

**RESPONSES OF FISH AND SALAMANDER COMMUNITIES TO THE
FLOOD OF '96**

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On February 6-8, 1996, a major flood dramatically altered stream ecosystems and adjacent riparian areas in river basins throughout the Pacific Northwest. High streamflows, landslides, and debris flows moved boulders, deposited sediment, and shifted some channels; but at the same time other streams within the same basins exhibited little change. In the H.J. Andrews Experimental Forest LTER, winter flows in Lookout Creek commonly range from 100-200 cfs, and the peak discharge measured on February 7th was 9,800 cfs, exceeding the flood of record for the 50-yr monitoring period (see <http://www.fsl.orst.edu/lter/flood.htm> for photographs and detailed ecological information). Results of summer research on fish and salamanders in long-term study reaches and stream restoration projects in the Cascades and Coast Range will be presented. The relationships between survival and rates of recovery for these vertebrate species will be related to the observed responses. In general, we predict that the more mobile salmonids will show greater survival and faster recovery than the more benthic or slowly dispersing species, such as sculpins and salamanders. Preliminary results indicate that salmonid populations are roughly 50% lower than pre-flood populations, but fry are emerging at all study sites. Sculpin populations have been decreased to a greater extent. Surprisingly, Pacific giant salamanders appear to have similar populations as pre-flood periods. Of the five stream reaches in which we have established stream restoration projects, four survived the flood and increased the volumes of large wood. Vertebrate community responses in restored and non-restored reaches will be compared in this presentation, but data are being collected in mid to late summer and results are not yet available.

**AN ASSESSMENT OF LANDSLIDE FREQUENCY & MAGNITUDE IN THE
FISH CREEK AND ROARING RIVER WATERSHEDS (CLACKAMAS
RIVER SUBBASIN): A VALIDATION OF WATERSHED ANALYSIS**

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Aerial photo interpretation provides the foundation for an assessment of landslide frequency and magnitude in the Fish Creek and Roaring River watersheds; two fifth-field watersheds in the Clackamas River Subbasin. Fish Creek, a heavily managed watershed impacted by timber harvesting and road building activities beginning in 1944, is contrasted with the relatively unimpacted Roaring River Watershed. Landslide frequency and magnitude for these two watersheds is compared for two separate 100-year flood events: 1964 and 1996. A post-1964 flood assessment of landslide frequencies in these two watersheds revealed nearly a two-fold rate of incidence in the Fish Creek Watershed compared to Roaring River. A total of 55 landslides were inventoried for the Fish Creek Watershed following the 1964 flood event: 73% associated with roads, 22% associated with timber harvest units, and 5% associated with unmanaged forest stands. Twenty-seven landslides were inventoried for the Roaring River Watershed following the 1964 flood event: 89% associated with unmanaged forest stands and 11% associated with one main road along the upper watershed perimeter. An cursory aerial assessment of the 1996 flood conducted in mid-February indicates a rate of landslide frequency for Fish Creek at 4.5 fold greater than that for Roaring River?this is likely a low estimate. A detailed assessment of the 1996 flood event will be conducted during the summer of 1996 to provide a more thorough analysis of landslide frequency, landslide magnitude, and further investigate relational factors for landslide initiation and incidence. Landform types and geological characterizations identified through watershed analysis will be examined in relation to landslide occurrence, providing a validation for landslide predictability and management recommendations made the 1994 Fish Creek Watershed Analysis.

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