

Mojave Tarplant (*Deinandra mohavensis*)

Legal Status

State: Endangered; S2S3¹

California Rare Plant

Rank: 1B.3²

Federal: Bureau of Land Management Sensitive; U.S. Forest Service Region 5 Sensitive Plant Species

Critical Habitat: N/A

Recovery Planning: N/A



Photo courtesy of Heath McAllister.

Taxonomy

Mojave tarplant is in the sunflower family (Asteraceae) (Jepson Flora Project 2011). Mojave tarplant was originally described by D.D. Keck (1935) as *Hemizonia mohavensis* and was reclassified as *Deinandra mohavensis* in 1999 (Baldwin 1999). The taxonomic revision was intended to more accurately reflect phylogenetic relationships within Madiinae (a subtribe within Asteraceae) (Baldwin 1999). The plant was thought to be extinct but was rediscovered by A. Sanders in 1994 in the San Jacinto Mountains, in Riverside County (Sanders et al. 1997).

Mojave tarplant is an annual plant approximately 10 to 100 centimeters (3.9 to 39 inches) in height. A full physical description of the species can be found in the *Jepson eFlora* (Jepson Flora Project 2011).

Distribution

General

There are a total of 75 occurrences in the California Natural Diversity Database (CNDDDB) at 124 localities (CDFW 2013a). Mojave tarplant is known in Kern, Riverside, Inyo, and San Diego counties (believed

¹ **S2S3:** the rank is somewhere between S2, Imperiled and S3, Vulnerable.

² **1B:** Rare, threatened, or endangered in California and elsewhere; **X.3:** Not very endangered in California.

extirpated from San Bernardino County) (CDFW 2013a) (Figure SP-P11). This species occurs at elevations of 460–1,600 meters (1,509–5,250 feet) (CNPS 2011; Jepson Flora Project 2011). The distribution is discontinuous and possibly relictual.

Distribution and Occurrences within the Plan Area

Historical

This species was not known to occur in the Plan Area prior to 1990 (CDFW 2013a; Figure SP-P11).

Recent

Within the Plan Area, Mojave tarplant is known from the desert slope of the southern Sierra Nevada Mountains in Kern County (Sanders 2006a). There are 10 occurrences at 13 localities in the Plan Area, all within Kern and Inyo counties. The majority of localities are located west of Highway 14 and east of the Sequoia National Forest; north of Interstate 40; near Cutterbank Spring; in Jawbone Canyon; near Short Canyon; in lower Esperanza Canyon; in lower Water Canyon; and in the vicinity of Cross Mountain (CDFW 2013a; Figure SP-P11). Mojave tarplant may also occur at Red Rock Canyon in Red Rock Canyon State Park in Kern County (Faull, pers. comm. 1998, cited in Sanders 2006a).

Natural History

Habitat Requirements

Mojave tarplant occurs in open moist sites in arid regions near the margins of the desert, within chaparral, coastal scrub, desert scrub, riparian scrub, and woodland (CNPS 2011; Sanders 2006a; Jepson Flora Project 2011). Plants are typically observed in seeps and along grassy swales and intermittent creeks. The most suitable habitat occurs in mountainous areas within microhabitats of low gradient streams and on gentle slopes with few shrubs and trees. This species is associated with clay or silty soils that are saturated with water early in the year. Mojave tarplant prefers areas that are dry at the surface but which have a substantial water source at depth through summer.

Dwarfed plants occasionally are found in drier sites near occupied moist areas (Sanders et al. 1997). This cycle of early saturation with later desiccation may reduce competition from other plant species; dryness during drought years may further reduce competition (Sanders 2006a).

At the type locality, Mojave tarplant was known to occur along a sandy intermittent creek; however, this habitat is now believed to be atypical and not suitable to maintain a permanent population. Sanders et al. (1997) note that some occurrences of Mojave tarplant are associated with sand where the sand is adjacent to more typical habitat.

Table 1. Habitat Associations for Mojave Tarplant

Land Cover Type	Habitat Designation	Habitat Parameters	Supporting Information
Mesic openings in chaparral, desert and coastal scrub, woodland, and riparian scrub	Primary	Clay or silty soils (sometimes sand); seasonally (winter and spring) saturated with water; 460–1,600 meters (1,509–5,250 feet)	CNPS 2011; Sanders et al. 1997; Sanders 2006a; Jepson Flora Project 2011

Reproduction

Mojave tarplant is an annual plant that blooms from June through January (CNPS 2011). Flowering peaks between August and October. Once flowering has begun, it continues until the plants begin to senesce. Fruit maturity and dispersal are continuous as well. Unlike most former *Hemizonia* species, including the segregated *Deinandra*, Mojave tarplant is self-compatible (Baldwin pers. comm. 1998, cited in Sanders 2006a); the only other self-compatible member of *Deinandra* is Red Rock tarplant (Tanowitz 1982). Pollination studies have not been conducted for Mojave tarplant; however, Faull (1987) observed small beetles and honey bees visiting Red Rock tarplant flowers, a closely related species.

Mojave tarplant blooms from June through January (CNPS 2011). Flowering peaks between August and October. Once flowering has

begun, it continues until the plants begin to senesce. Fruit maturity and dispersal are continuous as well. Seed dispersal vectors have not been reported for this species; however, the seeds are relatively heavy and may just fall to the ground around the source plant. The seeds are not armed with any obvious mechanisms, such as hooks or wings, for long-distance dispersal (Sanders 2006a). Bruce Baldwin (pers. comm., cited in Sanders 2006b) reports that ray achenes of *Hemizonia* (including the segregated *Deinandra*) maintain some degree of dormancy while the disk achenes freely germinate.

Mojave tarplant is known to reproduce easily in cultivation (B. Baldwin, pers. comm. 1998, cited in Sanders 2006a) and has been known to colonize disturbed areas in a botanical garden (S. Boyd, pers. comm. 1998, cited in Sanders 2006a).

Ecological Relationships

As described in Habitat Requirements, Mojave tarplant is associated with seasonally saturated clay or silty soils on gentle slopes or low gradient streams, with few shrubs and trees. These saturated areas are typically dry at the surface but provide a substantial water source at depth through summer (Sanders et al. 1997). This species has a discontinuous and possibly relictual distribution (Sanders 2006a), and little is known of its life history and ecological relationships. Although pollination studies have not been conducted for Mojave tarplant, Faull (1987) has observed small beetles and honey bees visiting Red Rock tarplant flowers, a closely related species. Seed dispersal vectors have not been reported for this species; however, the seeds are relatively heavy and may just fall to the ground around the source plant. The seeds are not armed with any obvious mechanisms, such as hooks or wings, for long-distance dispersal (Sanders 2006a). Mojave tarplant is threatened by grazing, recreational activities, development, hydrological alterations, road maintenance, and vehicles (CNPS 2011). Within the Plan Area, intense cattle grazing and trampling may be the most significant threats.

Population Status and Trends

Global: G2G3, Imperiled/Vulnerable (NatureServe 2011, Conservation Status last reviewed XXXX)

State: S2S3, Imperiled/Vulnerable (CDFW 2013b)

Because this species was only recently rediscovered (in 1994) there is little information available on population trends. Of the 13 occurrences in the Plan Area, four are on BLM lands, two are on private land, and ownership is unknown for two of the occurrences. The occurrence on private land near Cutterbank Spring numbered 14 individuals in 2003. Approximately 15,000 plants were observed at the other occurrence on private land located at the south end of Kelso Valley in 2010. Many more plants were observed in 2011, including an additional 1,500 plants in the northeastern portion of the occurrence (CDFW 2013a). Of the two occurrences for which ownership is unknown, one numbered in the thousands in 1998 and the other numbered 109 individuals in 2003. Of the four occurrences on BLM land, one numbered 50,000 in 2003 (with 30 rosettes observed very early in the year in 2004), one numbered in the several hundreds in 2008, and one numbered 5,000 in 1998 (and was locally common in 2001 and numbered 3,000 in 2003). Approximately 50,000 plants were observed in 2003 at the occurrence at Cutterbank Spring on BLM lands; 30 plants were observed in 2004 in their rosette form in an early season survey, and plants were “abundant around the springs and in the surrounding drainage channels” in 2010 (CDFW 2013a). Overall, there are 69 occurrences in Kern, Riverside, and San Diego counties (CDFW 2013a) and most of these appear to have number of individuals estimated only once, making it difficult to discern a population trend.

Threats and Environmental Stressors

Mojave tarplant is threatened by grazing, recreational activities, development, hydrological alterations, road maintenance, and vehicles (CNPS 2011). The type locality was modified by construction of the Mojave River Forks Dam. Within the Plan Area, cattle grazing occurs at some of the Mojave tarplant occupied areas, and in some areas is locally intense and may pose a threat. However, the sticky plants of the genus *Deinandra* (also called “tarweeds”) may not be

palatable to cattle, so grazing may not be a major threat and trampling by cattle around limited watering sources in dry areas may be a greater threat (Sanders 2006a).

Conservation and Management Activities

Four of the occurrences are known from BLM land, two are on private land, and ownership is unknown for two of the occurrences (CDFW 2013a). No current conservation or management activities have been identified for Mojave tarplant.

Data Characterization

The general distribution of Mojave tarplant is discontinuous and patchy. Sanders (2006a) recommends that additional surveys be conducted in the southern Sierra Nevadas and along the north foot of the Transverse Range, particularly the San Gabriel Mountains. Within the Plan Area, four of the occurrences are known from BLM lands, two are on private land, and ownership is unknown for two of the occurrences. Many of the known occurrences outside the Plan Area occur within the San Bernardino and Cleveland National Forests and therefore receive some protection (Sanders 2006a). The species is known to be self-compatible (B. Baldwin, pers. comm. 1998, cited in Sanders 2006a) and a related species (Red Rock tarplant) is known to be insect-pollinated (Faull 1987). Little is known regarding the species' seed dispersal and recruitment.

Management and Monitoring Considerations

Because the global distribution of Mojave tarplant is discontinuous and patchy, Sanders (2006a) recommends that additional surveys be conducted in the southern Sierra Nevadas and along the north foot of the Transverse Range, particularly the San Gabriel Mountains. Additional surveys may identify new occurrences.

Mojave tarplant is threatened by grazing, recreational activities, development, hydrological alterations, road maintenance, and vehicles (CNPS 2011). Measures to control these threats should be considered.

Species Modeled Habitat Distribution

This section provides the results of habitat modeling for Mojave tarplant, using available spatial information and occurrence information, as appropriate. For this reason, the term “modeled suitable habitat” is used in this section to distinguish modeled habitat from the habitat information provided in Habitat Requirements, which may include additional habitat and/or microhabitat factors that are important for species occupation, but for which information is not available for habitat modeling.

There are 270,463 acres of modeled suitable habitat for Mojave tarplant in the Plan Area. Appendix C includes a figure showing the modeled suitable habitat in the Plan Area.

Literature Cited

- Baldwin, B.G. 1999. “New combinations and new genera in the North American tarweeds (*Compositae-Madiinae*).” *Novon* 9:462–471.
- CDFW (California Department of Fish and Wildlife). 2013a. “*Deinandra mohavensis*.” Element Occurrence Query. California Natural Diversity Database (CNDDB). RareFind, Version 4.0 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed September 2013.
<http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>.
- CDFW. 2013b. *Special Vascular Plants, Bryophytes, and Lichens List*. CNDDB. January 2013. Accessed February 2013.
http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp.
- CNPS (California Native Plant Society). 2011. *Inventory of Rare and Endangered Plants* (online edition, v8-01a). Sacramento, California: California Native Plant Society. Accessed May 2011.
<http://www.cnps.org/inventory>.

- Faull, M.R. 1987. "Management of *Hemizonia arida* (Asteraceae) by the California Department of Parks and Recreation." In *Conservation and Management of Rare and Endangered Plants: Proceedings of a California Conference on the Conservation and Management of Rare and Endangered Plants*, edited by T.S. Elias, 429–439. Sacramento, California: The California Native Plant Society.
- Jepson Flora Project. 2011. "*Deinandra mohavensis*." B.G. Baldwin, ed. *Jepson eFlora* [v. 1.0]. Berkeley, California: University of California. Accessed December 2011. <http://ucjeps.berkeley.edu/IJM.html>.
- Keck, D.D., 1935. "Studies Upon the Taxonomy of the Madiinae." *Madroño* 3:9–10.
- NatureServe. 2011. "*Deinandra mohavensis*." *NatureServe Explorer: An Online Encyclopedia of Life*. Version 7.1. Arlington, Virginia: NatureServe. Accessed March 2012. <http://www.natureserve.org/explorer>.
- Sanders, A.C., D.L. Banks and S. Boyd. 1997. "Rediscovery of *Hemizonia mohavensis* (Asteraceae) and Addition of Two New Localities." *Madroño* 44:197–203.
- Sanders, A.C. 2006a. "Mojave Tarplant." West Mojave Plan Species Accounts. U.S. Department of the Interior, Bureau of Land Management. January 2006. Accessed May 27, 2011. http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.79a96f52.File.pdf/mohavetar1.PDF.
- Sanders, A.C. 2006b. "Red Rock Tarplant." West Mojave Plan Species Accounts. U.S. Department of the Interior, Bureau of Land Management. January 2006. Accessed May 27, 2011. http://www.blm.gov/pgdata/etc/medialib//blm/ca/pdf/pdfs/cdd_pdfs.Par.79a96f52.File.pdf/mohavetar1.PDF.
- Tanowitz, B.D. 1982. "Taxonomy of *Hemizonia* sect. *Madiomeris* (Asteraceae: Madiinae)." *Systematic Botany* 7:314–339.

