



Amphibian and Reptile Annual Report

2016



June 1, 2016

Cover photo: Adult northern red-legged frog near Elk River. 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

Manager: Sal Chinnici, Manager, 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 report covering the 2015-2016 monitoring period we have continued to focus on upcoming watershed analysis revisitation, as originally discussed in the 2013-2014 summary report. Therefore, this report discusses the status and results of occupancy surveys conducted during the reporting period in the Freshwater and Lower Eel-Eel River Delta (LEED) Watershed Analysis Units. No changes in the monitoring strategy are recommended at this time.

Project Manager / Primary Author



Sal Chinnici

Project document distribution list.

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

Matt Goldsworthy
NOAA Fisheries
1655 Heindon Rd.
Arcata, CA 95521

Dominik Scwhab
Cal Fire
135 Ridgway
Santa Rosa, CA 95401

James Bond
U.S. Fish and Wildlife Service
Arcata Fish and Wildlife Office
1655 Heindon Rd.
Arcata, CA 95521

Kurt McCray
Cal Fire
118 Fortuna Blvd.
Fortuna, CA 95540

This page intentionally left blank.

TABLE OF CONTENTS

LIST OF TABLES vi

LIST OF FIGURES vi

Introduction..... 1

Covered Species..... 2

 Southern Torrent Salamander and Tailed Frog 2

 Introduction..... 2

 Methods 2

 Results and Discussion: Southern Torrent Salamander 3

 Results and Discussion: Tailed Frog..... 6

 Foothill Yellow-Legged Frog 8

 Introduction..... 8

 Methods 9

 Results and Discussion 9

 Northern Red-Legged Frog 9

 Introduction..... 9

 Methods 10

 Results and Discussion 10

 Western Pond Turtle..... 11

 Introduction..... 11

 Methods 12

 Results and Discussion 13

Watershed Analysis 14

Summary and Recommendations..... 16

References..... 17

LIST OF TABLES

Table 1. Southern Torrent Salamander (RHVA) Survey Summary..... 5
Table 2. Habitat codes for southern torrent salamander and tailed frog survey summaries. 6
Table 3. Tailed Frog (ASTR) Survey Summary. 8
Table 4. Northern Red-legged Frog (RAAU) Survey Summary. 11

LIST OF FIGURES

Figure 1. Southern Torrent Salamander..... 2
Figure 2. Tailed Frog. 2
Figure 3. Foothill Yellow-legged Frog. 9
Figure 4. Northern Red-legged Frog..... 10
Figure 5. Western Pond Turtle..... 12
Figure 6. Basking pond turtle on Lower Yager Creek..... 13

INTRODUCTION

The purpose of this annual 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 2015 to 7 June 2016.

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 2015-2016 monitoring period we are in the third year of effort on upcoming watershed analysis revisitation units. Therefore, this report discusses the status and results of occupancy surveys conducted during the reporting period in the Freshwater and LEED Watershed Analysis Units (WAU). The Elk River/Salmon Creek WAU revisitation has been completed and submitted to the Wildlife Agencies. The Freshwater and Van Duzen River WAUs are scheduled for 2016-2017, which will be followed by the Lower Eel – Eel Delta WAU in 2017-2018.

COVERED SPECIES

SOUTHERN TORRENT SALAMANDER AND TAILED FROG

Introduction

The southern torrent salamander (*Rhyacotriton variegatus*) and tailed frog (*Ascaphus truei*) 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 is 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 will allow 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 that prevailed previous to the 2015-2016 winter rainfall have in some cases required that surveys be conducted earlier in the season.

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. During the reporting period 2015-2016, Freshwater Creek and LEED occupancy monitoring sites were visited.

Results and Discussion: Southern Torrent Salamander

During the period covered by this report (2015-2016) surveys focused on the Freshwater WAU, with less effort in the LEED WAU, in preparation for upcoming watershed analysis revisitation.

A total of 27 occupancy surveys were conducted at eight known or historic southern torrent salamander sites in the Freshwater WAU between 31 May and 2 June, 2016 (Table 1). Occupancy by southern torrent salamanders was confirmed at four of the eight sites, for an occupancy rate of 0.5, compared to six of eight Freshwater sites (0.75) in 2014-2015, five of eight Freshwater sites in 2013-2014 (0.64), and the property-wide occupancy rate of 0.81 for the 2012-2013 report. As more years of survey are accumulated we will be able to look at crude trends over time.

In the LEED WAU, four surveys were completed at two known sites (798 and 998) on 27 July and 25 September, 2015 (Table 1). One of the two sites (998) was occupied by southern torrent salamanders. Site 998 was occupied by torrent salamanders on the last survey there in 2013. Site 798 which has been a monitoring site for both southern torrent salamanders and tailed frogs, had a positive detection for tailed frog on this survey, but not torrent salamander.

Timing may have negatively affected results during the most recent Freshwater survey as they were done toward the very end of the general survey window for the species (November through May). In contrast, the previous Freshwater occupancy surveys were completed during January and February and had higher occupancy rates. However, none of the survey reaches were found to be dry, and other habitat conditions seemed favorable (e.g. water temperature). The LEED surveys were done well outside of the preferred

survey window (i.e. July and September), but were successful in locating target species, demonstrating that there can be flexibility in survey timing in habitat with perennial flow.

Similar to the 2014-2015 surveys, Freshwater sites 1, 3, 177, and 180 were occupied, whereas sites 182 and 192 were not occupied during this survey period. At site 182 only coastal giant salamander (*Dicamptodon tenebrosus*) larvae were found, and no amphibian species were located at 192. A single adult red-legged frog was observed at site 201 on June 1. No other covered species were found at the RHVA locations during the current survey period. Coastal giant salamanders were observed at six of the Freshwater sites, and one of the LEED sites. Coastal giant salamanders are potential predators of southern torrent salamanders (e.g. Brode 1995).

No obvious changes in belt habitat conditions (e.g. habitat type, gradient, substrate, or canopy) were noted between years for the Freshwater WAU. No degraded habitats 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. This bears further examination by HRC. There were no changes in RMZ prescriptions between survey periods.

Habitat characteristics for the four occupied belts in Freshwater of 2015-2016 can be summarized as follows (last period results in parentheses). See Table 2 for habitat codes.

- Habitat type: cascade/falls habitat was at 50% (66.7%), followed by low gradient riffle and step pool at 25% (11%).
- Belt gradient: range 10-120%; mean 54.3% (15-45%; mean 24.2%).
- Belt substrate: 100% (100%) of the sites were of competent rock.
- Belt embeddedness was low to moderate overall, averaging 1.25 (1.56).
- Belt canopy was high overall, with a range of 82-91%; mean 86.9% (41-92.5%, mean 74.9%).

During this survey period in the Freshwater WAU we also took one water temperature measurement (°C) in the first survey reach at the beginning of the surveys. This was intended as a quick look at water temperatures at the survey locations, and not related to more intensive survey monitoring such as is conducted at our Class 1 stream Aquatics Trend Monitoring program sites. Water temperatures were cold, and within a range generally considered beneficial for southern torrent salamanders (7 – 12° C, mean of 9.4°) (Diller and Wallace 1996, Welsh and Lind 1996).

Similar habitat conditions were recorded at the LEED sites (e.g. competent substrate, moderate embeddedness, high canopy closure). Water temperature was not recorded at these sites in 2015.

Table 1. Southern Torrent Salamander (RHVA) Survey Summary.

WAW	Date	Site ID	Occupied?	Belt Habitat	Belt Gradient	Belt Substrate	Belt Embed	Belt Canopy	Species ID	Water Temp °C
Freshwater	31-May-16	1	No	C/F	90	C	2	86.5%	DITE	11°
Freshwater	31-May-16	1	Yes	C/F	120	C	1	82.0%	RHVA	
Freshwater	31-May-16	3	No	C/F	35	C	1	89.5%	DITE	12°
Freshwater	31-May-16	3	No	C/F	47	C	1	91.0%	DITE	
Freshwater	31-May-16	3	Yes	C/F	47	C	1	91.0%	RHVA	
Freshwater	02-Jun-16	6	No	SP	25	C	2	89.5%		9°
Freshwater	02-Jun-16	6	No	HGR	16	C	2	80.5%		
Freshwater	02-Jun-16	6	No	C/F	27	C	3	74.5%		
Freshwater	02-Jun-16	6	No	C/F	45	C	3	83.5%		
Freshwater	31-May-16	177	No	SP	25	C	2	80.5%		7°
Freshwater	31-May-16	177	Yes	SP	40	C	2	83.5%	RHVA	
Freshwater	31-May-16	177	No	SP	40	C	2	83.5%	DITE	
Freshwater	01-Jun-16	180	Yes	LGR	10	C	1	91.0%	RHVA	8°
Freshwater	01-Jun-16	180	No	LGR	10	C	1	91.0%	DITE	
Freshwater	01-Jun-16	182	No	HGR	10	C	2	97.0%	DITE	10°
Freshwater	01-Jun-16	182	No	HGR	15	C	2	98.5%	DITE	
Freshwater	01-Jun-16	182	No	SP	20	C	2	92.5%	DITE	
Freshwater	01-Jun-16	182	No	SP	20	C	2	91.0%	DITE	
Freshwater	31-May-16	192	No	SP	30	C	2	57.5%		9°
Freshwater	31-May-16	192	No	SP	30	C	2	91.0%		
Freshwater	31-May-16	192	No	HGR	13	C	2	100.0%		
Freshwater	31-May-16	192	No	HGR	16	C	2	100.0%		
Freshwater	01-Jun-16	201	No	C/F	60	C	1	62.5%		9°
Freshwater	01-Jun-16	201	No	HGR	25	C	2	75.0%	DITE	
Freshwater	01-Jun-16	201	No	HGR	25	C	2	75.0%	RAAU	
Freshwater	01-Jun-16	201	No	SP	30	C	2	91.0%		
Freshwater	01-Jun-16	201	No	SP	30	C	2	97.0%		
LEED	27-Jul-15	798	No	LGR	3	C	2	89.5%	DITE	NA
LEED	27-Jul-15	798	No	LGR	3	C	2	89.5%	ASTR	
LEED	25-Sep-15	998	Yes	C/F	75	C	2	95.5%	RHVA	NA
LEED	25-Sep-15	998	Yes	C/F	75	C	2	95.5%	RHVA	

Table 2. 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.	
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	

Results and Discussion: Tailed Frog

During the period covered by this report a total of 24 occupancy surveys were conducted at 11 known or historic tailed frog sites in the Freshwater WAU between 16 April 2016 and 7 June 2016 (Table 3).

Occupancy by tailed frogs was confirmed at eight of the 11 surveyed sites, for an occupancy rate of 0.73, compared to an occupancy rate of 1.0 for four Freshwater sites in 2015, 1.0 for three Freshwater sites in 2013-2014, and 0.30 for all WAUs included in the 2012 - 2013 survey period (Bear/Mattole, ERSC, Freshwater, Lower Eel, Upper Eel, Van Duzen, and Yager/Lawrence).

LEED site 798 was surveyed for both torrent salamander and tailed frog as discussed above. On the survey of 27 July, 2015 a tailed frog tadpole was located, rendering this site occupied for this period.

Similar to the RHVA survey results, there was little change in belt habitat conditions (e.g. habitat type, gradient, substrate, or canopy) noted between years, and there were no changes in RMZ prescriptions between survey periods. No degraded habitats were noted.

Surveys done during this season were done during the preferred sampling period for this species (i.e. March-June) and with good water conditions. Only one site (200) was noted as having flow conditions that may have been too low at the time of survey for tailed frog. Both tadpoles and adults were noted on surveys. The conditions during this period were good for observing ASTR tadpoles attached to rocks. As discussed earlier, the LEED site was surveyed outside of the preferred survey period but had positive results due to perennial flow on this reach of Chadd Creek.

Other species found at the tailed frog locations included coastal giant salamanders (five sites in Freshwater, one site in LEED). Coastal giant salamanders are also known to prey on tailed frog tadpoles (e.g. Nussbaum et al, 1983).

Given the small sample size, habitat characteristics for the eight occupied Freshwater WAU belts can be summarized as follows (last period results in parentheses):

- Habitat type: four in low gradient riffle and two each in high gradient riffle and step pool (similar to last period, although no cascade/falls habitat was represented this season).
- Belt gradient: range 0%-45%, mean 13.4% (2%-25%, mean 16%).
- Belt substrate: all of the 11 sites were of competent rock (same).
- Belt embeddedness: low overall, averaging 1.8 (1.3).
- Belt canopy was high overall, with a range of 64%-98.5%, mean 83.9% (41 – 89.5%, mean 80.2%).

As with the torrent salamander surveys during this survey period, we also took one water temperature measurement (°C) in the first survey reach at the beginning of the surveys. Water temperatures were cold, and within a range generally considered beneficial for tailed frogs (10-14° C, mean of 11.6°) (Brown 1975, Claussen 1973).

Habitat conditions at the single occupied LEED site were similar (e.g. competent substrate, moderate embeddedness, high canopy closure). Water temperature was not recorded at this site in 2015.

The Freshwater WAU tailed frog surveys completed during this time period were done during the preferred survey period and were generally successful, similar to the 2014-2015 sampling period. In contrast, 2013-2014 surveys were not conducted during the suggested sampling period, but were opportunistically done in conjunction with torrent salamander surveys at or near the tailed frog sites, and when staff was available. Again, although the LEED survey was done outside the preferred survey window, positive results were likely due to the perennial nature of the reach surveyed. Similar to other survey periods, detections of ASTR tadpoles dominate the positive results, with their distinctive tail marking and habit of using the suction-like mouthparts to forage on stream cobble. This would be expected, given the timing of the surveys and the location of the detections primarily in the low gradient riffles in areas with competent rock.

Table 3. Tailed Frog (ASTR) Survey Summary.

WAU	Date	Site ID	Occupied?	Belt Habitat	Belt Gradient	Belt Substrate	Belt Embed	Belt Canopy	Species ID	Water Temp °C
Freshwater	01-Jun-16	165	Yes	LGR	1	C	2	98.50%	ASTR	11.5°
Freshwater	31-May-16	166	Yes	LGR	7	C	2	91.00%	ASTR	12°
Freshwater	19-Apr-16	170	Yes	SP	45	C		64.00%	ASTR	11.5°
Freshwater	01-Jun-16	175	Yes	SP	0	C	3	76.00%	ASTR	11°
Freshwater	02-Jun-16	179	No	LGR	6	C	2	95.50%	DITE	11°
Freshwater	02-Jun-16	179	Yes	LGR	3	C	1	94.00%	ASTR	
Freshwater	06-Jun-16	183	No	HGR	40	C	2	68.50%		11°
Freshwater	06-Jun-16	183	No	HGR	40	C	2	74.50%	DITE	
Freshwater	06-Jun-16	183	No	HGR	30	C	2	79.00%		
Freshwater	06-Jun-16	183	No	SP	40	C	2	59.50%	DITE	
Freshwater	06-Jun-16	186	No	LGR	5	C	2	91.00%		11.5°
Freshwater	06-Jun-16	186	No	HGR	13	C	2	94.00%	DITE	
Freshwater	06-Jun-16	186	Yes	HGR	32	C	2	91.00%	ASTR	
Freshwater	06-Jun-16	200	No	C/F	70	C	2	70.00%		11°
Freshwater	06-Jun-16	200	No	C/F	75	C	2	92.50%		
Freshwater	06-Jun-16	200	No	LGR	3	C	3	91.00%		
Freshwater	06-Jun-16	200	No	HGR	23	C	2	88.00%		
Freshwater	02-Jun-16	206	Yes	LGR	2	C	1	80.50%	ASTR	14°
Freshwater	02-Jun-16	206	No	LGR	2	C	1	80.50%	DITE	
Freshwater	06-Jun-16	210	No	HGR	10	C	1	47.00%	DITE	10°
Freshwater	06-Jun-16	210	No	HGR	15	C	1	47.00%	DITE	
Freshwater	06-Jun-16	210	No	LGR	3	C	3	83.50%	DITE	
Freshwater	06-Jun-16	210	No	LGR	6	C	3	91.00%	DITE	
Freshwater	07-Jun-16	1175	Yes	HGR	17	C	1	76.00%	ASTR	13°
LEED	27-Jul-15	798	No	LGR	3	C	2	89.50%	DITE	NA
LEED	27-Jul-15	798	Yes	LGR	3	C	2	89.50%	ASTR	

FOOTHILL YELLOW-LEGGED FROG

Introduction

There are currently no foothill yellow-legged frog (RABO) monitoring sites in the Freshwater Creek WAU, and surveys in the LEED WAU have not commenced as of the date of this report, hence there are no survey results to report here.

The foothill yellow-legged frog is a species that inhabits open, sunny, low gradient reaches of streams and rivers. It is not a species that is diagnostic of closed canopy and cold water temperatures. Incidental observations have occurred in the Freshwater WAU, but occupancy monitoring sites have not yet been established. The species could also potentially occur in the lower reaches of Freshwater Creek, primarily off of HRC lands. There are monitoring sites in the LEED WAU and results will be reported for the 2016-2017 survey period.



Figure 3. Foothill Yellow-legged Frog.

Methods

Survey and monitoring techniques for this species are also area-constrained searches, concentrating on surveying river and stream reaches for eggs, tadpoles, and adults. As with the surveys for the headwaters species, an occupancy level survey has been implemented for foothill yellow-legged frogs, using similar techniques but terminating the survey once the target species has been found. The survey continues until specimens are found or the entire reach is surveyed.

Survey sites are visually searched for the presence or absence of foothill yellow-legged frogs, using a 400-meter reach as the survey site. Surveys are concentrated during a period when the larger tadpoles, recent metamorphs, and adults are relatively easy to locate by searching the slow water edges of the wetted channel, typically June through September. Occupancy is established when an adult, juvenile, tadpole, or eggs are found at the survey site.

Results and Discussion

There are no results to discuss for the foothill yellow-legged frog for this reporting period.

NORTHERN RED-LEGGED FROG

Introduction

Current survey efforts for the northern red-legged frog (*Rana aurora aurora*) have been focused on attempting to determine if known breeding sites within the WAUs continue to be occupied. There are currently 39 breeding sites distributed throughout HRC lands. Monitored breeding sites for this report are in the Freshwater (n = 4) WAU.



Figure 4. Northern Red-legged Frog.

Methods

For this survey period we continued to use the abbreviated survey method developed for the occupancy-level surveys. Known breeding sites are inspected for evidence of adults, juveniles, and egg masses. For the period covered by this report we visited four known sites in the Freshwater WAU between 19 May and 7 June, 2016 using the occupancy level survey (Table 4).

Results and Discussion

HRC pond sites generally fall into one of three categories: 1) relatively small in size, resulting from heavy equipment use during past logging operations and the building of associated logging roads, 2) roadside settling basins used to prevent sediment from getting into rivers and streams, and 3) naturally occurring ponds and wetlands in low-lying areas.

There were a total of four surveys conducted to four monitoring sites in the Freshwater WAU during this reporting period. During this sampling effort, only one of the four sites was occupied by red-legged frogs (site 133, Table 4), this result was similar to the last reporting period, when one of five sites surveyed in Freshwater were occupied by red-legged frogs, compared to a rate of 0.49 for all property-wide sites visited during the 2012 – 2013 season.

Surveys this period were not conducted during the preferred timeframe (November through March) for observing adults, juveniles, or egg masses of this species. All four sites had low water levels, or were dry, when visited this season. At site 133 the positive detection was based on hatched out and degrading egg mass remnants.

Water temperatures taken at sites with water (1 and 133) were relatively cool. No degraded habitats were noted, although growth of riparian vegetation around site 54 in the Freshwater WAU has resulted in increased shade that appears to have rendered the site unsuitable for RAAU, and it was not surveyed this period.

HRC surveys have indicated that, in normal rainfall years, red-legged frogs within the study area deposit eggs from October through February, considerably earlier than suggested in the literature for other regions of the West Coast (Storm 1960, Brown 1975, Licht 1969). Sites with ponded water were often heavily utilized for egg deposition, while pools that we observed within watercourses were not utilized. Egg masses were generally deposited in shallow water, or the shallow regions of larger ponds. In addition, egg masses can persist for extensive periods of time, (e.g., four to six weeks), allowing for flexibility in a sampling schedule. More recently, during years of below normal rainfall, known breeding sites do not have enough water for egg deposition, and require surveys immediately after rainfall to check for occupancy.

Table 4. Northern Red-legged Frog (RAAU) Survey Summary.

WAW	Site ID	Date	Water Source	Formation	Occ by RAAU?	Species ID	Water Temp °C
Freshwater	1	4/19/2016	Stream	Basin	No	NA	12
Freshwater	2	6/7/2016	Rain Pooling	Equipment	No	NA	Dry
Freshwater	67	6/7/2016	Rain Pooling	Equipment	No	NA	Dry
Freshwater	133	4/19/2016	Spring	Roadside ditch	Yes	RAAU, HYRE	13.5

RAAU=red-legged frog, TAGR=rough-skinned newt, AMGR=northwestern salamander, HYRE=Pacific tree frog

WESTERN POND TURTLE

Introduction

The only covered reptile under the HRC HCP is the western pond turtle (*Emys marmorata*). The distribution of this species on HRC lands was poorly understood in comparison to the other covered species, but locations of pond turtles have been accumulating since the implementation of HCP monitoring programs, and the species distribution on the covered lands can now be called widespread in suitable habitats.



Figure 5. Western Pond Turtle.

Methods

The goal of the baseline surveys for pond turtles was to determine the distribution of this species on HRC lands, using techniques of observing potential habitat (e.g., Holland 1994). The sampling season for pond turtles is the summer period, or specifically June through September. We have noted that turtles can be observed both earlier and later in the season here on the north coast of California when flow conditions permit.

Methods include using visual searches (i.e., walking surveys), snorkel-surveys, and floating surveys of suitable watercourses looking for basking adults (Figure 6). Turtles can often be seen using the same basking structures over multiple years. When conducting floating surveys, surveyors stop floating above areas of potential habitat to walk the area and scan for animals.

Since the survey techniques for pond turtles are not invasive or destructive, no changes to methods were necessary to transition to occupancy level surveys. A total of 18 sites currently make up the property-wide pond turtle sample. There are currently no monitoring sites in the Freshwater WAU, so there are no results to report here.



Figure 6. Basking pond turtle on Lower Yager Creek.

Results and Discussion

There are no pond turtle monitoring sites on HRC lands in the Freshwater WAU. Pool habitat does not appear to be a limiting factor, but basking sites in open canopy sites along the creek are generally unavailable. Given the relatively small sample property-wide, new pond turtle sites will continue to be added when found, and used as baseline sites. However, pond turtle habitat in the Freshwater WAU tends to be off of HRC lands, although adjacent (e.g. Freshwater Park).

WATERSHED ANALYSIS

There are eight WAUs covering HRC lands:

- Freshwater
- Van Duzen
- Lower Eel/Eel Delta
- Elk River/Salmon Creek
- Upper Eel/Larabee Creek
- Bear River
- Yager Creek
- North Fork Mattole

The initial round of watershed analyses has been completed for all eight WAUs, and watershed analysis revisitation is currently in progress. The Elk River/Salmon Creek WAU revisitation has been completed and submitted to the Wildlife Agencies. The Freshwater and Van Duzen WAUs are in process.

Each watershed analysis report contains an amphibian/reptile module. Results from each module are considered during the watershed analysis synthesis, and through prescription development, to minimize, and if necessary, mitigate management effects on the covered amphibians and reptile.

In general, the results of the amphibian and reptile modules have shown that the covered species are present in the WAUs, and that there are occurrences of degraded habitat, potential habitat, and suitable, occupied habitat. Site-specific prescriptions for Class I, II, and III waters have been developed in keeping with the habitat needs of the covered species. The individual watershed analysis reports are on file at HRC and available upon request.

The goal of watershed analysis revisitation for each WAU relative to the covered amphibians and reptile is to address questions concerning any changes in distribution, habitat, and possible impacts of land management on the species since the original watershed analysis; by using known location and monitoring data, and utilizing available habitat information. Additional information generated by other watershed analysis modules that address aspects of the WAU such as landslides, sediment levels, loss or creation of wetlands and ponds, and water temperatures can be incorporated during the watershed analysis revisitation process.

As an example, the Elk River WAU revisit (HRC 2014) provided the following information:

“HRC completes annual monitoring of covered species habitat and presence as described under the Aquatic Conservation Plan (ACP) in the HCP. These covered species include southern torrent

salamander (Rhyacotriton variegatus), tailed frog (Ascaphus truei), northern red-legged frog (Rana aurora aurora), foothill yellow-legged frog (Rana boylei), and northwestern pond turtle (Emys marmorata). Distribution of covered species continues to be fairly widespread in suitable habitat. The ERSC WAU continues to host quality habitat for southern torrent salamanders, northern red-legged frogs, and tailed frog. Monitoring efforts have not focused on habitats preferred by yellow legged frogs or western pond turtles, which are more limited in the ERSC WAU.

All information gathered since the initial Watershed Analysis supports those earlier findings. HRC surveys have indicated that red-legged frogs within the property-wide study area deposit their eggs from October through February which is considerably earlier than suggested in literature for other regions of the West Coast (Storm 1960, Brown 1975, Licht 1969). Property-wide monitoring has also found that ponded waters were often heavily utilized for egg deposition (one site with over 320 egg masses), while pools observed within watercourses were not utilized.

At this time, all monitoring suggests that prescriptions intended to protect watercourses by minimizing water temperature increases, minimize sediment input and encourage LWD recruitment continue to provide good habitat for amphibians and reptiles within the ERSC WAU.”

SUMMARY AND RECOMMENDATIONS

For the 2015-2016 survey period efforts were focused on occupancy level surveys in the Freshwater WAU to support the watershed analysis revisit, site-specific watershed analysis questions, and on classification of waters for THPs. Survey effort by species is reflected by the number of occupied sites, as discussed above. A total of 55 individual surveys were conducted. Survey effort was distributed as follows: southern torrent salamander (n = 27), tailed frog (n = 24), and northern red-legged frog (n = 4). There are no foothill yellow-legged frog or pond turtle monitoring sites in the Freshwater WAU.

Distribution of covered species continues to be fairly widespread in suitable habitat. No degraded habitats of any of the species were noted, although it has been noted that increased growth of riparian vegetation around ponds and wetlands can render them unsuitable for red-legged frog breeding. 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. During ensuing survey seasons, occupied amphibian/reptile habitat will continue to be monitored over time to develop an index of occupancy. No changes in the monitoring strategy are recommended at this time.

REFERENCES

- Brode, J.M. 1995. Report to the Fish and Game Commission: Status Review of the Southern Torrent Salamander (*Rhyacotriton variegatus*) in California. State of California, the Resources Agency, Department of Fish and Game. 23 pp. and Appendices.
- Brown, H. A. 1975. Reproduction and development of the red-legged frog, *Rana aurora*, in northwestern Washington. Northwest Science 49 (4): 241-252.
- Brown, H. A. 1975. Temperature and development of the tailed frog, *Ascaphus truei*. Comparative Biochemistry and Physiology, 50A: 397-405.
- Claussen, D.L. 1973. The thermal relations of the tailed frog, *Ascaphus truei*, and the Pacific treefrog, *Hyla regilla*. Comparative Biochemistry and Physiology, 44A: 137-153.
- 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.
- Holland, D.C. 1994. The Western Pond Turtle: Habitat and History. Final Report. Prepared for: U.S. Department of Energy, Bonneville Power Administration, Environment, Fish and Wildlife. P.O. Box 3621, Portland, Oregon 97208-3621.
- HRC. 2014. Elk River/Salmon Creek Watershed Analysis Revisited, Review Draft. 129 pp. plus Appendices.
- Licht, L. E. 1969. Comparative breeding behavior of the red-legged frog (*Rana aurora aurora*) and the western spotted frog (*Rana pretiosa pretiosa*) in southwestern British Columbia. Canadian Journal of Zoology 47 (6): 1287-1299.
- Nussbaum, R.A., E.D. Brodie, Jr., and R.M. Storm. 1983. Amphibians and reptiles of the Pacific Northwest. Univ. Idaho Press, Moscow, Idaho.
- Storm, R. M. 1960. Notes on the breeding biology of the red-legged frog (*Rana aurora aurora*). Herpetologica 16 (4): 251-259.
- Welsh, H.H., and A.J. Lind. 1996. Habitat correlates of the southern torrent salamander, *Rhyacotriton variegatus* (Caudata:Rhyacotritonidae), in northwestern California. Journal of Herpetology, 30:385-398.