

## **5-YEAR REVIEW**

Short Form Summary

**Species Reviewed:** *Stenogyne campanulata* (No common name)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2007. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 71 species in Oregon, Hawaii, Commonwealth of the Northern Mariana Islands, and territory of Guam. Federal Register 72(45):10547-10550.

### **Lead Region/Field Office:**

Region 1/Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii

### **Name of Reviewer(s):**

Christian Torres-Santana, Pacific Islands Fish and Wildlife Office, Student Trainee Biologist  
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 conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS) beginning on March 8, 2007. The review was based on the final critical habitat designation for *Stenogyne campanulata* and other species from the island of Kauai, as well as a review of current, available information. The Bernice P. Bishop Museum provided an initial draft of portions of the five-year review. The evaluation of the status of the species was prepared by our lead PIFWO biologist and reviewed by the Plant Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

### **Background:**

For information regarding the species' listing history and other facts, please refer to the Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database for threatened and endangered species ([http://ecos.fws.gov/tess\\_public](http://ecos.fws.gov/tess_public)).

### **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 *Stenogyne campanulata* published in the Federal Register on February 27, 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 *S. campanulata*.

*Stenogyne campanulata* is a short-lived perennial herb first collected in 1986 on sheer, virtually inaccessible north-facing cliffs below the upper rim of Kalalau Valley, Kauai, and subsequently described in 1989 (Weller and Sakai 1989). At the time *Stenogyne campanulata* was federally listed, it was known only from that single population totaling about 50 individuals (USFWS 1992). The critical habitat designation reported three occurrences containing 66 individuals originally discovered in the left branch of Kalalau Valley on State-owned land in Na Pali Coast State Park (USFWS 2003). In 2004, Perlman (2006) cited a single population containing fewer than 20 individuals and in 2006, approximately 50 individuals were reported in one population (USFWS 2008).

Little is known about the life history of *Stenogyne campanulata*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown. Herbarium vouchers at Bernice P. Bishop Museum (C. Imada, Bernice P. Bishop Museum, pers. comm. 2008) and National Tropical Botanical Garden (2008a) suggest that *S. campanulata* flowers in January, May, June, and August; fruiting specimens were reported on January, April, May, and June.

The major threats to this species remain herbivory and habitat degradation by feral goats (*Capra hircus*) (Factors A, C, and D); habitat disturbance by feral pigs (*Sus scrofa*) (Factors A and D) and competition from introduced invasive plant species such as *Erigeron karvinskianus* (daisy fleabane), *Rubus argutus* (Florida prickly blackberry), and *Kalanchoe pinnata* (airplant) (Factor E) (USFWS 1992, 1995, 2003).

In addition to all of the other threats, species like *Stenogyne campanulata* 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, flooding and disease outbreaks (Factor E). When considered on their own, the natural processes associated with being a single island endemic do not affect *S. campanulata* 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 from or predation by introduced species (Factor E) (USFWS 1991, 1995, 2003).

To safeguard existing genetic material, propagation for genetic storage and reintroduction is occurring at the National Tropical Botanical Garden (2007, 2008b). Currently, no seeds or plants are stored for controlled propagation and genetic storage. Four plants propagated at National Tropical Botanical Garden have been outplanted for long-term storage at their garden in Limahuli. The Hawaii Division of Forestry and Wildlife received 13 plants from National Tropical Botanical Garden for outplanting in 2006 and 17 in 2007, but their current status is unknown, as they have not been observed since outplanting (USFWS 2008).

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for plants from the island of Kauai (USFWS 1995), based on whether the species is an annual, a short-lived perennial (fewer than ten years), or a long-lived perennial. *Stenogyne campanulata* is a short-lived perennial, and to be considered stabilized, which is the first step in recovering the species, the taxon must be managed to control threats (*e.g.*, fenced) and be represented in an *ex situ* (off-

site) collection. In addition, a minimum of three populations should be documented on the island of Kauai. 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 as there are about 50 known wild plants and 30 reintroduced individuals, and none of the threats have been managed (see Table 1). Therefore, *Stenogyne campanulata* meets the definition of endangered as it remains in danger of extinction throughout its range.

### **Recommendations for Future Actions:**

- Continue collection of genetic resources for storage, future propagation and reintroducing into protected suitable habitat within historical range.
- Construct enclosure fences to protect individuals from the negative impacts of feral pigs, and eradicate introduced invasive plant species within the enclosures.
- Enhance current natural populations with appropriate genetic individuals.
- Monitor success or failure of reintroductions.
- Work with the Hawaii Division of Forestry and Wildlife to initiate planning and contribute to implementation of ecosystem-level restoration and management to benefit this species in Kalalau Valley.
- Survey geographical and historical range for a thorough current status of the species.
- Assess genetic variability within extant and *ex situ* populations.
- Study *Stenogyne campanulata* 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:**

National Tropical Botanical Garden. 2007. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

National Tropical Botanical Garden. 2008a. Herbarium database; National Tropical Botanical Garden, Kalaheo, Hawaii. Available online at <<http://ntbg.org/herbarium>>. Accessed 10 March 2008.

National Tropical Botanical Garden. 2008b. Report on controlled propagation of listed and candidate species, as designated under the U.S. Endangered Species Act. Unpublished.

Perlman, S. 2006. Plant Extinction Prevention status of Kauai species. August 28, 2006. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; determination of endangered status for six plants from the Kokee region, island of Kauai, Hawaii; final rule. Federal Register 57(93):20580-20589.

[USFWS] U.S. Fish and Wildlife Service. 1995. Recovery plan for the Kauai plant cluster. U.S. Fish and Wildlife Service, Portland, OR. 270 pages.

[USFWS] U.S. Fish and Wildlife Service. 2003. Endangered and threatened wildlife and plants; final designation or nondesignation of critical habitat for 95 plant species from the islands of Kauai and Niihau, HI; final rule. Federal Register 68(39):9116-9479.

[USFWS] U.S. Fish and Wildlife Service. 2008. Rare plant tracking database. Pacific Islands Fish and Wildlife Office, Honolulu, HI. Accessed on April 28, 2008. Unpublished.

Weller, S.G., and A.K. Sakai. 1989. *Stenogyne*: in Wagner, W.L., D.R. Herbst, and S.H. Sohner, Contributions to the Flora of Hawaii. II. Begoniaceae - Violaceae and the Monocotyledons. Occasional Papers Bernice P. Bishop Museum 29:88-130..

**Personal communication:**

Imada, C. Research Specialist, Bernice P. Bishop Museum, e-mail communication to C. Torres-Santana (USFWS) on June 30, 2008.

**Table 1. Status of *Stenogyne campanulata* from listing through 5-year review.**

<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>Stability Criteria identified in Recovery Plan</b>	<b>Stability Criteria Completed?</b>
1992 – listing	~ 50	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
1995 – recovery plan	~ 50	0	All threats managed in all 3 populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2003 – critical habitat	51-66	0	All threats managed in all 3 populations	No
			Complete genetic storage	Unknown
			3 populations with 50 mature individuals each	No
2008 – 5-yr review	~ 50	30	All threats managed	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No

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SIGNATURE PAGE for 5-YEAR REVIEW of *Stenogyne campanulata*

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

**Recommendation resulting from the 5-year review:**

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- No Change in listing status

**Acting Field Supervisor, Pacific Islands Fish and Wildlife Office**

Patrick Sousa

Date 6/2/09