OREGON SLENDER SALAMANDER AND CLOUDED SALAMANDER STUDY
1999 FIELD WORK SUMMARY

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[This study was funded by Oregon Department of Fish and Wildlife. NERI surveyors were contracted to carry out field work in cooperation with principal investigator, David Vesely, Pacific Wildlife Research, who designed the study and analyzed/reported the results. These 3 reports summarize our data from the 3 years of field work.]

STUDY AREAS

In order to extend the geographic scope of the study of Oregon slender salamander (*Batrachoseps wrighti*), the 1999 field work was conducted in Douglas fir stands located within 3 regions. To obtain data at lower elevations and near the western edge of the species' range, surveys were carried out at sites within Silver Falls State Park (SP), and adjacent lands on the Salem District of the Bureau of Land Management (BLM). At the southern end of the species' range, sites were located on the Blue River Ranger District (RD) and the Middle Fork Willamette RD of the Willamette National Forest (NF). All of these regions were also within the known range of the clouded salamander (*Aneides ferreus*).

METHODS

Within each of the 3 regions, a list of potential sites was developed in each of 3 categories or strata:

- naturally regenerated, old growth stands (OG)
- second growth stands that had been clearcut logged in the 1950s and 1960s, planted after prescribed burning, and that had developed to stem exclusion (SG)
- plantations established after clearcut logging and prescribed burning in the early 1990s (CC)

For Silver Falls SP (see separate NERI report), stands in each stratum were identified from vegetation/ cover type/ condition map overlays on aerial photographs (State Service Center for Geographic Information Systems), provided by Jay Schleier (SP biologist), which were based on Maurita Smyth, 1996, *Final plant community inventory report, Silver Falls State Park Master Plan Update Project.* We also identified stands during discussions with Maurita Smyth (environmental consultant) and with Al Tocchini (SP forester). OG stands were classified as "Forest: Coniferous Upland – Mature, Suitability Class 1." SG stands were classified as "Forest: Coniferous Upland – Moderate, Suitability Class 2." CC stands for this region appeared on the 1996 and 1997 aerial photographs as fresh clearcuts, but were on BLM land and not classified on SP maps. For the Blue River RD and Middle Fork Willamette RD, stands in each stratum were identified from district map overlays of northern spotted owl habitat, stand structure, and stand year-of-harvest. OG stands were those classified as spotted owl nesting habitat or activity centers. SG stands were those that had been harvested between 1950 and 1969, and that were identified as overstocked young stands planned for thinning. CC stands were those that had been harvested between 1990 and 1996. Neither stand size nor aspect was standardized, but all stands were below 3800 feet elevation.

From the list of potential sites in each stratum in each region, sites to be surveyed were randomly selected. At the time of the field survey, if a selected stand did not meet the established criteria

(e.g., not predominantly Douglas fir, SG stand that was poorly developed and had not reached stem exclusion), it was dropped from the list and another site was randomly selected.

Each of the selected study sites was surveyed once between 3 May and 4 June, 1999, using a time constrained survey. With 2 to 5 surveyors, a total of 5 person-hours was spent searching for Oregon slender salamanders (BAWR), clouded salamanders (ANFE), and any other terrestrial amphibians in each study site. Surveyors worked in roughly parallel transects across each site to prevent searching the same object twice. Debris mounds, bark slabs, wood chunks, branches, rocks, some duff and fine litter or moss, and any other potential cover objects were searched, and sections of logs were torn apart. Surface objects were returned to approximately their original positions, and disturbed sections of logs were roughly reassembled. Each BAWR or ANFE caught was measured (SVL), and the cover, substrate, and soil temperature recorded (see Appendix 1 for categories). All other amphibians and reptiles caught were measured or categorized as juvenile or adult. All captured amphibians and reptiles were immediately released at the capture sites.

At the end of the survey (or with the stopwatch stopped during the survey), a 5-meter square habitat plot was laid out, centered on each BAWR or ANFE detection point. If 2 or more individuals were found within 10 meters, a single plot was used. For each detection plot, a second plot was randomly located within the stand. In each detection or random plot, several habitat characteristics were measured: aspect, slope, % canopy closure, topographic position, and % bark on the ground. The cumulative total length of all log segments within the plot was recorded in 5 diameter and 5 decay class categories. The number of snags within each plot was recorded in 5 diameter and 3 decay class categories. GPS position and elevation (from topographic maps) were recorded once per site.

RESULTS

For the 1999 field work, 43 stands were surveyed, of which 18 were in Silver Falls SP and adjacent BLM land, 12 on the Blue River RD, and 13 on the Middle Fork Willamette RD. Fifteen sites were old growth stands, 14 were 2nd growth, and 14 were clearcuts. In addition, 8 other sites in Silver Falls SP were surveyed for the Oregon Parks and Recreation Department, but were not included in this study.

On the 43 study sites surveyed, a total of 152 BAWR and 53 ANFE were found. BAWR were found more frequently in OG sites (94) than in SG (40) or CC (18) sites. This species was found more frequently at Silver Falls (129) than on the Blue River (17) or Middle Fork Willamette (6) RDs. ANFE were found more frequently in OG (25) and CC (24) sites than in SG stands (4). This species was more frequently found on the Blue River (30) and Middle Fork Willamette (21) RDs than at Silver Falls SP (2).

Many individuals of 5 other species of amphibians were found on the study sites. Most were ensatinas, including a female with 12 eggs. Dunn's and northwestern salamanders, roughskin newts, and Pacific treefrogs were also found. Four species of reptiles were also found in small numbers on the study sites: northern alligator lizard, western fence lizard, western skink, and northwestern garter snake.

Table 1 summarizes the total number for all study sites, and the average per site, for BAWR, ANFE, and the 4 other most commonly found species, for each stratum and each region. Table 2 is the number of each amphibian and reptile species found on each site (including the extra sites at Silver Falls SP) and for each region. Table 3 provides the legal description and UTM coordinates for each of the surveyed sites. Table 4 is the data print-out of all amphibians and reptiles found on all sites.

DISCUSSION

The amphibian surveys and habitat measurements were done by Alan Swanson, Charlotte Corkran, Hal Hushbeck, Karl Hartzell, Doug Gomez, and David Harrington ("The Truffle Pigs"). Analysis of the amphibian and habitat data from the study site surveys will be done by David Vesely, Pacific Wildlife Research.

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Appendix 1. LOG DECAY CLASS DESCRIPTIONS

LOG FROM LIVE TREE OR CLASS 1 SNAG

	1	2	3	4	5
BARK	tight	partly loose	loose	soft or none	soft or none
TWIGS	present	none	none	none	none
TEXTURE	solid	mostly solid	fairly hard chunks	soft blocks & layers	soft powder
COLOR	original	original	faded	red, brown	red, brown
SUPPORT/ SAG	up on stobs	up on stobs, but sagging	sagging, or on ground	all on ground	partly in ground
INVADING ROOTS	none	none	in outer sapwood	into heartwood	into heartwood
SHAPE	round	round	round	roundish	oval

LOG FROM SNAG WITH NO BARK, HARDENED OUTER WOOD

	(1)	2	3	4	5
TEXTURE	--	mostly solid	hard outer, softer chunks	soft outer & blocks	soft powder
COLOR	--	original	gray, tan	gray, tan	gray, tan
SUPPORT/ SAG	--	up on stobs, but sagging	sagging, or on ground	all on ground	partly in ground
SHAPE	--	round	round	roundish	oval

Adapted from Maser et al. (1979 and 1988).

AMPHIBIAN DATA SHEET DEFINITIONS

Header Information

1) REGION: Silver Falls St. Park (SF); Willamette Nat. Forest (WF); other.
2) STRATUM: Nat. regen. (late –successional), Old har., New har. (< 5 years prior to study)
3) STAND: Unique letter and/or number combination to identify stand from others in stratum
4) STIME: Start time of search or time of last capture on previous sheet
5) ETIME: End time of search or time of last capture recorded on this sheet
6) ATEMP: Air temperature (C) recorded at start of this sheet
7) STEMP : Soil temperature (C), approx. 10-cm below the surface recorded at start of this sheet.
8) SKY: 1=clear, 2=overcast, 3=pt cloudy, 4=rain. Record when completing sheet

Capture Data

1) SPP: Four letter acronym for species observed.
2) ID#: Detection number unique to this site: B1, B2…. B(N) for BAWR. A for ANFE.
3) SUBST: Substrate the amphibian was resting upon when first observed.
    1 = conifer log, decay 1
    2 = conifer log or chunk decay 2
    3 = conifer log or chunk decay 3

4 = conifer log or chunk decay 4
5 = conifer log or chunk decay 5
6 = bark
7 = litter, branches, fine woody debris, duff
8 = rock, mineral soil
9 = other (e.g. hardwood)

4) COVER: Cover lying immediately above amphibian when first observed. Use same code as for SUBST. Also 10 = exposed / not using cover.
5) LENGTH: Snout-vent length (mm).