Surveys for Oregon Spotted Frog (*Rana pretiosa*) and Cascades Frog (*Rana cascadae*) at select wetlands in the Trout Lake Creek Watershed, Gifford Pinchot National Forest, Mt. Adams Ranger District

Submitted
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Abstract

Surveys were conducted in the Trout Lake Creek Watershed on the Gifford Pinchot National Forest in August 2009 to gather information on Cascades Frog and Oregon Spotted Frog distribution and to assess habitat suitability for Oregon Spotted Frogs at various wetlands along Trout Lake Creek and its tributaries at elevations above 2000 ft. Eleven sites in six areas were surveyed. Visual encounter surveys, combined with dip netting, were the main methods used to find frogs and larval stages. Precautions were taken between each survey site to prevent the possible transfer of chytrid (Bd), an amphibian pathogen, from one site to another. Each amphibian and reptile encountered was documented including information on observation time, UTM location from a Garmin 12X GPS unit, species, life stage, sex, habitat and microhabitat. Of the eleven areas surveyed, Cascades Frogs were found at nine sites and Oregon Spotted Frog at only one site previously known to be occupied. Cascades Frogs were observed at almost every water body surveyed in the upper reaches of the Trout Lake Creek watershed. The two recently metamorphosed Oregon Spotted Frogs found are significant because US Forest Service and Washington Department of Fish and Wildlife biologists reported no Oregon Spotted Frog egg masses found at the site for the last two years. Sharp-tailed snake, another Forest Service sensitive species, was newly documented in one area three miles from Forest Service lands and one mile from a known site.

Introduction

The Oregon Spotted Frog is a Pacific Northwest endemic that has been lost from an estimated 70-90% of its historical range (Hayes et al. 1997). In Washington, the species occurs in the Black River watershed in Thurston County, Trout Lake Creek watershed in Klickitat County and Conboy National Wildlife Refuge in Klickitat County. The species is a Washington State Endangered Species and a Federal Candidate species.

The Cascades Frog is a US Forest Service Sensitive species, a Federal Species of Concern and a Washington State Monitor species. The NatureServe global rank is G3G4 (vulnerable) based on concern over declines in some areas of the range, especially at the edges (http://www.natureserve.org/explorer/ accessed August 25, 2009).

K.R. McAllister and W. P. Leonard conducted Spotted Frog inventories in the early 1990s including surveys in Washington's national forests (McAllister and Leonard 1993). At that time, Oregon Spotted Frog populations in the vicinity of the Gifford Pinchot National Forest were known from Trout Lake Natural Area Preserve and Conboy National Wildlife Refuge (McAllister and Leonard 1993). Surveys by McAllister and Leonard (1993) included Meadow Creek and Grand Meadows in the Mt. Adams Ranger District of the Gifford Pinchot National Forest. They found Cascades Frog (*Rana cascadae*) and Pacific Treefrog (*Pseudacris regilla*) at Meadow Creek and Cascades Frog and Northwestern Salamander (*Ambystoma gracile*) at Grand Meadows. No Oregon Spotted Frogs were found.

Over a decade has passed since surveys for the Oregon Spotted Frog were conducted in this area of the Gifford Pinchot National Forest. Since that time, Leonard (1997) confirmed the presence of breeding Oregon Spotted Frogs on the Gifford Pinchot National Forest (T7N R9E Sec. 31, Skamania County) at a beaver pond between the old and new Trout Lake Creek campground. The site has been called both the "Trout Lake Creek beaver pond" and the "USFS beaver pond" depending on the source. This and two other sites, discovered since 1993, occur in beaver and human made ponds that differ from the large, shallow, warm, emergent marshes typical of the species' habitat in Washington. The other two sites are the "NAP beaver pond" (T06N R10E Sec. 9) and "SDS ponds" (T06N R10E Sec. 06). Both sites are at about the same elevation of 622 m (2040 ft.). These three sites occur northwest of the extensive emergent wetland (elev. 583 m [1940 ft.] at Trout Lake Natural Area Preserve (NAP). The two beaver created ponds are fed by springs that flow parallel to Trout Lake Creek. In both cases, there is aquatic connectivity to Trout Lake Creek downstream from the ponds. The SDS ponds appear to be partially human created (D. Anderson, pers. comm.).

The NAP beaver pond, SDS pond and USFS beaver pond are respectively 1.58 km, 3.85 km and 4.45 km from the nearest documented breeding site in the main Trout Lake NAP wetland. This suggests that the Oregon Spotted Frogs can colonize new sites at some distance from the main population.

The ponds and associated wetlands are small. All are less than or equal to 4 hectares (9 acres) during most of the summer. Hayes (1994) suggests 4 hectares represents a

possible minimum size necessary to support an Oregon Spotted Frog population. Egg mass counts at the three sites are typically less than 50 egg masses per site, indicating that populations at these sites are small. The USFS beaver pond population is known to have persisted for at least a decade.

The main goal of the surveys summarized below was to gather more information on Cascades Frog and Oregon Spotted Frog distribution in the Trout Lake Creek watershed, and to assess habitat suitability for Oregon Spotted Frogs at various wetlands along Trout Lake Creek and its tributaries.

Survey Sites
Surveys took place in nine areas of the Trout Lake Creek watershed within the Gifford Pinchot National Forest, Townships 7 and 8 North and Ranges 8, 9, and 10 East. The focal areas for these surveys included 1) "The USFS beaver pond" south to Trout Lake Creek (approximately ½ mile), 2) Trout Lake Creek downstream from Skull Creek (approximately 1 mile), 3) Meadow Creek area, 4) Langfield Falls area, 5) North Fork of Trout Lake Creek, 6) wetlands at fork of Forest Service (FS) Road 539 x FS Road 88, 7) Steamboat Lake, 8) Grand Meadows Creek and 9) Grand Meadows. In addition, a brief stop was made at Big Mosquito Lake.

Methods
Survey sites were chosen based on habitat features visible in color othophotos and connectivity to Trout Lake Creek. Of greatest interest were emergent wetlands fed by streams or creeks with minimal areas of shrub cover and pond sites along creeks. Accessibility was taken into consideration where possible for efficiency. Getting to some sites required navigating through forest uplands resulting in more travel and less survey time. All sites selected were within about 1 km (6/10 mile) of a road.

Survey methods were similar to those used by McAllister and Leonard (1993) including walking water edges, wading shallows and sweeping a fine-meshed net through water and vegetation ("dip netting"). At first encounter, many of the meadows appeared dry except for saturated soils. In these cases, the entire area was searched for any standing water.

All surveys were conducted by a volunteer, Dan Ritter, and me. Precautions were taken between each survey site to prevent the possible transfer of chytrid (*Bd*), an amphibian pathogen, from one site to another. Each amphibian and reptile encountered was documented including information on observation time, UTM location from a Garmin 12X GPS unit, species, life stage, sex, habitat and microhabitat. A subset of observed amphibians was measured. These measurements included snout-vent length (SVL) for anurans and total length (TL) for larval anurans and salamanders. Attempts were made to photograph each species encountered at a site. Voucher photographs of Oregon Spotted Frog and Cascades Frog included four views important for identification including the dorsal, ventral and lateral surfaces, as well as a photograph showing the orientation of the eyes.

Results

A brief description of survey results is included for each surveyed area and a summary of these results is in Table 2. The figures that follow show the survey areas and species found. The base maps are from 1970s USGS 7.5 topographic maps. The topographic map name is included in each figure. This area of the state was not surveyed in 1970 so the USGS 7.5 topographic maps do not have section lines. Township, range and section information comes from a Department of Natural Resources GIS layer. The UTM locations, as well as habitat and life history information for each species observation, are available in an Excel spreadsheet in the appendix. This information will also be entered into the US Forest Service database (FAUNA) and the Washington Department of Fish and Wildlife WSDM database, Olympia, Washington. The Washington Natural Heritage Program will enter element occurrences into the Biotics database as funding becomes available for Oregon Spotted Frog and Sharp-tailed Snake.

Survey sites are listed in alphabetical order by creek name or place name and then by survey date. Areas surveyed are indicated by polygons and lines. The entire area within the polygon was searched. The dots represent the locations where amphibians and reptiles were observed. The four or five letter species codes indicate species (Table 1). In some cases, these computer generated labels overlapped. For clarity, each wetland has a yellow tag (label) with a summary of the species observed. More detailed information about each observation can be found in Excel spreadsheets in the appendix.

Table 1. Species codes used in figures and appendix (Excel sheet).

Species code	Species	Common name
AMMA	*Ambystoma macrodactylum*	Long-toed Salamander
AMGR	*Ambystoma gracile*	Northwestern Salamander
TAGR	*Taricha granulosa*	Rough-skinned Newt
RANCA	*Rana cascadae*	Cascades Frog
HYRE	*Hyla/Pseudacris regilla*	Pacific Treefrog
BUBO	*Bufo boreas*	Western Toad
THSI	*Thamnophis sirtalis*	Common Garter Snake
THOR	*Thamnophis ordinoides*	Northwestern Garter Snake
CONTE	*Contia tenuis*	Sharp-tailed Snake

Table 2. Summary of species found at each survey site in August 2009.

Site name	Survey date	Map	Oregon Spotted Frog (*Rana pretiosa*)*	Cascades Frog (*Rana cascadae*)*	Other species observed
Grand Meadows	Aug. 6	Fig. 2	Not detected	Present	Small larval *Ambystoma* sp.
Grand Meadows Creek	Aug. 6	Fig. 2	Not detected	Not detected	Northwestern Salamander, Pacific Treefrog
Meadow Creek	Aug. 4, 5	Fig. 4	Not detected	Present	Northwestern Garter Snake
Meadow Creek wetlands and pond (4 sites)	Aug. 4, 5	Fig. 5	Not detected	Present	Rough-skinned Newt, Northwestern Salamander, Pacific Treefrog
Mosquito Creek	Aug. 3, 5	Fig. 7	Not detected	Present	Rough-skinned Newt, Northwestern Salamander, Western Toad
North Fork Trout Lake Creek (two sites)	Aug. 6	Fig. 8	Not detected	Present	Long-toed Salamander, Northwestern Salamander
Trout Lake Creek at "USFS Beaver Pond" site	Aug. 4	Fig. 9	Present	Not detected	Rough-skinned Newt, Pacific Treefrog
FS Road 88 at T07N R09E Sec. 35	Aug. 5	Fig. 10	-----	-----	Northern Alligator Lizard
FS Road 88 at T06N R10E Sec. 16	Aug. 6	Fig. 11	-----	-----	Common Garter Snake
FS Road 88 at T06N R09E Sec. 27, NE quarter	Aug. 6	Fig. 11	-----	-----	**Sharptailed Snake***
FS Road 8851 at Big Mosquito Lake	Aug. 7	Fig. 12	-----	Dead on road	Western Toad
FS Road 88 at T0N R09E Sec. 35	**Aug. 7**	**Fig. 10**	-----	-----	***Rana* species** dead on road

**US Forest Service sensitive species.*

Grand Meadows

August 6

At the start of the survey, skies were 100% overcast, there was a cool breeze, it was misty, air temperature was 8°C (46.4°F). Weather conditions were not ideal for observation of Cascades Frog or Oregon Spotted Frog. Conditions during the day cooled rapidly resulting in water temperature (11°C) warmer than the air temperature at the time of the survey.

Grand Meadows is located in T08N R09E Sec. 27 (Fig. 1). It is a large wet meadow (fen). A few small shallow pools of water were present at the time of survey. Rivulets provided the main aquatic habitat. The locations where species were observed are indicated on Figure 2. Five Cascades Frog tadpoles were netted in both a small area of standing water and in the rivulets. The tadpoles captured varied in development stage from just starting to develop hind limbs to all limbs present but still with a complete tail. Four juvenile frogs (30 mm SVL range) were also observed in the rivulets.

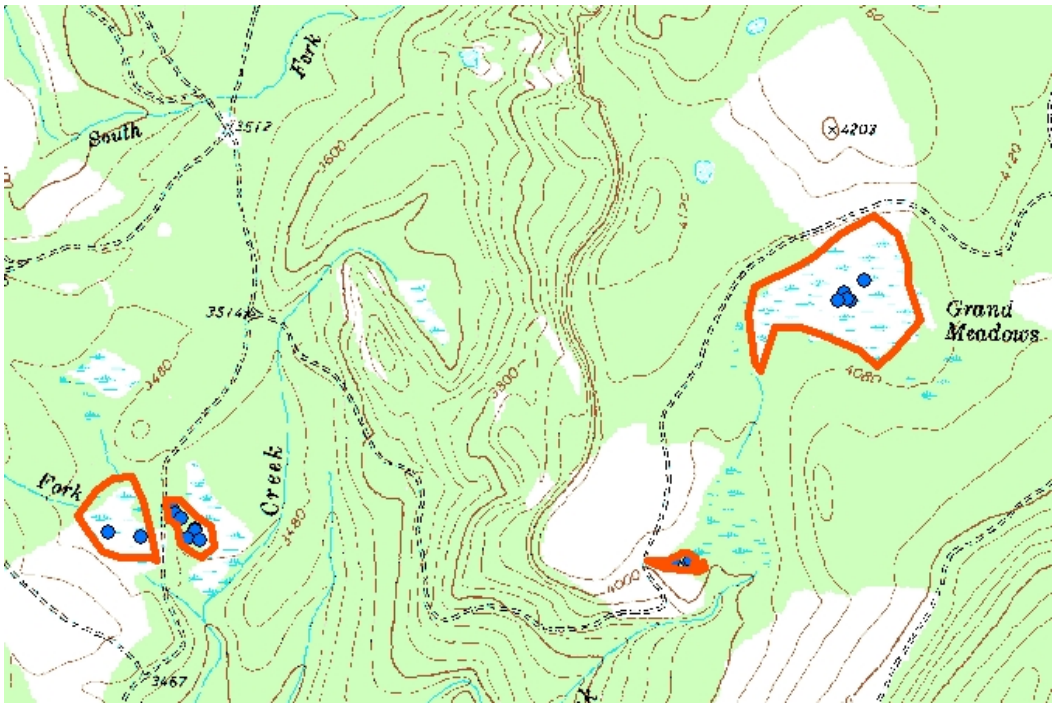

Figure 1. Survey areas at North Fork Trout Lake Creek (T08N R09E Sec. 33), Grand Meadows Creek (T08N R09E Sec. 27) and Grand Meadows (T08N R09E Sec. 27). Polygons indicate the survey areas. Dots represent locations of amphibians and reptiles observed during the surveys. ***Base layer from the Steamboat Mountain Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

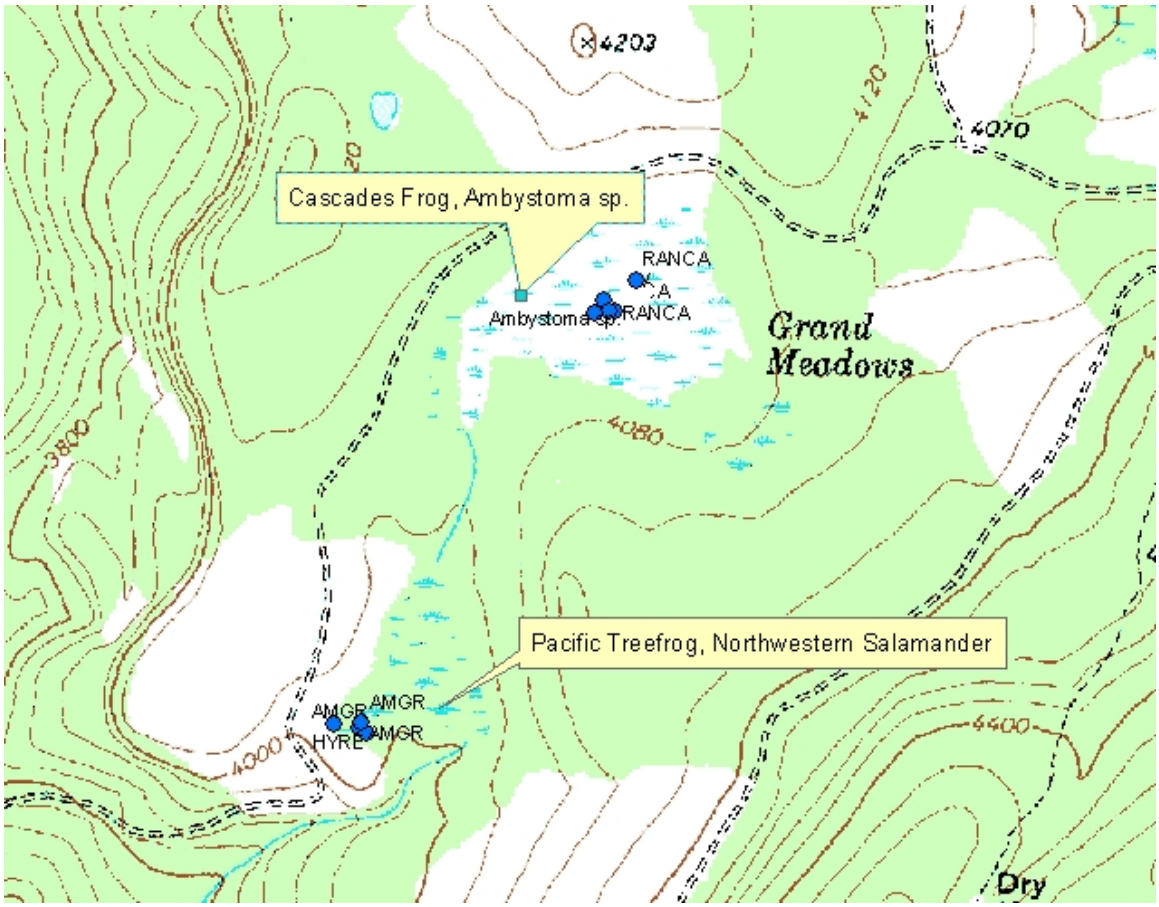

Figure 2. Survey results for Grand Meadows (T08N R09E Sec. 27) and a wetland along Grand Meadows Creek (T08N R09E Sec. 34). Dots represent the locations where amphibians were observed. ***Base layer from the Steamboat Mountain Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

Grand Meadows Creek

August 6

A wetland on Grand Meadows Creek (T08N R09E Sec. 34), located east of FS Road 8860 and 1.7 mile north from junction with FS Road 88, was surveyed briefly (Fig. 1). From the road walking east, the habitat was dominated by a tall sedge species. The amount of standing water increased to the east near the beaver influenced wetland with deeper water and channels off the creek. A beaver dam was present and appeared to be maintained. The locations where species were observed are indicated on Figure 2. A **Pacific Treefrog** metamorph was observed near the top of a sedge blade. Larval salamanders were common captures in the dipnets. Two size classes of **Northwestern Salamander** larvae were captured presumably hatched last year and this year. Two empty Northwestern Salamander egg masses were also observed. No Cascades Frogs were observed or dipnetted. At the end of the survey, skies were 100% overcast, there was a cool breeze, air temperature was 15°C (59° F) and it felt as if it might rain.

Meadow Creek

August 3-5

Four sites were surveyed along Meadow Creek and its tributaries (T7N R9E) (Fig. 3) Cascades Frogs were found at all sites with standing water. Two sites, represented by polygons with no dots in Figure 3, did not have any standing water at the time of the survey.

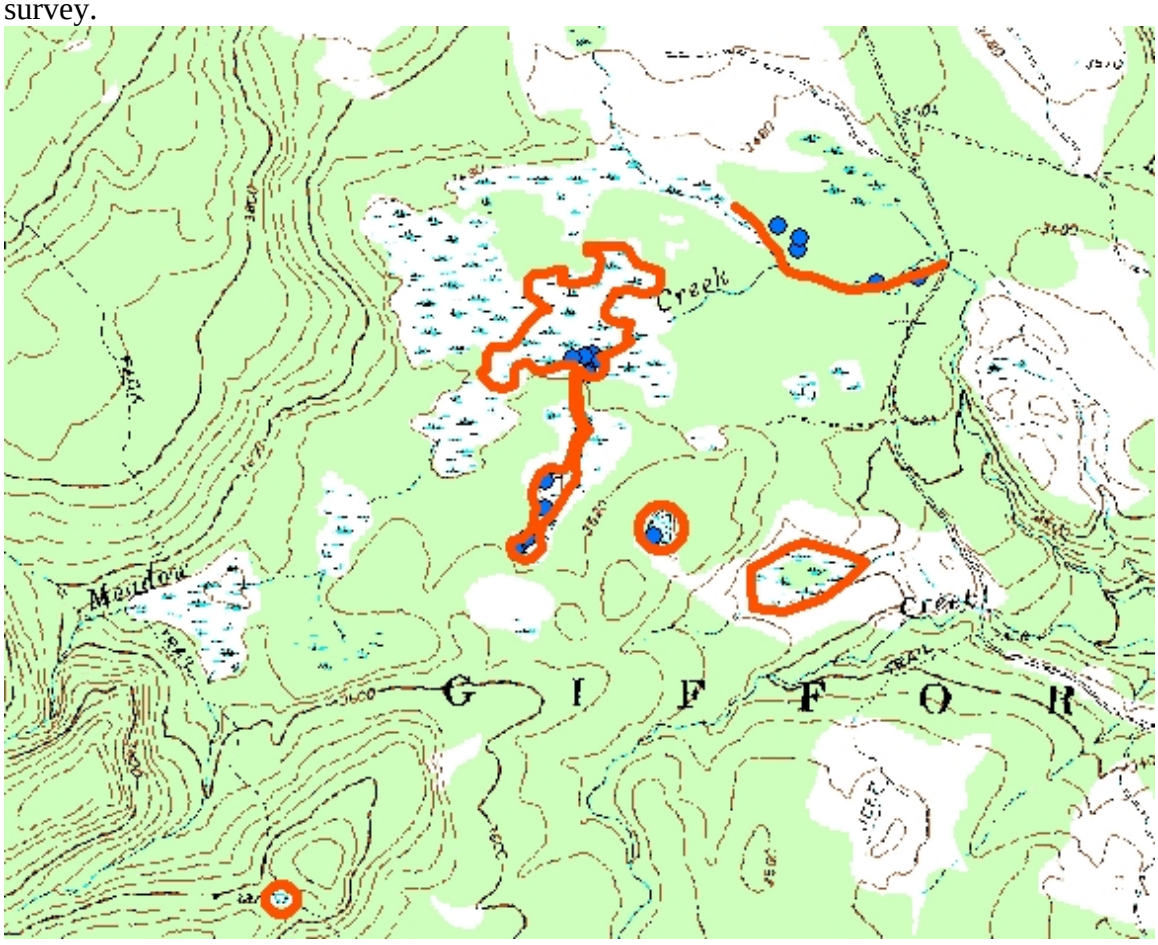

Figure 3. Meadow Creek sites surveyed August 3-4. Lines and polygons represent survey areas. Dots represent locations where amphibians and reptiles were observed. The two surveyed areas with no dots lacked standing water at the time of survey. ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

August 4

At the northern creek site (Fig. 3), the Cascades Frogs were basking on sandy edges of the creek in sunny openings (Fig. 4) in the late afternoon (1545-1646 hrs). Captured **Cascades Frogs** included an adult male (not measured) and two juveniles 31 mm SVL and 30 mm SVL. A few smaller frogs were observed but not captured in the grassy uplands a few meters from the creek. All fled into the creek. Based on general appearance and behavior, these little frogs were most likely Cascades Frogs.

A **Northwestern Garter Snake** (*Thamnophis ordinoides*) was also observed. This and the other Northwestern Garter Snakes observed during these surveys had abnormal tails.

This individual was missing the tip of the tail. Seeing multiple individuals with abnormal tails is most likely due to infection and may be due to a nematode infection known to cause tail loss in garter snakes.

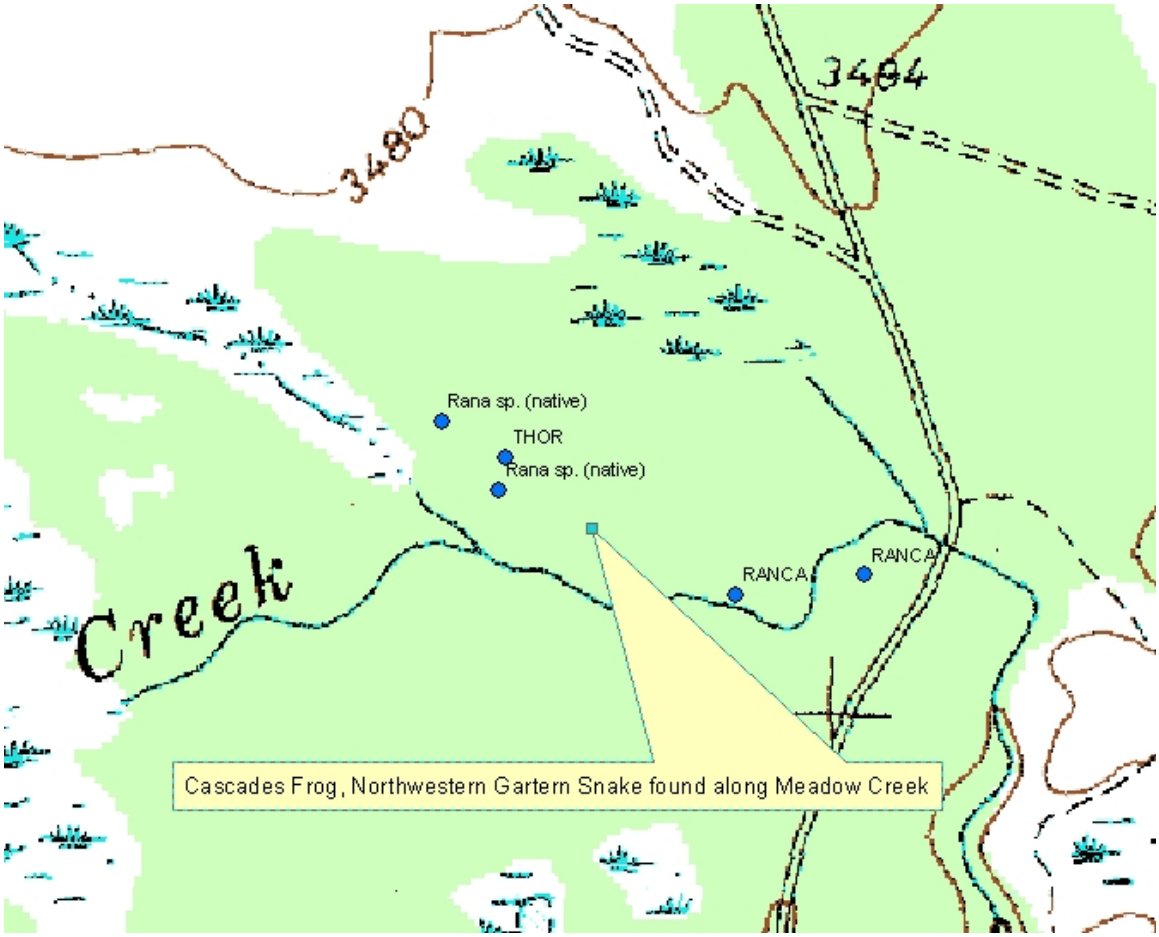

Figure 4. Amphibians and reptile observed (represented by dots) August 4 along Meadow Creek near where creek intersects with FS Road 88. This is the northern most site highlighted in Fig. 3. ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

A small pond south of Meadow Creek (Fig. 5) had thousands of newly metamorphosed **Cascades Frogs** on the muddy edge of the pond and in the water. All the metamorphs observed were similar in size. Some still had portions of the larval tail. The two frogs measured were 20 and 21 mm SVL. The water in the pond was shallow (less than 30 cm [1 ft.]) and the soils were organic. The clear water provided good visibility to the sediments and there was little vegetation in the water column. The muck made it difficult to get close enough to the water to use a dipnet to search for hidden larval amphibians. A few attempts were made without capture success. The water temperature on the muddy edge of the pond was 27°C (80.6°F) and the air temperature was 18°C (64°F) at 1802 hours. At the time of the survey the entire pond was shaded but it had been sunny earlier in the day.

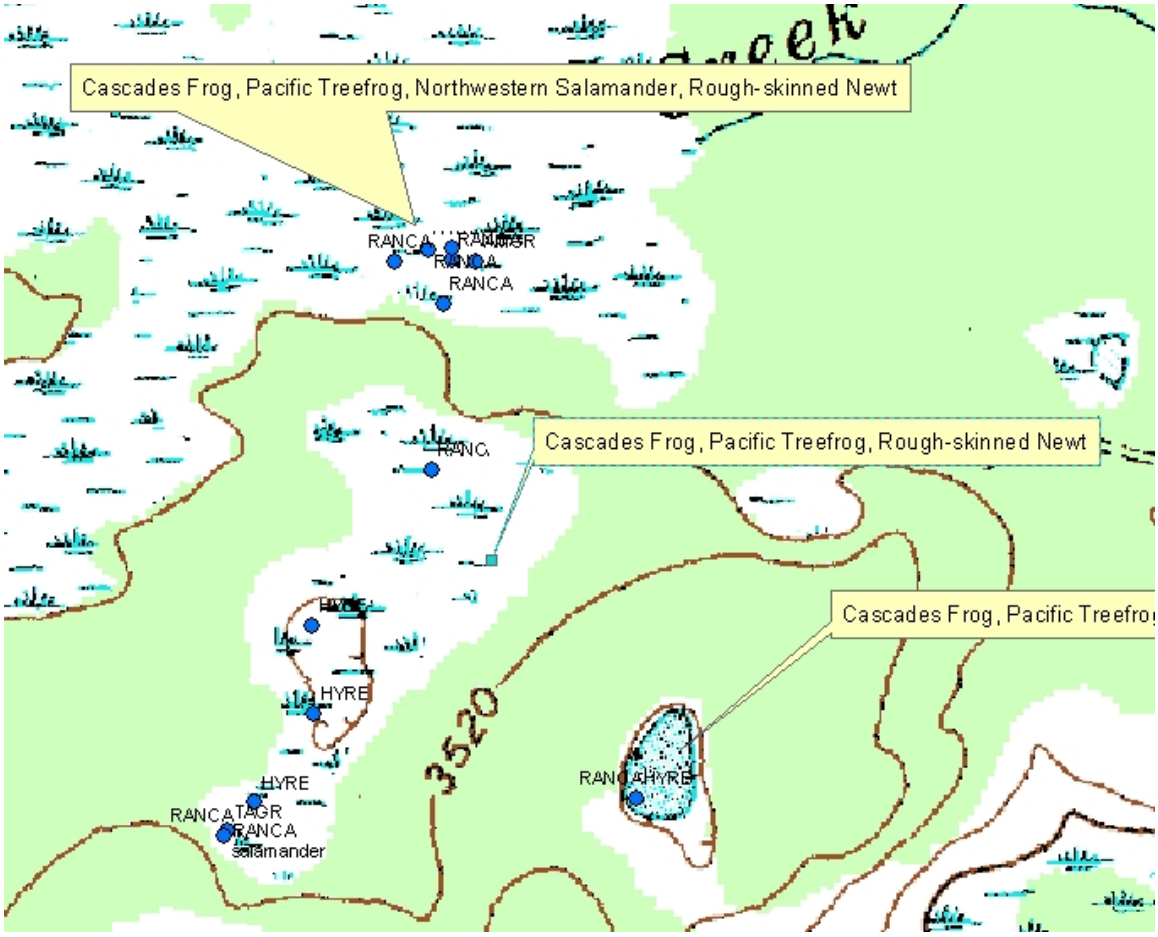

Figure 5. Amphibians observed at Meadow Creek wetlands. Each observation is represented by a dot. The pond was surveyed August 4 and the wetlands were surveyed on August 5 from the south wetland to the north wetland. ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

August 5

Two larger wetlands, north and south of Meadow Creek, were surveyed starting from the south and moving north including survey on Meadow Creek between the two wetlands (Fig. 5). Both sites were dominated by a tall sedge species that was dense throughout both wetlands and the soils were wet (saturated) without standing water. Water in the southern wet meadow (fen) was limited to small areas at the south end of the wetland near the wooded edge. The water temperature was 20°C (68°F) and the air temperature at 1134 hours was 19.5°C (67.1°F).

Locations of amphibians observed are indicated on Fig. 5. Adult, juvenile and larval stages of **Cascades Frogs** were found together in these areas of very shallow water. The **Cascades Frog** tadpoles had fully developed hind limbs without emerged forelimbs. One tadpole measured 15 mm SVL and 40 mm total length. One juvenile measured 29 mm SVL. An adult female measured 62 mm SVL. Three **Pacific Treefrogs** were observed. One was about 61 cm (2 ft.) off the ground on a small huckleberry bush and the others were up near the tops of sedges in areas away from standing water. A small larval

Rough-skinned Newt (approx. 1.5 cm TL) was capture in the same area as the **Cascades Frogs**. Two additional tiny (about 1 cm) larval salamanders were also captured but not identified.

Meadow Creek runs between the two wetlands. The 1970 Sleeping Beauty Quadrangle 7.5 minute topographic map indicates that the creek is to the north of where we actually encountered it. Meadow Creek is clearly visible on Washington Department of Natural Resources color orthophotos taken within the last five years. The area indicated on the topo map as Meadow Creek had a series of rivulets that probably drain into the main stem of Meadow Creek.

The main channel of Meadow Creek that we crossed on the way to the northern wetland was channelized, open and sunny. The soils along the creek were sandy and the banks were grassy. One adult **Cascades Frog** was basking on the shore and two adults were in grassy areas near the creek. The frogs in the grass fled into the creek as we approached. The air temperature was 18.5° C (65.3°F) in the shade at 1216 hrs.

The northern wetland (wet meadow or fen) was also dominated by a tall sedge throughout most of the site. The only standing water was slow flowing rivulets present in the southern portion of the wetland. This is where the amphibians were observed and captured. Two juveniles and one metamorph **Cascades Frogs** were observed. The metamorph measured 21 mm SVL and one of the juveniles measured 33 mm SVL. A **Pacific Treefrog** metamorph and an empty **Northwestern Salamander** egg mass were also found. Attempts were made to dip net for larval amphibians with little success due to thick algae and mucky soils that filled the net with each dip.

Mosquito Creek

August 3

A small wetland, located on FS Road 8851, about .5 miles north of the junction with FS Road 88, elevation 3600 ft., (T07N R09E Sec. 07) was surveyed (Fig 6). The sedge-rush meadow had saturated soils but no standing water other than a rivulet. Locations of amphibians observed are indicated on Fig. 7. Seven juvenile **Cascades Frogs** were found associated with the rivulet. Measured frogs were 33 mm and 31 mm SVL. A small larval salamander was captured but not identified. The frogs were observed between 1726 and 1744 hrs.

August 5

A survey was conducted at a wetland west of Tire Junction (T07N R09E Sec.18) (Fig. 6). Locations of amphibians observed are indicated on Fig. 7. We entered from the south and crossed a creek on the way. This creek is unnamed on the topographic map but is a tributary of Mosquito Creek. An adult female **Cascades Frog** was captured on the grassy bank of the creek at 1603 hours. She measured 51 mm SVL. A male, approximately 45-50 mm SVL, was captured at the creek on the way back to the vehicle at 1719 hours.

Standing water within the meadow (fen) was limited to a series of four small pools. The amphibians observed were concentrated in three pools (Fig. 7). In the southwest pool, a **Cascades Frog** tadpole with hind limb development was captured in a dip net. A larval

Rough-skinned Newt that measured 32 mm SVL, 65 mm total length was also captured. A large adult terrestrial **Rough-skinned Newt** was observed in the pond. A adult female **Western Toad** (*Bufo boreas*), that measured 115 mm SVL, was sheltering under the bank.

The second pool to the north could not be surveyed properly due to mucky edges and dense algae.

The third pool to the north had little vegetation. All the amphibians observed were visible in the water or on the edges of the pool. Tadpoles were also seen but none were captured. An adult **Cascades Frog** was observed under water partially submerged in the pool sediments. A tiny metamorph **Cascades Frog**, only about 1 cm SVL, was observed swimming. Three adult **Rough-skinned Newts** were observed in the water, one was identified as a female. An empty **Northwestern Salamander** egg mass was present in the pool as were 3 large larval **Northwestern Salamanders** (approximately 4-5 cm total length). One of the **Northwestern Salamanders**, with only the anterior portion of the head extending out of a hole in the muck, was unusually light in color. At the end of the survey, an attempt was made to capture this individual but it escaped capture by disappearing into the mucky sediments.

Four **Cascades Frogs** were observed in the fourth pool. One adult was under a log on the moist bank of the pool. A juvenile was observed on the shoreline where the soils were also saturated with water. A large adult female was captured but managed to flee up my sleeve. In the process of removing her, she let out a release call. A **Cascades Frog**, most likely male, responded from a hidden location under the bank next to the water's edge.

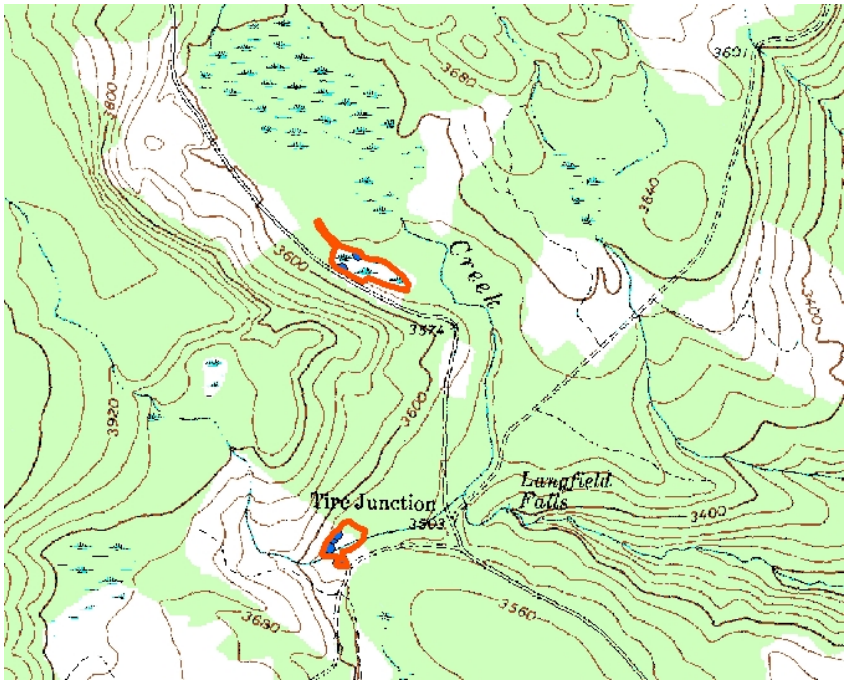

Figure 6. Mosquito Creek areas surveyed August 3 and August 5. ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

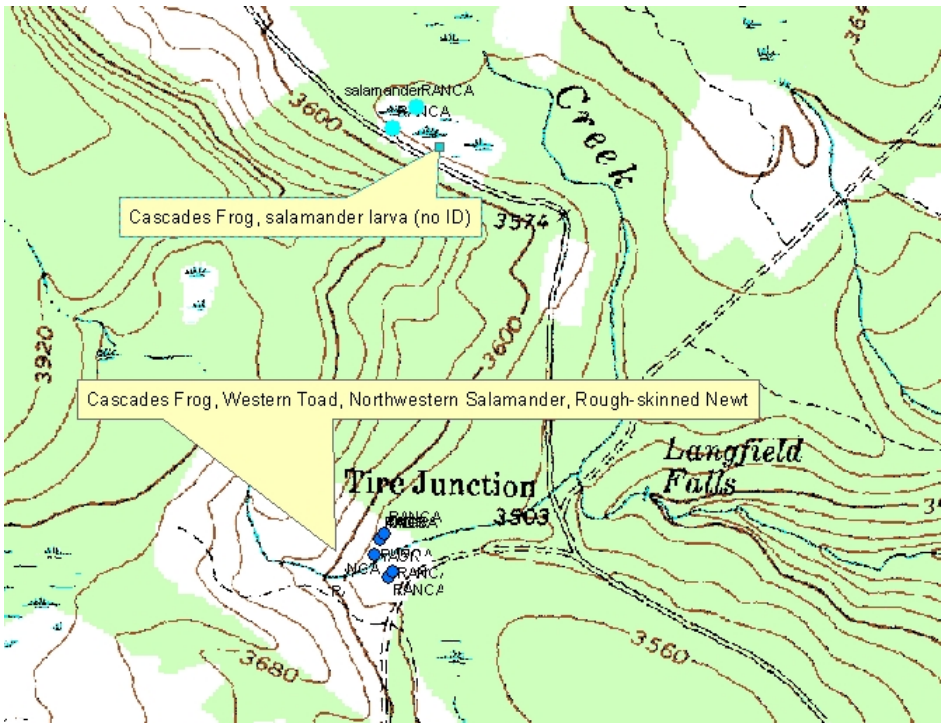

Figure 7. Amphibians observed at Mosquito Creek survey sites on August 3 (northern site) and August 5 (southern site). ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

North Fork Trout Lake Creek
August 6

Aquatic habitats on both sides of FS Road 88 were surveyed (Fig. 1). A cold weather front moved in the previous night resulting in cloud cover, cooler temperatures and light sprinkles. Air temperature at the start of the survey was 14°C (57.2 °F) with brief moments of sun. The survey habitat on the east side of the road started along the creek channel, then moved into a flooded forest (swamp) and then opened into a beaver influenced wetland.

Locations of observed amphibians are indicated on Fig. 8. **Cascades Frogs** were common along the creek. Newly metamorphosed **Cascades Frogs** fled into the water as we walked along the creek. At least thirteen were observed close enough to know they were ranid frogs. Three were captured to confirm identification and take measurements. All three captured frogs were **Cascades Frogs** and measured 20 mm SVL. A subabult/adult **Cascades Frog** was also captured and measured 43 mm SVL.

Two newly metamorphosed **Cascades Frogs** were captured in a swampy area off the main creek channel, as were small salamander larvae. In one case, the larval salamander was so small it was able to slip though the net mesh. Small larval salamanders, such as *Ambystoma gracile* and *A. macrodactylum*, can be difficult to distinguish. Based on general features and phenology, these small larvae were probably Northwestern Salamander and Rough-skinned Newt but the identification remains unconfirmed. A

larger larval salamander (20 mm SVL, 42 total length) was identified as **Long-toed Salamander** (*A. macrodactylum*).

No amphibians were observed or netted once we left the area with trees. Deeper water channels ran through the open wetland. The soils were unconsolidated on the edges and we were unprepared to cross or work in these types of waters. Dip netting from large downed logs that extended into the wetland did not result in any amphibian captures.

The habitat on the west side of the road was a wet meadow (fen) dominated primarily by sedge (Fig. 8). Two areas of water were present at the time of the surveys. The air temperature was 16°C (60.8 °F) with a light wind and 50% cloud cover.

The first pool covered about .01 hectares (.025 acres) and had about 15 cm (6 in.) of water remaining. Emergent vegetation (sedge and rush) was present in the pool. Two **Cascades Frog** tadpoles with hind limbs and two newly metamorphosed **Cascades Frogs** with partial tails were captured in fifteen minutes of dip netting. One of the metamorphosed Cascades Frogs measured 19 mm SVL. No larval salamanders were captured. Of note, ten large predaceous diving water beetles were captured during the fifteen minutes of dip netting.

The second area with standing water was a small isolated pool approximately 2 meters wide by 3 meters long. Water on the edge of the pool was 14°C (57.2 °F). This pool had a large neotenic (gilled adult) **Northwestern Salamander** in the pool and two recently metamorphosed Cascades Frogs on the pool edge. This pool had a small outlet channel (dry at the time of the survey) and may have been spring fed.

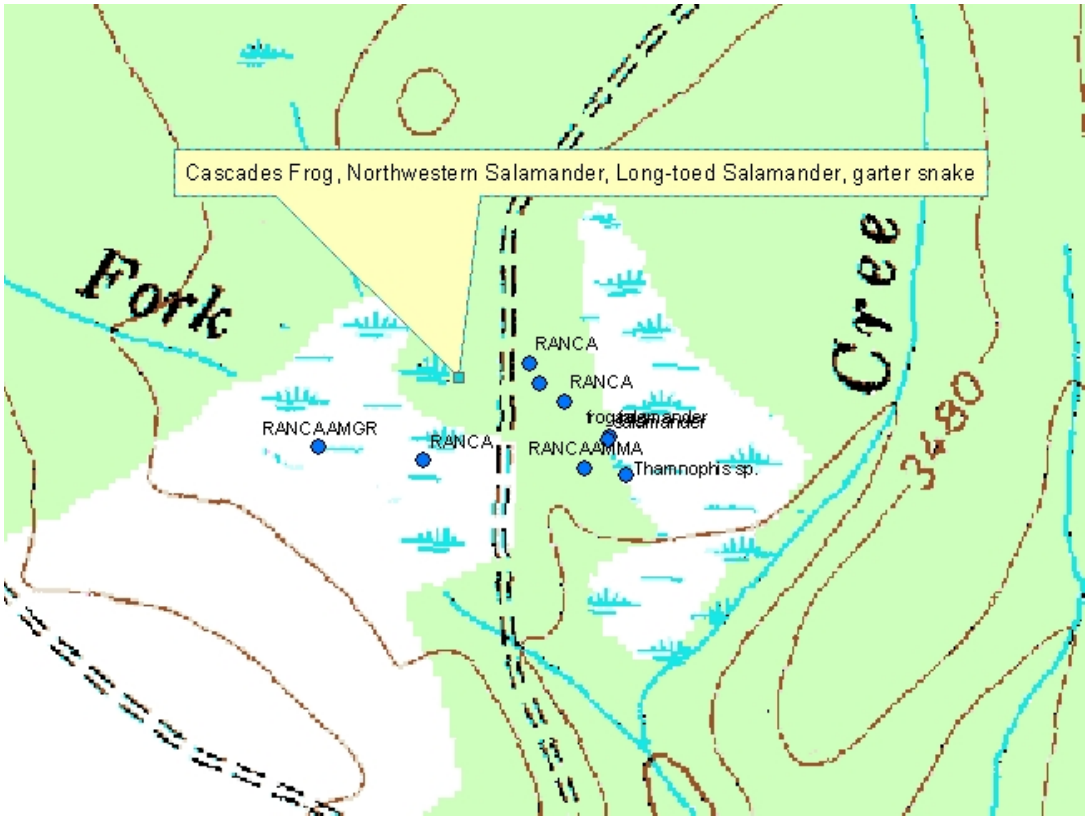

Figure 8. North Fork Trout Lake Creek survey areas on the east and west sides of FS Road 88 (T08N R09E Sec. 33). Amphibians and reptiles observed on August 6 are indicated by dots. ***Base layer from the Steamboat Mountain Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

Steamboat Lake

August 7

A brief visit was made to Steamboat Lake (T08N R09E Sec.31). Weather conditions were poor for seeing frogs. Skies were overcast with misty breezy conditions. Air temperature was 9°C (48.2°F). The lake is stocked with fish which can reduce the amphibian population and make detection difficult. No amphibians were observed during the brief visit.

Trout Lake Creek

August 4

The survey started at the USFS beaver pond located near the Skamania and Klickitat county border (T07N R10E Sec. 31) (Fig. 9). Locations of amphibians and reptiles observed are indicated in Fig. 9. Two newly metamorphosed **Oregon Spotted Frogs** were captured by dip net. Both still had portions of the tail. This observation is significant because of reports that no Oregon Spotted Frog egg masses were observed at the site this year. Other species found included **Pacific Treefrog** (*Pseudacris regilla*), **Rough-skinned Newt** (*Taricha granulosa*) and a garter snake, most likely but not confirmed as a Common Garter Snake (*Thamnophis sirtalis*). One of the newts was metamorphosing. It still had gills but it had also developed terrestrial "warty" skin. Based on its size and the timing of metamorphosis, this newt appeared to have overwintered in the larval form.

The outlet from this pond was then followed south to Trout Lake Creek. No other amphibians were found along the stream. One **Northwestern Garter Snake** was found basking near the stream. The tail was present but the tip was abnormal. It appeared dried out and looked as if it was going to fall off.

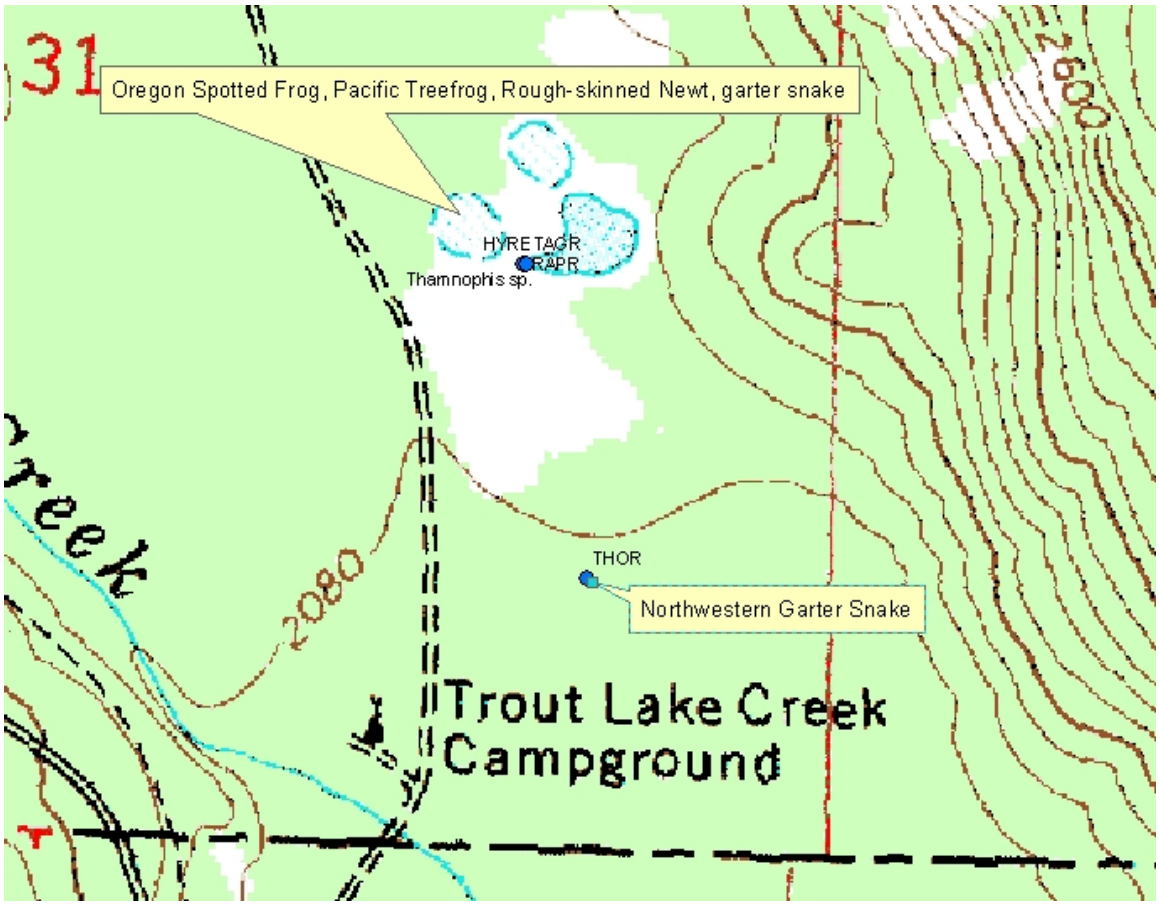

Figure 9. USFS beaver ponds (T07N R10E Sec. 31) survey results from August 4. The stream that flows out of the beaver ponds south to Trout Lake Creek is not mapped on the topographic map. The Northwestern Garter Snake was observed along the stream. ***Base layer from the Trout Lake Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

Incidental observations on roads

August 5

Northern Alligator Lizard (*Elgaria coerulea*) – An adult was found dead on FS Road 88 (T07N R09E Sec. 35) (Fig. 10). The habitat surrounding the road was forested on both sides with a mix of hardwoods and softwoods.

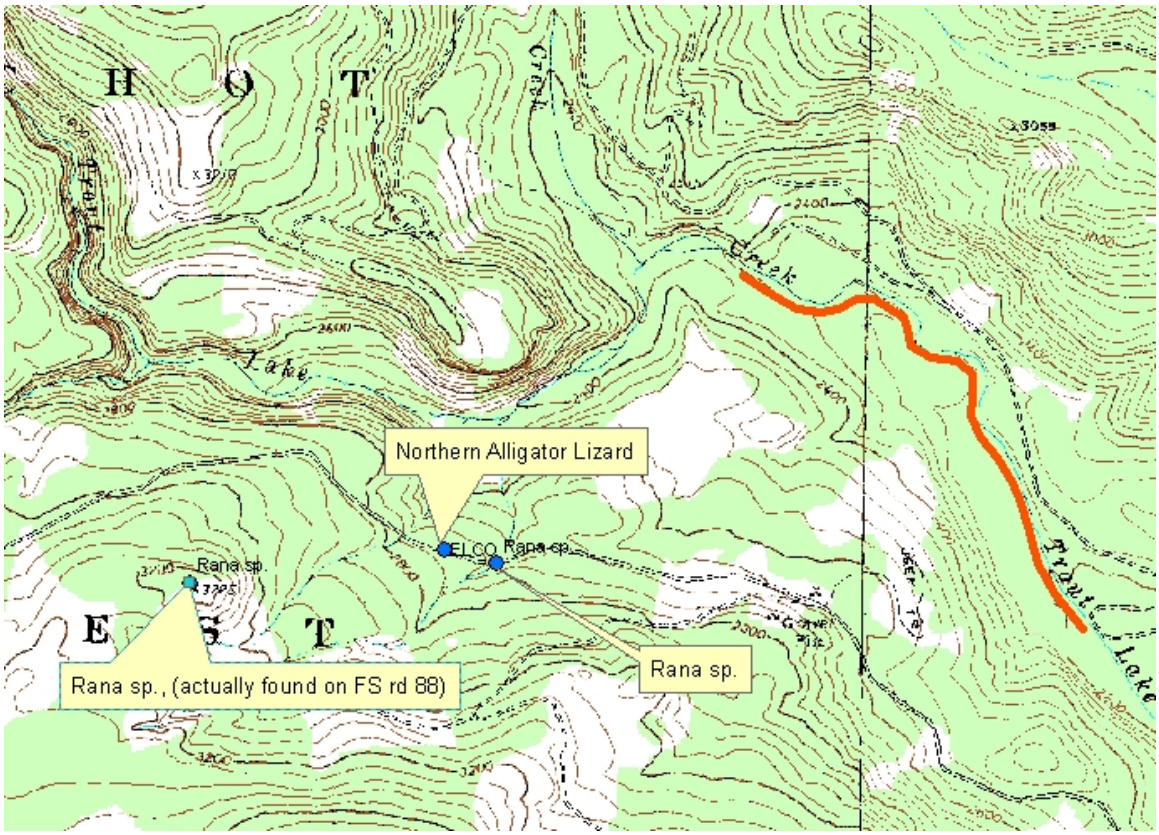

Figure 10. Amphibians and reptiles found dead on FS Road 88 while traveling to and from Trout Lake. ***Base layer from the Sleeping Beauty Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

August 6

Common Gartern Snake (*Thamnophis sirtalis*) - An adult was found dead on Trout Lake Creek Road near the entrance to Elk Meadows RV Park at 0850 hours (T06N R10E Sec. 16) (Fig. 11).

Sharp-tailed Snake (*Contia tenuis*) - An adult was found on Trout Lake Creek Road, 3 road miles (2.65 miles straight-line) (4.8 km and 4.26 km respectively) south of the Gifford-Pinchot National Forest (T06N R10E Sec. 16) (Fig. 11). More specifically, the snake was dead on the road near a southwest entrance to the Trout Lake Natural Area Preserve ("Barn entrance"). The head and chunks of the body had been removed by yellow-jackets (wasps) but otherwise the specimen was fresh. It was collected by the author as a site voucher. The habitat next to the road was mature mixed deciduous and conifers trees. Based on aerial photography, there are no oaks or rock features in the immediate vicinity. A cool weather front moved in the previous night resulting in lowered temperatures, cloud cover and light sprinkles. At the time the snake was found, temperatures were in the mid 50°F (13-14°C) and the road was dry. This location is about a mile from the other documented sites at the north edge of Trout Lake Natural Area Preserve and a site south of the town Trout Lake. The Sharp-tailed Snake is a US Forest Service sensitive species.

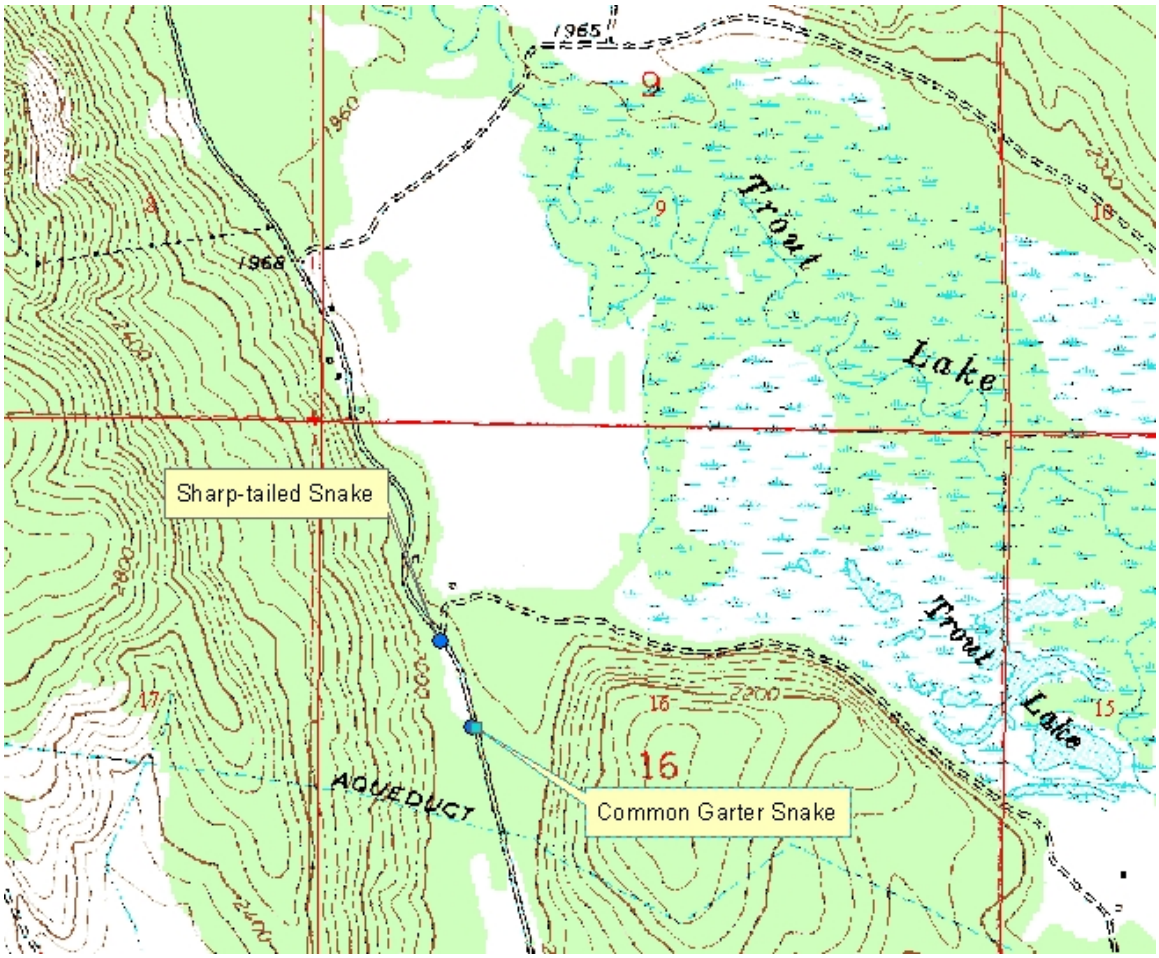

Figure 11. Location of Sharp-tailed Snake (*Contia tenuis*) and Common Garter Snake found dead on Trout Lake Creek road near Trout Lake Natural Area Preserve on August 6. ***Base layer from the Trout Lake Quadrangle, Washington – Skamania Co., 7.5 minute series topographic map, 1970.***

August 7

Pacific Treefrog (*Pseudacris regilla*) - An adult was found dead on FS Road 88 at T07N R09E Sec. 27, NE quarter.

Cascades Frog (*Rana cascadae*) **& Western Toad** (*Bufo boreas*) - The remains of an adult Western Toad and a juvenile Cascades Frog were found on FS Road 8851 at Big Mosquito Lake (Fig. 12). The Western Toad was at the entrance to the boat launch. The condition of the Western Toad specimen was fresh but flattened and pieces were scattered. The remaining skin and limbs, however, were distinctive and there is no doubt about the identity. The Cascades Frog was found about a 1/10 mile south of the boat launch and the condition of the specimen allowed identification to species.

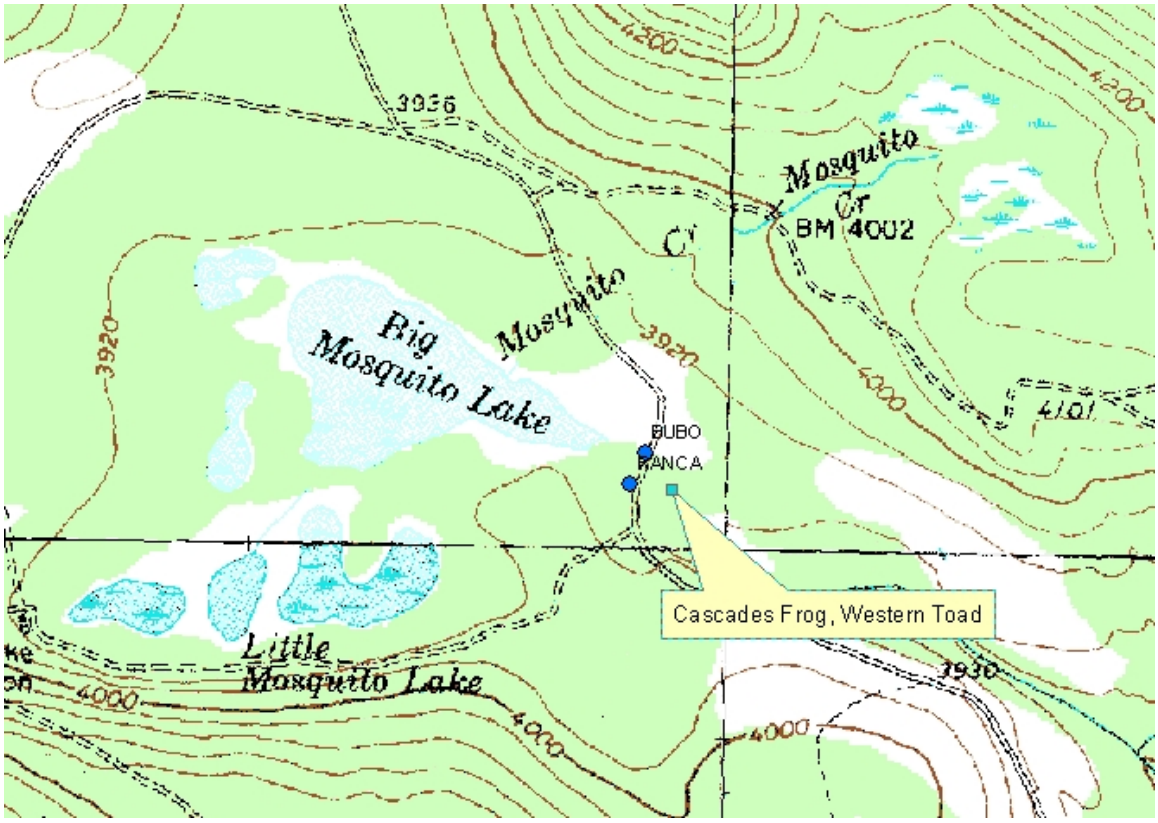

Figure 12. Locations of a Western Toad and Cascades Frog found dead on the road at Big Mosquito Lake.

Ranid frog (*Rana* sp.) - A ranid frog was found dead on FS Road 88 at T07N R09E Sec. 35 (Fig. 10).Yellow jackets (wasps) had removed most of the frog's tissues preventing identification to species. A creek runs next to the road at that location and flows into Trout Lake Creek. Finding either Cascades Frog or Oregon Spotted Frog at this location is interesting because of its proximity to the lower reaches of Trout Lake Creek (Fig. 10).

Northwestern Garter Snake (*Thamnophis ordinoides*) -A gravid female was found dead in the town of Trout Lake on FS Road 23 just past the junction with Highway 141. The road is next to the gas station on one side and Trout Lake Creek on the other. At least 8 embryos were visible next to and within the female. All appeared fully formed and near full term.

Discussion

Oregon Spotted Frogs were found only at the USFS beaver pond where they were already known to occur. The observation, however, is significant because US Forest Service and Washington Department of Fish and Wildlife biologists reported that they did not find any Oregon Spotted Frog egg masses at the site for the last two years. Flooding had breached the beaver dam sometime in 2007 or early in 2008 altering the oviposition site. The two Oregon Spotted Frogs found at the USFS beaver pond were both in the process of metamorphosis and still had remnants of the tail. Therefore, there is no question about

their site of origin. It is possible that the number of adult Oregon Spotted Frogs at the site is now small and/or that the frogs are using a new or unusual oviposition site(s).

Cascades Frogs were observed at almost every water body surveyed in the upper reaches of the Trout Lake Creek watershed. Detection was easy and fast, usually within five minutes of arriving at water. Cascades Frogs were in water or within a meter or two of water. The only exceptions were those found dead on roads. These surveys were timed to maximize detection by surveying when newly metamorphosed frogs were present. The most commonly observed Cascades Frogs during these surveys were in the 20-32 mm SVL size range. At the time of the surveys, I assumed that all these frogs were this years' newly metamorphosed frogs. The 27 to about 35 mm SVL, however, may be juveniles from the previous year (Nussbaum et al. 1983). Phenology would need to be tracked more closely at these sites to know for sure.

The Oregon Spotted Frog metamorphs were found within about fifteen minutes of the survey start time. Both were captured in the water with a dipnet. No adult Oregon Spotted Frogs were observed basking at the surface. Surveying the pond was not actually the goal of this part of the survey so only about 30 minutes total was spent at the site before moving on to do the survey of the pond outlet stream.

The Washington Department of Fish and Wildlife WSDM database has a record of Red-legged Frog (*Rana aurora*) at North Fork of Trout Lake Creek (T08N R09E Sec. 33, elev. 3360 ft. [1024 m]) in September 1996 reported by F. Currim of the US Forest Service. This is an unusual location for Red-legged Frog and no other observations of Red-legged Frogs in the Trout Lake Creek watershed have been made to date. We surveyed two areas of the North Fork of Trout Lake Creek on August 6, 2009. Cascades Frogs were common in both areas surveyed. No other ranids were observed. The Red-legged Frog and Oregon Spotted Frog have similar coloration and it was hoped that perhaps Oregon Spotted Frogs might actually be at this site. The area east of FS Road 88 does have open permanent water with beaver activity. No frogs or tadpoles were observed or captured in that habitat but the surveys were limited by lack of accessibility due to deeper water and unconsolidated soils. Aquatic funnel traps might provide better information but finding either Red-legged Frog or Oregon Spotted Frog at this elevation would be unusual.

Oregon Spotted Frogs are typically found at lower elevation in Washington and the higher elevations of the sites surveyed for this inventory may be outside the range at which the species can persist. Populations in Oregon are known from higher elevations but this may be possible due to the occurrences being at lower latitudes.

Interestingly, an adult male Cascades Frog was photographed by D. Anderson at the SDS site (T06N R10E Sec. 6, elev. 2060 ft. [628 m]) in 2007. This species rarely occurs at elevations below 2000 ft (610 m) (Leonard et al. 1993). This is the first documented occurrence of overlap between the Trout Lake Creek Oregon Spotted Frogs and Cascades Frogs. Whether or not this was just a single male Cascades Frog dispersing to a new area or indicative of a larger, undocumented population is unknown. Eggs collected at SDS

ponds and raised by the author this year were confirmed to be Oregon Spotted Frogs. Whether or not Oregon Spotted Frogs, a much more aquatic species, can or will make similar movements up the watershed is unknown. This ability to move up and down the watershed may become more significant as the effects of climate change start to alter weather and temperature patterns.

Most of the sites surveyed were wet meadows (fens) or creeks. At the time of these surveys, the meadows had saturated soils but areas of standing water were limited to small pools or rivulets. Based on our current understanding of Oregon Spotted Frog habitat, these sites probably do not provide suitable habitat for the highly aquatic Oregon Spotted Frog. The Cascades Frog is much more terrestrial and can move to creeks and other habitats as needed during the drier periods.

The North Fork of Trout Lake Creek (T08N R09E Sec. 33, elev. 3360 ft. [1024 m]) and the survey site on Grand Meadows Creek (T08N R09E Sec. 27, elev. 4040 ft. [1231 m]) had more permanent deeper water. Both sites had recent beaver activity including a dam at the Grand Meadows Creek site. Cascades Frogs were common along the North Fork of Trout Lake Creek and within the swampy habitats but none were seen in the more open, deeper water area. This area was difficult to access and the surveys were incomplete. Cascades Frogs were not detected at the Grand Meadows Creek site, only Northwestern Salamanders were captured in the dip nets. Aquatic funnel trapping might provide more information on the frogs that occupy these areas.

Recommendations

This was a rapid assessment. This type of inventory can provide general information about where the species occur but does not provide information on overall abundance or significant habitat features. For instance, some frogs such as Oregon Spotted Frog and Western Toad, return to the same oviposition sites every year. Identifying these significant locations is important for conservation and protection of each population.

Monitoring northwestern ranid populations, including Oregon Spotted Frogs and Cascades Frog, is recommended because of on-going declines. Typically this is done by monitoring the number of egg masses laid each spring. Each female is assumed to lay only one egg mass and most masses for these species are laid within about two to three weeks of each other. A total count of the egg masses at the site can be used to estimate the number of females breeding that year. Both species lay communally, placing egg masses into clusters laid by different females. There is no easy way to distinguish the egg masses of the two species. At this time, egg masses in lower reaches of the Trout Lake Creek watershed (less elevation 2160 ft. [660m]) are assumed to be Oregon Spotted Frog and those in the upper portions of the watershed (above 2160 ft.[660m]) are assumed to be Cascades Frog. Ideally, surveys would take place when the males are still present near the egg masses in order to verify species.

Accessibility to breeding sites during the period when eggs are laid may be problematic due to snow covered roads blocking access to sites. In these cases, surveys for tadpoles would be an option. The tadpoles of the two species are similar, especially small

tadpoles. For that reason, it is recommended that trapping be conducted later in the season when the tadpoles are large. The on-line Washington Herp Atlas (http://www1.dnr.wa.gov/nhp/refdesk/herp/) provides information on traits used to differentiate the tadpoles, as well as providing information on field guides available for our area.

Lastly, the Oregon Spotted Frog, Cascades Frog and Red-legged Frog are all similar in general appearance. Photographs must include multiple traits to be successfully used for identification or as a photo voucher. The photographs need to include 1) a dorsal view looking down on the frog, 2) a ventral view highlighting the coloration on the undersurfaces of the body and 3) a lateral view that clearly shows the junction of the leg and side of the body (groin). Other helpful traits for identification include a photograph looking directly at the face of the frog to capture the orientation of the eyes and a photograph of the foot with the toes extended to show the extent of toe webbing. Examples are available at the on-line Washington Herp Atlas (http://www1.dnr.wa.gov/nhp/refdesk/herp/). It is highly recommended that observation submitted to databases should include photographic vouchers, especially if the observation is from a new or unusual location.

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