

Work Task G4: Science/Adaptive Management Strategy

FY14 Estimate	FY14 Actual Obligations	Cumulative Expenditures Through FY14	FY15 Approved Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate
\$250,000	\$275,414.62	\$918,791.70	\$400,000	\$600,000	\$600,000	\$600,000

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Start Date: FY06

Expected Duration: FY55

Long-Term Goal: Ensure successful and efficient implementation of the LCR MSCP conservation measures

Conservation Measures: All conservation measures related to habitat creation, species research, system monitoring, and fish augmentation

Location: LCR MSCP planning area

Purpose: To define the procedure for implementing the LCR MSCP using the best available science and adaptive management processes

Connections with Other Work Tasks (Past and Future): All science-based work tasks

Project Description: The HCP conservation measures were designed to meet the biological needs of 26 covered species and to benefit 5 evaluation species. A science strategy, developed in FY06, defined the processes for ensuring implementation of the LCR MSCP using the best available science, and it described a two-tier planning process to ensure effective implementation of research and monitoring actions: first, a 5-year planning cycle and, second, annual work plans covering a 3-year cycle.

Every 5 years, a plan will be developed that describes the current knowledge of covered species, establishes the monitoring and research priorities for that 5-year period, and describes potential challenges that may inhibit successful implementation of the conservation measures. During each 5-year cycle, the accumulated data from ongoing research and monitoring will be reviewed along with existing species accounts. The highest priority for the next 5-year period is to complete any ongoing research and monitoring activities. Second priority will be given to new research and monitoring needs identified by ongoing work.

Third priority will be given to refining and updating life history datasets. Additional work may be generated from the evaluation of research conducted under Work Task G3.

LCR MSCP staff will participate in interagency meetings and workshops held to discuss natural resource conservation along the LCR. These meetings bring together scientists, managers, and resource users interested in the LCR ecosystem. Additional special topic workshops will be held for covered species or their habitats as needed to revisit the status of one or more of these species within the LCR MSCP area.

Recently completed, ongoing, and proposed research and monitoring activities will be reviewed as they relate to the current 5-year monitoring and research priority plan.

Previous Activities: The Science Strategy was developed in FY06–07. CRTR Group and CRAB meetings were attended. The *Habitat Creation Conservation Measure Accomplishment Tracking Process* was developed for tracking conservation measure accomplishment pertaining to the habitat creation conservation measures and approved by the Steering Committee in FY12. The *LCR MSCP Five-Year Monitoring and Research Priorities: 2008–2012* was completed in FY13.

FY14 Accomplishments: A habitat creation accomplishment analysis was conducted to show acreage totals for each species at each conservation area where applicable. These totals can be found in table 1-9.

An independent program review was completed on the bat monitoring projects; recommendations were made to better connect habitat data collection with managing conservation areas for covered bat species. Each bat research and monitoring project will be evaluated through the adaptive management process; recommendations for changes will be reported here and under the research and monitoring work task.

Conceptual ecological models (CEMs) are widely recognized and utilized in natural resource management and structured decisionmaking, as they provide a clear framework for guiding management actions. CEMs were developed for southwestern willow flycatcher, yellow-billed cuckoo, and razorback sucker at the end of 2014 in which a collection of hypotheses, such as species' life cycles, species habitat requirements and limitations, factors that control abundance, spatial and temporal distribution, quality of habitat conditions, and the causal relationships among them, were compiled. Understanding these elements and how they relate vary, with a high level of certainty in some cases and a great deal of uncertainty in others. CEMs collectively and individually provide managers with a record of the current knowledge, decisions made, and the next steps to be implemented.

CEMs were developed during this fiscal year for the following species: bonytail, flannelmouth sucker, western least bittern, western red bat, western yellow bat, gilded flicker, and Sonoran yellow warbler. These models are intended to be used to track species research and monitoring priorities related to conservation measure accomplishment.

In FY14, recommendations for three minor modifications to conservation measures were approved by the Steering Committee on April 23. The western yellow bat research and monitoring activities provided habitat information to adjust Conservation Measure WYBA1 to include the creation of roosting “or foraging” habitat since western yellow bats primarily roost in palm trees and forage in cottonwood-willow habitats. Research and monitoring for the Arizona Bell’s vireo provided a greater understanding of the variety of structural types the species uses. Conservation Measure BEVII was adjusted to include cottonwood-willow structure types I and II to the current III and IV. Colorado River cotton rat monitoring supported that Conservation Measure CRCR2 be adjusted to include cottonwood-willow and mesquite habitats because the species have been routinely found in all riparian habitats.

FY15 Activities: Research and monitoring activities will continue to be reviewed and evaluated internally as well as through independent reviewers.

Through recommendations from the independent program review of the bat research and monitoring program, it was decided to adjust system-wide acoustic monitoring to collect data seasonally when bats are most active and for covered species only as opposed to year round.

Development of CEMs continues for the following species: bonytail, flannelmouth sucker, western least bittern, western red bat, western yellow bat, gilded flicker, and Sonoran yellow warbler. Development of CEMs for the following species have begun: Yuma clapper rail, California black rail, Colorado River cotton rat, Yuma hispid cotton rat, elf owl, Gila woodpecker, vermilion flycatcher, Arizona Bell’s vireo, summer tanager, and MacNeill’s sootywing. These models are intended to be used to track species research and monitoring priorities related to conservation measure accomplishment.

A study designed to compare population estimates of razorback sucker using data from traditional trammel netting versus remote PIT tag scanners will be implemented in Lake Mohave in 2015. Population estimates have historically required mark-recapture data from trammel netting during the March roundup, but these are imprecise due to low recapture rates, and they require handling fish during the spawning season. Remote PIT scanning started in 2010 and has provided more precise estimates due to higher contact rates. However, the accuracy of these estimates is uncertain because scanners have not yet been deployed at all sites targeted by netting at the same time of year. Over the next 3 years, the area sampled with scanning will be expanded to more closely match

that of netting for the same time period used for developing population estimates. Scanning will also be done for a longer period of time to determine how population estimates vary with scanning effort and to track trends in fish activity on the spawning beds. Information from this study will be used to determine whether and how the frequency of trammel netting can be reduced to help avoid disturbing razorback sucker spawning activity.

As described in the “Fish Augmentation, Monitoring, and Research” overview in Species Research (Section C), efforts will begin in FY15 to better assess the current genetics of razorback sucker in Lake Mohave and develop a standardized long-term fisheries genetic monitoring program. Additional data will be gathered by collecting genetic samples at the time of tagging. This change in collection protocol, combined with the expanded use of remote PIT scanners, may greatly increase the precision of genetic stock assessment of Lake Mohave over time. This additional information is intended to assist the adaptive management process by defining the needs of the program with respect to the collection genetic information. A pilot demonstration is planned for early in FY16 to determine the feasibility and potential cost effectiveness of fully implementing this change. As part of the adaptive management process, an independent review of the genetic research will be initiated to help identify the appropriate level of effort and long-term needs for monitoring fisheries genetics.

Coordination with landowners and agency partners for development of conservation area managements plans will continue.

Proposed FY16 Activities: A prioritized program review of research and monitoring activities will be conducted and evaluated internally as well as through independent reviewers. Specific programs include: a fish genetics monitoring program, avian monitoring programs, and vegetation monitoring.

Following completion of all species-specific CEMs, a pilot spatial analysis will be conducted at select conservation areas using all relative data to assess proposed management guidelines. Once management guidelines have been established, the development of conservation area management plans is expected to begin.

Pertinent Reports: The reports titled *Final Science Strategy; LCR MSCP Five-Year Monitoring and Research Priorities—2008-2012*, *LCR MSCP Five-Year Monitoring and Research Priorities—2013-2017*, and *Final Habitat Creation Conservation Measure Accomplishment Tracking Process* are posted on the LCR MSCP Web site.