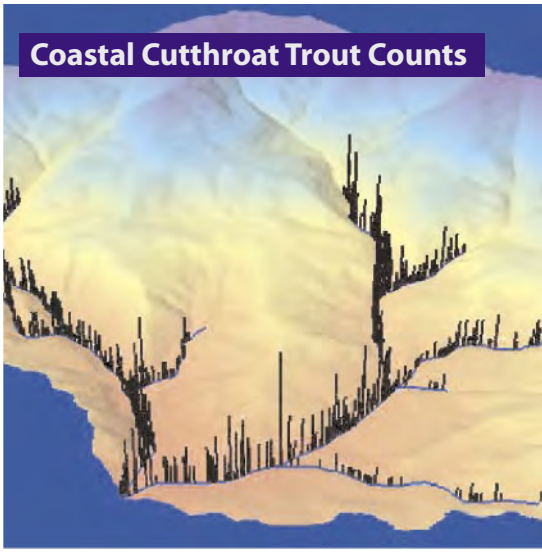
WATERSHEDS RESEARCH COOPERATIVE

HINKLE CREEK PAIRED WATERSHED STUDY


Photo: Michael Feinstein


Photo: David Leer



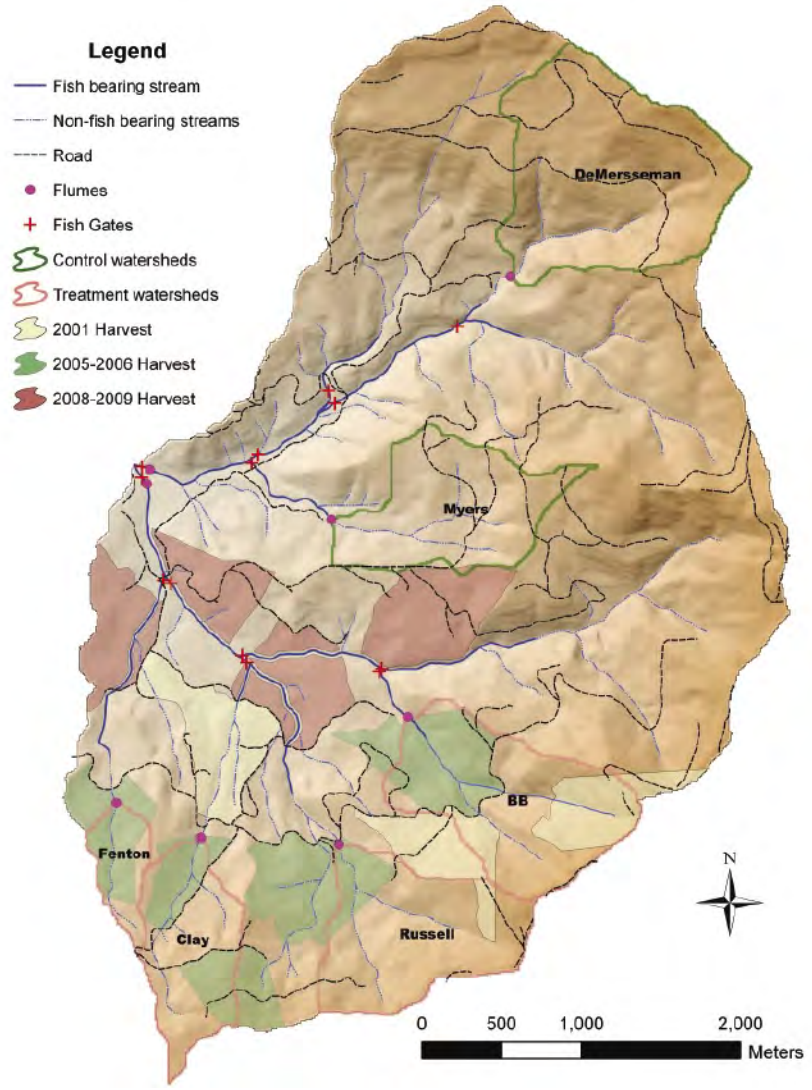
One of three comprehensive, decade-long studies of forest streams and the effects of contemporary forest practices across Western Oregon.

Across a vast landscape of Roseburg Forest Products' 60-year-old Douglas-fir trees, scientists have been installing instruments and tagging cutthroat trout with electronic bar codes. Hinkle Creek is Oregon's first paired watershed study in more than 30 years, and the first located entirely on private forestland. Roseburg Forest Products generously provided 5,000 acres of prime forestland for the study, allowing half to remain untouched for ten years.

Research results will improve our understanding of fisheries, water quality and aquatic habitat, providing policymakers with better information to guide decisions on future forest practices in the Pacific Northwest. Preliminary findings of the study are revealing interesting insights about stream temperature, sedimentation and fish survival.

- The Hinkle Creek Study marked the first significant paired watershed study in Oregon in over 30 years.
- The study will compare one watershed actively managed for wood production to one that remains unharvested.
- Research is examining the effects of timber harvest on fish, aquatic organisms, water quality, quantity, temperature and chemistry.
- Preliminary findings suggest that modern harvest practices in small streams without fish have little effect on stream temperature.

HINKLE CREEK STUDY AREA



THE STUDY

The purpose of the Hinkle Creek paired watershed study is to test the effectiveness of the Oregon Forest Practices Act (OFPA) and modern logging systems in protecting forest streams during harvest operations. The study is tackling important questions about the effects of logging across entire watersheds, at a time and scale never before possible. The Hinkle Creek study focuses on fish, water quality and aquatic organisms. In this study, half of the area is left untouched while the other is logged under provisions of the OFPA.


Photo: Michael Feinstein

NORTH FORK - THE CONTROL AREA

During the study, two control sub-watersheds will be left unharvested to serve as a baseline for comparison with the harvested watershed. Results can then be connected solely to the harvest activity, and not to independent environmental factors.

SOUTH FORK - THE TREATMENT AREA

Four sub-watersheds are being harvested in compliance with the OFPA, using existing roads and high-lift equipment for moving logs. Five harvest units on non-fish-bearing creeks were clearcut in 2005. Harvest operations left all understory vegetation and non-merchantable conifers within ten feet of the stream. The second round of harvest activity began in 2008, with logging adjacent to fish-bearing streams, while retaining a stream buffer as required by current regulations.

RESEARCH TIMELINE

2001-2005
Baseline Data Collection

2005-2006
First Harvest

2006-2007
Post-Treatment Data Collection

2008-2009
Second Harvest

2009-2011
Post-Treatment Data Collection

MAJOR RESEARCH PROJECTS

Water Quality—Temperature, Flow and Sediments

Are current buffer requirements sufficient? Water monitoring stations dot the study area. More than 45 thermistors track stream temperatures. Probes collect water quality data and flumes measure stream flow.

Fish

Are current forest practices around small non-fish-bearing streams effective at protecting fish populations downstream? Approximately 4,400 cutthroat trout were implanted with PITs (Passive Integrated Transponders, electronic bar codes). Thirteen stationary antennae, along with mobile antennae crews, track fish movement over the study area.

Stream Amphibians

Are amphibians affected by timber harvest? Field researchers monitor Pacific giant salamander abundance from baseline data through each round of clearcutting.

Aquatic Invertebrates

Do populations of invertebrates—food for fish—change after logging? Field researchers collect data on a range of aquatic invertebrates, including caddis flies, spiders, mayflies and stoneflies through watershed-wide sampling. Contents of fish stomachs are examined to determine how changes to invertebrate communities are translated to animals further up the food chain.

Stream Chemistry and Soil Resources

Does logging alter the chemistry of streams or the nutrients in soils? Scientists are tracking nutrients in the water and in the soils.

Photo: William Flaxington

Photo: Michael Feinstein

PRELIMINARY FINDINGS

Minimal change to stream temperatures

It has been assumed that logging and lack of shade cause stream temperatures to rise. However, of the four creeks studied, temperatures remained the same in one, decreased in another, and increased slightly in two. Cumulative temperature measurements downstream from multiple harvest units were similar to the control watershed.

Fish size, survival and distribution

At the stream segment and subwatershed scales, dramatic differences before and after harvest have not been detected for the measurements of abundance, growth or distribution for mature coastal cutthroat trout. Data analyses at channel unit and reach scales, where harvest effects may be easier to detect, are ongoing.

Slight sedimentation

Sediments appear to have increased in one stream after harvest, which might have occurred because increased water flow associated with harvest increased sedimentation by scouring the stream channel. No bare ground due to logging activity was observed near the stream.

DEMONSTRATION AREA AND OUTREACH

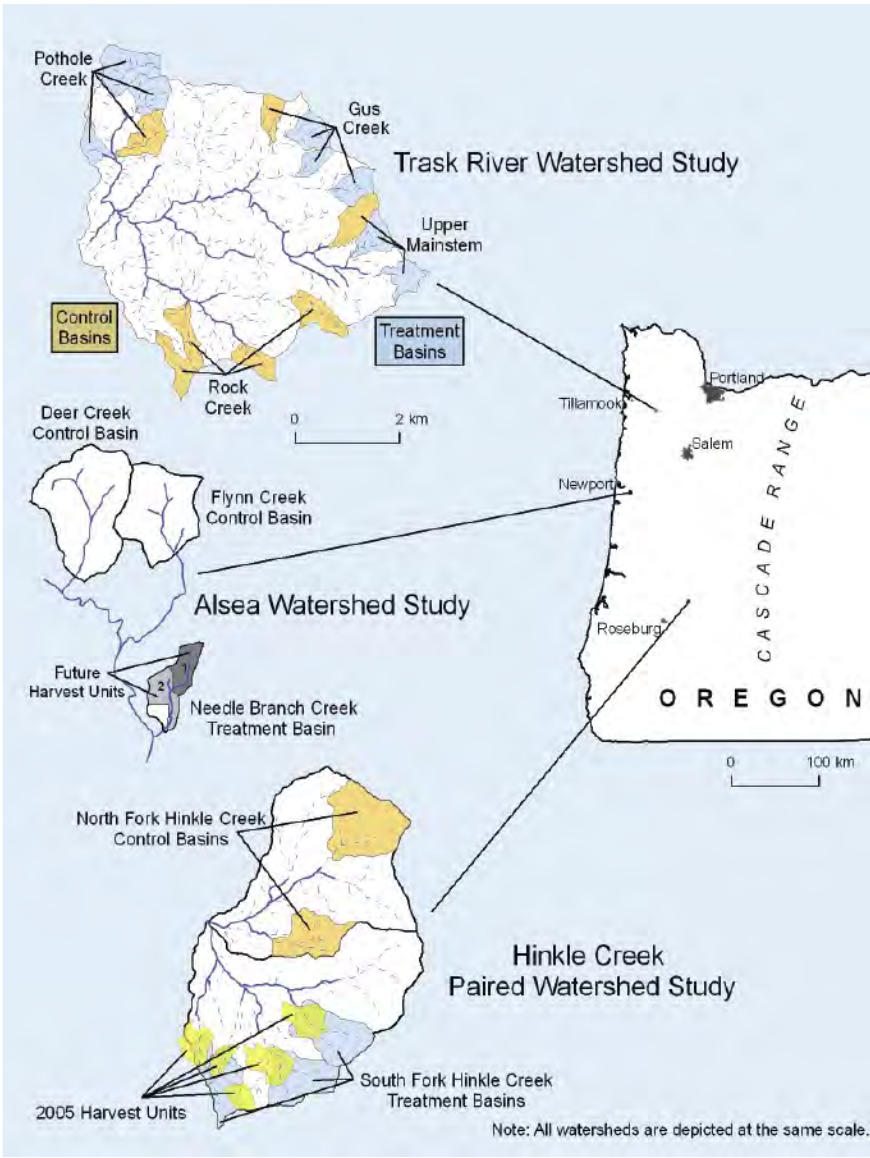
The Hinkle Creek paired watershed study offers a unique and significant array of educational opportunities for diverse audiences. More than 1,300 people have visited the study site since 2002. Field labs and field tours have drawn K-12 students and teachers, university students and faculty, public officials, natural resource professionals including foresters and fish and wildlife biologists, landowners and other citizens including members of watershed councils and conservation organizations.


Photo: Javier Goirigolzarri


Photo: OFRI

ONE OF THREE LONG-TERM WATERSHED STUDIES

The Hinkle Creek Paired Watershed Study is one of three long-term watershed studies underway in Oregon evaluating the effects of forest harvest on streams. The other long-term studies include the Trask River Study and the Alsea Watershed Study. These studies are managed by the Watersheds Research Cooperative (WRC), an umbrella organization for environmental research in Pacific Northwest watersheds affected by forest management practices. The WRC is a collaboration of individuals, companies, organizations and agencies, with primary leadership provided by the Oregon State University College of Forestry.



To learn more about the Watersheds Research Cooperative and its collaborators, or to view reports from the individual watershed studies, visit www.watershedsresearch.org.

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