

## 16.19 Taxon Summary: *Neraudia angulata*

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### *Neraudia angulata* var. *angulata*

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Photographer: Hawaii Natural Heritage Program



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### *Neraudia angulata* var. *dentata*

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Photographer: K. Kawelo and J. Lau



**Scientific name:** *Neraudia angulata* R.

Cowan var. *angulata* and *Neraudia angulata*

R. Cowan var. *dentata* Degener & R. Cowan

**Hawaiian name:** *Maaloa, oloa*

**Family:** Urticaceae (Nettle family)

**Federal status:** Listed endangered

**Description and biology:** *Neraudia angulata* is an upright shrub reaching up to 3 m (9.8 ft) in height. The leaves are alternately arranged, and measure 7-15 cm (2.7-5.9 in) long. The undersides of the leaves are usually obviously covered with hairs. The leaf margins are sometimes toothed. In some cases the teeth are large and numerous, giving the leaf margin a ragged appearance. The degree to which the leaf margins of a given plant are toothed can vary according to the time of year. The flowers of *N. angulata* are borne in axillary clusters. The mature fruit is small and seed-like, and is enclosed in a red fleshy calyx.

32 For a discussion of the differences between the two varieties of *N. angulata* see the taxonomic  
background section below.

34 According the literature on *N. angulata*, the species is dioecious (with male and female flowers  
on separate plants). However, cultivated plants have shown that this is not always so. Many  
36 plants can have both male and female flowers (Lau pers. comm. 2000). *Neraudias* are wind-  
pollinated (Wagner *et al.* 1990). Flowering and fruiting occurs throughout the year. The red  
38 fleshy calyx surrounding the mature fruit suggests that fruit-eating birds disperse the species'  
seeds. The plants appear to live for fewer than 10 years (Lau pers. comm. 2000).

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**Known distribution:** *Neraudia angulata* has been recorded throughout the Waianae Mountains  
42 from 370-701 m (1,200-2,300 ft) in elevation.

44 **Population trends:** It is difficult to gauge long term population trends with *N. angulata* because  
of the tendency of its populations to fluctuate (Lau pers. comm. 2000). It is clear, however, that  
46 the number of sites where this species grows is diminishing.

48 **Current status:** The total number of individuals of *N. angulata* is about 170, about 30 of which  
are within the Makua action area. The current populations units of *N. angulata* are listed in  
50 Table 16.55 and their sites are plotted on Map 16.29. The sites of the population units proposed  
for management for stability are characterized in Table 16.56 and threats to the plants at these  
52 sites are identified in Table 16.57.

54 **Habitat:** *Neraudia angulata* typically grows in dry forests and shrublands, and it occasionally  
extends into mesic forests and shrublands. Some of the plants occur on gulch slopes. Others are  
56 found growing on steep to nearly vertical cliffs, and on cliff ledges. The species can be found in  
the forest understory, as well as among shrubs and grasses in exposed, sunny situations.

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**Taxonomic background:** *Neraudia* is an endemic Hawaiian genus with five species. There are  
60 two recognized varieties of *N. angulata*: var. *angulata* and var. *dentata*. Variety *dentata* is  
characterized by leaf undersides with hairs projecting out from the leaf surface. Variety  
62 *angulata*, on the other hand, has leaf undersides with hairs lying close to the leaf surface,  
resulting in a silvery sheen. Another character distinguishing the two varieties is the leaf margin.  
64 Variety *angulata* does not have toothed margins. With var. *dentata*, however, examination of a  
colony large enough to provide an adequate sample will show that some percentage of the plants  
66 in the colony have at least some of their leaves exhibiting toothed leaf margins.

68 The taxonomy of *N. angulata* is in need of further study. The two varieties reportedly can be  
found growing near one another, yet remain distinct entities (Cowan 1949). However,  
70 populations have been found that seem not to represent either strict var. *dentata* or strict var.  
*angulata* (Lau pers. comm. 2000).

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**Outplanting considerations:** *Neraudia melastomifolia* is the other species of *Neraudia*  
74 occurring in the Waianae Mountains. It generally grows in habitats wetter than those of *N.*  
*angulata*. There is, however, at least a little overlap in the ranges of the two species, for instance  
76 in North Palawai Gulch in the southern Waianae Mountains. It is not known whether the two

78 species hybridize with one another. *Neraudia melastomifolia* should be avoided when  
outplanting *N. angulata*, unless the outplanting is being established in one of the few areas where  
80 the ranges of the two *Neraudias* naturally overlap.

82 In addition, any outplanting of *N. angulata* should proceed with caution with regard to other  
plants of *N. angulata*. The taxonomy of *N. angulata* is still not well understood, and much  
84 remains to be learned. All parts of the Waianae Mountains are potentially already occupied by  
one or more forms of *N. angulata*. When planning for outplantings of *N. angulata*, care must be  
86 taken to avoid unwittingly compromising the genetic integrity of the varieties, populations, and  
potential ecotypes currently included within *N. angulata*. Any outplanting of *N. angulata* should  
88 be conducted close to the source plants, and away from areas where plants with differing  
morphology or ecological preferences grow or potentially grow.

90 **Threats:** Fire poses a threat to many of the *N. angulata* population units. Fires have already  
destroyed or damaged portions of *N. angulata*'s habitat within the Makua action area, particularly  
92 in Kaluakauila Gulch and in Kahanahaiki. Other threats to *N. angulata* include feral goats and  
pigs, and alien plants. Also, *N. angulata*'s range extends into lands in the lower elevations of the  
94 Waianae Mountains, which were heavily grazed in the 1800's and early 1900's. Many of these  
lands are no longer grazed. On some other lands, however, cattle continue to threaten the  
96 species.

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100 **Table 16.55 Current Population Units of *Neraudia angulata*.** 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
Oahu:	Halona	15	0	15
	Kapuna	1	0	1
	Leeward Puu Kaua	3	0	3
	Makaha	70	0	70
	Makua	31	0	31
	Manawai	12	0	12
	Waianae Kai Makai	4	0	4
	Waianae Kai Mauka	46	0	46

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**Table 16.56 Site Characteristics for Population Units of *Neraudia angulata* Proposed for Management for Stability.**

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Population Unit:	Site Characteristics:			
	Habitat Quality	Terrain	Accessibility	Existing Fence
Kapuna	Medium-Low	Moderate	High	None
Makaha	High- Medium	Moderate to Vertical	Low to High	None
Makua	Low to High	Moderate to Vertical	Low to High	Large
Manawai	Medium-Low	Moderate	High	None
Waianae Kai Mauka	High-Medium	Moderate to Steep	High	None

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**Table 16.57 Threats to Population Units of *Neraudia angulata* Proposed for Management for Stability.**

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Population Unit:	Threats:										
	Pigs	Goats	Weeds	Rats	Black Twig Borer	Slugs and Snails	Other Arthro-pods	Fire Ignition	Fire Fuels	Erosion	Human Distur-bance
Kapuna	High	Medium	High	Unknown A	Unknown A	Unknown B	Unknown A	Very high	High	Low	Medium
Makaha	Medium	Medium	Medium	Unknown A	Unknown A	Unknown B	Unknown A	Very high	High	Low	Low, to Medium
Makua	Medium	Medium	Medium to High	Unknown A	Unknown A	Unknown B	Unknown A	Very high	Medium	Low	Low, to Medium
Manawai	High	High	High	Unknown A	Unknown A	Unknown B	Unknown A	High	Medium	Low	Medium
Waianae Kai Mauka	High	High	Medium	Unknown A	Unknown A	Unknown B	Unknown A	Very high	Medium	Low	Medium

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