

RESEARCH ABSTRACT

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**Study Title:** Recovery of stream ecosystems following catastrophic disturbances

**Key Words:** aquatic animal stream vertebrate  
invertebrate organic wood ecosystem blowdown zone  
algae fish amphibian sedimentation watershed archives

**Abstract:** This study was conducted in the Clearwater basin of Mount St. Helens. Three projects within the study investigate recovery of trout and sculpin populations, tailed frog populations, and invertebrate populations. Trout were studied in the main channel of Clearwater Creek, and the effects of large woody debris in the stream on fish populations were examined. Trout populations were still low as of 1990, being one-tenth to 20% of that in undisturbed stream systems; this appears largely due to interruption of spawning in years following the blast and to continuing lack of spawning habitat. Trout densities were found to be higher in areas with lots of woody debris. The condition of trout was high throughout the stream in years since 1984 presumably due to rapid recovery of high abundance of invertebrate prey. By 1985 sculpin densities were as high as or higher than in undisturbed streams.

Tailed frogs were studied in the tributaries of Clearwater Creek. Frog population densities in basins that were completely deforested were low or zero apparently due to increase in air and water temperatures above tolerance of frogs. Moderately high densities were recorded in streams in intact forests. In streams for which headwaters are in intact forests but the downstream area was deforested, frog population densities were the

highest recorded. These high densities appear due to a combination of conditions optimum for adults and tadpoles. Heavily shaded headwaters are ideal for adults, whereas open downstream reaches provide abundant algae on which the tadpoles feed.

Recovery of invertebrate populations in tributaries of Clearwater Creek was rapid due to scouring of sediments that revealed pre-eruption stream substrate within the first two years after the 1980 eruption.

Invertebrate populations in these tributaries were similar to undisturbed streams two years after the eruption. However, densities in the main stem of Clearwater Creek are still significantly lower than in undisturbed streams of similar size.

**Type of Measurement(s):** Numbers of individuals; mean size of tadpoles of tailed frogs; size of trout; particle size, discharge, and cover; frequency of pools and riffles, volumes of pools, stream temperatures.

**Frequency of Measurement(s):** Once per year beginning in 1980, ongoing.

**Data Storage:** Field notebooks; digital data on floppy disks in Systat format in personal possession.

**Long-term plans:** Data available for collaborative efforts: Projects are ongoing. Date of completion is indefinite. Several manuscripts are in progress (1991).

Data are available as background information for selective collaborations.