

**WESTERN RIVERSIDE COUNTY MSHCP
BIOLOGICAL MONITORING PROGRAM
FY 2011-12 WORK PLAN AND COST ESTIMATE**

1.0 INTRODUCTION

The overall goal of the Biological Monitoring Program (Monitoring Program) is to collect data on the 146 Covered Species and associated habitats for the purpose of assessing the MSHCP's effectiveness at meeting conservation objectives and to provide information for adaptive management. The activities described in this work plan for Fiscal Year 2011-12 continue the activities commenced in the previous fiscal year and follow the framework outlined in section 5.3 of the MSHCP. Fiscal Year 2011-12 is the eighth fiscal year and the seventh biological year of a five to eight year inventory phase of the Monitoring Program. Fiscal Year 2011-12 represents a significant transition period for the Monitoring Program as it shifts from the initial inventory phase to the long-term monitoring phase.

2.0 RESPONSIBILITIES

The Monitoring Program is implemented within the MSHCP Conservation Area on lands that are owned and managed by the various MSHCP participants. The Western Riverside County Regional Conservation Authority (RCA) has primary responsibility for funding the Biological Monitoring Program. To ensure consistency in monitoring efforts throughout the Conservation Area, the Monitoring Program is overseen and implemented by a Monitoring Program Administrator selected by the RCA. The duties and responsibilities of the Monitoring Program Administrator are described in Volume 1, Section 6.6.6 of the MSHCP. As per the MSHCP, the California Department of Fish and Game (DFG) is the Monitoring Program Administrator for the first eight years of the permit.

Due to State budget issues and hiring rules, the DFG has been unable to consistently fill the Monitoring Program Administrator position. In 2007 the DFG received a federal State Wildlife Grant to support its role as the Monitoring Program Administrator and develop a long-term monitoring strategy. The term of the grant ends September 30, 2012 and the entire grant has not been expended. The DFG has contracted with the RCA to provide the remaining portion of the grant to administer the Monitoring Program and develop the long-term monitoring strategy. In addition to this contract, the DFG is continuing to provide staff and resources to support the Monitoring Program.

In the absence of a DFG Monitoring Program Administrator, the RCA has contracted with the Santa Ana Watershed Association (SAWA) for an employee to fill the role of the Monitoring Program Administrator. The RCA works closely with the Monitoring Program Administrator to develop and implement the annual work plan and budget. The annual work plan is carried out by the Monitoring Program Administrator using DFG staff and staff contracted by the RCA through SAWA.

3.0 IMPLEMENTATION STRATEGY

The Monitoring Program is responsible for monitoring the status and trend of the 146 Covered Species and associated vegetation communities and wildlife habitats over a 500,000 acre Conservation Area. Because there is little existing scientifically-based data for the majority of Covered Species, the first eight years of the Monitoring Program are devoted to an inventory phase. The purpose of the inventory phase is to determine where Covered Species occur within the Conservation Area, to gather more information on their activity patterns, and to develop efficient protocols for detecting them. The development of protocols is necessary to test the reliability of survey methods, to determine whether a species is present in an area, and, if not detected, to provide a confidence level that the species is not present.

The transition from inventory phase to long-term monitoring phase will be gradual rather than abrupt. For species with short reporting requirements such as Quino checkerspot butterfly (annual) or coastal California gnatcatcher (every three years) long-term monitoring can be interpreted as already in place. For species with longer reporting requirements such as Los Angeles pocket mouse (every eight years) and with species-specific monitoring objectives requiring significant development and testing, the transition from inventory phase to long-term monitoring phase is ongoing.

One of the goals of the Monitoring Program is to develop efficient long-term monitoring protocols that reduce redundancies by collecting information on multiple species where possible. For example, bird species co-occurring in similar habitat (e.g., willow riparian) during the breeding season can be detected using the same survey protocols. There will always be some Covered Species that occur in isolated pockets within the Conservation Area or that are difficult to detect using standard survey protocols; for these species a focused survey effort will be required.

4.0 STAFF COMPOSITION

Monitoring Program staff work as a team to coordinate, develop, and implement required monitoring activities for the MSHCP. The Monitoring Program is composed of the following staff positions, which are filled based on availability of funding:

- Monitoring Program Administrator
- Lead Biologist(s)
- Database Manager
- GIS Analyst
- Office Manager
- Taxa Program Leads
- General Field Crew, bird specialization
- General Field Crew, mammal specialization
- General Field Crew, amphibian & reptile specialization
- General Field Crew, invertebrate specialization
- General Field Crew, plant specialization

Currently, the majority of staff are funded by the RCA through a contract with SAWA, a local non-profit agency. Additional staff will be hired through SAWA in FY 2011-12 and funded by the State Wildlife Grant. One Program Lead and up to 12 field crew are funded by the DFG.

5.0 SPECIFIC TASKS OF THE MONITORING PROGRAM

5.1 Administration & Coordination

Administering and coordinating the Monitoring Program requires a significant amount of effort. Sufficient staff and resources must be acquired, field work must be scheduled, land access must be coordinated with other agencies, and survey activities must take place. The Monitoring Program Administrator, Lead Biologist, and Office Manager carry out the following tasks:

- Develop annual work plans and budgets
- Identify contract needs, write scopes of work, manage contracts
- Advertise, interview, and hire Monitoring Program staff; conduct performance reviews
- Develop training manuals and training programs for staff
- Direct and schedule staff activities
- Identify field supply and equipment needs; submit orders; maintain inventory, including vehicles
- Identify land access needs and coordinate with agencies on access agreements
- Facilitate monthly reserve management/monitoring coordination meeting
- Attend monthly RCA team meetings and other agency meetings
- Give occasional presentations to the RCA Board
- Coordinate with Wildlife Agencies (DFG and U.S. Fish and Wildlife Service) on survey methodology and monitoring activities
- Develop the operations and implementation manuals
- Oversee production of annual survey reports
- Distribute Monitoring Program data as appropriate

5.2 Biological Surveys

Conducting biological surveys is the most visible part of the Monitoring Program. It is also the component that requires the most staff. Prior to collecting data, all aspects of a project must be developed. This includes identifying the purpose of the survey, choosing the data collection methods and sampling locations, selecting data analysis methods, and determining what answers the data are expected to provide. The following tasks are carried out by the Monitoring Program Administrator, Lead Biologist, GIS Analyst, Database Manager, Taxa Program Leads, and Field Crew:

- Develop protocols and sampling designs
- Implement focused species surveys
- Conduct community surveys for multiple species
- Conduct vegetation analyses

5.3 Training

The Monitoring Program is required to have a training program approved by the Wildlife Agencies to ensure consistent data collection, uniform implementation of protocols, handling procedures, and appropriate experience with Covered Species (Vol. 1, Sec. 7.0). The type of species training needed in any given year is dependent on the types of survey activities planned; however, safety training (e.g., first aid, CPR) is provided every year. Training is provided both by experienced Monitoring Program staff and by qualified outside entities (e.g., U.S. Geological Survey, U.S. Fish and Wildlife Service). The following training is required of Monitoring Program staff:

- Endangered species identification and handling
- Local flora and fauna identification
- Wilderness first aid and CPR training
- Defensive driver training

5.4 Data Management & Reports

All of the data collected by the Monitoring Program must be carefully managed. Prior to field work, data forms are developed and survey locations are mapped. Field data are collected both on paper datasheets and on Personal Digital Assistants (PDA). As data return from the field, they are entered into a database and checked for accuracy. After data collection is completed, the data are analyzed and a report is written describing survey results. The results of each year's monitoring efforts are provided in the Annual Report submitted to the RCA. The Monitoring Program Administrator, Lead Biologist, Database Manager, and GIS Analyst support and oversee the Taxa Program Leads and Monitoring Program staff in the completion of the following tasks:

- Field form and protocol development
- GIS mapping to support surveys, analysis, and reports
- Database development
- Data entry and quality control
- Data analysis, statistics
- Survey report writing
- Maintaining computer equipment and database

The Monitoring Program has an internal database, developed and managed by the Database Manager. Monitoring Program datasets that have been thoroughly proofed and certified complete by the Database Manager are submitted to DFG's Biogeographic Information and Observation System (BIOS), as well as to local partnering agencies at least once per year.

6.0 MONITORING EFFORTS IN FY 2011-12

Monitoring Program activities planned for FY 2011-12 are largely based on the requirements of the MSHCP species objectives found in Volume 2 of the MSHCP. The species objectives

specify time intervals for detecting and reporting on each of the Covered Species in the Conservation Area. When the species objectives do not specify a time interval, the status of the Covered Species must be reported on at least once every eight years as per General Management Measure 7 (Vol. 1 Sec. 5.0). In addition to the species objectives, survey priorities are influenced by the quantity and quality of information available for each species (little or poor information means more survey effort sooner), whether another agency is already conducting surveys (less effort required by the Monitoring Program), relative ease of gathering information (e.g., yellow warbler surveys during least Bell's vireo surveys), and priority of the species to the RCA and Wildlife Agencies (e.g., burrowing owl). Funding availability and extent of effort required is also considered when determining monitoring activities.

An overview of the monitoring efforts planned for FY 2011-12 along with a brief rationale for surveys is provided below. Details of survey methodology can be found in the survey protocols available at the Biological Monitoring Program office in Riverside, CA. The Monitoring Program's ability to complete these tasks will be dependant upon revenue flow at the RCA and the amount of support provided by the DFG.

6.1 Invertebrates

6.1.1 Quino Checkerspot Butterfly Survey

The species objectives for Quino checkerspot require the documentation of its distribution on an annual basis. The Monitoring Program has surveyed for Quino checkerspot in the Conservation Area during the last seven biological years. In FY 2011-12 surveys efforts will focus on monitoring recently occupied locations and surveying for the species in suitable habitat close to occupied areas.

6.1.2 Delhi Sands Flower-Loving Fly Survey

The species objectives for Delhi fly require documenting successful reproduction by this species at all three Core Areas identified in the MSHCP every year for the first five years of the permit and then as determined to be appropriate. Because Delhi fly is an endangered species with an extremely limited distribution within the Plan Area, the Monitoring Program has surveyed for Delhi fly within the lone accessible Core Area during the last seven biological years. Surveys for Delhi fly will continue in FY 2011-12, although the previous survey effort which allowed estimating the density of Delhi fly within its accessible Core Area will be reduced to simply documenting successful reproduction. The resources necessary for the FY 2011-12 effort will, thus, be greatly reduced.

6.1.3 Fairy Shrimp

Surveys on accessible lands within listed Core Areas for covered fairy shrimp (Santa Rosa Plateau, Riverside, and vernal pool) were conducted by Monitoring Program biologists in FY 2010-11. All three species were detected. The species objective for Santa Rosa Plateau fairy shrimp was met. Riverside fairy shrimp and vernal pool fairy

shrimp need to be found in additional Core Areas in order for their respective species objectives to be met. While the surveys required as part of the inventory phase are now complete, fairy shrimp surveys may be conducted in vernal pools within necessary Core Areas if there is adequate rainfall in FY 2011-12 to create new pools in areas already surveyed, or if additional lands are acquired.

6.2 Birds

6.2.1 Riparian Bird Nest Searching

The species objectives for the following species require continued use and successful reproduction within Core Areas once every three or five years: least Bell's vireo, willow flycatcher, yellow warbler, yellow-breasted chat, and yellow-billed cuckoo. Surveys targeting riparian birds in accessible riparian habitat within Core Areas were conducted in spring and early summer 2011 (FY 2010-11). Nest searching to demonstrate successful reproduction of the above species was conducted in conjunction with the riparian bird survey. The survey report summarizing riparian bird survey efforts in 2011 (FY 2010-11) will be written at the end of 2011.

Additional nest searching may be conducted in spring and early summer 2012 (FY 2011-12) as needed to assure appropriate effort within Core Areas to document reproduction of target species if it is occurring. Santa Ana Watershed Association biologists may also contribute data towards meeting previously unmet riparian bird species objectives, if necessary.

6.2.2 Coastal Sage Scrub Bird Nest Searching

The species objectives for California gnatcatcher require continued use and successful reproduction within Core Areas once every three years. Surveys targeting covered bird species found in coastal sage scrub were conducted in accessible coastal sage scrub vegetation within Core Areas in spring and early summer 2011 (FY 2010-11). Nest searching to demonstrate successful reproduction of the California gnatcatcher was conducted in conjunction with the coastal sage scrub bird survey. The survey report summarizing coastal sage scrub bird survey efforts in 2011 (FY 2010-11) will be written at the end of 2011.

Additional nest searching may be conducted in spring and early summer 2012 (FY 2011-12) as needed to assure appropriate effort within Core Areas to document reproduction of California gnatcatcher if it is occurring.

6.2.3 Golden Eagle

The species objectives for golden eagle require verification of reproduction in identified nesting locations or Core Areas at least once every eight years. Although golden eagle surveys were included in the Monitoring Program's FY 2010-11 work plan, lack of available resources dictated that those surveys be postponed. Pending available biologists, surveys will be made to locate nesting golden eagle pairs in FY 2011-12 and nests will be monitored to verify reproductive success. The level of effort

required by riparian bird and coastal sage scrub bird nest searching projects in 2012 will determine whether there are available biologists for this work. Monitoring Program staff will coordinate with the local raptor community to take advantage of existing information and maximize efficiency.

6.2.4 Burrowing Owl Monitoring

The species objectives for burrowing owl require the conservation of five Core Areas plus interconnecting linkages, all containing a breeding population of 120 owls with no fewer than five pairs in any one Core Area. Several land managers within the Conservation Area have recently installed artificial burrows and begun managing vegetation for burrowing owl. Surveys for burrowing owl were conducted by Monitoring Program biologists in spring and early summer 2011 (FY 2010-11). Surveys focused on areas that were not surveyed in previous efforts and areas being actively managed for burrowing owl. The survey report summarizing burrowing owl survey efforts in 2011 (FY 2010-11) will be written at the end of 2011.

Additional surveys may be conducted in spring and early summer 2012 (FY 2011-12) as needed to assure appropriate effort within Core Areas to document distribution and reproduction of burrowing owl. Continued monitoring of artificial burrows installed across the Conservation Area will also be conducted three times per year as according to the current draft of the Western Riverside County MSHCP Burrowing Owl Management Plan.

6.2.5 Marsh Birds

The species objectives for American bittern, black-crowned night heron, and great blue heron require the continued use of listed Core Areas at least once every eight years. No targeted surveys for American bittern, black-crowned night heron, or great blue heron have been conducted by the Monitoring Program to date, though all species have been detected incidentally. In the winter of FY 2011-12, surveys for these species will be conducted in marsh habitats within appropriate Core Areas.

6.2.6 Mountain Plover

The species objectives for mountain plover require continued use of four Core Areas at least once every eight years. No targeted surveys for mountain plover have been conducted by the Monitoring Program to date, though surveys organized by California Audobon have detected the species within the Plan Area in recent years. Monitoring Program biologists will conduct surveys for mountain plover in appropriate Core Areas as necessary in FY 2011-12.

6.3 Amphibians and Reptiles

6.3.1 Western Pond Turtle Trapping

The species objectives for western pond turtle require the continued use of conserved Core Areas as measured once every three years. Collaborative efforts to document the distribution of western pond turtle in southern California have been ongoing with the DFG and the U.S. Geological Survey since FY 2008-09. Surveys for western pond turtle in FY 2011-12 will be conducted in habitat at locations within Core Areas not recently documented as occupied where land access was recently acquired. Western pond turtle surveys in FY 2011-12 will conclude the inventory phase for this species.

6.3.2 Targeted Area Searches for Reptiles

San Bernardino mountain kingsnake, San Diego mountain kingsnake, southern rubber boa, and San Diego banded gecko have proven difficult to detect regardless of survey method. The species objectives for all four reptiles require documentation of the continued use of Core Areas at least once every eight years. Transect-based searches for San Diego banded gecko and artificial cover-based surveys for all species listed above proved inefficient at producing necessary species observation data.

Ultimately, there may be no truly efficient means to reliably detect these species as they are highly secretive and not typically found in high numbers. The importance of collecting incidental observations both from Monitoring Program biologists and from partnering agencies will continue to be stressed. Because surveys conducted to date are insufficient to determine that target species are truly absent from Core Areas where they have not been documented to occur, Monitoring Program biologists will also opportunistically search within Core Areas for these species when time and personnel are available. These targeted area searches will be significantly less labor-intensive than previous survey methods.

6.3.3 Western Spadefoot Survey

The species objectives for western spadefoot require maintaining successful reproduction at 75% of conserved breeding locations as measured once every eight years. Western spadefoot surveys to date have been conducted as part of vernal pool monitoring also targeting covered fairy shrimp species. Surveys targeting western spadefoot in FY 2011-12 will be decoupled from fairy shrimp/vernal pool surveys to better address the species objectives for western spadefoot. Surveys for western spadefoot beyond strictly vernal pool areas will be conducted in applicable Core Areas and conserved breeding locations to determine presence and breeding activity for this species if there is adequate rainfall in FY 2011-12. Isolated pools, road ruts, and creeks that do not strictly follow the definition of vernal pools will be surveyed in order to capture additional potential habitat for breeding spadefoot. Pending adequate rainfall, western spadefoot surveys in FY 2011-12 will conclude the inventory phase for this species.

6.4 Mammals

6.4.1 Los Angeles Pocket Mouse Trapping

The species objectives for Los Angeles pocket mouse require demonstrating that populations are stable or increasing in seven Core Areas and that at least 4,200 acres are occupied every eight years. Because this species objective requires both distribution and population trend information it will take more than one year's survey effort to determine whether or not the objective is being met. The FY 2011-12 surveys are a continuation of survey work in FY 2010-11.

6.4.2 San Bernardino Kangaroo Rat and Aguanga Kangaroo Rat Trapping

Both San Bernardino and Aguanga kangaroo rat are narrowly distributed in the Plan Area. Both species were detected during FY 2010-11 Los Angeles pocket mouse trapping and a targeted Aguanga kangaroo rat survey effort in FY 2010-11 helped delineate its existing distribution. The species objectives for both kangaroo rats require that 75% of the suitable habitat in the Conservation Area be occupied and that at least 20% of the occupied area have a density of 5 to 15 animals per hectare. FY 2011-12 survey efforts will build on the information gained in the 2010-11 effort to continue to address the species objectives for these kangaroo rats.

6.4.3 Carnivore Surveys

Species objectives for bobcat, coyote, long-tailed weasel, and mountain lion require the conservation of contiguous-habitat blocks and the maintenance of corridors that provide an effective means for dispersal. Surveys to detect the above-listed mammals in contiguous habitat blocks, linkages, and movement corridors identified by the MSHCP have been ongoing since 2007. Surveys in the contiguous habitat blocks are finished for the current eight year reporting period. Work in the linkages will continue opportunistically in FY 2011-12.

6.5 Plants

6.5.1 Rare Plant Surveys

There are 63 covered plant species with species objectives that require conserving and monitoring known populations within the Conservation Area. Surveys for rare plants in FY 2011-12 will continue efforts to determine the status of each species at known recorded sites on accessible lands within the Conservation Area. The focal species in any given year are dependent on weather conditions and accessibility of recorded sites. Nearly all historic locations of covered plant species within the Conservation Area have been visited in previous years. Thus, rare plant monitoring efforts in FY 2011-12 will focus on conducting surveys for covered plant species at recently acquired properties, documenting required localities for species not

adequately conserved, and revisiting locations determined to be occupied by covered plant species in a long-term monitoring context.

6.5.2 Engelmann Oak Study

The species objectives for Engelmann oak require maintaining recruitment of seedling and sapling oaks within conserved populations as measured across any consecutive five-year period. Surveys for Engelmann oaks in FY 2011-12 will continue efforts that began in FY 2005-06 and were substantially modified in FY 2010-11 to measure recruitment within accessible lands in the Conservation Area. After careful consideration of results achieved prior to FY 2010-11 and the effort required to obtain those results, the existing survey protocol was modified to better address the Engelmann oak species objectives with a more efficient study design. The study design employed in FY 2010-11 required substantially fewer resources and should be able to provide the necessary data after two or three years effort.

6.5.3 Vegetation Surveys

Vegetation surveys are a part of every project conducted by the Monitoring Program. The purpose of vegetation surveys is to describe the wildlife habitat within survey areas to gain a better understanding of potential drivers for observed species distributions.

6.5.4 Coastal Sage Scrub, Chaparral, and Grassland Monitoring Study

The MSCHP requires the Monitoring Program to assess the condition of vegetation communities within the Conservation Area (Vol. 1, Sec. 5.3.2). FY 2011-12 will be the final year of a three-year pilot effort to monitor coastal sage scrub, chaparral, and grassland vegetation communities. The current monitoring effort developed out of a pilot effort that began in 2008 to sample coastal sage scrub and chaparral communities in cooperation with Dr. Deutschman of San Diego State University, the San Diego Multiple Species Conservation Program, and Central Orange County Natural Community Conservation Plan.

6.6 Fish

6.6.1 Arroyo Chub Survey

The species objectives for arroyo chub require documenting the presence of this fish in identified Core Areas in the Santa Ana and Santa Margarita watersheds. The FY 2011-12 survey will be a continuation of the effort begun in FY 2009-10 and will involve surveys for arroyo chub in locations previously not accessible. The Monitoring Program will conduct surveys in the Core Areas in the Santa Margarita watershed. Partnering organizations are currently conducting long-term fish surveys in the Santa Ana watershed.

7.0 SCHEDULE OF MONITORING EFFORTS FOR FY 2011-12

Below is a tentative calendar of when surveys are planned for FY 2011-12. The “biological year” or “survey season” does not match the fiscal year, thus the calendar represents two different survey seasons. The first half of the calendar continues many of the activities commenced in FY 2010-11.

Survey	Jul 11	Aug11	Sep11	Oct11	Nov11	Dec11	Jan12	Feb12	Mar12	Apr12	May12	Jun12
Quino Checkerspot Survey												
Delhi Fly Survey												
Fairy Shrimp Survey												
Riparian Birds												
Coastal Sage Scrub Birds												
Golden Eagle Survey												
Burrowing Owl Monitoring												
Marsh Birds Survey												
Mountain Plover Survey												
Pond Turtle Trapping												
Reptile Searches												
Western Spadefoot Survey												
LAPM Trapping												
SBKR and AKR Trapping												
Carnivore Surveys												
Rare Plant Surveys												
Engelmann Oak Study												
Vegetation Surveys												
CSS Monitoring Study												
Arroyo Chub Survey												

8.0 BIOLOGICAL MONITORING PROGRAM COST ESTIMATE FOR FY 2011-12

The proposed FY 2011-12 Biological Monitoring Program budget is similar to previous budgets submitted to and approved by the RCA Board of Directors. The RCA has primary responsibility for funding the Biological Monitoring Program. The DFG funds a portion of the Biological Monitoring Program based on the availability of the State’s budget. A State Wildlife Grant was awarded in 2007 to fund Biological Monitoring Program activities and develop the long-term monitoring strategy. A contract approved by DFG and RCA as of March 3, 2011 releases \$788,027 to the RCA in order to develop the long-term monitoring strategy and provide for Biological Monitoring Program staff including the Monitoring Program Administrator. The majority of funding is allocated to contracts for monitoring staff.

ALLOCATION	COST
DFG Funded Labor & Supplies	
Biologist	74,737
General Field Crew (Scientific Aides)	216,401
Vehicle Usage (Fuel & Maintenance)	48,816
Subtotal DFG Funded Labor & Vehicles	\$339,954
RCA Funded Contracts	
Santa Ana Watershed Association (staff)	595,584
Santa Ana Watershed Association (staff reimbursements, vehicle fuel and maintenance)	15,000
Subtotal RCA Funded Contracts	\$610,584
State Wildlife Grant	
Santa Ana Watershed Association Contract (staff)	550,536
Subtotal State Wildlife Grant	\$550,536
RCA Funded Operating Expenses & Equipment	
Rent – Lease Buildings	83,761
Equipment (Fixed Assets)	74,500
Field Equipment & Misc. (Non-fixed Assets)	4,000
Office Supplies	5,000
Communications (Phones/DSL)	3,500
Maintenance – Computer Equipment	1,000
Training – Other	5,000
Subtotal RCA Funded O&E	\$176,761
Total Program Cost	\$1,677,835
Minus Total DFG Cost	- \$339,954
Minus State Wildlife Grant	- \$550,536
Grand Total RCA Cost	\$787,345

9.0 Contact Info

The FY 2011-12 Work Plan and Cost Estimate was prepared by the Monitoring Program Administrator and was submitted to the Regional Conservation Authority for approval. For more information, contact:

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