

San Diego Association of Governments
RAREST PLANTS II PROJECT
Final Report
SANDAG EMP Grant Agreement No. 5005511

Introduction

The Chaparral Lands Conservancy (TCLC) submits the final report for the Rarest Plants II Project EMP grant. Project activities included work relating to seed bulking for MSP plant species (EMP grant Task 1a), weed control (Task 1b), establishing a new MSP plant occurrence (Task 1d), supplementing and maintaining MSP plant occurrences (Task 1e), renewing permits (Task 1f), monitoring results (Task 1g), project management and travel (tasks 1h & 1i), fencing (Task 1j), and grant reporting and administration (Task 2a).

I. Project Background, Goals, & Objectives

The purpose of the EMP grant is to improve the conservation status of three high-priority MSP plants: Orcutt's spineflower (SL); short-leaved dudleya (SL), and Orcutt's brodiaea (SO). The goals of the EMP grant are to significantly increase available seed and to restore, supplement, and protectively manage populations of three high-priority MSP SL and SO plant species, and to monitor results. Objectives under the EMP grant include: Seed bulking for all three species; control of invasive weeds for all three species; establishment of one new Orcutt's spineflower occurrence; supplementation of population numbers and stewardship management to maintain approximately sixteen existing occurrences of Orcutt's spineflower and one existing occurrence each of short-leaved dudleya and Orcutt's brodiaea; and renewing permits for Project work.

II. Work Performed by Task

Manage & Protect MSP Species (Tasks 1a – 1l)

Budget: \$65,477

Spent: \$65,581

Match: N/A



Work under EMP grant Habitat & Species Restoration Tasks 1a through 1l was conducted by several entities including TCLC staff, contractors retained by TCLC for plant propagation and weed control and fencing, and City of San Diego Parks and Recreation Department staff and volunteers.

TCLC staff conducted surveys to identify suitable occurrences for seed collection for Orcutt's brodiaea, Orcutt's spineflower, and short-leaved dudleya and suitable locations for seeding Orcutt's spineflower.

A contractor retained by TCLC collected seed and propagated plants in a nursery to increase the number of available plants for use in supplementation of existing populations of Orcutt's brodiaea and short-leaved dudleya.

TCLC staff and a contractor retained by TCLC conducted planting and supplemental watering of approximately fifty short-leaved dudleya plants to supplement an existing occurrence at Torrey Pines State Natural Reserve Extension. Planting was conducted with the Center for Plant Conservation at the Institute for Conservation Research and San Diego Zoo Global and several plants emerged after planting. The Zoo prepared an experimental design and closely monitored the results of the planting.

TCLC staff, City of San Diego Parks and Recreation Department staff, and volunteers worked to control tocolote and other invasive non-native plants threatening Orcutt's brodiaea on the Carmel Mountain Preserve. Weed control contractors retained by TCLC worked to control purple veldt grass, sea fig, and other invasive non-native plants threatening Orcutt's spineflower in the Crest Canyon Preserve and Sorrento Hills Preserve. TCLC orchestrated work by California State Parks to control purple veldt grass and other invasive non-native plants threatening Orcutt's spineflower in the Torrey Pines State Natural Reserve. And TCLC staff and weed control contractors retained by TCLC worked to control brass buttons, filaree, and other invasive non-native plants threatening short-leaved dudleya at the Crest Canyon Preserve and Torrey Pines State Natural Reserve.

TCLC staff attempted to establish a new occurrence of Orcutt's spineflower by seeding seemingly suitable habitat on the Carmel Mountain Preserve. TCLC staff supplemented existing occurrences of Orcutt's spineflower on the Torrey Pines State Natural Reserve. And TCLC staff and volunteers will supplement existing occurrence by planting propagated Orcutt's brodiaea and short-leaved dudleya when they reach suitable maturity.

A contractor retained by TCLC installed approximately 568 linear feet of lodgepole post and cable fence to reroute a trail in the Crest Canyon Preserve that previously bisected a short-leaved dudleya population. Work was conducted in cooperation with City of San Diego Parks and Recreation Department staff who assisted with visitor education signs, piling cut brush to camouflage the closed trail, removal of old fence, breeding bird season monitoring, and administration.



TCLC staff and volunteers collected and placed plant debris to obscure and discourage use of unauthorized trails impacting Orcutt's spineflower and short-leaved dudleya occurrences on the Carmel Mountain Preserve, Crest Canyon Preserve, and Torrey Pines State Natural Reserve.

TCLC staff monitored the results of work to control weeds, establish a new occurrence of Orcutt's spineflower, supplement existing occurrences of Orcutt's brodiaea and Orcutt's spineflower and short-leaved dudleya, and fencing to protect one occurrence of short-leaved dudleya.

TCLC staff conducted management and travel to orchestrate implementation of the Project including preparation of contractor requests for proposals, weed control, seeding, preparation of fence design, monitoring, and supervising contractor and volunteer activities.

Grant Reporting & Administration (Task 2)

Budget: \$6,428

Spent: \$6,428

Match: N/A

Work completed under the EMP grant Grant Reporting & Administration Task 2 was conducted by TCLC staff and included Project accounting, review of contractor expenditures, maintenance of insurance policies, updates to property owners, and preparation of the EMP grant reports and invoices.

III. Challenges

A number of challenges were encountered over the course of the Project including the following:

- TCLC contractors were never successful in conducting seed bulking for Orcutt's spineflower. Seed collected previously from an occurrence considered important for replication on the Sorrento Hills Preserve did not germinate during attempted propagation by TCLC contractor. And the contractor was unable to collect new seed from the Sorrento Hills Preserve spineflower population due to drought or other unknown conditions resulting in few visible mature plants available for seed collection in multiple seasons of the EMP grant period. Contractors visited the site on several occasions over several seasons but no spineflowers were located for seed collection despite one seemingly good wet season. A spineflower occurrence at this site documented previously by TCLC either did not grow or dried to invisibility much earlier than other occurrences¹ and prior to attempted seed collection. Efforts were also not successful in

1. As an annual rather than perennial plant species, the germination and growth to maturity of Orcutt's spineflower appear to be highly dependent on temperatures and rainfall at each particular occurrence. Conditions appear to have been suboptimal at the Sorrento Hills Preserve even in the relatively wet spring of 2019 in contrast to seemingly excellent population numbers and conditions at nearby occurrences in Torrey Pines State Natural Reserve Extension.



collecting seed for seed bulking to supplement another important existing occurrence of Orcutt's spineflower at Oak Crest Park in Encinitas. No spineflowers were located at the Park for seed collection despite above average rainfall in the survey year and appropriately timed surveys in previously occupied habitat by TCLC staff and USFWS staff.

- Efforts were not successful to establish a new occurrence of Orcutt's spineflower in seemingly suitable habitat on the Carmel Mountain Preserve. Seed collected previously from the nearest spineflower occurrence on the Sorrento Hills Preserve and seeded on the Carmel Mountain Preserve site was either not viable, did not germinate, and/or did not reach maturity.
- Slow-growing propagated Orcutt's brodiaea and short-leaved dudleya were not mature enough for planting supplementation of existing occurrences during the EMP grant period. However, propagated plants are available for planting after the EMP grant period as described in the results section below.
- Off-trail pedestrian activity amidst short-leaved dudleya occurrences has been reduced at Torrey Pines State Natural Reserve Extension but persists despite years of work to reduce unauthorized access with signs, fencing, and educational visitor contact. Shoe prints in dried mud were found on top of or very near several short-leaved dudleya plantings and some small nails marking the location of plantings appear to have been removed.

IV. Results

The Rarest Plants II Project EMP grant has been mostly successful in accomplishing EMP grant and Project goals.

Seed Bulking for MSP Plant Species (EMP grant Task 1a)

Efforts were successful to implement EMP grant Task 1a. Seed was collected for Orcutt's brodiaea and short-leaved dudleya and plants of both species propagated. Approximately 580 individual corms were produced for Orcutt's brodiaea and 400 individual corms for short-leaved dudleya. Seed was not bulked for Orcutt's spineflower as described in the Challenges section above.

The term "seed bulking" was mistakenly applied to Orcutt's brodiaea and short-leaved dudleya for this EMP grant. In the future, this term is best applied to annuals as it is less appropriate for perennial plants like Orcutt's brodiaea and short-leaved dudleya that take years to reach maturity and for which seed bulking is not practical during the shorter period of EMP grants. In the general case of Orcutt's brodiaea and short-leaved dudleya, seed collection and propagation of corms for direct use at habitat restoration sites or suitable for storage or long-term seed production would be helpful and appropriate. And for this



EMP grant, the fundamental goal to significantly increase numbers of Orcutt's brodiaea and short-leaved dudleya was still achieved.

Weed control (Task 1b)

Efforts were successful to implement EMP grant Task 1b. TCLC staff and partners effectively controlled several species of invasive non-native plants threatening the viability of several occurrences of Orcutt's brodiaea, Orcutt's spineflower, and short-leaved dudleya on several conserved lands as described in the work performed by task section above.

GIS Work (Task 1c)

No new GIS work was ultimately necessary or conducted for EMP grant Task 1c.

Establish New MSP Plant Occurrence (Task 1d)

Efforts were not successful in establishing a new Orcutt's spineflower occurrence on the Carmel Mountain Preserve under EMP grant Task 1d as described in the challenges section above.

Supplement and Maintain Extant MSP Plant Occurrences (Task 1e)

Efforts were successful to implement EMP grant Task 1e. A contractor retained by TCLC successfully increased the number of available plants for use in supplementation of existing populations of Orcutt's brodiaea and short-leaved dudleya and TCLC staff and a contractor conducted planting and supplemental watering to maintain existing MSP plant occurrences as described in the work performed by task section above. Six new Orcutt's spineflower occurrences seeded under the previous Rare Plants Project EMP grant (5001767) have persisted with maintenance by TCLC under the current EMP grant.

During the course of work under EMP grant Task 1e, one entirely new short-leaved dudleya occurrence of at least two mature plants was discovered by TCLC staff at Torrey Pines State Natural Reserve Extension. And ten more mature plants were discovered at the known occurrence where no more than three plants had ever been documented previously. These numbers of newly documented mature plants are significant because the one known occurrence at Torrey Pines State Natural Reserve Extension has never been documented to support more than several dozen plants, most of which have been immature plants that may not survive to maturity. The Orcutt's brodiaea occurrence at the Carmel Mountain Preserve that was previously considered to be relatively small was also found to produce thousands of plants in 2019.



Renew Permits (Task 1f)

Efforts were successful to implement EMP grant Task 1f.

Monitor Results (Task 1g)

Efforts were successful to implement EMP grant Task 1g.

Project Management & Travel (Tasks 1h & 1i)

Efforts were successful to implement EMP grant task 1h and 1i.

Fencing (Task 1j)

Efforts were successful to implement EMP grant Task 1j. A contractor retained by TCLC successfully constructed fence to protect a vulnerable short-leaved dudleya occurrence as described in the work performed by task section above.

Closure Signs (Task 1k)

No new closure signs were ultimately necessary or installed for EMP grant Task 1k.

Tool Rental (Task 1l)

No tool rental was ultimately necessary or conducted for EMP grant Task 1l.

Grant Reporting & Project Administration (Task 2a)

Efforts were successful to implement EMP grant Task 2a.

Please direct any questions to David Hogan at 760 809-9244 or director@chaparralconservancy.org. Thank you for your consideration and SANDAG support to conduct the Rarest Plants II Project.



EMP grant Task 1e supplementation and maintenance of existing short-leaved dudleya population at Torrey Pines State Natural Reserve Extension.





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EMP grant Task 1a surveying for Orcutt's spineflower seed collection at the Sorrento Hills Preserve (above) and Orcutt's brodiaea at the Carmel Mountain Preserve (below).





EMP grant Task 1a surveying for Orcutt's brodiaea at the Carmel Mountain Preserve.





EMP grant Task 1b weeding the Orcutt's brodiaea occurrence at the Carmel Mountain Preserve.





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