

1.9 Orcutt's Brodiaea (*Brodiaea orcuttii*) – Category SO

Management Units with Known Occurrences

Orcutt's brodiaea is known from San Bernardino, Orange, and Riverside Counties south to San Diego County and Baja California, Mexico (Reiser 2001). The species' preferred habitat consists of vernal moist grasslands, mima mound topography, and the periphery of vernal pools. It is occasionally found growing on streamside embankments. Orcutt's brodiaea grows in soils of old terraces and alluvial fans, which are characterized as gravelly with or without a hardpan (Niehaus 1971). On Otay Mesa, soils include Stockpen gravelly loam, and on Mira Mesa, spoils include Redding gravelly loam (Reiser 2001). At vernal pool locations, Orcutt's brodiaea usually grows in swales leading into more developed pools and on the lower flanks of small mima mounds.

Within the MSPA, there are 7 large ($\geq 1,000$ plants since 2010) occurrences, 11 small occurrences ($< 1,000$ plants since 2010), and 5 occurrences of unknown size (see Table of Occurrences or online map: <http://arcg.is/2kFIdjS>). The large occurrences are on MU2 (General Dynamics East); MU4 (Simon Preserve, Elliot Preserve); and MU6 (Carroll Canyon Vernal Pool Preserve, Daley Ranch, Del Mar Mesa, Lopez Ridge). The small occurrences are on MU2 (Nobel Drive); MU3 (Otay Mountain, Otay Ranch Preserve, Copper Canyon); MU4 (Boulder Oaks Preserve, Oak Creek); MU6 (Escondido Creek Preserve, Rancho La Costa, Santa Fe Valley); and MU8 (Mount Olympus Preserve). The occurrences of unknown size are found on MU3 (Cedar Canyon, North San Ysidro Parcel); MU4 (North and West of El Capitan Reservoir on the Cleveland National Forest); and MU7 (Water's End).

Management Categorization Rationale

Orcutt's brodiaea should be managed as a Species Management Focus Category SO Species due to a moderate risk of loss of significant occurrences from Conserved Lands in the MSPA and because managing vegetation alone will not ensure persistence of the species (see Vol. 1, Table 2-4). Factors contributing to status include susceptibility to disturbance from invasive species, small populations fragmented by urbanization, and endemism.

The most serious threats to Orcutt's brodiaea are from development, foot traffic, grazing, nonnative plants, military activities, vehicles, road construction, road

maintenance, and dumping (CNPS 2016). Orcutt's brodiaea is also threatened by competition from nonnative plant taxa in areas where soil disturbance favors European species of plants (County of Riverside 2003).

Management and Monitoring Approach

The overarching goal for Orcutt's brodiaea is to maintain or enhance existing occurrences to ensure multiple conserved occurrences with self-sustaining populations to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and ensure persistence over the long term (>100 years) in grasslands and vernal pool vegetation communities.

For the 2017–2021 planning cycle, the management and monitoring approach is to:

- (1) Inspect Orcutt's brodiaea occurrences annually on Conserved Lands (see Table of Occurrences) using the regional rare plant IMG monitoring protocol to record abundance and collect habitat and threats covariate data to determine management needs. Conduct routine management actions identified. Depending on the type and level of threat, management should be conducted as needed, not necessarily every year, and using BMPs with precautions to do no harm.
- (2) Survey historical Orcutt's brodiaea locations to determine occurrence status; survey and delineate potentially suitable habitat for new occurrences; survey existing occurrences to identify the potential for enhancement and expansion; and at all sites collect data on occurrence status, habitat, and threats. Determine management needs.
- (3) Establish 2 new Orcutt's brodiaea occurrences at Proctor Valley and Cal Terraces/Denney Canyon. Invasive plant control should be conducted using BMPs so that invasive plants are reduced to $\leq 20\%$ absolute cover within the occurrence's occupied extent and adjacent suitable habitat.
- (4) Prepare an Orcutt's brodiaea section in the MSP Seed Collection, Banking, and Bulking Plan to preserve genetic diversity and rescue occurrences in case of catastrophic disturbance. The plan should include recommendations for collecting and storing seeds for conservation banking; management-oriented research; rescuing occurrences after catastrophic disturbances;

and seed bulking and outplanting to augment extant occurrences or to establish new occurrences with consideration of genetic implications for population sustainability.

- (5) Collect Orcutt's brodiaea seed for conservation banking and bulk seed for establishment of new occurrences at Cal Terraces/Denney Canyon and Proctor Valley. Begin implementing high-priority actions for Orcutt's brodiaea in the MSP Seed Collection, Banking, and Bulking Plan to collect and store seeds at a permanent seed bank and to provide propagules as needed for management-oriented research, existing population enhancement, and establishment of new occurrences.
- (6) Begin preparing an Orcutt's brodiaea section in the MSP Rare Plant Management Plan to maintain large occurrences and expand ≥ 3 small occurrences on Conserved Lands (see Table of Occurrences) based upon an assessment of data on occurrence status, habitat, and threats. Minimum criteria for enhancement are to reduce invasive annual nonnative plants and thatch to $\leq 20\%$ absolute cover within the occurrence's maximum occupied extent and a surrounding buffer area equal to 25% of this extent. Include recommendations from the MSP Seed Collection, Banking, and Bulking Plan; relevant BMPs; and for monitoring the effectiveness of management actions. Begin implementing highest-priority management actions identified for Orcutt's brodiaea in the MSP Rare Plant Management Plan and monitor effectiveness of implementation.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Orcutt's Brodiaea summary page:
https://portal.sdmmp.com/view_species.php?taxaid=42815

Orcutt's Brodiaea References

CNPS (California Native Plant Society). 2016. *Inventory of Rare and Endangered Plants* (Online Edition, v8-02). California Native Plant Society. <http://www.rareplants.cnps.org>.

County of Riverside. 2003. *Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Volume II- Section A MSHCP Conservation Area Description. Prepared for: County Of Riverside Transportation and Land Management Agency.* Prepared by: Dudek & Associates.

Niehaus, T. F. 1971. A Biosystematic Study of the Genus *Brodiaea* (Amaryllidaceae).
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Reiser, C. H. 2001. *Rare Plants of San Diego County*. San Diego, CA: Aquifer Press.