

**WESTERN RIVERSIDE COUNTY MSHCP  
BIOLOGICAL MONITORING PROGRAM  
FY 2015-16 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 2015-16 continue the activities commenced in the previous fiscal year and follow the framework outlined in section 5.3 of the MSHCP. Fiscal Year 2015-16 continues a significant transition period for the Monitoring Program as it shifts into the Long-term Monitoring Phase.

## **2.0 RESPONSIBILITIES**

Monitoring Program activities are 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 Wildlife (CDFW, formerly Department of Fish and Game) was the Monitoring Program Administrator for the first eight years of the permit (June 2004 – June 2012). In 2007 the CDFW received a federal State Wildlife Grant to support its role as the Monitoring Program Administrator and develop a long-term monitoring strategy. This grant expired in June 2012 with the primary deliverable being the long-term monitoring strategy document briefly described below. CDFW will continue to provide resources to support the Monitoring Program (vehicles and accessible staff) as available. These resources are expected to be minimal moving forward (i.e., one staff and one vehicle in FY 2015-16).

The Monitoring Program Administrator works closely with the RCA to develop and implement the annual work plan and budget. The annual work plan is carried out by the Monitoring Program Administrator using staff contracted by the RCA through the Santa Ana Watershed Association (SAWA) and CDFW staff.

## **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 was little existing scientifically-based

data for the majority of Covered Species, the first eight years of the Monitoring Program were devoted to an Initial Inventory and Assessment Phase. The purpose of the Inventory Phase was 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 was necessary to standardize data collection, to test the reliability of survey methods, to determine feasible and useful monitoring metrics, and to provide a confidence level that unobserved species are truly absent at the survey location, rather than overlooked.

The gradual transition from Inventory Phase to Long-term Monitoring Phase has been underway since 2012. For species with short reporting requirements such as Quino checkerspot butterfly (annual) or coastal California gnatcatcher (every three years) long-term monitoring is already in place. Multiple surveys for species with short reporting requirements have been conducted, providing the initial data points for population trend assessment. 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.

The transition into long-term monitoring involves developing monitoring metrics that are efficient to collect and robust measures of species status and population trend. The baseline monitoring objective for all Covered Species requires at least 75 percent of listed Core Areas or known locations to be documented as occupied at least once every eight years. As described in the Long-term Monitoring Strategy document developed by the Monitoring Program, monitoring protocols that provide additional information such as relative abundance of populations at occupied locations, reproductive success, or health of observed individuals will be employed whenever possible, to provide the most useful representations of species status. Monitoring Program staff have been collaborating with researchers at the University of California Riverside Center for Conservation Biology to develop conceptual models of Covered Species and their habitats that can help identify key population drivers and environmental stressors upon which management can act.

One of the explicit 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., riparian vegetation) 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.

The Long-term Monitoring Strategy describes a two-level design that gives priority to assessing the status of Covered Species as stated in the species-specific conservation objectives of the Plan which emphasize the continued occupancy of MSHCP-defined Core Areas or other areas of known occurrence. For some species, the objectives require that reproduction and/or minimum densities of individuals within species Core Areas be verified. The second level extends sampling for terrestrial vertebrates to the

entire Conservation Area in a cost-efficient manner. The Long-term Monitoring Strategy document also includes chapters describing monitoring goals and objectives, sample design considerations, proper protocol development, data and information management strategies, collaboration and communication with other organizations, and describes the organizational framework of the Monitoring Program.

#### **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)
- Data 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. Monitoring Program staff hired to replace departing staff in FY 2015-16 will be hired through SAWA. One Program Lead is currently provided by the CDFW, with funding from Caltrans.

#### **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 and maintain 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 requested presentations to the RCA Board
- Coordinate with Wildlife Agencies (CDFW and U.S. Fish and Wildlife Service) on survey methodology and monitoring activities
- Develop and maintain Program operations manual
- Oversee writing 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, Data Manager, Taxa Program Leads, and Field Crew:

- Develop field survey protocols and sampling designs
- Conduct field surveys using multi-species protocols when possible, and specific species protocols when necessary
- Conduct vegetation condition 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, animal handling procedures, plant specimen collection, 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. 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). Safety training (e.g., wilderness first aid, CPR) is provided to all incoming staff, and as often as needed to existing staff to keep American Red Cross certifications up-to-date. 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 digital data collection devices. 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, Data 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 and maintenance
- Data entry and quality control
- Data analysis using statistics
- Annual survey report writing
- Maintaining computer equipment and digital data collection devices

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

## **6.0 MONITORING EFFORTS IN FY 2015-16**

Monitoring Program activities planned for FY 2015-16 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 is a high priority species). Funding availability and extent of effort required is also considered when determining monitoring activity priority. Monitoring Program biologists help with ongoing MSHCP Management Program activities that benefit Covered Species (e.g., aquatic invasive species removal/control) to the fullest extent possible.

An overview of the monitoring efforts planned for FY 2015-16 along with a brief rationale for surveys is provided below. Detailed survey methods 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 continued funding from the RCA and the amount of support provided by the CDFW.

## **6.1 Invertebrates**

### **6.1.1 Quino Checkerspot Butterfly Survey**

The species objectives for Quino checkerspot butterfly require annual documentation of its distribution. The Monitoring Program has surveyed for Quino checkerspot butterfly in the Conservation Area during the last 11 biological years. In FY 2015-16 survey efforts will continue to focus on monitoring locations occupied within the last five years and surveying for the species in suitable habitat close to occupied areas. Monitoring Program biologists will coordinate with Reserve Managers conducting surveys for Quino checkerspot butterfly to avoid duplication of effort.

### **6.1.2 Delhi Sands Flower-Loving Fly (Delhi 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. There is currently just one Core Area with conserved land containing suitable habitat for the species. Because Delhi fly is an endangered species with an extremely limited distribution within the Plan Area, Monitoring Program biologists have surveyed for Delhi fly within the lone accessible Core Area during the last 11 biological years.

Surveys allowing calculation of density estimates of Delhi fly within its accessible Core Area were conducted from 2005-2010. In 2011 these efforts were reduced to simply documenting successful reproduction, greatly reducing necessary resources. However, the Management Program has recently been conducting management actions to control the spread of non-native vegetation within occupied habitat, and to potentially open up more habitat at the edges of the recently occupied area. In order to properly assess the effectiveness of these actions, the more intensive study design allowing a density estimate of Delhi fly to be calculated was conducted in FY 2014-15 and will be continued in FY 2015-16.

### **6.1.3 Fairy Shrimp Survey**

The species objectives for Santa Rosa Plateau, Riverside, and vernal pool fairy shrimp require the continued use of listed Core Areas at least once every eight years. Surveys on accessible lands within listed Core Areas for covered fairy shrimp have been conducted by Monitoring Program biologists in several years

during the Inventory Phase when adequate rainfall filled pools with water. The species-specific monitoring objective has been met for Santa Rosa Plateau fairy shrimp but 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 2015-16 to create new pools in areas already surveyed, or if additional lands are acquired.

## **6.2 Birds**

### **6.2.1 California Gnatcatcher Survey**

The species objectives for California gnatcatcher require continued use and successful reproduction within Core Areas at least once every three years. Targeted surveys for California gnatcatcher and associated coastal sage scrub birds were last conducted in FY 2013-14, with the objective for California gnatcatcher being achieved.

The U.S. Fish and Wildlife Service is organizing a regional monitoring survey effort for California gnatcatcher with the goals of conducting status and trend monitoring with habitat and species threat covariates, understanding post-fire population effects, and population responses to climate change. Participation in this larger-scope monitoring effort would also allow for the Monitoring Program to collect data needed to meet stated MSHCP objectives, with work beginning in FY 2015-16. There are at least two other covered bird species (rufous-crowned sparrow and Bell's sage sparrow) that occur in coastal sage scrub that can be monitored using the same survey protocol.

### **6.2.2 Nashville Warbler Survey**

The species objectives for Nashville warbler require focal surveys in the San Jacinto Mountains by Pine Cove and Lake Fulmor, their two designated Core Areas. Although unconfirmed, these are the two locations the species is presumed to have bred in the past. Monitoring Program biologists have previously detected Nashville warbler twice during the breeding season outside of the San Bernardino National Forest and several times within the San Bernardino National Forest but not during the breeding season. Focused surveys in FY 2015-16 will be conducted during the breeding season near Pine Cove and Lake Fulmor to confirm whether or not the species is currently breeding at those locations.

### **6.2.3 Tricolored Blackbird Survey**

Due to a precipitous population decline and widespread habitat loss, the tricolored blackbird was emergency-listed as an Endangered Species by the California Fish and Game Commission in December 2014. The species

objectives for tricolored blackbird require documenting the continued use and successful reproduction in at least one of five Core Areas every five years. Targeted surveys in 2014 confirmed that the objective as written is currently minimally achieved. However, populations in Riverside County, southern California and state-wide remain near historic lows. Management actions and public outreach activities are underway to enhance breeding and foraging habitat on conserved land and to avoid take of the species on private land. Tricolored blackbirds concentrate their breeding effort at only a few sites in any given year making each colony critical and relatively easy to monitor. Surveys to document population and reproduction status at sites with tricolored blackbird in FY 2015-16 will be conducted pending staff availability in order to continue providing updated information for adaptive management. The Tricolored Blackbird Working Group leads a state-wide census survey every three years, but is working on developing a sampling regime that could be implemented state-wide annually. Monitoring Program surveys would be incorporated into this larger effort.

#### 6.2.4 Raptor Reproduction Monitoring

The species objectives for turkey vulture and golden eagle require the continued use of and successful reproduction at known nesting locations every three, and eight years, respectively. Targeted surveys for turkey vulture nests were last conducted in 2008, and for golden eagle nests in 2012-2013. Future efforts will emphasize the vigilant tracking of raptor behavior while biologists are conducting other targeted survey work (e.g., coastal sage scrub, riparian, lake bird surveys) and regularly visiting known nest locations mentioned in the MSHCP or by local birders during the nesting season. Although the listed objectives for bald eagle do not require documentation of successful nesting within the Conservation Area, biologists will track bald eagle nests along with turkey vulture and golden eagle nests, as they are discovered. Because of the hopefully more efficient but less dependable nature of data resulting from this opportunistic effort, a report or reports summarizing the current status of these species and progress towards meeting species objectives will be written when there are significant results to convey.

#### 6.2.5 Burrowing Owl Monitoring

The species objectives for burrowing owl require the conservation of five Core Areas plus interconnecting linkages, containing a total breeding population of at least 120 owls with no fewer than five pairs in any one Core Area. Several land managers within the Conservation Area have installed artificial burrows and are managing vegetation for burrowing owl. Monitoring Program biologists will coordinate with Reserve Managers to be sure that breeding pair counts are conducted at locations known to recently support owls, or where owls have been recently actively translocated.

In FY 2015-16 continued monitoring of artificial burrows installed across the Conservation Area will be conducted three times per year as according to the

Western Riverside County MSHCP Burrowing Owl Management Plan. Additional surveys to obtain an accurate count of breeding pairs of burrowing owls within Core Areas will be conducted as needed by Monitoring Program biologists in FY 2015-16 to document distribution and reproduction of burrowing owl whether at artificial or natural burrow locations. Monitoring Program biologists will coordinate with Reserve Managers to avoid duplication of effort.

## **6.3 Amphibians and Reptiles**

### **6.3.1 Reptile Survey**

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.

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. Collection of incidental observations both from Monitoring Program biologists and partnering agencies will continue to be essential. 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 suitable habitat within Core Areas for these species when personnel are available. These targeted area searches will be significantly less labor-intensive than previous survey methods, and will also result in detections of the following Covered Species: Belding's orange-throated whiptail, coastal western whiptail, granite spiny lizard, northern red-diamond rattlesnake, San Diego horned lizard and southern sagebrush lizard.

### **6.3.2 Amphibian Stream Survey**

After conclusion of the Inventory Phase, species objectives for arroyo toad, mountain yellow-legged frog, California red-legged frog, and coast range newt require documentation of successful breeding populations within the Conservation Area at least every five or eight years. California red-legged frog may be extirpated from the Plan Area as no individuals have been observed by Monitoring Program biologists or reliably reported to the Monitoring Program since 2004. Ongoing efforts carried out by the U.S. Forest Service and U.S. Geological Survey largely account for mountain yellow-legged frog survey needs. Therefore, recent survey priority has been given to streams with appropriate habitat for arroyo toad (species objective was not met during Inventory Phase) and coast range newt (objective met in 2009). Surveys for stream-dependent amphibians began again in FY 2014-15 but are expected to take more than one year to complete. Ongoing Monitoring Program surveys will be conducted in conjunction with efforts carried out by the U.S. Forest Service and U.S. Geological Survey.

### 6.3.3 Western Spadefoot Survey

The species objectives for western spadefoot require maintaining successful reproduction at 75 percent of conserved breeding locations as measured once every eight years. Early Monitoring Program surveys for western spadefoot were mostly conducted as part of vernal pool monitoring also targeting covered fairy shrimp species. Surveys targeting western spadefoot in FY 2015-16 will be decoupled from fairy shrimp/vernal pool surveys to better address the species objectives for western spadefoot, which are not currently met. 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 2015-16. 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.

### 6.3.4 Western Pond Turtle Trapping

The species objectives for western pond turtle require the continued use of at least 75 percent of conserved Core Areas as measured once every three years. Surveys for western pond turtle in 2011 and 2012 confirmed that the objective was minimally met in the last reporting period. While larger populations were present in five Core Areas, just one pond turtle was captured in the San Jacinto River Core Area and no pond turtles were detected in the Chino Creek, and Temecula Creek Core Areas. If land with potentially suitable habitat has been acquired or significant habitat management has occurred within previously unoccupied cores, these cores will be resurveyed in FY 2015-16. However, the conserved areas within these cores were not appropriate for pond turtles during previous surveys so they will not be resurveyed without the above conditions. Previously occupied cores will be resurveyed in FY 2015-16 to determine the current status of the species within the Conservation Area. Additionally, if any turtles are translocated into occupied or unoccupied Core Areas, Monitoring Program biologists will monitor the results of these efforts.

## **6.4 Mammals**

### 6.4.1 Small Mammal Trapping

San Bernardino kangaroo rat is narrowly distributed within the Plan Area. The species-specific objectives require that at least 75% of the assumed 4,440 acres of suitable habitat in the Conservation Area be occupied and that at least 20% of the occupied area have a density of at least five animals per hectare. Monitoring Program trapping efforts primarily targeting Los Angeles pocket mouse in 2011 and 2012 confirmed that San Bernardino kangaroo rat was present in several areas along the San Jacinto River, although the trapping area was not extensive enough to determine whether the species objective is currently met. Targeted

surveys to determine the current distribution and density of San Bernardino kangaroo rat within the historic flood plains of the San Jacinto River and Bautista Creek and their tributaries began in late FY 2014-15 and will continue in FY 2015-16.

#### 6.4.2 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 in FY 2015-16, primarily using motion-triggered cameras to record images of target species.

While motion-triggered cameras and incidental observations provide regular data points for bobcat, coyote and mountain lion, previous analysis of survey techniques has shown that scent stations along transects following likely movement corridors is the most effective means to document long-tailed weasel occurrences. These surveys were last conducted in 2009 and can take more than one year to complete given the extent of the survey area. Pending staff availability, Monitoring Program biologists will conduct carnivore scent station surveys in habitat blocks and corridors particularly targeting long-tailed weasel in FY 2015-16. These surveys should additionally result in significant detections of other carnivore species.

#### 6.4.3 Brush Rabbit Surveys

Brush rabbit occurs throughout the Plan Area in suitable habitat. The species objectives for brush rabbit require the conservation of at least 18 Core Areas and interconnecting linkages. Species presence and continued use must be maintained at 75% of these areas at least once every eight years. While there are occasional reports of incidental observations of brush rabbit, Monitoring Program biologists had not conducted focused surveys for this species until FY 2014-15. Without having individuals in-hand, brush rabbit can be easily confused with desert cottontail as their ranges overlap and appearances are very similar. Thus, FY 2014-15 survey efforts involved live-trapping for rabbits within Core Areas. However, trap success was low. Pending staff availability, Monitoring Program biologists will conduct focused trapping for brush rabbit at additional locations within Core Areas in FY 2015-16. These surveys can be conducted in the less demanding fall and winter seasons, increasing their feasibility. Biologists will also deploy rabbit traps in the vicinity of small mammal traps when feasible to increase efficiency. Finally, the feasibility of using genetic analysis of scat pellets will be investigated to confirm brush rabbit presence at monitored locations.

## **6.5 Plants**

### **6.5.1 Rare Plant Survey**

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 2015-16 will continue efforts to update the current status of Covered Species on conserved lands. The focal species in any given year are dependent on weather conditions and accessibility of survey 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 2015-16 will focus on conducting surveys for covered plant species at recently acquired properties, documenting required localities for species not adequately conserved, and revisiting locations previously 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. Targeted surveys for Engelmann oaks were last conducted in FY 2011-12. Surveys for Engelmann oaks in FY 2015-16 will reproduce prior efforts to measure current recruitment within accessible lands in the Conservation Area.

### **6.5.3 Riparian Vegetation Monitoring**

The MSCHP requires the Monitoring Program to assess the condition of vegetation communities within the Conservation Area (Vol. 1, Sec. 5.3.2). A CDFW grant-funded update to the existing GIS-based vegetation community map was delivered in March 2015. This product will be extremely useful in comparing acreage, distribution and broad-scale vegetation condition changes in communities throughout the Plan Area. On-the-ground vegetation community monitoring efforts in recent years have focused on documenting the status of riparian vegetation within the Conservation Area. A pilot survey to determine a list of feasible goals, optimal methods, and achievable, useful results was initiated in the winter of 2012-13. RCA-managed properties that were high priorities for future restoration efforts were primarily targeted. FY 2015-16 vegetation community monitoring efforts will continue the percent cover-based sample design with an expanded distribution of sampling locations to better represent the extent of riparian vegetation within the Conservation Area.

### **6.5.4 Vegetation Surveys**

Vegetation surveys are conducted by trained botanists in conjunction with wildlife survey efforts as practicable and appropriate. 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.

**7.0 SCHEDULE OF MONITORING EFFORTS FOR FY 2015-16**

Below is a tentative calendar of when surveys are planned for FY 2015-16. 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 2014-15.

| Survey                        | Jul15 | Aug15 | Sep15 | Oct15 | Nov15 | Dec15 | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Quino Checkerspot Survey      |       |       |       |       |       |       |       |       |       |       |       |       |
| Delhi Fly Survey              |       |       |       |       |       |       |       |       |       |       |       |       |
| Fairy Shrimp Survey           |       |       |       |       |       |       |       |       |       |       |       |       |
| California Gnatcatcher Survey |       |       |       |       |       |       |       |       |       |       |       |       |
| Nashville Warbler Survey      |       |       |       |       |       |       |       |       |       |       |       |       |
| Tricolored Blackbird Survey   |       |       |       |       |       |       |       |       |       |       |       |       |
| Raptor Reproduction Survey    |       |       |       |       |       |       |       |       |       |       |       |       |
| Burrowing Owl Monitoring      |       |       |       |       |       |       |       |       |       |       |       |       |
| Reptile Survey                |       |       |       |       |       |       |       |       |       |       |       |       |
| Amphibian Stream Survey       |       |       |       |       |       |       |       |       |       |       |       |       |
| Western Spadefoot Survey      |       |       |       |       |       |       |       |       |       |       |       |       |
| Western Pond Turtle Trapping  |       |       |       |       |       |       |       |       |       |       |       |       |
| Small Mammal Trapping         |       |       |       |       |       |       |       |       |       |       |       |       |
| Carnivore Surveys             |       |       |       |       |       |       |       |       |       |       |       |       |
| Brush Rabbit Surveys          |       |       |       |       |       |       |       |       |       |       |       |       |
| Rare Plant Survey             |       |       |       |       |       |       |       |       |       |       |       |       |
| Engelmann Oak Study           |       |       |       |       |       |       |       |       |       |       |       |       |
| Riparian Veg Monitoring       |       |       |       |       |       |       |       |       |       |       |       |       |

**8.0 BIOLOGICAL MONITORING PROGRAM COST ESTIMATE FOR FY 2015-16**

The RCA has primary responsibility for funding the Monitoring Program. However, the CDFW funds a small portion of the Monitoring Program based on the availability of the State’s budget. The proposed FY 2015-16 Biological Monitoring Program budget is similar to previous budgets submitted to and approved by the RCA Board of Directors. The majority of funding is allocated to a contract with the Santa Ana Watershed Association for staff.

| <b>ALLOCATION</b>                                      | <b>COST</b>        |
|--|--------------------|
| <b>CDFW Funded Labor &amp; Supplies</b>                |                    |
| Biologist  | 81,445             |
| Vehicle Usage (Fuel & Maintenance)                     | 7,200              |
| Office Support (Internet service)                      | 1,000              |
| Subtotal CDFW Funded Labor & Vehicles                  | \$89,645           |
| <b>RCA Funded Contracts</b>                            |                    |
| Santa Ana Watershed Association (staff)                | 927,725            |
| Santa Ana Watershed Association (staff reimbursements) | 2,000              |
| Subtotal RCA Funded Contracts                          | \$929,725          |
| <b>RCA Funded Operating Expenses &amp; Equipment</b>   |                    |
| Rent – Lease Buildings                                 | 83,781             |
| Field Equipment & Misc. (Non-fixed Assets)             | 4,000              |
| Office Supplies  | 4,000              |
| Communications (Phones)                                | 7,000              |
| Maintenance – Computer Equipment                       | 13,120             |
| Computer Software (GIS License renewals)               | 1,189              |
| Training – Other                                       | 4,000              |
| Vehicle Fuel and Maintenance                           | 25,000             |
| Subtotal RCA Funded O&E                                | \$142,090          |
| Total Program Cost                                     | \$1,161,460        |
| Minus Total CDFW Cost                                  | - \$89,645         |
| <b>Grand Total RCA Cost</b>                            | <b>\$1,071,815</b> |

## **9.0 Contact Info**

The FY 2015-16 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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