Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Surveys of Threecorner Milkvetch (*Astragalus geyeri* var. *triquetrus*) and Sticky Buckwheat (*Eriogonum viscidulum*) in Fiscal Year 2016 – Lake Mead National Recreation Area

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

September 2016

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National Park Service
Bureau of Land Management
Bureau of Indian Affairs
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Lower Colorado River Multi-Species Conservation Program

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ACRONYMS AND ABBREVIATIONS

GPS	Global Positioning System
Lake Mead NRA	Lake Mead National Recreation Area
LCR MSCP	Lower Colorado River Multi-Species Conservation Program

Symbols

%	percent

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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. The LCR MSCP's purposes are to (1) protect the lower Colorado River 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 species on the lower Colorado River (Bureau of Reclamation 2004). Two rare plant species are covered under 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.

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 by the LCR MSCP until 2030 that 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. In 2016, the $10,000 was provided to the National Park Service to supplement their conservation program for these species at the Lake Mead NRA.

Conservation opportunities at the Lake Mead NRA include:

1. Monitoring populations of rare plants to identify threats

2. Conserving rare plant populations by reducing threats at a site-specific level, which may include removal of exotic plants and efforts to exclude activities, such as off-highway vehicles, which 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 2016.

METHODS

Threecorner Milkvetch Population Monitoring

Threecorner milkvetch populations (densities) at Sandy Cove are monitored every year and documented using a Global Positioning System (GPS). First, the boundary of known and potential threecorner milkvetch habitat is delineated in ArcGIS with a polygon feature, and then a permanent 30 x 30-meter grid system of plots is overlaid on the polygon. This type of grid system was first

implemented in 2013, and the original number of plots monitored was higher in 2013 than in 2016. Plots were deleted from monitoring if they were determined not to be threecorner milkvetch habitat or because of unsafe terrain (correct habitat but too steep to access safely for the employee and when surveying in steep terrain may also have resulted in damage to the plants). The threecorner milkvetch density categories are: none, 1–10, 11–25, 26–50, 51–75, 76–100, and 101+.

Additional populations and potential habitat areas were also surveyed by walking in the potential habitat, logging the route walked during the survey with a track log on the GPS.

Sticky Buckwheat Population Monitoring

The highest density of sticky buckwheat at the Lake Mead NRA is located between Lime Cove and Glory Hole. The presence and number of sticky buckwheat are documented on transects that were first established in 2013. In 2013, ten 100-meter random transects were placed in high-density sticky buckwheat locations (figure 1). The beginnings of each transect were located at the high water level (full pool) and documented with GPS. They were permanently marked with rebar as well as photographed for future monitoring. The ends of each transect were oriented downslope 100 meters and were not marked due to fluctuating water levels but located with GPS. The total number of sticky buckwheat is recorded within a 1-meter belt on the right side (side 1 on data sheet) and the left side (side 2 on the data sheet) of the transect.

Additional populations or potential habitat areas were surveyed. This was done by walking in the appropriate habitat, logging the route walked during the survey with a track log on the GPS. Sticky buckwheat were documented with GPS when found.

RESULTS

Threecorner Milkvetch Population Monitoring

Threecorner milkvetch surveys were conducted on March 1, 2, 9, 10, 16, and April 21, 2016, and the results are shown on figure 2. Four hundred seventy three plots (30 x 30 meters) were surveyed; 284 plots contained no plants, 132 contained 1–10, 27 contained 11–25, 15 contained 26–50, 5 contained 51–75, 1 contained 76–100, and 9 contained 101+ plants. The total number of threecorner milkvetch counted was 3,865.

Figure 1.—Sticky buckwheat transect locations.
Lime Cove (LC) and Glory Hole (GH) are shown next to each transect number.

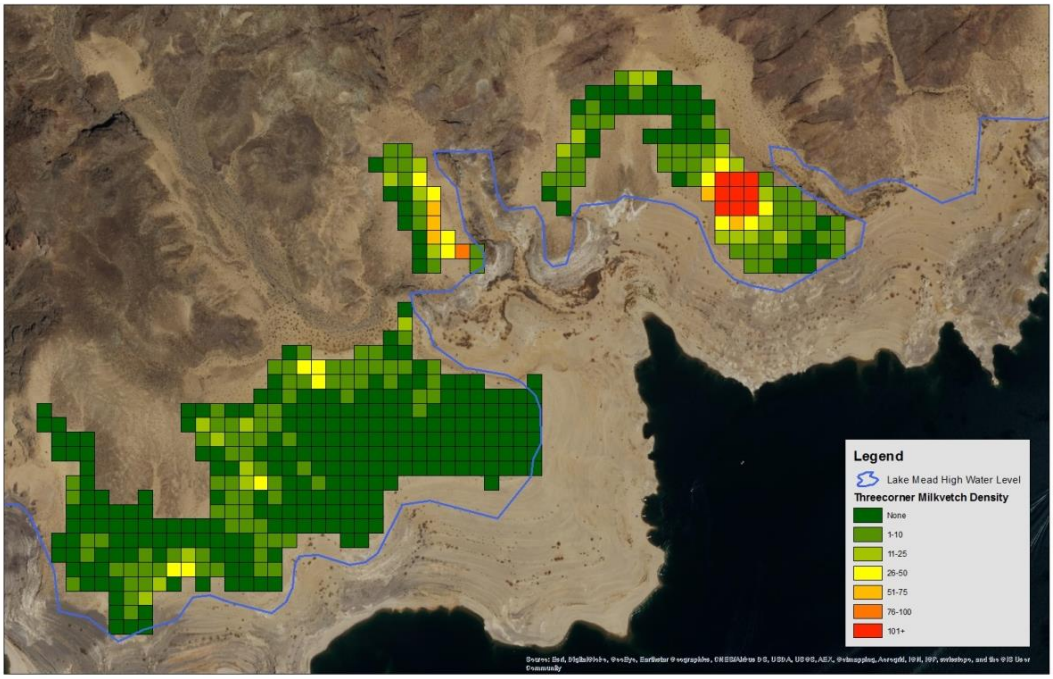

Figure 2.—Threecorner milkvetch monitoring grid at Sandy Cove.

Six acres were surveyed at Middle Point, and 107 threecorner milkvetch were documented (figure 3). Seven acres at Lime Cove were surveyed, and 8 threecorner milkvetch were documented (figure 4). These surveys were not conducted using the grid monitoring method but by walking the habitat, logging the route walked during the survey with a track log on the GPS. Threecorner milkvetch locations were documented with GPS when found.

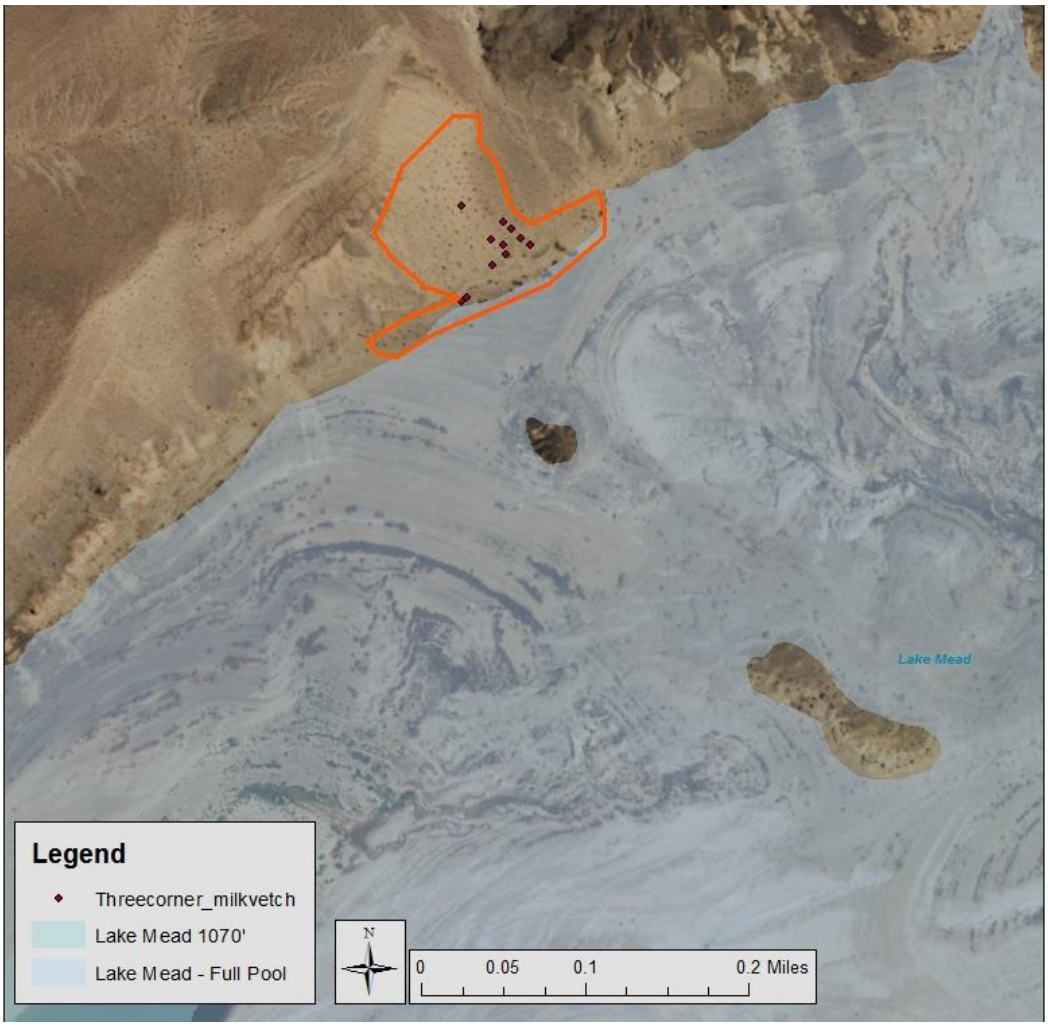

Figure 3.—Threecorner milkvetch survey at Middle Point.
The orange polygon represents the area surveyed.

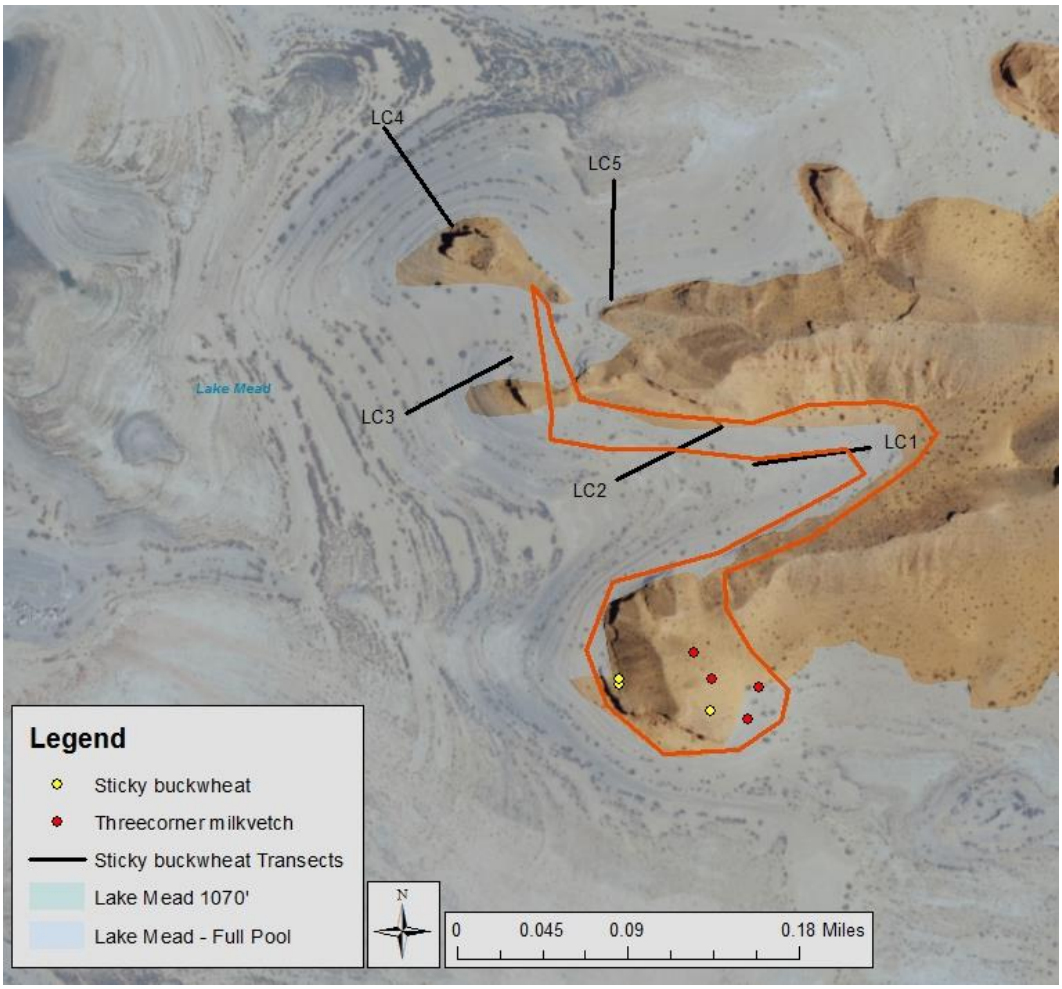

Figure 4.—Threecorner milkvetch and sticky buckwheat survey at Lime Cove. The orange polygon represents the area surveyed.

Sticky Buckwheat Population Monitoring

Sticky buckwheat transects were surveyed on April 27, 2016, and 145 plants were documented at Lime Cove. Transects at Glory Hole were not completed due to environmental conditions and other factors. For comparison, a total of 100 sticky buckwheat were found in transects at Lime Cove in 2015 and 539 in 2013.

Seven acres in the Lime Cove area were surveyed by walking the habitat, logging the route walked during the survey with a track log on the GPS. Sticky buckwheat were documented with GPS when found, resulting in an additional 120 plants (see figure 4).

DISCUSSION

Threecorner Milkvetch

From December 2015 to May 2016, Sandy Cove, Ebony Cove, and Blue Point Spring (closest weather reading to Lime Cove) received 1.7, 3.2, and 3.6 inches of precipitation, respectively. Even though the weather station locations received more precipitation than last year, there was an overall decrease (80.6%) in the number of threecorner milkvetch documented at the study sites. The temperature may have played a role in this decrease, as the temperatures during the growing season were warmer compared to last season. The average temperatures per day from February 15 to March 4, 2016, ranged from 0.3° to 15.6 °Fahrenheit higher than last season during the same period. During the germination period, January 6 to February 14, 2016, the average daily temperature ranged from 0.4–13.8 ° Fahrenheit below last season's temperatures. Other environmental factors, such as a decrease in pollinators during the flowering stage, could also explain the decrease in the numbers of plants documented.

Future pollination and germination research studies would be valuable to the National Park Service and other land managers that manage land with populations of threecorner milkvetch. Without understanding the environmental cues for this species, *true* population increases or declines will be difficult to determine.

Sticky Buckwheat

Sticky buckwheat numbers in transects at Lime Cove increased since 2015 by 45%; however, this may not represent a *true* increase in numbers in this population. Sticky buckwheat are annual plants that emerge in different places each year. The transects are located in two of the higher population areas; however, straight line transects do not always capture the true representation of a species that moves easily with wind and shifting sand. Casual walking around the sites did show many sticky buckwheat populations that were not captured in the transect data (see figure 4). Monitoring will continue next year on the same transects, but efforts should expand, if sufficient staff are available, to encompass a more simplified survey method. This could include walking the area with a GPS unit while documenting point or line locations of sticky buckwheat locations. A track log would document the exact area walked and could be duplicated if need be for future surveys at the same location. Sticky buckwheat would be counted 1 meter on either side of the track log, which would show a more widespread distribution of sticky buckwheat instead of focusing solely on stationary transects 100 meters long.

OTHER MANAGEMENT ACTIONS

In fiscal year 2016, 26 acres of Sahara mustard (*Brassica tournefortii*) were removed from the dunes/sandy areas and surrounding beaches at Sandy Cove (figure 5) and Lime Cove (figure 6). A total of 25.8 acres of Sahara mustard were removed from Sandy Cove, and a total of 0.2 acre was removed from Lime Cove.

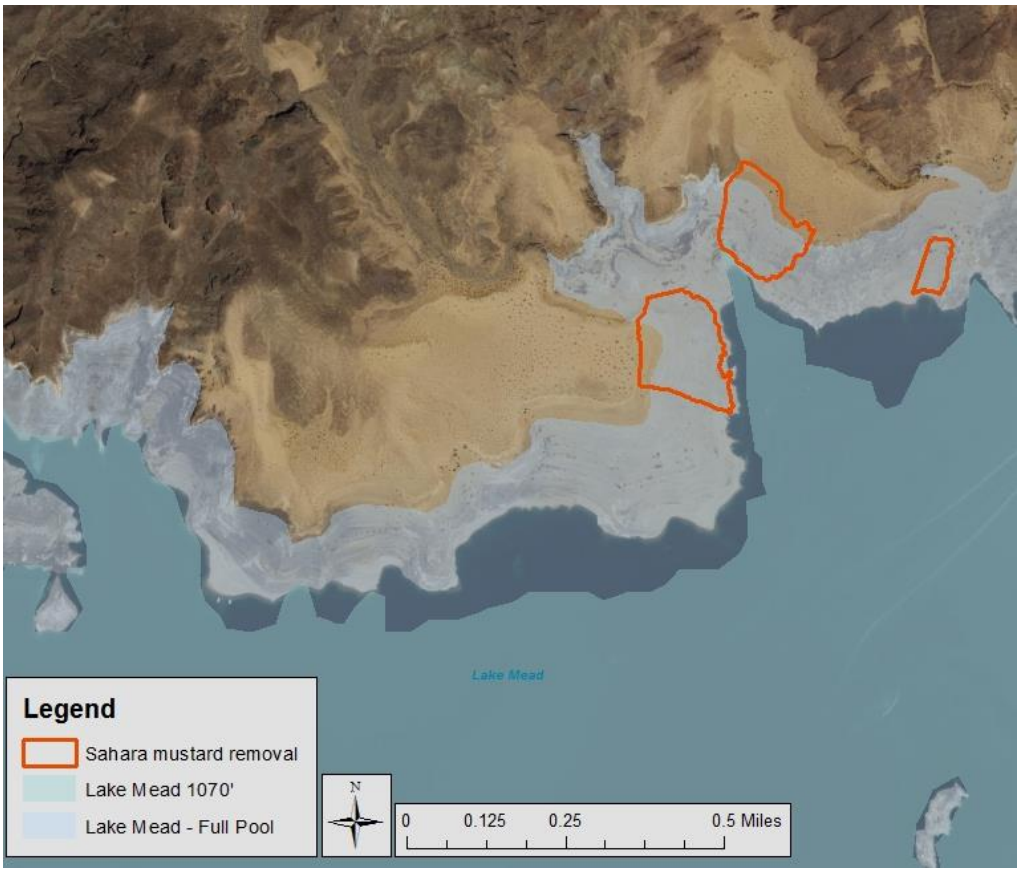

Figure 5.—Sahara mustard removal at Sandy Cove, totaling 25.8 acres.

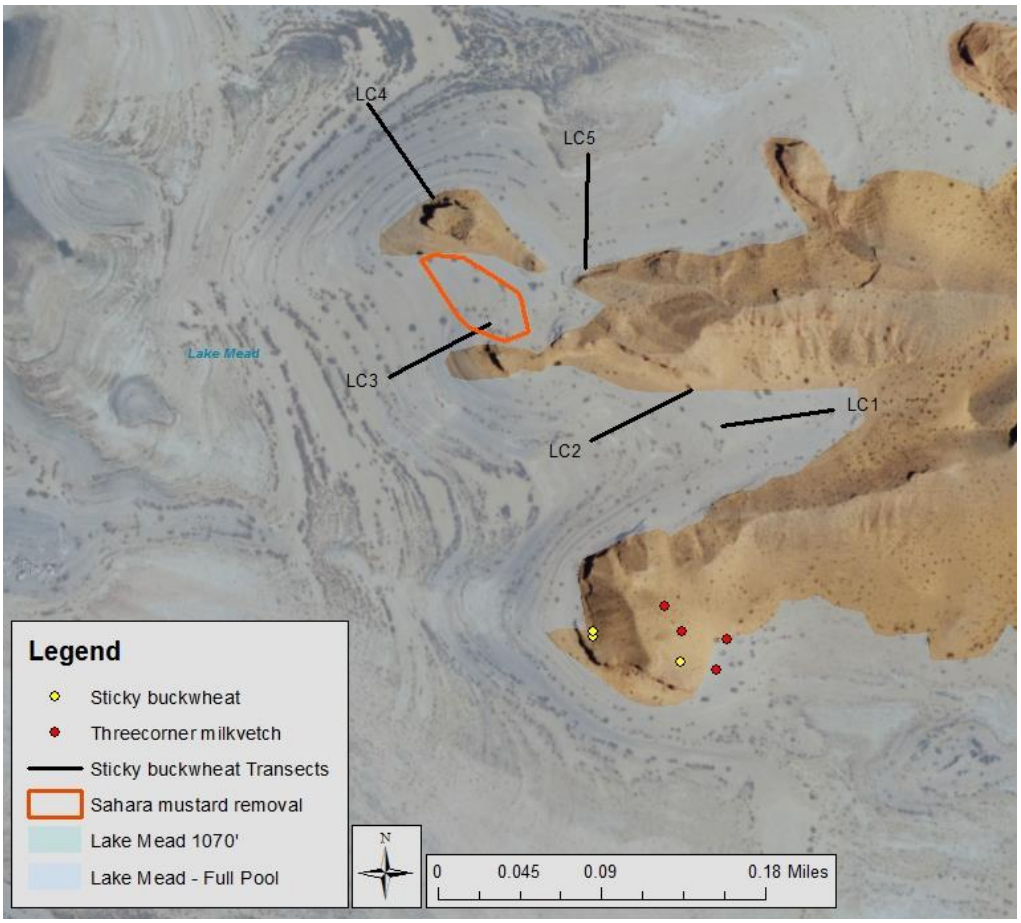

Figure 6.—Sahara mustard removal at Lime Cove, totaling 0.2 acre.

LITERATURE CITED

Bureau of Reclamation. 2004. Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan. Final. December 17. Sacramento, California.

Newton, A. and C. Norman. 2015. Surveys of Threecorner Milkvetch (*Astragalus geyeri* var. *triquetrus*) and Sticky Buckwheat (*Eriogonum viscidulum*) in Fiscal Year 2015 – Lake Mead National Recreation Area. Report submitted to the Bureau of Reclamation, Boulder City, Nevada, by the National Park Service, Boulder City, Nevada.