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Publications are arranged in two sections. The first section lists items published by the PNW Research Station and available through our distribution system. The second section lists publications available elsewhere. Within each section, items are grouped by general subject categories and alphabetically by author within categories.

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Pacific Northwest Research Station Publications

The following publications may be ordered by using the form on the inside back cover. Circle the code number for the publication.

Economics in Forest Management 98-072

Haynes, Richard W.

1999. Chip prices as a proxy for nonsawtimber prices in the Pacific Northwest. Res. Note PNW-RN-537. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 26 p.

The heavy focus on saw-log prices makes it difficult for land managers to develop price expectations for stands that contain both sawtimber and nonsawtimber logs. This raises questions about the availability and efficiency of proxy measures for nonsawtimber prices, such as export chip prices.

Keywords: Prices, stumpage, nonsawtimber, sawtimber, proxy, chip prices.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Ecosystem Function 96-254

Marcot, B.G.; Croft, L.K.; Lehmkuhl, J.F. [and others]

1998. Macroecology, paleoecology, and ecological integrity of terrestrial species and communities of the interior Columbia basin and northern portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-GTR-410. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 131 p. (Quigley, Thomas M., tech. ed. Interior Columbia River Basin Ecosystem Management Project: scientific assessment).

This report presents information on biogeography and broad-scale ecology (macroecology) of selected fungi, lichens, bryophytes, vascular

plants, invertebrates, and vertebrates of the interior Columbia River basin and adjacent areas. Rare plants include many endemics associated with local conditions. Potential plant and invertebrate bioindicators are identified. Species ecological functions differ among communities and variously affect ecosystem diversity and productivity. Species of alpine and subalpine communities are identified that may be at risk from climate change. Maps of terrestrial integrity are presented.

Keywords: Macroecology, paleoecology, ecological integrity, terrestrial communities, ecosystems, wildlife, fungi, lichens, bryophytes, vascular plants, invertebrates, arthropods, mollusks, amphibians, reptiles, birds, mammals, endemism, interior Columbia River basin, Klamath Basin, Great Basin.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

97-335

Mulder, Barry S.; Noon, Barry R.; Spies, Thomas A. [and others]

1999. The strategy and design of the effectiveness monitoring program for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-437. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 138 p.

This report describes the strategy and design of an effectiveness monitoring program for the Northwest Forest Plan. The described premise is to implement a prospective and integrated habitat-based approach to monitoring that provides a gradual transition from an intensive, individual species-resource focus to a more

extensive, ecosystems approach by using surrogates to measure the pattern and dynamics of habitat structure in place of monitoring biota. The report describes the scientific framework for monitoring, starting with conceptual models, that is the basis for designing plans for monitoring specific resources.

Keywords: Northwest Forest Plan, effectiveness monitoring, adaptive management, regional scale, habitat basis, conceptual model, integration, summary report, interpretive report, institutionalize.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Fire

98-162

Sandberg, David V.; Hardy, Colin C.; Ottmar, Roger D. [and others]

1999. National strategic plan: modeling and data systems for wildland fire and air quality. Gen. Tech. Rep. PNW-GTR-450. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 60 p.

Air pollution from fires used to manage ecosystems is an issue in many parts of the country. Land managers are rapidly expanding the use of fire for managing ecosystems, while air resource managers are accelerating efforts to reduce the impacts of fires on air quality. This plan provides a conceptual design as a first step toward balancing these goals, identifies information needs to support management and policy development, and identifies strategies for developing and implementing models and data systems.

Keywords: Fire, air, wildland fire, fire effects, fire management, fire modeling, air quality, air pollution, air resource management, data systems.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Fish and Wildlife

97-336

Lint, Joseph; Noon, Barry; Anthony, Robert [and others]

1999. Northern spotted owl effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-440. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43 p.

This report describes options for effectiveness monitoring of long-term trends of the northern spotted owl to evaluate the success of the Northwest Forest Plan in arresting downward population trends, and in maintaining and restoring the habitat conditions necessary to support viable owl populations on Federal lands. It describes options to address monitoring questions. A process to report status and trend results is presented that would provide a reference document for decisionmakers during periodic land use plan reviews.

Keywords: Northwest Forest Plan, effectiveness monitoring, northern spotted owl, suitable habitat, demographic study, remote sensing, GIS, landscape, stand-scale, predictive model.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

97-338

Madsen, Sarah; Evans, Diane; Hamer, Thomas [and others]

1998. Marbled murrelet effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-439. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 51 p.

This report describes options for effectiveness monitoring of long-term status and trends of the marbled murrelet to evaluate the success of the Northwest Forest Plan in maintaining and

restoring murrelet nesting habitat and populations on Federal lands. A two-phase approach is described that begins with developing reliable and repeatable processes for identifying nesting habitat and overcoming logistical and statistical problems before habitat and population trends can be accurately assessed. The use of predictive models to evaluate the relation between terrestrial habitat use and conditions and population densities and trends is described along with a process for data analysis and reporting.

Keywords: Northwest Forest Plan, effectiveness monitoring, marbled murrelet, nesting habitat, marine surveys, remote sensing, GIS, landscape, stand-scale, habitat assessment, predictive model.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

97-164

Rowland, Mary M.; Coe, Priscilla K.; Stussy, Rosemary J. [and others]

1998. The Starkey habitat database for ungulate research: construction, documentation, and use. Gen. Tech. Rep. PNW-GTR-430. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 48 p.

The Starkey project began in 1987 in the Starkey Experimental Forest and Range in northeast Oregon. Researchers are studying effects of forest management on interactions and habitat use of mule deer (*Odocoileus odocoileus hemionus*), elk (*Cervus elaphus nelsoni*), and cattle. A habitat database was compiled by using geographic information systems to examine relations between environmental variables and ungulate distribution and habitat use. The database contains over 100 variables associated with water, soils, roads,

topography, and structural features. Database construction and documentation are described for 1987-97. Error estimates for variables and simple applications of the database also are presented.

Keywords: Habitat database, GIS, spatial data, ungulates, mule deer, elk, cattle, northeast Oregon, Starkey project, accuracy assessment, Blue Mountains.

General

99-095

Mills, Thomas J.; Everest, Fred H.; Janik, Phil [and others]

1998. Science-management collaboration: lessons from the revision of the Tongass National Forest plan. *Western Journal of Applied Forestry*. 13(3): 90-96.

The revision of the Tongass National Forest land management plan, completed in May 1997, integrated Forest Service managers and scientists into one interdisciplinary team. This precedent-setting planning model produced a significant body of policy-relevant literature, a National Forest plan that balances competing public desires for natural resources while providing for long-term sustainability of those resources and planning decisions that are consistent with the best available scientific information. During the process, both scientists and managers faced numerous challenges and learned many lessons about collaborative partnerships.

Keywords: Science-management interface, collaboration, Tongass National Forest, land management.

99-096

Mills, Thomas J.; Solberg, Birger

1998. Research contributions to forest policy formulation: opportunities and cautions. In: Proceedings: international consultation on research and information systems in forestry; 1998 September 7-10; Gmunden, Austria. Vienna, Austria: Federal Ministry of Agriculture and Forestry: 19-31.

The importance of research information as an essential foundation for building policies is discussed, with cautions about the confusion of roles between the researcher and policymaker.

Keywords: Science-management interface, policies.

Insects

97-277

Lattin, John D.

1998. A review of the insects and mites found on *Taxus* spp. with emphasis on western North America. Gen. Tech. Rep. PNW-GTR-433. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 12 p.

Forty-two species of insects and mites found on *Taxus* are discussed, including all those known to occur in North America, of which 27 are known to occur in western North America.

Thirty-eight species are phytophagous, and 28 of these have sucking, rather than chewing, mouth parts. It is suggested that some of the chemical compounds present in the foliage of different species of *Taxus* select against chewing insects and favor fluid-feeding arthropods.

Keywords: Taxus, yew, insects, mites, host plant association, North America.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Plant Ecology

97-337

Hemstrom, Miles; Spies, Thomas; Palmer, Craig [and others]

1998. Late-successional and old-growth forest effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-438. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 37 p.

This report presents options for long-term effectiveness monitoring of late-successional and old-growth forests under the Northwest Forest Plan. It describes methods to answer questions about how much late-successional forest exists on Federal land, its pattern, how it is changing, and if the Forest Plan is providing for its conservation and management. A periodic process for reporting the status and trend of late-successional and old-growth forests on Federal lands is described, and links to finer scale monitoring of silvicultural and salvage effects on late-successional and old-growth forests are provided.

Keywords: Northwest Forest Plan, effectiveness monitoring, late-successional and old-growth forest, vegetation map, remote sensing, grid plots, landscape, GIS, stand-scale, trend model.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Recreation

98-030

Gregoire, Timothy G.; Buhyoff, Gregory J.
1999. Sampling and estimating recreational use. Gen. Tech. Rep. PNW-GTR-456. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 39 p.

This report provides guidance on the execution of sampling strategies to estimate recreation use. The procedures described are tools designed for use by resource managers, supervisors, and others in positions of responsibility for the allocation and maintenance of recreational resources.

Keywords: Sampling strategies, confidence intervals, stratified sampling.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Social Science

97-169

Clark, Roger N.; Meidinger, Errol E. [and others]
1998. Integrating science and policy in natural resource management: lessons and opportunities from North America. Gen. Tech. Rep. PNW-GTR-441. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 22 p.

Public pressure to resolve complex and often controversial issues (e.g., health, energy, natural resources) has resulted in policymakers and policy implementers seeking better knowledge on which to base their decisions. As a result, scientists have become more actively engaged in the creation and evaluation of policy. During the last several decades, the literature on the general practice of policy formulation, and issues surrounding the role of science and scientists, has grown markedly.

Keywords: Resource management, policy, science.

(This publication is available to download in pdf format at www.fs.fed.us/pnw/pubs.htm.)

Publications Available Elsewhere

The following publications are available through interlibrary loan, by writing to the locations indicated, or by using the form indicated.

Atmosphere

Bytnerowicz, Andrzej; Fenn, Mark; Ferguson, Sue; Grulke, Nancy

1997. Nutrient cycles and energy flows. In: Bytnerowicz, Andrzej, tech. coord. Atmospheric and biospheric interactions of gases and energy in the Pacific region of the United States, Mexico, and Brazil. Gen. Tech. Rep. PSW-GTR-161. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 13-20.

Carbon and nitrogen are the key elements for any form of life on Earth, and they are also essential constituents of various air pollutants affecting global climate. Better knowledge of carbon and nitrogen global cycles is needed for proper planning of management practices in terrestrial ecosystems. For the same reason, a sound knowledge of the climate-caused changes in distribution and rates of water resources is critically needed.

Keywords: Air pollution, climate change, forests, nutrient cycles, plant responses, simulation modeling.

(A limited supply of PSW-GTR-161 is available. To obtain a copy, email Richard Schneider at rschneider/rmrs@fs.fed.us or write to him at Rocky Mountain Research Station, 3825 E. Mulberry, Fort Collins, CO 80524.)

Bytnerowicz, Andrzej; Ferguson, Sue; Fujioka, Francis [and others]

1997. Simulation modeling: role and status. In: Bytnerowicz, Andrzej, tech. coord. Atmospheric and biospheric interactions of gases and energy in the Pacific region of the United States, Mexico, and Brazil. Gen. Tech. Rep. PSW-GTR-161. Albany, CA:

U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 27-32.

Numerical model simulations can help to explain and summarize current information on atmosphere and biosphere interactions. Absolution results are not possible, because models have unknown errors for both spatial and temporal applications, as well as limitations caused by variability and accuracy of input data. Results of simulation models thus should be considered scenarios of possibilities rather than estimates of future conditions. Simulation models nevertheless are valuable tools because they are designed on the basis of near-past and present conditions and not future conditions that are as yet unknown.

Keywords: Air pollution, climate change, forests, nutrient cycles, plant responses, simulation modeling.

(A limited supply of PSW-GTR-161 is available. To obtain a copy, email Richard Schneider at rschneider/rmrs@fs.fed.us or write to him at Rocky Mountain Research Station, 3825 E. Mulberry, Fort Collins, CO 80524.)

Grulke, Nancy; Miller, Paul; Ottmar, Roger; Poth, Mark

1997. Exchange of gases and aerosols between atmosphere and terrestrial ecosystems. In: Bytnerowicz, Andrzej, tech. coord. Atmospheric and biospheric interactions of gases and energy in the Pacific region of the United States, Mexico, and Brazil. Gen. Tech. Rep. PSW-GTR-161. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 5-11.

Emissions of certain air pollutants have pronounced effects on global temperatures, the amount of ultraviolet radiation reaching the

Earth, and the cycles of carbon and nitrogen. Forest and other terrestrial ecosystems may serve as sources and sinks for these pollutants. Rates of exchange of gases and aerosols between atmosphere and terrestrial ecosystems depend on many biotic and abiotic factors, and climate warming, forest fires, and forest management practices may be listed as some of the most important factors in this regard.

Keywords: Air pollution, climate change, nutrient cycles, plant responses, simulation modeling.

(A limited supply of PSW-GTR-161 is available. To obtain a copy, email Richard Schneider at rschneider/rmrs@fs.fed.us or write to him at Rocky Mountain Research Station, 3825 E. Mulbery, Fort Collins, CO 80524.)

Neilson, Ronald P.; Drapek, Raymond J.
1998. Potentially complex biosphere responses to transient global warming. *Global Change Biology*. 4: 505-521.

Feedback interactions between terrestrial vegetation and climate could alter predictions of the responses of both systems to a doubling of atmospheric carbon dioxide. Most previous analyses of biosphere responses to global warming have used output from equilibrium simulations of current and future climate, as compared to more recently available transient general circulation model (GCM) simulations. Vegetation responses to these two different classes of GCM simulation were compared by using an equilibrium vegetation distribution model, MAPSS (mapped atmosphere plant soil system). Average climatologies were extracted from the transient GCM simulations for current and doubled CO₂ concentrations for use by the equilibrium vegetation model. Most of the differences in global vegetation response appeared to be related to a very different simulated change in the pole-to-tropic temperature change. Also, the transient scenarios

produced much larger increases of precipitation in temperate latitudes, commensurate with a minimum in the latitudinal temperature change.

Keywords: General vegetation model, global warming, land surface, terrestrial biosphere, transient.

(See Corvallis order form B.)

Economics in Forest Management

Fight, Roger D.

1997. Financial analysis of ecosystem management activities in stands dominated by small-diameter trees. In: Barbour, R. James; Skog, Kenneth E., eds. Role of wood production in ecosystem management: Proceedings of the sustainable forestry working group at the IUFRO all division 5 conference; 1997 July; Pullman, WA. Gen. Tech. Rep. FPL-GTR-100. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory: 90-94.

In National Forests of the Intermountain West, attainment of ecosystem management objectives in many areas calls for the removal of small-diameter trees. The purpose of this paper is to describe an analysis tool for assessing the financial feasibility of commercial timber removal in stands dominated by small-diameter trees.

Keywords: Timber harvest, timber sale, ecosystem management, financial analysis.

(A limited supply of FPL-GTR-100 is available. To order, write to: Publications, Forest Products Laboratory, USDA Forest Service, One Gifford Pinchot Drive, Madison, WI 53706-2398.)

Ecosystem Function

Dahm, Hanna; Li, Ching-Yan; Januszek, Kazimierz

1997. Development of microorganisms and oxidation of some organic compounds in soil polluted with heavy metals. *Polish Journal of Soil Science*. XXX(2): 55-63.

Soil microbial populations and activities were compared between nonpolluted soil and soil polluted with heavy metals from industrial

emissions. Soils studied were collected from 22-year-old *Pinus sylvestris* stands and from 27-year-old mixed stands of *Betula verrucosa*, *Quercus sessilis*, and *Larix europea*. The polluted soil contained fewer microorganisms than the nonpolluted soil. Microbial activity, measured by soil enzyme activity, in the polluted soil was lower than that of the nonpolluted soil.

Keywords: Soil enzyme activity, soil biology, heavy metal.

(See Corvallis order form A.)

Everett, Richard; Camp, Ann E.; Furlong, Jim
1998. Impacts of land-use allocations on long-term forest landscape management. In: Calhoun, John M., ed. Forest policy: ready for renaissance. Seattle, WA: University of Washington, College of Forest Resources: 83-96.

Land use allocations partition forest landscapes into specific areas to meet an array of public expectations. The allocation approach works well when there is an abundant land base and the public demands are limited, but it falters when the land base is inadequate to meet an increasing diversity and intensity of use. Continued establishment of land use allocations restricts opportunities for meeting future public expectations and focuses management on segments rather than the entire landscape. As the number and kinds of land use allocations increase, current landscapes are administratively fragmented, and when individual components are managed for specific conditions or products, their contribution to larger scale objectives may be diminished.

Keywords: Land management, land use allocations, landscape management, whole-unit approach, emphasized uses, disturbance events.

(See Wenatchee order form.)

Neilson, Ronald P.

1997. The MAPSS model. In: USDA Forest Service global change research program highlights: 1991-95. Gen. Tech. Rep. NE-237. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Experiment Station: 66-77.

MAPSS (mapped atmosphere plant soil system) is a global biogeography model that simulates the potential natural vegetation that can be supported at any upland site in the world under a long-term steady-state climate. MAPSS operates on the fundamental principle that ecosystems will tend to maximize the leaf area that can be supported at a site by available soil moisture or energy.

Keywords: Biogeography model, LAI, leaf area index, vegetation distribution, simulation.

(See Corvallis order form B.)

Pauley, Eric F.; Collins, Beverly S.; Smith, Winston P.

1996. Early establishment of cherrybark oak in bottomland hardwood gaps: effects of seed predation, gap size, herbivory, and competition. In: Flynn, Kathryn M., ed. Proceedings of the Southern forested wetlands ecology and management conference; 1996 March 25-27; Clemson, SC. Clemson, SC: Clemson University, Consortium for Research in Southern Forested Wetlands: [Pages unknown].

Multiple effects of gap size, seed predation, herbivory, and herb layer competition on emergence, survival, and growth of cherrybark oak were examined.

Keywords: Bottom land hardwoods, cherrybark oak, group-selection harvest, herb competition, herbivory, regeneration, riparian forest, seed predation, uneven-aged management, white-tailed deer.

(See Juneau order form.)

Rózycki, Henryk; Strzelczyk, Edmund; Li, Ching-Yan

1998. Preliminary studies on bacteria of soil and of the root zone of black [*Alnus glutinosa* (L.) Gaertn.] and grey [*A. incana* (L.) Moench.] alder seedlings. *Acta Microbiologica Polonica*. 47(1): 91-103.

Bacterial community structures and functions on root surfaces and soils of black alder, *Alnus glutinosa*, and grey alder, *A. incana*, were studied. Bacterial populations were more numerous on root surface than in rhizosphere or nonrhizosphere soil. Slow-growing bacterial populations also were more numerous on root surface than in rhizosphere soil, where spore-forming bacilli were predominant. The bacteria capable of hydrolyzing urea, casein, gelatine, aesculin, and starch were relatively more frequent in the nonrhizosphere soil than on the root surface.

Keywords: Black alder, rhizosphere microbes, grey alder.

(See Corvallis order form A.)

Sabater, Sergi; Gregory, Stan V.; Sedell, James R. 1998. Community dynamics and metabolism of benthic algae colonizing wood and rock substrata in a forest stream. *Journal of Phycology*. 34: 561-567.

This paper compares both colonization dynamics and metabolism (productivity and respiration) of epixylic and epilithic algal communities in a forest stream of the Cascade Range, Oregon.

Keywords: Colonization, epilithic algae, epixylic algae, metabolism, nitrogen, photosynthesis, respiration, rock, wood.

(See Corvallis order form A.)

Fish and Wildlife

Bryant, Mason D.; Swanston, Douglas N.; Wissmar, Robert C.; Wright, Brenda E.

1998. Coho salmon populations in the karst landscape of North Prince of Wales Island, southeast Alaska. *Transactions of the American Fisheries Society*. 127: 425-433.

Karst topography is a unique and distinct landscape, and its geology may have important implications for salmon productivity in streams. The relation between salmonid communities and water chemistry and the influence of habitat was examined in a set of streams in north Prince of Wales Island, southeast Alaska. Streams in karst landscapes showed higher alkalinities than streams not influenced by karst landscapes. A significant, positive relation was observed between alkalinity and density of coho salmon (*Oncorhynchus kitsutch*) parr. Both coho salmon fry and parr tended to be larger in most karst-influenced streams than in nonkarst streams. Although past timber harvest practices in the riparian areas of several of the streams appeared to influence stream habitat and water temperature, streams flowing through karst landscapes has a distinct water chemistry. Furthermore, these streams appeared to support more fish than nonkarst streams.

Keywords: Coho salmon, Oncorhynchus kitsutch, karst, southeast Alaska, stream ecology.

(See Juneau order form.)

Bull, Evelyn L.; Blumton, Arlene K.

1997. Roosting behavior of postfledgling Vaux's swifts in northeastern Oregon. *Journal of Field Ornithology*. 68(2): 302-305.

In the 3 weeks after young Vaux's swifts (*Chaetura vauxi*) first left the nest, 64 percent of adult swifts and 44 percent of juvenile swifts roosted in the nest tree. The remainder of the

time, they roosted in trees up to 9.2 kilometers from the nest. Juveniles used more roost trees than did adults and went farther from the nest to the roost than did adults.

Keywords: Roost tree, swift, Vaux's swift, breeding, Chaetura vauxi.

(See La Grande order form.)

Cartwright, Margaret A.; Beauchamp, David A.; Bryant, Mason D.

1998. Quantifying cutthroat trout (*Oncorhynchus clarki*) predation on sockeye salmon (*Oncorhynchus nerka*) fry using a bioenergetics approach. Canadian Journal of Fisheries and Aquatic Science. 55: 1285-1295.

Although some sockeye salmon (*Oncorhynchus nerka*) enhancement programs achieve production goals in Alaska lakes, others like the Margaret Lake project fall well below expected levels. Bioenergetics model simulations, coupled with field sampling of predator diet and distribution, were used to quantify the intensity of cutthroat trout (*O. clarki*) predation on stocked sockeye salmon fry in Margaret Lake during 1993 and 1994. Model results indicated that, by September, cutthroat trout consumed an estimated 34 percent to 51 percent and 32 percent to 100 percent of the 200,000 and 1,000,000 sockeye salmon fry stocked in May 1993 and 1994, respectively. September hydroacoustic survey results estimated an 82 to 87 percent decline of fry in 1993 and 90 percent to 93 percent in 1994. Stomach fullness and evacuation estimates of total consumption were 59 percent of model estimates after the first fry release in 1994 and 120 percent of the model estimates after the second release. All approaches to estimating cutthroat trout predation on stocked fry suggested that piscivores played a substantial role in the decline of sockeye salmon fry in Margaret

Lake. The ability to estimate consumption is valuable in isolating predator influence on food web dynamics, especially in manipulated systems.

Keywords: Sockeye salmon, Oncorhynchus nerka, cutthroat trout, Oncorhynchus clarki, predation, Alaska.

(See Juneau order form.)

Gervais, Jennifer A.; Traveset, Anna; Willson, Mary F.

1998. The potential for seed dispersal by the banana slug (*Ariolimax columbianus*). American Midland Naturalist. 140: 103-100.

Banana slugs (*Ariolimax columbianus*) eat fruits of several Pacific Northwest plant species. Slime trails and direct observations indicate that slugs are capable of reaching the fruits of many wild plants and may act as seed dispersers, providing that they defecate viable seeds. In this study, captive slugs were fed the fruits of six herbs and shrubs to determine the effects of slug ingestion on seed germination. The effects on germination were species-specific. Despite the short distances slugs are likely to disperse seeds, their generalist habits and ubiquity suggest that they may have complex and ecologically significant effects on seed dispersal in Pacific Northwest forests.

Keywords: Banana slugs, Ariolimax columbianus, southeast Alaska, seed dispersal, salmonberry, Rubus spectabilis.

(See Juneau order form.)

Hamel, Paul B.; Cooper, Robert J.; Smith, Winston Paul

1998. The uncertain future for cerulean warblers in the Mississippi alluvial valley. In: The delta: connecting points of view for sustainable natural resources; 1996 August 13-16; Memphis, TN. Madison, MS: U.S. Department of Agriculture, Natural Resources Conservation Service: 95-109.

In this investigation, bird counts in randomly selected tracts of bottom land forest were compared with those in targeted, large-area tracts to determine the specific landscape

features associated with occurrences of these Neotropical migratory birds in the Mississippi alluvial valley. The warblers occurred on about half of the tracts selected for their large areas. Extensive tracts of forest, appropriately managed for sawtimber products, as well as publicly owned properties, are likely necessary for the persistence of these birds through the 21st century.

Keywords: Bottom land hardwood forest, cerulean warbler, Dendroica cerulea, forest management, Mississippi alluvial valley, Neotropical migrant, riparian forest, sensitive species, wildlife viability.

(See Juneau order form.)

Holiman, William C.; Benkman, Craig W.; Willson, Mary F.

1998. The importance of mature conifers to red crossbills in southeast Alaska. *Forest Ecology and Management*. 102: 167-172.

Red crossbills (*Loxia curvirostra*) in southeast Alaska feed mostly on seeds in the cones of western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*). During a year of poor cone production, red crossbills did not forage in young stands. Within mature stands, crossbills tended to forage preferentially on trees with large cone crops. These favored trees also were the larger and older trees, because cone production increases with tree size. The avoidance of young stands was especially pronounced during poor seed years and may have been related to the absence of mature trees containing numerous cones with many seeds. Mature stands may be critical for maintaining crossbill populations and possibly other species that eat conifer seeds.

Keywords: Crossbills, Loxia, conifers, southeast Alaska,.

(See Juneau order form.)

Holyan, James A.; Jones, Lawrence L.C.; Raphael, Martin G.

1998. American marten use of cabins as resting sites in central Oregon. *Northwestern Naturalist*. 79: 68-70.

American martens are generally thought of as living in areas removed from human influence. In central Oregon, martens were documented as using three different cabins as resting sites. At least four individuals used one cabin. Each cabin received only seasonal use by humans. The large accumulation of scats in one cabin (about 750) provided evidence of extensive use by martens.

Keywords: American marten, Martes americana, resting site, cabin, scat.

(See Olympia order form.)

Johnson, Bruce K.; Ager, Alan A.; Findholt, Scott L. [and others]

1998. Mitigating spatial differences in observation rate of automated telemetry systems. *Journal of Wildlife Management*. 62(3): 958-967.

Wildlife ecologists are increasingly interested in determining spatial distributions and habitat use of ungulates from locations estimated from both conventional and automated telemetry systems (ATS). An ATS at the Starkey Experimental Forest and Range in northeast Oregon tracks movements of elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and cattle. Localized variation in observation rate of stationary radio collars was detected in 1993, and a method was devised to estimate observation rate at various spatial scales by using animal location data over 4 years to determine if the variation was spatial or random. Five variants of a general linear model were formulated to obtain estimates of spatial variation in observation rate. Random variation accounted for 47 percent to 53 percent, and spatial variation accounted for 38

percent to 45 percent of the variation in observation rate. Semivariograms were useful to detect and quantify spatial variation in observation rate of animal locations determined from ATS.

Keywords: Automated telemetry systems, GPS, habitat selection, LORAN-C, observation rate, radiotelemetry, REML, sampling bias, semivariogram, spatial statistics.

(See La Grande order form.)

Krishnamurthy, Ramesh S.; Kiester, A. Ross
1998. Analysis of lion-tailed macaque habitat fragmentation using satellite imagery. *Current Science*. 75(3): 283-291.

Deforestation and forest fragmentation are the primary threats to the habitat of endangered lion-tailed macaques, *Macaca silenus*, in Karnataka, India. Landsat satellite images of northwest Karnataka, India, from 1977 and 1990 were analyzed and two study sites selected for analysis. Based on a group home range estimate of 131 hectares, contiguous habitat fragments large enough to support two or more groups of lion-tails remained available in the study area in 1990. A single contiguous patch of 14 718 hectares in site 1 and two contiguous patches in site 2 (4276 hectares and 9097 hectares) were available for reintroduction of captive lion-tailed macaque populations. Loss of habitat has been occurring primarily in and around previously disturbed regions. Ground-truthing of the identified potential unfragmented sites confirmed the results of the study.

Keywords: Habitat, fragmentation, macaque, India, satellite imagery.

(See Corvallis order form B.)

General

Cascade Center for Ecosystem Management
1998. Chanterelle mushroom productivity: response to young stand thinning. Corvallis, OR: Oregon State University; [U.S. Department of Agriculture, Forest Service], Pacific

Northwest Research Station; Blue River, OR: [U.S. Department of Agriculture, Forest Service], Willamette National Forest, Blue River Ranger District. 2 p.

Chanterelles are one of the most frequently harvested mushrooms in the National Forests. Response (over time) of chanterelle productivity to thinning treatments was examined by using the already established Young Stand Thinning and Diversity Study on the Blue River, McKenzie, and Oakridge Ranger Districts, Willamette National Forest.

Keywords: Fungi, special forest products, resource management, forest products.

(See Corvallis order form A.)

Gray, A.N.

1998. Old growth/ancient forests, conservation. In: Calow, P., ed. *Encyclopedia of ecology and environmental management*. Oxford, UK: Blackwell Science: 495-497.

The term "old growth" describes forests that have developed over a long period without experiencing catastrophic disturbance. The age at which old growth develops and the specific structural attributes characterizing old growth differ by forest type, climate, site conditions, and disturbance regimes. Most ecologists use a combination of structural characteristics to distinguish old growth from younger forests. Development, abundance, value, and conservation of old growth are discussed in this encyclopedia entry.

Keywords: Old growth, ancient forest, conservation.

(Available only from bookstores and libraries.)

Kline, Jeffrey; Wichelns, Dennis

1998. Measuring heterogeneous preferences for preserving farmland and open space. *Ecological Economics*. 26: 211-224.

Most researchers account for socioeconomic characteristics when conducting public preference surveys but do not account for differences in preferences that transcend socioeconomic categories. Identifying the public's attitudes regarding environmental programs and the role

they play in shaping individuals' preferences for policy alternatives can assist policymakers in developing programs that are consistent with public expectations. This paper uses factor analysis and a discrete choice model to describe differences in public preferences that result from different attitudes regarding the goals of programs designed to preserve farmland and open space. Results describe policy implications that are not apparent when models are used that address socioeconomic characteristics alone.

Keywords: Public preference, environmental amenities.

(See Corvallis order form B.)

Tepljakov, V.K.; Kuzmichev, Y. P.; Baumgartner, D.M.; Everett, R.L.

1998. A history of Russian forestry and its leaders. Pullman, WA: Washington State University, Department of Natural Resource Sciences and Cooperative Extension. 77 p.

This book describes the history and formation of Russian forest policy, legislation, and management from the 8th century to the present time. The beginning of forest science in Russia is described. Advances in soil science, forest ecology, valuation, organization, and management, and the theory of forest use over historical time are discussed. Contributions of influential Russian leaders are described by field and time period.

Keywords: Russian forest history, Russian forestry leaders, Russian forest management, soil science, forest ecology, forest valuation.

(This publication can be purchased from The Washington State University Natural Resources Extension. Please write them at Forestry Publications, Department of Natural Resources, WSU, P.O. Box 646410, Pullman, WA 99164-6410. For U.S. residents, the cost is \$12.00 plus \$3.00 shipping. Washington residents add 7.5% tax. Residents outside the U.S. can find information by navigating to www.ext.nrs.wsu.edu or by sending an email to mguse@coop.ext.cahe.wsu.edu.)

Genetics

Copes, D.L.; Pawuk, W.H.; Farr, W.A.; Silen, R.R. 1996. Relation of crown and foliage traits to height growth of Sitka spruce. *Western Journal of Applied Forestry*. 11(3): 77-80.

Four crown and foliage traits of a young Sitka spruce (*Picea sitchensis*) stand were tested with rooted cuttings in greenhouse and field plots for possible thinning selection guidelines. Repeatability estimates of the amount of genetic control over the four traits and the relation of those traits to height growth were evaluated 5 years after rooting. Only the blue-green trait was significantly associated with height growth. Average height of cuttings selected for green foliage was 17 percent greater than cuttings selected for blue foliage. Under greenhouse conditions, repeatability estimates of green or blue foliage were 98 percent versus 66 percent, respectively; 72 percent versus 89 percent for trees with dense or open crowns, respectively; 65 percent for the comparison of upright and horizontal branches; and 75 percent for the comparison of long or short branches.

Keywords: Sitka spruce, foliage, needle color, height-growth, thinning, selection, tree improvement.

(See Corvallis order form B.)

Insects

Hastings, Felton L.; Werner, Richard A.; Shea, Patrick J.; Holsten, Edward H.

1998. Persistence of carbaryl within boreal, temperate, and mediterranean ecosystems. *Forest Entomology*. 91(3): 665-670.

The dissipation and movement of carbaryl within soils of wet and dry sites in boreal (south-central Alaska), temperate (northwestern North Carolina), and mediterranean (east-central California) ecosystems were determined by high-pressure liquid chromatography analyses at 1, 20, 60, 90, 365, and 485 days after applications of aqueous 2 percent to forest soils. Highest levels of carbaryl occurred within the uppermost soil layers of each site. The greatest carbaryl persistence was within the North Carolina dry

site. All sites, with the exceptions of Alaska dry and North Carolina wet, had carbaryl levels exceeding 20 ppm in the upper layer of soil at 90 days.

Keywords: *Bark beetle control, residues, carbaryl, soils, environmental monitoring, carbamate.*

(See Juneau order form.)

Peck, Robert W.; Equihua-Martinez, Armando; Ross, Darrell W.

1997. Seasonal flight patterns of bark and ambrosia beetles (Coleoptera: Scolytidae) in northeastern Oregon. *Pan-Pacific Entomologist*. 73(4): 204-212.

The abundance and phenology of scolytid beetles collected in multiple-funnel traps baited with the Douglas-fir beetle (*Dendroctonus pseudotsugae* Hopkins) pheromones frontalin, seudenol, MCOL, and ethanol in northeastern Oregon are reported. Other than *D. pseudotsugae*, *D. ponderosae* Hopkins, and *D. rufipennis* (Kirby), 17,612 beetles from 44 species were collected between May 5 and September 21, 1993. *Dendroctonus brevicomis* LeConte and *Hylastes nigrinus* (Mannerheim) were most abundant (comprising 44.5 percent and 31.7 percent of the total, respectively), followed by *Pityophthorus confertus* Swaine (8.5 percent), *D. valens* LeConte (4.2 percent), *H. lognicollis* Swaine (3.4 percent), and *H. ruber* Swaine (2.7 percent). Most species were rare; the combined number of individuals of the 26 least common species comprised less than 1 percent of the total. *Pityophthorus deletus* LeConte and *P. grandis* Blackman are reported from Oregon for the first time. Flight activity for most species began after a seasonal increase in temperature in mid-May and subsided by late July. Seasonal flight patterns are shown for the 14 most abundant species. It is unknown how each species was affected by the lure, but ethanol may have been an important attractant for many species.

Keywords: *Insecta, Scolytidae, Oregon, phenology, pheromones, trapping.*

(See Corvallis order form B.)

Landscape Ecology

Song, Bo; Chen, Jiquan; Desanker, Paul V. [and others]

1997. Modeling canopy structure and heterogeneity across scales: from crowns to canopy. *Forest Ecology and Management*. 96: 217-229.

The primary objective of this study was to develop an efficient modeling approach to describe the three-dimensional hierarchical structure of individual crown shells within stands and coherent canopy patches. Crown shells were modeled by crown ratio, maximum cardinal radius, vertical position, and shape. Canopies were represented by adding unique crowns to simulated point patterns of trees of known aggregation as measured by Pielou's index of nonrandomness.

Keywords: *Crown, canopies, GIS, modeling, hierarchy.*

(See Corvallis order form A.)

Mycorrhizae

Smith, J.E.; Johnson, K.A.; Cázares, E.

1998. Vesicular mycorrhizal colonization of seedlings of Pinaceae and Betulaceae after spore inoculation with *Glomus intraradices*. *Mycorrhiza*. 7: 279-285.

Although Pinaceae and Betulaceae have been reported to contain *Glomus*-type root endophytes, the conditions influencing this symbiosis and its ecological importance are poorly understood. Seedlings of *Abies lasiocarpa*, *Alnus rubra*, *Pinus contorta*, *P. ponderosa*, *Pseudotsuga menziesii*, and *Tsuga heterophylla* were inoculated with *Glomus intraradices* to determine vesicular-arbuscular (VA) mycorrhizae development and responsiveness of these hosts. The role of companion VA mycorrhizal host plants on mycorrhizal colonization and nutrient uptake by *P. menziesii* also was examined in two experiments. Mean phosphorus content in the needles of colonized *P. menziesii* seedlings growth with *Calamagrostis rubescens* was about twice as great as in noncolonized *P. menziesii* seedlings grown with *C. rubescens*. Tissue nitrogen did not differ between these treatments.

Results of both experiments showed that *G. intraradices* colonization of Pinaceae is most successful when a VA host is present, although some colonization of Pinaceae occurred in the absence of a VA host.

Keywords: *Vesicular-arbuscular mycorrhiza, Pinaceae, Betulaceae, Calamagrostis rubescens, Glomus intraradices, spore inoculation.*

(See Corvallis order form B.)

Plant Ecology

Dominguez de Toledo, Laura S.; Castellano, Michael A.

1997. First report of *Gastrosporium simplex* (Gasteromycetes) from South America. Mycotaxon. 64: 443-448.

This paper is a portion of extensive studies to reexamine the Gasteromycete mycota of central Argentina. Specimens were collected on a 1991 trip to the eastern side of the Sierra Grandes de Córdoba. Further study revealed the specimens to be the genus *Gastrosporium*. Previously known only from the Mediterranean and central Europe, Asia Minor, and North America, this is a new record for the Southern Hemisphere.

Keywords: *Gastrosporium, Argentina, trufflelike fungi.*

(See Corvallis order form B.)

Kramer, Paul

1998. Native plant restoration of the copper mine tailings at Holden, WA. Seattle, WA: University of Washington. 90 p. M.S. thesis.

Copper mine tailings are difficult to revegetate owing to nutrient deficiencies, high levels of acidity, and potential metal toxicities. Successful restoration of copper mine tailings piles may require amendment of the existing substrate to create conditions more favorable for plant growth; selection of appropriately adapted species also may be critical. Greenhouse studies were conducted to isolate the effects of amendments on native plant growth and in the field to determine the differences in native plant response. A dramatic increase in nutrient content was associated with the amendment of biosolids. Because Sitka alder was most tolerant

of the tailings and was productive across the different substrates, it was recommended for restoration of this site. Overall, biosolids improved the survival, growth, and nutritional status of the native plants tested for restoration of copper mine tailings.

Keywords: *Copper mine tailings, reforestation, revegetation, amendments, Sitka alder, nutrients, native plants.*

(Available only through library or interlibrary loan.)

Pabst, Robert J.; Spies, Thomas A.

1998. Distribution of herbs and shrubs in relation to landform and canopy cover in riparian forests of coastal Oregon. Canadian Journal of Botany. 76: 298-315.

The objectives of this study were to (1) characterize the composition, distribution, and diversity of herb and shrub species in riparian forests of the central Coast Range of Oregon; (2) identify assemblages or groups of species occurring together on a consistent basis throughout the study area; and (3) relate the distribution of these groups and selected individual species to landforms, forest canopy attributes, and other environmental features.

Keywords: *Plant community ecology, riparian vegetation, landforms, disturbance.*

(See Corvallis order form A.)

Traveset, Anna; Willson, Mary F.

1998. Ecology of the fruit-colour polymorphism in *Rubus spectabilis*. Evolutionary Ecology. 12: 331-345.

Although some studies have focused on the color polymorphisms of flowers and fruits, little is known of their ecological and evolutionary significance. The potential contribution of several factors to the maintenance of fruit-color polymorphism in *Rubus spectabilis*, a common shrub in the temperate rain forests of southeast Alaska, was investigated. This study emphasized

the need to investigate fruits and seed characteristics that correlate with fruit color; the color preferences of avian consumers is only one of several selection pressures that determine the frequency distribution of fruit colors.

Keywords: Avian seed dispersal, color preferences, fruit polymorphism, seed germination, southeast Alaska.

(See Juneau order form.)

Plant Pathology

Hennon, Paul

1997. Summary of panel papers: disturbance in the boreal and sub-boreal forests of North America. In: Sturrock, Rona, comp. Proceedings of the 45th western international forest disease work conference; 1997 September 15-19; Prince George, BC. Victoria, BC: Canadian Forest Service: 11-12.

Concepts of disturbance are gaining popularity among administrators and forest managers because most management activities can be viewed as forms of physical disturbance with ecosystem consequences comparable to natural processes. Discussions included biotic and abiotic agents, including the overarching influence of climate. Fire, insects, tree diseases, and their interactions were considered as disturbance processes. Also considered were the ecosystem responses to these disturbances and how subsequent stand development might then affect the various disturbance agents and processes. Interactions studied among biotic and abiotic factors in the disturbance processes of forests of the Prince George, BC, area made it clear that a single discipline cannot make progress in understanding the complex causes and effects of forest disturbance. It was concluded that this area of study is an excellent arena in which to integrate disciplines of forest science.

Keywords: Disturbance ecology, boreal forests, fire, insects, disease.

(See Juneau order form.)

Maguire, Doug; Kanskie, Alan; Johnson, Randy [and others]

1998. Swiss needle cast growth impact study: report on results from phases I and II. Corvallis, OR: Oregon State University. 33 p.

Douglas-fir plantations in northern coastal Oregon were sampled to document the growth loss attributable to Swiss needle cast. Numerous indicator traits were used to model growth loss. In the final models, needle retention, although not the most correlated variable, was used to estimate growth loss because this variable facilitated statistical inference for the sampled population. On average, top height growth was reduced by about 10 percent in recent years, and basal growth was reduced 25 percent for the sampled population.

Keywords: Swiss needle cast, Phaeocryptopus gaemannii, growth modeling, Douglas-fir, disease.

(See Corvallis order form B.)

Thies, Walt

1997. Chairperson's opening remarks. In: Sturrock, Rona, comp. Proceedings of the 45th western international disease work conference; 1997 September 15-19; Prince George, BC. Victoria, BC: Canadian Forest Service: 5-7.

The profession of forest pathology has changed significantly in the past 24 years; more pathologists now work in the West in this field than ever before. They are more diverse in age, gender, race, skills, and interests. Technology has made them more efficient, and the nature of the job has changed. Managers today are concerned about the impact of diseases on many things, such as succession, increased fire risk, carbon cycling, and soils. Forest health is now seen as a reason for managing.

Keywords: Plant pathology.

(See Corvallis order form B.)

Recreation

Kline, Jeffrey D.; Swallow, Stephen K.
1998. The demand for local access to coastal recreation in southern New England. *Coastal Management*. 26: 177-190.

This paper examines the recreational demand for coastal access to a local, free-access site in southern New England. The study used data obtained from onsite interviews conducted during summer 1995 at Gooseberry Island, Massachusetts. The estimated average value of a visitor-day during the summer season is \$3.06 for weekdays and \$4.18 for weekends and holidays. Although these values are at the low end of the range of values published in existing literature addressing beach recreation, the aggregate value of recreational benefits derived from public access to undeveloped coastal areas likely is significant.

Keywords: Coastal access, contingent valuation, beach recreation.

(See Corvallis order form B.)

Regeneration

Kramer, P.A.; Zabowski, D.; Everett, R.L.; Scherer, G.
1998. Native plant restoration of biosolids-amended copper mine tailings. In: *Mining-gateway to the future: Proceedings of the 25th anniversary and 15th annual national meeting of the American Society for Surface Mining and Reclamation*; 1998 May 17-21; St. Louis, MO. [Place of publication unknown]; The American Society for Surface Mining and Reclamation: 92-100.

A study was conducted on copper mine tailings at Holden, WA, to evaluate the effect of an amendment of biosolids on the survival and growth of five native plant species (Sitka alder, bigleaf maple, fireweed, yarrow, and pearly everlasting). The biosolids amendment was shown to improve the growth of all species except maple. Fireweed produced 62 times more biomass in the biosolids-amended plot

compared to the unamended plot. Biosolids improved the survival, growth, and nutritional status of native plants on the copper mine tailings.

Keywords: Mine reclamation, Holden Mine, biosolids, revegetation, sewage sludge, plant analysis, nutrient uptake.

(See Wenatchee order form.)

Scherer, George; Everett, Richard
1998. Using soil island planting as dispersal vectors in large area copper tailings reforestation. In: *Mining-gateway to the future: Proceedings of the 25th anniversary and 15th annual national meeting of the American Society for Surface Mining and Reclamation*; 1998 May 17-21; St. Louis, MO. [Place of publication unknown]; The American Society for Surface Mining and Reclamation: 78-84.

The Wenatchee National Forest, Washington, undertook the reforestation of the 80-acre Holden copper mine tailings in 1989 by using 20 one-fourth acre, triangular shaped soil islands as a source of plant propagules targeted for gravel-covered tailings surfaces. The islands were constructed of soil and surface litter transported from a nearby gravel pit, and planted with four species of conifer seedlings, the shrub Sitka alder (*Alnus sinuata*), and eight species of grasses. After 36 months, grass seed had migrated 32 feet (11 m) from the soil island source. Grass shoots were present within 10 feet (3 m) downwind of the soil island, the most frequent being mountain brome (*Bromus marginatus*). Among the tree species, lodgepole pine (*Pinus contorta*) and Sitka alder grew an average of 6 inches (15-16 cm) after 40 months on the soil islands but somewhat less on the tailing surface. By the third growing season, the only tree species in reproductive condition on the tailings was alder. The soil-island technique is successful for grass dispersal and may have potential for conifer and alder migration.

Keywords: Mine reforestation, Alnus sinuata, Bromus marginatus, Pinus contorta, Holden mine.

(See Wenatchee order form.)

Remote Sensing

Kennedy, Robert E.; Cohen, Warren B.; Takao, Gen

1997. Empirical methods to compensate for a view-angle-dependent brightness gradient in AVIRIS imagery. *Remote Sensing and Environment*. 62: 277-291.

A view-angle-dependent brightness gradient was observed in an AVIRIS image of a forested region in Oregon's Cascade Range. A method of removing the view-angle effect was sought that would not alter the radiometric integrity of the image and that would require minimal ancillary information. Four methods were tested and evaluated in terms of remaining brightness gradient and retention of spectral characteristics.

Keywords: Remote sensing, satellite data, AVIRIS.

(See Corvallis order form A.)

Social Science

Burke, Tenley Boehm

1998. The capability of GIS to contribute to the social assessment of forest communities: a case study of the Central Cascades adaptive management area. Corvallis, OR: Oregon State University. 112 p. M.S. thesis.

Geographic information systems (GIS) have become essential for evaluating and monitoring the biophysical data of natural landscapes. The potential for using GIS in the social assessment of human landscapes associated with geographic regions of interests was examined. Communities surrounding Oregon's federally designated central Cascades adaptive management area were used as a case study to incorporate primary and secondary socioeconomic data into map layers suitable for assessment and monitoring.

Keywords: Social assessment, spatial analysis, human dimension.

(Available only through library or interlibrary loan.)

Soil, Site, Geology

Baichtal, James F.; Swanston, Douglas N.; Archie, Anne F.

1995. An ecologically-based approach to karst and cave resource management. In: 1995 national cave management symposium proceedings; 1995 October 25-28; Mitchell, IN. Indianapolis, IN: Indiana Karst Conservancy, Inc.: 10-27.

Karst lands impose land management liabilities not encountered in nonkarst areas because this three-dimensional landform functions differently than other landforms. Recognizing these differences, the Tongass National Forest, Alaska, has begun to change its land management strategies accordingly. The strategy proposed here focuses on the extent of the development of the karst topography and systems but most importantly on the openness of that system.

Keywords: Karst, caves, karst management, southeast Alaska.

(See Juneau order form.)

Wissmar, Robert C.; Swanston, Douglas N.; Bryant, Mason; McGee, Katherine

1997. Factors influencing stream chemistry in catchments on Prince of Wales Island, Alaska. *Freshwater Biology*. 38: 301-314.

This study provides a basis for developing a better understanding of the influences of surface-subsurface geological and hydrological factors, and climatic conditions, on stream chemistry and biota in high-latitude ecosystems.

Keywords: Stream chemistry, karst, stream ecology, southeast Alaska.

(See Juneau order form.)

Watershed Management

Benda, Lee E.; Miller, Daniel J.; Dunne, Thomas [and others]

1998. Dynamic landscape systems. In: Naiman, Robert J.; Bilby, Robert E., eds. River ecology and management lessons from the Pacific coastal ecoregion. New York: Springer-Verlag: 261-288. Chapter 11.

Dynamic landscape processes influence the supply, storage, and transport of water, sediment, and wood and shape many aspects of riparian and aquatic habitats. These processes comprise the disturbance regime of a watershed. The study of natural disturbances (and cumulative effects) in riverine and riparian areas requires a fundamental shift in focus from individual landscape elements over short time scales (years) to populations of landscape elements over greater time scales (decades to centuries). Temporal patterns of disturbance are best described by frequency distributions of a specific event occurring and the range of environmental conditions. Describing these distributions provides a framework for understanding and establishing criteria for cumulative effects of land management activities.

Keywords: Landscape dynamics, watersheds, disturbance, cumulative effects.

(Available only from bookstores and libraries.)

Hartsog, William; Kahklen, Keith; Moll, Jeffrey; Swanston, Douglas N.

1997. A monitoring system for measuring effects of roads on groundwater: equipment and installation. San Dimas, CA: U.S. Department of Agriculture, Forest Service, San Dimas Technology and Development Center. 9 p.

This report presents a system for monitoring groundwater levels used by USDA Forest Service field personnel to determine the effects

of roads or other management activities on groundwater resources. The report describes effective site conditions, equipment, installation, and methodologies used in this system.

Keywords: Groundwater, equipment, installation, monitoring.

(See Juneau order form.)

Johnson, Adelaide C.

1998. An investigation of the hydrology and hillslope stability of forests with natural yellow-cedar decline in headwater regions of southeast Alaska. Baltimore, MD: Johns Hopkins University. 52 p. M.S. thesis.

A natural decline in the population of yellow-cedar (*Chamaecyparous nootkatensis*) is occurring in pristine southeast Alaska forests and may be the most significant decline of any forest species in the Western United States. The frequency of landslides in cedar decline areas is three times larger than in areas of healthy forests. Three regions were investigated to determine the influence of yellow-cedar decline on root strength, soil saturation, and consequently, slope stability. Nearly complete deterioration was observed in roots up to 25 mm thick in cedar that had been dead for about 14 years. Soil saturation was quantified with piezometers installed in 120 wells located in steep hillsides with forests of cedar decline, healthy cedar, and spruce-hemlock. Piezometric measurements indicated that the frequency of soil saturation was not greater in areas of cedar decline, thereby suggesting that the increased slide frequency in these areas was due to loss of soil strength through root deterioration.

Keywords: Cedar decline, hydrology, root strength, hillslope stability.

(Available only through library or interlibrary loan.)

Johnson, Adelaide C.; Wilcock, Peter
1998. Effect of root strength and soil saturation on hillslope stability in forests with natural cedar decline in headwater regions of southeast Alaska. In: Haigh, Martin J.; Křeček, Josef; Rajwar, G.S.; Kilmartin, Marianne P., eds. *Headwaters: water resources and soil conservation: Proceedings of headwater '98, the 4th international conference on headwater control*; 1998 April; Merano, Italy. Rotterdam: A.A. Balkema: 381-387.

Three regions in southeast Alaska were investigated to determine the influence of yellow-cedar decline on root strength, soil saturation, and slope stability. Findings suggested that increased slide frequency in these areas is due to loss of soil strength through root deterioration. Complete soil saturation regularly occurred in slide-prone areas of both healthy and dead cedars.

Keywords: Cedar decline, hydrology, root strength, hillslope stability.

(See Juneau order form.)

McClure, Ellen M.
1998. Spatial and temporal trends in bed material and channel morphology below a hydroelectric dam complex, Deschutes River, Oregon. Corvallis, OR: Oregon State University. 85 p. M.S. thesis.

This study assesses the geomorphic impacts upon the Lower Deschutes River, Oregon, below the Pelton Round Butte hydroelectric project. A

conceptual model of spatial and temporal patterns of bed material size is proposed and considers changes in the frequency of bed-mobilizing flows and sediment supply following river impoundment. Results from this study suggested that for rivers where there is minor alteration to the flow regime and sediment supply, and where transport rates are low over time scales, measurable geomorphic impacts may be subdued.

Keywords: Fluvial geomorphology, floods, streamflow regulation, sedimentation.

(Available only through library or interlibrary loan.)

Wood Utilization

Keegan, Charles E., III; Wichman, Daniel P.; Blatner, Keith A. [and others]
1998. Mill residue volume factor changes in Idaho and Montana. *Forest Products Journal*. 48(3): 73-75.

Reported mill residue factors indicate volumes of residue generated per 1,000 board feet of lumber produced and per 1,000 square feet of plywood produced by mills in Idaho and Montana. Historic trends and projected changes are detailed. Since 1969, there has been an approximate 30-percent reduction in the volume of residue produced per 1,000 board feet of lumber and a 20-percent reduction per 1,000 square feet of plywood produced by Idaho mills.

Keywords: Residue, lumber, veneer.

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