Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Yuma East Wetlands

2013 Annual Report

March 2018

Work conducted under LCR MSCP Work Task E28

Lower Colorado River Multi-Species Conservation Program Steering Committee Members

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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 Game and Fish Department
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The Nature Conservancy

Lower Colorado River Multi-Species Conservation Program

Yuma East Wetlands

2013 Annual Report

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March 2018

Miller, D., C. Dodge, and S. Kokos. 2018. Yuma East Wetlands, 2013 Annual Report. Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, Nevada.

ACRONYMS AND ABBREVIATIONS

DPOC4	Drainage Pump Outlet Channel #4
FY	fiscal year
Heritage	Yuma Crossing National Heritage Area
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
ph	potential of hydrogen
Quechan Tribe	Quechan Tribe of the Fort Yuma Indian Reservation
Reclamation	Bureau of Reclamation
YEW	Yuma East Wetlands

Symbols

#	number
%	percent

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1.0 INTRODUCTION

The purpose of this annual report is to summarize all activities that have occurred at Yuma East Wetlands (YEW) from October 1, 2012, through September 30, 2013, Federal fiscal year (FY) 2013, and projected activities for FY14. Water usage is presented for the calendar year, January through December 31, 2013, consistent with reporting for water accounting.

1.1 Background

In 2000, the city of Yuma and the Quechan Tribe of the Fort Yuma Indian Reservation (Quechan Tribe) collaborated to analyze the potential of restoring YEW, which was a historic wetland in the Yuma community. During project planning, the site contained vast amounts non-native plant species, makeshift camps, and illegal dumping.

Federal permits were issued to the Yuma Crossing National Heritage Area (Heritage), which is the lead implementing agency for YEW. The first habitat establishment consisted of small demonstration projects planted with Fremont cottonwoods (*Populus fremontii)* and Goodding's willows (*Salix gooddingii)* along the Colorado River bank line. These initial projects proved successful, and both the city of Yuma and the Quechan Tribe approved the use of their land and water for project purposes.

Since 2000, the Bureau of Reclamation (Reclamation) has participated in the development of YEW outside the Lower Colorado River Multi-Species Program (LCR MSCP). Past activities not funded by the LCR MSCP included attendance at workshops and planning meetings, use of heavy equipment, an irrigation system review, and a refined water accounting tabulation.

Habitat restoration activities began at the site in 2004 and were supported by multiple sources, including grants from the Arizona Water Protection Fund and Reclamation. Invasive saltcedar (*Tamarix* spp.) stands were cleared, backwater channels and shallow marshes were excavated, and native riparian and marsh vegetation were planted. In 2013, the LCR MSCP entered into a partnership with the Quechan Tribe, the city of Yuma, the Arizona Game and Fish Commission, and the Heritage to support the long-term management of YEW. The LCR MSCP will contribute toward maintaining existing habitat and support adaptive management actions that will benefit threatened and endangered wildlife species. To date, 380 acres have been established, creating a mosaic of marsh, screwbean mesquite (*Prosopis pubescens*), honey mesquite (*Prosopis glandulosa*), and cottonwood-willow habitat.

2.0 CONSERVATION AREA INFORMATION

2.1 Purpose

The cottonwood-willow land cover created at YEW will be managed for southwestern willow flycatchers (*Empidonax traillii extimus*), yellow-billed cuckoos (*Coccyzus americanus occidentalis*), and other terrestrial wildlife species covered by the LCR MSCP. Marsh land cover types created will be managed for California black rails (*Laterallus jamaicensis coturniculus*), western least bitterns (*Ixobrychus exilis hesperis*), and Yuma clapper rails (*Rallus longirostris yumanensis* [also known as Yuma Ridgway's rail = *R. obsoletus yumanensis*]). Riparian areas with a grassy understory would be managed for Yuma hispid cotton rats (*Sigmodon hispidus eremicus*). A map of YEW-managed acreage is shown on figure 1.

2.2 Location

YEW is located in Arizona in Reach 6 between River Miles 31 and 32. A location map of the conservation area is shown on figure 2.

2.3 Landownership

The land is owned by the Quechan Tribe, the city of Yuma, and the Arizona Game and Fish Commission. A map of the approximate landownership boundaries for the conservation area is shown on figure 3.

2.4 Water

YEW receives water from two water entitlements. The city of Yuma will be charged for the diversions and uses on YEW lands administered or owned by the city of Yuma. The Arizona entitlement of the Quechan Tribe will be charged for consumptive use of water on lands administered or owned by the Quechan Tribe.

2.5 Agreements

A Land Use Agreement was signed and executed in 2013 between the Quechan Tribe, the Arizona Game and Fish Commission, the city of Yuma, the Heritage, and Reclamation to secure land and water for YEW 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. Reclamation will

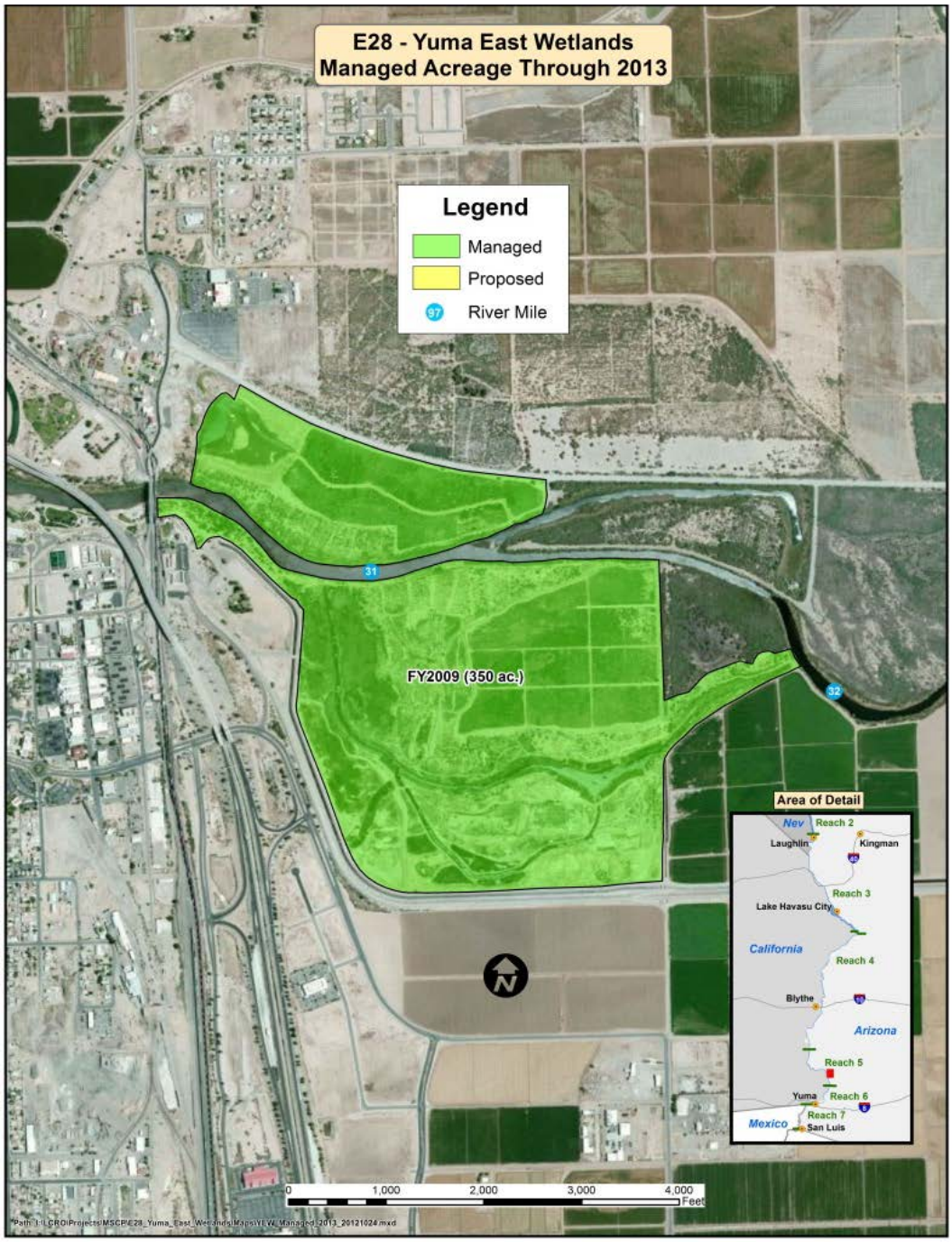

Figure 1.—YEW-managed acreage through 2013.

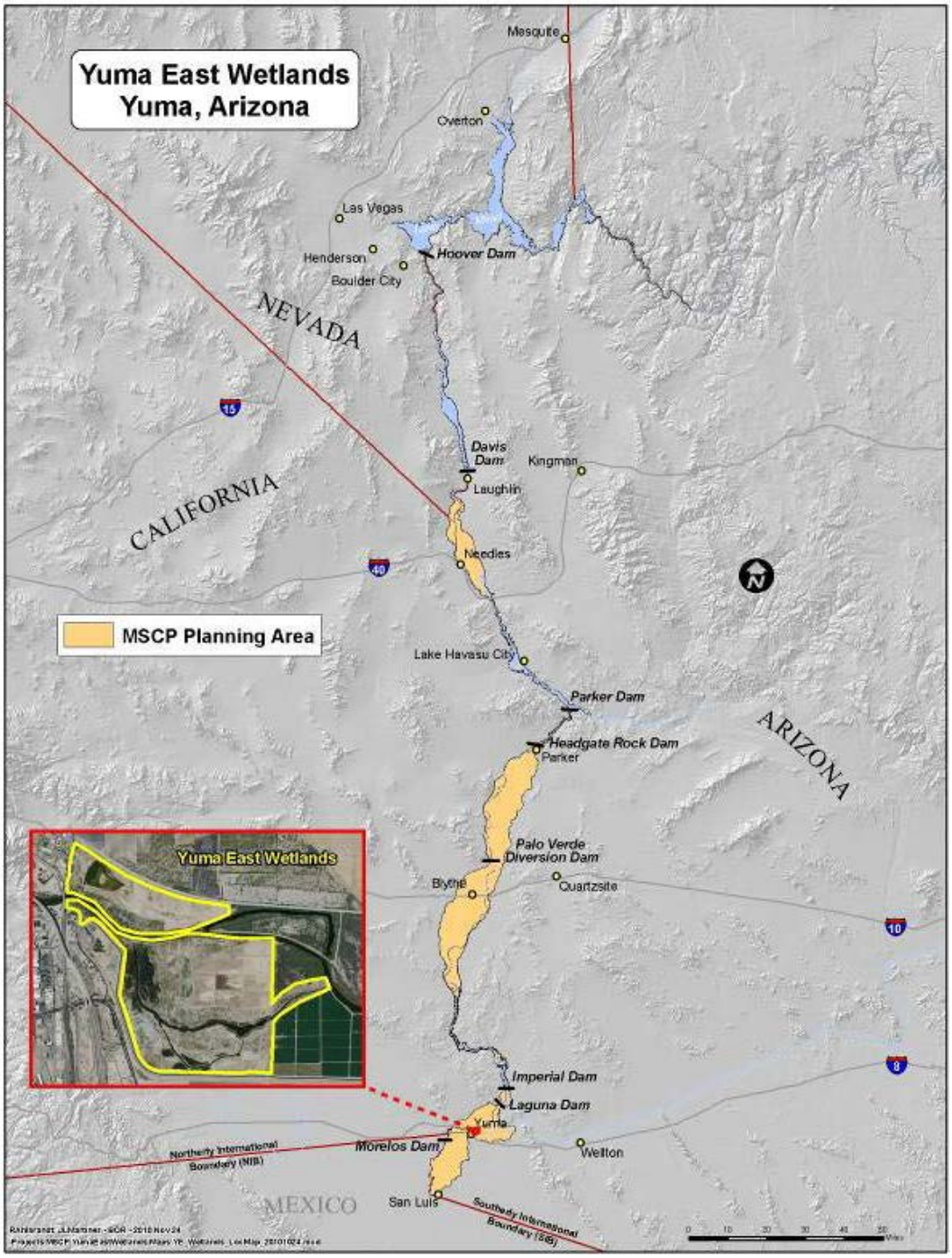

Figure 2.—LCR MSCP planning area, with YEW in the inset.

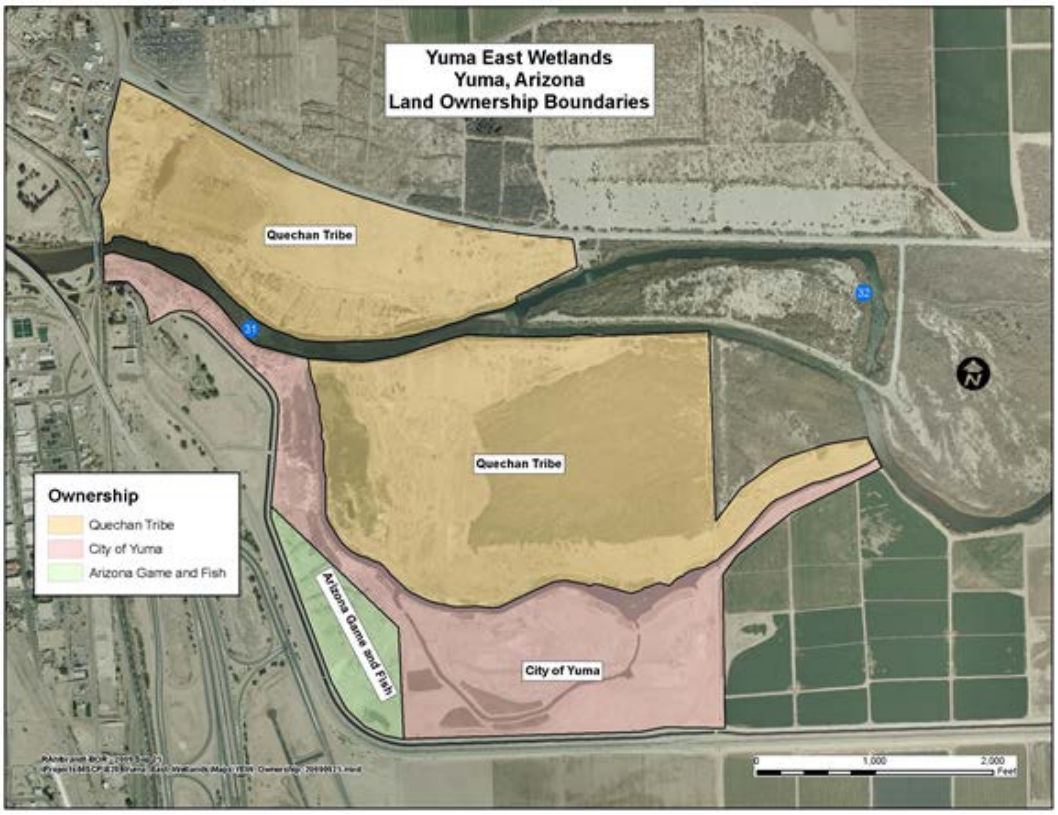

Figure 3.—YEW landownership boundaries.

provide 70% of the funds required to manage and maintain YEW, while the Heritage, the city of Yuma, and the Quechan Tribe will provide 30% through cost-shared funding and in-kind maintenance services.

A funding agreement was signed in 2013 between Reclamation and the Heritage to provide the Federal share of funding for operations and habitat maintenance of YEW.

An annual work plan and budget for YEW operations and maintenance for FY14 was developed and approved by all stakeholders.

2.6 Public Use

Public use of YEW is regulated and determined by YEW stakeholders included in the Land Use Agreement (see “Section 2.5, Agreements”). Public use is limited to passive recreation activities such as hiking on the conservation area and park trails, swimming in the Colorado River, fishing, and boating.

2.7 Law Enforcement

Law enforcement activities at YEW are performed by the City of Yuma Police Department, the Yuma County Sheriff's Office, Quechan Tribal police, the Quechan Tribal Game Warden, Bureau of Land Management law enforcement rangers, and the Arizona Game and Fish Department.

2.8 Wildfire Management

YEW is located within several Federal, State, Tribal, and city fire jurisdictions. The agencies involved with fire management include the City of Yuma Fire Department, Bureau of Land Management Office of Wildland Fire, and the Bureau of Indian Affairs Office of Wildland Fire. Tribal, Federal, and State agencies in Arizona have entered into a Wildland Fire Management Joint Powers Master Agreement whereby they agreed to work cooperatively to improve efficiency by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds among the agencies for management of wildland fires. The State of Arizona has agreements in place with the Federal agencies. These agreements are located on the National Interagency Fire Center Web site: https://www.nifc.gov/.

3.0 HABITAT DEVELOPMENT AND MANAGEMENT

Habitat development and major planting of YEW has been completed, and the primary focus of work will be on habitat monitoring, habitat maintenance, infrastructure maintenance/upgrades, operations and maintenance efficiency, and long-term sustainability. The management activities in FY13 consisted of administering the Federal agreement, developing the FY14 annual work plan and budget, implementing the LCR MSCP vegetation and wildlife monitoring protocols for the habitat, developing standard operating procedures for the irrigation system, updating the 2013 Safety Plan update, submitting water accounting data to Reclamation, and attending coordination meetings with stakeholders.

3.1 Planting

In FY13, small areas were planted where native vegetation did not become established during initial restoration efforts. Established land cover types are shown on figure 4.

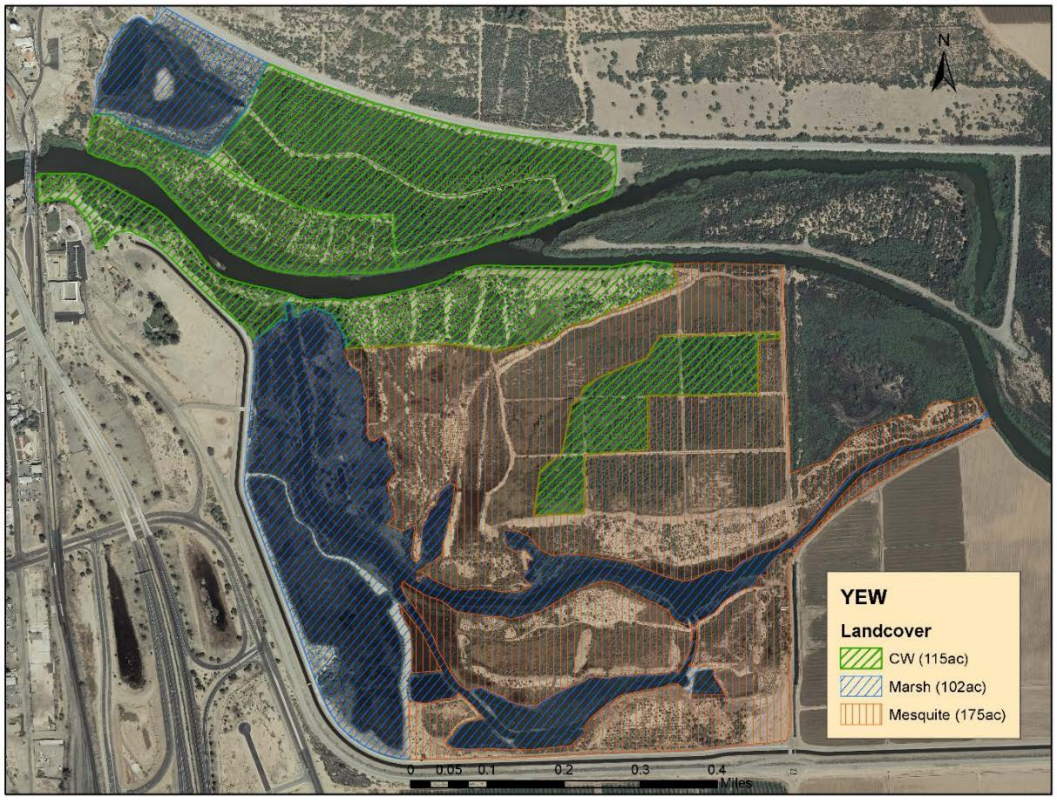

Figure 4.—YEW, LCR MSCP land cover types.

3.2 Fertilizing

A water-run fertilizer was applied via a drip tube into the concrete-lined canal three times annually. Applications occurred once each during spring, summer, and fall using 24-0-0-3 urea nitrate and sulfur.

Sulfuric acid was injected into the drip irrigation system to help reduce hard water buildup in components and to promote plant health. Although other acids, such as citric or vinegar can be used, sulfuric acid is commonly used because it is inexpensive and highly available. An acid tank for storing the sulfuric acid was installed inline with the drip irrigation system and placed at a higher elevation than the drip supply line. A gravity drip tube from the acid tank injected the sulfuric acid into the drip supply line. Besides reducing buildup and reducing maintenance of components, sulfuric acid was also used to help infiltration characteristics of the soil – the acid helps release micronutrients into the soil and reduces the pH.

3.3 Irrigation

Several irrigation sources and methods were utilized on the conservation area. Figure 5 depicts the various irrigation sources and management zones for the site.

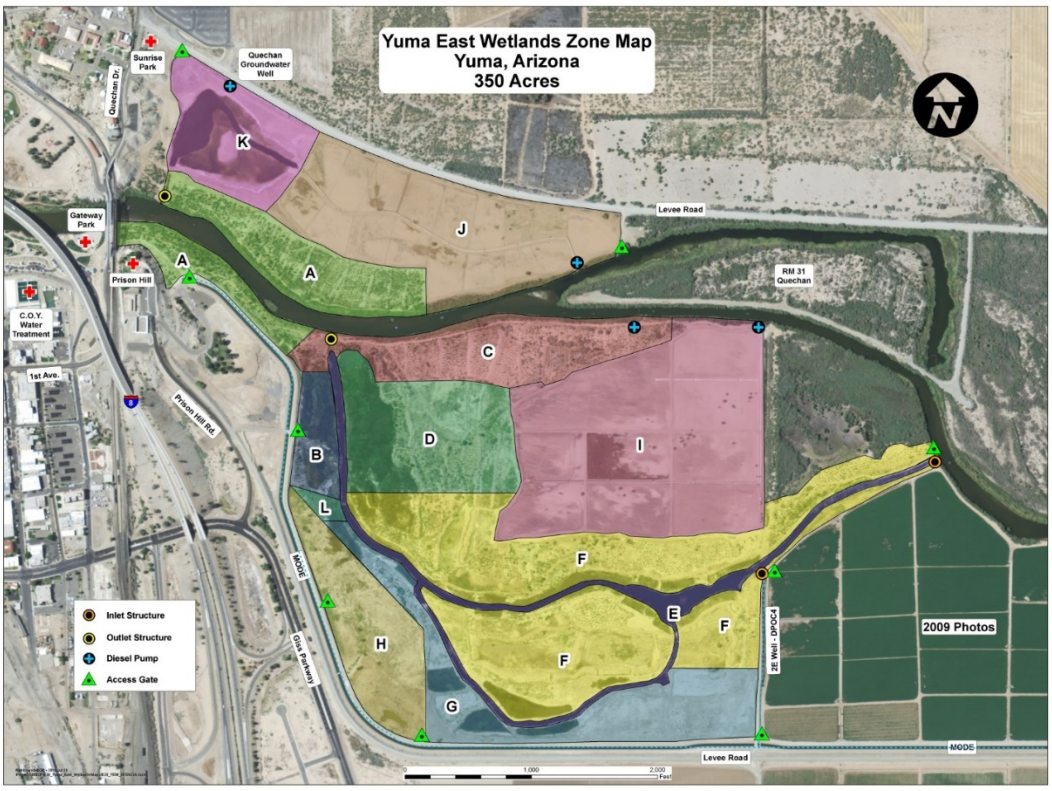

Figure 5.—YEW irrigation sources and zone map.

3.3.1 Flood Irrigation Pumps

The first source of water was flood irrigation from diesel-driven pumps servicing the laser level fields. Fresh Colorado River water was pumped into the concrete-lined canal. Once the canal was full, an irrigator opened and closed the gates as the irrigation plan dictates. A canal gate was opened until the water reached the opposite end of the field. Once water reached the other side, the irrigator closed the gate and opened the following gate. Flood irrigation of the two largest riparian areas was conducted biweekly in spring, weekly in summer, biweekly in fall, and monthly in winter. A pump log recorded the total hours the pump operated and was also used to schedule preventative maintenance. The pumps deliver water to Zones I and J as shown on figure 5.

3.3.2 City of Yuma Decant Line

The second irrigation source is four outlets from the decant line that have been installed within the South Channel. The decant lines discharge approximately

1 acre-foot per day of backflow water from the City of Yuma Water Treatment Plant. These flows assist in maintaining the water surface elevation of the South Channel marsh. The decant line delivers water to portions of Zones A, B, E, and H as shown on figure 5.

3.3.3 Drainage Pump Outlet Channel #4

The third irrigation source is from Drainage Pump Outlet Channel #4 (DPOC4), which delivers groundwater from the Yuma Valley to support agricultural production and to meet International Treaty requirements for salinity levels of the Colorado River into Zone E. DPOC4 output varies considerably depending on groundwater conditions and Reclamation operations. When operating, DPOC4 production discharges into the 2E drain, which terminates in the South Channel marsh via a lined canal.

Water flowing through DPOC4 may pass through the site but must route back to the Colorado River. Outflows from DPOC4 may not be stored within the marsh or used to change the marsh surface water elevation. DPOC4 is operated solely to meet treaty and agricultural requirements; its operation cannot be depended upon, requested, or modified to meet site requirements.

3.3.4 Quechan Tribe Dewatering Wells

The fourth source of irrigation is two dewatering wells located on Quechan lands north of YEW, which discharge flows into the North Channel marsh. These flows are utilized as the primary water resource for Zone K. Operation of the wells is at the discretion of the Quechan Tribe.

3.3.5 Drip Irrigation

The fifth source of irrigation is drip irrigation using diesel pumps. The pumps deliver water to small emitters or a small-diameter line that is placed at the base of the plants. Many of the dry, upland areas and slopes were irrigated using drip irrigation. Plants utilizing drip irrigation were watered once a week during spring, summer, and fall. Irrigation in winter was reduced to once a month or once every 3 weeks. A pump log recorded the total hours the pump was operated and was also used to schedule preventative maintenance. The drip system delivered water to portions of Zones A, C, D, F, G, and L as shown on figure 5.

3.4 Site Management

Maintenance activities can be separated into two categories: (1) infrastructure maintenance and (2) habitat maintenance. Infrastructure maintenance is conducted primarily by Reclamation's in-house staff and includes access road

maintenance, pump maintenance/repair, fuel delivery, and related activities. Habitat maintenance is conducted by the Heritage and includes weeding of invasive species, replanting native species, maintaining the irrigation outfall structures, maintenance and repair of the drip irrigation systems, coordinating activities with Reclamation/LCR MSCP, application of herbicide when required, fertilizer ordering and application, vehicle maintenance, safety meetings, and ensuring the site meets Arizona occupational safety and health work standards.

Damage to the North Channel pump due to entrainment of sediment has occurred over the last couple of years. The pump placement will be redesigned to address this issue.

4.0 MONITORING

4.1 Avian Monitoring

Avian monitoring in 2013 included surveys for southwestern willow flycatchers, yellow-billed cuckoos, marsh birds, and riparian breeding birds.

4.1.1 Southwestern Willow Flycatcher Surveys

The riparian habitat was surveyed five times for southwestern willow flycatchers from May 1 through August 31, 2013. Ten survey points monitored in previous years were dropped, as they were not located in potential southwestern willow flycatcher nesting habitat, and five new points were added to areas that were restored to potential southwestern willow flycatcher nesting habitat. All of the birds detected after June 15 were considered to be southwestern willow flycatchers. Birds detected before June 15 were considered migrant willow flycatchers (*E. trailli*).

No breeding southwestern willow flycatchers were detected. Ten migrant willow flycatchers were detected within the first and second survey periods (May 17 and June 4, 2013). Eight of the migrant willow flycatchers were detected within the first survey period (May 17, 2013) in the restored riparian habitats. Two migrant willow flycatchers were detected along the river transect during the second survey period (June 4, 2013) (table 1). Cowbirds (*Molothrus* sp.) were also detected during each survey (McLeod and Pellegrini 2014).

Table 1.—Number of migrant willow flycatchers detected during five surveys of two transects in the YEW area between May and July 2013

Survey site	Transect date				
	May 17 and 20	June 3–4	June 18–19	July 2–3	July 11–12
River transect	0	2	0	0	0
Restored riparian 1	8	0	0	0	0
Total migrant willow flycatchers detected	**8**	**2**	**0**	**0**	**0**

4.1.2 Yellow-billed Cuckoo Surveys

Five surveys for yellow-billed cuckoos were conducted in restored riparian habitat from June through August, 2013. Two yellow-billed cuckoos were detected on June 24, one on July 6, and three on July 17. No yellow-billed cuckoos were detected during the July 30 or August 9 surveys. Six yellow-billed cuckoos and one possible breeding territory (table 2) were detected (McNeil and Tracy 2013).

Table 2.—Yellow-billed cuckoo territories at YEW

Site name	Estimated territories		
	POS[1]	PRB[2]	COB[3]
Yuma East Wetlands	1	0	0

[1] Possible breeding territory (POS) = Two or more total detections in an area during two survey periods and at least 10 days apart.
[2] Probable breeding territory (PRB) = POS territory plus yellow-billed cuckoos observed carrying food, traveling as a pair, or exchanging vocalizations.
[3] Confirmed breeding territory (COB) = Observation of copulation, stick carry, nest, or fledgling.

4.1.3 Marsh Bird Surveys

Presence/absence surveys for marsh bird species were conducted by the Heritage between March 15 to May 31, 2013 (Fred Phillips Consulting, LLC 2014). Call-playback surveys for the California black rail, western least bittern, Virginia rail (*Rallus limicola*), and Yuma clapper rail were performed using a standardized protocol from the National Marsh Bird Monitoring Program (Conway 2008). Twenty-three wetland study sites in the conservation area and adjacent river channel were monitored (figure 6). Due to a miscommunication regarding the location of monitoring sites, five of the sites were not surveyed during the March or May survey periods. Four of the five sites that were missed during these periods were non-restored marsh sites, and one was located in a restored site.

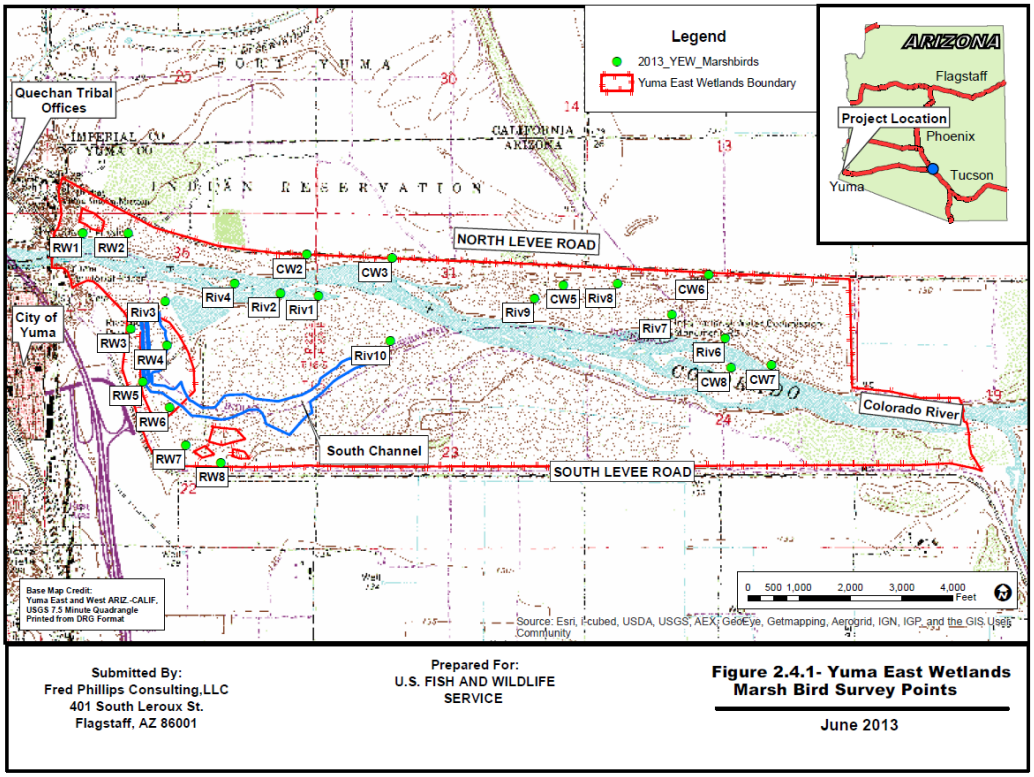

Figure 6.—Marsh bird survey points.

One Yuma clapper rail was detected during the March survey, two were detected during the April survey, and three individuals were detected during the May survey. All the Yuma clapper rails detected during the survey period were using the restored marsh habitats, which were primarily dominated by California bulrush (*Schoenoplectus californicus*). There were a total of six detections of western least bitterns (table 3).

Table 3.—Number and species of marsh birds detected during the marsh bird surveys at YEW

Species	Detections
Western least bittern	6
Pied-billed grebe (*Podilymbus podiceps*)	10
Yuma clapper rail	6
Virginia rail	6
Sora (*Porzana carolina*)	7

4.1.4 General Bird Surveys

Bird surveys were conducted using a double sampling area search method to determine use by breeding LCR MSCP riparian bird species. Surveys were only conducted on portions of the conservation area with more than 2 years' growth. Ten species (53 pairs) of birds were detected breeding within the habitat at YEW. Gila woodpeckers (*Melanerpes uropygialis*), Sonoran yellow warblers (*Dendroica petechia sonorana = Setophaga petechia sonorana*), and migrant willow flycatchers were detected but not confirmed breeding (Great Basin Bird Observatory 2014).

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 YEW and to determine the age, sex, and reproductive status of bats that were captured.

4.2.1.1 Acoustic Surveys

One long-term acoustic bat monitoring station was installed and operated in YEW in 2013. The station consists of a 40-foot pole with anabat acoustic monitoring equipment attached to the pole 25 feet high. This station can record and monitor bat calls throughout the year. Operation of the monitoring station began on September 11, 2013, and a total of 20 days of acoustic monitoring were conducted in FY13. Western yellow bats (*Lasiurus xanthinus*) and western red bats (*Lasiurus blossevillii*) were detected (Broderick 2016).

4.2.1.2 Capture Surveys

Bats were captured with mist nets 1 night a month from May to September in the cottonwood-willow habitat in the AHA section of the site. Western yellow bats and California leaf-nosed bats (*Macrotus californicus*) were captured (table 4) (Calvert 2016).

4.2.2 Rodent Monitoring

Live trapping was conducted during April and November 2013 to determine the presence of Yuma hispid cotton rats. Sixty traps were placed in transects in four locations dominated by alkali sacaton (*Sporobolus airoides*). During April, one Yuma hispid cotton rat was detected in Zone I and one in Zone F, for a total capture rate of 1.7% (table 5). Surveys conducted during November resulted in 13 Yuma hispid cotton rats captured in the 2 sites, for a total capture rate of

Table 4.—Bat captures per month in FY13

Species	May	June	July	August	September	Totals
Big brown bat (*Tadarida brasiliensis*)	19	9	13	3	2	46
California leaf-nosed bat*	0	0	0	0	1	1
California myotis (***Myotis californicus***)	0	0	0	0	1	1
Cave myotis (*Myotis velifer*)	0	0	1	0	0	1
Mexican free-tailed bat (*Tadarida brasiliensis*)	1	0	0	0	0	1
Pallid bat (***Antrozous pallidus***)	1	0	0	0	1	2
Western yellow bat	**1**	**0**	**1**	**0**	**0**	**2**
Yuma myotis (*Myotis yumanensis*)	0	1	0	0	0	1
Totals	**22**	**10**	**15**	**3**	**5**	**55**

Note: Species in bold is a LCR MSCP covered species; * indicates an evaluation species.

Table 5.—Summary of small mammal capture efforts at YEW during the 2013 monitoring season

Site	Date	Species	Captures	Number of traps	Capture %
YEW AHA	4/12/2013	Yuma hispid cotton rat	1	60	1.7%
YEW	4/12/2013	Yuma hispid cotton rat	1	60	1.7%
YEW I-1	11/15/2013	Yuma hispid cotton rat	6	60	10.0%
YEW I-2	11/15/2013	Yuma hispid cotton rat	7	60	11.7%
YEW I-2	11/15/2013	Desert pocket mouse	1	60	1.7%

10.8% (see table 5). Additionally, one desert pocket mouse (*Chaetodipus penicillatus*) was captured in Zone I, with a capture rate of 1.7% (the subspecies could not be determined. It is unknown if this is the *sobrinus* subspecies being evaluated by the LCR MSCP) (Hill and Calvert 2016).

4.3 MacNeill's Sootywing Skipper Monitoring

MacNeill's sootywing skipper (*Pholisora gracielae = Hesperopsis gracielae* [MacNeill]) presence was monitored by the Heritage. Monitoring focused on inspecting quailbush (*Atriplex lentiformis*) for the presence of MacNeill's sootywing skippers without a systematic approach. Searches included walking a transect through quailbush habitat and searching for the skippers for 2 hours (figure 7). Searches were conducted once per month from April to September. No MacNeill's sootywing skippers were detected during the surveys (Fred Phillips Consulting, LLC 2014).

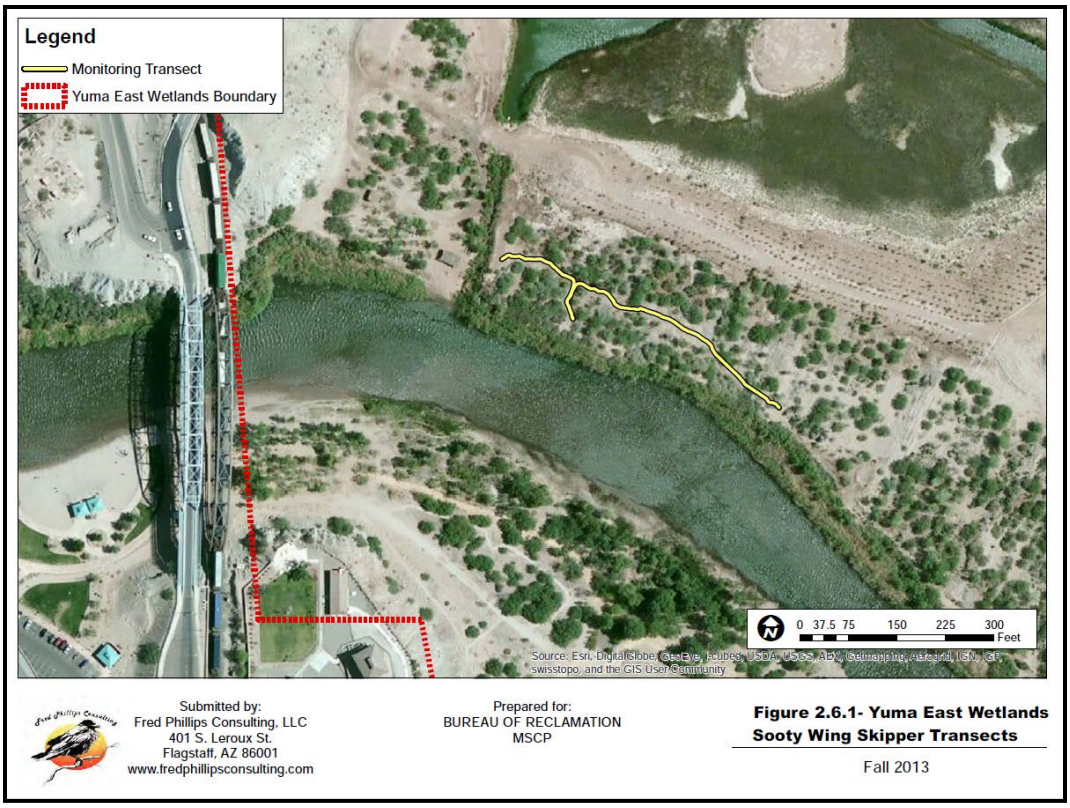

Figure 7.—Survey location for MacNeill's sootywing skipper surveys.

5.0 HABITAT CREATION CONSERVATION MEASURE ACCOMPLISHMENT

5.1 Vegetation Monitoring

Vegetation measurements were collected to evaluate the vegetation structure from the ground to the upper canopy. Parameters included tree and shrub density, tree heights, and canopy closure.

The tree density in cottonwood-willow plots (Fremont cottonwood, Goodding's willow, and coyote willow [*Salix exigua*] [stem density]) ranged from 2–474 trees per acre. The shrub density (willow baccharis [*Baccharis salicifolia*]) and saltcedar) in plots ranged from 4–605 shrubs per acre. Fremont cottonwood, Goodding's willow, screwbean and honey mesquite tree heights ranged in plots from 0–25.77 feet (vegetation height encompasses both trees and shrubs). The average canopy closure measured at each plot ranged from 0–100%.

5.2 Evaluation of Yuma East Wetlands

The process for habitat creation conservation measure accomplishment was finalized in October 2011 (LCR MSCP 2011). Since YEW is new to the LCR MSCP and the Anderson and Ohmart classification has not been completed, YEW will be evaluated in FY14 using the habitat creation conservation measure accomplishment process.

6.0 ADAPTIVE MANAGEMENT RECOMMENDATIONS

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). Under the Adaptive Management Program, conservation areas will be assessed for biological effectiveness and whether they 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 conservation areas after initial implementation.

Currently, there are no adaptive management recommendations for YEW. Recommendations may be made through the adaptive management process for site improvements in the future once monitoring data are collected over a few years and then analyzed.

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