

AN INVENTORY OF AMPHIBIANS ON U.S. FOREST SERVICE  
RESEARCH NATURAL AREAS IN SOUTHWESTERN OREGON

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## ABSTRACT

In 1998-1999, we conducted visual encounter surveys for amphibians at 1 proposed and 8 established U.S. Forest Service Research Natural Areas in southwestern Oregon. Our objective was to investigate the distribution of species considered sensitive or of special management interest to the Forest Service. We detected 15 species of amphibians: 9 species of salamander representing 5 families and 6 species of anurans (frogs and toads) from 4 families. We detected 3 amphibians that are included on the USFS sensitive species list: *Plethodon elongatus* (Del Norte salamander), *Rhyacotriton variegatus* (Southern torrent salamander), and *Rana boylei* (Foothill yellow-legged frog). We did not detect the Siskiyou Mountain salamander (*P. stormi*). The surveyed USFS Research Natural Areas in southwestern Oregon provide habitat for most of the region's diverse herpetofauna. These relatively undisturbed RNAs can provide a baseline against which to evaluate the effects of local management activities.

## INTRODUCTION

The U.S. Forest Service initiated the Research Natural Area (RNA) system in 1927 to protect undisturbed representatives of vegetation communities (Franklin *et al.* 1972). Research Natural Areas encompass both common and unique ecosystem types, and many RNAs contain endangered or sensitive species. These reserves provide managers with a valuable ecological baseline for comparison with other similar lands under more intensive management. Faunal communities on many RNAs remain relatively unstudied, particularly for taxonomic groups such as amphibians and reptiles.

At the request of the Pacific Northwest Research Station in 1998, we initiated a study of amphibian occurrence and diversity on U.S. Forest Service RNAs in southwestern Oregon (Figure 1). We were especially interested in determining the presence of sensitive species as well as furthering our understanding of amphibian distributions within the region. The southern Cascades/Klamath-Siskiyou region is of particular biogeographic and conservation interest due to its high botanical and herpetological diversity (Nussbaum *et al.* 1983, Bury and Pearl 1999). In addition, two endemic woodland salamanders occur within the region and are of conservation concern: the Del Norte salamander (*Plethodon elongatus*) and Siskiyou Mountain salamander (*P.*

*stormi*). Results from these surveys may help to identify sites and questions for further research, as well as assist in evaluation of management activities.

## METHODS

During the 1998 and 1999 field seasons, we conducted amphibian surveys at 1 proposed and 8 established RNAs in southwestern Oregon (Table 1). We made 1 – 4 visits to each RNA. Our surveys were in spring and summer, and were timed to maximize probability of detecting sensitive species (*e.g.*, mid-spring after rains for surface-active terrestrial salamanders). Survey teams of 1 – 4 people used visual encounter surveys and opportunistic object searches to detect amphibian occurrence (following standardized or basic approaches; see Corn and Bury 1990). In streams, we sorted through cobble and debris accumulations (see Bury and Corn 1991). In all cases, we used a "light touch" (*e.g.*, we did not uproot large cover objects) and attempted to return cover objects to their pre-disturbance positions. We tried to sample all major habitat types found in the accessible portions of each RNA, but we spent additional time sampling habitats known to be favored by certain sensitive species (*e.g.*, ponds for ranid frogs and western toads, talus accumulations for plethodontid salamanders, and headwater seeps and streams for torrent salamanders). Nomenclature follows Nussbaum et al. (1983). See Appendix for complete list of regional amphibian names.

## RESULTS

The following discussion provides a review of survey results by site. Table 2 summarizes amphibian species and life stages detected in each RNA.

### *Ashland RNA, Rogue River National Forest*

The Ashland RNA includes much of the East Fork Ashland Creek watershed in Jackson County. It was established as an example of ponderosa pine (*Pinus ponderosa*)-Douglas-fir (*Pseudotsuga menziesii*) forests in southwestern Oregon, but due to its wide elevation range, contains a variety of plant communities. Fire suppression appears to be favoring the Douglas Fir (S. Greene, pers. comm.). Lower elevations on the RNA experience a Mediterranean climate, defined by hot, dry

summers, and moist, cool winters. Upper elevations (>5000 feet) are characterized by a mixed coniferous forest and experience high winter snowfall. We encountered Tailed frog (*Ascaphus truei*) and Pacific giant salamander (*Dicamptodon tenebrosus*) in low densities in the upper segments of the East Fork. Water temperatures were cold (ca. 6-8°C) during our survey of the upper slopes at the end of April, and snow remained throughout the upper north-facing slopes. Among terrestrial salamanders, only one metamorphosed *D. tenebrosus* was found. The more xeric southwest-facing habitats (mixed pine forest and oak savanna) around the reservoir supported a high density and diversity of lizards: Western skinks (*Eumeces skiltonianus*), Fence lizards (*Sceloporus occidentalis*), Sagebrush lizards (*S. graciosus*) and Northern (*Elgaria coerulea*) and Southern alligator lizards (*E. multicaudata*). Adult Roughskin newts (*Taricha granulosa*) were also found under cover objects, and are suspected to use the reservoir as breeding habitat. Egg masses and young larvae of Pacific treefrogs (*Pseudacris regilla*) were found in several small pools near the reservoir. While we observed no snakes during our surveys, these low, warm slopes probably offer suitable habitat and lizard prey for a variety of snakes.

#### *Cedar Log Flat RNA, Siskiyou National Forest*

Cedar Log Flat RNA includes open Jeffrey pine (*Pinus jeffreyi*) forest on east-facing serpentine slopes, several bogs with California pitcher plant (*Darlingtonia californica*), and deciduous riparian zones along Cedar Log Creek and Slate Creek. Pacific treefrogs were found breeding in larger pools in several of the *Darlingtonia* bogs during our early spring survey. Few amphibians were observed in the xeric serpentine hillside. However, we found *Ensatina eschscholtzii* on the edge of the serpentine outcrop. Southern torrent salamanders (*Rhyacotriton variegatus*) were present in one small groundwater seep along a steep, north-facing slope above Cedar Log Creek. This *Rhyacotriton variegatus* locality is of interest because it is near the eastern extent of the species' range at this latitude (see Nussbaum *et al.* 1983). We found *Plethodon elongatus* (one of two lungless salamanders endemic to the Siskiyou Mountains) in low densities in each of two surveys. Potential habitat exists for Foothill yellow-legged frogs (*Rana boylei*) along Slate Creek, which borders the east edge of the RNA, but we did not detect them in limited searches. Similarly, *Dicamptodon tenebrosus* should be present in Slate Creek and Cedar Log Creek, but were not detected in our limited searches. Our spring visits indicated a speciose lizard assemblage with

observations and capture of *Eumeces skiltonianus*, *Sceloporus occidentalis*, and *Elgaria multicarinata* in open and shrubby areas in the serpentine slope. Pacific rattlesnakes (*Crotalus viridis*) have been observed at this RNA by other personnel (D. Vroman, pers. comm.).

#### *Coquille Falls RNA, Siskiyou National Forest*

The Coquille Falls RNA is located in Coos County, less than 2 km upstream of the Port Orford Cedar RNA. Coquille Falls RNA includes a steep ravine on the South Fork of the Coquille River and old-growth forest of Douglas fir and Port Orford cedar (*Chamaecepharis lawsonia*). Aquatic habitat includes at least one permanent stream and several intermittent headwater streams and seeps. The mature forest on the northeast-facing slope contains large amounts of large woody debris that is often high-quality habitat for terrestrial salamanders. We encountered *Ensatina eschscholtzii* and *Aneides ferreus* in this area. Larvae of *Rhyacotriton variegatus* and *Dicamptodon tenebrosus* occurred in seeps and small streams along the lower slopes of these mature forests. We detected *Plethodon dunni* along the larger unnamed tributary, and *Taricha granulosa* in slow pools and under woody debris on the banks of the South Fork of the Coquille River during the summer visit. *Thamnophis atratus* (Aquatic garter snake) adults were also observed along the South Fork of the Coquille, and this species is also likely to occur in the Port Orford Cedar RNA.

#### *Hoover Gulch RNA, Siskiyou National Forest*

The Hoover Gulch RNA includes steep north-facing slopes along the Illinois River. Several small intermittent and semi-permanent tributaries drain these slopes. Much of the RNA supports a mixed forest of mature Douglas fir, western white pine, madrone and other non-serpentine mesic flora. We found *Plethodon elongatus* and *Ensatina eschscholtzii* concentrated in and around talus outcrops near the top of the ridge. Salamanders appeared to segregate by cover type, with *Plethodon elongatus* more frequently under talus and *Ensatina eschscholtzii* under accumulations of woody debris. One headwater stream contained multiple age-classes of *Rhyacotriton variegatus*, as well as low densities of adult *Ascaphus truei* and larval *Dicamptodon tenebrosus*. During our second survey 1 month after the first, discharge in this stream had decreased substantially, and stream amphibians

were much more difficult to locate. Whether they had borrowed into the cobble substrate or had left the stream was not determined. No lentic habitats were detected on the site. One rubber boa (*Charina bottae*) was encountered along the ridgeline.

#### *Lemmingsworth Gulch RNA, Siskiyou National Forest*

Lemmingsworth Gulch RNA includes most of the Packsaddle Gulch drainage just west of the Kalmiopsis Wilderness. Much of the drainage is ultramafic geology, and vegetation is predominately taxa tolerant of the serpentine or peridotite substrate. Upslope forests are combinations of Jeffrey and lodgepole pine, with hardwood shrub understories. Douglas fir forests are limited to lower elevation, non-serpentine patches near the North Fork of the Smith River. We surveyed terrestrial and aquatic habitats along the north-facing slope, including wetlands with pitcher plants (*Darlingtonia*), a small semi-permanent pond, and the lowland non-serpentine forest at the base of the RNA. We found terrestrial salamanders (low densities of *Ensatina eschscholtzii* and *Plethodon elongatus*) in the non-serpentine forest near the North Fork of the Smith River. *Dicamptodon tenebrosus* larvae were encountered in a small tributary stream in the same area. *Rhyacotriton variegatus* were found in one spring near the NF Smith River. Adult *Taricha granulosa* were the only amphibian observed in the small pond at the base of Packsaddle Gulch.

#### *Limpy Rock RNA, Umpqua National Forest*

Limpy Rock RNA occupies a steep south-facing slope that includes most of the Dog Creek drainage, a tributary of the North Fork of the Umpqua River. Forests are predominately Douglas fir and the RNA provides habitat for several rare and endangered plants. Tributaries of varying permanence exist on the site, as do three wetlands (one permanent pond, one seasonal pond, and one seasonal marsh). The amphibian assemblage at this RNA appears to be one of the most diverse of our sampled sites, with stream, pond and terrestrial taxa well-represented. We detected breeding use of the permanent pond by *Ambystoma gracile*, *Taricha granulosa*, *Pseudacris regilla*, and *Rana cascadae*. We also detected *Aneides ferreus*, which were rarely encountered during our spring

sampling of other RNA's. This RNA was the only site where we encountered *Rana cascadae* and *Plethodon vehiculum* (Western red-backed salamanders). We found stream amphibians (*Ascaphus truei*, *Dicamptodon tenebrosus* and *Rana boylei*) in the lower sections of the main tributaries, but none were detected around the road crossings in the steeper, higher headwater sections. We also observed Northwestern (*Thamnophis ordinoides*) and Common garter snakes (*T. sirtalis*) in several small clearings. Three Rubber boas and two Northern alligator lizards were found associated with south-facing talus slopes.

*Oliver Matthews RNA (Proposed), Rogue River National Forest*

The Oliver Matthews proposed RNA occupies a north-facing slope of the high Siskiyou Mountains, including a sizeable portion of the Sturgis Creek watershed. The proposed RNA includes a wide range of elevations, with subalpine habitat in its highest elevations. Miller Lake, a smaller pond, and a tributary of Sturgis Creek are aquatic habitats within or immediately adjacent to the proposed RNA. We only found one terrestrial salamander (*Ensatina eschscholtzii*) and an adult *Dicamptodon tenebrosus*, but conditions in that area were dry when we surveyed in 1998. This site was the only RNA we examined on which Western toads (*Bufo boreas*) were detected. No amphibians were detected in or around Miller Lake. The paucity of amphibians may be related to combination of factors, including its steep sides, simple structure, heavy recreational use, and abundance of stocked fish. The stream that drains the lake had low densities of larval *Dicamptodon tenebrosus* and adult *Ascaphus truei*, but they appeared only beyond ca. 100 meters below the water control structure in the lake. This may be related to effects of the top-water draw from Miller Lake, which likely ceases to overflow in the dry summer months, reducing the creek to a small discharge.

*Port Orford Cedar RNA, Siskiyou National Forest*

The Port Orford Cedar RNA abuts the South Fork of the Coquille River and Johnson Creek at their confluence. Much of the RNA is steep, densely forested terrain. Vegetation is diverse and ranges from riparian hardwoods to Douglas fir/tanoak and rhododendron thickets near the ridgeline. The amphibian fauna was found to be one of the more diverse among the RNAs sampled. We found terrestrial salamanders (*Plethodon dunni*, *P. elongatus*, and *Ensatina eschscholtzii*) along the north-facing slopes above Johnson Creek. We found *E. eschscholtzii* and *P. elongatus* on the more gradual slope toward the top of the ridge. We located *Rana boylei* during spring and summer surveys in both Johnson Creek and the South Fork of the Coquille River. Adult *Taricha granulosa* were detected in the South Fork of the Coquille River during both visits. During the spring visit, we found *Ambystoma gracile* (Northwestern salamander) and *Rana aurora* egg masses and *T. granulosa* adults in a semi-permanent pond. We did not detect *Dicamptodon tenebrosus*, but suitable habitat exists for them in Johnson Creek and an unnamed small tributary.

*Wheeler Creek RNA, Siskiyou National Forest*

The Chetco Ranger District in the Siskiyou National Forest administers Wheeler Creek RNA. The RNA was established in 1972 as an example of mature redwood/Douglas fir/tanoak forest, and is one of the few remaining unharvested stands in the area. The majority of the RNA occupies a steep, mesic, north-facing slope. Our spring surveys detected low numbers of *Plethodon elongatus* and *Ensatina eschscholtzii* in the upslope redwood forest, where the ground layer typically consists of a thick layer of organic litter atop the mineral substrate. We captured *Plethodon elongatus* and *Ensatina eschscholtzii* along Wheeler Creek and near the ridge top, where the ground layer was more heterogeneous than on the redwood slope. Adult *Taricha granulosa* and larval *Dicamptodon tenebrosus* were detected in lower reaches of Wheeler Creek. We detected *Rhyacotriton variegatus* and *Ascaphus truei* in the riparian forest and upper portion of Wheeler Creek.

## DISCUSSION

Among the 9 RNAs that we surveyed in 1998–1999, we detected the highest number of amphibian species (10) and total life stages (17) at Limpy Rock in the North Umpqua drainage (Table 2). A high detection of life stages suggests that the site contains juxtaposed habitat for breeding and non-breeding animals, and thus may be of particularly high value. We also found high amphibian richness at Port Orford Cedar (8 species, 11 life stages) and Coquille Falls RNAs (7 species, 10 life stages). These RNAs are within 2 km of one another, which suggests this section of the South Fork of the Coquille may be a hotspot for amphibians. Limpy Rock and Port Orford Cedar possess a wide variety of aquatic and terrestrial habitats, and they appeared to be the RNAs with the highest precipitation in non-serpentine areas. Further surveys at these RNAs are likely to reveal additional amphibian species. For example, *Plethodon dunni* was not detected at Limpy Rock, and *Dicamptodon tenebrosus* was not detected at Port Orford, but habitat exists for these species on the respective RNAs.

Sensitive species of amphibians occurred in several RNAs. *Plethodon elongatus* are of management concern, and were formerly listed as Survey and Manage species under the Northwest Forest Plan. We found this salamander at 4 of 8 RNAs within the species' range as currently known. Several of the RNAs (particularly Hoover Gulch) appeared to support at least locally high densities of *Plethodon elongatus*. We did not detect the California slender salamander (*Batrachoseps attenuatus*), Siskiyou Mountain salamander (*Plethodon stormi*) or the Oregon spotted frog (*Rana pretiosa*). This lack of detections is most likely a result of the RNAs either lacking appropriate habitat or being outside the species' range in the region. We detected 3 species of true frogs (Family Ranidae), and all these are State species-of-concern or protected. *Rana cascadae*, *R. aurora*, and *Bufo boreas* were detected at one RNA each. For *R. aurora*, this low rate of detection is probably the result of lack of appropriate aquatic breeding habitats. *Rana cascadae* are widespread and locally common in the main axis of the Cascade Range, and we detected a breeding population in the only RNA we surveyed along the Cascades (Limpy Rock). *Rana cascadae* also occurs farther south in the Trinity Alps and neighboring ranges in California. The historic distribution of the species in the Siskiyou bridge between Cascade Range and Trinity Alps is poorly understood. Ponds and lakes are limited in number and widely spaced in the Oregon Siskiyou. *Rana pretiosa* (a Federal candidate species) is usually associated with large open marshes, and the sampled RNAs did not appear to offer

any habitats of this type. We had hoped for more detections of *B. boreas*, which probably occurred patchily in the region. There is concern over the status of *B. boreas* over much of its range in the western USA. USGS is investigating this question with a concurrent study in hopes of better understanding the dimension of the problem.

We conclude that RNAs in southwestern Oregon are generally representative of the complete set of expected regional amphibian fauna, and that several of these areas are valuable reserves of amphibian biodiversity. These RNAs provide an important opportunity to investigate habitat affinities and patterns of abundance for several sensitive amphibians in relatively undisturbed low- and mid-elevation environments. Their value is now enhanced because of the 2002 Biscuit fire in southwestern Oregon and northern California, which is almost 500,000 acres of mixed severity burns. This fire affected selected areas of Hoover Gulch RNA, and suppression activities related to the Biscuit fire may have impacted the Lemmingsworth Gulch RNA (<http://www.biscuitfire.com/assessment.htm>). Portions of the Limpy Rock RNA burned as part of another fire in 2002. There may be future opportunity to compare the herpetofaunas pre- and post-fire in these RNAs.

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Stebbins, R.C. 1985. *Western Reptiles and Amphibians* (2nd ed.). The Peterson Field Guide Series No. 16. Houghton Mifflin Co., Boston, Mass. 336p.

## RELATED PRODUCTS

Funding for this project provided partial support for the following products and events:

Bury, R.B. and C.A. Pearl. 1999. Klamath-Siskiyou Herpetofauna: Biogeographic patterns and conservation strategies. *Natural Areas Journal* 19:341-350.

Parker, M., R.B.Bury, and C.A. Pearl. Amphibians and reptiles of the Siskiyou. A field class taught at Siskiyou Ecology Institute, Cave Junction, OR. June 1998.



Table 1. US Forest Service Research Natural Areas surveyed as part of this inventory.

<b>Research Natural Area</b>	<b>National Forest</b>	<b>Elevation Range (ft)</b>	<b>Size (ha)</b>	<b>Survey Time (person-hrs)</b>
Ashland	Rogue River	2,800 – 4,600	570	21
Cedar Log Flat	Siskiyou	1,700 – 3,300	166	25
Coquille Falls	Siskiyou	1,000 – 2,500	202	9
Hoover Gulch	Siskiyou	1,100 – 4,000	511	17
Lemmingsworth Gulch	Siskiyou	1,100 – 2,710	495	16
Limpy Rock	Umpqua	1,750 – 4,350	760	27
Oliver Matthews (proposed)	Rogue River	2,500 – 6,000	Not available	14
Port Orford	Siskiyou	850 – 2,500	454	16
Wheeler Creek	Siskiyou	550 – 1,770	135	23

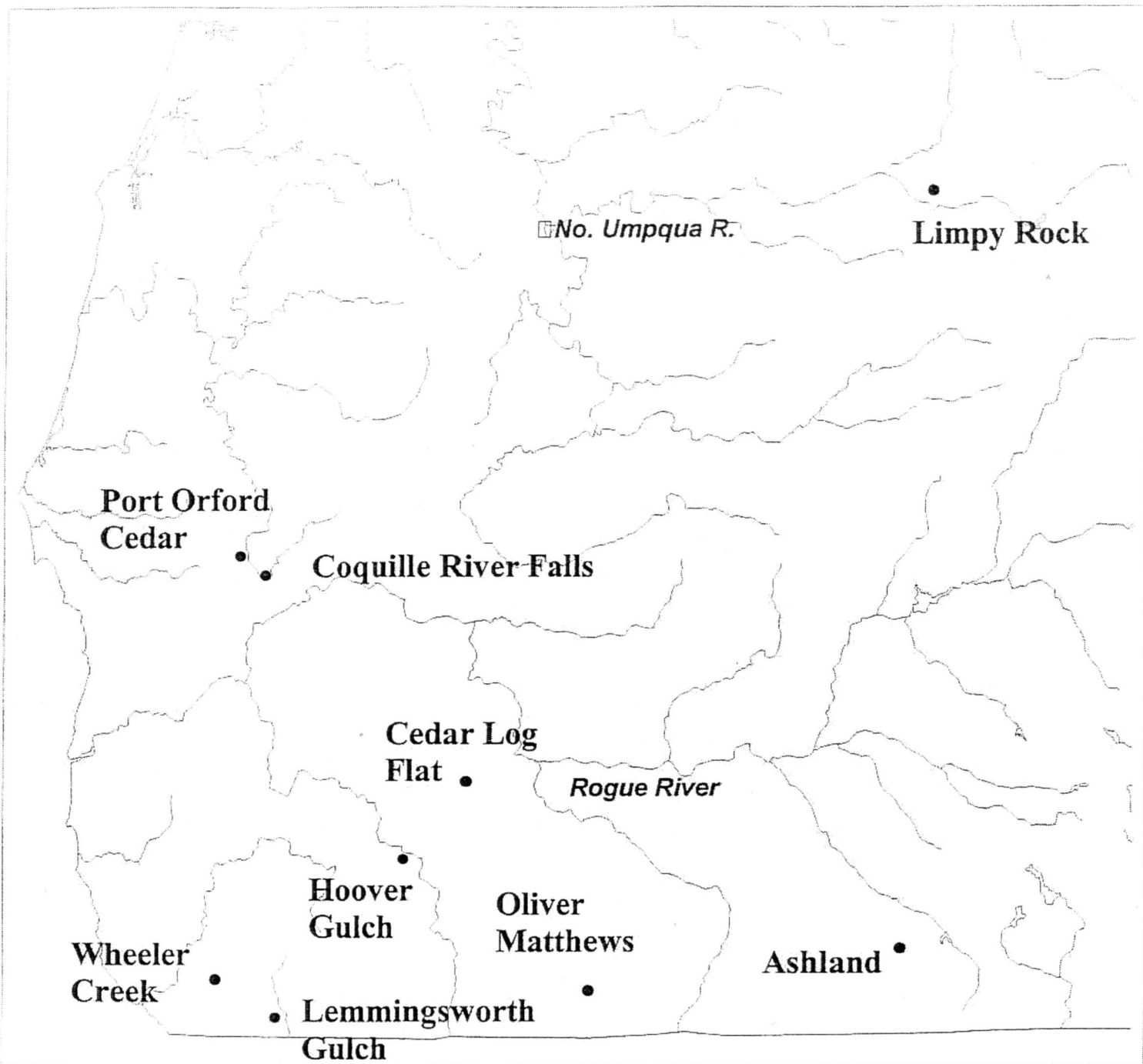


Table 2. Amphibian species and life stage occurrences on US Forest Service Research Natural Areas in southwestern Oregon.

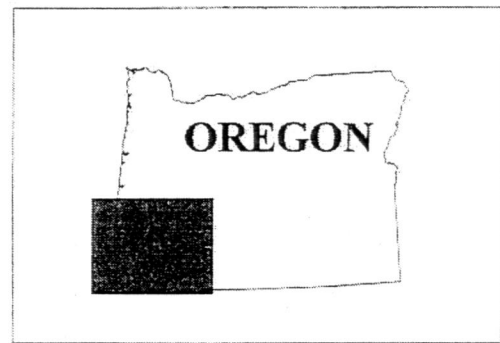
	RESEARCH NATURAL AREA									Num. RNAs
	Ashland	Cedar Log	Coquille Falls	Hoover Gulch	Lengwrth Gulch	Limpy Rock	Oliver Matthews	Port Orford	Wheeler Creek	
<b>Salamanders</b>										
<i>Ambystoma gracile</i>						E		E		2
<i>Dicamptodon tenebrosus</i>	TA		L	L	L	NA, L	TA		L	7
<i>Aneides ferreus</i>			A			A				2
<i>Ensatina eschscholtzii</i>		A	A, J	A	J	J	A	A	A, J	8
<i>Plethodon dunni</i>			A, J					A, J		2
<i>Plethodon elongatus</i>		A, J	A	A, J	A			A, J	A, J	6
<i>Plethodon vehiculum</i>						A, J				1
<i>Rhyacotriton variegatus</i>		A, L	L	A, L	A, L				A	5
<i>Taricha granulosa</i>	A		A, J		A	A	A, J	A	A	7
<b>Frogs and Toads</b>										
<i>Bufo boreas</i>							A, E			1
<i>Pseudacris regilla</i>	E, L	A, E				A, L	A, E	A		5
<i>Ascaphus truei</i>	A, L			A		A, L	A		A	5
<i>Rana aurora</i>								E		1
<i>Rana boylei</i>					J	A, J		A, J		3
<i>Rana cascadae</i>						A, J, L				1
Species Detected (Life stages)	4 (6)	4 (7)	7 (10)	5 (7)	6 (7)	10 (17)	6 (9)	8 (11)	6 (8)	

Life stages are : A = Adult, E = Egg mass, J = Juvenile, L = Larvae, NA = Neotenic Adult, TA = Terrestrial Adult.





20 0 20 Kilometers



- Research Natural Areas
- ~ Major Rivers

Figure 1.



APPENDIX

Species list of native amphibians found in the Klamath–Siskiyou region (southwestern Oregon and northern California) based on Nussbaum et al. (1983), Stebbins (1985) and Integrated Taxonomic Information System (<http://www.itis.usda.gov/itis/>). Format is: FAMILY, *Species* (Author), Common Name

Caudata (Salamanders)

AMBYSTOMATIDAE

<i>Ambystoma gracile</i> (Baird, 1859)	Northwestern Salamander
<i>Ambystoma macrodactylum</i> (Baird, 1849)	Long-toed Salamander

DICAMPTODONTIDAE

<i>Dicamptodon tenebrosus</i> (Baird and Girard, 1852)	Pacific Giant Salamander
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PLETHODONTIDAE

<i>Aneides ferreus</i> Cope, 1869	Clouded Salamander
<i>Aneides flavipunctatus</i> (Strauch, 1870)	Black Salamander
<i>Batrachoseps attenuatus</i> (Eschscholtz, 1833)	California Slender Salamander
<i>Ensatina eschscholtzii</i> Gray, 1850	Ensatina
<i>Plethodon dunni</i> Bishop, 1934	Dunn's Salamander
<i>Plethodon elongatus</i> Van Denburgh, 1916	Del Norte Salamander
<i>Plethodon stormi</i> Highton and Brame, 1965	Siskiyou Mountain Salamander
<i>Plethodon vehiculum</i> (Cooper, 1860)	Western Redback Salamander

RHYACOTRITONIDAE

<i>Rhyacotriton variegatus</i> Stebbins and Lowe, 1951	Southern Torrent Salamander
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SALAMANDRIDAE

<i>Taricha granulosa</i> (Skilton, 1849)	Roughskin Newt
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Anura (Frogs and Toads)

ASCAPHIDAE

*Ascaphus truei* Stejneger, 1899

Tailed Frog

BUFONIDAE

*Bufo boreas* Baird and Girard, 1852

Western Toad

HYLIDAE

*Pseudacris regilla* Baird and Girard, 1852

Pacific Treefrog

RANIDAE

*Rana aurora* (Baird and Girard, 1852)

Red-legged Frog

*Rana boylei* (Baird, 1854)

Foothill Yellow-legged Frog

*Rana cascadae* (Slater, 1939)

Cascade Frog