

**Western Riverside County
Multiple Species Habitat Conservation Plan (MSHCP)
Biological Monitoring Program**

Coast Range Newt (*Taricha tarosa tarosa*)
Survey Report 2005



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(Revised September 19, 2006)

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NOTE TO READER:

This report is an account of survey activities undertaken by the Biological Monitoring Program for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP was permitted in June of 2004. The Biological Monitoring Program monitors the distribution and status of the 146 Covered Species within the Conservation Area to provide information to Permittees, land managers, the public and the Wildlife Agencies (i.e. the California Department of Fish and Game and the U.S. Fish and Wildlife Service). Monitoring Program activities are guided by the MSHCP Species Objectives for each Covered Species, the MSHCP information needs identified in Section 5.3 or elsewhere in the document, and the information needs of the Permittees.

The primary preparer of this report was the 2005 amphibian Field Crew Leader, Shirley Bartz. If there are any questions about the information provided in this report, please contact the Monitoring Program Administrator. If you have questions about the MSHCP, please contact the Executive Director of the Western Riverside County Regional Conservation Authority. For further information on the MSHCP and the RCA, go to www.wrc-rca.org

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OVERVIEW

There are four Covered stream-dependent amphibian species with species objectives requiring the determination of successful reproduction within the MSHCP Conservation Area that can be detected by visual encounter surveys: arroyo toad (*Bufo californicus*), California red-legged frog (*Rana aurora draytonii*), mountain yellow-legged frog (*Rana muscosa*), and coast range newt (*Taricha torosa torosa*). In 2005, the Monitoring Program coordinated with the U.S. Geological Survey (USGS) on a stream survey protocol to assess the quality of stream habitats for the above Covered amphibian species. Stream assessment surveys were conducted in accessible waterways in the Conservation Area between May and December 2005. Surveys for Covered amphibians generally used the same protocol (with the exception of night surveys for California red-legged frog), but differed in the waterways surveyed and time of year surveys took place. This report describes methodology and survey results for coast range newt only. Individual survey reports have been prepared for mountain yellow-legged frog, California red-legged frog, and arroyo toad and are not discussed further in this report.

INTRODUCTION

The coast range newt (*Taricha torosa torosa*, “CRNT”) is a California species of special concern. CRNT has narrow habitat requirements and requires specific breeding conditions with a limited distribution in the MSHCP Plan Area. The known distribution of CRNT is restricted to the Santa Ana Mountains bioregion. Terrestrial habitats for this species generally include grassland, woodland, and forest. However, breeding activities are limited to streams and creeks that exhibit “pool and run” hydrology, with breeding occurring in deep pools and oviposition in slow-moving runs. Species objective 5 for CRNT states:

“within the MSHCP Conservation Area, Reserve Managers will maintain occupancy of at least 75% of the occupied coast range newt habitat and determine if successful reproduction is occurring as measured by the presence/absence of larvae or egg masses once a year for the first five years after permit issuance”. (Dudek and Associates 2003).

Survey Goals

The intent of surveys in 2005 for CRNT was to survey known breeding locations within Core Areas and other potentially suitable habitat in accessible areas of the Plan Area (i.e., Santa Ana Mountain bioregion). Because the timing of CRNT breeding activity overlapped with breeding activity of other Covered amphibian species, we used a community survey approach to collect data on CRNT reproductive success. In this way, migrating or mating adults and egg masses would be encountered during diurnal stream surveys and foraging larvae would be detected during nocturnal surveys. Specifically, our surveys goals were to:

- A) Document CRNT breeding locations in Santa Ana Mountains bioregion.
- B) Collect data to estimate occupancy in the area of inference (surveyed streams and similar habitat).
- C) Evaluate the use of community surveys to detect CRNT reproductive success.

- D) Provide input on changes/additions to field methodology for future surveys.
- E) Share survey data with Reserve Managers who will evaluate the information and take steps to change or maintain management strategies.

METHODS

Protocol Development

The USGS Western Ecological Research Center, San Diego Field Station drafted the protocol, *USGS Aquatic Species and Habitat Assessment Protocol for Southcoast Ecoregion Rivers, Streams, and Creeks* (USGS 2005), which was used by the Monitoring Program for amphibian stream surveys in 2005. Minor revisions were made to the protocol to ensure it would meet the requirements of the MSHCP species objectives for CRNT and other covered amphibian species. Since the protocol has not been finalized by USGS, it was not included as an Appendix to this report. A copy of the protocol can be found in the Monitoring Program office or by contacting USGS directly.

Personnel and Training

All field observers took part in discussion of and training in the use of the USGS amphibian survey protocol on 27 July 2005. Lead surveyor training included observation of live and preserved adult and larval specimens of coast range newts. Training took place at locations where CRNT have been detected. Other amphibian crew members also attended the USGS training session and were accompanied by lead surveyors on all stream surveys during which time identification skills were tested and verified. Biological Monitoring Program surveyors conducting CRNT surveys in 2005 included:

- Adam Malisch (Regional Conservation Authority)
- Shirley Bartz (Regional Conservation Authority)
- Debbie De La Torre (Regional Conservation Authority)
- Christine Rothenbach (Regional Conservation Authority)
- Kimberly Oldehoeft (Regional Conservation Authority)
- Ricky Escobar (California Department of Fish and Game)
- Annie Bustamante (California Department of Fish and Game)
- Rosina Gallego (California Department of Fish and Game)
- Karin Cleary-Rose (U.S. Fish and Wildlife Service)
- Brian Root (U.S. Fish and Wildlife Service)

Study Site Selection

Study sites were chosen using a GIS map of historic locations. Surveys were conducted within accessible lands in the Santa Ana Mountains bioregion, as well as other suitable habitat in the Conservation Area. Additional suitable habitat was identified using habitat characteristic descriptions in the MSHCP species account for CRNT. Selection characteristics included streams with:

- Riparian areas from sea level to 1830 m (~ 6000 f)

- Stream hydrology characterized by deep pools and slow-moving runs
- Riparian and upland habitat characterized as grassland, woodland, or forest

Habitat types included sycamore/alder, willow scrub, oak woodland, and grassland communities, as well as mixed elements of these habitats. Waterways surveyed in the Santa Ana Mountains included Los Alamos, San Mateo, San Juan, and Tenaja Creeks. Cole Creek and tributaries on the Santa Rosa Plateau were also surveyed by Mark Jennings (during surveys for California red-legged frogs) and Biological Monitoring Program biologists.

Survey Methods

Survey methods are described in the USGS Aquatic Species and Habitat Assessment Protocol for South coast Ecoregion Rivers, Streams, and Creeks, 2005. All waterways (main creeks and tributaries) to be surveyed were sectioned into 250 m segments, with segment numbers beginning (Reach 1, Reach 2, etc.) at a downstream confluence with a larger order waterway. Daytime visual encounter and dip-net surveys were conducted along stream banks and within the channel from downstream to upstream areas by at least two surveyors. Survey time per segment varied according to streambed characteristics and abundance of amphibians detected. Surveys for CRNT occurred concurrently with larval surveys for arroyo toad, mountain yellow-legged frog, and California red-legged frog. CRNT surveys were conducted from 23 May to 1 December 2005, between the hours of 0900 and 2300.

Within each surveyed segment, data were collected when target and non-target amphibian species were detected. At the first encounter of each life stage (egg mass, larvae, adult) for all species detected, UTM coordinates were saved as waypoints in a GPS unit. Waypoints included a creek name code, tributary number, and reach (segment) number (Example: FM1R6 = Fuller Mill Creek, trib 1, reach 6) and were linked to a time/date.

Data on habitat characteristics were collected at the beginning and end of each surveyed segment. Data collected at the beginning of each surveyed segment included: date, observer, time, general weather description, temperature in shade at 1m above ground, average wind speed, presence/absence of water, water temperature, pH, percent dissolved oxygen, mg/L dissolved oxygen, conductivity, wetted depth and width of stream channel, water velocity and number of wetted channel braids. Data collected at the end of a survey included: presence and name of exotic plant species, percent wet length, percent shallow, medium and deep pools, presence and number of plunge pools, presence and type of aquatic refugia, percent of three most common aquatic substrates, presence and type of recent disturbance.

Night Surveys

The stream assessment surveys described above are best used to detect egg, and life stages of CRNT. Night surveys were also conducted to detect larval CRNT at suitable locations identified during daytime stream assessment surveys. The protocol for night surveys was similar to daytime surveys (i.e., visual encounter and dip-net techniques) with the exception that flashlights were used to look for the “eyeshine” of adult amphibians, and many of the stream

characteristics taken during the day were not taken during the night (e.g., water velocity, upland and riparian vegetation).

Data Analysis

The intent of the 2005 survey effort was to locate breeding populations of CRNT in the MSHCP Core Areas to meet MSHCP species objectives. In subsequent years where there is budget and crew available, data analyses will include a calculation of Proportion of Area Occupied (PAO, see MacKenzie et al. 2002). PAO will provide us with detection probability of coast range newt in surveyed creeks, which will in turn allow us to estimate CRNT occupancy in the Plan Area. Calculation of PAO requires multiple visits to survey locations. Although night surveys included revisits to waterways previously visited during day surveys, the number of revisited segments was very small ($n = 9$) and would not meet requirements of PAO analyses.

In addition to PAO, analyses of habitat characteristics and association of CRNT with predicted habitat variables will be conducted as sample size allows (estimated to follow 2006 field season). Habitat characteristics noted in the MSHCP as being strongly associated with presence of coast range newt will be analyzed for associations between presence (or non-presence) of the focal species.

Raw data are housed in the USGS database at the San Diego Field Station and at the Biological Monitoring Program office in Riverside.

RESULTS

In 2005, the Biological Monitoring Program surveyed waterways in Core Areas and five areas of suitable habitat, for a total of 93 segments (23.25 km; Table 1). Approximately 127 coast range newts (including adults and larvae) and 1 egg mass were detected (Table 2). Evidence of breeding CRNT populations was found at the following waterways in the Santa Ana Mountains bioregion (Figure 1):

- 1 segment of San Mateo Creek (larvae)
- 6 segments of Tenaja Creek (egg masses, larvae, and adults)
- 5 segments of San Juan Creek (larvae)
- 2 segments of Cole Creek (larvae and juvenile newt)

Habitat characteristics varied among waterways (Table 3a, Table 3b). Because CRNT surveys were conducted at night as well as during the day, data collected on night surveys did not include water velocity, upland, or riparian community characteristics. At creeks supporting breeding CRNT populations, the most common upland vegetation was Oak Woodland, with the most dominant vegetation layer consisting of California live oak (*Quercus agrifolia*). The most common riparian vegetation was California Sycamore (*Platanus racemosa*) and alder (*Alnus rhombifolia*). Water velocity in creeks supporting adult or larval coast range newts averaged 40 cm per second. This was very similar to the average velocity of all creeks surveyed for CRNT (37 cm/second).

DISCUSSION

Species objective 6 for CRNT requires the MSHCP to maintain occupancy of at least 75% of the occupied coast range newt habitat and determine if successful reproduction is occurring at known breeding locations within Core Areas and other potentially suitable habitat in accessible areas of the Plan Area MSHCP Conservation Area. Evidence of breeding CRNT was detected in 14 segments in 4 waterways in 2005. Due to constraints in crew sizes, survey efforts for CRNT were focused on the Cleveland National Forest and the Santa Rosa Plateau, which only account for coverage of approximately 60% of the MSHCP listed Core Areas (Santa Ana Mountain Bioregion and the Santa Rosa Plateau). Thus, only five of seven MSHCP identified breeding population locations were surveyed. As breeding activity in northern portions of the Santa Ana Mountains remains unknown, we cannot conclude that the MSHCP species objective stated above was met. The Monitoring Program will continue to conduct annual CRNT surveys for the first five years after permit issuance, as required by the MSHCP.

Water velocities where CRNT was detected in 2005 were not discernibly different from velocities where CRNT was not detected. This suggests that water velocity was appropriate for breeding CRNT throughout waterways where stream assessment surveys were conducted by the Biological Monitoring Program in 2005. Overall, habitat characteristics preferred by breeding CRNT (grassland and oak woodland riparian and upland habitats from sea level to 1830 m in elevation) were common at a majority of sites where community surveys were conducted.

Recommendations for Future Surveys

Below is a list of recommendations for future surveys for CRNT in western Riverside County.

1. Begin hiring crew and start surveying earlier in season. Hiring and time constraints resulted in a reduction in the number of waterways surveyed. Amphibian surveys conducted in 2005 included four species with overlapping activity schedules. If stream surveys had begun earlier more surveys could have been completed earlier, thus providing time for CRNT-specific surveys of the northern Santa Ana Mountains.
2. Hire more field crew members. An increase in the number of crew available for teams of surveyors would improve preparation survey timing described above.
3. Prioritize visits to waterways by creek size. Although 2005 proved to be a year of high water levels in Plan Area waterways, small creeks were still noted as dry late in the field season. By visiting smaller order creeks earlier in the field season, chances of missing breeding activity due to loss of habitat (i.e., evaporation) will be reduced.
4. Incorporate landscape/vegetation communities that apply specifically to the MSHCP. Many of the upland and riparian vegetation communities available for selection on the datasheets were not found in the Plan Area (San Diegan Sage Scrub). Amphibian surveyors would benefit from several pre-survey visits (accompanied by a botanist) with

the express purpose of identifying and categorizing communities common to CRNT habitat.

5. Collect data on proximity of human disturbance. Although riparian conditions may be suitable for development of larval CRNT, if upland conditions necessary for adult aestivation and juvenile dispersal are not available, or lost in the course of a breeding season, populations of CRNT will not persist. The addition of a measure of distance to nearest human disturbance will provide information on land area available to adult and juvenile life stages. A field for this variable needs to be added to the datasheet.

Data Sharing with Reserve Managers

Extreme winter precipitation in 2004-05 led to higher than average water levels in rivers and creeks of western Riverside County in 2005. It is highly probable that amphibian populations were effected by these high water levels. Increased water levels from March to July may have provided extended time for breeding and larval development, as well as greater prey and cover availability for adult and juvenile amphibians. It is also possible that high water levels resulted in increased flow and scouring in channels where CRNT had previously bred or developed into adult life stages.

The results of our surveys for CRNT in 2005 indicate that populations of this species may be breeding at levels high enough to satisfy the species goals of the MSHCP. The preparation of this report is the first step in a process by which survey data and management recommendations will be made available by the Biological Monitoring Program to Reserve Managers. Depending on climatic and other variables in this year and the next, comparisons of breeding activity to be reported in 2006 may provide Reserve Managers with some indication of population trends.

REFERENCES

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- MacKenzie, D.I., J. D. Nichols, B.L. Gideon , S. Droege, A. Royle, and C.A. Langtimm. 2002. Estimating site occupancy rates when detection probabilities are less than one. *Ecology*, 83: 2248 – 2255.
- University of California, Riverside, Center for Conservation Biology. 2005. Final Report: Western Riverside County Multiple Species Habitat Conservation Program. Prepared for California Department of Fish and Game, under contracts titled: Inland Ecosystems of California: Resource Assessment Project and Western Riverside County and Sierra Nevada Wildlife Assessment Project. May 4, 2005.

Table 1. Coast Range Newt Survey Results in 2005. Non target species encountered during surveys included western toad (*Bufo boreas*), Pacific treefrog (*Hyla regila*), California tree frog (*H. cadaverina*), and bullfrog (*Rana catesbeiana*).

Creek Name	MSHCP Status	Survey Date	Observers¹	#Segs	TATA	Other Spp
San Juan Creek	Core Area	23 - 27 May	2, 3	18	Yes	B. californicus, H. cadaverina, H. regila
Tenaja Creek	Core Area	24 May - 19 Oct	1, 7, 8,	8	Yes	H. regila, H. cadaverina, B. boreas
Los Alamos Creek	Core Area	30 May - 3 Jun	2, 3, 4, 6	12	No	H. cadaverina, R. catesbeiana
Cole Creek	Core Area	6 Jun - 1 Dec 05	1, 2, 3	24	Yes	B. californicus, B. boreas, H. regila
San Mateo	Core Area	12-18 Oct 05	1, 3, 4, 5,	7	Yes	H. regila, H. cadaverina, R. catesbeiana
Arroyo Seco	Potential Habitat	17 May - 20 Oct	1, 2, 3, 4, 5, 6	7	No	
Arroyo del Torro Creek	Potential Habitat	28 May - 3 Jun	1, 4, 5, 7	7	No	
West Temecula Creek	Potential Habitat	23 - 24 Jun	2, 4, 5	3	No	
Santa Gertrudis Creek	Potential Habitat	13-Jul-05	2, 5	4	No	
Warm Springs	Potential Habitat	15-Jul-05	2, 5	3	No	
Total Segments Surveyed				93		

¹ RCA Biologists: 1: S. Bartz, 2: R. Escobar, 3: A Malisch, 4: A. Bustamante, 5: R. Gallego, 6: K. Cleary-Rose, 7: D. De La Torre, 8: B. Root, 9: C. Rothenbach

Table 2. Coast range newt (*Taricha torosa torosa*) detections in 2005. Abundance represents estimates of individual detections.

CRNE Detections

Creek Name	Segment #	Location	Survey Date	Easting	Northing	Lifestage	Abundance
Cole Creek	22	Mainstem	16-Sep	474697	3709784	Larvae	50
Cole Creek	10	Mainstem	1-Dec-05	475728	3711927	Larvae	1
San Juan Creek	3	Trib 2	9-Nov-05	459825	3718911	Larvae	1
San Juan Creek	3	Trib 2A	24-May-05	460352	3718432	Adult	1
San Juan Creek	4	Trib 2A	9-Nov-05	460606	3718350	Juvenile	1
San Juan Creek	3	Trib 2A	9-Nov-05	460492	3718432	Juvenile	1
San Juan Creek	2	Trib 2A	9-Nov-05	460183	3718410	Juvenile	1
San Mateo Canyon	4	Trib 10	14-Oct-05	462877	3713123	Larvae	1
Tenaja Canyon	33	Mainstem	25-May-05	461964	3710071	Adult	20
Tenaja Canyon	25	Mainstem	25-May-05	463431	3708853	Adult	20
Tenaja Canyon	20	Mainstem	25-May-05	464307	3708291	Larvae	5
Tenaja Canyon	19	Mainstem	26-May-05	465553	3708193	Egg Mass	1
Tenaja Canyon	20	Mainstem	26-May-05	464307	3708291	Adult	20
Tenaja Canyon	19	Mainstem	26-May-05	464524	3708198	Larvae	5

Location coordinates are in UTM's, Datum = WGS84, Zone 11S

Table 3a. Habitat Characteristics at coast range newt detection locations on night surveys. Breeding coast range newts have been noted to prefer deep pools, slow-moving runs, and riparian and upland habitat characterized as grassland, woodland, or forest.

Survey Date	Block	Reach	Easting	Northing	S Pools	M Pools	D Pools
18-Nov-05	Cole Creek	22	474509	3709700	1-10%	0%	0%
1-Dec-05	Cole Creek	10	475805	3712000	11-25%	1-10%	0%
14-Oct-05	San Mateo Cyn Trib 10	4	463020	3713026	26-50%	11-25%	1-10%
9-Nov-05	San Juan Creek Trib 2	3	459822	3718862	76-100%	1-10%	0%
9-Nov-05	San Juan Creek Trib 2A	4	460545	3718345	11-25%	1-10%	0%
9-Nov-05	San Juan Creek Trib 2A	2	460121	3718432	26-50%	1-10%	0%

Table 3b. Habitat Characteristics at coast range newt detection locations on day surveys. Breeding coast range newts have been noted to prefer deep pools, slow-moving runs, and riparian and upland habitat characterized as have been grassland, woodland, or forest. Water velocity units are in cm per second.

Survey Date	Block	Reach	Easting	Northing	S Pools	M Pools	D Pools	Velocity	UplandCommunity	RiparianCommunity
24-May-05	San Juan Crk Trib 2A	3	460352	3718432	26-50%	26-50%	11-25%	0.2	Oak Woodland	Southern Willow Scrub
25-May-05	Tenaja Canyon	33	461964	3710071	26-50%	26-50%	1-10%	0.42	Oak Woodland	Southern Willow Scrub
26-May-05	Tenaja Canyon	19	464524	3708198	51-75%	26-50%	1-10%	0.14	Oak Woodland	Sycamore-Alder Woodland
25-May-05	Tenaja Canyon	25	463431	3708853	51-75%	51-75%	1-10%	1.1	Oak Woodland	Sycamore-Alder Woodland
26-May-05	Tenaja Canyon	20	464307	3708291	76-100%	26-50%	1-10%	0.16	Oak Woodland	Sycamore-Alder Woodland

Figure 1. Locations of all stream surveys conducted in 2005 and detections of mountain yellow-legged frog, arroyo toad, and coast range newt. California red-legged frog was not detected in 2005.

