



Amphibian and Reptile Annual Report

2017



June 1, 2017

Cover photo: Adult southern torrent salamander - Freshwater Creek watershed. 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 2016-2017 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 Van Duzen River and Lower Eel River – Eel River Delta 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

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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 2016 to 1 June 2017.

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 2016-2017 monitoring period we are in the fourth 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 Van Duzen River (VD) and Lower Eel River – Eel River Delta (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. Above average rainfall during the 2016-2017 winter resulted in high flow conditions that delayed 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: Southern Torrent Salamander

During the reporting period 2016-2017, accessible VD occupancy monitoring sites were visited. LEED (and Freshwater) southern torrent salamander (RHVA) sites were visited during the previous monitoring period and discussed in the 2016 annual report.

A total of three occupancy surveys were conducted at three known or historic southern torrent salamander sites in the VD WAU between 17 November, 2016 and 13 April, 2017 (Table 1). Occupancy by southern torrent salamanders was confirmed at all three sites, for an occupancy rate of 1.0, compared to four of the eight Freshwater sites (0.50) in 2015-2016, and the final property-wide occupancy rate of 0.81 for the 2012-2013 report. The last time these sites were surveyed was during the 2013 survey season and all three of the sites were occupied by southern torrent salamanders at that time. As more years of survey are accumulated we will be able to look at crude trends over time.

Survey timing was good for the VD surveys this period, as they were all done within the general survey window for the species (November through May). However, heavy rainfall and road conditions prevented further surveys during this period.

No coastal giant salamander (*Dicamptodon tenebrosus*) or any other amphibian species were found at any of the VD sites, including covered species. 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 survey years for the Van Duzen 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 three occupied belts in the VD WAU of 2016-2017 are summarized in Table 1. Given the small sample size it is not appropriate to provide any data summaries or analysis beyond this. See Table 2 for habitat codes.

Table 1. Southern Torrent Salamander (RHVA) Survey Summary

WAU	Date	Site ID	Occupied?	Belt Habitat	Belt Gradient	Belt Substrate	Belt Embed	Belt Canopy	Species ID	Water Temp °C
Van Duzen	17-Nov-16	20	No	SP	35	C	2	67.0%		NA
Van Duzen	17-Nov-16	20	Yes	C/F	48	C	1	64.0%	RHVA	NA
Van Duzen	10-Apr-17	1148	Yes	C/F	80	C	1	74.5%	RHVA	NA
Van Duzen	13-Apr-17	19	Yes	C/F	90	C	3	86.5%	RHVA	NA

Table 2. Habitat codes for southern torrent salamander and tailed frog survey summaries

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

Results and Discussion: Tailed Frog

During the period covered by this report a total of four occupancy surveys were conducted at four known or historic tailed frog sites in the Van Duzen and LEED WAUs between 15 June 2016 and 5 May 2017 (Table 3).

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

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 ASTR tadpoles were noted on surveys. The conditions during this period were good for observing ASTR tadpoles attached to rocks.

Other species found at the tailed frog locations included coastal giant salamanders (one site in VD), and red-legged frog (also one site in VD). Coastal giant salamanders are also known to prey on tailed frog tadpoles (e.g. Nussbaum et al, 1983).

Habitat characteristics for the four occupied belts in the LEED and VD WAUs of 2016-2017 are summarized in Table 3.

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
LEED	15-Jun-16	1548	No	HGR	18	C	1	89.5%		NA
LEED	16-Jun-16	1548	Yes	LGR	7	C	1	82.0%	ASTR	NA
LEED	06-Jul-16	798	Yes	LGR	10	C	1	83.5%	ASTR	NA
Van Duzen	14-Apr-17	144	Yes	LGR	2	C	2	74.5%	ASTR	NA
Van Duzen	05-May-17	1114	Yes	HGR	20	C	2	89.5%	ASTR	NA

FOOTHILL YELLOW-LEGGED FROG

Introduction

Due to high flow conditions on the Eel and Van Duzen Rivers, foothill yellow-legged frog (RABO) surveys in the VD and LEED WAUs 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. There are monitoring sites in the VD and LEED WAUs and results will be reported for the 2017-2018 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 Van Duzen WAU (n = 2).



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 two known sites in the VD WAU on 8 November, 2016 and 18 April, 2017 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. Both sites visited during this period were natural ponds

There were a total of two surveys conducted to two monitoring sites in the VD WAU during this reporting period. During this sampling effort, only one of the two sites was occupied by red-legged frogs

(site 52, Table 4). This result is similar to an occupancy rate of 0.49 for all property-wide sites visited during the 2012 – 2013 season.

Surveys this period were generally conducted during the preferred timeframe (November through March) for observing adults, juveniles, or egg masses of this species. All sites had water levels at or near capacity when visited this season. Adults and juveniles were both heard and seen at site 52, but no egg masses had been deposited at the time of the visit. Observations indicated that adults were congregating at the site for breeding.

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.

WAU	Site ID	Date	Water Source	Formation	Occ by RAAU?	Species ID	Water Temp °C
Van Duzen	52	11/8/2016	Rain Pooling	Natural pond	Yes	RAAU	NA
Van Duzen	90	4/18/2017	Rain Pooling	Natural pond	No	NA	NA
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 two monitoring sites in the VD WAU, however high flows restricted access to the river, as well as access to basking sites for the turtles, so there are no results to report here.



Figure 6. Basking pond turtle on Lower Yager Creek.

Results and Discussion

High flows on both the Van Duzen and Eel Rivers prevented pond turtle surveys during this survey period. Pool habitat is not a limiting factor, and basking sites in open canopy along the rivers are generally abundant. Observations of pond turtles in these WAUs are common in suitable habitat when the river flows have receded and air temperatures have increased.

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 2016-2017 survey period efforts were focused on occupancy level surveys in the Van Duzen and Lower Eel – Eel Delta WAUs to support the watershed analysis revisits, 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 nine individual surveys were conducted. Survey effort was distributed as follows: southern torrent salamander (n = 3), tailed frog (n = 4), and northern red-legged frog (n = 2). There were no foothill yellow-legged frog or pond turtle monitoring surveys in these WAUs during this survey period due to high flows on the Van Duzen and Eel Rivers.

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.