

**WESTERN RIVERSIDE COUNTY MSHCP
BIOLOGICAL MONITORING PROGRAM
FY 2016-17 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 2016-17 continue the activities commenced in the previous fiscal year and follow the framework outlined in section 5.3 of the MSHCP. Fiscal Year 2016-17 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 to be 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. The grant expired in June 2012 with the primary deliverable being the long-term monitoring strategy document briefly described below. CDFW continues to provide resources to support the Monitoring Program in the form of one dedicated Monitoring staff member and vehicles. These resources are expected to continue moving forward.

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 2016-17 will be hired through SAWA. One Program Lead is currently provided by the CDFW, with endowment 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, checked for accuracy, and certified by the Data Manager. After data are certified, they are analyzed and interpreted 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 2016-17

Monitoring Program activities planned for FY 2016-17 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 2016-17 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 12 biological years. In FY 2016-17 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 12 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 revisited in FY 2014-15 and FY 2015-16, and will continue in FY 2016-17.

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 were 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. Ongoing fairy shrimp surveys may be conducted in vernal pools within necessary Core Areas if there is adequate rainfall in FY 2016-17 to create new pools in areas already surveyed, or if additional lands are acquired.

6.2 Birds

6.2.1 California Gnatcatcher Nest Searching

The species objectives for California gnatcatcher require continued use and successful reproduction within Core Areas at least once every three years. In FY 2015-16 the U.S. Fish and Wildlife Service organized a regional monitoring 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. Monitoring Program biologists participated in this larger-scope monitoring effort which also allowed for the Monitoring Program to collect data needed to meet stated MSHCP objectives. However, because the regional monitoring protocol did not include nest searching, additional surveys in spring and early summer 2017 (FY 2016-17) will be conducted as needed to document reproduction of California gnatcatcher if it is occurring. Distribution data for other covered bird species (e.g., rufous-crowned sparrow and Bell's sage sparrow) that occur in coastal sage scrub will also be collected.

6.2.2 Riparian Bird Survey and Nest Searching

The species objectives for least Bell's vireo, willow flycatcher, and yellow-billed cuckoo require continued use and successful reproduction within Core Areas once every three years. Targeted surveys for riparian birds were last conducted in the spring of 2014. Surveys in FY 2016-17 will target the above species in accessible riparian habitat within designated Core Areas. Nest searching to demonstrate successful reproduction will occur in conjunction with the riparian bird survey. Distribution and reproduction data for all other covered riparian bird species (e.g., yellow warbler, yellow-breasted chat, white-tailed kite) with longer reporting requirement intervals will also be recorded.

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 2015 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 2016-17 will be conducted pending staff availability in order to continue providing updated information for adaptive management.

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. Survey efforts in FY 2016-17 will emphasize the vigilant tracking of raptor behavior while biologists are conducting other targeted survey work (e.g., California gnatcatcher and riparian 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 2016-17 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 2016-17 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. Survey efforts targeting the above species in FY 2016-17 will include distributing a new type of artificial cover constructed of multiple layers of corrugated non-toxic roofing material to provide additional opportunities for species detections at survey locations. Biologists will distribute these artificial cover objects during the first survey of a given location and any subsequent searches will include checks of the cover to determine if target or non-target species are using them.

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 ranging from every five to every 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 (monitoring objective was not met during Inventory Phase) and coast range newt (monitoring objective currently met). Surveys for stream-dependent amphibians are ongoing, in conjunction with efforts carried out by the U.S. Forest Service and U.S. Geological Survey, and subject to appropriate survey conditions (i.e., adequate rainfall).

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 2016-17 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 2016-17. 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.

Surveys in FY 2014-15 and 2015-16 have targeted large populations at the Santa Margarita Ecological Reserve and Santa Rosa Plateau Ecological Reserve. Surveys in FY 2016-17 will expand to include the smaller populations within recently occupied Core Areas to determine the current status of the species within the Conservation Area. If land with potentially suitable habitat has been acquired or significant habitat management has occurred within previously unoccupied cores, these cores will also be resurveyed in FY 2016-17. 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.

6.4 Mammals

6.4.1 Small Mammal Trapping

The species objectives for Aguanga kangaroo rat 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. Aguanga kangaroo rat was detected during previous small mammal trapping surveys targeting Los Angeles pocket mouse and a targeted Aguanga kangaroo rat survey effort was

last conducted in FY 2010-11. Results from these efforts confirmed that Aguanga kangaroo rat is extremely narrowly distributed within the Plan Area.

Small mammal trapping efforts targeting Aguanga kangaroo rat were initiated again in the latter part of FY 2015-16 and will continue at the beginning of FY 2016-17. These surveys will attempt to reconfirm recently occupied habitat and determine whether or not any population expansion has occurred since the FY 2010-11 trapping effort.

The species objectives for Los Angeles pocket mouse require the Monitoring Program to demonstrate that populations are stable or increasing in seven Core Areas and that at least 4,200 acres are occupied every eight years. This species objective requires distribution and population trend information and thus require more than one year's survey effort to determine whether or not this objective is being met. Small mammal trapping efforts targeting Los Angeles pocket mouse were last conducted from 2009 – 2012. Survey effort beginning in FY 2016-17 will begin after completion of Aguanga kangaroo rat-focused trapping and will concentrate on obtaining current species distribution information. It is expected that the Los Angeles pocket mouse trapping effort will also yield significant information about other covered small mammals.

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 linkages will continue in FY 2016-17, 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 2016-17. These surveys should additionally result in significant detections of other carnivore species. Furthermore, Monitoring Program biologists are exploring potential collaborations with other researchers using specially-trained dogs to detect rare species. Long-tailed weasel is a species with typically low densities, broad distribution area, and a life history pattern that makes it difficult for biologists to detect. However the scent left behind by long-tailed weasels should be easily identified by properly trained dogs. The cost and logistics of such a survey are being researched and any potential application will be

thoroughly field-tested before accepting results as confirmation of species presence and documentation of species objective status.

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 and FY 2015-16 survey efforts involved live-trapping for rabbits within Core Areas to determine the feasibility of this strategy for broader scale monitoring within the Plan Area. However, trap success was low, suggesting the possible need for alternate or supplementary methods of monitoring brush rabbits.

Pending staff availability, Monitoring Program biologists will continue focused trapping for brush rabbit at additional locations within Core Areas in FY 2016-17. 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 practical to increase efficiency.

Two additional techniques are also being considered as possibilities to increase the variety of monitoring methods for brush rabbits. The first involves using genetic analysis of scat pellets to confirm brush rabbit presence at monitored locations and would require partnership with a research institution set up for genetic analysis. The second involves deploying the same specially-trained detection dogs as described in the Carnivore Surveys section above to detect brush rabbits. As with long-tailed weasel and any other Covered Species being considered, surveys using detection dogs will be thoroughly field-tested before accepting results as confirmation of species presence and documentation of species objective status.

6.5 Fish

6.5.1 Arroyo Chub Survey

The species objectives for arroyo chub require documenting the presence of this fish in 75 percent of its identified Core Areas in the Santa Ana and Santa Margarita watersheds. The monitoring objective for arroyo chub is not currently met. In FY 2016-17, the Monitoring Program will conduct surveys in the Santa Margarita watershed to reassess species status. In the Santa Ana watershed, the Monitoring Program will continue to coordinate with other local groups conducting native fish surveys.

6.6 Plants

6.6.1 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 2016-17 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 2016-17 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.

6.6.2 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 initiated again in FY 2015-16 and reproduced prior efforts to measure current recruitment within accessible lands in the Conservation Area. The large majority of Engelmann oaks within the Plan Area are found at the Santa Rosa Plateau Ecological Reserve which was thoroughly surveyed in FY 2015-16. However, smaller populations exist at the Southwestern Riverside County Multi-Species Reserve and the Santa Margarita Ecological Reserve. These smaller populations will be visited in FY 2016-17, completing the survey effort for the current five-year period. Any other remnant individual trees at additional locations are incorporated into the general rare plant survey effort as described above to reconfirm presence at known locations.

6.6.3 Vegetation Community Monitoring

In addition to monitoring-focused conservation objectives for each Covered Species, 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 targeted coastal sage scrub (CSS) and CSS-grassland and CSS-chaparral transition areas from 2008 – 2012. Documenting the status of riparian vegetation within the Conservation Area has been the focus in recent years. These surveys have concentrated on

determining a list of feasible goals, optimal methods, and achievable, useful results. RCA-managed properties that were high priorities for future restoration efforts have been primarily targeted. Pending staff availability, FY 2016-17 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.

6.6.4 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 2016-17

Below is a tentative calendar of when surveys are planned for FY 2016-17. 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 2015-16.

Survey	Jul16	Aug16	Sep16	Oct16	Nov16	Dec16	Jan17	Feb17	Mar17	Apr17	May17	Jun17
Quino Checkerspot Survey												
Delhi Fly Survey												
Fairy Shrimp Survey												
California Gnatcatcher Nest Searching												
Riparian Bird Survey and Nest Searching												
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												
Arroyo Chub Survey												
Rare Plant Survey												
Engelmann Oak Study												
Vegetation Community Monitoring												

8.0 BIOLOGICAL MONITORING PROGRAM COST ESTIMATE FOR FY 2016-17

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 2016-17 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.

ALLOCATION	COST
CDFW Funded Labor & Supplies	
Biologist	\$ 97,212
Vehicle Usage (Fuel & Maintenance)	7,200
Office Support (Internet service)	1,000
Subtotal CDFW Funded Labor & Vehicles	\$ 105,412
RCA Funded Contracts	
Santa Ana Watershed Association (staff)	\$ 940,365
Santa Ana Watershed Association (staff reimbursements)	2,000
Subtotal RCA Funded Contracts	\$ 942,365
RCA Funded Operating Expenses & Equipment	
Rent – Lease Buildings	\$ 83,781
Field Equipment & Misc. (Non-fixed Assets)	5,500
Office Supplies	4,000
Communications (Phones)	7,000
Maintenance – Computer Equipment	13,500
Computer Software (GIS License renewals)	1,188
Training	4,000
Vehicle Fuel and Maintenance	25,000
Subtotal RCA Funded O&E	\$ 143,969
Total Program Cost	\$1,191,746
Minus Total CDFW Cost	-105,412
Grand Total RCA Cost	\$1,086,334

9.0 Contact Info

The FY 2016-17 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:

Western Riverside County MSHCP
Monitoring Program Administrator
Karen Riesz
4500 Glenwood Drive, bldg C
Riverside, CA 92501
kriesz@biomonitoringrca.org