Work Task G6: Conceptual Ecological Models

FY16 Estimate	FY16 Actual Obligations	Cumulative Expenditures Through FY16	FY17 Approved Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate	FY20 Proposed Estimate
$40,000	$27,482.43	$3,359.07	$40,000	$40,000	$40,000	$40,000

Contact: Jimmy Knowles, (702) 293-8172, jknowles@usbr.gov

Start Date: FY16

Expected Duration: FY55

Long-Term Goal: Species research and monitoring

Conservation Measures: BEVI1, BLRA1, BLRA2, BONY2, CLNB1, CLNB2, CLRA1, CLRA2, CRCR1, CRCR2, CRTO1, CRTO2, CRTO3, DPMO1, ELOW1, FLSU1, GIFL1, GIWO1, LEBI1, LLFR1, LLFR2, LLFR3, MNSW1, MNSW2, MRM1, MRM2, MRM3, PTBB1, PTBB2, RASU2, SUTA1, VEFL1, WIFL1, WIFL2, WRBA1, WRBA2, WYBA1, WYBA3, YBCU1, YBCU2, YHCR1, YHCR2, and YWAR1

Location: System-wide, Arizona, California, Nevada

Purpose: To assess and organize existing knowledge on each LCR MSCP covered and evaluation species to determine research, monitoring, and habitat requirements for current and future research, monitoring, habitat creation, and fish augmentation projects

Connections with Other Work Tasks (Past and Future): Previous work was done through Work Tasks C3 (closed), G3, and G4. Information collected under this work task is currently being used to develop future work tasks and research projects, design monitoring programs and habitat creation projects, and to implement the adaptive management process. Information from this work task will be used under Fish Augmentation (Section B), Species Research (Section C), System Monitoring (Section D), Conservation Area Development and Management (Section E), and Post-Development Monitoring (Section F).

Project Description: To successfully create and manage habitats for LCR MSCP covered species, conceptual ecological models (CEMs) are being developed to better direct research and monitoring efforts as well as management.

CEMs are widely recognized and utilized in natural resource management and structured decisionmaking, as they provide a clear framework for informing management actions.

CEMs integrate and organize existing knowledge concerning (1) what is known about an ecological resource, with what certainty, and the sources of this information, (2) critical areas of uncertain or conflicting science that demand resolution to better guide management planning and action, (3) crucial attributes to use while monitoring system conditions and predicting the effects of experiments, management actions, and other potential agents of change, and (4) how the characteristics of the resource are expected to change as a result of altering its shaping/controlling factors, including those resulting from management actions.

Previous Activities: New start in FY16.

FY16 Accomplishments: First editions of CEMs for the following covered species were finalized: Arizona Bell's vireo (*Vireo bellii arizonae*), bonytail (*Gila elegans*), California black rail (*Laterallus jamaicensis coturniculus*), Colorado River cotton rat (*Sigmodon arizonae plenus*), elf owl (*Micrathene whitneyi*), flannelmouth sucker (*Catostomus latipinnis*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), MacNeill's sootywing skipper (*Pholisora gracielae = Hesperopsis gracielae* [MacNeill]), Sonoran yellow warbler (*Dendroica petechia sonorana = Setophaga petechia sonorana*), southwestern willow flycatcher (*Empidonax traillii extimus*), summer tanager (*Piranga rubra*), vermilion flycatcher (*Pyrocephalus rubinus*), western least bittern (*Ixobrychus exilis hesperis*), western red bat (*Lasiurus blossevilli*), western yellow bat (*Lasiurus xanthinus*), yellow-billed cuckoo (*Coccyzus americanus occidentalis*), Yuma clapper rail (*Rallus longirostris yumanensis* [also known as Yuma Ridgway's rail = *R. obsoletus yumanensis*]), and Yuma hispid cotton rat (*Sigmodon hispidus eremicus*). All of these CEMs were posted on the LCR MSCP Web site in FY16.

The species accounts updated in FY14 under Work Task C3 (closed) were finalized and published during FY16. Information from these species accounts were incorporated into the CEMs for covered species during FY16.

FY17 Activities: The CEM developed in FY14 for the razorback sucker will be updated to reflect new information about the species, and standardized text to match the new CEM format will be incorporated.

The LCR MSCP will participate in a workshop on how to use the species-specific CEMs to better understand the impacts of management actions on habitat created under the LCR MSCP and the relationship between these actions and their effect on covered species. Development of decision support tools for select

conservation areas will help model the impacts that management actions have on created habitat and the covered species. Once the analyses are complete, the CEMs will be used in the development of conservation area management plans.

CEMs for the five LCR MSCP evaluation species (Colorado River toad [*Bufo alvarius = Incilius alvarius*], lowland leopard frog [*Rana yavapaiensis = Lithobates yavapaiensis*], California leaf-nosed bat [*Macrotus californicus*], pale Townsend's big-eared bat [*Corynorhinus townsendii pallescens = Plecotus townsendii pallescens = C. townsendii townsendii*], and desert pocket mouse [*Chaetodipus penicillatus sobrinus*]) will begin to be developed.

Proposed FY18 Activities: Updates to CEMs will be made as new information is received, with literature searches being performed at least once per year. The CEMs for the five LCR MSCP evaluation species will be finalized.

Pertinent Reports: CEMs were posted on the LCR MSCP Web site in FY16.