Lower Colorado River Multi-Species Conservation Program
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National Park Service
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Bureau of Indian Affairs
Western Area Power Administration

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The Nature Conservancy
Lower Colorado River
Multi-Species Conservation Program

Threecorner Milkvetch and Sticky Buckwheat Conservation in the Lake Mead National Recreation Area

2021 Annual Report

Prepared by:
Carrie Norman,\(^1\) National Park Service

\(^1\) Vegetation Biologist, Carrie_Norman@nps.gov, 702-293-8734
ACRONYMS AND ABBREVIATIONS

GPS       Global Positioning System
Lake Mead NRA Lake Mead National Recreation Area
LCR       lower Colorado River
LCR MSCP  Lower Colorado River Multi-Species Conservation Program
NPS       National Park Service
TNC       The Nature Conservancy
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INTRODUCTION

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a coordinated, comprehensive, long-term multi-agency effort to conserve and recover endangered species and to protect and maintain wildlife habitat on the lower Colorado River (LCR). The LCR MSCP’s purposes are to (1) protect the LCR environment while ensuring the certainty of existing river water and power operations, (2) address the needs of threatened and endangered wildlife under the Endangered Species Act, and (3) prevent the listing of additional LCR species (LCR MSCP 2004). Two rare plant species occur within the covered areas designated in the LCR MSCP: threecorner milkvetch (Astragalus geyeri var. triquetrus) and sticky buckwheat (Eriogonum viscidulum). Both species occur within the Lake Mead National Recreation Area (Lake Mead NRA), which is administered by the National Park Service (NPS).

Conservation measure goals were created under the LCR MSCP to provide funding for threecorner milkvetch and sticky buckwheat conservation programs. A total of $10,000 per year will be provided under the LCR MSCP until 2030, which will go toward an ongoing conservation program for the two rare plants or to another entity that has been approved by the U.S. Fish and Wildlife Service to implement conservation activities for these plant species.

Conservation opportunities at the Lake Mead NRA include:

1. Monitoring populations of rare plants to identify threats
2. Conserving rare plant populations through reduction of threats at a site-specific level, which may include removal of exotic plants and efforts to exclude activities such as off-highway vehicles that degrade habitat

This summary report was prepared to update the status, monitoring results, and conservation actions for these rare plant species at the Lake Mead NRA for fiscal year 2021.

METHODS

Threecorner Milkvetch Population Monitoring

Threecorner milkvetch populations at Sandy Cove are monitored by mapping their spatial distribution. A polygon was used to delineate known and potential threecorner milkvetch habitat in ArcGIS Desktop, and then a permanent 30- x 30-meter grid system was overlaid on the habitat polygon. This grid system was implemented in 2013 and contained 600 plots. The number of plots sampled each year varies based on available funding and personnel.
Between 2013 and 2017, 130 plots were removed from the monitoring grid. Some were removed because they were determined not to be threecorner milkvetch habitat (such as areas where annual grasses stabilized the sand, restricting the milkvetch from growing). Other plots were removed because of unsafe terrain, including those with the correct habitat that were too steep for an employee to safely access and those where plants would have been damaged while surveying in the steep terrain. Many of the plots removed along the periphery contain steep terrain. The number of threecorner milkvetch is counted in each plot. Each plot is then assigned a density score each year based on the number of plants observed in the plot. The threecorner milkvetch density categories are none, 1–10, 11–25, 26–50, 51–75, 76–100, and 101+.

After collecting many years of data, the NPS decided it was not necessary, or efficient with limited staffing, to do this intensive survey every year. Instead, during low precipitation years, surveys consist of recording the number of plants in high density squares (101+), documented in previous years’ complete surveys.

Additional populations or potential habitat areas are also surveyed. This is done by walking in the appropriate habitat, logging the route walked during the surveys with a tracklog on the Global Positioning System (GPS). Threecorner milkvetch observed within 1 meter on either side of the tracklog were counted and documented on the GPS as either a point, line, or polygon. The number of plants is recorded per feature on the GPS unit.

The NPS was unable to survey any areas for threecorner milkvetch in fiscal year 2021, as no plants emerged due to lack of precipitation.

**Threecorner Milkvetch Habitat Treatments**

This season, the NPS planned to control native sixweeks fescue (*Vulpia octoflora*) and non-native Mediterranean grass (*Schismus* spp.), which are stabilizing the dunes, using both an herbicide and mechanical treatment. By controlling these grassy areas, more habitat will be created over time for threecorner milkvetch. The NPS would utilize the same 30-meter square plots at Sandy Cove as in the monitoring grid (used in previous monitoring years) but only treat a percentage of the squares that resulted in zero threecorner milkvetch numbers over the past 6 years.

**Sticky Buckwheat Population Monitoring**

The highest density of sticky buckwheat at the Lake Mead NRA is located between Lime Cove and Glory Hole. The locations of sticky buckwheat are
documented, logging the route walked during the surveys with a tracklog on the GPS unit. Plants are counted and documented as either a point, line, or polygon, and the number of plants is recorded, per feature, on the GPS unit. Sticky buckwheat plants are counted within 1 meter on either side of the tracklog.

The NPS was unable to survey any areas for sticky buckwheat in fiscal year 2021, as no plants emerged due to lack of precipitation.

**RESULTS**

**Threecorner Milkvetch Population Monitoring**

A site visit was conducted in April to monitor threecorner milkvetch at Sandy Cove in the high density plots. No threecorner milkvetch plants had emerged, so surveys were not conducted. Seeds germinate following sufficient precipitation during the winter months, which is about 15 to 25 millimeters in the northern Mojave Desert (Beatley 1967; The Nature Conservancy [TNC] 2007); they tend not to germinate when there is less precipitation (TNC 2007). Powell (1999a, 199b) noted that “abundant” rainfall is thought to stimulate germination and growth of threecorner milkvetch (TNC 2007).

**Threecorner Milkvetch Habitat Treatments**

Site visits were conducted at Sandy Cove in early February and then again in late February to remove Sahara mustard (*Brassica tournefortii*) in areas where the invasive weed had been found in the past. There were no plants found. With nothing there to control, the crews were diverted to control Sahara mustard in the developed areas of Boulder Beach and Callville Bay. These two areas can directly affect the threecorner milkvetch population at Sandy Cove, as wind blows the seeds and/or plants across the lake. There were hardly any Sahara mustard at these locations either.

Application of pre-emergent herbicide on Mediterranean grass at Sandy Cove to increase threecorner milkvetch habitat was not conducted because there was no rain forecasted. Pre-emergent herbicides need rainfall to activate the chemical.
Sticky Buckwheat Population Monitoring

Site visits and surveys were not conducted at Lime Cove. Sticky buckwheat were not expected to emerge, as there was a lack of precipitation throughout the Lake Mead NRA. Seeds germinate following sufficient precipitation during the winter months, which is about 15 to 25 millimeters in the northern Mojave Desert (Beatley 1967; TNC 2007). Years with above average and much-above average winter rains yield very high germination rates, and when adequate temperature and moisture follows during the growing season, sticky wild buckwheat produce high numbers of individuals—much higher than any documented for threecorner milkvetch, which sometimes is associated with it. Their presence and abundance varies annually and is dictated by temperature and moisture. Seed banks replenish in years with wetter and cooler spring conditions. It is unknown how long seed banks remain viable without replenishment (TNC 2007).

DISCUSSION

Threecorner Milkvetch

In fiscal year 2022, the NPS is scheduled to spray pre-emergent herbicide on native sixweeks fescue and non-native Mediterranean grass in specific plots that have no prior history of threecorner milkvetch populations, with a goal of increasing threecorner milkvetch habitat. Sahara mustard may also be removed. This work will only be conducted if sufficient precipitation occurs to allow plants to emerge in spring and if water levels are high enough that crews can access the beaches surrounding the rare plant populations by boat.

Sticky Buckwheat

Sticky buckwheat are annual plants that emerge in different places each year. The fluctuating water levels of Lake Mead may enable the plant to expand its population and density levels at Lime Cove if there is sufficient precipitation. Surveys will only be conducted if sufficient precipitation occurs to allow plants to emerge in spring. Glory Hole will not be surveyed due to fluctuating water levels, which can limit access.
LITERATURE CITED


