



# 2022 Amphibian and Reptile Summary Report

June 1, 2022



Cover photo: Foothill yellow-legged frog, Eel River gravel bar. Photo by HRC Forest Sciences staff.

## **Humboldt Redwood Company (HRC) Project Description**

**Title:** Amphibian and Reptile Monitoring

**Purpose:** Habitat Conservation Plan Monitoring

**Date Initiated:** March 1999

**Projected End Date:** Ongoing

**Project Manager:** Sal Chinnici, Director, Forest Sciences

### **Executive Summary:**

The HRC HCP includes four covered amphibians (southern torrent salamander, tailed frog, yellow-legged frog, and red-legged frog) and one covered reptile (western pond turtle). The HCP's strategy for conserving and monitoring the covered amphibian and reptile species is a landscape approach to protecting habitat, assessment of habitat conditions through watershed analysis, and species surveys and population monitoring.

With this summary report covering the 2021-2022 monitoring period there was an emphasis on watershed analysis revisitation work for the Upper Eel Watershed Analysis Unit (WAU), and we also cover cumulative monitoring efforts in the WAU to date. For tailed frogs, site occupancy and habitat conditions were monitored at ten different sites during 2013 and 2021. For southern torrent salamanders, site occupancy and habitat conditions were monitored at 18 different sites during the years 2012-2014, and 2021. For foothill yellow-legged frogs, site occupancy and habitat conditions have been monitored at 45 sites over the years 2011 - 2013, 2017, and 2021. Surveys for northwestern pond turtles indicated that they are common in suitable habitat on the mainstem Eel River. We visited three monitoring locations to check for occupancy in 2021. No northern red-legged frog surveys were conducted in the Upper Eel WAU during the 2021-2022 reporting period. Results of monitoring efforts are discussed below.

**Project Manager:**



Director, Forest Sciences

**Document Distribution List**

Susan Sniado  
CA Dept. of Fish & Wildlife  
Northern California - North Coast Region  
610 2nd Street  
Eureka, CA 95501

Clarence Hostler  
NOAA Fisheries  
1655 Heindon Rd.  
Arcata, CA 95521

Dominik Scwhab  
Cal Fire  
135 Ridgway  
Santa Rosa, CA 95401

John Peters  
U.S. Fish and Wildlife Service  
Arcata Fish and Wildlife Office  
1655 Heindon Rd.  
Arcata, CA 95521

Chris Curtis  
Cal Fire  
118 Fortuna Blvd.  
Fortuna, CA 95540

## INTRODUCTION

The purpose of this summary report is to provide the results of surveys and monitoring of the covered amphibian and reptile species of the Humboldt Redwood Company (HRC) Habitat Conservation Plan (HCP). This report covers the period of 2021 to 2022 and is focused on the Upper Eel WAU, including cumulative monitoring efforts in this WAU to date.

Surveys and habitat assessments for the covered species have been ongoing through implementation of HCP monitoring strategies. Sections of the HCP addressing amphibians and reptiles include: 6.3.2.1, 6.3.5.2.4, and 6.10. These HCP sections discuss the process by which both watershed analysis and effectiveness monitoring address the covered species' habitat needs.

Four amphibian and one reptile species are covered under the HRC HCP: the southern torrent salamander (*Rhyacotriton variegatus*, RHVA); tailed frog (*Ascaphus truei*, ASTR); northern red-legged frog (*Rana aurora aurora*, RAAU); foothill yellow-legged frog (*Rana boylei*, RABO); and northwestern pond turtle (*Emys marmorata marmorata*, EMMA). None of these species are currently listed under the federal or state endangered species acts, but all are listed as California Species of Special Concern.

The initial WA for the Upper Eel River WAU, completed in 2007, included an Amphibian and Reptile Module (Appendix F) (Scotia Pacific 2007) which described the life history and habitat requirements of the covered species. Further discussion, including monitoring methods, have been provided in HRC Amphibian and Reptile HCP Annual Reports.

## RESULTS AND DISCUSSION

For tailed frogs, site occupancy and habitat conditions (Table 1 and 2) were monitored at ten different sites during 2013 and 2021. Effort was not equal over the years. A total of 42 individual belt surveys were conducted (Table 2).

For southern torrent salamanders, site occupancy and habitat conditions were monitored at 18 different sites during the years 2012-2014, and 2021. A total of 110 surveys were conducted during the period (Table 3).

For foothill yellow-legged frogs, site occupancy and habitat conditions have been monitored at 45 sites over the years 2011 - 2013, 2017, and 2021. A total of 157 individual surveys were conducted during this time (Table 4).

Surveys for northwestern pond turtles have indicated that they are common in suitable habitat on the mainstem Eel River (i.e., deep pools with suitable basking structure). We have also monitored small ponds located within tributary drainages such as Carson Creek, Balcom Creek and Pond Creek. We visited three monitoring locations to check for occupancy in 2021 (Table 5).

### *Tailed Frog*

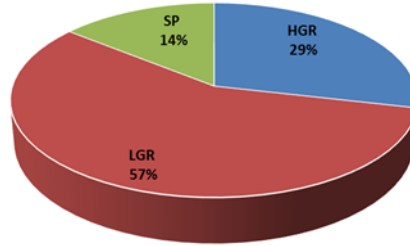
In the initial Upper Eel WA, tailed frogs were detected in the steep Channel Geomorphic Unit (CGU) tributaries of the Eel River and Larabee Creek. Tailed frogs were also found in lower gradient CGUs along Larabee Creek, however, within this CGU the animals were located within high gradient riffles within the reach.

As a result of the surveys from the original WA, we established ten monitoring locations. Complete survey results for tailed frog are shown in **Error! Reference source not found.**

These sites have been visited a total of 16 times, with 42 belt surveys, since the initial Upper Eel WA. Tailed frog adults and tadpoles were observed on 14 of the surveys. Southern torrent salamanders, coastal giant salamanders (*Dicamptodon tenebrosus*), red-legged frogs and foothill yellow-legged frogs were also observed.

Sample sizes are relatively small, but some patterns emerge from analysis. Belt habitat type was primarily low gradient riffle (LGR) and high gradient riffle (HGR) at 57% and 29%, respectively (Figure ).

Observing tailed frogs, in particular tadpoles, in riffles is consistent with the tailed frog literature (e.g., Nussbaum et al. 1983).



**Figure 1.** Belt habitat types at Upper Eel WAU tailed frog monitoring sites, 2013-2021.

Belt gradient ranged from 2 to 80%, with a mean of 13.2%. For belt substrate, all sites were of competent rock. This result is consistent with all monitoring sites being located within consolidated geologies. Belt embeddedness calls ranged from 1-3 with a mean of 2.3 (0 to 50% embeddedness, mean in the 26-50% range). When compared to the Properly Functioning Conditions (PFC) Matrix used for habitat condition evaluation in the initial WA, code 2 embeddedness would fall within the Poor (i.e., > 40%) category.

Belt canopy cover had a range of 59% to 100%, with a mean of 88%. The PFC target for canopy cover considered beneficial for tailed frog is > 85%. Tailed frog observations in 2021 were of tailed frog tadpoles, indicating that successful breeding is occurring in this WAU.

### ***Southern Torrent Salamander***

In the initial watershed analysis for the Upper Eel WAU, southern torrent salamanders were observed in Class II streams only, and were associated with streams in the Yager formation, but not in the Wildcat formations. We have continued to monitor the sites investigated during the initial WA and have added additional sites over time. Additional sites were among the areas identified for surveys or as potential habitat during the initial WA. Complete survey results southern torrent salamander are shown in

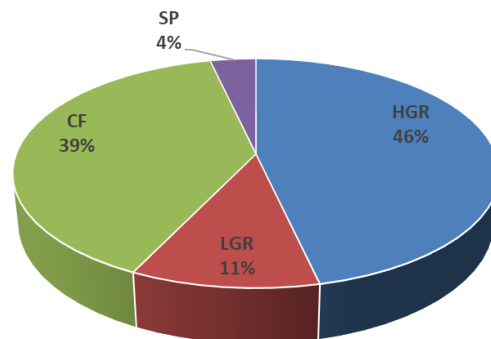
Figure 4. Example of occupied southern torrent salamander habitat.

There are currently 18 southern torrent salamander monitoring sites in the WAU. There has been a total of 27 visits to the monitoring sites during the years 2013-2021. Surveys consisted of 44 individual belt surveys. Southern torrent salamanders were observed at 15 of the 18 monitoring sites during the survey period. Other species observed at these sites include tailed frog, coastal giant salamander, northern red-legged frog, and foothill yellow-legged frog.



**Figure 2.** Larval southern torrent salamander.

Overall, belt gradient ranged from 2% to 98%, with a mean of 35%. The substrate at all belts consisted of competent rock. High gradient riffle (HGR) and Cascade falls (CF) were the primary habitat types (46% and 39% respectively). Results are consistent with the literature regarding the habitat of the southern torrent salamander (e.g., Diller and Wallace 1996).



**Figure 3.** Belt habitat types at Upper Eel WAU RHVA monitoring sites, 2013-2021.





**Figure 4.** Example of occupied southern torrent salamander habitat.

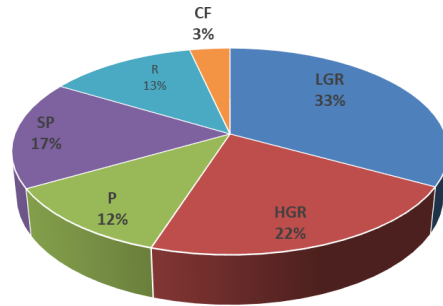
Belt embeddedness ranged from 1 to 3 calls (0 to 75% embeddedness), with an average of 1.9. When compared to the PFC Matrix used for habitat condition evaluation in the initial WA, this result would generally fall within the Good (i.e., < 25%) to Fair (i.e., 25-40%) targets.

Belt canopy cover had a range of 23% to 100%, with a mean of 83%, close to the PFC target for canopy cover considered beneficial for southern torrent salamanders at > 85%. Both larvae and adult southern torrent salamanders have been observed in the WAU in 2021, indicating that the species is continuing to inhabit and breed in the WAU.

### ***Foothill Yellow-legged Frog***

The foothill yellow-legged frog is widely distributed along the Upper Eel River and its floodplain tributaries, including Larabee Creek, and was noted in the initial WA as being the most frequently observed species. For monitoring purposes, we have continued to focus on the mainstem Eel River and Larabee Creek, as well as several of the tributaries that had been identified as potential habitat in the initial WA. Surveys were conducted during 2011 - 2013, 2017 and 2021. A total of 157 surveys were conducted at 45 sites during this time. Foothill yellow-legged frogs were observed at 43 of the 45 monitoring sites (Table 4). Coastal giant salamanders, northern red-legged frogs, rough-skinned newts, tailed frogs, and Pacific tree frogs were also observed.

Habitat and substrate conditions on these surveys are consistent with known foothill yellow-legged frog habitats and the existing literature on the species. Stream segment habitats consisted primarily of low and high gradient riffles ( 33% and 22% respectively) (Figure 5). Boulder and cobble comprised 74% of the substrate types encountered (45% and 29% respectively), while gravel made up 23%. The range of canopy cover estimates at the stream segments reflects the distribution of sites ranging from the Eel River and Larabee Creek floodplains up into the floodplain tributaries, as 22% of the sites were in the low canopy category (0-20%), and 72% falling within 61-80% and 81-100% (26% and 46% respectively).



**Figure 5.** Stream segment habitat types at Upper Eel WAU foothill yellow-legged frog monitoring sites, 2011-2021.

### *Northwestern Pond Turtle*

For the initial Upper Eel WA, pond turtles were observed in the main stem of the Eel River, main stem of Larabee Creek (below the gorge), and at the Balcom Creek and Scott Creek ponds. These observations were primarily of turtles basking on large wood or rocks on the ponds or large pool areas of the low gradient watercourse reaches, and in some cases of turtles seeking refuge on underwater habitat structure.

Using our knowledge of locations of suitable habitat within the WAU we have subsequently surveyed and documented at least three northwestern pond turtle sites on HRC lands. These include the Mainstem Eel, Balcom Creek, and Pond Creek sites. Habitat is characterized by deep pools, abundant LWD and boulders for basking, and adjacent sandy banks that can be used for nesting.

Surveys were conducted during the summer of 2021 (Table 5). Drought conditions during 2021 and preceding years have resulted in the smaller ponds being dry or nearly so (i.e., Balcom Creek and Pond Creek). Scott Creek Pond has been dry and was not surveyed. In contrast, large pools on the mainstem Eel River continue to show occupancy of northwestern pond turtles in spite of low flow conditions. In fact, during low flow conditions turtles are often more visible due to greater availability of basking sites.

Relative to pond turtle habitat conditions, pool frequency, pool quality, LWD, and canopy cover do not appear to be limiting factors on the Upper Eel River and Larabee Creek. Northwestern pond turtles seem to be locally abundant in the monitoring reaches, as well as in similar habitat elsewhere on the river.



**Figure 6.** Northwestern pond turtles basking on logs on Eel River.

## **SUMMARY AND RECOMMENDATIONS**

For the 2021-2022 survey period efforts were focused on occupancy level surveys in the Upper Eel WAU to support the watershed analysis revisit, site-specific watershed analysis questions, and on classification of waters for THPs.

Distribution of covered species continues to be widespread in suitable habitat. No degraded habitats of any of the species were noted. Watershed analysis has aided in finding areas of good habitat to be maintained, as well as areas of habitat that can be improved or restored. No changes in the monitoring strategy are recommended at this time.

### Literature Cited

Diller, L.V. and R.L. Wallace. 1996. Distribution and habitat of *Rhyacotriton variegatus* on managed, young growth forests in north coastal California. *Journal of Herpetology*, 30:184-191.

Nussbaum, R.A., E.D. Brodie Jr. and R.M. Storm. 1983. *Amphibians and Reptiles of the Pacific Northwest*. University of Idaho Press. Moscow, Idaho.

Scotia Pacific Company, LLC. 2007. Upper Eel Watershed Analysis. Amphibian and Reptile Assessment, Appendix F. Scotia Pacific Company, LLC Sciences. October 26, 2007. 78 pp.

**Table 1.** Habitat codes for tailed frog and southern torrent salamander survey summaries.

Parameter	Explanation	
<b>Habitat Type</b>	<b>P</b> =Pool <b>R</b> =Run <b>LGR</b> =Low Gradient Riffle	<b>HGR</b> =High Gradient Riffle <b>C/F</b> =Cascade/Falls <b>SP</b> =Step Pool
<b>Substrate C/I</b>	Competent ( <b>C</b> ): if substrate is hard and does not break in the hand it is competent. Incompetent ( <b>I</b> ) Substrate readily crumbles or has plasticity it is incompetent.	
<b>Embeddedness (1-4)</b>	<b>1</b> =0-25% <b>2</b> =26-50%	<b>3</b> =51-75% <b>4</b> =76-100%
<b>Species ID</b>	<b>RHVA</b> = southern torrent salamander <b>ASTR</b> = tailed frog	<b>DITE</b> = coastal giant salamander <b>RAAU</b> = northern red-legged frog

**Table 2.** Complete results for tailed frog (ASTR) surveys.

Site #	Date	Belt #	Belt Habitat Type	Belt Gradient %	Belt Substrate	Belt Embed	Belt Canopy %	Species ID	Age ID	Count
27	1/31/2013	1	CF	60	C	2	0.805	NA	NA	NA
27	1/31/2013	2	CF	35	C	3	0.76	NA	NA	NA
27	1/31/2013	1	HGR	60	C	2	0.985	RHVA	A	1
437	6/13/2013	1	CF	70	C	1	0.85	NA	NA	NA
437	6/13/2013	2	LGR	6	C	2	0.91	ASTR	T	2
1173	6/13/2013	1	SP	80	C	2	0.895	ASTR	T	1
476	6/28/2013	1	LGR	2	C	3	0.59	ASTR	T	2
515	6/28/2013	1	LGR	3	C	2	0.88	ASTR	T	1
525	7/26/2013	1	HGR	12	C	2	0.85	ASTR	T	1
580	7/26/2013	1	LGR	3	C	3	0.94	NA	NA	NA
580	7/26/2013	2	LGR	5	C	3	0.97	ASTR	T	1
580	7/26/2013	2	LGR	5	C	3	0.97	DITE	L	1
27	5/17/2021	1	HGR	10	C	2	1	DITE	L	1
27	5/17/2021	2	HGR	12	C	3	1	DITE	L	1
27	5/17/2021	1	HGR	10	C	2	1	ASTR	L	2
27	5/17/2021	2	HGR	8	C	2	1	DITE	L	1
437	5/17/2021	1	HGR	10	C	2	0.98	DITE	L	2
437	5/17/2021	2	SP	18	C	2	1	DITE	L	1
437	5/17/2021	1	HGR	10	C	2	1	DITE	L	1
437	5/17/2021	2	HGR	10	C	2	1	ASTR	L	1
1173	5/17/2021	1	SP	15	C	2	0.84	DITE	L	1
1173	5/17/2021	2	SP	10	C	3	0.63	RHVA	A	1
1173	5/17/2021	1	SP	5	C	2	0.63	DITE	L	3
1173	5/17/2021	2	SP	5	C	2	0.63	ASTR	L	1
525	5/25/2021	1	LGR	3	C	2	0.75	ASTR	L	1
476	5/25/2021	1	HGR	3	C	2	0.72	ASTR	L	1
476	5/25/2021	1	CF	50	C	1	0.78	RHVA	A	1
515	5/25/2021	1	HGR	10	C	3	0.75	RHVA	A	1
515	5/25/2021	2	HGR	10	C	3	0.75	RHVA	L	1
515	5/25/2021	1	HGR	3	C	2	0.94	NA	NA	NA
515	5/25/2021	2	LGR	2	C	3	0.85	ASTR	L	1
580	5/26/2021	1	CF	30	C	2	0.97	RHVA	A	1
580	5/26/2021	1	CF	30	C	2	0.97	RAAU	A	1
580	5/26/2021	1	CF	30	C	2	0.97	RABO	J	1
580	5/26/2021	2	LGR	5	C	3	0.87	RHVA	A	1
580	5/26/2021	2	LGR	5	C	3	0.87	DITE	L	1
580	5/26/2021	2	LGR	5	C	3	0.87	RAAU	A	1
457	6/1/2021	1	HGR	2	C	2	1	NA	NA	NA
457	6/1/2021	2	SP	6	C	2	1	NA	NA	NA
457	6/1/2021	1	LGR	3	C	1	1	ASTR	L	1
478	6/1/2021	1	SP	7	C	3	0.85	DITE	L	2
478	6/1/2021	2	LGR	4	C	3	0.81	ASTR	L	1

A = adult, L = larvae, T = tadpole, NA = not available

LGR = low gradient riffle, C/F = cascade/falls, HGR = high gradient riffle, P = pool, SP = step pool

ASTR = *Ascaphus truei* (tailed frog), DITE = *Dicamptodon tenebrosus* (coastal giant salamander), RABO

= *Rana boylii* (foothill yellow-legged frog), RAAU = *Rana aurora aurora* (northern red-legged frog)

**Table 3.** Complete results for southern torrent salamander (RHVA) surveys.

Site #	Date	Belt #	Belt Habitat Type	Belt Gradient %	Belt Substrate	Belt Embed	Belt Canopy %	Species ID	Age ID	Count
23	1/4/2012	1	CF	85	C	1	0.655	RHVA	L	1
770	1/21/2013	1	HGR	85	C	1	0.88	RHVA	L	1
770	1/21/2013	1	SP	80	C	1	0.97	NA	NA	NA
456	1/21/2013	1	CF	70	C	1	0.895	RHVA	L	1
456	1/21/2013	1	CF	33	C	2	0.91	NA	NA	NA
23	1/21/2013	1	CF	85	C	1	0.88	RHVA	L	2
23	1/21/2013	1	HGR	65	C	1	0.88	NA	NA	NA
12	1/22/2013	1	HGR	32	C	2	0.625	ASTR	T	0
12	1/22/2013	2	CF	98	C	3	0.76	NA	NA	NA
12	1/22/2013	1	SP	32	C	2	0.985	NA	NA	NA
11	1/22/2013	1	HGR	25	C	2	0.61	ASTR	T	1
11	1/22/2013	2	CF	58	C	3	0.82	DITE	L	1
11	1/22/2013	1	HGR	35	C	1	0.835	RHVA	A	1
33	1/25/2013	1	CF	85	C	1	0.64	RHVA	A	1
33	1/25/2013	1	CF	85	C	1	0.64	DITE	L	1
15	1/28/2013	1	CF	85	C	1	0.895	RHVA	L	1
15	1/28/2013	1	HGR	30	C	2	0.895	NA	NA	NA
23	1/28/2013	1	CF	60	C	1	0.955	NA	NA	NA
23	1/28/2013	2	SP	45	C	2	0.895	NA	NA	NA
23	1/28/2013	1	CF	83	C	1	0.85	NA	NA	NA
997	1/30/2013	1	CF	65	C	2	0.895	NA	NA	NA
997	1/30/2013	2	CF	95	C	2	0.88	NA	NA	NA
997	1/30/2013	1	SP	40	C	2	0.85	NA	NA	NA
3	1/30/2013	1	HGR	35	C	1	0.835	RHVA	L	2
1189	1/31/2013	1	CF	40	C	2	0.94	NA	NA	NA
1189	1/31/2013	2	HGR	30	C	3	0.985	DITE	L	1
1189	1/31/2013	1	CF	40	C	2	1	NA	NA	NA
1189	1/31/2013	2	CF	40	C	2	1	NA	NA	NA
27	1/31/2013	1	CF	60	C	2	0.805	NA	NA	NA
27	1/31/2013	2	CF	35	C	3	0.76	NA	NA	NA
27	1/31/2013	1	HGR	60	C	2	0.985	RHVA	A	1
12	2/12/2013	1	HGR	32	C	2	0.625	RHVA	L	1
18	2/12/2013	1	CF	30	C	1	0.715	RHVA	A	1
18	2/12/2013	1	CF	30	C	1	0.715	DITE	A	1
23	2/14/2013	1	CF	50	C	2	0.94	NA	NA	NA
23	2/14/2013	2	CF	85	C	2	0.895	NA	NA	NA
23	2/14/2013	1	SP	30	C	2	0.94	NA	NA	NA
23	2/14/2013	2	CF	65	C	2	0.865	NA	NA	NA
997	2/25/2013	1	CF	75	C	2	0.895	DITE	L	3
997	2/25/2013	2	HGR	15	C	2	0.91	RHVA	L	1
997	2/25/2013	2	HGR	15	C	2	0.91	DITE	L	1
437	6/13/2013	1	CF	70	C	1	0.85	NA	NA	NA
437	6/13/2013	2	LGR	6	C	2	0.91	ASTR	T	2
1173	6/13/2013	1	SP	80	C	2	0.895	ASTR	T	1
476	6/28/2013	1	LGR	2	C	3	0.59	ASTR	T	2
515	6/28/2013	1	LGR	3	C	2	0.88	ASTR	T	1



Site #	Date	Belt #	Belt Habitat Type	Belt Gradient %	Belt Substrate	Belt Embed	Belt Canopy %	Species ID	Age ID	Count
525	7/26/2013	1	HGR	12	C	2	0.85	ASTR	T	1
580	7/26/2013	1	LGR	3	C	3	0.94	NA	NA	NA
580	7/26/2013	2	LGR	5	C	3	0.97	ASTR	T	1
580	7/26/2013	2	LGR	5	C	3	0.97	DITE	L	1
770	12/16/2013	1	HGR	85	C	2	0.865	RHVA	L	1
33	12/16/2013	1	CF	85	C	1	0.485	RHVA	L	1
11	12/17/2013	1	HGR	25	C	2	0.485	NA	NA	NA
11	12/17/2013	2	CF	60	C	3	0.775	NA	NA	NA
11	12/17/2013	1	HGR	40	C	1	0.73	NA	NA	NA
11	12/17/2013	2	HGR	30	C	1	0.775	NA	NA	NA
12	12/17/2013	1	CF	90	C	1	0.545	RHVA	A	1
15	12/27/2013	1	SP	32	C	1	0.91	DITE	L	1
15	12/27/2013	2	CF	83	C	1	0.895	DITE	L	1
15	12/27/2013	2	CF	83	C	1	0.895	RHVA	L	1
456	12/30/2013	1	CF	80	C	1	0.835	DITE	L	2
456	12/30/2013	2	CF	65	C	1	0.895	NA	NA	NA
23	1/3/2014	1	HGR	80	C	1	0.67	RHVA	A	1
3	2/4/2014	1	LGR	5	C	1	0.225	RHVA	M	1
3	2/4/2014	1	LGR	5	C	1	0.225	RABO	J	1
11	2/13/2014	1	HGR	40	C	1	0.455	RHVA	L	1
27	5/17/2021	1	HGR	10	C	2	1	DITE	L	1
27	5/17/2021	2	HGR	12	C	3	1	DITE	L	1
27	5/17/2021	1	HGR	10	C	2	1	ASTR	L	2
27	5/17/2021	2	HGR	8	C	2	1	DITE	L	1
437	5/17/2021	1	HGR	10	C	2	0.98	DITE	L	2
437	5/17/2021	2	SP	18	C	2	1	DITE	L	1
437	5/17/2021	1	HGR	10	C	2	1	DITE	L	1
437	5/17/2021	2	HGR	10	C	2	1	ASTR	L	1
1173	5/17/2021	1	SP	15	C	2	0.84	DITE	L	1
1173	5/17/2021	2	SP	10	C	3	0.63	RHVA	A	1
1173	5/17/2021	1	SP	5	C	2	0.63	DITE	L	3
1173	5/17/2021	2	SP	5	C	2	0.63	ASTR	L	1
11	5/25/2021	1	CF	15	C	2	0.88	ASTR	L	1
11	5/25/2021	1	CF	15	C	2	0.88	DITE	L	1
11	5/25/2021	2	CF	30	C	2	0.96	ASTR	L	3
11	5/25/2021	2	CF	30	C	2	0.96	RHVA	A	1
525	5/25/2021	1	LGR	3	C	2	0.75	ASTR	L	1
476	5/25/2021	1	HGR	3	C	2	0.72	ASTR	L	1
476	5/25/2021	1	CF	50	C	1	0.78	RHVA	A	1
515	5/25/2021	1	HGR	10	C	3	0.75	RHVA	A	1
515	5/25/2021	2	HGR	10	C	3	0.75	RHVA	L	1
515	5/25/2021	1	HGR	3	C	2	0.94	NA	NA	NA
515	5/25/2021	2	LGR	2	C	3	0.85	ASTR	L	1
580	5/26/2021	1	CF	30	C	2	0.97	RHVA	A	1
580	5/26/2021	1	CF	30	C	2	0.97	RAAU	A	1
580	5/26/2021	1	CF	30	C	2	0.97	RABO	J	1
580	5/26/2021	2	LGR	5	C	3	0.87	RHVA	A	1
580	5/26/2021	2	LGR	5	C	3	0.87	DITE	L	1

Site #	Date	Belt #	Belt Habitat Type	Belt Gradient %	Belt Substrate	Belt Embed	Belt Canopy %	Species ID	Age ID	Count
580	5/26/2021	2	LGR	5	C	3	0.87	RAAU	A	1
33	5/28/2021	1	CF	30	C	3	0.49	NA	NA	NA
33	5/28/2021	2	HGR	5	C	2	0.93	RHVA	A	1
3	5/28/2021	1	LGR	5	C	2	0.59	DITE	L	5
3	5/28/2021	2	HGR	7	C	2	1	RHVA	L	1
23	5/28/2021	1	HGR	5	C	2	0.91	RHVA	L	2
23	5/28/2021	1	HGR	5	C	2	0.91	DITE	L	2
12	5/28/2021	1	HGR	12	C	2	0.602	RHVA	A	1
12	5/28/2021	1	HGR	12	C	2	0.602	DITE	L	4
15	5/28/2021	1	HGR	5	C	2	0.97	RHVA	L	1
15	5/28/2021	1	HGR	5	C	2	0.97	DITE	L	5
997	5/28/2021	1	LGR	5	C	2	0.79	RHVA	A	1
1189	5/28/2021	1	HGR	6	I	3	0.97	DITE	L	6
1189	5/28/2021	2	CF	10	C	4	0.97	DITE	L	2
1189	5/28/2021	1	HGR	5	I	3	0.96	DITE	L	3
1189	5/28/2021	2	LGR	5	I	3	0.96	DITE	L	2

A = adult, L = larvae, T = tadpole, J = juvenile, NA = not available

LGR = low gradient riffle, C/F = cascade/falls, HGR = high gradient riffle, SP = step pool

ASTR = *Ascaphus truei* (tailed frog), DITE = *Dicamptodon tenebrosus* (coastal giant salamander),

RHVA = *Rhyacotriton variegatus* (southern torrent salamander)

**Table 4.** Complete results of foothill yellow-legged frog (RABO) surveys.

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
365	21-Sep-11	CARSON CR	LGR	3-6.5	Cobble	81-100%	RABO	1
368	21-Sep-11	LARABEE CR	R	0-3	Cobble	0-20%	RABO	4
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	DITE	4
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	DITE	3
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	DITE	4
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	RAAU	1
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	RABO	2
366	22-Sep-11	CHRIS CR	P	3-6.5	Gravel	81-100%	TAGR	1
404	22-Sep-11	BALCOM CR	LGR	3-6.5	Cobble	81-100%	DITE	1
404	22-Sep-11	BALCOM CR	LGR	3-6.5	Cobble	81-100%	TAGR	1
404	22-Sep-11	BALCOM CR	LGR	3-6.5	Gravel	61-80%	RABO	1
405	22-Sep-11	BALCOM CR	SP	3-6.5	Silt/Clay	81-100%	DITE	2
405	22-Sep-11	BALCOM CR	SP	3-6.5	Silt/Clay	81-100%	RABO	2
378	23-Sep-11	EEL RIVER	R	0-3	Cobble	0-20%	RABO	1
378	23-Sep-11	EEL RIVER	R	0-3	Cobble	0-20%	RABO	2
378	23-Sep-11	EEL RIVER	R	0-3	Cobble	0-20%	RABO	2
378	23-Sep-11	EEL RIVER	LGR	0-3	Cobble	0-20%	RABO	1
378	23-Sep-11	EEL RIVER	LGR	0-3	Cobble	0-20%	RABO	2
381	26-Sep-11	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	RABO	1
381	26-Sep-11	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	RABO	1
388	26-Sep-11	KAPPLE CR	HGR	3-6.5	Cobble	81-100%	RABO	2
388	26-Sep-11	KAPPLE CR	HGR	3-6.5	Cobble	81-100%	RABO	1
367	27-Sep-11	THOMPSON CR	LGR	3-6.5	Cobble	61-80%	RABO	4
371	27-Sep-11	EEL RIVER	R	0-3	Gravel	0-20%	RABO	6
382	27-Sep-11	EEL RIVER	R	0-3	Gravel	0-20%	RABO	1
396	27-Sep-11	EEL RIVER	P	0-3	Gravel	0-20%	RABO	9
402	27-Sep-11	BELL CR	LGR	3-6.5	Cobble	61-80%	RABO	1
402	27-Sep-11	BELL CR	LGR	3-6.5	Cobble	61-80%	RABO	1
437	27-Sep-11	MCCANN CR	HGR	6.5-20	Boulder	81-100%	ASTR	1
437	27-Sep-11	MCCANN CR	HGR	6.5-20	Boulder	81-100%	RABO	1
370	28-Sep-11	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	2
370	28-Sep-11	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	4
373	28-Sep-11	NEWMAN CR	LGR	0-3	Cobble	81-100%	RABO	6
373	28-Sep-11	NEWMAN CR	LGR	0-3	Cobble	81-100%	RABO	1
385	28-Sep-11	LARABEE CR	P	0-3	Gravel	0-20%	RABO	3
395	28-Sep-11	DAUPHINY CR	P	0-3	Silt/Clay	41-60%	RABO	1
407	28-Sep-11	POISON OAK CR	LGR	0-3	Gravel	61-80%	DITE	1
407	28-Sep-11	POISON OAK CR	LGR	0-3	Cobble	81-100%	DITE	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
407	28-Sep-11	POISON OAK CR	LGR	0-3	Cobble	81-100%	DITE	1
407	28-Sep-11	POISON OAK CR	LGR	0-3	Cobble	61-80%	DITE	1
410	28-Sep-11	POISON OAK CR	LGR	>20	Cobble	81-100%	DITE	1
410	28-Sep-11	POISON OAK CR	SP	>20	Boulder	81-100%	DITE	1
410	28-Sep-11	POISON OAK CR	SP	>20	Cobble	81-100%	DITE	1
410	28-Sep-11	POISON OAK CR	SP	>20	Cobble	81-100%	RABO	1
637	28-Sep-11	NEWMAN CR	P	6.5-20	Cobble	81-100%	DITE	2
637	28-Sep-11	NEWMAN CR	P	6.5-20	Cobble	81-100%	HYRE	1
637	28-Sep-11	NEWMAN CR	P	6.5-20	Gravel	81-100%	RABO	1
364	29-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	RABO	4
372	29-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	NA	NA
372	29-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	NA	NA
372	29-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	RABO	5
372	29-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	RABO	2
409	29-Sep-11	SCOTT CR	SP	6.5-20	Boulder	81-100%	DITE	1
409	29-Sep-11	SCOTT CR	SP	6.5-20	Boulder	81-100%	RABO	1
409	29-Sep-11	SCOTT CR	SP	6.5-20	Boulder	81-100%	RABO	2
409	29-Sep-11	SCOTT CR	SP	6.5-20	Boulder	81-100%	RABO	1
398	30-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	RABO	5
398	30-Sep-11	LARABEE CR	R	0-3	Boulder	0-20%	RABO	2
457	30-Sep-11	ARNOLD CR	SP	6.5-20	Cobble	81-100%	NA	NA
457	30-Sep-11	ARNOLD CR	SP	6.5-20	Boulder	81-100%	NA	NA
457	30-Sep-11	ARNOLD CR	SP	6.5-20	Boulder	61-80%	RABO	1
377	06-Oct-11	EEL RIVER	P	0-3	Gravel	0-20%	RABO	1
387	06-Oct-11	EEL RIVER	R	0-3	Gravel	0-20%	RABO	3
476	07-Oct-11	SCOTT CR	HGR	>20	Boulder	61-80%	NA	NA
476	07-Oct-11	SCOTT CR	HGR	>20	Boulder	61-80%	NA	NA
476	07-Oct-11	SCOTT CR	HGR	>20	Boulder	61-80%	DITE	1
476	07-Oct-11	SCOTT CR	HGR	>20	Boulder	61-80%	RABO	1
478	12-Oct-11	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	1
478	12-Oct-11	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	RABO	1
478	12-Oct-11	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	NA	NA
478	12-Oct-11	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	NA	NA
481	12-Oct-11	NO-NAME CREEK	LGR	3-6.5	Cobble	81-100%	RABO	1
511	13-Oct-11	BOULDER CR	HGR	6.5-20	Boulder	61-80%	NA	NA
511	13-Oct-11	BOULDER CR	HGR	6.5-20	Boulder	61-80%	RABO	1
580	13-Oct-11	BOULDER CR	CF	>20	Boulder	61-80%	NA	NA
580	13-Oct-11	BOULDER CR	HGR	>20	Boulder	61-80%	NA	NA
580	13-Oct-11	BOULDER CR	HGR	>20	Cobble	61-80%	DITE	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
580	13-Oct-11	BOULDER CR	HGR	>20	Cobble	61-80%	DITE	1
386	14-Oct-11	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	RABO	1
386	14-Oct-11	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	NA	NA
386	14-Oct-11	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	NA	NA
386	14-Oct-11	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	NA	NA
389	17-Oct-11	POISON OAK CR	LGR	6.5-20	Gravel	61-80%	DITE	2
389	17-Oct-11	POISON OAK CR	LGR	6.5-20	Cobble	61-80%	DITE	2
389	17-Oct-11	POISON OAK CR	LGR	6.5-20	Cobble	61-80%	DITE	3
389	17-Oct-11	POISON OAK CR	LGR	6.5-20	Cobble	61-80%	DITE	1
525	18-Oct-11	POND CR	SP	6.5-20	Boulder	81-100%	DITE	2
525	18-Oct-11	POND CR	SP	6.5-20	Boulder	81-100%	DITE	1
525	18-Oct-11	POND CR	HGR	6.5-20	Boulder	81-100%	DITE	1
525	18-Oct-11	POND CR	HGR	6.5-20	Boulder	81-100%	NA	NA
392	20-Oct-11	LARABEE CR	LGR	6.5-20	Cobble	81-100%	RABO	3
389	10-Sep-12	POISON OAK CR	LGR	0-3	Gravel	61-80%	DITE	1
389	10-Sep-12	POISON OAK CR	LGR	0-3	Gravel	61-80%	RABO	1
407	10-Sep-12	POISON OAK CR	LGR	0-3	Gravel	61-80%	RABO	2
410	10-Sep-12	POISON OAK CR	LGR	6.5-20	Gravel	81-100%	DITE	1
410	10-Sep-12	POISON OAK CR	SP	6.5-20	Cobble	81-100%	DITE	3
410	10-Sep-12	POISON OAK CR	SP	6.5-20	Cobble	81-100%	DITE	3
410	10-Sep-12	POISON OAK CR	SP	6.5-20	Cobble	81-100%	DITE	5
371	12-Sep-12	EEL RIVER	R	0-3	Gravel	0-20%	RABO	2
381	12-Sep-12	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	DITE	2
381	12-Sep-12	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	DITE	3
381	12-Sep-12	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	RABO	1
388	12-Sep-12	KAPPLE CR	HGR	3-6.5	Cobble	61-80%	DITE	2
388	12-Sep-12	KAPPLE CR	HGR	3-6.5	Cobble	61-80%	RABO	3
388	12-Sep-12	KAPPLE CR	HGR	3-6.5	Cobble	61-80%	RABO	1
373	13-Sep-12	NEWMAN CR	LGR	0-3	Cobble	61-80%	RABO	2
437	13-Sep-12	MCCANN CR	HGR	6.5-20	Cobble	81-100%	DITE	2
437	13-Sep-12	MCCANN CR	HGR	6.5-20	Cobble	81-100%	RABO	2
637	13-Sep-12	NEWMAN CR	P	6.5-20	Gravel	81-100%	RABO	3
378	21-Sep-12	EEL RIVER	R	0-3	Cobble	0-20%	RABO	1
378	21-Sep-12	EEL RIVER	R	0-3	Cobble	0-20%	RABO	2
378	21-Sep-12	EEL RIVER	LGR	0-3	Boulder	0-20%	RABO	1
378	21-Sep-12	EEL RIVER	LGR	0-3	Boulder	0-20%	RABO	5
387	21-Sep-12	EEL RIVER	R	0-3	Gravel	0-20%	RABO	2
365	24-Sep-12	CARSON CR	LGR	3-6.5	Cobble	81-100%	RABO	1
365	24-Sep-12	CARSON CR	LGR	3-6.5	Cobble	81-100%	RABO	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
366	24-Sep-12	CHRIS CR	P	3-6.5	Silt/Clay	81-100%	DITE	1
366	24-Sep-12	CHRIS CR	P	3-6.5	Silt/Clay	81-100%	HYRE	1
366	24-Sep-12	CHRIS CR	P	3-6.5	Silt/Clay	81-100%	RAAU	1
366	24-Sep-12	CHRIS CR	P	3-6.5	Silt/Clay	81-100%	RABO	1
367	24-Sep-12	THOMPSON CR	LGR	0-3	Cobble	61-80%	RABO	1
367	24-Sep-12	THOMPSON CR	LGR	0-3	Cobble	61-80%	RABO	2
368	24-Sep-12	LARABEE CR	R	0-3	Cobble	0-20%	RABO	8
372	24-Sep-12	LARABEE CR	R	0-3	Boulder	0-20%	RABO	1
372	24-Sep-12	LARABEE CR	R	0-3	Boulder	0-20%	RABO	2
375	24-Sep-12	SONOMA CR	LGR	0-3	Gravel	81-100%	NA	NA
375	24-Sep-12	SONOMA CR	LGR	0-3	Cobble	61-80%	DITE	1
375	24-Sep-12	SONOMA CR	LGR	0-3	Cobble	61-80%	RABO	1
375	24-Sep-12	SONOMA CR	LGR	0-3	Cobble	61-80%	NA	NA
375	24-Sep-12	SONOMA CR	LGR	0-3	Cobble	81-100%	NA	NA
396	24-Sep-12	EEL RIVER	P	0-3	Gravel	0-20%	RABO	6
404	24-Sep-12	BALCOM CR	P	3-6.5	Gravel	81-100%	DITE	2
404	24-Sep-12	BALCOM CR	LGR	3-6.5	Cobble	81-100%	DITE	4
404	24-Sep-12	BALCOM CR	LGR	3-6.5	Gravel	81-100%	DITE	3
404	24-Sep-12	BALCOM CR	LGR	3-6.5	Gravel	81-100%	RABO	1
405	24-Sep-12	BALCOM CR	LGR	3-6.5	Gravel	81-100%	RABO	1
409	24-Sep-12	SCOTT CR	SP	6.5-20	Boulder	81-100%	DITE	1
409	24-Sep-12	SCOTT CR	SP	6.5-20	Boulder	81-100%	NA	NA
409	24-Sep-12	SCOTT CR	SP	6.5-20	Boulder	61-80%	NA	NA
409	24-Sep-12	SCOTT CR	HGR	6.5-20	Boulder	81-100%	NA	NA
412	24-Sep-12	SONOMA CR	LGR	0-3	Cobble	61-80%	RABO	1
370	25-Sep-12	LARABEE CR	LGR	0-3	Boulder	0-20%	RAAU	8
370	25-Sep-12	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
370	25-Sep-12	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
385	25-Sep-12	LARABEE CR	P	0-3	Gravel	0-20%	RABO	10
364	26-Sep-12	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
364	26-Sep-12	LARABEE CR	R	0-3	Gravel	0-20%	RABO	4
377	26-Sep-12	EEL RIVER	P	0-3	Gravel	0-20%	RABO	1
377	26-Sep-12	EEL RIVER	P	0-3	Gravel	0-20%	RABO	2
382	26-Sep-12	EEL RIVER	R	0-3	Gravel	0-20%	RABO	3
402	26-Sep-12	BELL CR	LGR	3-6.5	Cobble	61-80%	RABO	2
398	27-Sep-12	LARABEE CR	R	0-3	Boulder	0-20%	RABO	2
398	27-Sep-12	LARABEE CR	R	0-3	Boulder	0-20%	RABO	1
457	27-Sep-12	ARNOLD CR	SP	6.5-20	Boulder	81-100%	NA	NA
457	27-Sep-12	ARNOLD CR	SP	6.5-20	Boulder	81-100%	NA	NA

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
457	27-Sep-12	ARNOLD CR	SP	6.5-20	Boulder	61-80%	NA	NA
457	27-Sep-12	ARNOLD CR	SP	6.5-20	Boulder	81-100%	NA	NA
481	27-Sep-12	NO-NAME CR	LGR	3-6.5	Cobble	81-100%	RABO	1
481	27-Sep-12	NO-NAME CR	LGR	3-6.5	Cobble	81-100%	RABO	2
511	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	61-80%	DITE	2
511	27-Sep-12	BOULDER CR	HGR	6.5-20	Boulder	61-80%		1
511	27-Sep-12	BOULDER CR	LGR	6.5-20	Gravel	61-80%	DITE	1
511	27-Sep-12	BOULDER CR	LGR	6.5-20	Gravel	61-80%	NA	NA
525	27-Sep-12	POND CR	SP	6.5-20	Boulder	81-100%	DITE	4
525	27-Sep-12	POND CR	SP	6.5-20	Boulder	81-100%	DITE	4
525	27-Sep-12	POND CR	HGR	6.5-20	Boulder	61-80%	DITE	5
525	27-Sep-12	POND CR	HGR	6.5-20	Boulder	81-100%	DITE	2
580	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	81-100%	ASTR	2
580	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	81-100%	DITE	6
580	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	81-100%	RAAU	1
580	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	81-100%	RHVA	2
580	27-Sep-12	BOULDER CR	SP	6.5-20	Boulder	81-100%	DITE	1
580	27-Sep-12	BOULDER CR	HGR	6.5-20	Cobble	41-60%	DITE	1
580	27-Sep-12	BOULDER CR	HGR	6.5-20	Cobble	81-100%	DITE	1
580	27-Sep-12	BOULDER CR	HGR	6.5-20	Cobble	81-100%	RAAU	1
386	28-Sep-12	BRIDGE CR	LGR	3-6.5	Boulder	61-80%	RABO	4
395	28-Sep-12	DAUPHINY CR	P	0-3	Silt/Clay	41-60%	RABO	1
476	28-Sep-12	SCOTT CR	HGR	6.5-20	Boulder	61-80%	DITE	6
476	28-Sep-12	SCOTT CR	SP	6.5-20	Boulder	61-80%	DITE	6
476	28-Sep-12	SCOTT CR	SP	6.5-20	Boulder	61-80%	RHVA	1
476	28-Sep-12	SCOTT CR	SP	6.5-20	Boulder	61-80%	DITE	3
476	28-Sep-12	SCOTT CR	SP	6.5-20	Boulder	61-80%	DITE	3
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	1
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	3
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	ASTR	1
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	2
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	RHVA	1
478	28-Sep-12	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	1
392	03-Oct-12	LARABEE CR	LGR	3-6.5	Cobble	81-100%	RABO	1
373	25-Jun-13	NEWMAN CR	LGR	0-3	Cobble	61-80%	RABO	3
373	25-Jun-13	NEWMAN CR	LGR	0-3	Cobble	61-80%	RABO	1
373	25-Jun-13	NEWMAN CR	LGR	0-3	Cobble	61-80%	RABO	2
310	16-Jul-13	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
365	16-Jul-13	CARSON CR	LGR	0-3	Boulder	81-100%	RABO	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
385	16-Jul-13	LARABEE CR	P	0-3	Gravel	0-20%	RABO	1
404	16-Jul-13	BALCOM CR	P	3-6.5	Gravel	81-100%	RABO	1
405	16-Jul-13	BALCOM CR	LGR	3-6.5	Gravel	81-100%	DITE	1
405	16-Jul-13	BALCOM CR	LGR	3-6.5	Gravel	81-100%	RABO	1
637	17-Jul-13	NEWMAN CR	P	3-6.5	Gravel	81-100%	RABO	2
366	29-Jul-13	CHRIS CR	LGR	0-3	Gravel	81-100%	RABO	3
368	29-Jul-13	LARABEE CR	R	0-3	Cobble	0-20%	RABO	15
372	29-Jul-13	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
372	29-Jul-13	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	5
392	29-Jul-13	LARABEE CR	SP	3-6.5	Boulder	81-100%	RABO	1
409	29-Jul-13	SCOTT CR	SP	6.5-20	Boulder	81-100%	NA	NA
409	29-Jul-13	SCOTT CR	SP	6.5-20	Boulder	81-100%	RABO	1
481	29-Jul-13	No-Name Cr	LGR	3-6.5	Cobble	0-20%	RABO	1
580	29-Jul-13	BOULDER CR	HGR	6.5-20	Cobble	81-100%	DITE	1
580	29-Jul-13	BOULDER CR	HGR	6.5-20	Cobble	81-100%	RABO	1
367	12-Aug-13	THOMPSON CR	LGR	0-3	Cobble	21-40%	NA	NA
367	12-Aug-13	THOMPSON CR	LGR	0-3	Cobble	61-80%	RABO	1
371	12-Aug-13	EEL RIVER	R	0-3	Cobble	0-20%	RABO	4
371	12-Aug-13	EEL RIVER	R	0-3	Cobble	0-20%	RABO	3
382	12-Aug-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	2
382	12-Aug-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	2
388	12-Aug-13	KAPPLE CR	LGR	3-6.5	Cobble	41-60%	DITE	1
388	12-Aug-13	KAPPLE CR	LGR	3-6.5	Cobble	41-60%	RABO	1
396	12-Aug-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	5
396	12-Aug-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	3
402	12-Aug-13	BELL CR	P	3-6.5	Gravel	61-80%	RABO	2
407	12-Aug-13	POISON OAK CR	LGR	0-3	Gravel	81-100%	RABO	1
386	14-Aug-13	BRIDGE CR	LGR	3-6.5	Boulder	21-40%	NA	NA
386	14-Aug-13	BRIDGE CR	LGR	3-6.5	Boulder	41-60%	RABO	1
398	28-Aug-13	LARABEE CR	R	0-3	Boulder	0-20%	RABO	1
457	28-Aug-13	ARNOLD CR	SP	6.5-20	Boulder	81-100%	DITE	1
457	28-Aug-13	ARNOLD CR	SP	6.5-20	Boulder	81-100%	RABO	2
366	30-Aug-13	CHRIS CR	P	0-3	Gravel	81-100%	DITE	1
366	30-Aug-13	CHRIS CR	P	0-3	Gravel	81-100%	RAAU	5
366	30-Aug-13	CHRIS CR	P	0-3	Gravel	81-100%	RABO	3
364	03-Sep-13	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	2
364	03-Sep-13	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	1
378	03-Sep-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	1
378	03-Sep-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	4



Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
387	03-Sep-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	3
387	03-Sep-13	EEL RIVER	R	0-3	Gravel	0-20%	RABO	10
437	03-Sep-13	MCCANN CR	HGR	6.5-20	Cobble	81-100%	RABO	1
478	03-Sep-13	ARNOLD CR	HGR	3-6.5	Boulder	81-100%	RABO	1
375	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	DITE	2
375	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	RABO	3
375	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	NA	NA
375	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	RABO	1
375	04-Sep-13	SONOMA CR	P	0-3	Cobble	61-80%	NA	NA
377	04-Sep-13	EEL RIVER	R	0-3	Sand	0-20%	RABO	5
377	04-Sep-13	EEL RIVER	R	0-3	Sand	0-20%	RABO	1
377	04-Sep-13	EEL RIVER	R	0-3	Sand	0-20%	RABO	1
381	04-Sep-13	THOMPSON CR	HGR	6.5-20	Boulder	81-100%	RABO	2
412	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	DITE	4
412	04-Sep-13	SONOMA CR	LGR	0-3	Cobble	61-80%	RABO	3
389	10-Sep-13	POISON OAK CR	LGR	0-3	Cobble	41-60%	DITE	3
389	10-Sep-13	POISON OAK CR	LGR	0-3	Cobble	41-60%	RABO	5
410	10-Sep-13	POISON OAK CR	HGR	3-6.5	Gravel	81-100%	DITE	4
410	10-Sep-13	POISON OAK CR	HGR	3-6.5	Gravel	81-100%	DITE	3
410	10-Sep-13	POISON OAK CR	HGR	3-6.5	Gravel	81-100%	RABO	1
511	11-Sep-13	BOULDER CR	HGR	6.5-20	Boulder	41-60%	RABO	1
525	11-Sep-13	POND CR	SP	6.5-20	Boulder	81-100%	RAAU	1
525	11-Sep-13	POND CR	SP	6.5-20	Boulder	81-100%	DITE	1
525	11-Sep-13	POND CR	HGR	6.5-20	Boulder	81-100%	NA	NA
525	11-Sep-13	POND CR	HGR	6.5-20	Boulder	81-100%	NA	NA
476	12-Sep-13	SCOTT CR	SP	6.5-20	Boulder	81-100%	RABO	1
69	10-Oct-17	BEAR CR	LGR	0-3	Boulder	61-80%	DITE	1
69	10-Oct-17	BEAR CR	LGR	0-3	Boulder	41-60%	NA	NA
69	10-Oct-17	BEAR CR	P	0-3	Boulder	41-60%	NA	NA
69	10-Oct-17	BEAR CR	P	0-3	Boulder	61-80%	NA	NA
72	23-Oct-17	HOWE CR	LGR	0-3	Cobble	21-40%	RABO	1
72	23-Oct-17	HOWE CR	R	0-3	Cobble	41-60%	NA	NA
72	23-Oct-17	HOWE CR	LGR	0-3	Cobble	41-60%	NA	NA
73	25-Oct-17	SHIVELY CR	R	0-3	Gravel	81-100%	RABO	1
73	25-Oct-17	SHIVELY CR	LGR	0-3	Cobble	41-60%	NA	NA
73	25-Oct-17	SHIVELY CR	R	0-3	Gravel	81-100%	NA	NA
190	27-Oct-17	BEAR CR	HGR	0-3	Cobble	41-60%	NA	NA
190	27-Oct-17	BEAR CR	HGR	0-3	Boulder	61-80%	RABO	1
190	27-Oct-17	BEAR CR	HGR	0-3	Boulder	21-40%	RABO	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
396	22-Jul-21	EEL RIVER	LGR	0-3	Cobble	0-20%	RABO	7
387	22-Jul-21	EEL RIVER	P	0-3	Cobble	0-20%	RABO	1
382	22-Jul-21	EEL RIVER	R	0-3	Cobble	0-20%	RABO	10
389	23-Jul-21	POISON OAK CR	LGR	0-3	Cobble	61-80%	RABO	1
410	23-Jul-21	POISON OAK CR	SP	6.5-20	Gravel	61-80%	NA	NA
410	23-Jul-21	POISON OAK CR	SP	6.5-20	Gravel	81-100%	NA	NA
410	23-Jul-21	POISON OAK CR	SP	6.5-20	Gravel	81-100%	NA	NA
410	23-Jul-21	POISON OAK CR	SP	6.5-20	Gravel	81-100%	NA	NA
407	23-Jul-21	POISON OAK CR	LGR	0-3	Boulder	81-100%	RABO	1
437	23-Jul-21	MCCANN CR	HGR	3-6.5	Boulder	81-100%	RABO	2
377	26-Jul-21	EEL RIVER	P	0-3	Gravel	0-20%	RABO	10
375	26-Jul-21	SONOMA CR	LGR	0-3	Boulder	81-100%	RABO	2
378	26-Jul-21	EEL RIVER	P	0-3	Boulder	0-20%	RABO	10
371	05-Aug-21	EEL RIVER	P	0-3	Gravel	0-20%	RABO	5
388	05-Aug-21	KAPPLE CR	LGR	0-3	Boulder	81-100%	NA	NA
388	05-Aug-21	KAPPLE CR	LGR	0-3	Boulder	81-100%	RABO	1
367	05-Aug-21	THOMPSON CR	LGR	0-3	Boulder	61-80%	RABO	10
373	06-Aug-21	NEWMAN CR	LGR	0-3	Cobble	81-100%	RABO	5
637	06-Aug-21	NEWMAN CR	SP	0-3	Cobble	81-100%	NA	NA
637	06-Aug-21	NEWMAN CR	SP	0-3	Boulder	61-80%	NA	NA
637	06-Aug-21	NEWMAN CR	LGR	0-3	Gravel	0-20%	NA	NA
637	06-Aug-21	NEWMAN CR	LGR	0-3	Gravel	81-100%	NA	NA
381	10-Aug-21	THOMPSON CR	HGR	3-6.5	Boulder	61-80%	RABO	1
404	13-Aug-21	BALCOM CR	LGR	0-3	Boulder	61-80%	NA	NA
404	13-Aug-21	BALCOM CR	LGR	0-3	Gravel	61-80%	NA	NA
404	13-Aug-21	BALCOM CR	LGR	0-3	Gravel	61-80%	RABO	2
364	13-Aug-21	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	10
372	13-Aug-21	LARABEE CR	LGR	0-3	Boulder	0-20%	RABO	2
385	13-Aug-21	LARABEE CR	LGR	0-3	Gravel	0-20%	RABO	5
370	13-Aug-21	LARABEE CR	P	0-3	Gravel	0-20%	RABO	1
395	25-Aug-21	DAUPHINY CR	LGR	0-3	Gravel	81-100%	RABO	7
369	25-Aug-21	LARABEE CR	P	0-3	Boulder	0-20%	RABO	1
365	25-Aug-21	CARSON CR	LGR	0-3	Boulder	81-100%	RABO	5
366	25-Aug-21	CHRIS CR	LGR	0-3	Gravel	81-100%	RABO	7
405	27-Aug-21	BALCOM CR	SP	3-6.5	Gravel	81-100%	RABO	1
409	27-Aug-21	SCOTT CR	CF	3-6.5	Boulder	81-100%	RAAU	1
409	27-Aug-21	SCOTT CR	CF	3-6.5	Boulder	81-100%	NA	NA
409	27-Aug-21	SCOTT CR	CF	3-6.5	Boulder	61-80%	RABO	1
386	30-Aug-21	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	RAAU	1

Site #	Date	Watercourse	Habitat Type	Gradient Class	Substrate Type	Canopy Class	Species ID	Count
386	30-Aug-21	BRIDGE CR	HGR	3-6.5	Boulder	61-80%	RABO	1
412	07-Sep-21	SONOMA CR	HGR	3-6.5	Boulder	81-100%	NA	NA
412	07-Sep-21	SONOMA CR	HGR	3-6.5	Boulder	61-80%	RABO	2
478	08-Sep-21	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	RAAU	1
478	08-Sep-21	ARNOLD CR	SP	6.5-20	Boulder	81-100%	RAAU	1
478	08-Sep-21	ARNOLD CR	SP	6.5-20	Boulder	61-80%	NA	NA
478	08-Sep-21	ARNOLD CR	HGR	6.5-20	Boulder	81-100%	DITE	1
457	08-Sep-21	ARNOLD CR	LGR	3-6.5	Boulder	81-100%	RABO	2
580	09-Sep-21	BOULDER CR	CF	6.5-20	Boulder	81-100%	NA	NA
580	09-Sep-21	BOULDER CR	CF	6.5-20	Boulder	41-60%	NA	NA
580	09-Sep-21	BOULDER CR	CF	6.5-20	Boulder	61-80%	RAAU	2
580	09-Sep-21	BOULDER CR	LGR	6.5-20	Cobble	61-80%	RAAU	2
525	09-Sep-21	POND CR	HGR	6.5-20	Cobble	61-80%	RAAU	1
525	09-Sep-21	POND CR	HGR	6.5-20	Boulder	81-100%	ASTR	1
525	09-Sep-21	POND CR	HGR	6.5-20	Boulder	61-80%	NA	NA
525	09-Sep-21	POND CR	SP	6.5-20	Boulder	81-100%	DITE	1
476	09-Sep-21	SCOTT CR	CF	6.5-20	Boulder	81-100%	DITE	5
476	09-Sep-21	SCOTT CR	CF	6.5-20	Boulder	61-80%	DITE	3
476	09-Sep-21	SCOTT CR	CF	6.5-20	Boulder	81-100%	DITE	1
476	09-Sep-21	SCOTT CR	CF	6.5-20	Boulder	81-100%	DITE	8
511	14-Sep-21	BOULDER CR	SP	3-6.5	Boulder	61-80%	NA	NA
511	14-Sep-21	BOULDER CR	CF	3-6.5	Boulder	61-80%	NA	NA
511	14-Sep-21	BOULDER CR	HGR	3-6.5	Boulder	81-100%	NA	NA
511	14-Sep-21	BOULDER CR	SP	3-6.5	Boulder	81-100%	RAAU	1
511	14-Sep-21	BOULDER CR	SP	3-6.5	Boulder	81-100%	DITE	1
481	20-Sep-21	NO NAME CR	SP	3-6.5	Boulder	81-100%	NA	NA
481	20-Sep-21	NO NAME CR	HGR	3-6.5	Boulder	81-100%	NA	NA
481	20-Sep-21	NO NAME CR	LGR	3-6.5	Cobble	61-80%	RAAU	3
481	20-Sep-21	NO NAME CR	LGR	3-6.5	Cobble	81-100%	RAAU	3
402	21-Sep-21	BELL CR	LGR	0-3	Gravel	41-60%	RABO	1
392	22-Sep-21	LARABEE CR	HGR	3-6.5	Gravel	81-100%	RABO	9

A = adult, L = larvae, T = tadpole, J = juvenile, NA = not available. LGR = low gradient riffle, C/F = cascade/falls, HGR = high gradient riffle, P = pool, R = run. DITE = *Dicamptodon tenebrosus* (coastal giant salamander).

**Table 5.** Complete results of northwestern pond turtle surveys.

<b>Site #</b>	<b>Date</b>	<b>WAU</b>	<b>Tributary</b>	<b>Habitat Type</b>	<b>Occupied?</b>	<b>Notes</b>
981	7-Sep-21	Upper Eel	Mainstem Eel	Pool	Y	In pool basking on log
834	10-Sep-21	Upper Eel	Balcom Creek	Pond	N	Pond nearly dry
372	14-Sep-21	Upper Eel	Pond Creek	Pond	N	Pond was dry