

## **WHITE-MARGINED BEARDTONGUE**

*Penstemon albomarginatus* M.E. Jones

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**Management Status:** Federal: USFWS Species of Concern  
California: S1.2, G2 (CDFG, 1998)  
CNPS: List 1B, R-E-D code 3-2-2 (Skinner and Pavlik, 1994)

### **General Distribution:**

White-margined beardtongue occurs in southern Nevada, western Arizona, and in the western Mojave Desert in San Bernardino County, California. Its distribution in the western Mojave is restricted, occurring in a large four-mile long wash near Pisgah Crater and Lavic Lake, extending southwest from Sleeping Beauty Peak, crossing Interstate 40, and terminating in a flat spreading basin south of the freeway (CDFG, 1997b; Scogin, 1989). Plants are also found in another wash extending south southeast from the same peak for a shorter distance, not all the way to Interstate 40 at Argos, and at Lavic, north of Lavic Lake along Lavic Road (CDFG, 1997b). In western Arizona it is scattered over a plain that extends westward from the Hualapai Mountains, covering an area of approximately 100 square miles between Yucca and Dutch Flat (Button, 1991; Kearney and Peebles, 1964). There are also fifteen populations in southern Nevada, twelve from Clark County and three from Nye County.

### **Distribution in the West Mojave Planning Area:**

All of the California occurrences described above occur within the WMPA.

### **Natural History:**

White-margined beardtongue is an herbaceous perennial plant in the figwort family (Scrophulariaceae). The stems arise from a 12-48 in (30-120 cm) long taproot that is sunk deep in sandy soil, with the crown just above soil level. Stems reach heights of 6-12 in. (1.5-3 cm), are glaucous and glabrous, and bear entire spatulate leaves that are 0.4-1.2 in. (1-3 cm) long. These petioled, glossy, green leaves have entire margins, which are white and scarious, giving this plant its name of "white-margined" beardtongue. Flower calyces are also white-margined with narrow lance-shaped lobes, and are 0.1-0.2 in. (3-5 mm) long. The corolla is pink to lavender or white, tubular with spreading lobes, and glaucous except the hairy floor. The anthers are spread flat, and the staminode is glabrous (Hickman, 1993; Munz, 1974).

Flowers bloom from March to May (Munz, 1974), and the flowering does not always appear to be dependent on amount of rainfall. It is believed that established plants may bloom even in very dry years by utilizing water and food resources in the large taproot (Scogin, 1989). However, rainfall probably affects seedling germination and survival (Scogin, 1989), and in the California population, seedlings are more numerous south of the Interstate 40 where they most likely receive more accumulated rainfall runoff (Scogin, 1989). The showy flowers are visited by several insects, including small carabid beetles, large flies, and vespids wasps with orange abdomens. Pollen was observed on upper body surfaces of the vespids, making them the most likely pollinator (Scogin, 1989). An attempt was made to determine self-compatibility in this

species by exclusion of insect vectors with wire mesh, but the mesh was removed during the study, and no conclusions could be drawn. Observations of very isolated plants that set seed suggests self-compatibility, and the pollen-ovule ratio approaches that of many facultatively out-crossing species (Scogin, 1989). The absence of this species in other drainages nearby might suggest that the seeds are not dispersed long distances, but more likely may be due to the fact that suitable stabilized deep sand habitat is not available at these other sites. The small seeds could possibly be scattered short distances by ants or rodents, or may get transported down the wash by water in very wet years. The tendency for plants to occur in scattered groups of up to 20 individuals, and the fact that young cuttings have been shown to produce adventitious roots in experiments at Rancho Santa Ana Botanic Garden (Scogin, 1989) suggest that vegetative reproduction may occur in this species in its natural habitat, even though attempts to propagate from cuttings at the garden failed (Scogin 1989). Genetic studies of clusters in the field could determine if each group was clonal.

### **Habitat Requirements:**

In California, this plant occurs in fine alluvial sand in a wide canyon within a creosote bush scrub community . The sand is deep and stabilized, holding the long taproot in place. It is also present in wind-blown sand at the head of the canyon. It occurs at elevations from 2000-3000 ft. (700-1000 m.) in alkaline soil (Scogin, 1989). In Nevada, the plants prefer the base of hills and mountains in wind-blown sand dune-like areas, but are also found in deep loose sand in wash bottoms. In Arizona, it occurs in sandy loam uplands and sandy washes in a broad alluvial plain, but gravelly areas alternating with and interspersed with the sandy places do not support this species.

### **Population Status:**

The location in California near Pisgah Crater probably constitutes a single extended population consisting of more than 450 plants spread out along a four mile long wash and sandy basin (Scogin, 1989). Population estimates are not available for the population at Lavic. In 1993, Bransfield and Rutherford found at least 200 plants along benches and terraces adjacent to the easternmost drainage in which plants were previously found. These plants also inhabited wind-blown sand deposits at the base of Sleeping Beauty Peak. It is unclear if Bransfield's and Rutherford's survey extends to the north the range previously recorded for this drainage. Arizona's population of white-margined beardtongue is the largest population known, but no total population estimate is available. It lies within a 100 mi<sup>2</sup> alluvial valley west of the Hualapai Mountains. The upper reaches of this valley with highest white-margined beardtongue densities are being purchased by the Bureau of Land Management. Nevada has twelve recently-discovered population in addition to the three that were previously known. Many of these populations have thousands of plants.

### **Threats Analysis:**

In California, a freeway, a powerline, and three pipelines cross the wash in which the white-margined beardtongue occurs. Numerous utility access roads provide a means by which off highway vehicle (OHV) enthusiasts could get their vehicles into the wash. An established plant may survive occasional damage by tires due to the ability to resprout from the taproot (Scogin 1989). However, churning motions from tires could uproot the taproot (Scogin 1989), and it is

possible that frequent damage or crushing of above-ground parts could soon use up the reserves in the taproot. It is also likely that seedlings and young plants in loose sand could be completely destroyed by tires. The remote location of the population and the scattered nature of the plants limits the amount of damage from OHVs at present, so it appears that white-margined beardtongue will not likely be extirpated from this area by recreational human activities in the near future. However, with increasing population growth in urban areas, off-road enthusiasts are traveling farther to find recreational opportunities in less crowded areas, so management steps must be taken to limit access to white-margined beardtongue habitat. The Mannix tank trail is in use as a corridor for the purpose of tank maneuvering between Twentynine Palms and Fort Irwin military bases (K. Waln, pers. comm., 1997). It runs from Mannix to Hector, and currently does not overlap with the range of this species. However, military units have been observed camping in areas where this species occurs, outside of the military base boundary, and military-issue debris has been observed in the area (Lands and Renewable Resources, 1988). There are currently some mining claims within the species' range, so the plant could have localized disruptions from future mining activities. It has been suggested that these plants might have potential for horticultural production (Button, 1991), but attempts to propagate them from cuttings have been unsuccessful, as have attempts at transplantation (Scogin, 1989). The Bureau of Land Management is attempting to acquire white-margined beardtongue habitat in Arizona. Currently the species' range is a checkerboard of BLM managed land, and land owned by a railroad. The land acquisition plan will allow the BLM to control fewer acres of total white-margined beardtongue habitat, but there will be an increase in the total acreage of BLM controlled habitat with high densities of this species. This area will be fenced to discourage vehicular travel and prevent habitat damage. The lower density habitat will then be in private hands, and will be sold as large rural residential lots. Button (1991) notes that white-margined beardtongue in Arizona readily colonizes areas within its habitat that were previously disturbed but where there is now limited vehicular use, such as pipeline routes. Grazing probably does not impact this species much, since it is found growing next to stock tanks in Arizona. The Nevada populations are mostly in Clark County, clustered near Las Vegas. The human population in Las Vegas is increasing dramatically, so there will probably be increased impacts to the white-margined beardtongue from people seeking outdoor recreational opportunities away from the city.

### **Biological Standards:**

The most important management step that must be taken to insure continued survival of the WMPA population is active management of OHV usage. Recreational and military vehicular access to the wash and sandy basin should be severely restricted.

Constant vehicular travel by OHVs and tanks would most certainly uproot and destroy the plants. Scogin (1989) indicates that there is a parking area off the Interstate 40 frontage road that is heavily used by recreationists and possibly military vehicles. This area has the highest density of white-margined beard-tongue, and he suggests that a barrier be erected there to prevent access.

Monitoring of populations, including seed set, seedling counts, and flowering effort by established plants every year or two will help to indicate population health and fluctuation, establish the importance of effects of weather conditions on population size, and may help indicate if management strategies are successful. More propagation studies should be carried out to determine if seedlings, cuttings, or transplanted plants could be used for mitigation efforts.

**Literature Cited:**

- Button, C. 1991. Our unique Arizona flora: White-margined beard-tongue. Arizona Native Plant Society newsletter.
- California Department of Fish and Game (CDFG). 1997a. Special Plants List (Aug.), Natural Diversity Data Base, Sacramento, California.
- California Department of Fish and Game. 1997b. Natural Diversity Data Base, RareFind Report.
- Hickman, J.C. 1993. The Jepson Manual: Higher Plants of California. Univ. of California Press, Berkeley, California
- Kearney, T.H., and Peebles, R.H. 1964. Arizona Flora. Univ. of California Press, Berkeley, California.
- Lands and Renewable Resources, 1988. Letter to Calif. Desert District Manager.
- Munz, P.A. 1974. A flora of southern California. University of California Press, Berkeley, California.
- Scogin, R. 1989. Studies of *Penstemon albomarginatus* in California. Report for Rancho Santa Ana Botanic Garden, Claremont, California.
- Skinner, M.W. and B.M. Pavlik (eds.). 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California, CNPS Special Publication Number 1 (5th ed.). California Native Plant Society, Sacramento, California.