

Work Task G1: Data Management

FY15 Estimate	FY15 Actual Obligations	Cumulative Expenditures Through FY15	FY16 Approved Estimate	FY17 Proposed Estimate	FY18 Proposed Estimate	FY19 Proposed Estimate
\$850,000	\$572,953.39	\$4,560,746.11	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000

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Start Date: FY07

Expected Duration: FY55

Long-Term Goal: Data management will be an ongoing task for species research, system monitoring, habitat creation, post-development monitoring, and habitat maintenance programs.

Conservation Measures: All

Location: Program-wide

Purpose: To develop and maintain an accessible, multi-disciplinary, spatially referenced, relational database to consolidate, organize, document, store, and distribute scientific information related to the LCR MSCP

Connections with Other Work Tasks (Past and Future): Database management is integral for the successful completion of the work tasks undertaken: Fish Augmentation (Section B), Species Research (Section C), System Monitoring (Section D), Conservation Area Development and Management (Section E), Post-Development Monitoring (Section F), Adaptive Management Program (Section G), and Funding Accounts (Section H).

Project Description: Under this work task, the data management team manages all aspects of the LCR MSCP that are related to the database, data collection, applications development, and software management. To fully implement the program, a database management system is being developed to handle the data collected through the species research, system monitoring, habitat creation, post-development monitoring, adaptive management, and habitat maintenance programs. Database design, initial implementation, and maintenance are funded under this work task.

Previous Activities: Hardware was purchased to increase data storage for the implementation of the centralized database. The Intranet/document/calendar management system was upgraded and modified to accommodate the future needs

of the LCR MSCP. Implementation of remote data collection from field data loggers began at Beal Lake for the fish program. The Native Fish Augmentation Database was maintained.

Database design and implementation of the LCR MSCP database management system was completed. Data modules for the database were acquired and phased in according to priority for implementation of the Habitat Conservation Plan. The modules consist of an application for data entry that is standardized for input into the database. On an annual phased approach, all standardized projects will be incorporated into the database.

The Minckley Library project was completed in March 2012. The library is now available as a searchable database that houses over 11,000 total documents, including a variety of literature types, which were digitized and organized using bibliographic software.

It was determined in FY12 that the entire planning area needed to be delineated to standardize site naming conventions for locations where data collection would be conducted. This delineation will be updated as needed throughout the LCR MSCP term.

Mobile data loggers and software for collection of data in the field were acquired. These units standardize all data collection across LCR MSCP projects. Mobile electronic field forms (MEFFs)/data dictionaries for data collection were developed and are now used for all field data collection.

FY15 Accomplishments: The Native Fish Augmentation Database continued to be maintained. Maintenance and updates to the LCR MSCP Web site continued. Field data collection devices and supporting software were purchased to support data collection activities.

Data collection processes were reviewed, updated, and maintained. MEFFs were also created (or updated) and tested for the following projects: southwestern willow flycatcher (D2, D3 [closed], and F2), lowland leopard frog (C62 and D12), Colorado River toad (C62 and D12), Colorado River/Yuma hispid cotton rats (D10 and F3), small mammal demographic studies (C27), bat surveys and research (C35 [closed], D9, and F4), and yellow-billed cuckoo (D7 and F2). Documentation for all MEFFs was created so that end-users had the necessary reference materials for proper MEFF use. Additionally, LCR MSCP staff trained end-users in how to use the MEFFs for field data collection.

The LCR MSCP database continued to be maintained and upgraded for location, species, project-related reference tables, and utility procedures to centralize processing of project data, with emphasis on the support of MEFF needs (e.g., MEFF locations, codes, etc.). Database schemas and data/photo import/conversion codes were designed, built, and tested in support of the MEFFs for wildlife monitoring. Support continued to be offered for users of

desktop computer-based data entry forms, including form and code updates, data merging, internal quality queries, and assistance in the design and creation of contractor-required queries for avian system-wide surveys. Quality assurance measures for field data collection processes were developed, with full audit trails from raw field data to final production data. MEFF data viewers were also developed during FY15 in support of projects for the southwestern willow flycatcher (D2, D3 [closed], and F2) and yellow-billed cuckoo (D7 and F2). The data viewers allow field surveyors to view collected data in tables shortly after field collection as part of the quality assurance process.

The use of remote and continuous data collection from data loggers continued to be developed and supported. The external data upload site was updated and maintained in order to improve data flow.

Efforts to restructure and more effectively maintain the LCR MSCP spatial database began in FY15.

A project management software plug-in was purchased to help track and implement project objectives.

FY16 Activities: The LCR MSCP Web site continues to be maintained and updated. Light detection and ranging data and aerial image acquisition for selected conservation areas is being supported under Work Tasks C60 and F1 for the current year's acquisition while the management of this data is being handled under this work task.

The data collection processes continue to be updated and/or maintained, and MEFFs are being evaluated, developed, updated (and/or maintained), and tested for the following projects: elf owl (C24), MacNeill's sootywing (F6), fish augmentation (B1), fish monitoring (F5), southwestern willow flycatcher (D2 and F2), lowland leopard frog (C62 and D12), Colorado River toad (C62 and D12), Colorado River/Yuma hispid cotton rats (D10 and F3), small mammal demographic studies (C27), bat surveys and research (C35 [closed], D9, and F4), and yellow-billed cuckoo (D7 and F2). Support for the purchase of MEFF development tools, Global Positioning System devices, and supporting software continues.

Under the LCR MSCP, the following continues to be reviewed and developed: (1) program-wide standards for data collection, (2) documentation for data collection processes in the field, and (3) automated data collection requirements when using mobile devices, which helps to ensure that data collection is consistent.

Development of database schema, data mapping, and coding continues in order to support importation of collected MEFF data into the standardized LCR MSCP database for all projects. This effort includes the creation of new and/or evaluation of existing queries to support each project. Accompanying process

flow documentation is also being created or updated for overall database maintenance and project-specific operations. Upgrades to the LCR MSCP database were performed early in FY16. As part of this upgrade, all data collected in the previous few years using the standard LCR MSCP Access forms/MEFFs are being imported into the upgraded LCR MSCP database.

Maintenance of the Native Fish Augmentation Database continues, and preliminary efforts to incorporate this into the LCR MSCP database have begun.

The project management software plug-in purchased in FY15 is being configured to help track and implement project objectives. It is expected that this plug-in be fully operational by the end of FY16.

An evaluation of technologies, processes, and methods to incorporate all legacy data into the LCR MSCP database will begin during FY16. The efforts that began in FY15 to restructure and maintain the LCR MSCP spatial database is ongoing.

Proposed FY17 Activities: Existing MEFFS will continue to be updated, and new MEFFs will continue to be developed or tested for all projects that involve data collection. Support for the purchase of MEFFs, Global Positioning System devices, and supporting software will continue. Additionally, the search for and testing of more advanced and efficient methods of electronic field data collection methods will continue.

The LCR MSCP database will continue to be maintained and upgraded as needed. Light detection and ranging data acquisition will continue to be supported under Work Task F1, but the raw data will be managed and maintained under this work task.

Database schemas and data import/conversion codes will continue to be designed or updated in support of the MEFFs for projects as appropriate. All related database documentation (e.g., schema design, MEFF to Structured Query Language data mapping, processing work flows, standard naming conventions, etc.) will be maintained or created as required. Efforts to provision software that will enable project coordinators to access LCR MSCP database tables will continue. Importation of all data into the database will continue.

Legacy data will begin to be imported into the LCR MSCP database using the technologies and methods identified during FY16. The inclusion of legacy data and the business intelligence and data mining tools available in the upgraded database version will allow all of the data collected during the life of the LCR MSCP to be leveraged, enabling more informed management decisions.

The Native Fish Augmentation Database will continue to be maintained, with other fish project data modules being constructed following standardization of

individual projects. Once the fisheries projects have been standardized, consolidation of the Native Fish Augmentation Database with the LCR MSCP database will begin using LCR MSCP standards.

LCR MSCP staff will continue to refine the quality assurance procedures already in place. This effort includes the use of the external SharePoint site to upload all raw data for tracking and quality assurance.

Project management software will be used to track and implement project objectives to assist with timely project completion.

Pertinent Reports: N/A