Humboldt Redwood™

Amphibian and Reptile Summary Report

2021

June 1, 2021

Cover photo: Adult female southern torrent salamander. 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 2020-2021 monitoring period there was an emphasis on watershed analysis revisitation work for the Lower Eel-Eel Delta (LEED) and Upper Eel Watershed Analysis Units (WAU), as well as initial watershed analysis for the Mad River-Upper Jacoby Creek WAU. A total of six tailed frog/southern torrent salamander monitoring locations were visited in 2020, and a total of eight locations have been visited to date in 2021. Species presence and habitat information was collected at all sites during both the 2020 and 2021 seasons. For the Mad River-Upper Jacoby Creek WAU initial watershed analysis, no species distributional or monitoring surveys have been conducted to date, and species distribution data are very limited for this WAU, so inferences about potentially suitable habitat were based on 1) known species distribution from the CNDDB, Green Diamond Resource Company (GDRCo), and field observations, 2) available information from the adjacent Freshwater WAU, and 3) known geologic information.

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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 1 June 2020 to 1 June 2021.

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.

Records of species occurrence have been gathered from incidental observations recorded during Timber Harvesting Plan (THP) surveys, historical records, and wildlife monitoring surveys, including protocol surveys of Class I and Class II waters (streams, watercourses, seeps, springs, lakes, ponds, and wetlands). The methods and protocols used to survey for the five covered species were developed cooperatively between the Wildlife Agencies and HRC and are described briefly in the following sections.

With this report covering the 2020-2021 monitoring period we are continuing our effort on upcoming watershed analysis revisitation units. Monitoring effort was focused on the LEED and Upper Eel WAUs, as well as initial watershed analysis for the Mad River-Upper Jacoby Creek WAU.

COVERED SPECIES

SOUTHERN TORRENT SALAMANDER AND TAILED FROG

Introduction

The southern torrent salamander (*Rhyacotriton variegatus*) and tailed frog (*Ascaphus truei*) (Figures 1 and 2) are treated jointly in this report and in survey protocols due to their preference for headwater habitats and high gradient streams. Briefly, the tailed frog and southern torrent salamander protocol was intended to fulfill the needs of distributional surveys for these two species. The goal of this protocol was to determine the approximate distribution in WAUs using an area-constrained search of Class II watercourses, seeps, and springs.

Following the initial baseline distributional surveys, it was recognized that, in some cases, the vigorous sampling techniques originally used for the baseline surveys could potentially negatively impact sub-populations. As a result, we have moved to an occupancy level survey, using similar techniques but terminating the survey once the focus species has been found, or continuing to survey the entire reach if no specimens are located. This technique has allowed us to monitor the persistence of sub-populations within WAUs without risking potential habitat damage.

Figure 1. Southern Torrent Salamander

Figure 2. Tailed Frog

Methods

The survey protocol for tailed frogs and southern torrent salamanders uses an area-constrained search method of Class II waters. The protocol has been appended to previous reports and is available upon request. The suggested sampling period for torrent salamanders is after the first winter rains (e.g., October-November) through May, depending on weather and watercourse conditions. For tailed frogs the

suggested sampling period is March through June, again depending on weather and watercourse conditions. Based on the results of previous surveys, it appears that the survey season for both species may be extended when favorable water conditions exist, although drought conditions have in some cases required that surveys be conducted earlier in the season. Conversely, above average rainfall during the winter may result in high flow conditions that delay surveys.

The protocol surveys have been used to build a distributional map for the two species. In order to monitor the persistence of subpopulations of these species and continue to inform the watershed analysis revisitation process, occupancy surveys of previously located sites have been conducted using an abbreviated protocol in which the survey is considered complete once at least one individual of the target species is found.

Results and Discussion

During the reporting period for 2020-2021 a total of 14 monitoring locations were visited in the LEED and Upper Eel WAUs to survey for southern torrent salamanders and tailed frogs and to record habitat conditions at the sites. In addition, covered species distribution and habitat conditions in the Mad River-Upper Jacoby Creek WAU was evaluated for the initial watershed analysis.

A total of six monitoring sites, including known or historic tailed frog and southern torrent salamander locations, were visited in 2020 (Table 1). All sites were in the LEED WAU. At these sites 10 reaches consisting of one or more belts were surveyed for covered species. Southern torrent salamanders (one larval salamander) were observed at only one site, and tailed frogs were observed at two of the sites (two adults), resulting in low apparent occupancy of these species.

Coastal giant salamanders (*Dicamptodon tenebrosus*) were observed at 5 of the 6 sites (primarily larvae). Coastal giant salamanders are potential predators of southern torrent salamanders. Other covered species observed included foothill yellow-legged frogs (*Rana boylii*) at one of the sites.

All 2020 surveys occurred in September and October, outside the optimal survey period for these species, and in particular, outside the period when tailed frog larvae would be most visible when clinging to rocks in the watercourses. Therefore, it is difficult to make any conclusions about covered species occupancy at these locations in 2020.

Relative to habitat conditions, characteristics for the surveyed belts can be summarized as follows. See Table 1 for habitat codes.

- Habitat type: high gradient riffles comprised the majority of belts (67%).
- Belt gradient: range 2-30%; mean 10%.
- Belt substrate: 100% (100%) of the sites were of competent rock.
- Belt embeddedness was generally moderate, averaging 2.4.
- Belt canopy was high overall, with a range of 59-100%; with a mean of 93%.

Table 1. Southern torrent salamander (RHVA) and tailed frog (ASTR) 2020 survey summary.

WAU	Date	Site ID	Reach	Belt	Belt Habitat	Belt Gradient	Substrate	Substrate Type	Belt Embed	Belt Canopy	Species ID
LEED	01-Oct-20	18	1	1	HGR	5	Bo	C	2	59%	RABO
LEED	01-Oct-20	18	1	2	HGR	5	Bo	C	2	75%	RABO
LEED	01-Oct-20	18	2	2	HGR	5	Bo	C	2	95%	RABO
LEED	01-Oct-20	18	2	1	HGR	5	Bo	C	2	96%	RABO
LEED	28-Sep-20	735	1	1	HGR	15	Co	C	2	98%	DITE
LEED	28-Sep-20	735	1	2	HGR	20	Co	C	3	100%	DITE
LEED	28-Sep-20	735	2	1	HGR	30	Co	C	3	100%	DITE
LEED	25-Sep-20	798	1	1	LGR	2	Co	C	2	94%	DITE
LEED	25-Sep-20	798	2	1	HGR	10	Bo	C	2	97%	DITE
LEED	25-Sep-20	798	1	2	HGR	10	Co	C	2	100%	DITE
LEED	24-Sep-20	998	1	1	HGR	25	Bo	C	3	98%	NA
LEED	24-Sep-20	998	1	2	LGR	10	Gr	C	2	100%	DITE
LEED	24-Sep-20	998	2	1	SP	15	Gr	C	3	100%	DITE
LEED	24-Sep-20	998	2	2	LGR	10	Gr	C	1	100%	DITE, RHVA
LEED	29-Sep-20	1174	1	1	HGR	5	Co	C	3	76%	DITE
LEED	29-Sep-20	1174	1	2	HGR	5	Co	C	3	98%	DITE, ASTR
LEED	29-Sep-20	1548	1	1	LGR	2	Bo	C	3	97%	DITE
LEED	29-Sep-20	1548	1	2	LGR	2	Bo	C	3	97%	DITE,ASTR

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

Parameter	Explanation	
Habitat Code	**P**=Pool	**HGR**=High Gradient Riffle
	R=Run	**C/F**=Cascade/Falls
	LGR=Low Gradient Riffle	**SP**=Step Pool
Substrate C/I	Competent (**C**) hard and does not break in the hand it is competent.	
	Incompetent (**I**) Readily crumbles or has plasticity it is incompetent.	
	Bo = Boulder, **Co** = Cobble, **Gr** = Gravel, **S** = Sand or silt	
Embeddedness (1-4)	**1**=0-25%,	**3**=51-75%
	2=26-50%	**4**=76-100%
Species ID	**RHVA** = southern torrent salamander	**DITE** = coastal giant salamander
	ASTR = tailed frog	**RABO** = foothill yellow-legged frog
	ANFL = black salamander	**BAAT** = California slender salamander
	RAAU = northern red-legged frog	

A total of eight monitoring sites, including known or historic tailed frog and southern torrent salamander locations, were visited in 2021 (Table 3). Five sites were in the LEED WAU, and three in the Upper Eel WAU. At these sites 16 reaches consisting of one or more belts were surveyed for covered species.

Southern torrent salamanders (one larval salamander) were observed at only one site, and tailed frogs were observed at three of the sites (all larvae), resulting in low apparent occupancy of these species.

Coastal giant salamanders (*Dicamptodon tenebrosus*) were observed at 5 of the 8 sites (all larvae). No other covered species were observed at any of the sites.

All 2021 surveys were conducted in April and May which is within the suggested survey period for these species, and tailed frog larvae were more visible than during the 2020 surveys. However, given the ongoing drought conditions in the region, indications of summer low flow conditions were already observed at the monitoring locations at the time of the surveys.

Relative to habitat conditions for these surveys, characteristics for the surveyed belts can be summarized as follows. See Table 1 for habitat codes.

- Habitat type: low gradient riffles comprised the majority of belts (48%), followed by high gradient riffles (26%).
- Belt gradient: range 1-30%; mean 8%.
- Belt substrate: 100% (100%) of the sites were of competent rock.
- Belt embeddedness was generally low to moderate, averaging 2.1.
- Belt canopy was high overall, with a range of 63-100%; with a mean of 97%.

No significant changes in belt habitat conditions (e.g., habitat type, gradient, substrate, or canopy) were noted between years for the LEED WAU. No degraded habitats in either WAU were noted due to landslides, blowdown, etc. However, belt habitat and belt gradient calls are in some cases slightly different between years and may be due to changes in observers rather than actual changes in habitat. There were no changes in RMZ prescriptions between survey periods.

Table 3. Southern torrent salamander (RHVA) and tailed frog (ASTR) 2021 survey summary.

WAU	Date	Site ID	Reach	Belt	Belt Habitat	Belt Gradient	Substrate	Substrate Type	Belt Embed	Belt Canopy	Species ID
LEED	5/20/2021	17	2	1	LGR	2	Gr	C	2	100%	NA
LEED	5/20/2021	17	2	2	LGR	2	Gr	C	2	100%	NA
LEED	5/20/2021	17	1	1	LGR	3	Co	C	2	100%	NA
LEED	5/20/2021	17	1	2	LGR	4	Gr	C	2	100%	NA
LEED	5/20/2021	18	1	1	LGR	2	Gr	C	2	100%	NA
LEED	5/20/2021	18	1	2	LGR	2	Gr	C	2	100%	NA
LEED	5/20/2021	18	2	1	LGR	2	Gr	C	2	100%	NA
LEED	5/20/2021	18	2	2	LGR	2	Gr	C	2	100%	NA
Upper Eel	5/17/2021	27	2	2	HGR	8	Co	C	2	100%	DITE
Upper Eel	5/17/2021	27	1	1	HGR	10	Bo	C	2	100%	DITE
Upper Eel	5/17/2021	27	2	1	HGR	10	Bo	C	2	100%	DITE
Upper Eel	5/17/2021	27	1	2	HGR	12	Bo	C	3	100%	DITE
Upper Eel	5/17/2021	437	1	1	HGR	10	Bo	C	2	98%	DITE
Upper Eel	5/17/2021	437	2	1	HGR	10	Bo	C	2	100%	DITE
Upper Eel	5/17/2021	437	2	2	HGR	10	Bo	C	2	100%	ASTR, DITE
Upper Eel	5/17/2021	437	1	2	SP	18	Bo	C	2	100%	DITE
LEED	5/19/2021	735	1	1	HGR	5	Bo	C	3	100%	NA
LEED	5/19/2021	735	1	2	SP	15	Bo	C	3	100%	NA
LEED	5/19/2021	735	2	1	SP	15	Bo	C	3	100%	NA
LEED	5/19/2021	735	2	2	SP	15	Bo	C	3	100%	NA
LEED	5/19/2021	798	1	1	LGR	4	Gr	C	2	91%	NA
LEED	5/19/2021	798	1	2	C/F	30	Bo	C	3	91%	NA
LEED	5/19/2021	798	2	1	LGR	4	Gr	C	2	100%	DITE
LEED	5/19/2021	798	2	2	LGR	5	Co	C	2	100%	ASTR, DITE
Upper Eel	5/17/2021	1173	2	1	SP	5	Co	C	2	63%	ASTR, DITE
Upper Eel	5/17/2021	1173	1	2	SP	10	Bo	C	3	84%	RHVA
Upper Eel	5/17/2021	1173	1	1	SP	15	Bo	C	2	84%	DITE
LEED	4/20/2021	1548	1	2	LGR	1	Gr	C	1	100%	NA
LEED	4/20/2021	1548	2	1	LGR	1	Gr	C	1	100%	NA
LEED	4/20/2021	1548	1	1	LGR	2	Gr	C	2	100%	NA
LEED	4/20/2021	1548	2	2	LGR	2	Gr	C	2	100%	DITE

Summary of Mad River-Upper Jacoby Creek (MUJ) Watershed Analysis Unit

Although species distribution data are very limited in this WAU, inferences about potentially suitable habitat can be based on 1) known species distribution from the CNDDB, GDRCo, and field observations, 2) available information from the Freshwater WAU, and 3) known geologic information.

Based on available species distribution data, all five of the covered species are known to occur in this WAU. Two of the species (foothill yellow-legged frogs and northwestern pond turtles) are abundant along the Mad River. The other covered species (southern torrent salamander, tailed frog, and northern red-legged frog) are locally common in suitable habitat.

Based on geologic investigations in the WAU, the primary geologic formation is the Central Belt Franciscan Complex, which contains consolidated rock. Greywacke components in the area is comparable to the rock in the Freshwater Creek WAU at or below Road 15, which is hard enough to be competent for road surfacing, and therefore provides consolidated substrate suitable for the covered species. The combination of geology, incised topography, and typical regional density of watercourses indicates that

potential habitat for southern torrent salamanders, tailed frogs, foothill yellow-legged frogs and western pond turtles occurs throughout the WAU.

The geologic deposits in the Jacoby sub-watershed are Falor formation, which in this portion of the Mad River watershed, has an appearance and composition similar to the Hookton formation in Railroad Gulch: sandy, poorly indurated with fine to coarse gravels mixed in. The Falor formation is only present in the Jacoby Creek sub-basin and is limited to the ridgeline, and therefore should not negatively impact potential habitat in the watercourses. Springs usually develop near its contact with the underlying Central Belt Greywacke, which could potentially result in southern torrent salamander habitat. During management activities it continues to be important to identify seep and spring habitat and protect it from fine sediment inputs. Other types of the Central Belt Greywacke, including Mélange and Broken, also have characteristics of consolidated rock that is suitable as habitat for the covered species.

Stream channels with moderate to high gradient step-pool and cascade/falls habitat, with high canopy cover and cobble/gravel substrates, provide habitat for tailed frogs, while instream torrent salamander habitat is typically found in Class II headwater streams and off-channel seeps. Coarse sediment available in the streams provide interstitial spaces and thus good habitat for the headwater amphibians.

Areas of concern identified in previous watershed analyses apply to the MUJ WAU for the amphibian and reptile covered species. These include:

- Preventing fine sediment inputs from roads and other sources into waters.
- Retention of appropriate levels of canopy cover to maintain cool water temperatures.
- Proper identification of Class II waters, including seeps, springs, and ponds that provide habitat for covered species.

SUMMARY AND RECOMMENDATIONS

For the 2020-2021 survey period efforts were focused on occupancy level surveys in the LEED and Upper Eel WAUs to support the watershed analysis revisit, site-specific watershed analysis questions, and on classification of waters for THPs. In addition, covered species distribution and habitat conditions in the MUJ WAU was evaluated for the initial watershed analysis.

Survey effort during this period was focused on southern torrent salamander and tailed frog monitoring locations. No northern red-legged frog, foothill yellow-legged frog or northwestern pond turtle surveys were conducted.

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.