

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Neraudia ovata* (No common name)

Current Classification: Endangered

FR Notice announcing initiation of this review:

U.S. Fish and Wildlife Service (USFWS). 2006. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 70 species in Idaho, Oregon, Washington, Hawaii, and Guam. Federal Register 71(69):18345-18348.

Lead Region/Field Office:

Region 1

Pacific Islands Fish and Wildlife Office, Gina Shultz, Assistant Field Supervisor
Endangered Species

Name of Reviewer(s):

Marie Bruegmann, Pacific Islands Fish and Wildlife Office, Plant Recovery Coordinator
Marilet A. Zablan, Pacific Islands Fish and Wildlife Office, Recovery Program Leader
and Acting Assistant Field Supervisor for Endangered Species

Methodology used to complete this 5-year review:

This review was based on the final critical habitat designation for *Neraudia ovata* and other species from the island of Hawaii, as well as a review of current, available information. The National Tropical Botanical Garden, subcontracted by the Hawaii Biodiversity and Mapping Program, provided an initial draft of portions of the 5-year review.

Background:

For information regarding the species listing history and other facts, please refer to the Threatened and Endangered Species System (TESS) which is part of the Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database.

Application of the 1996 Distinct Population Segment (DPS) Policy:

This Policy does not apply to plants.

Review Analysis:

Please refer to the final critical habitat designation for *Neraudia ovata* published in the Federal Register on July 2, 2003 (USFWS 2003) for a complete review of the species' status (including biology and habitat), threats, and management efforts. No new threats and no significant new information regarding the species biological status have come to light since listing to warrant a change in the Federal listing status of *N. ovata*.

No remaining individuals of *Neraudia ovata* have been reported at most of 12 historically known locations (Hawaii Biodiversity and Mapping Program 2005), including several in the Hawaii Volcanoes National Park, and others at Kaloko, Kau, Kaupulehu, Kahuku,

Kapua, Kealahou, Kanahou (Big Island Plant Extinction Prevention Program 2006; Hawaii Biodiversity and Mapping Program 2005). At the time of listing, *N. ovata* was known from 11 individuals in 2 populations (USFWS 1994). Currently remaining natural populations of *N. ovata* include 14 to 18 mature individuals and up to 125 immature individuals. Two plants were found recently at Puu Anahulu on State land and one plant is known from at Manuka (J.L. Perry, Division of Forestry and Wildlife, pers. comm. 2007). The remainder of the plants are found within the U.S. Army's Pohakuloa Training Area. An additional plant that may represent *Neraudia ovata* was found in Laupahoehoe, in Kohala, in 2005, but the identification of this specimen has not been verified yet (Big Island Plant Extinction Prevention Program 2006).

Efforts have been made to improve genetic variability and seedling vigor at the U.S. Army's Pohakuloa Training Area. Except for three individuals each founder in propagation is represented by both a male and female specimen. Seed was collected from ten individuals from the U.S. Army's Pohakuloa Training Area. Over 15,000 seeds are held in storage (U.S. Army Pohakuloa Training Area 2007; Center for Conservation and Research Training Seed Storage Laboratory 2007). Individuals are being grown for reintroduction at Volcano Rare Plant Facility and the U.S. Army Pohakuloa Training Area (U.S. Army Pohakuloa Training Area 2006; Volcano Rare Plant Facility 2007).

Numerous plants have been reintroduced with approximately 85 percent survival after one to two years, all within small-scale fenced areas. Currently, there are 13 immature individuals at Koaia Tree Sanctuary, 23 mature and 16 immature individuals at Oweowe (Puu Waawaa), 5 immature individuals at Kipuka Kalawamauna, 12 immature individuals in Kipuka Alala, 72 immature individuals on Puu Waawaa cone; 22 individuals on Puu Huluhulu, an undetermined number at Manuka and Kiolakaa Ranger Station in Kau District; 164 immature individuals at Hilina Pali (Hawaii Volcanoes National Park 2006; Big Island Plant Extinction Prevention Program 2006; U.S. Army Pohakuloa Training Area 2006; J.L. Perry, pers. comm. 2007). Most individuals reach reproductive status before leaving the nursery, but return to a vegetative status or experience severe leaf drop at drier outplanting sites. A small amount of recruitment of seedlings has been noted at only one outplanting site (U.S. Army Pohakuloa Training Area 2006). In total, 14 to 18 naturally occurring individuals exist and 23 mature and nearly 300 immature individuals have been reintroduced into 9 locations. None of these populations has stable numbers, based on the interim stability criteria in the recovery plan (USFWS 1998).

Invasive introduced plant species (Factor E) that impact *Neraudia ovata* by modifying the habitat include *Pennisetum setaceum* (fountain grass), *Schinus terebinthifolius* (Christmasberry), *Lantana camara* (lantana), *Leucaena leucocephala* (haole koa), and *Kalanchoe tubiflora* (chandelier plant) (Hawaii Biodiversity and Mapping Program 2005). Ungulates, including mouflon (*Ovis montanus*), feral pigs (*Sus scrofa*), and goats (*Capra hircus*), also disturb the area and spread invasive plant seeds (Factors A and D). *Neraudia ovata* is susceptible to red spider mites (*Tetranychus urticae*) both in the greenhouse and in the wild (Factor C) (U.S. Army Pohakuloa Training Area 2006). Fire (Factor E) and rats (Factor C) are also threats to *N. ovata* (USFWS 2007).

In addition to all of the other threats, species like *Neraudia ovata* that are endemic to small portions of a single island are inherently more vulnerable to extinction than widespread species because of the higher risks posed to a few populations and individuals by random demographic fluctuations and localized catastrophes such as hurricanes and disease outbreaks (Factor E). When considered on their own, the natural processes associated with being a single island endemic do not affect *N. ovata* to such a degree that it is threatened or endangered with extinction in the foreseeable future, but these natural processes can exacerbate the threat from anthropogenic factors, such as habitat loss for human development or predation by alien species (Factor E) (USFWS 1998).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan addendum for plants from the island of Hawaii (USFWS 1998), based on whether the species is an annual, a short-lived perennial (fewer than 10 years), or a long-lived perennial. *Neraudia ovata* is a short-lived perennial, and to be considered stable, the taxon must be managed to control threats (*e.g.*, fenced) and be represented in an *ex situ* (at other than the plant's natural location, such as a nursery or arboretum) collection. In addition, a minimum of three populations should be documented on the island of Hawaii. Each of these populations must be naturally reproducing and increasing in number, with a minimum of 50 mature individuals per population.

The stabilization goals for this species have not been met (see Table 1). Therefore, *Neraudia ovata* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Collect fruit from all remaining naturally occurring individuals for genetic storage.
- Augment reintroductions with representatives of all naturally occurring individuals.
- Monitor of all known locations in order to determine recruitment activity.
- Construct large-scale fencing around all wild and reintroduced individuals.
- Control invasive introduced plant species and rodents around all wild and reintroduced individuals.
- Continue reintroducing individuals into protected suitable habitat and expand to additional locations.
- Study reintroduced *Neraudia ovata* populations with regard to population size and structure, geographical distribution, flowering cycles, pollination vectors, seed

dispersal agents, longevity, specific environmental requirements, limiting factors, and threats.

References:

- Big Island Plant Extinction Prevention Program. 2006. Program Database. Unpublished.
- Center for Conservation and Research Training Seed Storage Laboratory. 2007. Database. Unpublished.
- Hawaii Biodiversity and Mapping Program. 2005. Program Database. Unpublished.
- Hawaii Volcanoes National Park. 2006. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- U.S. Army Pohakuloa Training Area. 2007. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.
- U.S. Army Pohakuloa Training Area. 2006. Update for genetic safety net species found at Pohakuloa Training Area. U.S. Army Garrison Hawaii. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 2007. Rare plant tracking database. August 29, 2007. Unpublished.
- [USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation and nondesignation of critical habitat for 46 plant species from the island of Hawaii, HI; final rule. Federal Register 68(127):39624-39722.
- [USFWS] U.S. Fish and Wildlife Service. 1998. Big Island II: Addendum to the recovery plan for the Big Island plant cluster. U.S. Fish and Wildlife Service, Portland, OR. 80 pages + appendices.
- [USFWS] U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants; determination of endangered status for thirteen plants from the island of Hawaii, state of Hawaii. Federal Register 61(198):53137-53153.
- Volcano Rare Plant Facility. 2007. Report on controlled propagation of species, as designated under the U.S. Endangered Species Act. Unpublished.

Personal Communication:

- Moriyasu, Patty. 2007. Propagator, Volcanoes Rare Plant Facility, Email to M. Bruegmann, USFWS, August 3, 2007.
- Perry, J. Lyman. 2007. Botanist, Division of Forestry and Wildlife, Hawaii District, Email to M. Bruegmann, USFWS, July 16, 2007.

Table 1. Status of *Neraudia ovata* from listing through 5-year review.

Date	No. wild indivs	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1994 – listing	11	0	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
1998 – recovery plan	11	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partial
			3 populations with 50 mature individuals each	No
2003 – critical habitat	12	ca 60	All threats managed in all 3 populations	Partial
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2007 – 5-yr review	ca 150 (9% mature)	ca 325 (7% mature)	All threats managed	Partial
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW on *Neraudia ovata*

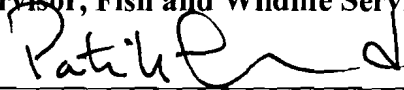
Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

<u> </u>	Delisting
<u> </u>	Reclassify from Endangered to Threatened status
<u> </u>	Reclassify from Threatened to Endangered status
<u> X </u>	No Change in listing status

Field Supervisor, Fish and Wildlife Service

Approve



Date

1/18/08