

SNOQUALMIE PASS AMPHIBIAN SURVEYS FINAL REPORT – October, 1999

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INTRODUCTION

During the spring and fall of 1999, we conducted surveys for Van Dyke's salamander (*Plethodon vandykei*, PLVA) and other amphibians along the fiber optics line paralleling the Tinkham and Denny Creek Roads on the west side of Snoqualmie Pass, in King County, Washington. Surveys followed the U. S. Forest Service (FS) "Survey and Manage Species" Protocol for PLVA.

The area surveyed is adjacent to the South Fork of the Snoqualmie River. The lower section (Tinkham Road, including the highway crossing and east to the Denny Creek Road intersection) is mostly second-growth forest dominated by western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*), with a smaller component of Douglas fir (*Pseudotsuga menziesii*). The elevation ranges between 1480 and 1920 feet. The lower part of the Denny Creek Road section has some old-growth Douglas fir, hemlock, and cedar, while the upper part is mostly mature hemlock, silver fir (*Abies amabilis*), and Engelmann spruce (*Picea engelmannii*). This section is between 1920 and 2880 feet in elevation.

The first two surveys were conducted between June 14 and June 27. Due to lingering snow and down logs across the road at the upper end of the survey area, and to the greater number of culverts than anticipated, these two surveys were split between three visits. Drying habitat conditions and other field work commitments necessitated waiting until after the first heavy fall rains to complete this project. The third survey was conducted on October 19 and 20.

METHODS

Before traveling to the site for each survey, we checked weather forecasts to ensure that environmental conditions would be within the Protocol requirements. Soil temperatures had to be between 4 and 15°C, with air temperatures remaining above freezing the night before surveys, and surface cover objects had to be moist to wet underneath. Before the fall survey, we talked with local FS personnel to ascertain that sufficient rain had fallen for salamanders to be active at the surface. Air and soil temperatures were taken at the beginning of each day's surveyed section, and generally again during the warmest time in mid-afternoon.

For the spring surveys, culverts were located by scanning the roadside ditch while walking or driving, and by noting the sound of flowing water. For the fall survey, all existing culverts had been marked with paint or flagging. Decisions as to which culverts would be replaced had not been made by the time of the surveys. Therefore, all culvert areas that had creeks, seeps, pools, wet gravel, or down logs were surveyed for at least 50 feet above and below the road, and up to 150 feet in what was deemed the most appropriate habitat.

At each culvert examined, pieces of cobble and small down wood were lifted or tipped up and gravel was gently raked. Accessible sections of larger down logs were opened; bark and blocks of wood were lifted or tipped up. We looked for salamanders underneath all of these potential cover objects, and then replaced them in approximately their original positions, roughly

rebuilding sections of logs that were examined. Ponded water adjacent to culverts was visually searched, but dipnets were not used to find larval stages of pond-breeding species. Cobble and gravel at the edges of streams were searched as described, but dipnets were not used to find larval stages of stream-breeding amphibians.

The numbers and species of all amphibians detected were recorded, and the snout-to-vent length was measured on a sample of individuals. Approximate locations of all amphibians was recorded in field notes and/or on maps of the survey area.

RESULTS

For the first survey, the weather was partly cloudy and soil temperatures were 10-14°C. For the second survey (including the first and second surveys of the uppermost section), the weather was light to moderate rain and soil temperatures were 5-11°C. For the third survey, the weather was mostly sunny and soil temperatures were 5-8°C. Surface cover objects were moist on the first and third visits and wet on the second visit.

During each of the three surveys, about 67 of the approximately 94 culvert crossings were examined. One area was found that had water seeping through a fractured rock outcrop. Most exposed rock was a soft conglomerate, with a few areas of rock outcrop and granite-type boulders near the upper end of the survey area. Cobble and gravel at the surface, and in and along streams, were of granite-type rock throughout the surveyed area. The majority of down logs found and examined were cedar, with a few Douglas fir and one noble fir (*Abies procera*). Much of the survey route, especially along the Tinkham Road, traversed sloping wetland habitat, where the initial road building had intersected the water flow, creating pools in the roadside ditches.

No PLVA were found during any of the three surveys. The only terrestrial salamander of any species found was a single ensatina (*Ensatina eschscholtzii*) on the fall survey. Although we did not specifically search for stream species, several Pacific giant salamanders (*Dicamptodon tenebrosus*) and tailed frogs (*Ascaphus truei*) were found in the edges of small streams. Pond breeding amphibian species were more commonly encountered, particularly in the roadside ditches and adjacent pools. We found egg masses of Northwestern salamander (*Ambystoma gracile*) and Pacific treefrog (*Hyla regilla*) during the spring surveys. Several red-legged frogs (*Rana aurora*) and Cascades frogs (*Rana cascadae*) were also found on each visit, as well as tadpoles of the latter species in one pool. A few tadpoles of both treefrog and Cascades frog still had not completed metamorphosis by the time of the third survey. One common garter snake (*Thamnophis sirtalis*) was also observed during the first survey. Table 1 summarizes the seven amphibian species and one reptile detected. Figures 1 and 2 show the approximate locations of these sightings.

DISCUSSION

Van Dyke's salamander occurs in three disjunct populations: the west slope of the Cascade Range in the southern half of Washington, the Olympic Peninsula, and the Willapa Hills in

TABLE 1. Amphibians and reptiles found during three surveys in 1999 along Tinkham and Denny Creek Roads on the west side of Snoqualmie Pass. AMGR = northwestern salamander, DITE = Pacific giant salamander, ENES = ensatina, ASTR = tailed frog, HYRE = Pacific treefrog, RAAU = red-legged frog, RACA = Cascades frog, THSI = common garter snake. E = egg masses, L = larvae (including tadpoles), J = juveniles, A =adults.

| | AMGR | DITE | ENES | ASTR | HYRE | RAAU | RACA | THSI |
|------------------------------|------|------|------|------|------|------|-------------------|------|
| 1st SURVEY | | | | | | | | |
| Tinkham Rd. | 19E | 1L | | | 20E | 2A | 2,000L, 2J, 6A | 1A |
| Denny Cr. Rd. | | | | 1L | | | | |
| 2nd SURVEY | | | | | | | | |
| Tinkham Rd. | 19E | | | | 20E | 1A | 2,000L, 2A | |
| Denny Cr. Rd. | | 2L | | | | | | |
| 3rd SURVEY | | | | | | | | |
| Tinkham Rd. | | 4L | 1A | 1A? | 2L | 2A | 7L, 1A | |
| Denny Cr. Rd. | | 1L | | 3L | | | | |

southwestern Washington. There are no records in the Washington Department of Wildlife (WDW) database for PLVA in the Snoqualmie drainage or elsewhere in King County (Lori Salzer, WDW, pers. comm., October 27, 1999). No other surveys for PLVA are known to have been conducted in the Snoqualmie drainage (Kelly McAllister, WDW, pers. comm., October 28, 1999). The nearest sites known to be occupied by PLVA are just north of Mt. Rainier in Pierce County, roughly 30 miles to the southwest.

Van Dyke's salamander has generally been found in or adjacent to seeps in fractured rock outcrops; in moist, mossy talus on north-facing slopes; or at the wet edges of small, rocky streams. The exception is on the Olympic Peninsula where it has also been found away from rock features in large down logs associated with small streams (Corkran and Thoms, 1996; Leonard et al., 1993; Wilson et al., 1995). Habitat surveyed in the project area appeared to be marginal for PLVA, with only one seepy rock outcrop and no talus. Most logs were cedar, rather than the Douglas fir that appears to be associated with most terrestrial salamander species. Logs either were too hard to pry open and probably were inaccessible to salamanders, or were rotting into dry powder and appeared to be unsuitable habitat for salamanders. Several streams appeared to have washed out recently, providing limited habitat for stream amphibians and marginal habitat for PLVA.

By the criteria developed and mapped in Wilson et al. 1995, There seems to be no environmental factor to prevent PLVA being present in the drainage, if indeed their range extends this far north in the Cascade Range. There appeared to be some potentially more suitable habitat nearby along the interstate highway and elsewhere in the South Fork Snoqualmie River drainage. We did not have time to investigate these other sites.

Replacement of some culverts, while apparently not affecting PLVA, may affect several other amphibian species. The work may drain some of the small ponds that have developed as a result of the original road building. These ponds are now being used by northwestern salamander and Pacific treefrog as breeding sites. Both red-legged frog (FS Sensitive species) and Cascades frog (WDW Monitor species) are also using these ponds and associated wetlands at least for foraging. There appeared to be breeding habitat for red-legged frog (as well as northwestern salamander and Pacific treefrog) in several larger wetlands near the Tinkham Road, although evidence of breeding was not observed. The fact that Cascades frogs were breeding, apparently successfully, in a ditch beneath a highway overpass may be indicative of their hardiness and mobility. Presumably these individuals were from a source population in the nearby Alpine Lakes Wilderness Area, and breeding in the ditch may have been an opportunistic response to the unusually late thawing of the lakes. Culvert replacement along the Tinkham and Denny Creek Roads does not appear to present a significant threat to any amphibian species.

LITERATURE CITED

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