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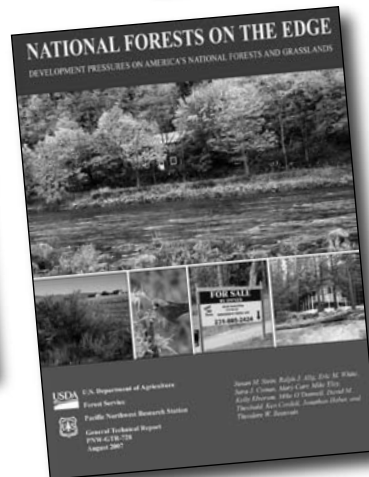
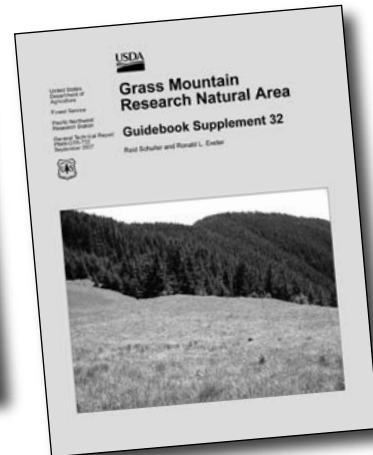
Forest Service

Pacific Northwest  
Research Station



# Recent Publications of the Pacific Northwest Research Station

*Fourth Quarter, 2007*



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The Pacific Northwest (PNW) Research Station is one of eight research units in the USDA Forest Service. The research units collectively conduct the most extensive and productive program of integrated forestry research in the world. The PNW Research Station was established in 1925. The Station has its headquarters in Portland, Oregon; 11 research laboratories and centers in Alaska, Oregon, and Washington; and 11 active experimental areas (watershed, range, and experimental forests). The Station also conducts research in more than 20 research natural areas.

Our mission is to generate and communicate scientific knowledge that helps people understand and make informed choices about people, natural resources, and the environment.

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### **Fairbanks**

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2770 Sherwood Lane  
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- Ecosystem Structure and Function
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- Fire

- Forest Management
- Geomorphology and Hydrology
- Invasive Plants and Animals
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- Landscape Ecology
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- Resource Inventory
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## What Is Treesearch?

**Treesearch** is an online system for locating and delivering publications by Research and Development scientists in the USDA Forest Service. Publications in the collection include research monographs published by the agency as well as papers written by our scientists but published by other organizations in their journals, conference proceedings, or books. Research results behind these publications have been peer-reviewed to ensure the best quality of science.

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The screenshot shows the USDA Forest Service Treesearch website. The header includes 'USDA FOREST SERVICE' and 'Forest Service National Links'. The main title is 'Research & Development Treesearch'. A search bar is present with the placeholder '(enter query)'. A navigation menu on the left lists: Treesearch Home, About Treesearch, Contact Us, Research & Development, Forest Products Lab, International Institute of Tropical Forestry, Northern, Pacific Northwest, Pacific Southwest, Rocky Mountain, Southern, and Help. The main content area is titled 'USDA FS Research Publications' and includes a search form for on-line publications with fields for Keywords, Author, Title, and a date filter (Starting: 1998, Through: 2008). A sidebar on the right offers a 'Search for Station Series Publications' with dropdown menus for 'Any' and 'Any'. Below the search form, there is a section for '20 Most Recently Added Publications By Station' with a list of stations: Forest Products Lab, International Institute of Tropical Forestry, Northern Research Station, Pacific Northwest Research Station, Pacific Southwest Research Station, Rocky Mountain Research Station, and Southern Research Station. Another sidebar on the right shows a 'Listing of Publications in the Treesearch Database (number pubs on-line)' with a list: FPL (1,454), IITF (13), NRS (7,225), PNW (2,791), PSW (2,563), RMRS (2,401), SRS (6,620), and All Publications (23,170). The footer contains 'USDA' and 'US' logos, a 'top' link, and a row of links: Disclaimers, FOIA, Privacy Policy, Quality of Information, and Print This Page.

## Station Publications

These publications are available for download at the Web site listed under each abstract. To order a printed Station publication, circle its five-digit number on the inside back cover, cut out the order form, place in an envelope, and send it to the address indicated. Please do not remove the label containing your name and address. It is used to send your publications. If there is no label, please fill in your name and address.

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### Atmosphere

06-157

► Rapp, V., 2006.

**A clear picture of smoke: BlueSky smoke forecasting.** Science Update 14. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 12 p.

Effective smoke management for prescribed burning requires reliable forecasting of potential smoke effects. The BlueSky framework contains and combines models and data about weather, fires and fuels, emissions, and terrain. By integrating these models into a unified framework, BlueSky is able to predict smoke concentrations and trajectories. As a research tool still under development, BlueSky is being used to create regional forecasts for smoke from multiple wildfires or prescribed fires. Visualization programs are used to create graphic Web displays. Started in the Pacific Northwest, BlueSky has been expanded to provide real-time predictions from large wildfires throughout the contiguous United States and from prescribed fires in some regions.

*Keywords:* smoke, wildfire, fuels, emissions.

<http://www.treesearch.fs.fed.us/pubs/24626>

### Bibliographies

07-496

► Pacific Northwest Research Station. 2007.

**Recent publications of the Pacific Northwest Research Station, third quarter 2007.**

*Keywords:* Bibliographies (forestry).

<http://www.fs.fed.us/pnw/pubs/3q07.pdf>

### Economics

07-530

► Warren, D.D. 2007.

**Production, prices, employment, and trade in Northwest forest industries, all quarters 2005.**

Res. Bull. PNW-RB-254. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 165 p.

Provides current information on lumber and plywood production and prices; employment in the forest industries; interational trade in logs, lumber, and plywood; volume and average prices of stumpage sold by public agencies; and other related items.

*Keywords:* Forestry business economics, lumber prices, plywood prices, timber volume, stumpage prices, employment (forest products industries), marketing (forest products), imports and exports (forest products).

<http://www.treesearch.fs.fed.us/pubs/28840>

## Ecosystem Structure and Function

### 07-156

- Schuller, R.; Exeter, R.L. 2007.

**Little Sink Research Natural Area: guidebook supplement 31.** Gen. Tech. Rep. PNW-GTR-725. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 24 p.

This guidebook describes the Little Sink Research Natural Area, a 32.38-ha (80-acre) tract occupying an area of geologically unstable marine siltstone exhibiting natural geomorphic disturbances including landslides, slump benches, scarps, basins, and ponds. The area supports forested stands dominated by Douglas-fir (*Pseudotsuga menziesii*) as well as stands co-dominated by Douglas-fir and bigleaf maple (*Acer macrophyllum*) representative of coniferous forest along the foothills of the Willamette Valley.

*Keywords:* Research natural area, geomorphic instability, natural disturbance, Douglas-fir forest, Oregon coast range, Willamette Valley foothill forest.

<http://www.treesearch.fs.fed.us/pubs/28913>

### 07-232

- Schuller, R.; Exeter, R.L. 2007.

**Grass Mountain Research Natural Area: guidebook supplement 32.** Gen. Tech. Rep. PNW-GTR-732. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p.

This guidebook describes the Grass Mountain Research Natural Area, a 377-ha (931-ac) tract in the Oregon Coast Range. The area supports a grass bald complex surrounded by stands dominated by noble fir (*Abies procera*) and/or Douglas-fir (*Pseudotsuga menziesii*) in the overstory, and western hemlock (*Tsuga heterophylla*) in the understory. The area also contains a small rock garden plant community along high-elevation ridges, and young Douglas-fir forest that originated from a wildfire. Headwaters

of high-elevation, Oregon Coast Range streams are surrounded by noble fir forest and add to the site diversity.

*Keywords:* Research natural area, grass bald, grass meadow, rock garden community, noble fir forest, Douglas-fir forest, Oregon Coast Range, grass meadow invasion, high-elevation stream headwaters.  
<http://www.treesearch.fs.fed.us/pubs/28762>

### 07-233

- Schuller, R.; Exeter, R.L. 2007.

**Forest Peak Research Natural Area: guidebook supplement 33.** Gen. Tech. Rep. PNW-GTR-730. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 23 p.

This guidebook describes the Forest Peak Research Natural Area (RNA), a 62.8-ha (153.3-ac) tract containing a mature Douglas-fir (*Pseudotsuga menziesii*) forest and a grass bald within the Willamette Valley Foothill Ecoregion. Forest Peak RNA also contains an undisturbed third-order stream reach.

*Keywords:* Research natural area, Douglas-fir forest, Oregon Coast Range, Willamette Valley foothill forest, grassland meadow, grass bald, third-order stream.

<http://www.treesearch.fs.fed.us/pubs/28760>

### 07-234

- Schuller, R.; Exeter, R.L. 2007.

**Saddle Bag Mountain Research Natural Area: guidebook supplement 34.** Gen. Tech. Rep. PNW-GTR-731. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 22 p.

This guidebook describes the Saddle Bag Mountain Research Natural Area, a 121-ha (300-ac) tract established to represent an old-growth remnant of Pacific silver fir (*Abies amabilis*) and western hemlock (*Tsuga heterophylla*) forest in the Oregon Coast Range. Pacific silver fir and noble fir (*Abies*

*procera*) occur as isolated remnants, and both species are approaching the southern limits of their natural range in the Oregon Coast Range.

*Keywords:* Research natural area, old-growth forest, Pacific silver fir forest, western hemlock forest, noble fir forest, Douglas-fir forest, Oregon Coast Range, remnant population.

<http://www.treesearch.fs.fed.us/pubs/28761>

## Forest Management

### 07-135

► Mazza, R. 2007.

**Managing forests after fire.** Science Update 15. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 12 p.

Fire is a part of the forest ecosystem, and its effects have been well documented in the scientific literature. But controversy remains about the effects of management options in a burned forest, and the scientific basis for decisionmaking about postfire management is uncertain and has not been effectively articulated. Management concerns include minimizing insect outbreaks and the potential for reburn, ensuring tree regeneration, and minimizing erosion and its effects on aquatic systems, and capturing the economic value of wood through postfire timber harvests. Postfire timber harvests may lead to different outcomes depending on the biophysical setting of the forest, patterns of burn severity, and method and timing of tree removal. The management objectives for the area ultimately determine how these concerns are addressed.

*Keywords:* Fire, postfire timber management, postfire timber harvests, insects, reburn.

<http://www.fs.fed.us/pnw/pubs/science-update-15.pdf>

### 07-078

► Miner, C.; Jacobs, R.; Dykstra, D.; Bittner, B., eds. 2007.

**Proceedings: International conference on transfer of forest science knowledge and technology.** Gen. Tech. Rep. PNW-GTR-726. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 255 p.

This proceedings compiles papers presented by extensionists, natural resource specialists, scientists, technology transfer specialists, and others at an international conference that examined knowledge and technology transfer theories, methods, and case studies. Theory topics included adult education, applied science, extension, diffusion of innovations, social marketing, technology transfer, and others. Descriptions of methods and case studies collectively covered a wide range of current approaches that include combined digital media, engagement of users and communication specialists in the full cycle of research, integrated forestry applications, Internet-based systems, science writing, practices for water quality, forest reforestation practices, a land management system, portable timber bridges, reduced-impact logging, silvicultural practices, urban forestry, and many others. Innovation users included forest-land owners; land managers; logging industry; natural resource professionals; policymakers; public; rural and urban communities—and those in the interface between these two; and others. Technology transfer and related efforts took place in countries throughout the world.

*Keywords:* Technology transfer, communication, education, forest research, forest management, knowledge management.

<http://www.treesearch.fs.fed.us/pubs/28422>



## 07-199

- Thompson, J. 2007.

**Green-tree retention in harvest units: boon or bust for biodiversity?** Science Findings 96. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 6 p.

In response to societal concerns about clearcutting in the Pacific Northwest, structural or green-tree retention is now an integral part of harvest prescriptions on federal lands. However, the benefits of different levels or patterns of retention for the ecological, microclimatic, and aesthetic attributes of resulting forest stands remain speculative. The Demonstration of Ecosystem Management Options (DEMO) study was designed to address this information gap by evaluating the ecological effects of green-tree retention in mature Douglas-fir forests. DEMO is an interdisciplinary study that was established at six locations in Washington and Oregon, and includes six harvest treatments that enable researchers to contrast the effects of retention level (15 to 100 percent of original basal area) with spatial pattern (dispersed vs. aggregated) for a variety of response variables.

*Keywords:* Green-tree retention, DEMO.

<http://www.fs.fed.us/pnw/sciencef/scifi96.pdf>

lands along their boundaries. National forests and grasslands provide critical social, ecological, and economic benefits to the American public. This study projects future housing density increases on private rural lands at three distances— $\frac{1}{2}$ , 3, and 10 miles—from the external boundaries of all national forests and grasslands across the conterminous United States. Some 21.7 million acres (about 8 percent) of rural lands located within 10 miles of the National Forest System boundaries are projected to undergo increases in housing development by 2030. Nine individual national forests are projected to experience increased housing density on at least 25 percent of adjacent private lands at one or more of the distances considered. Thirteen national forests and grasslands are projected to have more than a half-million acres of adjacent private rural lands experience increased housing density. Such development and accompanying landscape fragmentation pose substantial challenges for the management and conservation of the ecosystem services and amenity resources of National Forest System lands, including access by the public. Research such as this can help planners, managers, and communities consider the impacts of local land use decisions.

*Keywords:* Land use change, housing density, public lands, environmental services.

<http://www.treesearch.fs.fed.us/pubs/28858>

## Land Use Economics

### 07-220

- Stein, S.M.; Alig, R.J.; White, E.M.; Comas, S.J.; Carr, M.; Eley, M.; Elverum, K.; O'Donnell, M.; Theobald, D.M.; Cordell, K.; Haber, J.; Beauvais, T.W. 2007.

**National forests on the edge: development pressures on America's national forests and grasslands.** Gen. Tech. Rep. PNW-GTR-728. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 26 p.

Many of America's national forests and national grasslands—collectively called the National Forest System—face increased risks and alterations from escalating housing development on private rural

## Plant Pathology

### 07-143

- Muir, J.A.; Hennon, P.E. 2007.

**A synthesis of the literature on the biology, ecology, and management of western hemlock dwarf mistletoe.** Gen. Tech. Rep. PNW-GTR-718. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 142 p.

Hemlock dwarf mistletoe is a small, inconspicuous parasite that has significant effects on tree growth and stand structure in coastal forest ecosystems of western North America. Most previous research focused on the effects of hemlock dwarf mistletoe on timber production. Previous clearcut harvesting of large areas that removed virtually all infected

trees and forestry practices that established even-aged stands of trees effectively prevented or minimized future hemlock dwarf mistletoe impacts. Under this regime, further research on hemlock dwarf mistletoe was considered unnecessary. However, current forestry practices that restrict clearcut harvesting to small openings and retain live trees to preserve attributes of old-growth forests create conditions that appear highly favorable for enhanced seed production by hemlock dwarf mistletoe, early spread of the mistletoe to infect young trees, and, consequently, increased growth impacts to residual trees over time. More information is needed on the biology and impacts of hemlock dwarf mistletoe in coastal western hemlock retention-harvested forests in the United States and Canada. Further work is recommended to develop sampling and monitoring procedures to determine hemlock dwarf mistletoe spread and impacts. We also need to investigate several unusual aspects of hemlock dwarf mistletoe biology and development such as long-distance seed dispersal and persistence in old-growth forests. Detailed tree, stand, and forest-level models are needed to monitor and project hemlock dwarf mistletoe effects over a wide range of ecological conditions and management regimes in coastal forests.

*Keywords:* Disease management, *Arceuthobium*, selection harvest, retention harvest, disease impact.

<http://www.treesearch.fs.fed.us/pubs/28423>

## Recreation

### 07-270

► Cervený, L. 2007.

**Sociocultural effects of tourism in Hoonah, Alaska.** Gen. Tech. Rep. PNW-GTR-734. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 115 p.

This report examines the growth and development of the tourism industry in Hoonah, Alaska. An ethnographic approach was used to examine how tourism growth occurred and its implications for resident relations with the natural environment and community institutions.

*Keywords:* Tourism, Alaska, rural communities, change.

[http://www.fs.fed.us/pnw/pubs/pnw\\_gtr734.pdf](http://www.fs.fed.us/pnw/pubs/pnw_gtr734.pdf)

### 07-200

► White, E.M.; Zarnoch, S.J.; English, D.B.K. 2007.

**Area-specific recreation use estimation using the National Visitor Use Monitoring Program data.** Res. Note. PNW-RN-557. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 26 p.

Estimates of national forest recreation use are available at the national, regional, and forest levels via the USDA Forest Service National Visitor Use Monitoring (NVUM) Program. In this research note we have detailed two approaches whereby the NVUM sampling data may be used to estimate recreation use for sub-forest areas within a single national forest or for sub-forest areas combining several national forests. In the “new forest” approach, recreation use is estimated using NVUM data obtained only from NVUM interview sites within the area of interest. In the “all-forest information” approach, recreation use is estimated using sample data gathered on all portions of the national forest(s) that contain the area of interest.

*Keywords:* Recreation visits, National Visitor Use Monitoring program, recreation use estimation, recreation area.

<http://www.treesearch.fs.fed.us/pubs/27928>

## Journals and Other Publications

The following publications were not published by the Pacific Northwest Research Station, although the work was supported by the Station. These publications may be viewed online at the USDA Research and Development Treesearch Web site listed under each article. If you would like a hard copy, you may print the articles from this Web site. For more information about Treesearch, see page 3 of this report.

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(Visit or request article from the  
Interlibrary Loan section)

## Aquatic/Riparian Systems

- ▶ Williams, J.E.; Reeves, G.H. 2006.

**Stream systems.** In: Apostol, D.; Sinclair, M., eds. Restoring the Pacific Northwest: the art and science of ecological restoration in Cascadia. Washington, DC: Island Press: 298–318. Chapter 13.

*Keywords:* Stream restoration, aquatic habitat.

<http://www.treesearch.fs.fed.us/pubs/29313>

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## Ecosystem Structure and Function

- ▶ Kumar, A.; Marcot, B.G.; Roy, P.S. 2006.

### **Spatial patterns and processes for shifting cultivation landscape in Garo Hills, India.**

In: Laforteza, R.; Sanesi, G., eds. Patterns and processes in forest landscapes: consequences of human management. Proceedings of the 4<sup>th</sup> meeting of IUFRO Working Party 8.01.03. Locorotondo, Bari, Italy: Accademia Italiana di Scienze Forestali: 8 p.

*Keywords:* Shifting cultivation, slash-and-burn, tropical forest, India, forest patch size, wildlife habitat corridors.

[http://www.fs.fed.us/pnw/pubs/journals/pnw\\_2006\\_kumar001.pdf](http://www.fs.fed.us/pnw/pubs/journals/pnw_2006_kumar001.pdf)

## Fire

- ▶ Gavin, D.G.; Hallett, D.J.; Hu, F.S.; Lertzman, K.P.; Prichard, S.J.; Brown, K.J.; Lynch, J.A.; Bartlein, P.; Peterson, D.L. 2007.

**Forest fire and climate change in western North America: insights from sediment charcoal records.** *Frontiers in Ecology and Environment*. 5(9): 499–506.

*Keywords:* Paleo-fire, fire history, climate change, fire regimes.

<http://www.treesearch.fs.fed.us/pubs/29317>

- ▶ Hammer, R.B.; Radloff, V.C.; Fried, J.S.; Stewart, S.I. 2007.

**Wildland-urban interface housing growth during the 1990s in California, Oregon, and Washington.** *International Journal of Wildland Fire*. 16: 255–265.

*Keywords:* Fire management, housing density growth.

<http://www.treesearch.fs.fed.us/pubs/29325>

- ▶ Peterson, D.L.; Johnson, M.C. 2007.

**Science-based strategic planning for hazardous fuel treatment.** *Fire Management Today*. 67(3): 13–18.

*Keywords:* Fire management, fuel treatment, fire models, decision support.

<http://www.treesearch.fs.fed.us/pubs/29336>

- ▶ Varner, J.M., III; Hiers, J.K.; Ottmar, R.D.; Gordon, D.R.; Putz, F.E.; Wade, D.D. 2007.

**Overstory tree mortality resulting from reintroducing fire to long-unburned longleaf pine forests: the importance of duff moisture.** *Canadian Journal of Forest Research*. 37: 1349–1358.

*Keywords:* Longleaf pine, duff consumption, fire, prescribed fire, crown scorch, southern forests.

<http://www.treesearch.fs.fed.us/pubs/29337>

- ▶ Wales, B.C.; Suring, L.H.; Hemstrom, M.A. 2007.

**Modeling potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon, USA.** *Landscape and Urban Planning*. 80: 223–236.

*Keywords:* Forest restoration, fuels management, habitat modeling, *Lynx canadensis*, Interior Northwest Landscape Analysis System (INLAS), wildlife habitat.

<http://www.treesearch.fs.fed.us/pubs/29338>

## Fish

- ▶ Saiget, D.A.; Sloat, M.R.; Reeves, G.H. 2007.

**Spawning and movement behavior of migratory coastal cutthroat trout on the western Copper River Delta, Alaska.** *North American Journal of Fisheries Management*. 27: 1029–1040.

*Keywords:* Coastal cutthroat trout, life history variation, fish movement.

<http://www.treesearch.fs.fed.us/pubs/29339>

## Forest Management

- ▶ Ares, A.; Terry, T.; Harrington, C.; Devine, W.; Peter, D.; Bailey, J. 2007.

**Biomass removal, soil compaction, and vegetation control effects on five-year growth of Douglas-fir in coastal Washington.** *Forest Science*. 53(5): 600–610.

*Keywords:* Long-term forest productivity, forest soils, vegetation, *Pseudotsuga menziesii*, soil water.

<http://www.treesearch.fs.fed.us/pubs/29340>

- ▶ Ekbia, H.R.; Reynolds, K.M. 2007.

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