



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Dennis Underwood Conservation Area Restoration Development and Monitoring Plan



November 2018

Work conducted under LCR MSCP Work Task E39

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

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Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
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Yuma Irrigation District
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Other Interested Parties Participant Group

QuadState Local Governments Authority
Desert Wildlife Unlimited

California Participant Group

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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

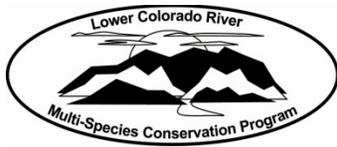
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Native American Participant Group

Hualapai Tribe
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Lower Colorado River RC&D Area, Inc.
The Nature Conservancy



Lower Colorado River Multi-Species Conservation Program

Dennis Underwood Conservation Area Restoration Development and Monitoring Plan

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ACRONYMS AND ABBREVIATIONS

CESA	California Endangered Species Act
HCP	Habitat Conservation Plan
LCR	lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
lidar	light detection and ranging
Metropolitan	The Metropolitan Water District of Southern California
PVID	Palo Verde Irrigation District
Reclamation	Bureau of Reclamation

Symbols

%	percent
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1.0 INTRODUCTION

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is a 50-year multi-stakeholder Federal and non-Federal partnership created to balance the use of Lower Colorado River (LCR) water resources with the conservation of native species and their habitats in compliance with the Endangered Species Act. The program is cooperatively funded by the Federal Government and the States of Arizona, California, and Nevada, and other permittees, within these States. This long-term effort works toward the recovery of listed species and protects and maintains wildlife habitat along the LCR from the full pool elevation of Lake Mead to the Southerly International Boundary with Mexico through implementation of a Habitat Conservation Plan (HCP).

A major component of the LCR MSCP is the creation and management of habitat to benefit 27 covered species. Fremont cottonwood- Goodding's willow (*Populus fremontii-Salix gooddingii*) (hereafter cottonwood-willow), honey mesquite (*Prosopis glandulosa*), marsh, and backwater are the predominant land cover types to be created under the LCR MSCP. Habitat creation goals include the establishment of a total of 8,132 acres of habitat, including 5,940 acres of cottonwood-willow, 1,320 acres of honey mesquite, 512 acres of marsh, and 360 acres of backwater.

This report outlines the preliminary concept, project parameters, and monitoring activities for the development of 635 acres to satisfy both a portion of the LCR MSCP habitat requirements described in the LCR MSCP Habitat Conservation Plan (LCR MSCP 2004a) and a portion of California Endangered Species Act (CESA) Incidental Take Permit No. 2081-2005-008-06. Restoration of the site includes planting both the honey mesquite and cottonwood-willow land cover types.

1.1 Purpose

The purpose of this project is to comply with the LCR MSCP and CESA mitigation requirements by creating and maintaining the cottonwood-willow and honey mesquite land cover types for covered species in Reaches 3–6 of the Colorado River in California.

The Dennis Underwood Conservation Area will partially meet and/or support the following conservation measures (LCR MSCP 2004a):

- WIFL1– Create 4,050 acres of southwestern willow flycatcher (*Empidonax traillii extimus*) habitat

**Dennis Underwood Conservation Area
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- YWAR1 – Create 4,050 acres of Sonoran yellow warbler (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*) habitat
- VEFL1 – Create 5,208 acres of vermilion flycatcher (*Pyrocephalus rubinus*) habitat
- BEVI1 – Create 2,983 acres of Arizona Bell’s vireo (*Vireo bellii arizonae*) habitat
- ELOW1 – Create 1,784 acres of elf owl (*Micrathene whitneyi*) habitat
- GIFL1 – Create 4,050 acres of gilded flicker (*Colaptes chrysoides*) habitat
- GIWO1 – Create 1,702 acres of Gila woodpecker (*Melanerpes uropygialis*) habitat
- YBCU1 – Create 4,050 acres of yellow-billed cuckoo (*Coccyzus americanus occidentalis*) habitat
- SUTA1 – Create 602 acres of summer tanager (*Piranga rubra*) habitat
- WRBA2 – Create 765 acres of western red bat (*Lasiurus blossevillii*) roosting habitat
- WYBA3 – Create 765 acres of western yellow bat (*Lasiurus xanthinus*) roosting habitat

1.2 Location and Description

The Dennis Underwood Conservation Area is in Imperial County, California, in Sections 25 and 36, Township 9 South, Range 21 East, San Bernardino Meridian. The project site is currently uncultivated agricultural land located within the Palo Verde Irrigation District (PVID) between Colorado River Miles 97 and 99 (figure 1), approximately 18 miles south of Blythe, California.

The Colorado River and Cibola National Wildlife Refuge border the Dennis Underwood Conservation Area to the east. The LCR MSCP Pretty Water Conservation Area borders it to the south, and agricultural lands border to the west and north.

Dennis Underwood Conservation Area
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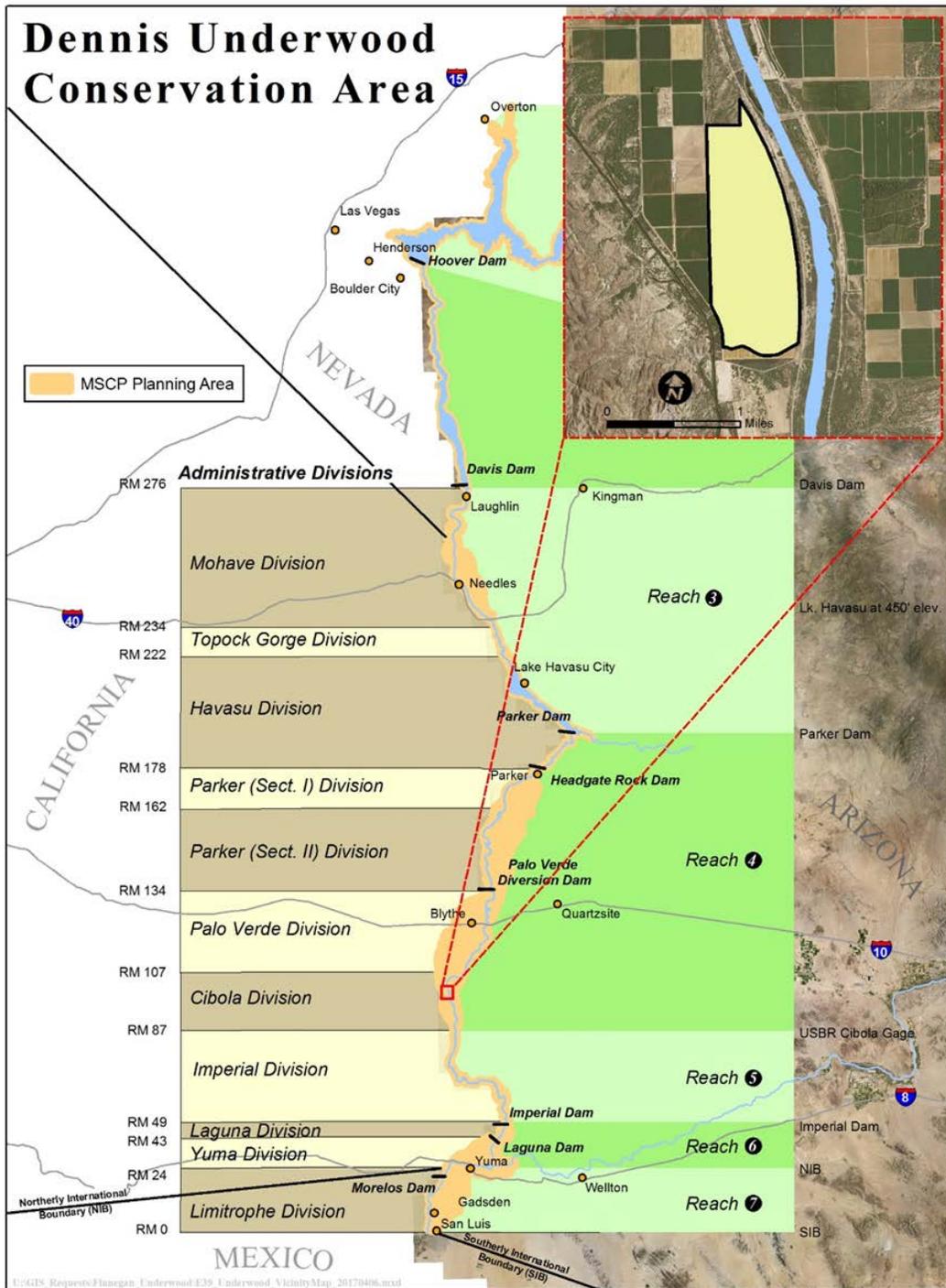


Figure 1.—LCR MSCP planning area map showing the location of the Dennis Underwood Conservation Area.

1.3 Landownership

The Dennis Underwood Conservation Area is on Metropolitan Water District of Southern California (Metropolitan) lands. Metropolitan and the Bureau of Reclamation (Reclamation) have agreed to enter into an easement for conservation purposes to facilitate the development and long-term management of the conservation area. Property ownership will be retained by Metropolitan.

1.4 Water

The 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. Metropolitan, 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. Colorado River water will continue to be conveyed through the existing PVID system to irrigate the native plant restoration areas.

1.5 Easement

The easement for conservation purposes between Reclamation and Metropolitan provides the terms and authorization for use and development of the Dennis Underwood Conservation Area and serves to document the rights and obligation of both parties in perpetuity.

2.0 RESTORATION AND DEVELOPMENT PLAN

Implementation of the Dennis Underwood Conservation Area will serve as partial fulfillment to the LCR MSCP's 5,940 acres cottonwood-willow habitat and 1,320 acres honey mesquite habitat. Reclamation would design, restore, create, operate, maintain, and monitor approximately 506 acres of the cottonwood-willow and 122 acres of the honey mesquite land cover types within the conservation area (figure 2). Seven acres located on the north end of the property will be managed by LCR MSCP and remain undeveloped. The project will incorporate the general design and target criteria identified in the LCR MSCP Programmatic Environmental Impact Statement/Environmental Impact Report (LCR MSCP 2004b) and the HCP.

Dennis Underwood Conservation Area
 Restoration Development and Monitoring Plan

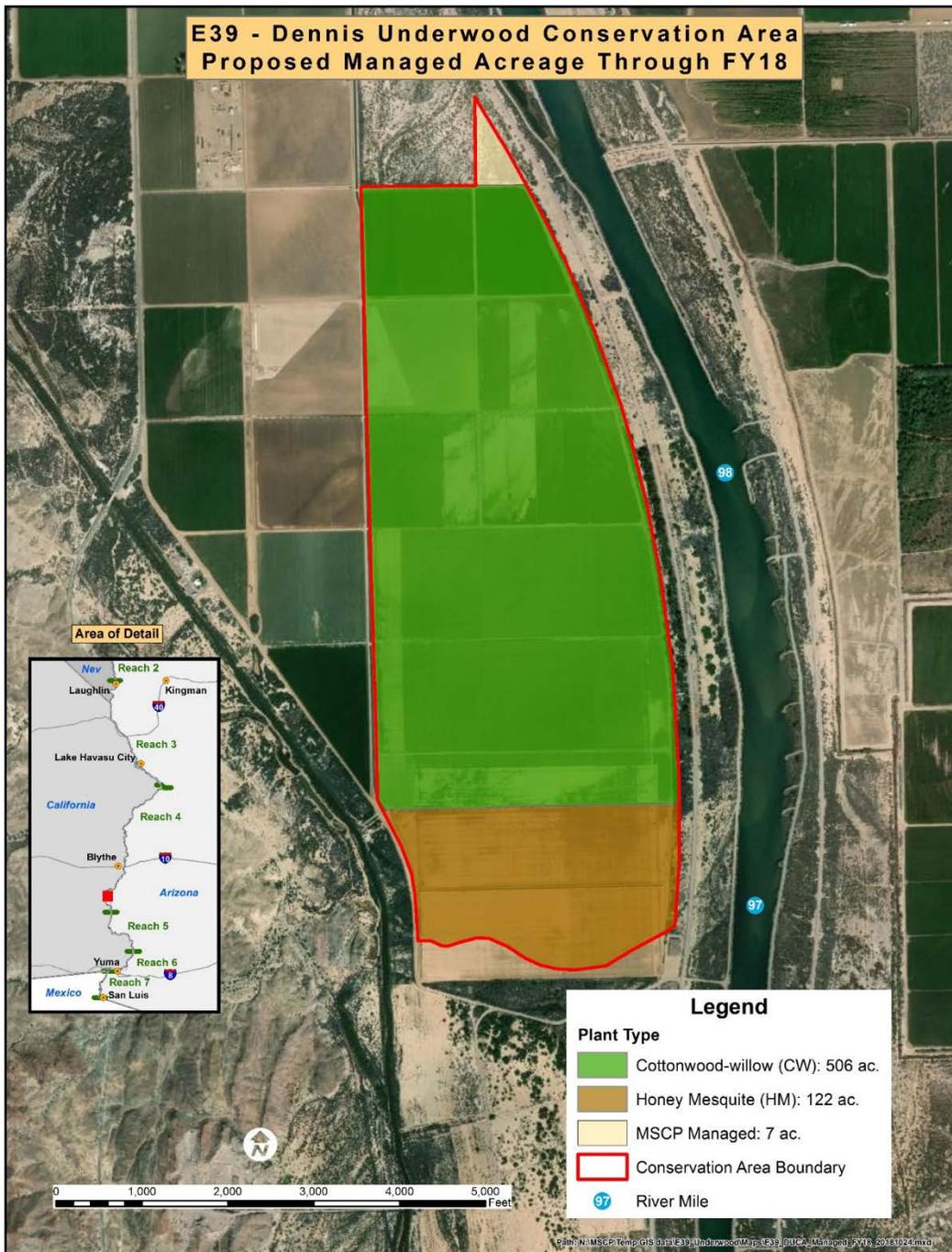


Figure 2.—Proposed habitat types and managed acreage for the Dennis Underwood Conservation Area, FY18.

**Dennis Underwood Conservation Area
Restoration Development and Monitoring Plan**

The project would include the following overall design elements:

- Design and manage habitat to support cottonwood-willow types I–IV
- Create a minimum cottonwood-willow patch size of 50 acres
- Include moist soils
- Design and manage habitat to support honey mesquite type III
- Create patches of at least 50 acres of honey mesquite
- Create honey mesquite habitat type III

2.1 Conceptual Design

The site will be planted as cottonwood-willow and honey mesquite habitat types. The cottonwood-willow habitat will include cottonwood stands of both low- and high-density, patches of Goodding's and coyote willow and grass species, swales, and honey mesquite (see figures 4 and 5). The swales would have a maximum depth of 4 feet and a maximum width of 100 feet. The swale will be created using dry-cutting (dry land excavation) methods. Dry-cutting earthwork includes excavation, grading, and contouring the channels within each field. The swales may provide moist surface soil, slow-moving water, or ponded water conditions to promote insect production during the southwestern willow flycatcher breeding season.

This creation approach is intended to create cottonwood-willow stands that will exceed the habitat value of existing cottonwood-willow stands, by supporting (LCR MSCP 2004):

- Cottonwood-willow trees at a density greater than 10% as classified under the Anderson and Ohmart classification system (1984)
- Increased diversity of plant species
- Increased insect production and abundance
- Creation of structural diversity

The honey mesquite patches adjacent and within the cottonwood-willow will:

- Be a representation of historical riparian vegetation within the LCR flood plain
- Support greater insect diversity and abundance associated with natural habitats (LCR MSCP 2004a)

2.2 Ground Preparation

Ground preparation activities center around clearing the site, surface contouring, and other site improvements necessary to support successful native plant restoration. Draft design calculations indicate that approximately 81,000 cubic yards of material would be excavated to create the proposed swales. The excavated material would be placed between honey mesquite furrows and used for road repair.

2.3 Planting

The planting plan includes the design and plans for hand or mass transplanting of the cottonwood-willow and honey mesquite land cover types. Approximately 167 acres of honey mesquite and about 461 acres of the cottonwood and willow would be planted. The planting design would result in a mosaic of cottonwood-willow, coyote willow (*Salix exigua*), and honey mesquite at this site.

2.3.1 Honey Mesquite

Honey mesquite will be planted in furrows (figure 3). The furrows will be cut into the fields to a depth of 2–3 feet and spaced 15–50 feet apart, with moderate sinuosity (figure 3). Honey mesquite are typically planted at the invert of the furrow. The trees may be planted at a distance of 20–40 feet within the furrow. The number of trees planted is dependent on the density selected and would range between 22–11,906 honey mesquite per acre.

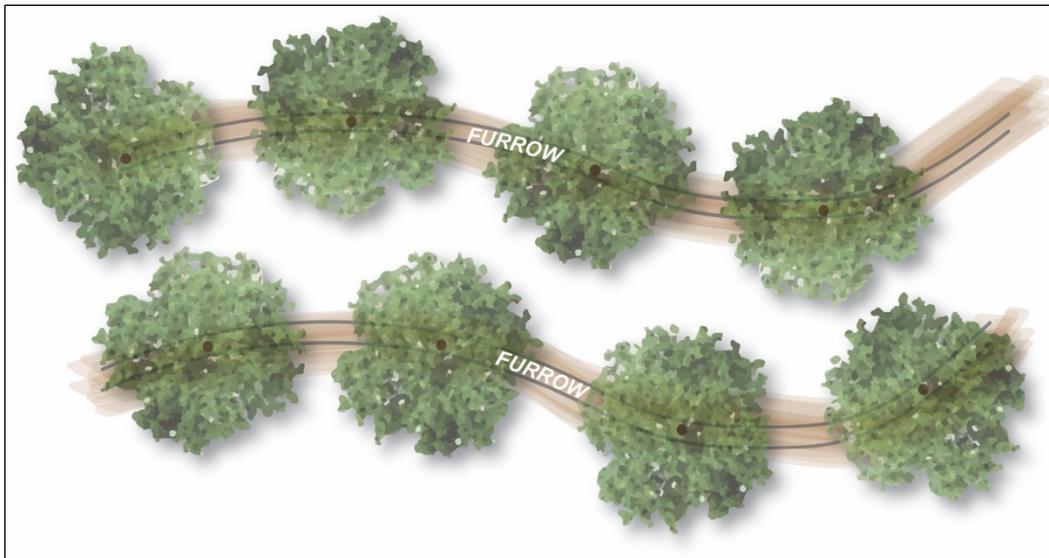


Figure 3.—Example of a furrow planting with honey mesquite.

**Dennis Underwood Conservation Area
Restoration Development and Monitoring Plan**

The honey mesquite will be irrigated for 3 years, with only the furrows receiving irrigation.

2.3.2 Cottonwood-Willow

The cottonwood-willow habitat planting design (figure 4) includes:

- A riparian edge, which will be planted along the edges of the canals and farm roads, and will include:
 - Grasses planted at a high density of about 3,267 plants per acre
 - Mule-fat (*Baccharis salicifolia*) and desert broom (*Baccharis sarothroides*)

Planting at a lower density of about 2,178 plants per acre

- Goodding's and coyote willow planted at a density of about 1,452 plants per acre
- Honey mesquite planted at a density of about 50 plants per acre
- A willow clearing, which will be planted with a mix of:
 - Grasses planted at a high density of about 3,267 plants per acre
 - Mule-fat and desert broom planted at a lower density of about 1,452 plants per acre
 - Goodding's and coyote willow planted at a density of about 2,178 plants per acre
- Low-density cottonwood and coyote willow will be planted with about 109 plants per acre
- High-density cottonwood and Goodding's willow will be planted with about 2,178 plants per acre
- Swales will be planted with:
 - Grasses planted at a high density of about 3,267 plants per acre
 - Mule-fat and desert broom planted at a lower density of about 1,452 plants per acre
 - Coyote willow planted at a density of about 2,178 plants per acre

Dennis Underwood Conservation Area
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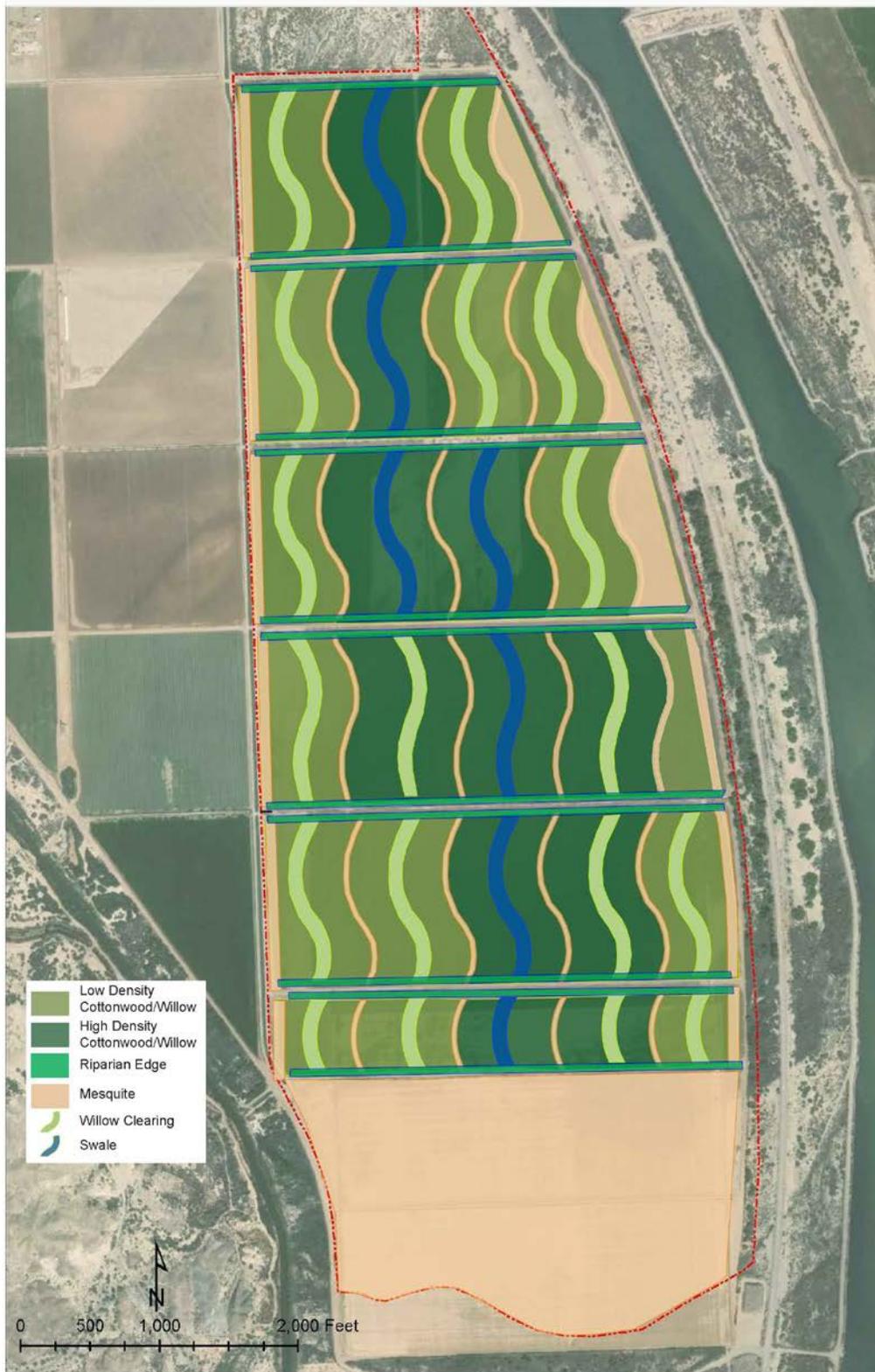


Figure 4.—Conceptual planting plan for the Dennis Underwood Conservation Area.

**Dennis Underwood Conservation Area
Restoration Development and Monitoring Plan**

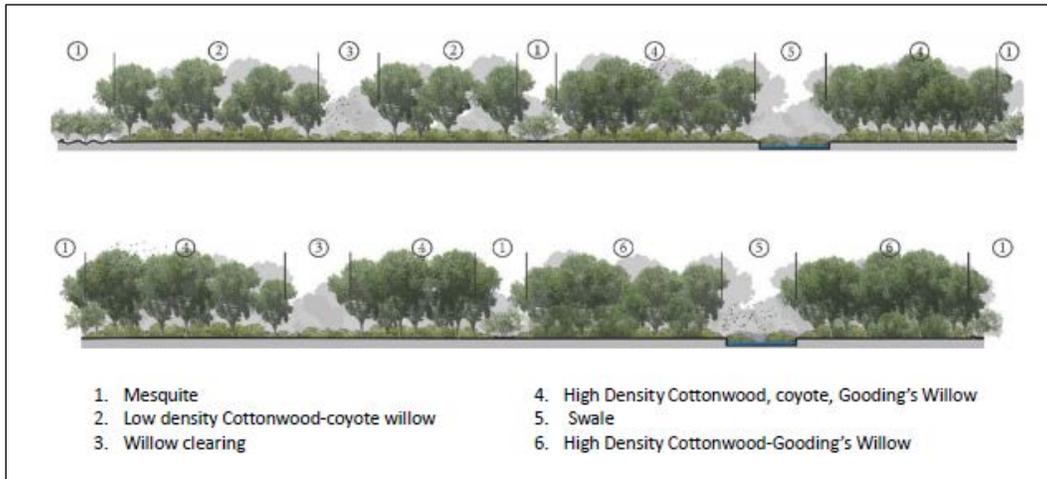


Figure 5.—Cross section example similar to the proposed planting plan.
Drawing is not to scale.

3.0 MANAGEMENT OVERVIEW

3.1 Site Management

Reclamation will be responsible for ensuring long-term operation and maintenance of the Dennis Underwood Conservation Area. Following completion of the conservation area, a conservation area management plan will be developed, which will include habitat objectives for the conservation area, monitoring requirements, fire management, predator/competitor management, vegetation management, infrastructure maintenance, permitted uses, and water management.

3.2 Public Use

The Dennis Underwood Conservation Area is closed to the public and is expected to remain closed after development by the LCR MSCP.

3.3 Law Enforcement

The LCR MSCP is responsible for law enforcement at the Dennis Underwood Conservation Area. Reclamation will provide annual funding to the Bureau of Land Management for law enforcement assistance, responding to public safety issues, and for controlling unauthorized activities at the conservation area.

3.4 Wildfire Management

The LCR MSCP is responsible for wildfire management at the Dennis Underwood Conservation Area. As guided by commitments in the LCR MSCP Habitat Conservation Plan, wildfire management practices on the conservation area will “Reduce the risk of loss of related habitat to wildfire by providing resources to suppress wildfires, e.g., contributing to and integrating with local, State, and Federal agency fire management plans, and implement land management and habitat creation measures to support the reestablishment of native vegetation that is lost to wildfire” (LCR MSCP 2010).

Federal, State, and local fire agencies, either by existing management agreements or mutual aid agreements, provide wildland fire suppression, incident dispatch, fire investigation, fuels reduction, and potential fire restrictions. The full range of suppression strategies are available to managers provided that selected options do not compromise firefighter or public safety, are cost effective, consider the benefits of suppression and the values to be protected, and are consistent with resource objectives.

Reclamation will provide annual funding to the Bureau of Land Management for fire suppression and other support. A site-specific fire management plan will be drafted as described in the LCR MSCP Law and Fire Strategy (LCR MSCP 2010).

3.5 Site Maintenance

Reclamation will be responsible for maintaining all infrastructure, access roads, and habitat created throughout development of the Dennis Underwood Conservation Area.

4.0 MONITORING

4.1 Wildlife and Habitat Monitoring

As stated above, the Dennis Underwood Conservation Area will be managed for southwestern willow flycatchers, Sonoran yellow warblers, vermilion flycatchers, Arizona Bell’s vireos, elf owls, gilded flickers, Gila woodpeckers, yellow-billed cuckoos summer tanager, western red bats, and western yellow bats. The site will be added to conservation area monitoring for these species once habitat develops. Monitoring will be conducted to document presence but may not be required annually.

4.1.1 Pre-Development Monitoring

Pre-development monitoring is designed to establish baseline data for evaluating post-development and to identify whether covered species inhabit the site prior to construction. Pre-development monitoring will not be conducted, as the site consists of agricultural fields that are regularly disturbed by plowing and harvesting of crops, and it does not contain covered species habitat.

Compliance monitoring will be conducted as needed during construction.

4.1.2 Post-Development Monitoring

Post-development monitoring will be implemented to assess the effectiveness of the conservation area and management activities in achieving the goals of the HCP. Post-development monitoring includes conducting presence surveys for targeted species such as marsh birds.

Habitat monitoring was designed to determine whether conservation areas are providing the habitat requirements needed by targeted covered species. Habitat characteristics will be determined primarily through vegetation structure derived from light detection and ranging (lidar) data. Species monitoring will document targeted covered species' use of the created habitat. Monitoring protocols have been developed for documenting species' responses to created land cover types. The following monitoring may occur:

- Cottonwood-willow and honey mesquite will be surveyed annually for neotropical birds during the breeding season (April – June). If covered species are observed, species-specific surveys, nest searches, and mist netting/banding may be conducted.
- Southwestern willow flycatcher surveys will be conducted in areas of suitable habitat (cottonwood-willow) during the breeding season (May – August). Surveys will be conducted according to the standardized protocol (Sogge et al. 2010). If breeding or resident birds are detected, they may be captured and banded. If breeding occurs at the site, nests will be monitored for success.
- Yellow-billed cuckoo surveys will be conducted in areas of suitable habitat (cottonwood-willow) during the breeding season (June – September). Surveys will be conducted according to a standardized protocol that is being developed for Reclamation (Haltermann et al. 2015). If breeding or resident birds are detected, they may be captured and banded. If breeding occurs at the site, nests will be monitored for success.

- Bat monitoring will be conducted for LCR MSCP covered and evaluation bat species from June through August. Acoustic and/or capture surveys may be conducted in suitable habitat.
- Colorado River cotton rat (*Sigmodon arizonae plenus*) monitoring may be conducted for presence if appropriate habitat is found. Trapping will occur at night and will be concentrated in areas where native grasses are present. The number of traps will be determined by how much of the native grass successfully develops in dense enough patches that a Colorado River cotton rat population can be sustained.
- Presence surveys may be conducted for the MacNeill's sootywing skippers if quailbush (*Atriplex lentiformis*) is present within the honey mesquite land cover type.
- When cavities become present in the riparian habitat, species-specific presence surveys for elf owls and gilded flickers may be conducted.

5.0 ADAPTIVE MANAGEMENT

Adaptive management relies on obtaining 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). Adaptive management ensures conservation areas are biologically effective and fulfill the conservation measures outlined in the HCP. Post-development monitoring and species research results will be used to adaptively manage conservation areas after initial implementation. If it is determined through monitoring that additional information is needed to better define covered species habitat requirements, these data will be collected using the procedures outlined in the LCR MSCP Science Strategy (LCR MSCP 2007). Alterations or changes to conservation areas can be accomplished through management activities; these activities will be initiated through the adaptive management process. Conservation areas will be manipulated and/or maintained for covered species using the best available science throughout the 50-year term of the LCR MSCP.

5.1 Monitoring Analysis and Evaluation

Monitoring data (primarily vegetation structure derived from lidar data) will be assessed to determine whether a site meets species-specific habitat requirements, which are the limiting factors for habitat to be considered covered species habitat in accordance with the current knowledge. In order to more effectively and efficiently manage conservation areas, sites will be designed to

ensure that they more than adequately fulfill these habitat requirements and will then be monitored over time to see whether habitat quality decreases as the sites change.

5.2 Recommendations

If it is determined that a site does not meet the species-specific habitat requirements, recommendations for site modifications may be made by the following means:

- Comparison of monitoring results with species-specific habitat requirements to identify the habitat characteristics not being met that can be remedied by site manipulations (plant removal, additional plantings, site contouring, etc.) or changes to the watering regime
- Comparison of results with previous successful and unsuccessful conservation areas to look for differences in site characteristics (elevation, distance to river, climate, etc.), baseline conditions, planting design, plant and animal species composition, watering regimes, and abiotic conditions that may help explain why the site has not fulfilled the species-specific habitat requirements
- Review of other studies that may provide insight into additional covered species habitat requirements or different restoration techniques to achieve the desired conditions

These recommendations of how to move toward fulfilling species-specific habitat requirements will be included in the annual report (as further described in the next section). They will also be used to improve future project designs where appropriate.

6.0 REPORTS

6.1 Annual Report

An annual report summarizing the following will be prepared by Reclamation and made available each calendar year:

- A general description of the status of the project and the effects on covered species
- A description of all restoration activities and monitoring actions conducted over the past year

- A summary of monitoring and research activities conducted over the past year
- Results and analyses of monitoring and research data
- An assessment of the effectiveness of each mitigation measure in minimizing and compensating for project impacts
- The total number of acres planted
- The total number of acres that meet or exceed the performance standards
- Any other applicable information

6.2 Final Report

A final report will be prepared by Reclamation and submitted no later than 180 days after the completion of all mitigation measures. The final report is anticipated in 2055 and will include the following:

- All available information regarding project-related incidental take of covered species
- Information regarding other project impacts on covered species in California Endangered Species Act Incidental Take Permit No. 2081-2005-008-06
- An assessment of the effectiveness of the permit's conditions of approval for minimizing and compensating for project impacts
- Recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the covered species
- Any other pertinent information

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