

# TERRESTRIAL SALAMANDER SURVEYS IN SILVER FALLS STATE PARK May, 1999

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## OBJECTIVES

During May of 1999, terrestrial amphibian surveys were conducted at Silver Falls State Park. The project was two-pronged. Most surveys were part of a study of the Oregon slender salamander (*Batrachoseps wrighti*) and clouded salamander (*Aneides ferreus*) that was initiated in 1997. Surveys were also conducted to provide information to the Oregon State Parks and Recreation Department on distribution and general abundance of terrestrial amphibians. The objectives of the project were:

- To survey forest stands at low elevations and near the western edge of the range of the Oregon slender salamander.
- To continue development of an interactive habitat analysis application to estimate suitability for Oregon slender salamanders in forest stands of different structure.
- To examine microhabitat selection by clouded salamanders.
- To assist the Oregon State Parks and Recreation Department by conducting surveys for terrestrial amphibians in Silver Falls State Park, including sites where stand thinning and park improvements are planned.

## SURVEY AREAS

The forest stands surveyed were in Silver Falls State Park (Park) and adjacent Bureau of Land Management (BLM) lands, in Marion County in northwestern Oregon. Stands were predominantly Douglas fir (*Pseudotsuga menziesii*), and were in several categories. Stands selected for the study were in one of 3 stand conditions: naturally regenerated old growth stands, second growth stands established after clearcut harvest approximately 30 to 50 years ago, and new plantations established after clearcut harvest within the last 5 years on BLM lands. Other sites selected for survey were stands around existing Park developments where improvements are planned, and stands of several ages or conditions but particularly those currently being considered for thinning.

## METHODS

Sites selected for the study included 6 old growth stands, 7 second growth stands, and 5 clearcuts. Other stands in the Park included one young stand, 5 stands with at least some old growth trees, and 2 wetland areas. A total of 32 person-days was spent on the surveys.

In stands selected for the study, a 5-hour time constrained survey was conducted. Two to 5 surveyors spent a total of 5 person-hours actually searching for salamanders. Surveyors walked roughly parallel courses through the stand, picking up a sample of all types of potential hiding cover, including bark slabs, wood chunks, branches, rocks, and moss. Sections of logs and stumps encountered were searched by lifting up bark and tearing open some of the wood. All objects moved were replaced in approximately their original positions, and disturbed sections of logs and stumps were roughly reassembled (or pieces were piled to provide appropriate salamander habitat). All Oregon slender salamanders

(BAWR) and clouded salamanders (ANFE) found were measured (snout-to-vent length) and the cover and substrate they were using were recorded. All other amphibians and reptiles found were counted and recorded as adults or juveniles. After the end of the survey, or while the stopwatch was stopped during the survey, a 5-square-meter habitat plot was laid out at each site where a BAWR or ANFE was found. In each plot, surveyors recorded the slope, aspect, topographic position, canopy density, % of ground covered by loose bark, numbers of snags and stumps grouped by diameter and decay class, and cumulative length of log sections within the plot grouped by diameter and decay class. For each habitat plot at a salamander detection point, a second habitat plot was randomly located and similar data recorded. These data will be analyzed as part of the study, and are not included in this report.

In other stands selected within the Park, a less formal survey was conducted. One to 4 surveyors spent a total of 1½ to 5 person-hours searching potential hiding cover as described above. All amphibians and reptiles found were counted and recorded as adults or juveniles. No habitat data were recorded.

During and between surveys for terrestrial amphibians, and at all other times surveyors were in the Park, other vertebrate wildlife species identified by sight, sound, or sign were recorded on a checklist.

## RESULTS

At least one species of amphibian was found at every site surveyed, and usually 2 or 3 species were noted. The most commonly encountered species was BAWR, which accounted for 145 (56%) of the 261 amphibians recorded. *Ensatina (Ensatina eschscholtzii)* were also commonly found. Six other amphibian species and one snake were found in the Park, but ANFE and a lizard were only found in the BLM clearcuts. [Note: Amphibian data are part of the data files for the BAWR 1999 study report.]

BAWR were more abundant in the old growth stands than in the younger stand conditions, averaging 13 per survey (5 person-hours) in old growth, 5 per survey in second growth, and 3 per survey in recent clearcuts. *Ensatina* showed similar but less pronounced differences in abundance, averaging 7 per survey in old growth, 5 in second growth, and 3 in clearcuts.

Only one amphibian was found while searching in and around the small wetlands north of the Ranches, but 2 species were noted while just walking past the beaver pond to the southeast. Only a short time was spent looking in stream habitat, and one species was recorded. A second species, Cascade torrent salamander (*Rhyacotriton cascadae*), was reported by a volunteer who had hiked to below South Falls before joining our project.

A total of 50 bird species was found in the Park and adjacent BLM lands, and 10 mammal species were detected. On one occasion, screams and other noises were heard from high up in a tree in a dense forest stand. These sounds were tentatively identified as having been made by one or more American marten (*Martes americana*). See Table 1.

## DISCUSSION

Cold and unsettled weather probably contributed to the rather small number of birds found, and cold soil temperatures may have been a factor in detection of ANFE in some stands during the first week of surveys.

At least one BAWR was found in every forested site surveyed except for one. Silver Falls State Park yielded the highest relative abundance of BAWR and of total amphibians of any area surveyed in the 3 years of the study. BAWR were even found in all 5 recent clearcuts that were surveyed on BLM lands outside of the Park, whereas none was found on any of 10 recent clearcuts surveyed in 1998. On the other hand, few ANFE were found, and none within the Park. This may have been due to the cold weather, or to this species' apparent preference for open canopy conditions with large logs and snags – conditions found in the clearcuts but not in the forested stands surveyed within the Park.

The old growth stands surveyed had abundant quantities of large diameter snags and logs, and salamanders were most commonly found under or between slabs of bark from large Douglas fir snags, in large diameter Douglas fir logs of decay class 4 (blocks and layers of red wood), and in debris piles containing these habitat elements. Many of the second growth stands surveyed had numerous logs, as well as tall cut stumps of Douglas fir, which provided habitat rather similar to that of naturally occurring snags. The BLM clearcuts had abundant quantities of very large diameter snags and logs, which had not been consumed by slash burning. All of the terrestrial amphibians found were exclusively or predominantly in Douglas fir wood. Some individuals were found in western red cedar (*Thuja plicata*) or other conifer wood, but none was in deciduous wood.

Where recently undisturbed conifer forest surrounded a developed site, BAWR and other terrestrial amphibians were found, and appeared to be as abundant as in similar stands elsewhere in the Park. In mixed conifer/deciduous forest, terrestrial amphibians were only found in conifer logs (predominantly Douglas fir), and none was found in wood from deciduous tree species. BAWR and ensatina were most common in large Douglas fir wood in closed canopy forests, ANFE was only found in large Douglas fir and other conifer wood in open canopy areas, and Dunn's salamander (*Plethodon dunni*) was only found in large conifer wood adjacent to streams in closed canopy forests. Terrestrial adults of pond breeding amphibians were also occasionally found in large conifer wood in closed canopy forests.

It was apparent during the surveys that BAWR, ANFE, and other terrestrial amphibians were most abundant where the greatest quantities of large diameter logs and snags remain. Conversely, where potential hiding cover was sparse, terrestrial amphibians were scarce. Park development and forest management that remove large woody debris will probably reduce local numbers of these species. On the other hand, careful thinning of suppressed stems to release the dominant trees in overly dense stands may hasten the development of large diameter trees which will eventually provide the habitat elements apparently preferred by BAWR, ANFE, and the other terrestrial amphibian species.