

## 2 **16.2 Taxon Summary: *Alectryon macrococcus* var. *macrococcus***



4 Photographer: J. Obata

6 **Scientific name:** *Alectryon macrococcus* Radlk. var. *macrococcus*

**Hawaiian name:** *Mahoe, alaalahua*

8 **Family:** Sapindaceae (Soapberry family)

**Federal status:** Listed endangered

10 **Description and biology:** *Alectryon macrococcus* var. *macrococcus* is a tree up to 11 m (34 ft)  
 12 tall. Fully mature trees are usually multi-trunked. The trunks have a sinewy appearance. The  
 14 leaves are compound, with 2-5 pairs of leaflets, each of which measure 10-28 cm (3.9-10.9 in)  
 long. The flowers are borne in panicles up to 30 cm (11.7 in) long. Flowers are either perfect  
 16 (possessing male and female reproductive parts), or staminate (possessing only male  
 reproductive parts). Pollination of the taxon is probably carried out by insects. The roundish  
 18 fruits are 2.5-7 cm (0.9-2.7 in) in diameter. On Kauai the fruits have been observed to be  
 uniformly small on all of the fruiting trees, averaging about 2.5 cm (1.0 in) in diameter (Wood  
 20 pers. comm. 2000). On the other islands the fruits are much larger, averaging about 4 cm (1.6 in)  
 in diameter (Lau pers. comm. 2000). The hard rind of the fruit often cracks open when the fruit  
 22 is ripe to expose the contents of the fruit. Most of the volume within the hard rind is taken up by  
 the aril, or the fleshy part of the fruit; and a single flattish seed at the end of the fruit takes up the  
 24 remainder. The aril is red, and has a pleasant taste somewhat like that of a mountain apple  
 (*Syzygium malaccense*). Upon maturity the fruit sometimes cracks open to expose the bright red,  
 26 glossy-surfaced aril next to the glossy dark brown to blackish outer surface of the seed. It is  
 hypothesized that the large flightless ducks extant in Hawaii before human settlement acted as  
 dispersal agents for *A. macrococcus* var. *macrococcus*.

28 A substantial percentage of the trees flower but never bear fruit despite appearing relatively  
 30 healthy (Lau pers. comm. 2000). Although the cause of this is not documented, it may be that  
 some trees only bear flowers that are functionally male.

32 There is little information on growth rates of wild plants and their age of maturation. However,  
34 two trees in cultivation have been observed to flower for the first time when they were about 15  
36 years old. At that age they were about 6 m (20 ft) tall. They were single-trunked, with the  
trunks measuring about 14 cm (5.5 in) in diameter (Lau pers. comm. 2000). Wild trees  
undoubtedly live for decades based on observed growth rates and tree sizes (Lau pers. comm.  
2000).

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**Known distribution:** *Alectryon macrococcus* var. *macrococcus* is known from Kauai, Oahu,  
40 Molokai, and West Maui. On Kauai it has been found on the western side of the island from  
Olokele Canyon to Kalalau Valley. On Oahu it is known primarily from the Waianae  
42 Mountains, where it has been recorded throughout the mountain range, on both the windward  
and leeward sides. There are only two historical records of the taxon in the Koolau Mountains.  
44 On Molokai it has been documented only from the western portion of East Molokai. On West  
Maui it has been found in the valleys and gulches on the eastern, southern, and western sides of  
46 the West Maui Mountains. Recorded elevations for *A. macrococcus* var. *macrococcus* range  
from 366 to 1,036 m (1,200 to 3,400 ft).

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**Population trends:** This taxon has been steadily declining since the introduction of the black  
50 twig borer, *Xylosandrus compactus*. Many of the mature trees are dying. Young trees are not  
common, and seldom do seedlings reach sapling size before being killed by the twig borer.

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**Current status:** *Alectryon macrococcus* var. *macrococcus* is still extant throughout its recorded  
54 range except for the Koolau Mountains of Oahu. The taxon apparently has always been  
relatively rare on Molokai and West Maui. Over the last three decades, only about ten plants  
56 have been observed on Molokai and fewer than 20 have been observed on West Maui. This  
species is most common on parts of Kauai and in the Waianae Mountains of Oahu.  
58 Approximately 80 plants are thought to remain on Kauai. It is estimated that about 300 plants  
still remain in the Waianae Mountains, with more than half occurring in the three population  
60 units of Central Kaluaa to Central Waieli, Makaha, and West Makaleha. About 77 plants are in  
the Makua action area. The current populations units of *A. macrococcus* var. *macrococcus* are  
62 listed in Table 16.4 and their sites are plotted on Maps 16.2, 16.3, 16.4, and 16.5. The sites of  
the population units proposed for management for stability are characterized in Table 16.5 and  
64 threats to the taxon at these sites are identified in Table 16.6.

66 **Habitat:** *Alectryon macrococcus* var. *macrococcus* occurs in gulch bottoms and on lower gulch  
slopes in native mesic forests. These forests are often composed of a mix of tree species such as  
68 *alaa* (*Pouteria sandwicensis*), *papala kepau* (*Pisonia* spp.), *lama* (*Diospyros sandwicensis* and  
*D. hillebrandii*), *kopiko* (*Psychotria* spp.), *ohia* (*Metrosideros* spp.), and *kolea* (*Myrsine* spp.).  
70 As with most rare Hawaiian mesic forest plants, *A. macrococcus* var. *macrococcus* is found  
primarily on the north-facing sides of gulches.

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**Taxonomic background:** *Alectryon macrococcus* is the only species of the genus occurring in  
74 Hawaii. The species is comprised of two varieties: the Makua target taxon, var. *macrococcus*,  
and var. *auwahiensis*, which is endemic to the south and northwestern slopes of East Maui. The  
76 two varieties are distinguished only by the hairiness of the leaf underside, with var. *auwahiensis*  
being the hairier of the two (Linney 1987).

78 **Outplanting considerations:** No outplantings of *A. macrococcus* var. *macrococcus* are  
80 proposed due to the threat of black twig borer herbivory. If outplantings were to be carried out,  
82 there are no concerns with respect to inadvertently allowing unnatural hybridization between the  
two varieties, as their ranges are well separated. *Alectryon macrococcus* does not have any close  
relatives in Hawaii that could potentially hybridize with it.

84 **Threats:** The most serious threat to *A. macrococcus* var. *macrococcus* is the black twig borer.  
This minute beetle was discovered to be present on Oahu in 1961 and is now widespread in  
86 Hawaii (Nelson and Davis 1972). The female black twig borer tunnels into the center of living  
twigs and lays eggs in the hollowed twigs. The physical damage caused by tunneling coupled  
88 with the introduction of pathogens often results in the death of the twigs. Chronic infestation  
leads to a gradual weakening of the tree, and eventual premature death. All trees of this taxon  
90 are being affected by the black twig borer to some degree.

92 Other threats to *A. macrococcus* var. *macrococcus* include invasive alien animal species, which  
degrade the target taxon's habitat, and harm the plants by feeding on them, trampling them, or  
94 uprooting them while rooting for food. Alien plants also threaten the taxon by altering its  
habitat, and competing with it for sunlight, moisture, nutrients, and growing space. Also, some  
96 alien plants, such as tall grasses, can cause and increase the size and frequency of fires. Feral  
pigs and goats threaten the taxon by disturbing and altering the taxon's habitat and potentially  
98 feeding upon it. Additional threats include rats (which eat the seeds of the taxon), cattle grazing,  
and fire. At least one Kauai population unit (Haelele) may be suffering from the presence of  
100 black-tailed deer, and axis deer threaten certain population units on Molokai and Maui.

102 **Table 16.4 Current Population Units of *Alectryon macrococcus* var.**  
 104 ***macrococcus*.** The numbers of individuals include mature and immature plants, and do not include seedlings. Population units proposed for management are shaded.

Island	Population Unit Name	Total Number of Individuals	No Management Proposed	Management Proposed
Kauai:	Haeleele	3	0	3
	Kalalau	11	0	11
	Koaie	65	0	65
Oahu:	Alaiheihe	10	10	0
	Central and East Makaleha	21	21	0
	Central Kaluaa to Central Waieli	53 - 58	0	53 - 58
	Ekahanui	4	4	0
	Halona	1	1	0
	Huliwai	6	6	0
	Kaawa	3	3	0
	Kahanahaiki	2	0	2
	Kapuna	6	0	6
	Kaumoku Nui	1	1	0
	Keaau	2	2	0
	Makaha	77	0	77
	Makua	15	0	15
	Manawai	2	2	0
	Mikilua	2	2	0
	Napepeiauolelo	1	1	0
	North Mohiakea	2	2	0
	North Palawai	1	1	0
	North Waieli	3	3	0
	Pahole	7	0	7
Palikey Gulch	2	2	0	
South Kaluaa	17	17	0	
South Mohiakea	17	0	17	
Waianaekai	11	1	16	
West Makaleha	45	1	44	
Molokai:	Kahuaawi	1	0	1
	Kaunakakai to Kawela	8	0	8
	Kawela and Makolelau	1	0	1
Maui:	Haena Nui	15	0	15
	Honokowai	2	0	2
	Iao	2	0	2
	Launiupoko	1	0	1
	Waikapu	1	0	1

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**Table 16.5 Site Characteristics for Population Units of *Alectryon macrococcus* var. *macrococcus* Proposed for Management for Stability.**

Population Unit:	Site Characteristics:			
	Habitat Quality	Terrain	Accessibility	Existing Fence
Central Kaluaa to Central Waieli	Medium-Low	Moderate	High	Large, None
Makaha	High-Medium	Moderate	High	None
Makua	High-Medium	Steep	Medium	None
Pahole	High-Medium	Moderate	High	Large
West Makaleha	High-Medium	Moderate	High	None

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**Table 16.6 Threats to Population Units of *Alectryon macrococcus* var. *macrococcus* Proposed for Management for Stability.**

Population Unit:	Threats:										
	Pigs	Goats	Weeds	Rats	Black Twig Borer	Slugs and Snails	Other Arthro-pods	Fire Ignition	Fire Fuels	Erosion	Human Distur-bance
Central Kaluaa to Central Waieli	Low, Medium	N/A	Medium	Low	High	Unknown A	Unknown A	High	Medium	Low	Medium
Makaha	Medium	High	Medium	High	High	Unknown A	Unknown A	Very high	Medium	Low	Medium
Makua	Medium	Medium	Medium	High	High	Unknown A	Unknown A	Very high	Medium	Low	Medium
Pahole	Low	Low	Medium	High	High	Unknown A	Unknown A	Very high	Medium	Low	Medium
West Makaleha	Medium	Medium	Medium	Unknown B	High	Unknown A	Unknown A	Very high	Medium	Low	Medium

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