common name	221	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	0.00	High
<i>Maesa walkeri</i>	No common name	97	GU, CNMI	Yes (12%)	High	Biotic - Unknown	Biotic	Unknown	Insect	0.00	High
<i>Melanthera kamolensis</i>	Nehe	17	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melanthera tenuifolia</i>	Nehe	18	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	27.04	High
<i>Melicope adscendens</i>	Alani	19	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.67	High
<i>Melicope balloui</i>	Alani	222	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	12.85	High
<i>Melicope christophersenii</i>	Alani	20	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	33.38	High
<i>Melicope degeneri</i>	Alani	223	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope haupuensis</i>	Alani	224	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope hiiakae</i>	Alani	225	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	16.70	High
<i>Melicope knudsenii</i>	Alani	21	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.59	High
<i>Melicope lydgatei</i>	Alani	226	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	17.52	High
<i>Melicope mucronulata</i>	Alani	227	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	1.49	High
<i>Melicope munroi</i>	Alani	22	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope ovalis</i>	Alani	228	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	1.98	High
<i>Melicope pallida</i>	Alani	229	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	7.41	High

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<i>Melicope paniculata</i>	Alani	230	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope puberula</i>	Alani	231	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope quadrangularis</i>	Alani	232	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Melicope reflexa</i>	Alani	233	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	13.40	High
<i>Melicope saint-johnii</i>	Alani	234	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	19.75	High
<i>Melicope zahlbruckneri</i>	Alani	235	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	18.20	High
<i>Mucuna sloanei</i> var. <i>persericea</i>	Sea bean	23	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	1.97	High
<i>Myrsine fosbergii</i>	Kolea	24	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	5.71	High
<i>Myrsine juddii</i>	Kolea	25	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	12.92	High
<i>Myrsine knudsenii</i>	Kolea	236	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	0.00	High
<i>Myrsine linearifolia</i>	Kolea	237	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	No Mention	Insect	0.00	High
<i>Myrsine mezii</i>	Kolea	238	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	0.00	High
<i>Myrsine vaccinioides</i>	Kolea	239	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Bird, Mammal	Unknown	Insect	0.00	High
<i>Neraudia ovata</i>	No common name	240	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	No Mention	Abiotic, Insect	5.10	Medium
<i>Nesogenes rotensis</i>	No common name	241	CNMI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Nothocestrum breviflorum</i>	`Aiea	242	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	10.52	Medium
<i>Nothocestrum latifolium</i>	`Aiea	243	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	5.75	Medium
<i>Nothocestrum peltatum</i>	`Aiea	244	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Nototrichium humile</i>	Kulu`i	245	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Insect, Bird, Mammal	Unknown	Unknown	11.73	Medium
<i>Ochrosia haleakalae</i>	Holei	86	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Insect, Bird	1.53	Low
<i>Ochrosia kilaueaensis</i>	Holei	87	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Insect, Bird	4.64	Low
<i>Osmoxylon mariannense</i>	No common name	74	CNMI	Yes (12%)	Medium	Biotic - Unknown	Bird, Mammal	No	Unknown	0.00	Medium
<i>Peperomia subpetiolata</i>	`Ala `ala wai nui	246	HI	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Unknown	6.46	Medium

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Peucedanum sandwicense</i>	Makou	247	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	5.14	Medium
<i>Phyllanthus saffordii</i>	No common name	75	GU	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Phyllostegia bracteata</i>	No common name	26	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	11.35	High
<i>Phyllostegia brevidens</i>	No common name	27	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	14.49	High
<i>Phyllostegia floribunda</i>	No common name	28	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	8.47	High
<i>Phyllostegia haliakalae</i>	No common name	248	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	10.44	High
<i>Phyllostegia helleri</i>	No common name	249	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Phyllostegia hirsuta</i>	No common name	250	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	18.21	High
<i>Phyllostegia mannii</i>	No common name	251	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	19.01	High
<i>Phyllostegia parviflora</i>	No common name	252	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	12.39	High
<i>Phyllostegia pilosa</i>	No common name	29	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	1.94	High
<i>Phyllostegia racemosa</i>	Kiponapona	253	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	16.53	High
<i>Phyllostegia renovans</i>	No common name	254	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Phyllostegia stachyoides</i>	No common name	255	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	3.88	High
<i>Phyllostegia velutina</i>	No common name	256	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	15.62	High
<i>Phyllostegia waimeae</i>	No common name	257	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Phyllostegia warshaueri</i>	No common name	258	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	6.10	High
<i>Phyllostegia wawrana</i>	No common name	98	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Pittosporum halophilum</i>	No common name	30	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	22.17	High
<i>Pittosporum hawaiiense</i>	No common name	31	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	7.26	High
<i>Pittosporum napaliense</i>	Ho`awa	259	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.19	High
<i>Plantago hawaiiensis</i>	Kuahiwi laukahi	260	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Abiotic, Insect	35.14	Low
<i>Plantago princeps</i>	Kuahiwi laukahi	88	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Unknown	7.11	Low

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Platydesma cornuta cornuta</i>	No common name	32	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	20.39	High
<i>Platydesma remyi</i>	No common name	33	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	8.90	High
<i>Platydesma rostrata</i>	Pilo kea lau li`i	261	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Polyscias bisattenuata</i>	No common name	76	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.39	Medium
<i>Polyscias flynnii</i>	No common name	262	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Polyscias gymnocarpa</i>	`Ohe`ohe	263	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	14.53	Medium
<i>Polyscias lydgatei</i>	No common name	264	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	10.89	Medium
<i>Portulaca sclerocarpa</i>	Po`e	77	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	17.89	Medium
<i>Portulaca villosa</i>	Ihi	78	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	3.07	Medium
<i>Pritchardia hardyi</i>	(=Na`ena`e) lo`ulu	79	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Pseudognaphalium (=Gnaphalium) sandwicensium var. molokaiense</i>	`Ena`ena	265	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	6.02	Medium
<i>Psychotria grandiflora</i>	Kopiko	34	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Psychotria hexandra ssp. oahuensis</i>	Oahu wild coffee (=kopiko)	35	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	16.00	High
<i>Psychotria hobdyi</i>	Kopiko	266	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Psychotria malaspinae</i>	Aplokating-palpoan	267	GU	Yes (12%)	Medium	Biotic - Unknown	Biotic	Unknown	Insect, Bird	0.00	Medium
<i>Pteralyxia kauaiensis</i>	Kaulu	89	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Insect, Bird	0.00	Low
<i>Pteralyxia macrocarpa</i>	Kaulu	90	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Insect, Bird	19.43	Low
<i>Ranunculus hawaiiensis</i>	Makou	268	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	22.75	Medium
<i>Ranunculus mauiensis</i>	Makou	269	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	13.79	Medium
<i>Sanicula mariversa</i>	No common name	270	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	40.05	Medium
<i>Sanicula purpurea</i>	No common name	80	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	No Mention	Insect	1.56	Medium
<i>Sanicula sandwicensis</i>	No common name	36	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	No data	High
<i>Santalum haleakalae var. lanaiense</i>	Lanai sandalwood (=`iliahi)	37	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	1.98	High
<i>Santalum involutum</i>	No common name	271	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.86	High
<i>Scaevola coriacea</i>	Dwarf naupaka	272	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	6.59	Medium

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Schenkia sebaeoides</i>	Awiwi	81	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	4.67	Medium
<i>Schiedea attenuata</i>	No common name	273	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Schiedea diffusa ssp. diffusa</i>	No common name	274	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	10.29	High
<i>Schiedea hawaiiensis</i>	Ma`oli`oli	275	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	100.00	High
<i>Schiedea helleri</i>	No common name	276	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Schiedea jacobii</i>	No common name	277	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	29.20	High
<i>Schiedea kauaiensis</i>	No common name	278	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Schiedea laui</i>	No common name	279	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	10.89	High
<i>Schiedea nuttallii</i>	No common name	280	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	15.59	High
<i>Schiedea salicaria</i>	No common name	38	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Schiedea stellarioides</i>	Laulihilihi	281	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Schiedea trinervis</i>	No common name	282	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No Mention	Insect	42.80	High
<i>Schiedea viscosa</i>	No common name	283	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.39	High
<i>Sesbania tomentosa</i>	Ohai	39	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	No	Insect	8.69	High
<i>Sicyos alba</i>	`Anunu	284	HI	Yes (12%)	High	Biotic - Unknown	Bird, Mammal	Unknown	Insect	21.68	High
<i>Sicyos lanceoloideus</i>	No common name	285	HI	Yes (12%)	High	Biotic - Unknown	Bird, Mammal	Unknown	Insect	8.78	High
<i>Sicyos macrophyllus</i>	`Anunu	40	HI	Yes (12%)	High	Biotic - Unknown	Bird, Mammal	Unknown	Insect	15.25	High
<i>Silene alexandri</i>	No common name	41	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	2.15	High
<i>Silene hawaiiensis</i>	No common name	42	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	28.32	High
<i>Silene lanceolata</i>	No common name	286	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	11.57	High
<i>Silene perlmanii</i>	No common name	287	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	36.23	High
<i>Solanum guamense</i>	Berenghenas halomtano	288	GU, CNMI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Solanum incompletum</i>	Popolo ku mai	289	HI	Yes (12%)	High	Biotic - Unknown	Biotic	Unknown	Insect	11.08	High
<i>Solanum nelsonii</i>	Popolo	290	HI	Yes (12%)	High	Biotic - Unknown	Biotic	Unknown	Insect	12.37	High
<i>Spermolepis hawaiiensis</i>	No common name	82	HI	Yes (12%)	High	Biotic - Unknown	Abiotic	Unknown	Insect	7.76	Medium
<i>Stenogyne angustifolia angustifolia</i>	No common name	43	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	13.16	High
<i>Stenogyne bifida</i>	No common name	291	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	9.75	High
<i>Stenogyne campanulata</i>	No common name	292	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Stenogyne cranwelliae</i>	No common name	293	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High

Scientific Name	Common Name	Number	Location	Direct effects expected (yes or no, reduction in dry weight when exposed in use areas that may have effects)	Effects to Pollinators	Method of Reproduction (risk modifier)	Seed Dispersal Vector (risk modifier)	Obligate or Specific Pollinator (risk modifier)	Pollination Vector*	% Range Overlap with Federal Lands	Risk Ranking
<i>Stenogyne kaalae</i> ssp. <i>sherffii</i>	No common name	294	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	24.55	High
<i>Stenogyne kauaulaensis</i>	No common name	295	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	13.25	High
<i>Stenogyne kealiae</i>	No common name	44	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Tabernaemontana rotensis</i>	No common name	91	GU, CNMI	Yes (12%)	Medium	Biotic - Unknown	Abiotic	Unknown	Insect, Bird	0.00	Low
<i>Trematolobelia singularis</i>	No common name	83	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Bird, Mammal	unknown	Insect, Bird	0.00	Medium
<i>Vigna o-wahuensis</i>	No common name	45	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	5.81	High
<i>Viola chamissoniana</i> ssp. <i>chamissoniana</i>	Pamakani	46	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Insect	No Mention	Insect	20.19	High
<i>Viola lanaiensis</i>	No common name	296	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Insect	No Mention	Insect	0.00	High
<i>Viola oahuensis</i>	No common name	47	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Insect	Unknown	Insect	8.98	High
<i>Wikstroemia skottsbergiana</i>	No common name	297	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	0.00	High
<i>Wikstroemia villosa</i>	No common name	298	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	26.98	High
<i>Xylosma crenatum</i>	No common name	299	HI	Yes (12%)	Medium	Biotic - Unknown	Abiotic, Biotic	Unknown	Unknown	0.00	Medium
<i>Zanthoxylum dipetalum</i> var. <i>tomentosum</i>	A`e	300	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	unknown	Insect	16.95	High
<i>Zanthoxylum hawaiiense</i>	A`e	301	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	7.99	High
<i>Zanthoxylum oahuense</i>	A`e	302	HI	Yes (12%)	High	Biotic - Unknown	Abiotic, Biotic	Unknown	Insect	9.96	High

\*Information in this column was used to inform the ranking metrics or the draft determination when relevant.

**Cumulative Effects and Environmental Baseline:** Please refer to the Status of the Species accounts (Appendix C) and overarching Environmental Baseline and Cumulative Effects sections of this Opinion.

**Additional Conservation Measures:**

Additional information on these new conservation measures can be found in the *Description of the Action* section and Appendix A-2 of this biological opinion, and further information on the anticipated impacts of each measure in the *Effects of the Action* section.

Several additional conservation measures have been recently provided by EPA and will be implemented as part of the Action. These measures will apply to all species in this assessment group with corresponding use type overlap and usage (i.e., mosquito adulticide, agricultural and residential uses). All measures are anticipated to limit the exposure of pollinators and seed dispersers to malathion in the described use area where it occurs in or around the range of the species, thus further reducing the risk of reproductive effects to the species. We summarize the new measures and our related assumptions below.

**Bloom restrictions:** New restrictions on orchards and vineyards, pasture, and other crops UDLs will prohibit application of malathion within three days prior to bloom, during bloom, and until petal fall is complete on certain crops. This measure is anticipated to limit the exposure of pollinators/seed dispersers to malathion in this use area where it occurs in or around the range of the species, reducing the risk of impacts to reproduction.

**Reduced application number and rate:** New restrictions on corn, cotton, orchards and vineyards, pasture, other crops, and vegetables and groundfruit lower the maximum allowable number of applications (previously ranging from 3-13 applications per year, depending on the specific crop) to 2-4 per year, as described in the Description of the Action of this Opinion. This is anticipated to reduce the amount of malathion used and decrease exposure to the species and its pollinators/seed dispersers, thus decreasing the risk of impacts to reproduction and direct impacts to the plant itself.

**Residential use label changes:** New restrictions to the method and frequency of application for residential use of malathion are anticipated to significantly reduce exposure to species and their pollinators/seed dispersers that overlap with developed and open space developed areas. Label changes will ensure that residential use is limited to spot treatments only (rendering spray drift offsite unlikely) and reducing the extent of area which can be treated in the developed and open space developed areas by as much as 75% or more from modeled values. In addition, we expect the frequency of exposure to decrease as the number of allowable applications is reduced from “repeat as necessary” to a maximum of 2–4 applications per year (depending on the specific residential use). Retreatment intervals of 7-10 days between any repeated applications are expected to reduce environmental concentrations by allowing initial residues to degrade prior to the next application. We anticipate this measure will further reduce exposure to biotic pollinators and seed dispersers, thus decreasing the risk of impacts to reproduction and sub-lethal impacts to the plant itself.

**Table 3: Summary of Conclusions**

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
1	<i>Abutilon menziesii</i>	Ko`oloa`ula	HI	High	High	Medium	NJ
2	<i>Canavalia napaliensis</i>	`Awikiwiki	HI	High	High	Medium	NJ
3	<i>Canavalia pubescens</i>	`Awikiwiki	HI	High	High	Medium	NJ
4	<i>Euphorbia celastroides var. kaenana</i>	`Akoko	HI	Medium	High	Medium	NJ
5	<i>Euphorbia eleanoriae</i>	`Akoko	HI	High	High	Medium	NJ
6	<i>Euphorbia remyi var. remyi</i>	`Akoko	HI	High	High	Medium	NJ
7	<i>Exocarpos menziesii</i>	Menzies ballart	HI	High	High	Medium	NJ
8	<i>Haplostachys haplostachya</i>	Honohono	HI	High	High	Medium	NJ
9	<i>Hedyotis megalantha</i>	Paudedo	GU	High	High	Medium	NJ
10	<i>Hibiscus brackenridgei</i>	(=Native yellow hibiscus) ma`o hau hele	HI	High	High	Medium	NJ
11	<i>Isodendrion hosakae</i>	Aupaka	HI	High	High	Medium	NJ
12	<i>Kadua degeneri</i>	No common name	HI	High	High	Medium	NJ
13	<i>Kadua fluviatilis</i>	Kampua`a	HI	High	High	Medium	NJ
14	<i>Korthalsella degeneri</i>	Hulumoa	HI	High	Medium	Medium	NJ
15	<i>Lipochaeta lobata var. leptophylla</i>	Nehe	HI	High	High	Medium	NJ
16	<i>Lipochaeta venosa</i>	No common name	HI	High	High	Medium	NJ
17	<i>Melanthera kamolensis</i>	Nehe	HI	High	High	High	NJ
18	<i>Melanthera tenuifolia</i>	Nehe	HI	High	High	Medium	NJ
19	<i>Melicope adscendens</i>	Alani	HI	High	High	High	NJ
20	<i>Melicope christophersenii</i>	Alani	HI	High	High	Medium	NJ
21	<i>Melicope knudsenii</i>	Alani	HI	Medium	High	Medium	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
22	<i>Melicope munroi</i>	Alani	HI	High	High	Medium	NJ
23	<i>Mucuna sloanei</i> var. <i>persericea</i>	Sea bean	HI	High	High	Medium	NJ
24	<i>Myrsine fosbergii</i>	Kolea	HI	High	High	Medium	NJ
25	<i>Myrsine juddii</i>	Kolea	HI	High	High	Medium	NJ
26	<i>Phyllostegia bracteata</i>	No common name	HI	High	High	Medium	NJ
27	<i>Phyllostegia brevidens</i>	No common name	HI	High	High	Medium	NJ
28	<i>Phyllostegia floribunda</i>	No common name	HI	High	High	Medium	NJ
29	<i>Phyllostegia pilosa</i>	No common name	HI	High	High	Medium	NJ
30	<i>Pittosporum halophilum</i>	No common name	HI	High	High	Medium	NJ
31	<i>Pittosporum hawaiiense</i>	No common name	HI	High	High	Medium	NJ
32	<i>Platydesma cornuta</i> <i>cornuta</i>	No common name	HI	High	High	Medium	NJ
33	<i>Platydesma remyi</i>	No common name	HI	High	High	Medium	NJ
34	<i>Psychotria grandiflora</i>	Kopiko	HI	High	High	Medium	NJ
35	<i>Psychotria hexandra</i> ssp. <i>oahuensis</i>	Oahu wild coffee (=kopiko)	HI	High	High	Medium	NJ
36	<i>Sanicula sandwicensis</i>	No common name	HI	High	High	Medium	NJ
37	<i>Santalum haleakalae</i> var. <i>lanaiense</i>	Lanai sandalwood (=`iliahi)	HI	High	High	Medium	NJ
38	<i>Schiedea salicaria</i>	No common name	HI	High	High	Medium	NJ
39	<i>Sesbania tomentosa</i>	Ohai	HI	High	High	Medium	NJ
40	<i>Sicyos macrophyllus</i>	`Anunu	HI	High	High	High	NJ
41	<i>Silene alexandri</i>	No common name	HI	High	High	Medium	NJ
42	<i>Silene hawaiiensis</i>	No common name	HI	High	High	Medium	NJ
43	<i>Stenogyne angustifolia</i> <i>angustifolia</i>	No common name	HI	High	High	Medium	NJ
44	<i>Stenogyne kealiae</i>	No common name	HI	High	High	Medium	NJ
45	<i>Vigna o-wahuensis</i>	No common name	HI	High	High	Medium	NJ
46	<i>Viola chamissoniana</i> ssp. <i>chamissoniana</i>	Pamakani	HI	High	High	Medium	NJ
47	<i>Viola oahuensis</i>	No common name	HI	High	High	Medium	NJ
48	<i>Abutilon eremitopetalum</i>	No common name	HI	High	Medium	Medium	NJ
49	<i>Achyranthes splendens</i> var. <i>rotundata</i>	Round-leaved chaff-flower	HI	High	Medium	Medium	NJ
50	<i>Bidens campylotheca</i> <i>pentamera</i>	Ko`oko`olau	HI	High	Medium	Medium	NJ
51	<i>Bidens micrantha</i> ssp. <i>ctenophylla</i>	Ko`oko`olau	HI	High	Medium	Medium	NJ
52	<i>Bidens micrantha</i> ssp. <i>kalealaha</i>	Ko`oko`olau	HI	High	Medium	Medium	NJ
53	<i>Clermontia samuelii</i>	`Oha wai	HI	High	Medium	Medium	NJ
54	<i>Cyanea duvalliorum</i>	Haha	HI	High	Medium	Medium	NJ
55	<i>Cyanea gibsonii</i>	Haha	HI	High	Medium	Medium	NJ
56	<i>Cyanea humboldtiana</i>	Haha	HI	High	Medium	Medium	NJ
57	<i>Cyanea kauaulaensis</i>	No common name	HI	High	Medium	Medium	NJ
58	<i>Cyanea magnicalyx</i>	Haha	HI	High	Medium	Medium	NJ
59	<i>Cyanea maritae</i>	Haha	HI	High	Medium	Medium	NJ
60	<i>Cyanea profuga</i>	Haha	HI	High	Medium	Medium	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
61	<i>Cyanea remyi</i>	Haha	HI	High	Medium	Medium	NJ
62	<i>Cyanea st.-johnii</i>	Haha	HI	High	Medium	Medium	NJ
63	<i>Cyrtandra ferripilosa</i>	Haiwale	HI	High	Medium	Medium	NJ
64	<i>Cyrtandra nanawaleensis</i>	Haiwale	HI	High	Medium	Medium	NJ
65	<i>Cyrtandra polyantha</i>	Ha`iwale	HI	High	Medium	Medium	NJ
66	<i>Cyrtandra viridiflora</i>	Ha`iwale	HI	High	Medium	Medium	NJ
67	<i>Delissea undulata</i>	No common name	HI	High	Medium	Medium	NJ
68	<i>Dubautia plantaginea magnifolia</i>	Na`ena`e	HI	High	Medium	Medium	NJ
69	<i>Euphorbia deppeana</i>	`Akoko	HI	High	Medium	Medium	NJ
70	<i>Geranium multiflorum</i>	Nohoanu	HI	High	Medium	Medium	NJ
71	<i>Hesperomannia arborescens</i>	No common name	HI	High	Medium	Medium	NJ
72	<i>Isodendrion pyrifolium</i>	Kula wahine noho	HI	High	Medium	Medium	NJ
73	<i>Lobelia gaudichaudii ssp. koolauensis</i>	No common name	HI	High	Medium	Medium	NJ
74	<i>Osmoxylon mariannense</i>	No common name	CNMI	High	Medium	Medium	NJ
75	<i>Phyllanthus saffordii</i>	No common name	GU	High	Medium	Medium	NJ
76	<i>Polyscias bisattenuata</i>	No common name	HI	High	Medium	Medium	NJ
77	<i>Portulaca sclerocarpa</i>	Po`e	HI	High	Medium	Medium	NJ
78	<i>Portulaca villosa</i>	Ihi	HI	High	Medium	Medium	NJ
79	<i>Pritchardia hardyi</i>	(=Na`ena`e) lo`ulu	HI	High	Medium	Medium	NJ
80	<i>Sanicula purpurea</i>	No common name	HI	High	Medium	Medium	NJ
81	<i>Schenkia sebaeoides</i>	Awiwi	HI	High	Medium	Medium	NJ
82	<i>Spermolepis hawaiiensis</i>	No common name	HI	High	Medium	High	NJ
83	<i>Trematolobelia singularis</i>	No common name	HI	High	Medium	Medium	NJ
84	<i>Cyanea eleeleensis</i>	Haha	HI	High	Low	Low	NJ
85	<i>Hibiscadelphus giffardianus</i>	Hau kuahiwi	HI	High	Low	Low	NJ
86	<i>Ochrosia haleakalae</i>	Holei	HI	High	Low	Low	NJ
87	<i>Ochrosia kilaueaensis</i>	Holei	HI	High	Low	Low	NJ
88	<i>Plantago princeps</i>	Kuahiwi laukahi	HI	High	Low	Low	NJ
89	<i>Pteralyxia kauaiensis</i>	Kaulu	HI	High	Low	Low	NJ
90	<i>Pteralyxia macrocarpa</i>	Kaulu	HI	High	Low	Low	NJ
91	<i>Tabernaemontana rotensis</i>	No common name	GU, CNMI	Medium	Low	Low	NJ
92	<i>Cyanea calycina</i>	Haha	HI	Medium	Medium	Low	NJ
93	<i>Cyanea hamatiflora ssp. hamatiflora</i>	Haha	HI	Medium	Medium	Low	NJ
94	<i>Cyrtandra dentata</i>	Ha`iwale	HI	Medium	Medium	Low	NJ
95	<i>Lipochaeta waimeaensis</i>	Nehe	HI	Medium	Medium	Low	NJ
96	<i>Lobelia niihauensis</i>	No common name	HI	Medium	Medium	Low	NJ
97	<i>Maesa walkeri</i>	No common name	GU, CNMI	Medium	High	Low	NJ
98	<i>Phyllostegia wawrana</i>	No common name	HI	Medium	High	Low	NJ
99	<i>Abutilon sandwicense</i>	No common name	HI	High	Medium	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
100	<i>Acaena exigua</i>	Liliwai	HI	High	High	Low	NJ
101	<i>Achyranthes mutica</i>	No common name	HI	High	Medium	Low	NJ
102	<i>Alectryon macrococcus</i>	Mahoe	HI	High	High	Low	NJ
103	<i>Bidens amplexans</i>	Ko`oko`olau	HI	High	Medium	Low	NJ
104	<i>Bidens campylothea waihoiensis</i>	Ko`oko`olau	HI	High	Medium	Low	NJ
105	<i>Bidens conjuncta</i>	Ko`oko`olau	HI	High	Medium	Low	NJ
106	<i>Bidens hillebrandiana ssp. hillebrandiana</i>	kookoolau	HI	High	Medium	Low	NJ
107	<i>Bidens wiebkei</i>	Ko`oko`olau	HI	High	Medium	Low	NJ
108	<i>Bonamia menziesii</i>	No common name	HI	High	High	Low	NJ
109	<i>Canavalia molokaiensis</i>	`Awikiwiki	HI	High	High	Low	NJ
110	<i>Charpentiera densiflora</i>	Papala	HI	High	Medium	Low	NJ
111	<i>Clermontia drepanomorpha</i>	`Oha wai	HI	High	Medium	Low	NJ
112	<i>Clermontia lindseyana</i>	`Oha wai	HI	High	Medium	Low	NJ
113	<i>Clermontia peleana</i>	`Oha wai	HI	High	Medium	Low	NJ
114	<i>Clermontia pyrularia</i>	`Oha wai	HI	High	Medium	Low	NJ
115	<i>Colubrina oppositifolia</i>	Kauila	HI	High	High	Low	NJ
116	<i>Cyanea acuminata</i>	Haha	HI	High	Medium	Low	NJ
117	<i>Cyanea asplenifolia</i>	Haha	HI	High	Medium	Low	NJ
118	<i>Cyanea copelandii ssp. copelandii</i>	Haha	HI	High	Medium	Low	NJ
119	<i>Cyanea copelandii ssp. haleakalaensis</i>	Haha	HI	High	Medium	Low	NJ
120	<i>Cyanea crispa</i>	Haha	HI	High	Medium	Low	NJ
121	<i>Cyanea dolichopoda</i>	Haha	HI	High	Medium	Low	NJ
122	<i>Cyanea dunbarii</i>	Haha	HI	High	Medium	Low	NJ
123	<i>Cyanea glabra</i>	Haha	HI	High	Medium	Low	NJ
124	<i>Cyanea hamatiflora ssp. carlsonii</i>	Haha	HI	High	Medium	Low	NJ
125	<i>Cyanea horrida</i>	Haha nui	HI	High	Medium	Low	NJ
126	<i>Cyanea kolekoleensis</i>	Haha	HI	High	Medium	Low	NJ
127	<i>Cyanea koolauensis</i>	Haha	HI	High	Medium	Low	NJ
128	<i>Cyanea kuhihewa</i>	Haha	HI	High	Medium	Low	NJ
129	<i>Cyanea kunthiana</i>	Haha	HI	High	Medium	Low	NJ
130	<i>Cyanea lanceolata</i>	Haha	HI	High	Medium	Low	NJ
131	<i>Cyanea lobata</i>	Haha	HI	High	Medium	Low	NJ
132	<i>Cyanea mannii</i>	Haha	HI	High	Medium	Low	NJ
133	<i>Cyanea marksii</i>	Haha	HI	High	Medium	Low	NJ
134	<i>Cyanea mauiensis</i>	Haha	HI	High	Medium	Low	NJ
135	<i>Cyanea mceldowneyi</i>	Haha	HI	High	Medium	Low	NJ
136	<i>Cyanea munroi</i>	Haha	HI	High	Medium	Low	NJ
137	<i>Cyanea obtusa</i>	Haha	HI	High	Medium	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
138	<i>Cyanea pinnatifida</i>	Haha	HI	High	Medium	Low	NJ
139	<i>Cyanea platyphylla</i>	â`akuâ`aku	HI	High	Medium	Low	NJ
140	<i>Cyanea procera</i>	Haha	HI	High	Medium	Low	NJ
141	<i>Cyanea purpurellifolia</i>	No common name	HI	High	Medium	Low	NJ
142	<i>Cyanea rivularis</i>	Haha	HI	High	Medium	Low	NJ
143	<i>Cyanea shipmanii</i>	Haha	HI	High	Medium	Low	NJ
144	<i>Cyanea solanacea</i>	Popolo	HI	High	Medium	Low	NJ
145	<i>Cyanea stictophylla</i>	Haha	HI	High	Medium	Low	NJ
146	<i>Cyanea tritomantha</i>	`aku	HI	High	Medium	Low	NJ
147	<i>Cyanea truncata</i>	Haha	HI	High	Medium	Low	NJ
148	<i>Cyrtandra crenata</i>	Ha`iwale	HI	High	Medium	Low	NJ
149	<i>Cyrtandra cyaneoides</i>	Mapele	HI	High	Medium	Low	NJ
150	<i>Cyrtandra filipes</i>	Ha`iwale	HI	High	Medium	Low	NJ
151	<i>Cyrtandra giffardii</i>	Ha`iwale	HI	High	Medium	Low	NJ
152	<i>Cyrtandra gracilis</i>	No common name	HI	High	Medium	Low	NJ
153	<i>Cyrtandra hematos</i>	Ha`iwale	HI	High	Medium	Low	NJ
154	<i>Cyrtandra kaulantha</i>	Ha`iwale	HI	High	Medium	Low	NJ
155	<i>Cyrtandra limahuliensis</i>	Ha`iwale	HI	High	Medium	Low	NJ
156	<i>Cyrtandra munroi</i>	Ha`iwale	HI	High	Medium	Low	NJ
157	<i>Cyrtandra oenobarba</i>	Ha`iwale	HI	High	Medium	Low	NJ
158	<i>Cyrtandra oxybapha</i>	Ha`iwale	HI	High	Medium	Low	NJ
159	<i>Cyrtandra paliku</i>	Haiwale	HI	High	Medium	Low	NJ
160	<i>Cyrtandra sessilis</i>	Ha`iwale	HI	High	Medium	Low	NJ
161	<i>Cyrtandra subumbellata</i>	Ha`iwale	HI	High	Medium	Low	NJ
162	<i>Cyrtandra tintinnabula</i>	Ha`iwale	HI	High	Medium	Low	NJ
163	<i>Cyrtandra wagneri</i>	Haiwale	HI	High	Medium	Low	NJ
164	<i>Cyrtandra waiolani</i>	No common name	HI	High	Medium	Low	NJ
165	<i>Delissea rhytidosperma</i>	No common name	HI	High	Medium	Low	NJ
166	<i>Dubautia imbricata imbricata</i>	Na`ena`e	HI	High	High	Low	NJ
167	<i>Dubautia kalalauensis</i>	Naenae	HI	High	High	Low	NJ
168	<i>Dubautia kenwoodii</i>	Naenae	HI	High	High	Low	NJ
169	<i>Dubautia pauciflorula</i>	Na`ena`e	HI	High	Medium	Low	NJ
170	<i>Dubautia plantaginea ssp. humilis</i>	Na`ena`e	HI	High	Medium	Low	NJ
171	<i>Dubautia waialealae</i>	Na`ena`e	HI	High	High	Low	NJ
172	<i>Eugenia bryanii</i>	No common name	GU	High	Medium	Low	NJ
173	<i>Eugenia koolauensis</i>	Nioi	HI	High	High	Low	NJ
174	<i>Euphorbia halemanui</i>	Akoko	HI	High	High	Low	NJ
175	<i>Euphorbia kuwaleana</i>	`Akoko	HI	High	High	Low	NJ
176	<i>Euphorbia remyi var. kauaiensis</i>	`Akoko	HI	High	High	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
177	<i>Euphorbia rockii</i>	`Akoko	HI	High	High	Low	NJ
178	<i>Exocarpos luteolus</i>	Heau	HI	High	High	Low	NJ
179	<i>Gardenia mannii</i>	Nanu	HI	High	High	Low	NJ
180	<i>Gardenia remyi</i>	Nanu	HI	High	High	Low	NJ
181	<i>Geranium hanaense</i>	Nohoanu	HI	High	Medium	Low	NJ
182	<i>Geranium hillebrandii</i>	Nohoanu	HI	High	Medium	Low	NJ
183	<i>Geranium kauaiense</i>	Nohoanu	HI	High	Medium	Low	NJ
184	<i>Gouania vitifolia</i>	No common name	HI	High	High	Low	NJ
185	<i>Heritiera longipetiolata</i>	Ufa-halomtano	GU, CNMI	High	Medium	Low	NJ
186	<i>Hibiscadelphus hualalaiensis</i>	Hau kuahiwi	HI	High	Medium	Low	NJ
187	<i>Hibiscadelphus woodii</i>	Hau kuahiwi	HI	High	Medium	Low	NJ
188	<i>Hibiscus arnottianus ssp. immaculatus</i>	Koki`o ke`oke`o	HI	High	Medium	Low	NJ
189	<i>Hibiscus clayi</i>	Clay's hibiscus	HI	High	Medium	Low	NJ
190	<i>Hibiscus waimeae ssp. hannerae</i>	Koki`o ke`oke`o	HI	High	Medium	Low	NJ
191	<i>Isodendrion laurifolium</i>	Aupaka	HI	High	High	Low	NJ
192	<i>Isodendrion longifolium</i>	Aupaka	HI	High	High	Low	NJ
193	<i>Kadua cookiana</i>	Awiwi	HI	High	High	Low	NJ
194	<i>Kadua cordata ssp. Remyi</i>	Kopa	HI	High	High	Low	NJ
195	<i>Kadua coriacea</i>	Kio`ele	HI	High	High	Low	NJ
196	<i>Kadua laxiflora</i>	Pilo	HI	High	High	Low	NJ
197	<i>Kadua parvula</i>	No common name	HI	High	High	Low	NJ
198	<i>Kadua st.-johnii</i>	No common name	HI	High	High	Low	NJ
199	<i>Kanaloa kahoalawensis</i>	Kohe malama malama o kanaloa	HI	High	High	Low	NJ
200	<i>Keysseria (=Lagenifera) erici</i>	No common name	HI	High	Medium	Low	NJ
201	<i>Keysseria (=Lagenifera) helenae</i>	No common name	HI	High	Medium	Low	NJ
202	<i>Kokia kauaiensis</i>	Koki`o	HI	High	Medium	Low	NJ
203	<i>Labordia helleri</i>	Kamakahala	HI	High	Medium	Low	NJ
204	<i>Labordia lorenciana</i>	No common name	HI	High	Medium	Low	NJ
205	<i>Labordia lydgatei</i>	Kamakahala	HI	High	Medium	Low	NJ
206	<i>Labordia tinifolia var. wahiawaensis</i>	Kamakahala	HI	High	Medium	Low	NJ
207	<i>Labordia triflora</i>	Kamakahala	HI	High	Medium	Low	NJ
208	<i>Lepidium arbuscula</i>	`Anaunau	HI	High	High	Low	NJ
209	<i>Lepidium orbiculare</i>	No common name	HI	High	High	Low	NJ
210	<i>Lipochaeta fauriei</i>	Nehe	HI	High	Medium	Low	NJ
211	<i>Lipochaeta micrantha</i>	Nehe	HI	High	Medium	Low	NJ
212	<i>Lobelia monostachya</i>	No common name	HI	High	Medium	Low	NJ
213	<i>Lobelia oahuensis</i>	No common name	HI	High	Medium	Low	NJ
214	<i>Lysimachia daphnoides</i>	lehua makanoe	HI	High	High	Low	NJ
215	<i>Lysimachia filifolia</i>	No common name	HI	High	High	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
216	<i>Lysimachia iniki</i>	No common name	HI	High	High	Low	NJ
217	<i>Lysimachia lydgatei</i>	No common name	HI	High	High	Low	NJ
218	<i>Lysimachia maxima</i>	No common name	HI	High	High	Low	NJ
219	<i>Lysimachia pendens</i>	No common name	HI	High	High	Low	NJ
220	<i>Lysimachia scopulensis</i>	No common name	HI	High	High	Low	NJ
221	<i>Lysimachia venosa</i>	No common name	HI	High	High	Low	NJ
222	<i>Melicope balloui</i>	Alani	HI	High	High	Low	NJ
223	<i>Melicope degeneri</i>	Alani	HI	High	High	Low	NJ
224	<i>Melicope haupuensis</i>	Alani	HI	High	High	Low	NJ
225	<i>Melicope hiiakae</i>	Alani	HI	High	High	Low	NJ
226	<i>Melicope lydgatei</i>	Alani	HI	High	High	Low	NJ
227	<i>Melicope mucronulata</i>	Alani	HI	High	High	Low	NJ
228	<i>Melicope ovalis</i>	Alani	HI	High	High	Low	NJ
229	<i>Melicope pallida</i>	Alani	HI	High	High	Low	NJ
230	<i>Melicope paniculata</i>	Alani	HI	High	High	Low	NJ
231	<i>Melicope puberula</i>	Alani	HI	High	High	Low	NJ
232	<i>Melicope quadrangularis</i>	Alani	HI	High	High	Low	NJ
233	<i>Melicope reflexa</i>	Alani	HI	High	High	Low	NJ
234	<i>Melicope saint-johnii</i>	Alani	HI	High	High	Low	NJ
235	<i>Melicope zahlbruckneri</i>	Alani	HI	High	High	Low	NJ
236	<i>Myrsine knudsenii</i>	Kolea	HI	High	High	Low	NJ
237	<i>Myrsine linearifolia</i>	Kolea	HI	High	High	Low	NJ
238	<i>Myrsine mezii</i>	Kolea	HI	High	High	Low	NJ
239	<i>Myrsine vaccinioides</i>	Kolea	HI	High	High	Low	NJ
240	<i>Neraudia ovata</i>	No common name	HI	High	Medium	Low	NJ
241	<i>Nesogenes rotensis</i>	No common name	CNMI	High	High	Low	NJ
242	<i>Nothocestrum breviflorum</i>	`Aiea	HI	High	Medium	Low	NJ
243	<i>Nothocestrum latifolium</i>	`Aiea	HI	High	Medium	Low	NJ
244	<i>Nothocestrum peltatum</i>	`Aiea	HI	High	Medium	Low	NJ
245	<i>Nototrichium humile</i>	Kulu`i	HI	High	Medium	Low	NJ
246	<i>Peperomia subpetiolata</i>	`Ala `ala wai nui	HI	High	Medium	Low	NJ
247	<i>Peucedanum sandwicense</i>	Makou	HI	High	Medium	Low	NJ
248	<i>Phyllostegia haliakalae</i>	No common name	HI	High	High	Low	NJ
249	<i>Phyllostegia helleri</i>	No common name	HI	High	High	Low	NJ
250	<i>Phyllostegia hirsuta</i>	No common name	HI	High	High	Low	NJ
251	<i>Phyllostegia mannii</i>	No common name	HI	High	High	Low	NJ
252	<i>Phyllostegia parviflora</i>	No common name	HI	High	High	Low	NJ
253	<i>Phyllostegia racemosa</i>	Kiponapona	HI	High	High	Low	NJ
254	<i>Phyllostegia renovans</i>	No common name	HI	High	High	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
255	<i>Phyllostegia stachyoides</i>	No common name	HI	High	High	Low	NJ
256	<i>Phyllostegia velutina</i>	No common name	HI	High	High	Low	NJ
257	<i>Phyllostegia waimeae</i>	No common name	HI	High	High	Low	NJ
258	<i>Phyllostegia warshaueri</i>	No common name	HI	High	High	Low	NJ
259	<i>Pittosporum napaliense</i>	Ho`awa	HI	High	High	Low	NJ
260	<i>Plantago hawaiiensis</i>	Kuahiwi laukahi	HI	High	Low	Medium	NJ
261	<i>Platydesma rostrata</i>	Pilo kea lau li`i	HI	High	High	Low	NJ
262	<i>Polyscias flynnii</i>	No common name	HI	High	Medium	Low	NJ
263	<i>Polyscias gymnocarpa</i>	`Ohe`ohe	HI	High	Medium	Low	NJ
264	<i>Polyscias lydgatei</i>	No common name	HI	High	Medium	Low	NJ
265	<i>Pseudognaphalium (=Gnaphalium) sandwicense var. molokaiense</i>	`Ena`ena	HI	High	Medium	Low	NJ
266	<i>Psychotria hobdyi</i>	Kopiko	HI	High	High	Low	NJ
267	<i>Psychotria malaspinae</i>	Aplokating-palpoan	GU	High	Medium	Low	NJ
268	<i>Ranunculus hawaiiensis</i>	Makou	HI	High	Medium	Low	NJ
269	<i>Ranunculus mauiensis</i>	Makou	HI	High	Medium	Low	NJ
270	<i>Sanicula marivera</i>	No common name	HI	High	Medium	Low	NJ
271	<i>Santalum involutum</i>	No common name	HI	High	High	Low	NJ
272	<i>Scaevola coriacea</i>	Dwarf naupaka	HI	High	Medium	Low	NJ
273	<i>Schiedea attenuata</i>	No common name	HI	High	High	Low	NJ
274	<i>Schiedea diffusa ssp. diffusa</i>	No common name	HI	High	High	Low	NJ
275	<i>Schiedea hawaiiensis</i>	Ma`oli`oli	HI	High	High	Low	NJ
276	<i>Schiedea helleri</i>	No common name	HI	High	High	Low	NJ
277	<i>Schiedea jacobii</i>	No common name	HI	High	High	Low	NJ
278	<i>Schiedea kauaiensis</i>	No common name	HI	High	High	Low	NJ
279	<i>Schiedea laui</i>	No common name	HI	High	High	Low	NJ
280	<i>Schiedea nuttallii</i>	No common name	HI	High	High	Low	NJ
281	<i>Schiedea stellarioides</i>	Laulihilihi	HI	High	High	Low	NJ
282	<i>Schiedea trinervis</i>	No common name	HI	High	High	Low	NJ
283	<i>Schiedea viscosa</i>	No common name	HI	High	High	Low	NJ
284	<i>Sicyos alba</i>	`Anunu	HI	High	High	Low	NJ
285	<i>Sicyos lanceoloideus</i>	No common name	HI	High	High	Low	NJ
286	<i>Silene lanceolata</i>	No common name	HI	High	High	Low	NJ
287	<i>Silene perlmanii</i>	No common name	HI	High	High	Low	NJ
288	<i>Solanum guamense</i>	Berenghenas halomtano	GU, CNMI	High	High	Low	NJ
289	<i>Solanum incompletum</i>	Popolo ku mai	HI	High	High	Low	NJ
290	<i>Solanum nelsonii</i>	Popolo	HI	High	High	Low	NJ
291	<i>Stenogyne bifida</i>	No common name	HI	High	High	Low	NJ
292	<i>Stenogyne campanulata</i>	No common name	HI	High	High	Low	NJ

Number	Scientific Name	Common Name	Location	Vulnerability Ranking	Risk Ranking Without Habitat	Potential Exposure Ranking	Species Conclusion (J, NJ)*
293	<i>Stenogyne cranwelliae</i>	No common name	HI	High	High	Low	NJ
294	<i>Stenogyne kaalae ssp. sherffii</i>	No common name	HI	High	High	Low	NJ
295	<i>Stenogyne kauaulaensis</i>	No common name	HI	High	High	Low	NJ
296	<i>Viola lanaiensis</i>	No common name	HI	High	High	Low	NJ
297	<i>Wikstroemia skottsbergiana</i>	No common name	HI	High	High	Low	NJ
298	<i>Wikstroemia villosa</i>	No common name	HI	High	High	Low	NJ
299	<i>Xylosma crenatum</i>	No common name	HI	High	Medium	Low	NJ
300	<i>Zanthoxylum dipetalum var. tomentosum</i>	A`e	HI	High	High	Low	NJ
301	<i>Zanthoxylum hawaiiense</i>	A`e	HI	High	High	Low	NJ
302	<i>Zanthoxylum oahuense</i>	A`e	HI	High	High	Low	NJ

\*NJ = No Jeopardy; J = Jeopardy

#### Rationale for Species Conclusions

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed registration of malathion, and the cumulative effects, it is the Service's biological opinion that the registration of malathion, as proposed, is not likely to jeopardize the continued existence of the plant species in this assessment group.

For these species, we anticipate their high vulnerabilities and medium to high levels of risk to individuals or species is offset by low levels of usage of malathion, as described below. For species with a portion of their range on Federal lands, we did not quantitatively evaluate use or usage on in these areas, but we assume only low levels of usage, per the rationale described in the Biological Opinion. For the non-Federal lands portion of the species ranges, we have limited information on past malathion usage in the Pacific Islands, and thus our estimation of usage and exposure on non-Federal lands contains a large degree of uncertainty. Briefly, we anticipate that usage in non-agricultural areas will be low (up to 5% of overlap in any given area). We anticipate that the available agricultural usage data, which is from a single year and does not distinguish between use categories, likely provides an upper bound of malathion usage for our analysis, particularly as it includes all insecticides. For the Pacific Islands as a whole, this usage is also anticipated to be low (~5% of agricultural lands treated across the islands as an upper bound for malathion), though we cannot predict the degree of usage in proximity to particular species' ranges. However, given that 95% of agricultural fields are not anticipated to be treated with insecticides, we assume a low probability that any individual plant will be in proximity to agricultural usage of malathion. We further discuss our assumptions and analysis of usage data on Federal lands and in the Pacific Islands in the Usage section of this Opinion. (Due to the large number of species in this assessment group, we use the numbers assigned for the purpose of this analysis in the preceding table in our Assessment Group discussions below)

While we expect some individual plants in this assessment group will experience reduced growth due to direct exposure to malathion, we do not anticipate this reduction in growth would have species-level effects.

#### *Species Entirely on Federal Lands*

The following species occur entirely on federal lands: 85 (only individuals in the wild were re-introduced on to national park lands, 2015 5-year review), 185, 209 and 275. We anticipate usage within the range of these species will be low, based primarily on the usage data we acquired about malathion usage on Federal lands indicating that past malathion usage has occurred on public lands for a variety of uses, but usage has been minimal (see Usage section of Opinion), with only localized applications occurring on a rare basis. We expect any adverse effects to listed resources to be minimal, considering the small scale and low levels of past usage and in light of Federal agency programs that are designed to understand, avoid and minimize the effects to listed species. Therefore, we do not anticipate that the proposed action would appreciably reduce survival and recovery of these species in the wild.

#### *Remaining Species*

**Species numbered 84-91 (except species 85, covered in federal lands paragraph, above)** have high vulnerabilities based on their status, distribution and trends; low risk posed by labeled uses across their ranges; and low exposure within their ranges as shown above. These species have a high vulnerability due to their endangered status and/or limited range and/or low number of populations.

The risk posed by labeled uses across the range is anticipated to be low given these species' ability to rely on more than one pollinating taxon and the use of abiotic or a mixture of seed dispersers. These species rely on unknown species of insect and bird pollinators for successful reproduction and to maintain genetic diversity within and among populations. Mortality is expected for insect pollinators exposed to malathion on use sites or via spray drift. Bird pollinators exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. We anticipate adverse effects to these species due to the reduction in pollinating insects and birds that would result in reduced reproductive success.

These species, with the exception of *Cyanea eleeleensis*, use abiotic seed dispersal vectors (most likely wind and/or water); therefore, we do not anticipate use of malathion within their ranges will cause adverse effects to seed dispersal or the reproductive capacity of these species. *C. eleeleensis* relies on abiotic, bird, and mammal seed dispersers. Abiotic and mammalian seed dispersers are not anticipated to experience adverse effects from exposure to malathion. As described for bird pollinators, avian seed dispersers exposed to malathion may experience mortality and sublethal effects. Since *C. eleeleensis* can rely on multiple vectors for seed dispersal, and may depend on one type of seed dispersal vector if one of the others is temporarily reduced in numbers, we do not anticipate the adverse reproductive effects to this species as a result of seed disperser mortality will cause species-level effects.

We anticipate these species will have a low level of exposure given they exist primarily in forests where malathion is not registered for use, and spray drift has the potential to be blocked by the physical structure of the vegetation. In addition, usage is anticipated to be low (<5%) as discussed above. Furthermore, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, residential uses of malathion are now limited to two applications per year (reduced from as many as necessary) and to spot treatments only, reducing the application footprint and likelihood of spray drift within developed and open space developed areas. As a result, adverse effects to insect and bird pollinators and seed dispersers from malathion exposure are not anticipated to not cause species-level effects because of the relatively protected nature of the habitat where these species reside, low level of usage, and implementation of the conservation measures. Therefore, we do not anticipate the proposed action would appreciably reduce survival and recovery of these species in the wild.

**Species numbered 92-98** have medium vulnerabilities based on their status, distribution and trends; medium or high risk posed by labeled uses across their ranges; and low potential exposure within their ranges as shown above. These species have medium vulnerabilities based on increasing trends and neutral factors. As a result, they are somewhat less likely to withstand additional stressors in their environment, including declines in available pollinators and seed dispersers in their range from malathion exposure.

The risk posed by labeled uses across the range is anticipated to be medium for species 92-96 due to these species' ability to rely on more than one pollinating and seed dispersing taxon, namely insects and birds. The risk posed by labeled uses for species 97 and 98 is anticipated to be high due to their reliance exclusively on insect pollinators. These species rely on these pollinating insects and birds for successful reproduction and to maintain genetic diversity within and among populations. Mortality is expected for insect pollinators exposed to malathion on use sites or via spray drift. Bird pollinators exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. We anticipate adverse effects to these species due to the reduction in pollinating insects and birds that would result in reduced reproductive success.

These species rely on a variety of seed dispersal vectors, both abiotic and biotic, though the exact species are unknown in many cases. Mortality is expected for insect seed dispersers exposed to malation on use sites or via spray drift. Abiotic and mammalian seed dispersers are not anticipated to experience adverse effects from exposure to malathion. As described for bird pollinators, avian seed dispersers exposed to malathion may experience mortality and sublethal effects. Thus, we anticipate adverse effects the species in this subset that may use insect and/or bird seed dispersers due to the reduction in these seed dispersers that would lead to reduced reproductive success.

We anticipate these species will have a low level of exposure given they exist primarily in forests (species 93, 94, 97, and 98), on cliffs (species 96), or both (92 and 95). Malathion is not registered for use in forests and spray drift has the potential to be partially blocked by the physical structure of the vegetation, whereas cliffs tend to be physically isolated from areas where malathion use may occur. In addition, we anticipate a low level of malation usage (<5% as discussed above), across the species' ranges. Furthermore, we anticipate the conservation measures described above will reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants. As a result, adverse effects to insect and bird pollinators and seed dispersers from malathion exposure are not anticipated to cause species-level reproductive effects because of the relatively protected nature of the habitat where these species reside and the low level of usage. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers. Therefore, we do not anticipate the proposed action would appreciably reduce survival and recovery of these species in the wild.

**Species numbered 99-302 (except species 209 and 275 covered under federal lands, above)** have high vulnerabilities based on their status, distribution and trends; medium or high risk posed by labeled uses across their ranges; and low exposure within their ranges as shown above. These species have high vulnerabilities based mainly on their limited distribution, many are located on a single island in a restricted range. As a result, they are less likely to be able to withstand additional stressors in their environment, including declines in available pollinators and seed dispersers in their range from malathion exposure. Furthermore, some of these species (species

numbered 112, 156, 162, 180, 188, 190, 205, and 213) have pollinator loss or decline listed as a threat in FWS documents. This sub-set of species is assumed to have an ongoing reduction in available pollinators and thus have an existing impairment to their reproductive capacity. As such, these particular species are suspected to be even less able to withstand additional stressors in their environment, especially additional reductions in their pollinator populations. Species number 112, *Clermontia lindseyana*, is discussed individually, below as a representative species with previously identified pollinator loss.

The risk posed by labeled uses is either medium mainly due to the species' ability to rely on more than one pollinating taxon (insects and birds) and use of a variety of seed dispersal vectors, including abiotic (wind or water), or high, mainly due to the species' complete reliance on insects for pollination. These species rely on these pollinating insects and birds for successful reproduction and to maintain genetic diversity within and among populations. Mortality is expected for insect pollinators exposed to malathion on use sites or via spray drift. Bird pollinators exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. Furthermore, some of these species (species numbered 112, 156, 162, 180, 188, 190, 205, and 213) have pollinator loss or decline listed as a threat in FWS documents. This sub-set of species is assumed to have an ongoing reduction in available pollinators and thus have an existing impairment to their reproductive capacity. As such, we anticipate adverse effects to these species due to the reduction in pollinating insects and birds that would result in reduced reproductive success.

These species rely on a variety of seed dispersal vectors, both abiotic and biotic, though the exact species are unknown in many cases. Mortality is expected for insect seed dispersers exposed to malathion on use sites or via spray drift. Abiotic and mammalian seed dispersers are not anticipated to experience adverse effects from exposure to malathion. As described for bird pollinators, avian seed dispersers exposed to malathion may experience mortality and sublethal effects. Thus, we anticipate adverse effects to the species in this subset that may use insect and/or bird seed or other combinations of biotic seed dispersers due to the reduction in these seed dispersers that would lead to reduced reproductive success. However, species reliant solely upon abiotic seed dispersal vectors (species 169, 247, 260, and 270) are not anticipated to experience adverse reproductive effects from loss of seed dispersal capacity due to malathion exposure.

We anticipate these species will have a low level of exposure given they exist primarily in forests, on cliffs, or both (except *Plantago hawaiiensis*, discussed separately). Malathion is not registered for use in forests and spray drift has the potential to be partially blocked by the physical structure of the vegetation, whereas cliffs tend to be physically isolated from areas where malathion use may occur. In addition, we anticipate a low level of malathion usage (<5% as discussed above), across the species' ranges. Furthermore, we anticipate the conservation measures described above will reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants. As a result, adverse effects to insect and bird pollinators and seed dispersers from malathion exposure are not anticipated to cause species-level effects because of the relatively protected nature of the habitat where these species reside and low level of anticipated malathion usage. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators. Therefore, we do not anticipate the proposed action would appreciably reduce survival and recovery of these species in the wild.

Species 260, *Plantago hawaiiensis*, has a high vulnerability based on its endangered status and restricted distribution. It is anticipated to have a medium level of exposure given its preferred habitat of shrublands and old lava flows, where there is less potential for vegetation to block spray drift and a greater likelihood of proximity to malathion use areas. However, risk for this species is expected to be low. The latest status review in 2012 reports this species has very small, inconspicuous flowers with widely exerted stamens, typically associated with wind pollination. This species also relies solely on abiotic seed dispersal vectors. As such, we do not anticipate malathion exposure will cause adverse effects to pollinators or seed dispersers and thus the reproductive capacity of this species. Therefore, we do not anticipate the proposed action would appreciably reduce the survival and recovery of *P. hawaiiensis* in the wild.

Species 112, *Clermontia lindseyana*, a short-lived perennial member of the bellflower family with a high vulnerability based on its endangered status and restricted distribution mainly on the island of Hawaii, though individuals do exist on Maui. A total of approximately 124 wild individuals and over 2000 reintroduced plants are found across the range. Specific pollinator and seed dispersal vectors for this species are unknown, though are suspected to be native birds. The 2015 status review reports the only birds observed visiting the flowers of this species did not serve as pollinators, but instead nectar robbed the flowers 60-90% of the time. Avian pollinators and seed dispersers exposed to malathion may experience mortality and sublethal effects. Thus, we anticipate adverse effects due to mortality and sublethal effects to pollinators and seed dispersers that would lead to reduced reproductive success of this plant. However, this species' preferred habitats are montane and mesic forests where malathion usage is anticipated to be low given malathion is not registered for use in forests, and the vegetative structure of this habitat has the potential to block spray drift. In addition, *C. lindseyana* individuals are protected in many instances.

The largest population is located in Hawaii Volcanoes National Park, where many individuals are within a protective enclosure. More individuals are found within Hakalau National Wildlife Refuge and the Olelomoana, Kukuiopae and South Kona Forest Reserves managed by the state of Hawaii. We anticipate very low usage of malathion in these protected areas. Furthermore, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, residential uses of malathion are now limited to two applications per year (reduced from as many as necessary) and to spot treatments only, reducing the application footprint and likelihood of spray drift within developed and open space developed areas.

Thus, based on the low level of exposure expected, we do not anticipate the reductions in pollinator and seed disperser numbers resulting in reduction in reproductive capacity for this species to rise to the level of species-level effects. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species. Therefore, we do not anticipate the action would appreciably reduce survival and recovery *Clermontia lindseyana* in the wild.

**Species numbered 1-83** have high or medium vulnerabilities based on their status, distribution and trends; medium or high risk posed by labeled uses across their ranges; and high or medium exposure within their ranges as shown above. These species have high vulnerabilities due mainly to their endangered status, restricted ranges (often existing on one island in the Pacific), and in some cases very low numbers of individuals remaining in the wild. Those species with extremely low numbers of individuals and high exposure are discussed separately (species numbered 17, 19 and 40). Two species, number 4, *Euphorbia celastroides* var. *kaenana* and number 21, *Melicope knudsenii* (discussed individually, below) have medium vulnerabilities, as while they are endangered and have restricted distribution, they have increasing trends and in the case of *E. celastroides* var. *kaenana*, a relatively large number of individuals. All have medium or high risk based mainly on their dependence solely on insect pollinators in the case of species with high risk, and for those with medium risk, their ability to depend on more than one taxa for pollination. However, three species (39, *Sesbania tomentosa*, 55, *Cyanea gibsonii*, and 70, *Geranium multiflorum*) have high risk due to insect-exclusive pollination and because they have pollinator loss identified as a threat in a recent FWS document. These species are discussed separately, below. All species are expected to have medium exposure, (except species 17, *Melanthera kamolensis*, 19, *Melicope adscendens*, 40, *Sicyos macrophyllus*, and 82, *spermolepis hawaiiensis*, that have high exposure and are discussed below) given their preferred habitats are generally shrublands, grasslands, or other open areas where there is less potential for vegetation to block spray drift and a greater likelihood of proximity to malathion use areas.

All species in this sub-group, where known, use insect pollinators exclusively or a combination of bird and insect pollinators for pollen transfer, maintenance of genetic diversity between and among populations, and overall reproductive success. Mortality is expected for insect pollinators exposed to malathion on use sites or via spray drift. Bird pollinators exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird pollinators. We anticipate adverse effects to these species due to the reduction in pollinating insects and birds that would result in reduced reproductive success. For seed dispersal, these species rely on a variety of vectors, though all (except species 40 and 74 that use bird and mammal seed dispersers) have an abiotic component to their seed dispersal repertoire. There are no anticipated adverse effects to abiotic vectors from malathion exposure. As with pollinating vectors, mortality is expected for insect seed dispersers exposed to malathion on use sites or via spray drift. Avian seed dispersers exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. No mortality or sublethal effects are expected for mammalian seed dispersers from malathion exposure either on use sites or from spray drift. As a result, we anticipate adverse effects to these species due to the reduction in seed dispersing insects and birds that would result in reduced reproductive success.

We anticipate these species will have a medium level of exposure given they exist primarily in open habitats such as shrublands and grasslands where there is less potential for vegetation to block spray drift and a greater likelihood of proximity to malathion use areas. In addition, we anticipate usage to be low (e.g., <5%, as noted above). Furthermore, we anticipate the conservation measures described above will reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants. As a result, adverse effects to insect and bird pollinators and seed dispersers from malathion exposure are not anticipated to cause species-level effects because of the relatively protected nature of the habitat where these species reside, and the low level of anticipated usage. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers. Therefore, we do not anticipate the proposed action would appreciably reduce survival and recovery of this sub-set of species in the wild.

#### Species 21: *Melicope knudsenii*

The Alani, *Melicope knudsenii* is a perennial tree in the rue family found in a very restricted range only on the island of Kauai in the state of Hawaii. According to the most recent status review in 2018, there is only one remaining individual in the wild. Captive propagation efforts are underway but have not produced any plants for reintroduction. Historically, this species has been found in forested flats or talus slopes in dry or mesic forests (USFWS, 1995). The exact location of the remaining individual was not disclosed, though it is completely surrounded by fencing. Specific species of pollinators are unknown for this species, though insects are suspected based on known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success. However, while one source (NatureServe) identified the preferred habitat of this species as forests utilized as pastures, the most recent FWS documents do not indicate use of habitat as pasture as a threat to this species. Habitat is described as dryland forest where this species tends to grow tangled among other native shrubs (2018 5-year review). We expect forested habitats are less likely to experience malathion exposure as malathion is not registered for use in forests and the physical structure of these habitats is likely to block spray drift. In addition, we anticipate low levels of malathion exposure in the area where the one remaining individual survives. Thus, based on the low level of exposure expected, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects.

Therefore, we do not anticipate the action would appreciably reduce survival and recovery of *Melicope knudsenii* in the wild.

**Species 17, 19, 40 and 82:**

Species 17: *Melanthera kamolensis*

The nehe, *Melanthera kamolensis*, is a short lived, partially woody, perennial herb found only in a very restricted range in east Maui in the state of Hawaii. According to the most recent status review in 2018, there was only one known individual in the wild. However, captive propagation and reintroduction efforts have been occurring for a number of years and reintroductions have taken place at two protected sites in Kanaio Natural Area Reserve (NAR) managed by the state of Hawaii. There are approximately 50 individuals surviving due to these efforts. Specific species of pollinators are unknown for this species, though insects are suspected based on the known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success.

However, Kanaio NAR is actively managed to reduce the primary threats to this species including trampling and herbivory by non-native ungulates and feral pigs and competition from non-native invasive plants. Fence construction to completely enclose the area is underway. As a result, we anticipate there is a very low likelihood of malathion exposure in this protected area. Thus, based on the low level of exposure expected, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects. Therefore, we do not anticipate the action would appreciably reduce survival and recovery *Melanthera kamolensis* in the wild.

Species 19: *Melicope adscendens*

The Alani, *Melicope adscendens*, is a perennial, sprawling shrub in the rue family found only in a very restricted range in east Maui in the state of Hawaii. According to the most recent status review in 2018, there are only two individuals remaining in the wild. However, the Plant Extinction Prevention Program (PEPP) has undertaken a captive propagation effort for this species and has reintroduced at least three individuals at two sites in protected areas in east Maui. The exact location of these sites was not disclosed, though protection will not be complete until exclusion fences can be constructed. Specific species of pollinators are unknown for this species, though insects are suspected based on known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success. However, while one source (NatureServe) identified the preferred habitat of this species as forests utilized as pastures, the most recent FWS documents do not indicate habitat use as pasture as a threat to this species. Habitat is described as dryland forest where this species tends to grow tangled among other native shrubs (2018 5-year review). We expect forested habitats are less likely to experience malathion exposure as malathion is not registered for use in forests and the physical structure of these habitats is likely to block spray drift. In addition, we anticipate low levels of malathion exposure potential in the protected sites where this species is being reintroduced. Thus, based on the low level of exposure expected we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects.

Therefore, we do not anticipate the action would appreciably reduce survival and recovery of *Melicope adscendens* in the wild.

Species 40: *Sicyos macrophyllus*

The `Anunu, *Sicyos macrophyllus*, is a perennial vine in the gourd family found in a very restricted range on the island of Hawaii. The habitat for this species is described as forests in montane wet and dry ecosystems. This habitat has been increasingly fragmented by pastureland, leaving only patches of native forest. According to the 2016 listing document, there are 10 occurrences containing approximately 24-26 individuals remaining in the wild. In addition, outplanting of an unspecified number of individuals has occurred at several sites within Hawaii Volcanoes National Park. Malathion usage on federal lands is anticipated to be low as explained above. Specific species of pollinators are unknown for this species, though insects are suspected based on known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success.

Seed dispersers are thought to be birds and/or mammals. No mortality or sublethal effects are expected for mammalian seed dispersers from malathion exposure either on use sites or from spray drift. Avian seed dispersers exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. As a result, we anticipate adverse effects to this species due to the reduction in seed dispersing birds that would result in reduced reproductive success. However, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, the `Anunu occurs near pasture in Hawaii. New restrictions on pasture will prohibit application of malathion within three days prior to

bloom of alfalfa (the primary constituent of the pasture UDL), during bloom, and until petal fall is complete, thus reducing mortality of pollinators attracted to the alfalfa flowers. In addition, a reduction to two applications per year will be implemented for pasture.

While this species is found in forest habitats dispersed among pastureland, where malathion is registered for use, we anticipate a low level of usage in these areas (<5% as discussed above), including pasture. In addition, we expect forested habitats are less likely to experience malathion exposure as malathion is not registered for use in forests and the physical structure of these habitats is likely to block spray drift. Thus, based on the low level of exposure expected, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers

Therefore, we do not anticipate the action would appreciably reduce survival and recovery of *Sicyos macrophyllus* in the wild.

**Species 82: *Spermolepis hawaiiensis***

*Spermolepis hawaiiensis* is an annual herb in the parsley family found on multiple islands in the state of Hawaii (Kauai, Oahu, Molokai, Maui and Hawaii). The habitat for this species is described as dry shrubland, cultivated fields and pasture. According to the 2015 species status report, there are currently 5-6,000 individuals of this species. In addition, active captive propagation and reintroduction programs are ongoing, resulting in an unspecified number of outplanted individuals in Hawaii Volcanoes National Park, among other sites. Some populations are surrounded by exclosures, protecting them from ongoing threats, especially wandering cattle and other non-native ungulates that destroy or modify the plant's habitat.

Specific species of pollinators are unknown for this species, though insects are suspected based on known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success. Seed dispersal is thought to occur via wind, therefore no adverse reproductive effects are anticipated due to seed disperser exposure to malathion. However, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, *S. hawaiiensis* occurs in or near pasture on various islands within the state of Hawaii. New restrictions on pasture will prohibit application of malathion within three days prior to bloom of alfalfa (the primary constituent of the pasture UDL), during bloom, and until petal fall is complete, thus reducing mortality of pollinators attracted to the alfalfa flowers. In addition, a reduction to two applications per year will be implemented for pasture.

While we anticipate high exposure to this species based on its preferred habitat, anticipated usage is low (<5% as described previously), so we expect a small amount of this species range will be treated with malathion. Thus, based on the low level of exposure expected, the relatively well distributed populations across a number of islands, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators.

Therefore, we do not anticipate the action would appreciably reduce survival and recovery of *Spermolepis hawaiiensis* in the wild.

**Species 39, 55 and 70:**

**Species 55: *Cyanea gibsonii***

*Cyanea gibsonii* is a long-lived palm tree-like tree in the bellflower family endemic to the island of Lanai in the state of Hawaii. The habitat for this species is described as wet forests and shrublands, particularly in gulch bottoms or gulch slides. According to the 2018 species status report, there are three populations containing approximately 23 individuals. Captive propagation is underway, though there have yet to be any successful reintroductions.

Specific pollinators have not been identified for this species, but are likely insects or birds or both based on known pollinators of related species. Insect pollinators are anticipated to experience mortality if exposed to malathion. Bird pollinators exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird pollinators. Loss of pollinating vectors was listed as a secondary threat to the primary threats of herbivory and habitat modification from non-native ungulates, climate change and invasive plants in the 1995 Lanai Plants Recovery Plan. This threat was not mentioned in the 2014 or 2018 Status Reviews. Regardless, there may be a pre-existing reduction in the population of pollinators in the range of this species. As a result, we anticipate adverse effects to this species due to the reduction in pollinating insects and birds that would result in reduced reproductive success.

For seed dispersal, this species is suspected to rely on a variety of vectors, including abiotic. There are no anticipated adverse effects to abiotic vectors from malathion exposure. As with pollinating vectors, mortality is expected for insect seed dispersers exposed to malathion on use sites or via spray drift. Avian seed dispersers exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure

and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird seed dispersers. No mortality or sublethal effects are expected for mammalian seed dispersers from malathion exposure either on use sites or from spray drift. As a result, we anticipate adverse effects to these species due to the reduction in seed dispersing insects and birds that would result in reduced reproductive success.

While we anticipate medium potential exposure to this species based on its preferred habitat that includes open shrublands, anticipated usage is low (<5% as described previously), so we expect a small amount of the range of this species will be treated with malathion. In addition, construction of complete fencing around all three populations is underway and we anticipate low levels of malathion usage in these protected areas. Furthermore, we anticipate the conservation measures described above will reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants. Thus, based on the low level of exposure, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects.

Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers. Therefore, we do not anticipate the action would appreciably reduce survival and recovery of *Cyanea gibsonii* in the wild.

#### *Species 39: Sesbania tomentosa*

*Sesbania tomentosa* is a short-lived perennial shrub or small tree in the pea family found on all of the main Hawaiian Islands and Nihoa and Nicker islands. According to the most recent status review in 2021, the number of individuals has remained stable since the last 5-year review and reports 1,600-2,700 individuals on the main islands and approximately 5,500 in the Northwest Islands. Captive propagation and reintroduction efforts are underway, and to date several hundred individuals have been successfully reintroduced throughout the range.

Six insect species have been observed visiting this species, including native yellow-faced bees, non-native honey bees, and various ants (2015 5-year review). A secondary limiting factor mentioned in the status review is low fruit set caused by lack of pollination or self-incompatibility issues. More study to determine the exact causes of this issue was recommended. We anticipate adverse effects to this species due to the reduction in pollinating insects that would result in reduced reproductive success. Seed dispersal vectors are unknown but may be a combination of abiotic and biotic vectors. If this is the case, any insect or avian seed dispersers are expected to experience mortality and sub-lethal effects due to malathion exposure resulting in reduced reproductive capacity for this species. However, population numbers are stable and successful reintroductions are underway. A large proportion of the individuals are found in the Northwest Islands that are isolated and uninhabited, making malathion exposure highly unlikely. The populations on the main islands are protected on a number of federal and state lands and occur in coastal dry shrublands and grasslands where we anticipate medium exposure due to the inability of vegetation to block spray drift and greater likelihood of proximity to malathion use areas. These areas are also anticipated to see low malathion usage (<5% as discussed above). As a result, we anticipate there is low likelihood of malathion exposure within the range of this species. Furthermore, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants.

Thus, based on the low level of exposure expected, stable population numbers, we do not anticipate the reductions in pollinator numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers. Therefore, we do not anticipate the action would appreciably reduce survival and recovery *Sesbania tomentosa* in the wild.

#### *Species 70: Geranium multiflorum*

*Geranium multiflorum* is a long-lived perennial shrub in the geranium family endemic to east Maui that is found primarily in wet forests, but also montane grasslands and bog edges. According to the most recent status review in 2018, there were more than 500 individuals in 9 populations on the island. Captive propagation and reintroduction efforts are underway, and to date an unspecified number of individuals have been successfully reintroduced throughout the range, and at least 28 individuals are located in Haleakala National Park.

Pollinators are unknown, though suspected to be insects or birds based on known pollinators of related species. Seed dispersal vectors are also unknown, but may be a mix of abiotic and biotic vectors. Insect pollinators and seed dispersers are anticipated to experience mortality if exposed to malathion. Bird pollinators and seed dispersers exposed to malathion on use sites may experience mortality or sublethal effects, depending on the site of exposure and size of the bird. Smaller birds exposed on use sites with higher allowable use rates (e.g., developed, open space developed, orchards and vineyards) have a greater chance of being affected. Exposure to spray drift is not expected to result in effects to bird pollinators. Loss of pollinating and seed dispersing vectors was mentioned as a threat in the 2011 and 2018 Status Reviews, though was not classified as an immediate threat.

More research was deemed necessary to determine specific species of pollinators and seed dispersers and identify limiting factors related to this species' reproduction. As such, there may be a pre-existing reduction in the population of pollinators in the range of this species. We anticipate adverse effects to this species due to the reduction in pollinating and seed dispersing insects and birds that would result in reduced reproductive success.

However, population numbers are relatively high and successful reintroductions are adding to existing numbers. A portion of the populations can be found on protected federal or state lands, such as Haleakala National Park, Nanwi Natural Area Reserve and Waikamoi Preserve. In addition, some of the populations in these areas are completely fenced to protect them from their primary threats of habitat alteration and herbivory by non-native ungulates and feral pigs and invasive plants. We anticipate very low malathion usage in these protected areas and anticipate low malathion usage (<5% as discussed above) in unprotected parts of this species range.

Furthermore, we anticipate the conservation measures described above will further reduce the risk of exposure to both pollinators and seed dispersers and the resultant reproductive effects to the plant species. For example, new restrictions prohibit application on crops in certain UDLs three days prior to bloom, during bloom, and until petal fall is complete. Given that most pollinating insects are likely to be attracted to crops in bloom and thus more likely to be present in agricultural areas during these times, avoiding application during bloom is anticipated to reduce exposure and resultant mortality of pollinators important for these plants.

As a result, we anticipate there is low likelihood of malathion exposure within the range of this species. Thus, based on the low level of exposure expected, we do not anticipate the reductions in pollinator or seed disperser numbers and resulting reduction in reproductive capacity for this species to rise to the level of species-level effects. Moreover, we anticipate the conservation measures will further reduce the likelihood of exposure of the species and its pollinators and seed dispersers. Therefore, we do not anticipate the action would appreciably reduce survival and recovery *Geranium multiflorum* in the wild.