

Work Task E9: Hart Mine Marsh

FY16 Estimate	FY16 Actual Obligations	Cumulative Expenditures Through FY16	FY17 Approved Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate	FY20 Proposed Estimate
\$250,000	\$293,218.97	\$7,177,352.88	\$250,000	\$250,000	\$200,000	\$200,000

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Start Date: FY05

Expected Duration: FY55

Long-Term Goal: Habitat creation

Conservation Measures: BLRA1, CLRA1, CRCR2, and LEB11

Location: Reach 4, Cibola National Wildlife Refuge, River Mile 92, Arizona

Purpose: To create and manage marsh habitat for Yuma clapper rails (*Rallus longirostris yumanensis* [also known as Yuma Ridgway's rail = *R. obsoletus yumanensis*]), western least bitterns (*Ixobrychus exilis hesperis*), California black rails (*Laterallus jamaicensis coturniculus*), and Colorado River cotton rats (*Sigmodon arizonae plenus*)

Connections with Other Work Tasks (Past and Future): Vegetation and species monitoring are being addressed under Work Tasks F1–F4 and F7.

Project Description: Hart Mine Marsh was a decadent marsh located on the Cibola National Wildlife Refuge that was restored and expanded to create functional habitat for covered species. This was accomplished by the installation of control structures to manage water levels, providing sources of higher-quality surface water flows, making physical changes to the site's topography, and by planting and supporting native wetland and marsh vegetation. The approach was to remove a substantial amount of existing saltcedar (*Tamarix ramosissima*) from the site, deepen areas of existing open water, contour areas adjacent to those deeper areas, and manage water at the higher elevations to promote and sustain marsh cover type vegetation and wetland functions. The creation of habitat included both the establishment of native plants and management of water levels to meet management guidelines for integrating emergent vegetation and open water at varying depths into a mosaic of marsh habitats.

Annual Maintenance and Management: The primary source of water for Hart Mine Marsh is drainage water from fields in Farm Unit #1 on the

Cibola National Wildlife Refuge, which is delivered through Arnett Ditch into the marsh. However, Colorado River water can also be pumped and delivered either into Arnett Ditch or directly into the marsh. The increased management flexibility of the two sources of water, along with a series of water control structures, allow for stable water level management as well as the ability to manage salinity. Water deliveries are used to maintain static water levels during marsh bird nesting season and for flushing of the marsh in winter to manage salinity.

Vegetation maintenance at the marsh employs an integrated pest management approach that use both manual (hand pulling) and chemical (herbicide) treatment of invasive species, including saltcedar, phragmites (*Phragmites australis*), and five-hook bassia (*Bassia hyssopifolia*).

The annual costs associated with operating the marsh include operation and maintenance of the water control structures, maintenance of the pumping system and electrical costs, invasive and non-native vegetation control, and road maintenance.

Previous Activities: In FY09, the first phase of construction was completed and resulted in 92 acres of marsh. In FY10, Phase 2 of construction was completed and resulted in the creation of an additional 163 acres of marsh, for a total of 255 acres.

FY16 Accomplishments:

Maintenance/Restoration/Management: The majority of the activities that occurred in FY16 was for management, maintenance, and monitoring of the established marsh.

Minor construction activities in FY16 included upgrades to the water control infrastructure. Frequently used canal gates were retrofitted (new headrails and stems installed) so that they can be exercised (raised and lowered) with a gas-powered or electric actuator. The retrofit and upgrade allowed for more efficient use of labor resources and will also allow the gates to be exercised on a more frequent basis.

Arnett Ditch conveys water from both the Colorado River and the agricultural fields north of Hart Mine Marsh, to the marsh, and eventually drains back into the Colorado River. Cattails (*Typha* spp.) had overgrown the drain, and the entire length of the drain to the west of Hart Mine Marsh was cleared in cooperation with the Cibola National Wildlife Refuge and resulted in the increased obligations.

Pump Stand Replacement: The pump stand is in a shallow section of the river; sediment transport and entrainment modeling was completed to refine the design.

Planning of the design for the pump stand replacement will continue, as work is anticipated to be completed in FY18. Replacement of the pump stand was provided by the U.S. Fish and Wildlife Service.

Monitoring: Monitoring was conducted at Hart Mine Marsh for vegetation, marsh birds, and MacNeill's sootywing skippers (*Pholisora graciellae* = *Hesperopsis graciellae* [MacNeill]).

Vegetation data were collected in FY16 using light detection and ranging (LiDAR) remote sensing techniques.

Marsh bird surveys were conducted on three occasions at the wetland portions of the site. Western least bitterns and Yuma clapper rails were detected and are presumed to be breeding at the site. California black rails were not detected.

Surveys were conducted for MacNeill's sootywing skippers in 2016. Adults and eggs were detected in March.

FY17 Activities:

Maintenance/Restoration/Management: Management and monitoring of Hart Mine Marsh will continue.

Pump Stand Replacement: The preliminary design, including addressing sediment intake at this site, will be completed. Replacement pumps and high-density polyethylene piping have been purchased.

Monitoring: Marsh bird surveys will be conducted March, April, and May. Vegetation data will be collected using LiDAR remote sensing techniques.

Proposed FY18 Activities:

Maintenance/Restoration/Management: Management and monitoring of Hart Mine Marsh will continue. No construction, restoration, or changes to the marsh management area anticipated.

Pump Stand Replacement: The pump stand replacement is scheduled for FY18 using funds provided by U.S. Fish and Wildlife Service.

Monitoring: Marsh bird surveys will be conducted in March, April, and May. Information from LiDAR vegetation data collected during FY14–17 will be used to determine the schedule for vegetation monitoring data collection for FY18 and beyond.

Pertinent Reports: The 2016 *Hart Mine Marsh Conservation Area Annual Report* will be posted on the LCR MSCP Web site once integration of the data collected throughout the calendar year is complete.