1.14 Otay Tarplant (*Deinandra conjugens*) – Category SS

Management Units with Known Occurrences

Otay tarplant is restricted in distribution to clay soils in grasslands and open coastal sage scrub in southwest San Diego County and northwest Baja California, Mexico (Reiser 1994). There are 28 occurrences on Conserved Lands in MU3 (see Table of Occurrences) and a single small isolated occurrence in Paradise Valley in MU2, though this occurrence is not prioritized in an IMA. Large occurrences (>5,000 individuals) are found at Bonita Meadows, Trimark, Johnson Canyon, west of Moody Canyon, Proctor Valley, Rolling Hills Ranch, north side of Otay River Valley, Mother Miguel grasslands, Dennery Canyon, Rice Canyon, and the Rancho Jamul Ecological Reserve.

Management Categorization Rationale

Otay tarplant is warranted for designation as a Species Management Focus Category SS Species due to a moderate risk of loss of significant occurrences from Conserved Lands in the MSPA (see Vol. 1, Table 2-4). Factors contributing to this risk of loss include a limited range in southwestern San Diego County and northwestern Baja California, restricted distribution in the MSPA with occurrences in only 2 MUs, an annual life cycle, self-incompatibility in reproduction, and a high level of threats. This management categorization is further supported by ongoing regional management of Otay tarplant as part of the South County Grasslands project (CBI 2012). For these reasons, Otay tarplant is important to manage with a species-specific focus; however, because it has many large, conserved occurrences it is designated an SS rather than SO species.

The primary threat to Otay tarplant occurrences is invasive nonnative plants, especially annual grasses and forbs (USFWS 2009; IEMM 2012). Populations are also impacted by direct disturbance from off-highway vehicle activity; illegal trails; trampling; and maintenance of access roads, utility corridors, trails, and fuel modification zones. Otay tarplant is at risk of loss of genetic connectivity due to habitat fragmentation and a potential loss of pollinators.

Management and Monitoring Approach

The overarching goal for Otay tarplant is to maintain or enhance occurrences and establish historic occurrences, as needed, 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 grassland and coastal sage scrub communities.

The following goals and objectives for Otay tarplant are based upon those developed by the South County Grasslands Project (CBI 2012; Land IQ and CBI 2015) in order to integrate and ensure consistency in management efforts. Because this is a Category SS species, not all management actions identified below may be implemented within the planned time period if it is determined there is an urgent need to allocate scarce management resources to species at a higher risk of loss from the MSPA.

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

(1) Conduct annual inspections of extant occurrences of Otay tarplant on Conserved Lands (see Table of Occurrences) using the regional rare plant IMG monitoring protocol to record spatial extent, estimate abundance, and collect habitat and threat covariate data to determine management needs.

(2) Conduct routine management actions identified through the annual IMG monitoring at Otay tarplant occurrences on Conserved Lands. Depending on the type and level of threat, management should only be conducted as needed, not necessarily every year, and using BMPs with precautions to do no harm.

(3) Continue the collaboration with the South County Grasslands Project initiated in 2014 to develop BMPs for landscape-scale restoration of Otay tarplant habitat in MU3 that includes testing methods of seeding and invasive plant control so that nonnative plants and thatch are reduced to <20% relative cover and thatch to <5 centimeters tall and native plants ≥25% relative cover. These percent cover criteria could be revised based on data collected from an acceptable reference site.

(4) Continue a study begun in 2016 to characterize the population genetic structure, gene flow, and genetic diversity for Otay tarplant occurrences. The study will determine if there is evidence of mixed ploidy levels within or among occurrences; evaluate vulnerability of occurrences to genetic drift and loss of genetic diversity; assess the level of gene flow among

occurrences; identify if there are signatures of genetic bottlenecks or low genetic diversity in occurrences that have undergone recent reductions; and look for evidence of local population adaptation. Based on the results of the genetic analyses, management recommendations will include whether common garden and reciprocal transplantations are necessary before proceeding with population enhancement or restoration and will provide specific recommendations for collecting, bulking, and distributing seed to enhance existing occurrences or establish new occurrences.

(5) Continuing for 3 years at the 3 Otay tarplant restoration sites initiated under the South County Grasslands Project, use BMPs to maintain the maximum occupied extent and a surrounding buffer area equal to 25% of this extent by preventing ground disturbance and reducing nonnative plants and thatch to <20% total cover and thatch to <5 centimeters tall,

(6) Begin preparing an Otay tarplant section in the MSP Rare Plant Management Plan that prioritizes management actions to maintain and expand conserved 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 ≤20% absolute cover within the occurrence's maximum occupied extent and a surrounding buffer area equal to 25% of this extent. Include recommendations for Otay tarplant from the MSP Seed Collection, Banking, and Bulking Plan, relevant BMPs, and for monitoring the effectiveness of management actions. Begin implementation of highest-priority management actions for Otay tarplant identified in the MSP Rare Plant Management Plan and monitor effectiveness of implementation.

(7) Prepare a section for Otay tarplant in the MSP Seed Collection, Banking, and Bulking Plan to preserve genetic diversity and rescue occurrences in case of catastrophic disturbance. The plan should incorporate best science and management practices (e.g., Wall 2009; Royal Botanic Gardens, Kew 2016) and provide guidelines for collecting and storing seeds over the long term at a permanent, established conservation seed bank (e.g., Institute for Conservation Research Native Plant Seed Bank, Rancho Santa Ana Botanic Garden Seed Conservation Program) and for providing a source of seeds for management purposes. 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. Begin implementing the MSP Seed Collection, Banking, and Bulking Plan for Otay tarplant 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.

(8) Continue field research into soils and habitat relationships and development of habitat suitability and climate change models for Otay tarplant and other edaphic endemic plants to better understand habitat requirements and to identify and prioritize geographic areas important for connectivity, restoration, and range shifts due to climate change and other threats.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Otay Tarplant summary page: https://portal.sdmmp.com/view_species.php?taxaid=780273

Otay Tarplant References

CBI (Conservation Biology Institute). 2012. Draft Otay Tarplant Management Vision South County Grasslands Project.

IEMM (Institute for Ecological Monitoring and Management). 2012. A Conceptual Model for: Otay Tarplant (Deinandra conjugens). Prepared for The Nature Conservancy. 1/3/2012. San Diego State University.

Land IQ and CBI (Land IQ and Conservation Biology Institute). 2015. South County Grassland Project, Phase 2, 2015 Final Report. Prepared for SANDAG TransNet EMP Land Management Grant Program. June 2015.

Reiser, C. H. 1994. Rare Plants of San Diego County. Imperial Beach, CA.

Royal Botanic Gardens, Kew. 2001. *Field Manual for Seed Collectors: Seed Collecting for the Millennium Seed Bank Project, Royal Botanic Gardens, Kew*.

USFWS (U.S. Fish and Wildlife Service). 2009. Deinandra conjugens (Otay Tarplant) 5-Year Review: Summary and Evaluation. Prepared by the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California.

Wall, Michael. 2009. Seed Collection Guidelines for California Native Plant Species. Prepared for Rancho Santa Ana Botanic Garden.