Work Task C43: Population Demographics and Habitat Use of California Leaf-Nosed Bat, a Genetic Evaluation

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
$40,000	$15,413.97	$12,958.68	$60,000	$50,000	$0	$0

Contact: Allen Calvert, (702) 293-8311, acalvert@usbr.gov

Start Date: FY11

Expected Duration: FY14

Long-term Goal: Determine the population demographics and habitat use of an LCR MSCP evaluation species, the California leaf-nosed bat.

Conservation Measures: CLNB1, CLNB2.

Location: Reaches 3-5.

Purpose: Determine the population genetic history of California leaf-nosed bats along the LCR including geographic structuring, evolutionary history, and other population demographic parameters using modern molecular techniques and determine the distribution of genetic variation in California leaf-nosed bat roost sites and identify where individuals from different roosts are foraging.

Connections with Other Work Tasks (past and future): Data on roost site location and samples collected from restoration sites will come from surveys conducted under D9 and F4.

Project Description: This work task is being initiated to evaluate to status of California leaf-nosed bats along the LCR within the framework of the LCR MSCP using a modern molecular approach. This will allow a better understanding of how far individuals are willing to travel to forage (currently assumed to be only 5 miles) and what constitutes appropriate habitat.

Genetic samples from each of the known roost sites near the LCR and from individuals captured during system monitoring will be collected and DNA sequencing and microsatellite analyses will be performed. This will document the genetic structuring of roost sites and allow various population demographic parameters to be estimated. These parameters include population size, previous population expansion or contraction, and dispersal between roosts. Individuals collected during conservation area monitoring will be assigned to their most likely roost site based on their unique genetic signature. Distance from roosts to restoration sites and other pertinent habitat information will be determined using GIS.

Previous Activities: Preliminary activities of gathering genetic samples and mitochondrial sequencing for initial samples prior to FY12 were conducted under G3.

FY12 Accomplishments: Genetic samples were processed, data on mitochondrial sequencing was collected, and these data were analyzed. Additional samples were collected at new localities in southern Nevada.

FY13 Activities: Genetic samples will continue to be gathered, especially for locations away from the LCR to determine the uniqueness of haplotypes on the LCR and potentially the historic and current population of California leaf-nosed bats throughout its range. Analyses will include the use of phylogenetic networks, and analysis of molecular variance or other similar methods to describe and statistically test the population structuring of California leaf-nosed bat populations along the LCR and other locations in Arizona and Nevada. Funding was increased in FY13 to collect and process the additional samples that are necessary to complete the project. Previously, samples were collected while work was being conducted for other work tasks (F4 and D9).

Proposed FY14 Activities: Additional samples will be collected and analyzed on the LCR as well as other locations until the appropriate sample size is achieved. Samples are needed from populations away from the LCR in order to determine the importance of the LCR populations compared to the overall population. This will help determine the conservation significance of populations on the LCR. Once all data is collected, a full analysis will be made to determine population structure and size (past and present) which will help determine the species conservation status both on the LCR as well as throughout its range.

Pertinent Reports: *Genetic Characterization of Macrotus californicus Populations along the Lower Colorado River—2010 Annual Report* is available on the LCR MSCP website. The research design is available upon request.