Work Task D9: System Monitoring and Research of Covered Bat Species

FY16 Estimate	FY16 Actual Obligations	Cumulative Expenditures Through FY16	FY17 Approved Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate	FY20 Proposed Estimate
$390,000	$379,451.91	$2,140,764.49	$140,000	$140,000	$140,000	$140,000

Contact: Carrie Ronning, (702) 293-8106, cronning@usbr.gov

Start Date: FY04

Expected Duration: FY55

Long-Term Goal: System-wide monitoring and species research will be conducted for LCR MSCP bat species to monitor distribution and evaluate habitat implementation success (FY04–17), and system-wide monitoring and species research will be conducted for LCR MSCP bat species to monitor their distribution (FY18–55).

Conservation Measures: MRM1 (CLNB, PTBB, WRBA, and WYBA), WRBA1, and WYBA1

Location: System-wide along the lower Colorado River (LCR) below Hoover Dam

Purpose: To conduct system-wide monitoring of covered bat species to document their habitat use

Connections with Other Work Tasks (Past and Future): System-wide monitoring data will be used in conjunction with post-development monitoring (F4) to document habitat use of covered bat species.

Project Description: Several survey techniques will be used to detect the presence of covered and evaluation bat species. Acoustic surveys will be used to document their presence in existing riparian habitats. Roost surveys will be conducted to track bat populations and to survey species such as the pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens = Plecotus townsendii pallescens = C. townsendii townsendii*) and California leaf-nosed bat (*Macrotus californicus*), which are not readily detected by acoustic technology. Individual bats will be captured using techniques such as mist netting to obtain reference calls for bat identification and to verify reproductive status.

Previous Activities: An LCR bat monitoring protocol was produced to assist in the development of a system-wide distribution and demography monitoring plan for covered bat species. A system-wide acoustic monitoring program was implemented that coordinated the collection and analyses of acoustic bat data for system-wide monitoring of the LCR. Five permanent acoustic monitoring stations along the river collected data on bat species presence at the monitoring sites (year round through FY14 and from June – August annually starting in FY15). In FY14–15, a foraging distance study was conducted that used radio tracking techniques to estimate how far pale Townsend's big-eared and California leaf-nosed bats and would forage from their roosts to clarify the distances between roosts and conservation areas in Conservation Measures PTBB2 and CLNB2. California leaf-nosed bats were radio tracked from a mine near Palo Verde, California, in February and August to determine how far they would forage from known roosts during winter and summer. Preliminary data suggest that California leaf-nosed bats have the ability to travel up to and possibly more than 10 miles to forage on a given night during the winter season.

FY16 Accomplishments: The five permanent acoustic monitoring stations were operated from June – August to detect bat presence. The FY16 data will be analyzed in FY17.

California leaf-nosed bat roost outflight counts were conducted at nine mines during the winter season. They were recorded at the Homestake Mine in Nevada; Jackpot Mine, Hart Mine, and the Rio Vista Mine in Arizona; and the California Mine, Mountaineer Mine, Stonehouse Mine, 3C Mine, and Senator Mine in California. The Mountaineer Mine also contained pale Townsend's big eared bats. Based on the data collected since 2005, it has been determined that there is sufficient system-wide roost outflight baseline data to inform conservation area analyses; therefore, roost outflight counts will no longer be necessary on an annual basis. This completed the baseline data collection effort.

An inventory of all bats banded at mines and foraging habitat along the LCR from 1958–2016 was compiled. A summary analysis of acoustic data collected along the LCR between 2002 and 2007 was prepared.

The foraging distance study of pale Townsend's big-eared and California leaf-nosed bats along the LCR continued in FY16 to determine how far these species are capable of traveling between roosts and foraging areas. The results from a limited sample of radio-tracked bats in straight-line distances showed California leaf-nosed male bats flew at least 10.3 miles between roost and foraging areas (the margins of agricultural fields), and females were recorded flying a minimum of 8.7 miles. Bats captured at the Cibola Valley Conservation Area and the Cibola National Wildlife Refuge Unit #1 Conservation Area were tracked 7 and 9 miles back to the Hart Mine for roosting, and bats exiting Hart Mine followed washes relatively directly to the Cibola National Wildlife Refuge Unit #1 Conservation

Area and the Cibola Valley Conservation Area. Two bats captured at the Palo Verde Ecological Reserve were tracked approximately 7.6 miles to an area of multiple mine openings near the Goodman Wash in the Dome Rock Mountains. Although these distances are reported as straight lines, bats flew much further on indirect paths between roosting and foraging areas: one bat flew a minimum travel distance of 50 miles during the 4.5 hours it was tracked. From these preliminary results, it is clear that California leaf-nosed bats are capable of flying more than 5 miles between roost sites and foraging habitat provided by conservation areas, although they do not always utilize the conservation areas for foraging, instead choosing to forage along washes and agricultural areas.

Capture surveys were conducted at the ʻAhakhav Tribal Preserve once a month from June – August. A total of 199 bats of 10 species were captured, including one western yellow bat (*Lasiurus xanthinus*) and nine California leaf-nosed bats.

FY17 Activities: The five permanent acoustic monitoring stations will continue to operate. Data will be collected and analyzed for covered and evaluation species presence during the summer peak activity periods. Station data from the five non-LCR MSCP managed sites will be analyzed together with the LCR MSCP conservation area stations (F4) as a single acoustic monitoring network to document trends in LCR MSCP species activity levels across the program area. The FY15–16 data analysis will be completed. Archived acoustic data will be organized, analyzed, and compiled so that it may be entered into a single database.

The foraging distance study of California leaf-nosed and pale Townsend's big-eared bats will be completed. The roost outflight count, 1958–2016 banding inventory, and 2002–07 acoustic analysis reports will be finalized.

Standardization and consolidation of data and development of mobile electronic field forms for bat monitoring activities will continue. System-wide monitoring objectives will be defined and a monitoring plan developed for FY18–28. Costs in FY17 are expected to decrease for this work task, as efforts will be shifted to monitoring additional conservation area acreage under post-development monitoring (F4).

Proposed FY18 Activities: The five permanent acoustic monitoring stations will continue to operate, and data will be analyzed for covered and evaluation species presence during the summer peak activity periods. Data will also be analyzed using the conservation area stations. Bat captures may be conducted to validate the presence of covered and evaluation species.

Pertinent Reports: The report titled *2015 System-Wide Acoustic Monitoring of LCR MSCP Bat Species* is been posted on the LCR MSCP Web site. Other bat monitoring reports will also be posted upon completion.