

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

Stream Survey Report 2006



April 23, 2007

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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 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 information needs identified in MSHCP Section 5.3 or elsewhere in the document, and the information needs of the Permittees.

While we have made every effort to accurately represent our data and results, it should be recognized that our database is still under development. Any reader wishing to make further use of the information or data provided in this report should contact the Monitoring Program to ensure that they have access to the best available or most current data.

The primary preparer of this report was the 2006 Herpetology Program Lead, Natalie Marioni. 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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INTRODUCTION

Four MSHCP covered amphibian species inhabit stream environments in Southern California: mountain yellow-legged frog (*Bufo mucosa*; “BUMU”), arroyo toad (*Bufo californicus*; “BUCA”), coast range newt (*Taricha torosa torosa*; “TATO”), and California red-legged frog (*Rana aurora draytonii*; “RAAU”). Each of these species has specific objectives that require the monitoring of known breeding populations within the Conservation Area once every 5 years for the first 5 years of the permit, or across any consecutive 5 year period. The Monitoring Program has been collaborating with the U.S. Geological Survey, Western Ecological Research Center (USGS) and U.S. Forest Service (USFS) on amphibian stream surveys in the Conservation Area since 2003 to reduce overlapping survey efforts and to ensure consistent data collection methods. In 2006, stream surveys by the Monitoring Program focused on the latter 3 covered amphibian species which are the emphasis of this report. Only the USGS surveyed for BUMU in the San Jacinto Mountains in 2006; results are not discussed in this report, but can be viewed by contacting the USGS Western Ecological Research Center in San Diego.

The focus of stream surveys in 2006 was to assess stream habitats in the Conservation Area for suitability for BUCA, RAAU, and TATO and to document breeding locations within species-specific Core Areas and other potentially suitable habitat in the Conservation Area. The species objectives, suitable habitat, and MSHCP identified Core Areas for each species are described under each species section below. The following were the overall survey goals for 2006:

Survey Goals

- A) Document breeding locations for BUCA, TATO and RAAU within as many species-specific Core Areas and potential habitat stream segments as possible (Table 1).
- B) Assess stream habitat (e.g., water quality, upland and riparian vegetation, etc.) across the Conservation Area.
- C) Refine the protocol to optimize methodologies for future stream surveys.
- D) Provide data results to land managers for use in management decisions.

Arroyo Toad (*Bufo californicus*; “BUCA”)

BUCA has narrow habitat requirements, typically being restricted to the middle reaches of third order streams (Dudek & Associates 2003). Records of BUCA within the MSHCP Plan Area date from the mid 1930s to early 2000s. BUCA are additionally constrained by not inhabiting areas with a landscape slope of less than 3 percent. BUCA’s specific breeding habitat limits the potential areas they are likely to inhabit. Currently, the known distribution of BUCA in western Riverside County includes Temecula Creek, Arroyo Seco Creek, Tenaja Creek, Los Alamos Creek, San Jacinto River, Bautista Creek, and Wilson Creek. Many historic records of BUCA locations are taken from incidental sightings during surveys for other amphibian species and do not necessarily reflect habitats most preferred by BUCA (Stebbins 1951; Sweet 1989; Sweet 1992).

The species objectives for BUCA require the conservation of 9 Core Areas in the MSHCP Conservation Area. These Core Areas include: 1) San Juan Creek; 2) Los Alamos Creek; 3) San Jacinto River; 4) Indian Creek; 5) Bautista Creek; 6) Wilson Creek; 7) Temecula Creek; 8) Arroyo Seco; and 9) Vail Lake. Species objective 6 for BUCA states:

...within the MSHCP Conservation Area, Reserve Managers will maintain breeding populations at a minimum of 80 percent of the conserved breeding locations as measured by the presence/absence of juvenile toads, tadpoles, or egg masses across any 5 consecutive years (Dudek and Associates 2003).

Coast Range Newt (*Taricha torosa torosa*; “TATO”)

TATO also has narrow habitat requirements and requires specific breeding conditions with a limited distribution in the MSHCP Plan Area. The known distribution of TATO 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 TATO 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).

California Red-legged Frog (*Rana aurora draytonii*; “RAAU”)

Based on recent survey results by the Monitoring Program and by Mark Jennings (Rana Resources), RAAU has no known current distribution within the MSHCP Plan Area; however, areas of suitable habitat remain. RAAU is typically found in lowland streams, wetlands and pools where dense vegetation surrounds relatively deep water within small (< 300 km²) watersheds. Historically, RAAU occupied Arroyo Seco, San Juan Creek, several sewage treatment pools along the Santa Ana River near Fla-Bob airport (1974 and 1980), a northwest tributary of Arroyo del Torro, an area immediately east of Lake Elsinore, and now-developed upper reaches of Murrieta Creek and Santa Gertrudis Creek. The MSHCP species account for RAAU lists Cole Creek at the Santa Rosa Plateau Ecological Reserve as the only current known location in the MSHCP Plan Area. Species objective 6 for RAAU states:

...within the MSHCP Conservation Area, Reserve Managers will determine if successful reproduction is occurring as measured by the presence/absence of juvenile frogs, tadpoles, or egg masses populations once a year for the first five years after permit issuance and then as determined by the Reserve Management Oversight Committee (Dudek and Associates 2003).

METHODS

Protocol Development

We used an existing protocol, *Aquatic Species and Habitat Assessment Protocol for Southcoast Ecoregion Rivers, Streams, and Creeks*, written and distributed by the USGS. A few, minor adjustments were made to the protocol to satisfy our Program goals. The protocol uses a visual encounter survey method for detecting all life stages of amphibians, plus an assessment of habitat characteristics. The protocol requires all streams in the survey area to be divided into 250 m segments and numbered uniquely. The protocol is currently in draft form and is therefore not included as an attachment to this report. A copy of the protocol can be found at the Monitoring Program office in Riverside, CA or by contacting USGS directly.

Personnel and Training

All field crew attended a USGS training session on 29 March 2006 on the use of the USGS stream survey protocol and on identifying anuran (frog and toad) and fish species for our region. Species identification training included slides addressing key distinguishing characteristics between species, in addition to observing live and preserved specimen. Mock stream surveys were also conducted in the field, led by USGS biologists, to familiarize surveyors with both field and Personal Digital Assistant (PDA) techniques. Biologists conducting stream surveys in 2006 included:

- Natalie Marioni, Herpetology Program Lead (Regional Conservation Authority)
- Ricardo Escobar III (California Department of Fish and Game)
- Rosina Gallego (Regional Conservation Authority)
- Lesley Hanson (Regional Conservation Authority)
- Ryann Loomis (Regional Conservation Authority)
- Valerie Morgan (Regional Conservation Authority)
- Andrea Salzman (Regional Conservation Authority)
- Esperanza Sandoval (Regional Conservation Authority)

Study Site Selection

Surveys were conducted within accessible Core Areas for the 3 target amphibian species. Specific streams were primarily chosen based on suitable habitat parameters for BUCA and TATO (and not RAAU due to rarity) and in areas where evidence of breeding had been observed in previous surveys in 2005. Additional streams and stream segments were surveyed in an attempt to begin a complete stream and upland habitat assessment for the entire Conservation Area regardless of habitat conditions. Habitat assessments included areas where stream reaches may have been dry at the time of the survey. Stream reaches that were surveyed during the prior 2005 season and without any covered amphibian species detections were excluded from the 2006 surveys. Stream segments were surveyed in Arroyo Seco Creek, Bautista Creek, Cole Canyon Creek, Cole Creek, Horse Creek, Potrero Creek, San Juan Creek, and San Mateo Canyon and their tributaries.

Priority for surveys was placed on areas more likely to yield BUCA observations, based on streams where BUCA were detected in 2005 and a GIS layer of slope habitat. BUCA habitat is limited by a $\leq 3\%$ stream gradient (Miller and Miller 1936; Sweet 1992). Suitable TATO habitat includes stream sections with slow moving and/or pooling water with surrounding woodland habitat. Stream reaches suitable for BUCA and additionally suitable for TATO were given higher priority because of the likelihood that two Covered Species could be detected. No stream segments were targeted for RAAU, though sites where suitable habitat was found were noted to facilitate nighttime surveys to be conducted at these locations in 2007. Those segments more likely to yield BUCA observations were visited earlier in the season and during the BUCA breeding season. Habitat assessment surveys were more often conducted later in the season when a specific species was not being targeted to avoid interference with detection of amphibians.

Survey Methods

Detailed survey methodology is described in *USGS Aquatic Species and Habitat Assessment Protocol for Southcoast Ecoregion Rivers, Streams, and Creeks* (USGS 2005). All waterways (main creeks and tributaries) to be surveyed were sectioned into 250m segments, with segment numbers (i.e., Reach 1, Reach 2, etc.) beginning at a downstream confluence with a larger order waterway. Visual encounter surveys were conducted along stream banks and within the channel from downstream to upstream areas by at least two surveyors. All surveys were conducted in daylight hours (0800 – 1700 hours). Survey time per segment varied according to streambed characteristics and abundance of amphibians detected. All amphibians encountered, including common species, were sampled using visual encounter and dip-net techniques.

All data were recorded and stored using PDAs except during rare occasions when PDAs malfunctioned and paper datasheets were used (Appendix A). Upon returning to the office, PDA data were uploaded via the internet to the USGS Pendragon database housed at the San Diego Field Station. 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, dissolved oxygen (concentration and percent), conductivity, wetted depth and width of stream channel, water velocity, number of wetted channel braids and slope. Upstream photos of the beginning of each segment were also taken. 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, and presence and type of recent disturbance.

Additionally, within each surveyed segment, data were collected when any amphibian species were detected. At the first encounter of each life stage (i.e., tadpole, juvenile, adult) for all species detected, UTM coordinates were recorded in a PDA and were linked to landscape and water characteristics for that segment and by date and time. Stream surveys were conducted between 10 April and 6 July 2006.

Data Analysis

Raw data are housed in the USGS Pendragon database at the USGS San Diego Field Station and at the Biological Monitoring Program office in Riverside, CA. Data analyses were not conducted for BUCA or RAAU due to lack of data (see Results). TATO were surveyed in order to identify breeding populations throughout the Plan Area and statistical analyses were not planned. Once all of the breeding populations have been located, statistical analyses can be conducted to determine trends and differences in abundances of TATO within different habitats, including community type, number and percent of total segment length of pools and the presence of exotic species.

RESULTS

A total of 108 stream segments from 8 drainages and 19 separate main or tributary branches were surveyed within 5 species-specific Core Areas and 2 non-Core Areas (Tables 1, 2 and 3, Figure 1). Exotic species were detected at four locations during stream surveys (Table 2). Bullfrogs (*Rana catesbeiana*) were observed along Bautista Creek, Cole Canyon Tributary 3 and San Mateo Tributary 10 and crayfish (*Procambarus clarkii*) were observed at Cole Canyon Tributary 4. Only 2 stream systems had an average initial water depth >15cm. These 2 sites included Cole Creek Tributary 3 at 35cm and San Mateo Canyon Tributary 10 at 63cm average depth across all surveyed segments (Table 3). Note that the very small sample sizes at these locations (2 segments surveyed along Cole Creek Tributary 3, one segment along San Mateo Canyon Tributary 10) allows for the possibility that the recorded water depths are not representative of the entire stream reach. Additionally, most segments surveyed had low to no flow (<1 m/sec) water velocity (Table 3). Many otherwise suitable stream tributaries had considerably low to no water, precluding the effectiveness of stream surveys.

Arroyo Toad (BUCA)

No BUCA of any life stage were detected at any location. However, many Core Areas where they have been found previously were not surveyed in 2006. Personnel availability during species appropriate survey periods allowed us to survey only 3 out of 9 Core Areas for BUCA in 2006. Of those 6 areas not surveyed, 2 were also not surveyed in 2005 due to lack of access. Though no BUCA detections were made along any surveyed stream, suitable habitat ($\leq 3\%$ slope) was found along Bautista Creek, the Cole Creek tributaries and the Potrero tributaries (Table 3).

Coast Range Newt (TATO)

TATO were detected at 6 stream branches and 13 segments in the Santa Rosa Plateau (Cole Creek drainage) and the Santa Ana Mountains (San Juan and San Mateo Creeks) (Figure 2, Table 2). Adult, juveniles, and egg masses of TATO were all detected during these stream surveys, with at most 3 egg masses and 9 adults found in any stream segment (Table 4). A total of 30 TATO observations were made during the stream surveys in 2006.

Table 5 lists the habitat characteristics where TATO were detected, illustrating that most stream segments at TATO detection locations were surrounded by oak upland communities (10 out of 12 sites, 83%). Half of all detection locations had riparian scrub community while the remaining 50% of segments were comprised of a variety of other riparian community types (Coast Live Oak, Sycamore-Alder or other). The water velocity in segments where TATO were detected ranged from zero cm/sec (four segments) to 0.13 cm/sec. additionally, the depth of water at the beginning of each segment was less than 2 cm in all cases but three (10cm, 8cm, and 7cm).

Of the Cole Creek segments (irrespective of tributary) where TATO were detected, 1 segment was composed primarily of deep pools (51-75%), 1 segment of primarily medium pools (51-75%) and a third segment contained 21-50% medium pools. Two segments were equally comprised of shallow and medium pools. For the last segments, medium and deep pools made up 26-50% and 11-25% respectively of the wet length. Both San Mateo Canyon segments were 51-75% medium pools and 26-50% shallow pools. Shallow pools made up 51-100% of all the San Juan Creek segments (Table 4).

California Red-legged Frog (RAAU)

Two of 4 Core Areas were visited for daytime visual surveys. A total of 20 of 108 segments (5,000 m) potentially suitable for RAAU were surveyed in 2006. The wetted length of 9 of those segments was comprised of at least 1-10% deep (≥ 1 m) and 11-25% medium (> 10 cm, < 1 m) pools. The remaining 11 segments consisted of at least 11-25% medium pools. No RAAU or any evidence of breeding was detected by Monitoring Program biologists in 2006.

DISCUSSION

The focus of stream surveys in 2006 was to assess stream habitats in the Conservation Area for suitability for BUCA, RAAU, and TATO and to document breeding locations within species-specific Core Areas and other potentially suitable habitat in the Conservation Area. A total of 108 stream segments were surveyed in 2006, representing approximately 21 km of stream habitat. Nearly half (43.5%) of the segments were in Potrero Creek (non-Core Area), one quarter (26.9%) were in Cole Canyon and Cole Creek in the Santa Rosa Plateau Core Area, and one fifth (19.4%) were in Bautista Creek Core Area. Of the 3 covered amphibian species targeted in 2006, only TATO was detected. The Monitoring Program will continue to conduct surveys for the presence/absence of BUCA and RAAU juveniles, tadpoles, or egg masses as part of the initial Inventory Phase.

Species objective 5 for the TATO requires the Monitoring Program to document that newts are maintaining occupancy of at least 75% of their occupied habitat and to determine if successful reproduction is occurring at known breeding locations within Core Areas and other potentially suitable habitat in accessible areas of the MSHCP Conservation Area. In 2006, TATO were surveyed and detected within both Core Areas (Santa Ana Mountain Bioregion and the Santa Rosa Plateau). Within these Core Areas, TATO were detected at 13 segments of 3 different streams. Survey efforts for TATO were focused on the Cleveland National Forest and

the Santa Rosa Plateau, which accounts for coverage of approximately 60% of the listed MSHCP Core Areas. As breeding activity in northern portions of the Santa Ana Mountains remains unknown, we cannot currently conclude whether or not the MSHCP species objective stated above was met. The Monitoring Program will continue to conduct annual TATO surveys for the first 5 years after permit issuance as required by the MSHCP.

Of the 4 streams along which exotics were found, 3 of these were also RAAU Core Area locations. We do not have enough data to conclude that RAAU were not located at these sites because these exotic species were present, but this is important to note. RACA adults grow to be very large frogs and are known to prey upon tadpoles (Kiesecker and Blaustein 1997, 1998; Lawler et al. 1999). It has also been shown that RACA tadpoles will prey upon other tadpoles (Kiesecker and Blaustein 1997). These studies confirm that RACA do present a direct threat to the sensitive RAAU species.

Recommendations for Future Surveys

It is recommended that prior to next season's surveys (2007), a GIS model be created which would incorporate the primary habitat requirements for each stream dependent species (e.g., $\leq 3\%$ slope for BUCA). From this model, the number of potential segments with suitable habitat could be determined and thus for each species we could quantify the percentage of segments surveyed that satisfy the habitat criteria. Some habitat requirements (e.g., the presence of pools for TATO), may not be easily represented using GIS and some ground truthing may be necessary. This would enable us to better keep track of how well we are able to satisfy each species' specific objectives.

We will also continue to assess and ground truth stream and upland habitat for the entire Conservation Area, resulting in a comprehensive database of potential habitat. Once this is complete, we will then be able to incorporate these data into GIS, allowing us to create models and predict areas of suitability for future efforts.

Once the Inventory Phase of the Monitoring Program is completed and we have current records of species presence throughout the Conservation Area, we will monitor these locations more intensively to assess fluctuations in species abundance in order to further influence sound management decisions for each Covered Species.

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Table 1. Core Area designation by species and whether or not each Core Area was surveyed. When a species was found within one of its Core Areas, the box is shaded.

Location	Core Area	BUCA	TATO	RAAU	Surveyed in 2006
Arroyo Seco Creek	Yes	X			Yes
Avenoloca Mesa	Yes			X	No
Bautista Creek	Yes	X			Yes
Horse Creek	No				Yes
Indian Creek	Yes	X			No
Los Alamos Creek	Yes	X			No
Potrero Creek	No				Yes
Redonda Mesa	Yes			X	No
San Jacinto River	Yes	X			No
San Juan Creek	Yes	X			Yes
Santa Ana Mountains	Yes		X	X	Yes
Santa Rosa Plateau	Yes		X	X	Yes (Cole Canyon & Cole Creek)
Temecula Creek	Yes	X			No
Vail Lake	Yes	X			No
Wilson Creek	Yes	X			No

Table 2. Survey locations, dates, and amphibian species detected during stream surveys in 2006. Core Area designations are not species-specific.

Creek Name	MSHCP Status	Survey Dates	Observers*	# Segments Surveyed	BUCA	TATO	RAAU	Other Native Frog/Toad Spp.	Exotic Species
Arroyo Seco Creek Tributary 3	Core Area	10 April 2006	1, 2, 4, 6, 7, 9	1	None	None	None	None	None
Bautista Creek	Core Area	3 May – 27 June 2006	1, 2, 3, 4, 5, 6, 7, 8	21	None	None	None	<i>Bufo boreas</i> , <i>Hyla cadaverina</i> , <i>H. regilla</i>	<i>R.. catesbeiana</i>
Cole Canyon Tributary 3	Core Area	27 April 2006	6, 7	2	None	None	None	<i>H. regilla</i> , <i>Rana spp.</i>	<i>R.. catesbeiana</i>
Cole Canyon Tributary 4	Core Area	26 April 2006	4, 6	1	None	None	None	<i>H. regilla</i>	<i>Procambarus clarkii</i>
Cole Creek	Core Area	14 April – 1 June 2006	1, 2, 3, 7, 8	7	None	Yes	None	<i>H. cadeverina</i> , <i>H. regilla</i>	None
Cole Creek Tributary 3	Core Area	25 – 26 April 2006	1, 6, 7, 8	2	None	None	None	<i>H. cadeverina</i> , <i>H. regilla</i> , <i>Rana spp.</i>	None
Cole Creek Tributary 4	Core Area	26 – 27 April 2006	1, 4, 6	5	None	None	None	<i>H. regilla</i>	None
Cole Creek Tributary 5	Core Area	8 May – 9 June 2006	2, 3, 6, 7	4	None	Yes	None	<i>H. cadeverina</i> , <i>H. regilla</i> , <i>Rana spp.</i>	None
Cole Creek Tributary 5A	Core Area	5 May 2006	2, 8	5	None	None	None	<i>H. regilla</i>	None
Cole Creek Tributary 6	Core Area	5 May 2006	1, 6	3	None	Yes	None	<i>H. regilla</i>	None
Horse Creek		17 April 2006	2, 4, 7	3	None	None	None	<i>None</i>	None

Table 2 continued.

Creek Name	MSHCP Status	Survey Dates	Observers*	# Segments Surveyed	BUCA	TATO	RAAU	Other Native Frog/Toad Spp.	Exotic Species
Potrero Creek	Core Area	16 June – 6 July 2006	1, 3, 4, 5, 6, 8	24	None	None	None	<i>Bufo</i> spp., <i>H. regilla</i>	None
Potrero Creek Tributary 1A	Core Area	29 June 2006	3, 6	3	None	None	None	None	None
Potrero Creek Tributary 7	Core Area	16 May – 7 June 2006	1, 2, 4, 6, 8	13	None	None	None	None	None
Potrero Creek Tributary 7B	Core Area	22 – 30 June 2006	2, 4, 6	7	None	None	None	None	None
San Juan Creek Tributary 1	Core Area	2 May 2006	2, 6	1	None	Yes	None	<i>H. cadeverina</i>	None
San Juan Creek Tributary 2	Core Area	28 April 2006	2, 4, 6, 8	2	None	Yes	None	<i>H. regilla</i>	None
San Mateo Canyon	Core Area	11 May 2006	6, 7	2	None	Yes	None	<i>H. cadeverina</i>	None
San Mateo Canyon Tributary 10	Core Area	19 April 2006	1, 4, 7	1	None	None	None	<i>Bufo</i> species, <i>H. cadeverina</i>	<i>R. catesbeiana</i>
Total Segments Surveyed				108					

BUCA = arroyo toad (*Bufo californicus*); TATO = coast range newt (*Taricha tarosa tarosa*); RAAU = red-legged frog (*Rana aurora draytonii*)

*Observers: 1: Natalie Marioni, 2: Ricardo Escobar III, 3: Rosina Gallego, 4: Lesley Hanson, 5: Ryann Loomis, 6: Valerie Morgan, 7: Andrea Salzman, 8: Esperanza Sandoval, 9: Kristen Hoogheem

Table 3. Habitat characteristics for stream survey locations in 2006. Most commonly represented upland and riparian community types and average habitat characteristics across all stream survey segments for a given stream.

Creek Name	# Segments Surveyed	Upland Community	Riparian Community	Slope* (%)	Depth (cm)	S Pools	M Pools	D Pools	Velocity (m/sec)
Arroyo Seco Creek Tributary 3	1	Mixed Chaparral	Sage Scrub	-	-	0%	0	0%	0
Bautista Creek	21	Mixed Chaparral	Willow Scrub	4 (7)	1.37	76-100%	0-10%	0%	0.34
Cole Canyon Tributary 3	2	Non-native /Unknown	Willow Scrub	-	-	11-50%	0-50%	0%	-
Cole Canyon Tributary 4	1	Non-native	Non-native	-	-	1-10%	76-100%	1-10%	-
Cole Creek	7	Oak	Willow Scrub	<1 (4)	0.66	26-50%	11-25%	1-10%	0
Cole Creek Tributary 3	2	Oak / Grassland / Unknown	Mulefat Scrub / Unknown	-	35.13	25-50%	1-25%**	11-25%	0
Cole Creek Tributary 4	5	Non-native	Non-native	-	0	0%	0%	0%	0
Cole Creek Tributary 5	4	Unknown Grass	Unknown Riparian	<1	0.61	1-10%	1-10%	11-25%	0.03
Cole Creek Tributary 5A	5	Non-native	Unknown/other marshes	-	8.4	51-75%	1-10%	11-25%	0
Cole Creek Tributary 6	3	Non-native	Coast Live Oak	-	11	51-75%	11-25%	1-10%	0.04
Horse Creek	3	Mixed Chaparral	Mule fat scrub	-	-	0-10%	0%	0%	-
Potrero Creek	24	Sage Scrub	Cottonwood Willow	1 (23)	0.03	0%	0%	0%	0.29
Potrero Creek Tributary 1A	3	Sage Scrub	Mulefat Scrub	3 (2)	-	-	-	-	-
Potrero Creek Tributary 7	13	Sage Scrub	Mulefat Scrub	1 (5)	0.03	0%; 76-100% ^a	0%	0%	0.3
Potrero Creek Tributary 7B	7	Sage Scrub	Sage Scrub	2 (4)	-	0%	0%	0%	-
San Juan Creek Tributary 1	1	Oak	Willow Scrub	-	-	51-75%	11-25%	0%	-
San Juan Creek Tributary 2	2	Mixed Chaparral / Other Woodland	Oak / Willow Scrub	-	0.23	51-75%	11-50%**	0%	0.17
San Mateo Canyon	2	Oak	Coast Live Oak/Willow Scrub	-	0.23	26-50%	51-75%	0%	0.08
San Mateo Canyon Tributary 10	1	Mixed Chaparral	Sycamore-Alder	-	63	1-10%	51-75%	1-10%	0

*Slope was not collected at every reach. For the tributaries where slope was not collected at every reach, the number of sites where slope was collected is presented in parentheses.

** When there are only two segments per creek, the total range of pools is given.

^aThe two most frequently represented percentages.

Table 4. Coast range newt (TATO) detections in 2006. Abundance represents estimates of individual detections.

Survey Date	Creek Name	Segment No.	Location	Easting	Northing	Lifestage*	Abundance
28-Apr-06	San Juan Creek	2	Tributary 2	459776	3719106	EM	2
28-Apr-06	San Juan Creek	3	Tributary 2	459822	3718862	EM	2
28-Apr-06	San Juan Creek	4	Tributary 2	459877	3718626	ADL	5
2-May-06	San Juan Creek	1	Tributary 1	459225	3718851	ADL	9
2-May-06	San Juan Creek	1	Tributary 1	459225	3718851	EM	3
5-May-06	Cole Creek	2	Tributary 6	473861	3709174	EM	1
11-May-06	San Mateo Canyon	1	Main	463410	3712470	ADL	1
11-May-06	San Mateo Canyon	2	Main	463227	3712314	ADL/JUV	2
26-May-06	Cole Creek	3	Main	473835	3708267	ADL	1
26-May-06	Cole Creek	4	Main	473596	3708200	ADL	1
31-May-06	Cole Creek	5	Tributary 5	473755	3710192	JUV	1
31-May-06	Cole Creek	6	Main	473135	3708154	ADL	1
1-Jun-06	Cole Creek	9	Main	475992	3712069	ADL	1
TOTAL	3 streams	13 segments					30

Location coordinates are in UTMs, Datum = NAD83, Zone 11S

*Adult (ADL), Juvenile (JUV), Egg Mass (EM)

Table 5. Habitat Characteristics at TATO locations. 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. Data in columns "Shallow", "Medium", and "Deep" represent portions of segments with pools of this depth.

Survey Date	Creek Name	Segment #	Depth (cm)	S Pools	M Pools	D Pools	Velocity (cm/sec)	Upland Community	Riparian Community
28-Apr-06	San Juan Creek Tributary 2	2	10	51-75%	11-25%	0%	0.3	Oak	Unknown/Other Riparian
28-Apr-06	San Juan Creek Tributary 2	3	7	76-100%	26-50%	0%	0.2	Coast Live Oak	Coast Live Oak
28-Apr-06	San Juan Creek Tributary 2	4	0.2	76-100%	11-25%	0%	0.25	Mixed Chaparral	Oak
2-May-06	San Juan Creek Tributary 1	1	---	51-75%	11-25%	0%	---	Oak	Willow Scrub
5-May-06	Cole Creek Tributary 6	2	8	51-75%	11-25%	1-10%	0.13	Non-Native	Coast Live Oak
11-May-06	San Mateo Canyon Main	1	0.2	26-50%	51-75%	0%	0.05	Oak	Coast Live Oak
11-May-06	San Mateo Canyon Main	2	0.25	26-50%	51-75%	0%	0.1	Oak	Willow Scrub
26-May-06	Cole Creek Main	3	0.31	26-50%	51-75%	1-10%	0	Oak	Mule Fat Scrub
26-May-06	Cole Creek Main	4	0.12	1-10%	11-25%	51-75%	0	Oak	Sycamore-Alder
31-May-06	Cole Creek Tributary 5	5	0.17	1-10%	26-50%	11-25%	0.03	Oak	Willow Scrub
31-May-06	Cole Creek Main	6	1.1	26-50%	26-50%	1-10%	0	Oak	Willow Scrub
1-Jun-06	Cole Creek Main	9	0.11	26-50%	26-50%	1-10%	0	Oak	Willow Scrub

Location coordinates are in UTM's, Datum = NAD83, Zone 11S

Figure 1. Start locations for all 250 m stream segments surveyed in 2006.

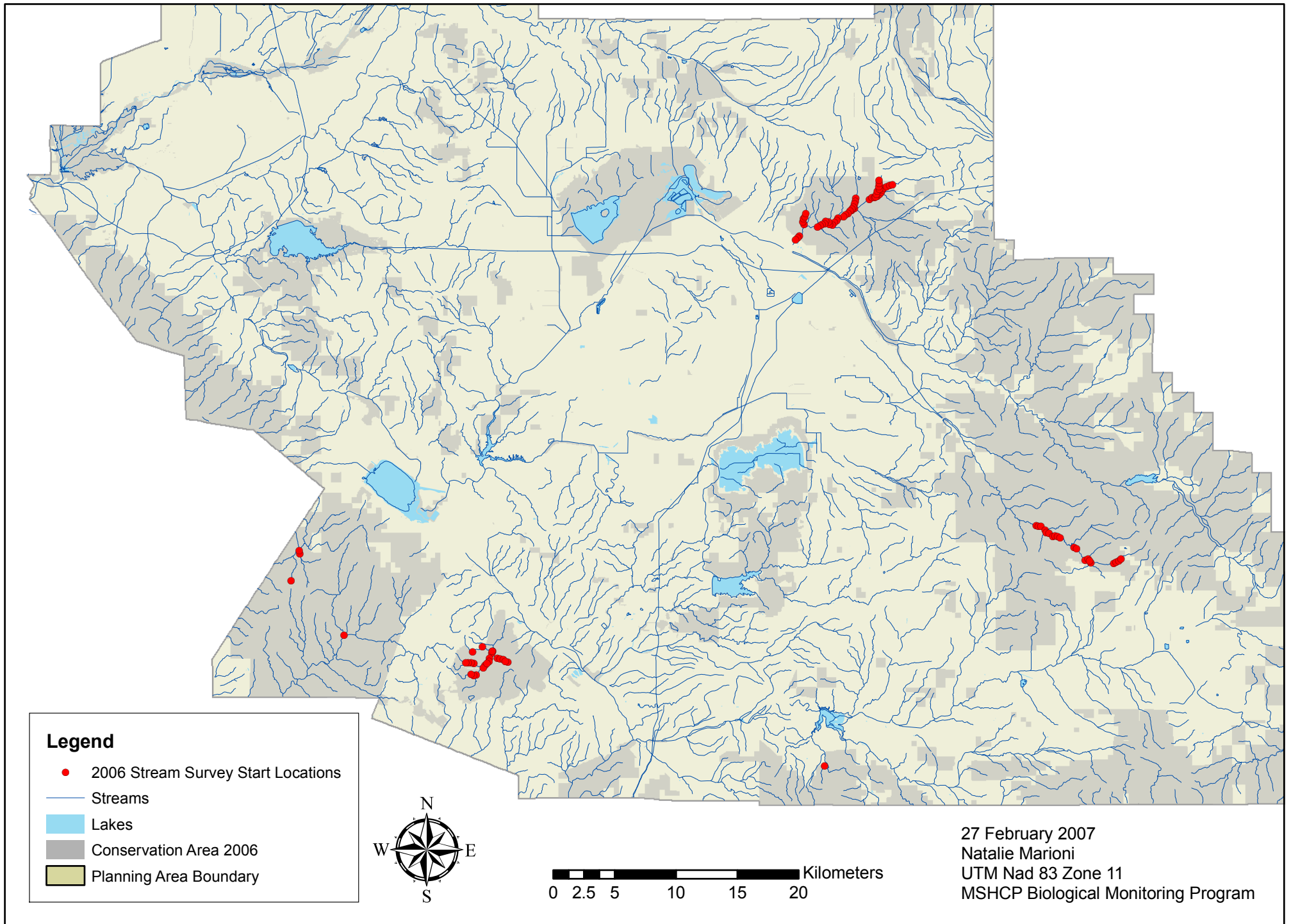
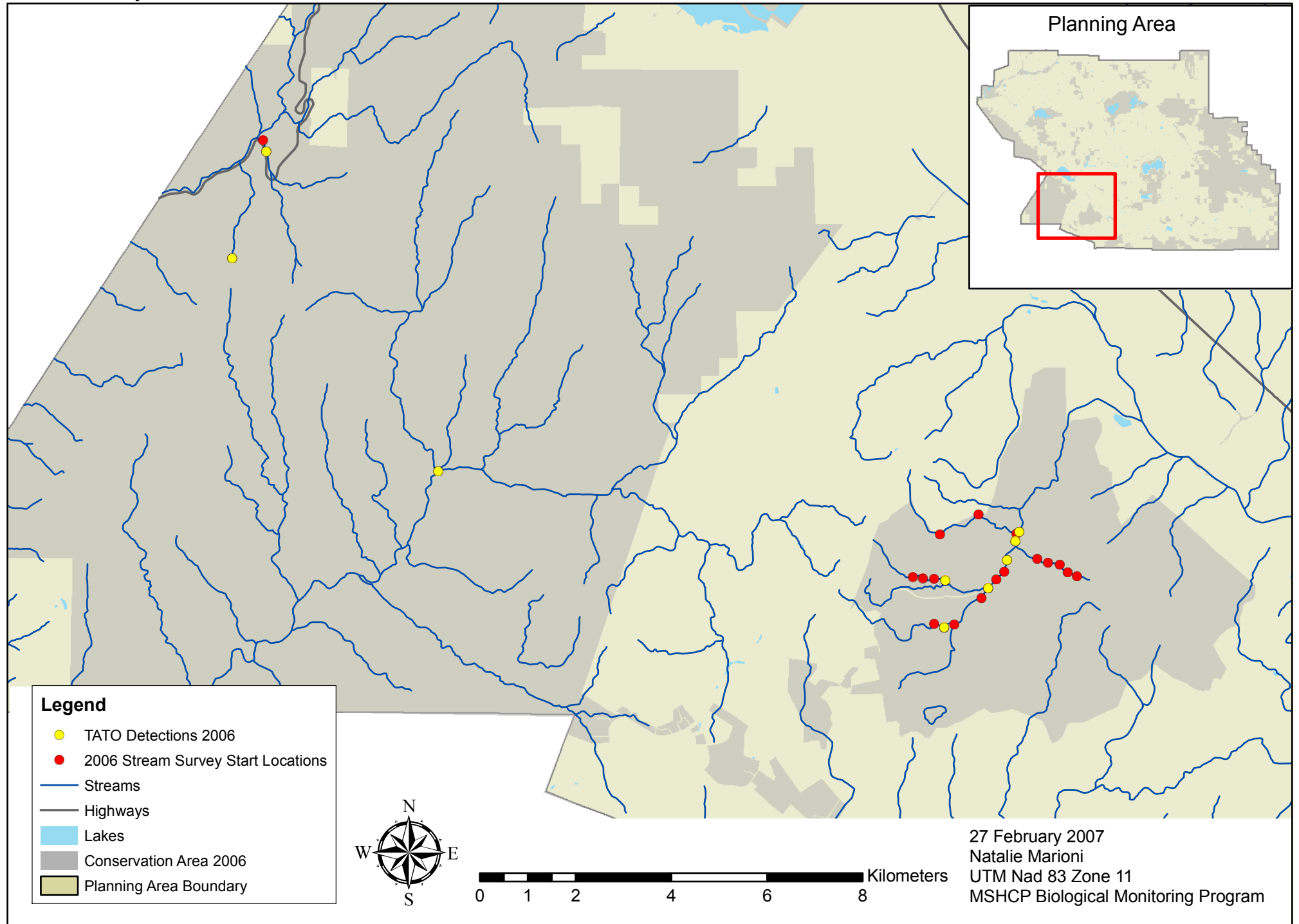


Figure 2. TATO detection (yellow) locations along stream survey reaches in 2006. TATO were observed while surveying San Juan Creek, San Mateo Canyon Creek and Cole Creek tributaries.



End Survey Vegetaion:

Upland Community			%	Cover Class*
Riparian Community	_____	Bank Substrate 1	_____	_____
Dom. Riparian Plant 1	_____	Bank Substrate 2	_____	_____
Dom. Riparian Plant 2	_____	Bank Substrate 3	_____	_____
Dom. Riparian Plant 3	_____	% Overhead Canopy	_____	_____

* 0%, 1-10%, 11-25%, 26-50%, 51-75%, 76-100%

End Survey Water (use % break-down shown above):

% Wet Length	_____	Plunge Pools Present?	Y / N	
% Shallow Pools (<10 cm)	_____	# Plunge Pools	_____	
% Medium Pools (> 10 cm < 1 m)	_____	Aquatic Refugia Present	Y / N	
% Deep Pools (>1 m)	_____	Types Refugia (circle all that apply)		Undercuts Tree Roots
Aquatic Substrate (give % for top 3)		Woody Debris	Rock Crevices	Submerged Veg
Clay	_____	Emergent Veg	Floating Material	
Silt	_____			
Sand	_____			

Additional Notes:

Gravel _____

Pebbles _____

Cobble _____

Boulder _____

Leaf litter _____

Wood Debris _____

Exotic Plants:

Species Size Class (few, small scattered patches, large contiguous stands)

Recent Disturbance (type):

Intensity (light, moderate, heavy)

NOTES:
