

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

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$100,000	\$101,177.29	\$345,896.29	\$130,000	\$150,000	\$150,000	\$150,000

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**Start Date:** FY04

**Expected Duration:** FY55

**Long-term Goal:** System monitoring and species research will be conducted for LCR MSCP bat species to determine distribution and to evaluate habitat implementation success.

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

**Location:** System-wide along the Lower Colorado River below Hoover Dam.

**Purpose:** Conduct system monitoring and research for the distribution of covered bat species utilizing roost surveys, acoustic survey techniques, and capture techniques following a protocol developed in FY06.

**Connections with Other Work Tasks (past and future):** System monitoring data will be used in conjunction with post-development monitoring (F4) to determine habitat needs and characteristics of covered bat species. Data collected will be used in future habitat creation projects listed in Section E.

**Project Description:** Several survey techniques will be utilized to detect covered species or provide equivalent data using indicator species. Acoustic surveys, conducted with Anabat or Sonabat technology, will be used to identify foraging behavior in native riparian stands for covered bat species. Roost surveys will be conducted to track bat populations and to survey species that are not readily detected by acoustic technology, such as Townsend's big-eared bat and California leaf-nosed bat. Individual bats will be captured using techniques such as mist netting to obtain reference calls for bat identification.

**Previous Activities:** Indigenous bat species were surveyed annually along the LCR from 2001 to 2006. A Lower Colorado River Bat Monitoring Protocol was produced to assist in the development of a system-wide distribution and demography monitoring plan for covered bat species.

**FY08 Accomplishments:** The AGFD is coordinating the collection and analysis of acoustic bat data for system-wide monitoring of the LCR.

Since March of 2008, AGFD has conducted a system-wide acoustic bat survey. AZGF has been deploying acoustical bat detectors at 72 sampling locations throughout the LCR, each of which is active for 2-night periods during each of four seasons. Placement of these detectors was stratified in 3 reaches of the LCR across four vegetation types likely to be affected by restoration activities. To date, we have detected all four LCR MSCP species and additionally the hoary bat (*Lasiurus cinereus*) in each of the three reaches. Detection rates for California leaf-nosed and western red bat were high in all habitat types, slightly lower for western yellow bat and hoary bat, and lowest for Townsend's big-eared bat. Four permanent acoustic detector stations were placed along the river and are providing data that will be useful for analyzing migration movements along the river as well as correlating bat activity with environmental variables. Data collected thus far from permanent stations suggests that bat activity was low during the winter but increased dramatically in early February, remaining high through March. During this time period, call minutes were highly correlated to nightly mean temperatures. Activity declined during April and remained steady in May. Throughout all months sampled, there was a negative correlation between call minutes and humidity and no relationship with moon phase or mean wind speed.

Out-flight counts were conducted in May 2008 on several mines including Stonehouse, Mountaineer, Californian, Islander, Pilot Rock, Jackpot, Gold Dome, Eureka, Golden Dream, 3C, and Heart mines. At the Mountaineer Mine fewer bats emerged, and there is evidence of recent human entry.

**FY09 Activities:** Acoustic surveys will continue for covered bat species along the LCR. Seventy-two non-permanent sites will be sampled to provide information on distribution and habitat use. Sampling areas will be selected to cover the broadest geographical area. Within these areas, sampling sites will be selected on a stratified basis to cover all major available habitats (cottonwood-willow, saltcedar, mesquite, and marsh). Four permanent Anabat monitoring stations will continue to operate to give year-round data.

In addition to acoustic surveys, habitat characteristics will be measured at each site, including vegetation composition and structure, and correlated with bat use. To assure comparability of data between sites and through time, coordination with cooperators will take place to develop standardized protocols for data collection. A centralized database where acoustic bat files can be stored and accessed is being developed. This database is intended to allow access by the external cooperators for input, storage, and analysis and is a logical place to centralize the acoustic data gathered under the LCR MSCP. These data will be linked to the LCR MSCP database.

Outflight counts will be conducted at various mines and bridges along the LCR in the spring and fall. These counts will be used to determine trends in California leaf-nosed bat and Townsends big-eared bat populations.

**Proposed FY10 Activities:** Acoustic surveys will continue for covered bat species as listed above. Mist netting, in conjunction with post-development monitoring (F4), will take place at least twice at both mature cottonwood-willow stands and in more mature restoration areas. Bat

populations will continue to be monitored at maternity sites and mines to determine abundance and distribution of covered and evaluation bat species.

**Pertinent Reports:** *Monitoring of Covered and evaluation bat species for the Lower Colorado River Multi-Species Conservation Program, Annual Report, 2008* will be posted to the Web site. A final mine survey summary report for years 2004-2008 will be prepared in April, 2009 and posted to the Web site.