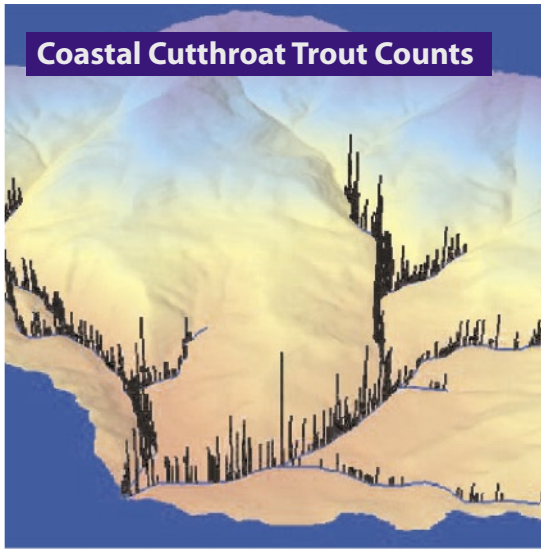
WATERSHEDS RESEARCH COOPERATIVE


Photo: Jordan Benner


Photo: Natalie Fobes



EXPANSIVE WATERSHED STUDIES TAKE A NEW LOOK AT CONTEMPORARY FOREST PRACTICES

In 1971, Oregon passed the landmark Forest Practices Act (OFPA), based in part on results from the Alsea Watershed Study, the most far-reaching forest watershed study of its time. Since then, dramatically changed harvest practices, broader environmental concerns and a limited amount of new research have raised questions about whether current stream-protection laws are adequate, go too far or don't go far enough.

Three modern paired watershed studies of unprecedented scope—on Hinkle Creek and the Trask and Alsea rivers—have been designed to help guide future stream protection practices in the Pacific Northwest. Each study is a ten-year set of projects across thousands of acres, using sophisticated monitoring and tracking technology that did not exist 30 years ago. The same scientists are using the same techniques in different geographic locations to investigate fish, water quality, stream flow and aquatic habitat across space and through time in ways never before possible.

These studies will provide the research necessary to help craft appropriate protective measures for 21st century forest practices, including the OFPA.

- After 30 years, new watersheds research is underway in Oregon in the form of paired watershed studies.
- Scientists at three major research sites —Hinkle Creek, Trask River and Alsea Watershed—are monitoring the effects of timber harvest on watersheds.
- Research is focusing on fish, amphibians and invertebrates as well as water temperature, quality and chemistry.
- Research data will help guide future forest practices in Oregon and elsewhere in the Pacific Northwest.


Photo: Michael Feinstein

WHAT ARE PAIRED WATERSHED STUDIES ?

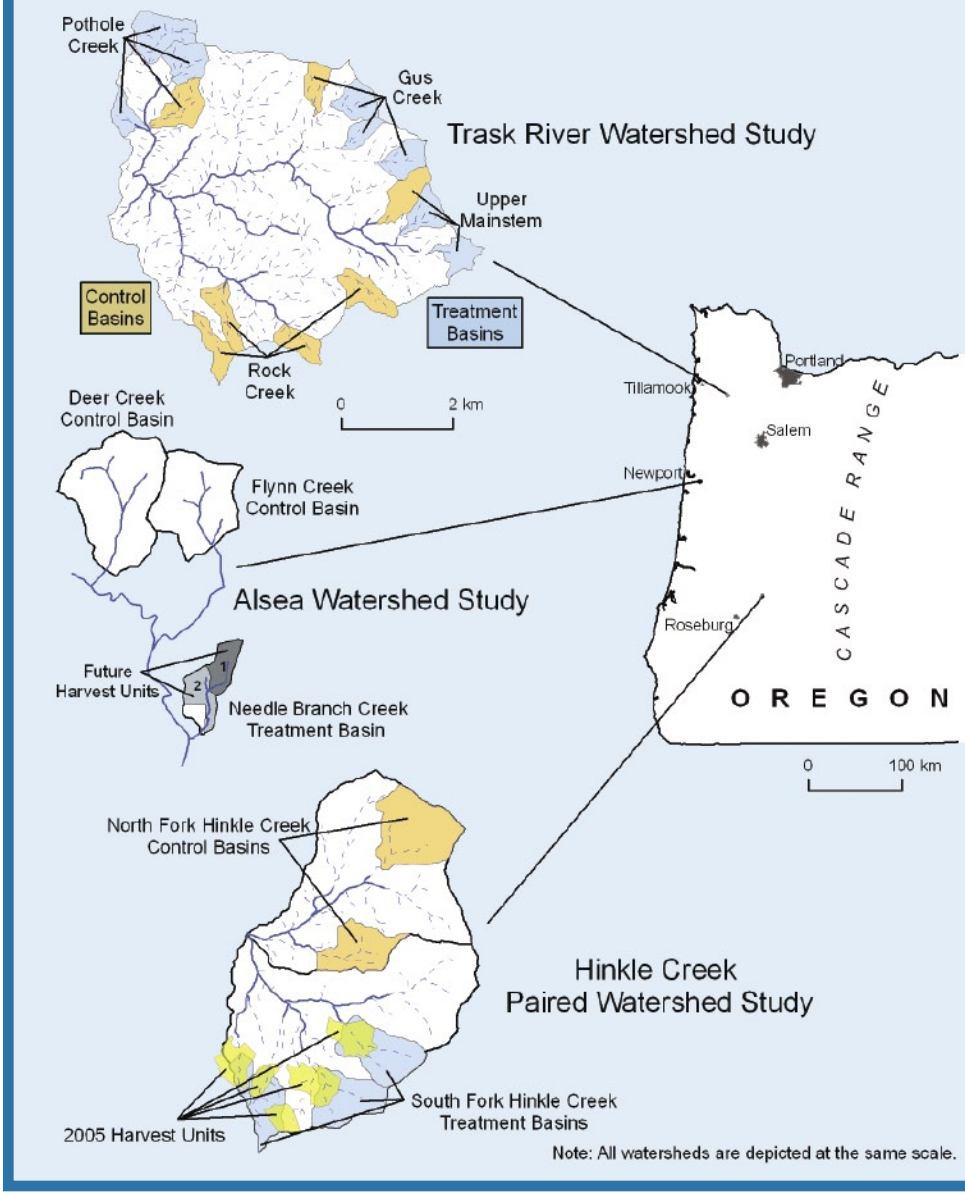
Paired watershed studies monitor two similar streams to evaluate the effects of forest harvests on those streams. One area (the control basin) is left unharvested. Another area (the treatment basin) is logged using current harvest practices. Effects are measured on water, soils, habitat and wildlife. Such studies are rare because they are immense, expensive and long-term, involving a wide range of scientists working across disciplines. Research partners commit to ten years of monitoring and data analysis. Costs can average nearly a million dollars a year, and funding is a formidable challenge. However, because they are conducted on such a large scale—5,000 acres or more—these studies can look at fish and wildlife behavior in a whole system, and reveal the cumulative effects of forest management throughout an entire watershed, rather than just the activities in one location.

PROTECTING FOREST STREAMS

Until recently, there has been limited study of forest headwater streams regarding the appropriate amount of streamside protection during harvest operations. Early regulations did not include streamside vegetative buffers for small streams. Yet small, non-fish-bearing streams can comprise 80% or more of all stream miles within a watershed and may be more sensitive to forest harvest than larger downstream rivers. While there have been many studies of the effects of logging on larger, fish-bearing rivers, headwater streams have not been studied in depth. This new watershed research will play a key role in guiding future forest practices.


Photo: OFRI

WATERSHEDS RESEARCH COOPERATIVE STUDY SITES



WATERSHED STUDIES: THEN AND NOW

The original Alsea Watershed Study was conducted between 1959 and 1973 in Oregon's Coast Range, and the results helped to set the initial stream protection rules of the OFPA. Both headwater and smaller fish-bearing streams were examined on watersheds up to 750 acres. The study evaluated the effects of logging practices, which at that time included clearcuts up to the edge of the stream and large, old trees being dragged across the ground. In the new studies, trees are smaller and harvested using aerial cables that elevate the logs being moved. All new harvesting efforts follow the current requirements of the OFPA.

TRASK RIVER (2006–2016)

The Trask study examines the effects of harvesting on small headwater streams including any impacts that are detected downstream. The study area extends across 6,000 acres in the headwaters of the Trask River. Watersheds are managed with a range of strategies including clearcuts or thinning with and without stream buffers on small non-fish bearing streams. Using advanced computer modeling, extensive field observations and additional experiments, scientists will examine the effects of logging on headwater streams. The findings should help improve our understanding of the important influence of headwater streams with and without tree-retention buffers. Treatment areas will be harvested following the OFPA, state and federal management plans. All three management approaches are being evaluated in the Trask study area.

ALSEA WATERSHED (2006–2016)

In the original Alsea Watershed Study, one basin was completely clearcut and slash-burned, leaving bare soil and no streamside vegetative buffers. The study recorded some of the most dramatic effects on water quality, stream temperature and dissolved oxygen ever observed in response to logging. The basin was successfully reforested, and the area is again ready for commercial harvest. Conducting a paired watershed study within this new harvest area offers a unique scientific opportunity to compare the effects of old and new forest practices on watershed resources. A new site for monitoring water flow has been installed, and state-of-the-art equipment is being added to monitor water quality, including turbidity, stream temperature and dissolved oxygen.

HINKLE CREEK (2001–2010)

Set on 5,000 acres of second-growth forest, Hinkle Creek is the first paired forest watershed study conducted entirely on private land. Scientists are gathering data on water quality, water quantity, fish, amphibians and aquatic invertebrates. High-tech equipment is tracking stream temperature, water flow, turbidity and fish movement. Scientists are tracking the movement of hundreds of individual fish throughout the watershed using stationary antennae and over 4400 PITs (Passive Integrated Transponders) implanted in resident cutthroat trout. One surprising result to date is that stream temperatures did not rise significantly after clearcutting.

STREAM TEMPERATURE STUDIES

Concurrent with these paired watershed studies, the Watersheds Research Cooperative (WRC) is leading a series of four stream temperature studies in Oregon that explore the influence of modified, and in some cases narrower vegetative buffers on stream temperature and productivity. Although cool water temperatures are desirable for many reasons, openings along streams can contribute to aquatic productivity. This study seeks to quantify those tradeoffs. Study areas include Big Rock Creek (west of Monmouth), Brome Creek (north of Roseburg), West Fork Mary's River (near Philomath) and Mill Creek (near Toledo).

OUTREACH AND EDUCATION

These paired watershed studies offer the opportunity to create a dynamic and expanding educational outreach program. Local K-12 schools witness scientific research on site and through classroom materials and lesson plans based on findings from the study. Pilot projects are being developed to share data with schools across the state. Tours are offered at demonstration areas, making the research accessible to neighboring landowners, students and the general public. State and regional policy leaders have visited and toured sites to learn about the research efforts underway. University classes in forest engineering and hydrology have examined the studies' research protocols. Numerous graduate students have used the research opportunities to advance their own degrees.


Photo: Javier Goirigolzarri

WATERSHEDS RESEARCH COOPERATIVE

The Watersheds Research Cooperative designs and conducts field-based research to study the effects of modern forest practices on fish and other aquatic organisms, along with water quality and quantity. The Cooperative is a collaboration of a diverse group of individuals, companies, organizations and agencies, with primary leadership provided by the Oregon State University College of Forestry. Committees include the Executive Steering, Advisory, Science Steering, Finance and Outreach. Cooperators and contributors include:

Bureau of Land Management • Colorado State University • Department of Fisheries and Wildlife, OSU College of Agricultural Sciences • Douglas County • Douglas Timber Operators • Friends of Paul Bunyan Foundation • Associated Oregon Loggers • Forest Capital Partners • Forest Engineering Department, OSU College of Forestry • Forest Science Department, OSU College of Forestry • National Council for Air and Stream Improvement • Oregon Department of Fish and Wildlife • Oregon Department of Forestry • Oregon Forest Industries Council • Oregon Forest Resources Institute • Oregon Watershed Enhancement Board • Plum Creek Timber Company • Resource Management Services • Roseburg Forest Products • Roseburg Public Schools • Starker Forests • U.S.D.A. Forest Service • U.S. Geological Survey Forest and Rangeland Ecosystem Science Center • Umpqua Fisheries Enhancement Derby • Weyerhaeuser Company

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

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