

Agency/Organization: US Geological Survey

Project Name: Clark County Rare Plant Propagation Research Phase II

Project Number: 2021-USGS-2075A

Reporting Period: July 1, 2025 – September 30, 2025

Project Contact Name and Information: Lesley DeFalco, Ph.D.; USGS, Western Ecological Research Center; 500 Date St., Boulder City, NV; 89005. (702) 294-6591. ldefalco@usgs.gov

QUESTION 1: What did you accomplish during this reporting period? How did these accomplishments help you reach the goal of your project? If relevant, what indicators or benchmarks were used to determine your progress?

We completed all greenhouse watering phases on soil seedbank samples collected from the Upper Virgin Valley population of *Eriogonum viscidulum* (ERVI), the Mud Lake (Dry Lake) and Mormon Mesa populations of *Astragalus geyeri* var. *triquetrus* (ASGET), and the Gold Butte and Bitter Springs Valley populations of *Arctomecon californica* (ARCA) to propagate these three species (M24). We transplanted emerging seedlings and grew them in the USGS greenhouse for seed collection to create conservation collections for the ASGET populations or nursery stock for ARCA. No ERVI seedlings were successfully transplanted and grown out from the samples (see Question 2).

We collected seed from 4 bagged *Eriogonum viscidulum* (ERVI) individuals at the Toquop Wash population in July 2025 (M23). We after-ripened seeds in the USGS shade house under prevailing summer temperatures, cleaned and counted the seeds, and placed them into storage with seed collected from the Toquop Wash population in 2023. Due to the low number of seeds collected, we did not conduct germination trials on this seed; however, based on prior trials, seeds appear filled and we expect to have similar viability as previous collections.

We continued to monitor germination of ARCA seeds collected in 2023 by Kelsey Graham (USDA) for a second round of germination based on the most successful treatment combinations from our initial trials with seed collected in 2022. We continue to transplant germinants from the treatment chambers and grow plants in the USGS greenhouse to test soils for propagation.

Dr. Lesley DeFalco presented project progress at the annual Multiple Species Habitat Conservation Plan Progress Report Symposium in August 2025, completing Milestone 25.

These Milestones are instrumental in field and greenhouse work and developing our final deliverables for this project.

QUESTION 2: What, if any, problems were encountered? Briefly describe those problems and the manner in which they were dealt.

Because no ERVI seedlings were successfully transplanted and grown out from surface soils we collected during Fall 2024, we were unable to harvest seeds from plants emerging from seedbank grown in the greenhouse (D21). To overcome the absence of seed for conservation collection, we requested and received an amendment to deliver an Excel workbook documenting all species

that emerged and their counts from this habitat collection. This aspatial data includes details of the greenhouse emergence trial and the composition of the seed bank at this site (i.e., native, nonnative and ERVI species; seedling counts; timing of emergence associated with watering and chemical treatments), which can be compared against seed bank composition at other sites.

As a perennial desert plant species, *Arctomecon californica* (ARCA) seeds display strong dormancy, such that germination occurs over a long period of time. Seeds collected in 2023 for propagation trials began to germinate after 4 weeks in cold wet chamber conditions and have continued germinating over the past 32 weeks (> 7 months). Once we plant germinated seeds into pots at the greenhouse, it takes 1-2 weeks before cotyledons emerge, and an additional 4-8 weeks for plants to grow large enough to be moved into large pots with experimental soils. Plants continue to grow slowly after transplant, and many plants are still too small for an accurate assessment of survival and growth in experimental soils. We requested and received an amendment to extend the due date for delivery of these plants, along with the associated report and data.

As a winter annual plant, *Eriogonum viscidulum* (ERVI) germinates and emerges only in years with adequate winter rainfall. Winter 2024/25 was substantially drier and warmer (La Niña climate signal) than the wetter and colder winter of 2023/24 (El Niño climate signal), which resulted in negligible precipitation at the two sites slated for ERVI seed collection to supplement seed collected in 2023 (Upper Muddy River and Toquop Wash). We found no seedlings of any plant species during surveys conducted at historic points throughout the Upper Muddy River population and bagged only five plants during surveys of the Toquop Wash population. In conjunction with collections in 2023, ERVI seed collected from the Toquop Wash population still does not meet the Center for Plant Conservation (CPC) guidelines for a conservation collection (<https://academy.saveplants.org/best-practices/acquiring-conservation-collection>) based on low number of maternal lineages. We requested and received an amendment to extend the due date for delivery of these seeds, allowing us to supplement collections in 2026, when we expect conditions to be more conducive to germination and survival of winter annual plants in habitat.

QUESTION 3: What, if any, proposed activities were not completed? Briefly describe those activities, the reasons they were not completed and your plans for carrying them out.

None.

QUESTION 4: What is the calculated percent of work completed?

We are approximately 30% toward project completion.

QUESTION 5: Do you foresee any upcoming problems with future project activities? If so, how do you propose to overcome those problems?

None anticipated.

QUESTION 6: Is there anything else you want to tell the DCP about this project?

We have nothing additional to note concerning this project.

QUESTION 7: What was produced during the reporting period?

During the reporting period, we produced Upper Virgin Valley Seed Bank Emergence Data (D21, formerly titled "Seed available for ERVI propagated from soil seed bank (ERVISb2)") and this Quarterly Progress Report (D24).