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WINTER 1998/1999

H.J. ANDREWS FOREST • ECOSYSTEM RESEARCH • EDUCATION • ADAPTIVE MANAGEMENT

The Cascade Center for Ecosystem Management is a research & management partnership among the Pacific Northwest Research Station, Oregon State University and the Willamette National Forest. Established in 1991, the Center integrates research and management programs historically centered on the H.J. Andrews Experimental Forest near Blue River, Oregon. The mission of the Cascade Center is to develop, apply, demonstrate, and share new research findings with resource managers and interested individuals.

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LAST ISSUE OF CASCADE CENTER NEWS:

*Cascade Center News to fully
merge with AMA Newsletter*

In an effort to streamline our efforts at the Cascade Center, we have decided to incorporate information from our research and management programs into the Central Cascades Adaptive Management Area newsletter. We are currently developing a Cascade Center

website which will also provide information on new publications, Cascade Center and Andrews Experimental Forest events, and short updates on key research findings. The Cascade Center site should be up and running in early Spring 1999. Look for a link from the Andrews Long-Term Ecological Research home page at: www.fsl.orst.edu/lter.

ANDREWS FOREST 50TH CELEBRATION

On Friday August 21, nearly 300 people gathered at the H.J. Andrews Experimental Forest east of Blue River, Oregon to celebrate the 50th anniversary of the Andrews Forest program. In addition to key representatives from the National Forest System, Oregon State University, Forest Service Research, and the National Science Foundation, spe-

cial guests included fourteen descendants of Horace Justin Andrews.



The Andrews family

TEACHING THE TEACHERS: 20 L.A. SCIENCE TEACHERS TO ATTEND SEMINAR AT ANDREWS FOREST IN MAY

Twenty high school science teachers from the Los Angeles area will be spending four days at the Andrews Forest engaged in hands-on field research with scientists from the Andrews and Cascade Center programs. The objective of the seminar is to provide an example of an integrated scientific approach to ecosystem management and the concept of adaptive management.

The seminar is sponsored by the Los Angeles County Office of Education and is funded by the Los Angeles Systemic Initiative (LA-SI) and the Eisenhower Fund. Most of the teachers have participated in other LA-SI programs including a similar four day seminar in either the Eastern Sierras or Yosemite National Park conducted by field science professionals and resource managers from the USDI Bureau of Land Management, USDA Forest Service and the USDI National Park Service.

VITAL SIGNS:

Water temperature monitoring in headwater streams in the Blue River Landscape Study

Long-term temperature monitoring was initiated this summer (1998) in small headwater streams in the Blue River watershed. Temperature sensors were placed in terminal headwater streams in two timber sale areas expected to be harvested in 1999 or 2000. By monitoring pre- and post-harvest stream temperatures we hope to (1) characterize variability in summer temperature regimes of these small headwater streams, (2) compare pre- and post-harvest temperature regimes with state temperature standards, and (3) quantify the effect that Blue River Landscape Study (BRLS) canopy retention prescriptions have on summer temperature regimes in these small streams. This effort is part of a larger monitoring program developed to help evaluate the results of the landscape management approach being implemented in the Blue River watershed.

Concern for the condition of aquatic ecosystems has driven many changes in land management activities in recent decades. The Northwest Forest Plan (NFP), published in 1994, includes an extensive Aquatic Conservation Strategy designed to restore and maintain aquatic ecosystems on federal lands in the Pacific Northwest. Standards and Guidelines in the NFP prescribe wide no-harvest riparian reserves adjacent to all streams, including intermittent streams, while upper slopes are managed intensively for timber production. By contrast, in the BRLS the rates of timber harvest and the landscape- and stand-level pattern of canopy retention are guided by a natural fire regime template. Therefore, a complete forest canopy is not often left near intermittent streams (except for reasons of slope instability, or other site-specific concerns). Instead, 15-70% canopy cover is retained in harvest units, and the distribution of canopy retention is weighted toward streams. Harvest rates are substantially lower in the landscape study due to longer rotations (100-200 years). No-harvest buffers are retained adjacent to fish-bearing streams.

Because the BRLS is affording somewhat less canopy protection to small headwater streams than prescribed in the NFP, the Cascade Center for Ecosystem Management has initiated long-term monitoring of water temperature and other ecosystem attributes in several streams in the basin.

We chose three streams each in the vicinity of two timber

sales recently sold in the Blue River watershed: North Fork Quartz (NFQ), and Blue River Face (BRF) (Fig. 1). Two harvest units from each sale were used in this monitoring

effort: one with a prescribed buffer and one with the standard prescription for non-fish-bearing streams as described previously for the BRLS. In addition, in the vicinity of each timber sale, a "control" stream was selected for comparison in a stand that would not be harvested. Three temperature sensors were placed in all harvest units and control streams: near the upper terminus of the stream channel, at the bottom of the unit, and one centered between. In addition, in the NFQ timber sale area, sensors were placed several hundred meters below the harvest units at the bottom of each tributary, just prior to its confluence with North Fork Quartz Creek.

Figure 2 illustrates the results of the first year of data collection, pre-harvest. One of the sensors was faulty, and one

Figure 1: locator map of the Blue River watershed in the Willamette National Forest of Oregon.

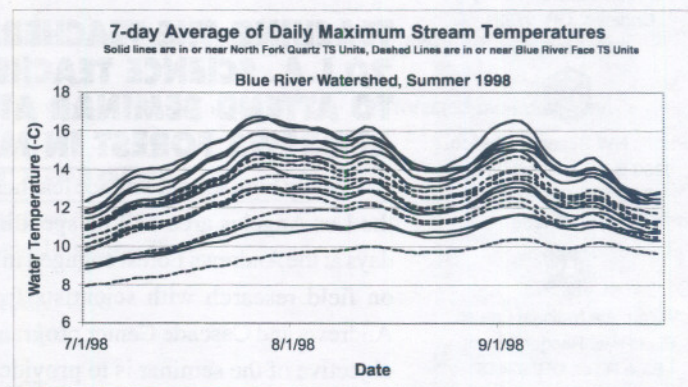
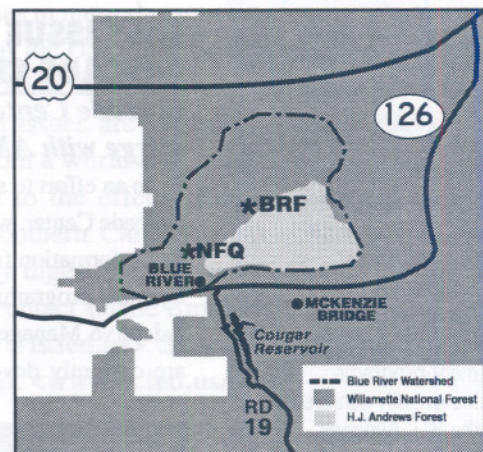
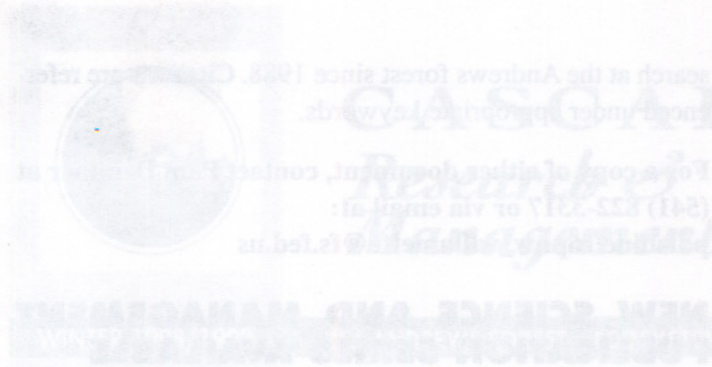


Figure 2: 7-day Average of Daily Maximum Stream Temperatures at 19 Locations in 6 Streams in the Blue River Watershed, Summer 1998, Prior to Timber Harvest



other was left high and dry when the streams dried up; therefore, data from only 19 of 21 sensors are shown. Notice the variability present in these streams. Some show summer peaks in temperature in mid-summer along with more variation through the summer season. Others show a slow, gradual increase in temperature through the summer, not peaking until late in the season. The NFQ streams (solid lines) are in a region of generally steeper slopes, and shallower soils, and more bedrock is exposed in the stream channel. In contrast, BRF streams (dashed lines) are in a region of more gentle topography, with deep volcanic deposits, and little or no bedrock exposure. The higher temperatures and variability in many NFQ streams indicate that stream temperature in these streams may be more controlled by energy inputs from solar radiation, while BRF stream temperatures may be more controlled by an extensive body of cold ground water.

The state standard for maximum stream temperature (7-day average of daily maxima) for the Blue River watershed is 64°F (17.8°C). Summer peaks (7-day average of daily maxima) were several degrees below this standard for most streams, but approached within about 1 degree Celsius for one stream in the NFQ timber sale area. An additional set of sites, in the northeast part of the watershed, is scheduled to enter the monitoring program in summer 1999.

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LINX PROJECT EXPLORES CONNECTIONS WITHIN AND BETWEEN RIVER ECOSYSTEMS

This summer Oregon State University researchers implemented a foodweb study on Mack Creek in the H.J. Andrews Forest as part of an intersite comparison, the Lotic Intersite Nitrogen eXperiment (LINX). This stream ecosystem study is designed to track movements of nitrogen through the aquatic foodweb community. Micro-amounts of N¹⁵ (atomically labeled ammonium) were dripped into Mack Creek over the course of six weeks beginning in July. Intensive sampling was conducted before, during, and after the experiment to examine nitrogen processing and uptake in multiple trophic levels within the stream (algae, detritus, microbes, macroinvertebrates, fish, frogs, and salamanders) and in adjacent terrestrial areas (riparian vegetation, water ouzels, dragonflies).

Nitrogen is an element of considerable interest in stream ecosystems. It limits productivity in some flowing waters while in others it is present to excess. Because streams serve as key hydrologic and biogeochemical links between uplands and downstream ecosystems, understanding how changes in climate, atmospheric deposition of nitrogen, or land use will affect landscapes requires working models of the structure and function of stream processes.

Mack Creek is one of ten sites nationwide selected for the study. Sites range in latitude from the tropics to the arctic and encompass broad gradients in background nitrogen levels, productivity, and hydrology. This range of ecosystems will provide robust tests of the influence of potential factors on nitrogen uptake, retention, and recycling. For more information, contact Linda Ashkenas, Department of Fisheries and Wildlife, Oregon State University: (541) 737-1966, email: linda.ashkenas@orst.edu.

NEW PUBLICATIONS:

A Landscape Plan Based on Historical Fire Regimes for a Managed Forest Ecosystem: the Augusta Creek Study

This new 82-page PNW Research Station publication describes the development of vegetation management regimes for the 19,000 acre Augusta Creek area based on the frequency, severity, and spatial pattern of historical fire regimes in the area. Analysis showed a greater amount of late-successional habitat, larger patches, and better habitat connectivity would result from application of this strategy as compared to literal application of standards and guidelines in the Northwest Forest Plan. The Augusta Creek Study was the forerunner for the Blue River Landscape Study currently being implemented in the Blue River watershed (approximately 57,000 acres).

Research Publications of the H.J. Andrews Experimental Forest, Cascade Range, Oregon: 1998 Supplement

This 94-page bibliography is a 10-year update to two previously published bibliographies on the research publications of the H.J. Andrews Experimental Forest. Published in conjunction with the 50th anniversary of the Andrews Forest, this bibliography lists approximately 700 publications, abstracts, theses, and unpublished reports associated with re-

search at the Andrews forest since 1988. Citations are referenced under appropriate keywords.

For a copy of either document, contact Pam Druliner at (541) 822-3317 or via email at: pdruline/r6pnw_willamette@fs.fed.us

NEW SCIENCE AND MANAGEMENT PUBLICATION SERIES AVAILABLE

Science Findings is a relatively new monthly publication covering key issues in natural resource science and management. Published by the USDA Forest Service, Pacific Northwest Research Station, the series was introduced in February 1998. Eleven issues are currently available and cover topics ranging from a worldwide perspective on wood supply and demand to the effect of military maneuvers on biodiversity in southern California. At six pages, *Science Findings* is easily digestible and well-designed. To get on the mailing list contact Diane Smith at (503) 808-2127 or [<desmith/r6pnw@fs.fed.us>](mailto:desmith/r6pnw@fs.fed.us). *Science Findings* is also available on the web at: [<www.fs.fed.us/pnw/>](http://www.fs.fed.us/pnw/).

The following hardcopy publications are available with request via mail or fax from: Publications, Cascade Center/HJ Andrews Forest, FSL, 3200 SW Jefferson Way, Corvallis, OR 97331 Fax: Publications (541) 758-7760

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- ☐ Rasmussen, Mary C.; Ripple, William J. 1998. Retrospective analysis of forest landscape patterns in western Oregon. *Natural Areas Journal*. 18(2): 151-163.
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- ☐ Hunter, Matthew G. 1993. *Communique #1: Young managed stands*. 16pp.
- ☐ Hunter, Matthew G. 1995. *Communique #2: Residual trees as biological legacies*. 28pp.
- ☐ Cascade Center: Purpose, roles, distinguishing features. 1996.
- ☐ The Young Stand Thinning and Diversity Study: Managing for diversity. 1996.
- ☐ Very Young Stand Management: An adaptive management case study. 1996.
- ☐ Long-Term Ecosystem Productivity: Integrated research site. 1996.
- ☐ The Blue River Landscape Study: Testing an alternative approach. 1997.
- ☐ The Northern Spotted Owl: Central Cascades demography study. 1997.
- ☐ Dead Wood, Bugs, Fungi, and New Forests: The log decomposition study. 1998.
- ☐ Chanterelle Mushroom Productivity: Response to young stand thinning. 1998.