

BOGGS LAKE HEDGE-HYSSOP

Gratiola heterosepala

USFWS: Species of Concern

CDFG: Endangered

CNPS: List 1B

Species Account

Status and Description. Boggs Lake hedge-hyssop (*Gratiola heterosepala*) was State-listed as endangered in November, 1978. It is a federal species of concern and is on CNPS' List 1B. Boggs Lake hedge-hyssop is an annual herb, less than 10 cm tall, in the plantain family (Plantaginaceae). The upper portion of the plant is glandular-sticky. The leaves and sepals (outer floral structures) are truncate, the latter unequally fused. The small, tubular flowers are yellow, except for the three white lower lobes, and are borne singly in the upper leaf-axils (Baldwin et al 2012, CNPS 2011)



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Range and Distribution. Boggs Lake hedge-hyssop was first collected in Lake County in 1923. Currently, there are 85 known occurrences which are "presumed extant" in California, including populations in Fresno, Lassen, Madera, Merced, Modoc, Placer, Sacramento, San Joaquin, Shasta, Siskiyou, Solano and Tehama Counties, as well as one occurrence in Oregon. (CNPS 2011, CNDDDB 2011). The primary area of concentration is the Modoc plateau. Boggs hedge-hyssop occurs in large numbers on the Jepson Prairie in Solano County.

Habitat and Ecology. Boggs Lake hedge-hyssop grows on clay substrates in vernal pools, small playa-type pools, marshy areas, on the margins of reservoirs and lakes, and in man-made habitats such as borrow pits and cattle ponds. It has been found in several types of vernal pools such as those with northern basalt flow, northern claypan, northern hardpan, and northern volcanic ashflow or mudflow substrates (USFWS 2003). Average maximum pool depth is 24 cm, and average pool size is 6.95 hectares (Barbour et al. 2007). Habitat for this species is found within annual grassland, oak woodland, juniper woodland, and conifer forest communities. Clay is the most frequently encountered soil type underlying occupied habitats, although loam and loamy sand have also been noted. Known sites in California range in elevation from 25 feet in Solano County to 5170 feet in Modoc County (USFWS 2005).

Boggs Lake hedge-hyssop is self-compatible, and is thought to have a significant seedbank due to the widely varying annual population levels. Its seeds germinate and grow underwater (Barbout et al. 2007)

Livestock-grazing and trampling can be detrimental if occurring before seedset or if it is concentrated in a small area. Moderate grazing is believed to be a compatible use, if it occurs after seeds are set (USFWS 2003).

Boggs Lake hedge-hyssop co-occurs most frequently with bractless hedge hyssop (*Gratiola ebracteata*), vernal pool allocarya (*Plagiobothrys stipitatus*), two-horned downingia (*Downingia*

bicornuta), slender Orcutt grass (*Orcuttia tenuis*) and creeping spike rush (*Eleocharis macrostachya*) (USFWS 2005). It also co-occurs with rare vernal pool species such as dwarf downingia (*Downingia pusilla*), little mousetail (*Myosurus minimus* ssp. *apus*), and possibly Heckard's pepper-grass (*Lepidium latipes* var. *heckardii*). It blooms April through August (CNDDDB 2011, CNPS 2011).

Population Levels and Occurrence in Plan Area. Bogg's Lake hedge-hyssop is found in deep vernal pools located within the Plan Area's Valley Grasslands and Vernal Pools Natural Community. Six populations of Boggs Lake hedge-hyssop have been reported from Solano County. All occur on and in the vicinity of Jepson Prairie Preserve. Population sizes range from a hundred to a million plants (CNDDDB 2011, CNPS 2011).

Threats to the Species. Boggs Lake hedge-hyssop plants are threatened by agriculture, urban development, intensive grazing and trampling, non-native species, and off-road vehicles (CNDDDB 2011, CNPS 2011). Twelve (14 percent) of known occurrences are in nature preserves such as the Jepson Prairie, and forty-seven (57 percent) of known occurrences are on Federal land, which does not guarantee their protection from disturbance. Volunteers monitor the populations in the nature preserves, and the U.S. Forest Service and the Bureau of Land Management developed a formal conservation strategy on lands they administer in northeastern California to protect 90 percent of the plants and sites from direct disturbance and hydrological alterations over a 10 year period (USFWS 2005).

Literature Cited

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