

SECTION G AMPHIBIAN DISTRIBUTION

INTRODUCTION

The Rockport Coastal Streams WAU includes the following planning watersheds: Hardy Creek planning watershed, Juan Creek planning watershed, and Howard Creek planning watershed. Surveys were conducted to determine the distribution of coastal tailed frogs (*Ascaphus truei*), northern red-legged frogs (*Rana aurora*), and southern torrent salamanders (*Rhyacotriton variegatus*) within the Rockport Coastal Streams WAU. This information is being collected throughout Mendocino Redwood Company's (MRC) ownership. The distribution of foothill yellow-legged frogs (*Rana boylei*) is well documented by MRC's salmonid distribution surveys and *R. boylei* has not been detected in the Rockport Coastal Streams WAU.

The amphibian assemblages of the Rockport Coastal Streams WAU are diverse and may indicate preferable stream habitat conditions in lower order (headwater) watercourses. Southern torrent salamanders (*R. variegatus*) and coastal tailed frogs (*A. truei*) are known to be good indicators of cold, sediment free stream habitats in the Pacific Northwest (Welsh and Ollivier 1998, Corn and Bury 1989). The Rockport Coastal Streams WAU has several meta-populations of *A. truei* and *R. variegatus* residing in the watershed, implying that several lower order watercourses provide cold, sediment free habitat.

Amphibian distribution surveys conducted in the Rockport Coastal Streams WAU have resulted in incidental detections of a northern red-legged frog adult (*Rana aurora*) in the Juan Creek planning watershed. This species is known to be struggling in most portions of their ranges in California. Other amphibian species detected during amphibian distribution surveys include: coastal giant salamanders (*Dicamptodon tenebrosus*), California slender salamanders (*Batrachoseps attenuatus*), black salamanders (*Aneides flavipunctatus*), northwestern salamanders (*Ambystoma gracile*), rough-skinned newts (*Taricha granulosa*), California newts (*Taricha torosa*), and Pacific tree frogs (*Hyla regilla*).

METHODS

Coastal Tailed Frogs (*Ascaphus truei*)

Surveys were conducted during the most appropriate season, when larval life forms are known to be present (May-August). Sites or streams selected to be surveyed were chosen based on the following criteria: site should have at least 750-meters of flowing water present (observer judgment); preferably a 2nd or 3rd order watercourse; stream should be high gradient (greater than 3% average gradient); and approximately 70% of sites have northerly or easterly aspects (landscape level).

Occasionally some sites were selected which did not meet the criteria outlined above. Most often, if site selection criteria were not met, surveys were conducted in larger main-stem watercourses due to a lack of flowing water in lower order tributaries. Lower order (2nd and 3rd) tributaries which did not have flowing water were noted as "Dry".

Upon arrival to the selected survey site, the site was flagged and labeled with a Site ID. The Site ID is the 2-letter planning watershed abbreviation plus a number, in order of survey completion

starting with 1001¹. For example, the first *A. truei* survey in Juan Creek (code RJ) planning watershed was RJ1001. Water temperature, pH, (EC) electrical conductivity and (TDS) total dissolved solids were measured at the time of the survey using a Hanna® HI 98129 water quality meter. If the water quality meter was not calibrated properly, or if low on batteries, the results were not included and denoted with “N/A”.

The selected stream was surveyed in an upstream direction, searching all potential habitats with the greatest effort expended in the “best” habitats. Surveys consist of looking for larvae attached to rocks on the stream bottom, using a glass bottomed viewing box to examine interstices, and turning over movable rocks while holding a dip-net downstream to catch dislodged larvae. The survey was considered complete after larval *A. truei* were observed, or after 30-minutes of search time elapsed (time constrained search, TCS). Several surveys were terminated due to a lack of habitat or flowing water upstream of the starting point. If the observer deemed the habitat to be suitable for *A. truei*, additional search time was spent.

Stream gradient was measured with a hand-held clinometer to the nearest 1%, from a section of the stream representative of the reach surveyed. Stream gradient measurements were then broken into classes as follows: 0-3%, 3-7%, 7-10%, 10-15%, 15-20%, 20-25%, 25-30%, 30-40%, and 40-50%. An embeddedness rating of streambed substrates was assessed within a representative riffle (observer judgment) by measuring the percentage of a stone lodged/cemented into the streambed. The overall rating of streambed substrate embeddedness was estimated as 0-25%, 25-50%, 50-75%, and 75-100% for each stream surveyed. Often the observer deemed the embeddedness rating to be variable throughout the watercourse surveyed. For example, low gradient riffles were highly embedded, while embeddedness in high gradient riffles was low. In these cases a greater range of ratings was presented (ie: 50-100% or 25-75%).

The aspect of the stream was recorded from a map, and rounded to the nearest cardinal direction (N, S, W, and E). The percent of canopy cover shading the watercourse, or percentage of wetted channel covered by overhead canopy, was estimated for each of the survey sites. The percent of canopy cover was a visual estimate performed by the observer in increments of 5%. Survey sites which were dry may or may not have had aspect and canopy cover estimates taken.

Northern Red-Legged Frogs (*Rana aurora*)

The entire Rockport Coastal Streams WAU was surveyed to determine the distribution of *R. aurora* potential breeding habitats, and to determine which breeding habitats were being utilized by the species at the time of the study. Potential breeding habitat was considered to be “pond” type habitat with sufficient water present to facilitate larval development of *R. aurora*.

Surveys for *R. aurora* were conducted in the late winter or early spring (from January 1 – May 1), when the species are known to be congregating at breeding sites to reproduce (B. Shaffer pers. comm.). Potential breeding sites were located via communications with MRC forestry staff, driving and walking roads, and examining aerial photographs. Potential breeding sites can be found by carefully listening to the calls of Pacific tree frogs (*Hyla regilla*) at night, and following the sounds of the calls to the water source.

Searches were performed at potential breeding sites using techniques aimed at detecting evidence of reproduction (tadpole or egg mass presence). The perimeter of the potential breeding site was

¹ Number started with 1001 to ensure that the survey sites were not given the same identifier as stream segments identified in the Rockport Coastal Streams WAU.

walked, turning over movable objects and looking into the water for conspicuous *R. aurora* egg masses. Dip nets and seines were used to capture larval *R. aurora* and other amphibian species from the potential breeding site. Small vessels (kayaks, rafts, etc) were used to survey the entire wetted area of the potential breeding site. Vegetation growing on the bank which was hanging into the water was lifted out of the water to potentially reveal attached egg masses. Upon the first visit to a potential breeding site, branches and vegetation were placed along a portion of the pond's wetted perimeter to provide easily searchable attachment media for oviposition. Upon returning to the potential breeding site to perform another survey, the branches were lifted out of the water and examined for egg masses.

Potential Breeding Site Re-visits

When potential *R. aurora* breeding habitat was located, but no evidence of reproduction was present, the site was considered a "potential breeding site". Potential breeding sites were re-visited at least once every two weeks to account for variation in the timing of oviposition, and to increase the likelihood of detecting *R. aurora*. The amount of time spent searching a potential breeding site (seining, dip-netting, etc) was variable dependent upon the observer's discretion. Large potential breeding sites typically required more search time than smaller "puddle-like" sites. Potential breeding sites were also re-visited during dark hours (night) once every month. Nocturnal surveys utilized primarily "eyeshine" techniques to detect post-metamorphic red-legged frogs congregating around the site. Nocturnal surveys performed at potential breeding sites did not utilize seines as a sampling method, nor was water quality measured due to the safety hazard of working at night around deep ponds.

Water temperature, pH, total dissolved solids, and electrical conductivity were measured using a Hanna® HI 98129 water quality meter at the time of the survey. If the water quality meter was not calibrated properly, or if low on batteries, the results were not included and denoted with "N/A". The percent of canopy cover shading the site, or percentage of the water's surface covered by overhead canopy, was estimated at each site location. The percent of canopy cover was a subjective visual estimate performed by the observer in increments of 5%. The area of the potential breeding site was estimated by multiplying the length by the mean width of the site. Site elevations were determined by plotting UTM coordinates onto a map, where elevation was recorded in increments of 40 feet from topographic map contour lines.

Each site identified was given a Site ID, and a "pond name" was determined. The Site ID is the 2-letter planning watershed abbreviation plus a number over 1100. For example, the first *R. aurora* survey in Juan Creek (code RJ) planning watershed was RJ1101. Site ID numbers began at 1101 to distinguish *R. aurora* potential breeding habitats from other amphibian survey sites sampled and from stream segment numbers identified in this watershed analysis. The pond name assigned to each potential breeding site was indicative of the geographical area, or of the characteristics of the site. Pond names were assigned to facilitate data interactions, improve communications regarding these sites, and to help promote the importance of these features.

If evidence of *R. aurora* reproduction was present (tadpoles or egg masses), then the site was considered a documented breeding site. Documented breeding sites were not re-visited.

Southern Torrent Salamanders (*Rhyacotriton variegatus*)

Each site surveyed was flagged and labeled with a Site ID. The Site ID is the 2-letter planning watershed abbreviation plus a number starting at 1200, in order of survey completion. For example, the first *R. variegatus* survey in the Juan Creek (code RJ) planning watershed was RJ1200. Water temperature and pH was measured using a Hanna® HI 98129 water quality meter

(when possible) at the time of the survey. Due to the shallow seeping nature of water flows in these habitats, often pH was difficult to measure without altering the streambed and was denoted as “NA” when not measured.

Survey sites were selected according to the following criteria: site must retain water perennially and have interstitial spaces that provides for inter-gravel water flow (not mud, sand, or silt dominated channels). The selected stream or seep was surveyed in an upstream direction, searching all potential habitats with the greatest effort expended in the “best” habitats. Best habitats are considered riffles dominated by cobble substrates, splash zones near waterfalls or plunge pools; and any higher gradient movable substrates within the wetted width. Surveys consist of turning over movable rocks and examining interstitial spaces for organisms. During high flows a dip-net was also used to catch dislodged organisms after turning over rocks. The survey was considered complete after the first individual was observed, or after 30-minutes of search time elapsed (time constrained search, TCS). Several surveys were terminated due to a lack of habitat or flowing water upstream of the starting point. Species detected were classified by life stage (larval ‘L’, sub-adult ‘SA’, and adult ‘A’).

Stream gradient was measured with a hand-held clinometer to the nearest 1%, from a stream segment deemed to be representative of the reach surveyed. Stream gradient measurements were then broken into classes as follows: 0-3%, 3-7%, 7-10%, 10-15%, 15-20%, 20-25%, 25-30%, 30-40%, and 40-50%. An embeddedness rating of streambed substrates was assessed within a representative riffle (observer judgment) by measuring the percentage of a stone lodged/cemented into the streambed. The overall streambed substrate embeddedness was estimated as 0-25%, 25-50%, 50-75%, and 75-100% for each site surveyed. Often the observer deemed the embeddedness rating to be variable throughout the watercourse surveyed. For example, low gradient riffles were highly embedded, while embeddedness in high gradient riffles was low. In these cases a greater range of ratings was presented (ie: 50-100% or 25-75%).

The aspect of the stream was recorded from a map, and rounded to the nearest cardinal direction (N, S, W, and E). The percent of canopy cover shading the watercourse, or percentage of wetted channel covered by overhead canopy, was estimated for the reach of watercourse surveyed. The percent of canopy cover was a visual estimate performed by the observer in increments of 5%. Survey sites which were dry may or may not have had aspect and canopy cover estimates taken.

Foothill Yellow-Legged Frogs (*Rana boylei*)

Foothill yellow-legged frogs prefer larger watercourses, and often are found co-existing with fish. Surveys conducted to determine the distribution of salmonids have not detected foothill yellow-legged frogs in the Rockport Coastal Streams WAU.

A hierarchical framework was used to select the initial locations of salmonid distribution survey sites in each stream. Major streams were broken into lower, middle and upper reaches. Smaller streams were divided into lower and upper reaches. One site is surveyed in each reach, resulting in 3 sites in larger streams, and 2 sites in smaller streams. Additional sites are added directly downstream and upstream of potential migration barriers to determine which species these barriers are impacting.

A survey site contains a minimum of two consecutive habitat sequences (pool-riffle sequences) and has a minimum length of ninety feet. The survey method used to determine the aquatic species present is single pass electrofishing or snorkeling. The effort put forth at each survey site is not sufficient to delineate the absence of a species. If future research develops reasonable

methods to determine the probability that a species is absent, these methods will be incorporated into future distribution surveys.

Prior to initiating surveys water quality is measured using a Horiba™ U-10 Water Quality Checker. Measurements taken are water temperature (°C), conductivity (microS/cc), dissolved oxygen (mg/L), and pH. Air temperature is measured with a pocket thermometer and water visibility is estimated. Stream discharge is estimated or measured with a Swoffer™ Model 2100 flow meter. The actual physical parameters measured at each site vary depending on equipment availability. Horiba™ U-10 Water Quality Checkers were not used prior to the surveys in 2000.

Diving (snorkeling) is used to assess species presence when stream conditions are considered adequate or when elevated stream temperatures have the potential to adversely impact the health of the animals being electrofished. The basic survey unit for diving consists of a minimum of two pools, however if riffles are deep enough to allow underwater observation these units are sampled.

AMPHIBIAN DISTRIBUTION RESULTS and DISCUSSION

The results of amphibian distribution surveys are discussed for each species in the Rockport Coastal Streams WAU. Maps G-1, G-2, and G-3 illustrate the locations of amphibian sampling sites in the Rockport Coastal Streams WAU. The species encountered while performing amphibian distribution surveys were recorded. These species are listed in Table G-1.

Table G-1: Scientific and common names for species observed, including abbreviation.

Abbreviation	Common Name	Scientific Name
ANUR	Unidentified Frog	unidentified anuran
BLK	Black Salamander	<i>Aneides flavipunctatus</i>
CAUD	Unidentified Salamander	unidentified caudate
CGS	Coastal Giant Salamander	<i>Dicamptodon tenebrosus</i>
CNT	California Newt	<i>Taricha torosa</i>
CSS	California Slender Salamander	<i>Batrachoseps attenuatus</i>
NEW	Unidentified Newt	<i>Taricha spp.</i>
NWS	Northwestern Salamander	<i>Ambystoma gracile</i>
PTF	Pacific Tree Frog	<i>Pseudacris regilla</i>
RLF	Northern Red-Legged Frog	<i>Rana aurora</i>
RSN	Rough-Skinned Newt	<i>Taricha granulosa</i>
STH	Steelhead/Rainbow Trout	<i>Oncorhynchus mykiss</i>
STS	Southern Torrent Salamander	<i>Rhyacotriton variegatus</i>
TLF	Coastal Tailed Frog	<i>Ascaphus truei</i>

Hardy Creek Planning Watershed

Coastal Tailed Frogs (Ascaphus truei)

Surveys were conducted at 8 sites throughout the planning watershed, of which 5 sites had *A. truei* detections (Table G-2).

Table G-2: Results from *A. truei* surveys conducted in the Hardy Creek planning watershed (114.12012), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedded	Stream Gradient	Water Temp °C	pH	EC / TDS	Drainage Acres	TLF Present	Other Species Present
RH1001	W	85	25-50	3-7	11.5	7.9	116/58	550	X	CGS
RH1002	W	95	0-25	0-3	12.0	N/A	N/A	871	X	CGS,STH
RH1003	S	90	0-25	3-7	12.5	N/A	N/A	616	X	CGS
RH1004	S	90	25-50	3-7	N/A	N/A	N/A	226	X	
RH1005	S	80	50-75	7-10	N/A	N/A	N/A	219		CGS
RH1006	W	90	0-25	3-7	13.0	N/A	N/A	396	X	CGS
RH1007	S	95	25-50	3-7	14.0	N/A	N/A	250		CGS
RH1008	W	95	0-50	7-10	11.5	N/A	N/A	119		CGS

Northern Red-Legged Frogs (Rana aurora)

No potential breeding sites were identified and there have been no incidental observations of *R. aurora* in the planning watershed during previous studies.

Southern Torrent Salamanders (Rhyacotriton variegatus)

Surveys were conducted at 9 sites throughout the planning watershed, of which 3 sites had *R. variegatus* detections (Table G-3). The majority of sites sampled had optimal habitat for this species.

Table G-3: Results from *R. variegatus* surveys conducted in the Hardy Creek planning watershed (114.12012), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedded	Stream Gradient	Habitat Type	Water Temp °C	pH	STS Present	Other Species Present
RH1200	N	75	25-75		S	6.6	7.21	X	
RH1201	N	95	0-50	40-50%	W	6.5	7.47		TLF
RH1202	N	90	25-75	30-40%	W	6.8	7.53		
RH1203	N	60	0-25	20-30%	S	8.7	7.01	X	
RH1204	N	50	0-25	30-40%	W	5.5	7.64	X	TLF,CGS
RH1205	N	40	25-50	40-50%	S	4.6	7.47		CGS
RH1206	N	85	0-50	40-50%	W	9.9	7.12		CGS,BLK,CSS
RH1207	W	95	25-50	40-50%	W	8.3	7.88		CGS
RH1208	W	95	0-50	20-30%	W	8.5	7.73		

Key to Habitat Types: (W) = Watercourse (S) = Seep or Spring (P) = Soil Pipe

Foothill Yellow-Legged Frogs (Rana boylei)

Foothill yellow-legged frogs have not been detected throughout the entirety of the Hardy Creek planning watershed.

Juan Creek Planning Watershed

Coastal Tailed Frogs (Ascaphus truei)

Surveys were conducted at 15 sites throughout the planning watershed, of which 11 sites had *A. truei* detections (Table G-4).

Table G-4: Results from *A. truei* surveys conducted in the Juan Creek planning watershed (114.12013), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedded	Stream Gradient	Water Temp °C	pH	EC / TDS	Drainage Acres	TLF Present	Other Species Present
RJ1001	N	85	25-50	7-10%	12.1	8.23	189/92	158	X	CGS
RJ1002	N	90	25-50	25-40%	11.5	8.13	174/87	27		
RJ1003	N	95	25-50	7-10%	11.8	7.98	186/93	127	X	CGS
RJ1004	N	90	25-50	7-10%	12.3	7.93	137/67	105	X	CGS
RJ1005	W	85	25-50	3-7%	12.6	8.1	153/76	541	X	CGS, NEW
RJ1006	W	85	25-50	3-7%	12.1	6.94	120/60	220	X	CGS
RJ1007	W	75	25-50	7-10%	12.7	6.61	175/88	317	X	CGS
RJ1008	N	90	25-50	30-40%	12.1	7.11	136/67	96		CGS
RJ1009	N	85	25-50	15-20%	12.7	7.41	142/71	145	X	CGS
RJ1010	N	75	50-100	3-7%	12.7	6.97	122/60	92		CGS
RJ1011	N	80	25-50	3-7%	12.2	7.8	150/75	179	X	CGS
RJ1012	S			7-10%	12.4	8.12	145/73	182	X	CGS
RJ1013	N	85	25-75	15-20%	12.3	8.23	109/54	43	X	CGS
RJ1014	W	90	25-50	7-10%	12.1	8.1	169/84	607	X	
RJ1015	S	80	50-75	7-10%	12.2	8.02	185/92	83		CGS

Northern Red-Legged Frogs (Rana aurora)

Six potential breeding sites were identified in the planning watershed and *R. aurora* was not detected at any of the sites (Table G-5). However, there have been two incidental observations of *R. aurora* adults in this planning watershed during previous studies.

Table G-5: Results of *R. aurora* surveys conducted in the Juan Creek planning watershed, (114.12013), Mendocino County, CA.

Site ID	Site Name	Surface area (ft ²)	Maximum Depth (ft)	% Canopy	RLF Present	Other Species Present
RJ1101	Fetzer Waterhole	750	>4	30		NWS(L,EM),PTF(A),CAUD(L),NEW(A),RSN(A),CNT(A)
RJ1102	South Mainline Pond	420	1.2	80		NWS(L,EM),PTF(A),NEW(A),RSN(A)
RJ1103	North Mainline Pond	1950	1.2	20		NWS(A,EM),PTF(A,L,EM),RSN(A),NEW(A),CAUD(L)
RJ1104	Fuel Pond	240	2.5	0		PTF(A,L,EM),NEW(A),ANUR(L)
RJ1105	Redwood Bowl Pond	1800	>6	60		
RJ1106	Juan Waterhole	1500	>6	10		PTF(L,EM),NEW(A),NWS(EM)

Key to Life Stages: (EM) = Egg Mass (L) = Larval (SA) = Sub-Adult (A) = Adult

Southern Torrent Salamanders (Rhyacotriton variegatus)

Surveys were conducted at 10 sites throughout the planning watershed, of which 8 sites had *R. variegatus* detections (Table G-6). The majority of sites sampled had optimal habitat for this species.

Table G-6: Results from *R. variegatus* surveys conducted in the Juan Creek planning watershed (114.12013), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedded	Stream Gradient	Habitat Type	Water Temp °C	pH	STS Present	Other Species Present
RJ1200	N	30	0-25	70-80%	S	10.7	7.78	X	CGS
RJ1201	N	50	0-25	40-50%	W	11.1	7.78	X	CGS
RJ1202	N	40	75-100	50-60%	S	10.8	7.26	X	
RJ1203	W	60	0-25	30-40%	W	10.6	7.79	X	CGS
RJ1204	N	40	25-50	25-30%	W	10.5	7.60	X	
RJ1205	N	70	0-25	50-60%	S	8.3	8.33	X	CGS
RJ1206	W	50	0-25	30-40%	W	9.0	8.13	X	CGS
RJ1207	N	65	75-100	30-40%	W	10.3	7.13		
RJ1208	N	85	25-50	50-60%	W	11.2	7.34	X	CGS
RJ1209	N	90	50-75	40-50%	W	11.3	7.18		BLK

Key to Habitat Types: (W) = Watercourse (S) = Seep or Spring (P) = Soil Pipe

Foothill Yellow-Legged Frogs (*Rana boylei*)

Foothill yellow-legged frogs have not been detected throughout the entirety of the main-stem of Juan Creek planning watershed.

Howard Creek Planning Watershed

Coastal Tailed Frogs (*Ascaphus truei*)

Surveys were conducted at 6 sites throughout the planning watershed, all the sites had *A. truei* detections (Table G-7).

Table G-7: Results from *A. truei* surveys conducted in the Howard Creek planning watershed (114.12020), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedded	Stream Gradient	Water Temp °C	pH	EC / TDS	Drainage Acres	TLF Present	Other Species Present
RW1001	S	90	50-75	0-3	11.0	N/A	N/A	190	X	CGS
RW1002	W	100	0-25	3-7	11.0	N/A	N/A	346	X	CGS
RW1003	S	90	0-25	3-7	12.0	N/A	N/A	287	X	CGS,STH
RW1004	N	100	0-25	3-7	12.4	7.44	150/74	208	X	CGS
RW1005	S	95	0-25	3-7	12.7	7.73	166/82	460	X	CGS
RW1006	W	90	0-50	7-10	12.3	7.44	212/148	140	X	CGS

Northern Red-Legged Frogs (*Rana aurora*)

No potential breeding sites were identified and there have been no incidental observations of *R. aurora* in the planning watershed during previous studies.

Southern Torrent Salamanders (*Rhyacotriton variegatus*)

Surveys were conducted at 10 sites throughout the planning watershed, of which 8 sites had *R. variegatus* detections (Table G-8). The majority of sites sampled had optimal habitat for this species.

Table G-8: Results from *R. variegatus* surveys conducted in the Howard Creek planning watershed (114.12020), Mendocino County, CA.

Site ID	Aspect	% Canopy	% Embedd	Stream Gradient	Habitat Type	Water Temp °C	pH	STS Present	Other Species Present
RW1200	N	50	25-50	40-50%	W	9.2	7.48	X	CGS, TLF
RW1201	S	50	25-50	50-60%	W	8.9	7.62		CGS, TLF
RW1202	N	85	25-50	30-40%	W	8.8	7.84		CGS
RW1203	N	80	0-25	70-80%	W	10.1	7.57	X	CGS
RW1204	N	90	25-50	50-60%	W	8.6	7.16		CGS,BLK
RW1205	N	75	0-25	20-30%	S	10.5	7.87	X	CGS,TLF,CSS
RW1206	N	95	25-75	50-60%	W	10.5	6.92		CGS,NWS
RW1207	N	85	0-25	40-50%	S	10.1	7.52	X	
RW1208	N	95	0-50	60-70%	W	10.0	7.65		
RW1209	S	95	0-25	50-60%	W	11.3	7.18	X	CGS

Key to Habitat Types: (W) = Watercourse (S) = Seep or Spring (P) = Soil Pipe

Foothill Yellow-Legged Frogs (*Rana boylei*)

Foothill yellow-legged frogs have not been detected throughout the entirety of the main-stem of Howard Creek planning watershed.

CONCLUSIONS

The amphibian species detected in the Rockport Coastal Streams WAU represent three of the four species having geographical ranges in the area. The three detected amphibian ‘Species of Special Concern’ (as designated by the State of California) are coastal tailed frogs, northern red-legged frogs, and southern torrent salamanders. Aquatic habitat types have remained functional in the Rockport Coastal Streams WAU to support the coastal tailed frogs and southern torrent salamanders. During surveys for southern torrent salamanders, coastal tailed frog adults were observed within seeps at five sampling locations. Based upon this evidence it appears as if seeps adjacent to larger watercourses may be an important habitat for tailed frogs; whether for foraging habitat or reproductive habitat. Insufficient breeding habitat for the other ‘Species of Special Concern’ may explain the absence of foothill yellow-legged frogs and the low density of northern red-legged frogs in the Rockport Coastal Streams WAU.

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**Rockport Coastal Streams
Watershed Analysis
Unit**

**Map G-1
Amphibian Distribution**

This map illustrates the documented locations of potential red-legged frog breeding sites, and the locations of surveys conducted for coast tailed frogs and southern torrent salamanders in the Rockport Coastal Streams WAU. Sites were surveyed by MRC in 2002-2008 in conjunction with this watershed analysis.

Amphibian Distribution Survey Sites

	Detected	Not Detected
Coast Tailed Frog		
Red-legged Frog		
Southern Torrent Salamander		

- MRC Ownership
 - Planning Watershed Boundary
 - Elk Creek Watershed Analysis Unit Boundary
- Flow Class**
- Class I
 - Class II
 - Class III

