Lower Colorado River Multi-Species Conservation Program
Steering Committee Members

Federal Participant Group
Bureau of Reclamation
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
Bureau of Indian Affairs
Western Area Power Administration

Arizona Participant Group
Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
Central Arizona Water Conservation District
Cibola Valley Irrigation and Drainage District
City of Bullhead City
City of Lake Havasu City
City of Mesa
City of Somerton
City of Yuma
Electrical District No. 3, Pinal County, Arizona
Golden Shores Water Conservation District
Mohave County Water Authority
Mohave Valley Irrigation and Drainage District
Mohave Water Conservation District
North Gila Valley Irrigation and Drainage District
Town of Fredonia
Town of Thatcher
Town of Wickenburg
Salt River Project Agricultural Improvement and Power District
Unit “B” Irrigation and Drainage District
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users’ Association
Yuma Irrigation District
Yuma Mesa Irrigation and Drainage District

California Participant Group
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City of Needles
Coachella Valley Water District
Colorado River Board of California
Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
San Diego County Water Authority
Southern California Edison Company
Southern California Public Power Authority
The Metropolitan Water District of Southern California

Nevada Participant Group
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Southern Nevada Water Authority
Colorado River Commission Power Users
Basic Water Company

Native American Participant Group
Hualapai Tribe
Colorado River Indian Tribes
Chemehuevi Indian Tribe

Conservation Participant Group
Ducks Unlimited
Lower Colorado River RC&D Area, Inc.
The Nature Conservancy

Other Interested Parties Participant Group
QuadState Local Governments Authority
Desert Wildlife Unlimited
Lower Colorado River
Multi-Species Conservation Program

Palo Verde Ecological Reserve

2016 Annual Report

Prepared by:
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Barbara Raulston, Wildlife Group
Becky Blasius and Jimmy Knowles, Adaptive Management Group
# Acronyms and Abbreviations

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<th>Full Form</th>
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<td>California Department of Fish and Wildlife</td>
</tr>
<tr>
<td>FY</td>
<td>fiscal year</td>
</tr>
<tr>
<td>LCR MSCP</td>
<td>Lower Colorado River Multi-Species Conservation Program</td>
</tr>
<tr>
<td>lidar</td>
<td>light detection and ranging</td>
</tr>
<tr>
<td>PVER</td>
<td>Palo Verde Ecological Reserve</td>
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<td>PVID</td>
<td>Palo Verde Irrigation District</td>
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<td>Reclamation</td>
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1.0 INTRODUCTION

The purpose of this annual report is to summarize all activities that have occurred at the Palo Verde Ecological Reserve (PVER) from October 1, 2015, through September 30, 2016, which is Federal fiscal year (FY) 2016. Water usage is presented for the calendar year, January 1 through December 31, 2016, consistent with the Colorado River Accounting and Water Use Report: Arizona, California, and Nevada, Calendar Year 2016 (Bureau of Reclamation [Reclamation] 2017).

1.1 BACKGROUND

The PVER encompasses 1,352 acres of the historical flood plain of the Colorado River near Blythe, California. Formerly, the property was known as the Riverview Ranch and was owned by the Travis family. The ranch was acquired by the Trust for Public Lands in 2004 to offset degradation of wildlife habitat along the lower Colorado River. On September 3, 2004, the property was conveyed to the State of California. The State identified up to 1,300 acres of active agricultural lands on this property for habitat restoration under the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), a 50-year multi-partner program administered by Reclamation (LCR MSCP 2004).

The California Department of Fish and Wildlife (CDFW) and the LCR MSCP jointly planned the conversion of portions of the PVER from agricultural crops to a mix of native plant species. Now that planting is completed, the created habitats will be managed for species covered under the LCR MSCP throughout the 50-year life of the program. Existing infrastructure consists primarily of an irrigation system comprised of 9.2 miles of lined and unlined irrigation ditches and associated slide gates, a 100-horsepower electric pump, and approximately 14 miles of access roads. All the acreage had been in agricultural crops—grain, small melons, and alfalfa—since the late 1930s.

2.0 CONSERVATION AREA INFORMATION

2.1 Purpose

The purpose of the development of the PVER was to convert 1,023 acres of agricultural land to riparian habitat that would be managed for southwestern willow flycatchers (Empidonax trailli extimus) and other LCR MSCP covered species that utilize the Fremont cottonwood-Goodding’s willow (Populus fremontii-Salix gooddingii) (hereafter cottonwood-willow) and honey mesquite (Prosopis glandulosa) land cover types.
2.2 Location

The PVER is located in Reach 4, in southeastern Riverside County, California, approximately 5 miles north of Blythe. It is within the historic flood plain of the lower Colorado River and between River Miles 128 and 134 (figure 1).

2.3 Landownership

The PVER is owned by the CDFW, which has dedicated 1,023 acres for the restoration and maintenance of native land cover types by the LCR MSCP. The CDFW manages two parcels for migratory waterfowl and upland game.

2.4 Water

The Palo Verde Irrigation District (PVID) has an entitlement to Colorado River water for use on up to 104,500 acres of land within the PVID pursuant to a contract between the United States and the PVID dated February 7, 1933. The CDFW, as a landowner within the PVID, has the right to order Colorado River water from the PVID for pumping through the PVID canal system to its fields. The CDFW has made Colorado River water available for irrigation of the native plants.

2.5 Agreements

A Land Use Agreement was signed in 2007 by Reclamation and the CDFW to secure land and water for the PVER for the remainder of the 50-year LCR MSCP. The agreement outlines the rights and responsibilities of each partner in the project’s development and maintenance.

2.6 Public Use

The CDFW has the authority, and is the lead, to regulate hunting and recreation uses pursuant to CDFW statutes, regulations, and policies at the PVER. In cooperation with Reclamation, the CDFW coordinates its public use and related activities so they are compatible with management of the site for the LCR MSCP. Low-impact public uses, such as wildlife watching, sport fishing, and education/outreach, are expected at the PVER; however, these uses may be regulated depending on future occupation of the habitat by listed species.
Figure 1.—PVER location map.
2.7 Law Enforcement

The CDFW is responsible for law enforcement at the PVER. A LCR MSCP Conservation Area Specific Fire Management & Law Enforcement Strategy was finalized for the PVER (LCR MSCP 2010).

2.8 Wildfire Management

A LCR MSCP Conservation Area Specific Fire Management & Law Enforcement Strategy has been finalized for the PVER and is posted on the LCR MSCP Web site. The LCR MSCP will continue to work with local State and Federal fire agencies to reduce the risk of wildland fire and to maintain clear lines of communication among agencies.

3.0 Habitat Development and Management

Riparian land cover types have been created at the PVER, from 2006 to 2013, and are being managed for LCR MSCP covered species (figure 2).

3.1 Planting

No planting occurred at the PVER in 2016.

3.2 Irrigation

The fields at the PVER are flood irrigated. Water usage for the PVER for the calendar year is reported from the PVID’s Water Order System. During 2016, 17,303 acre-feet (16.9 acre-feet per acre, per year) of water was applied to the fields at the PVER. The water usage reported by the PVID does not reflect consumptive use or unmeasured return.

3.3 Site Management

Normal road maintenance, such as grading and gravel road base replacement, was done as needed.
Figure 2.—PVER managed acreage through FY16.
3.3.1 Weed Management
Invasive weeds and plant material were removed adjacent to the irrigation ditches to protect their integrity. Disking was done quarterly along the levee road and extended 50 feet into the fields to protect the integrity of the road and to reduce the risk of fire.

3.3.2 Pest Management
No pest management at the PVER was needed this year.

3.3.3 Nursery Management
Plant material was collected from the nursery in November 2015 through January 2016 for planting at other LCR MSCP conservation areas.

4.0 MONITORING

4.1 Avian Monitoring
Avian monitoring in FY16 included surveys for southwestern willow flycatchers, yellow-billed cuckoos (*Coccyzus americanus occidentalis*), riparian breeding birds, small mammals, and MacNeill’s sootywing skippers (*Pholisora gracielae* = *Hesperopsis gracielae* [MacNeill]).

4.1.1 Southwestern Willow Flycatcher Surveys
Surveys to detect the presence of southwestern willow flycatchers were conducted five times during FY16 in cottonwood-willow habitat. No breeding southwestern willow flycatchers were detected. One unpaired male southwestern willow flycatcher was detected in the same area of PVER Phase 2 from June 5 through June 14, and the bird appeared to be unpaired. It was not detected, either at the PVER or at any other study area, after June 14. No other southwestern willow flycatchers were detected in the vicinity during that period. Because this male was detected repeatedly, it was considered a resident. Most birds detected after June 24 or individuals detected repeatedly before June 24 are considered to be southwestern willow flycatchers. Migrant willow flycatchers (*Empidonax trailli*) were detected in May and June. Birds detected before June 24 and those detected only once after June 24 are considered migrant willow flycatchers (McLeod and Pellegrini 2017).
4.1.2 Yellow-billed Cuckoo Surveys

Four surveys for yellow-billed cuckoos were conducted within the riparian portion of the PVER. During the first survey period (June 15 – June 30), there were 54 cuckoo detections. Two surveys are conducted during the second survey period (approximately July 1 – July 31) and resulted in 106 detections. Between approximately August 1–15, there were 49 detections.

Breeding was confirmed at the PVER in FY16. Due to the behavior of this species, detections alone do not indicate the number of cuckoos present, nor do detections confirm breeding. The number, timing, and location of detections, along with behaviors observed, may be used to estimate abundance, distribution, and/or breeding status. There were 50 confirmed pairs, 15 probable pairs, and 39 possible territories at the PVER in FY16. Forty-one nests were found incidental to surveys (Parametrix, Inc., and Southern Sierra Research Station 2017).

4.1.3 General Bird Surveys

Bird surveys were conducted to detect breeding LCR MSCP riparian bird species and other territorial riparian bird species. Surveys were conducted within areas of the cottonwood-willow and honey mesquite land cover types that were of adequate growth to support breeding birds. General bird surveys resulted in the detection of 26 species (396.25 territories) of birds breeding within the surveyed plots. Arizona bell’s vireos (*Vireo bellii arizonae*), Sonoran yellow warblers (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*), and summer tanagers (*Piranga rubra*) were confirmed breeding (Great Basin Bird Observatory 2017).

Table 1 shows the number of breeding territories of LCR MSCP covered species at the PVER in FY16 (Great Basin Bird Observatory 2017).

<table>
<thead>
<tr>
<th>LCR MSCP covered species</th>
<th>Number of confirmed breeding pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arizona bell’s vireo</td>
<td>1</td>
</tr>
<tr>
<td>Sonoran yellow warbler</td>
<td>6</td>
</tr>
<tr>
<td>Summer tanager</td>
<td>5.25</td>
</tr>
</tbody>
</table>

1 Number of breeding territories refers to the number of territories that are within the sampled area for pairs that were confirmed breeding. Partial territories are possible, as the amount of each territory within the sampled area was estimated to 0.25, 0.5, 0.75, or 1.0.
4.2 Small Mammal Monitoring

4.2.1 Bat Monitoring

Acoustic and capture survey methods were used to monitor bats in order to document the presence of species using the conservation area and to determine the age, sex, and reproductive status of bats that were captured.

4.2.1.1 Acoustic Surveys

Two long-term monitoring stations were operated at the PVER during June, July, and August 2016. Western red bats (*Lasiurus blossevillii*) and western yellow bats (*Lasiurus xanthinus*) were detected (table 2). Table 2 summarizes the total number of nights the four LCR MSCP species were detected in FY16 (Mixan and Diamond, *in press*).

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of nights recorded (PVER 1/PVER 2)</th>
<th>Total nights detected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Western red bat</td>
<td>Western yellow bat</td>
</tr>
<tr>
<td></td>
<td>PVER 1</td>
<td>PVER 2</td>
</tr>
<tr>
<td>June</td>
<td>30/15</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>31/31</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>31/31</td>
<td></td>
</tr>
</tbody>
</table>

4.2.1.2 Capture Surveys

Bats were captured using mist nets at the PVER 1 night per month in June, July, and August. LCR MSCP species captured included one western red bat, two western yellow bats, and three California leaf-nosed bats (*Macrotus californicus*). No Pale Townsend’s big-eared bats (*Corynorhinus townsendii pallescens = Plecotus townsendii pallescens = C. townsendii*) were captured (Hill 2018b).

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1 Genetic analyses on the pale Townsend’s big-eared bat indicate that the lower Colorado River is likely in the range of the Pacific Townsend’s big-eared bat (*Corynorhinus townsendii townsendii*) rather than the pale Townsend’s big-eared bat (Piaggio and Perkins 2005). The bats recorded along the lower Colorado River will be referred to as pale Townsend’s big-eared bats in this report, as the nomenclature change has not yet been verified by the U.S. Fish and Wildlife Service.
4.2.2 Rodent Monitoring
Live trapping was conducted in FY16 at the PVER to determine the presence of Colorado River cotton rats (*Sigmodon arizonae plenus*) and desert pocket mice (*Chaetodipus penicillatus* spp.). Table 3 lists the results from the trapping conducted on October 21 and 22, 2015. On March 4, 2016, 60 traps each were set in Phases 4 and 5, and no covered species were captured (Hill 2017, 2018a).

Table 3.—Number of covered rodent species captured at the PVER, October 2015

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of traps</th>
<th>Colorado River cotton rat</th>
<th>Desert pocket mouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 4</td>
<td>120</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Phase 7</td>
<td>60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Phase 8</td>
<td>60</td>
<td>3</td>
<td>1</td>
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4.3 MacNeill’s Sootywing Skipper Monitoring
Surveys for MacNeill’s sootywing skippers (*Pholisora gracielae* = *Hesperopsis gracielae* [MacNeill]) were conducted on March 19, 2016. MacNeill’s sootywing skippers were documented in Phases 1, 4, and 6 (Hill 2016).

5.0 HABITAT CREATION CONSERVATION MEASURE ACCOMPLISHMENT

5.1 Vegetation Monitoring
Vegetation data were collected in FY16 using light detection and ranging (lidar). Lidar measures the vegetation structure throughout the canopy and provides the ability to identify structural diversity and successional growth stages. Conservation area vegetation will be evaluated on a periodic basis using lidar to ensure the habitat is meeting species’ requirements. A procedure to analyze and provide vegetation structure metrics will be developed, and the results will be presented in future reports.

5.2 Evaluation of Conservation Area Habitat
The Final Habitat Creation Conservation Measure Accomplishment Tracking Process was finalized in October 2011 (LCR MSCP 2011). All areas within the PVER were designed to benefit covered species at the landscape level.
To meet species habitat creation requirements, the Habitat Conservation Plan provides goals for habitat creation based on land cover types. These land cover types are described using the Anderson and Ohmart vegetation classification system (Anderson et al. 1976, 1984a and 1984b). Thirteen species with habitat creation goals have creditable acres at the PVER. These species, including their corresponding conservation measure acronyms, are: southwestern willow flycatcher (WIFL1), western red bat (WRBA2), western yellow bat (WYBA3), Colorado River cotton rat (CRCR2), yellow-billed cuckoo (YBCU1), elf owl (Micrathene whitneyi) (ELOW1), gilded flicker (Colaptes chrysoides) (GIFL1), Gila woodpecker (Melanerpes uropygialis) (GIWO1), vermilion flycatcher (Pyrocephalus rubinus) (VEFL1), Arizona Bell’s vireo (BEVI1), Sonoran yellow warbler (YWAR1), summer tanager (SUTA1), and MacNeill’s sootywing skipper (MNSW2) (table 4).

Table 4.—Species-specific habitat creation conservation measure creditable total acres for 2016

<table>
<thead>
<tr>
<th>Species-specific habitat creation conservation measure</th>
<th>WIFL1</th>
<th>WRBA2</th>
<th>WYBA3</th>
<th>CRCR2</th>
<th>YBCU1</th>
<th>ELOW1</th>
<th>GIFL1</th>
<th>GIWO1</th>
<th>VEFL1</th>
<th>BEVI1</th>
<th>YWAR1</th>
<th>SUTA1</th>
<th>MNSW2</th>
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</thead>
<tbody>
<tr>
<td>Creditable acres in 2016</td>
<td>0</td>
<td>304</td>
<td>304</td>
<td>0</td>
<td>0</td>
<td>226</td>
<td>226</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>446</td>
</tr>
<tr>
<td>Total, including previous years</td>
<td>945</td>
<td>1,023</td>
<td>1,023</td>
<td>1,023</td>
<td>945</td>
<td>985</td>
<td>945</td>
<td>985</td>
<td>1,023</td>
<td>945</td>
<td>945</td>
<td>945</td>
<td>40</td>
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6.0 **Adaptive Management**

Adaptive management relies on the initial receipt of new information, the analysis of that information, and the incorporation of the new information into the design and/or direction of future project work (LCR MSCP 2007). The Adaptive Management Program’s role is to ensure habitat creation sites are biologically effective and fulfill the conservation measures outlined in the Habitat Conservation Plan for 26 covered species and if they potentially benefit 5 evaluation species. Post-development monitoring and species research results will be used to adaptively manage habitat creation sites after initial implementation. Once monitoring data are collected over a few years, and then analyzed for the PVER, recommendations may be made through the adaptive management process for site improvements in the future.

There are no adaptive management recommendations for the PVER at this time.
LITERATURE CITED


Palo Verde Ecological Reserve
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