ROCKY MOUNTAIN
Research Station

January–March 2005

New Publications

First Quarter 2005

What's Inside . . .

- *Big sagebrush*
- *History of Rocky Mountain Research Station*
- *Stream channel software*
- *Digital data logger*
- *New fact sheets on fuels planning*

. . . and much more

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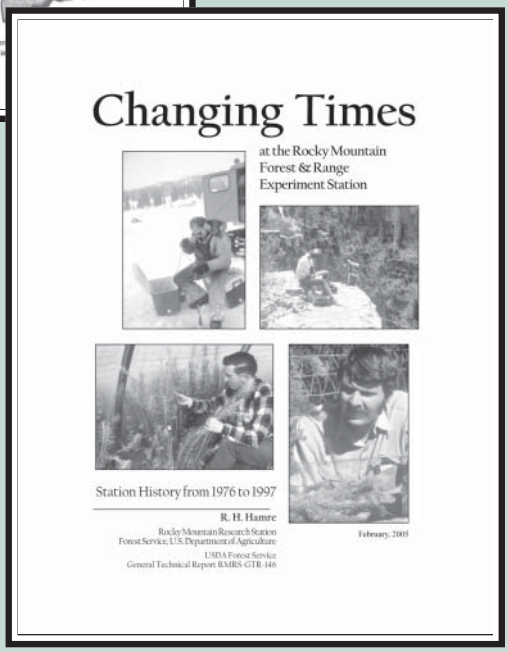

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	Order No.	
Big sagebrush	1	**Big sagebrush: a sea fragmented into lakes, ponds, and puddles**. Welch, Bruce L. 2005. Gen. Tech. Rep. RMRS-GTR-144. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 210 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr144.html Approximately 50 percent of the sagebrush sea that pioneers saw in their travels along the Oregon Trail has given way to agriculture, cities and towns, range management practices, creeping expansion of woodlands, alien weed species, and the historic view that big sagebrush is a worthless plant. Two ideas are promoted in this report: (1) big sagebrush is a nursing mother to a host of organisms that range from microscopic fungi to large mammals, and (2) many range management practices applied to big sagebrush ecosystems are not science based.
Stereophoto guide	2	**Stereo photo guide for estimating canopy fuel characteristics in conifer stands**. Scott, Joe H.; Reinhardt, Elizabeth. 2005. Gen. Tech. Rep. RMRS-GTR-145. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 49 p. plus stereoscope. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr145.html Stereo photographs, hemispherical photographs, and stand data are presented with associated biomass and canopy fuel characteristics for five Interior West conifer stands. Canopy bulk density, canopy base height, canopy biomass by component, available canopy fuel load, and vertical distribution of canopy fuel are presented for each plot at several stages of sampling, each corresponding to a level of simulated low thinning. This guide will help fuel managers estimate canopy fuel characteristics in similar forest conditions.
RMRS history	3	**Changing times at the Rocky Mountain Forest & Range Experiment Station: Station history from 1976 to 1997**. Hamre, R. H. 2005. Gen. Tech. Rep. RMRS-GTR-146. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 66 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr146.html *Changing Times* includes a review of early Station history, touches on changing societal perspectives, how the Station has changed physically and organizationally, technology transfer, a sampling of major characters, how some Station research has been applied, and a timeline of significant and/or interesting events.

	Order No.	
WinXSPRO user's guide	4	**WinXSPRO, a channel cross section analyzer, user's manual, version 3.0**. Hardy, Thomas; Panja, Palavi; Mathias, Dean. 2005. Gen. Tech. Rep. RMRS-GTR-147. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 95 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr147.html WinXSPRO is an interactive Windows™ software package designed to analyze stream channel cross section data for geometric, hydraulic, and sediment transport parameters. WinXSPRO was specifically developed for use in high-gradient streams (gradient >0.01) and supports four alternative resistance equations for computing boundary roughness and resistance to flow. WinXSPRO allows the user to subdivide the channel cross section into multiple subsections and has the ability to vary water-surface slopes with discharge to reflect natural conditions.
Forest biomass	5	**A strategic assessment of forest biomass and fuel reduction treatments in Western States**. 2005. Gen. Tech. Rep. RMRS-GTR-149. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 17 p. http://www.fs.fed.us/research/infocenter.html. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr149.html This assessment characterizes, at a regional scale, forest biomass that can potentially be removed to implement the fuel reduction and ecosystem restoration objectives of the National Fire Plan for the Western United States. The assessment area covers forests on both public and private ownerships in the region and describes all standing tree volume. Analysis of treatment areas and potential removals is included.
Grand Fir Mosaic	6	**Reforestation trials and secondary succession with three levels of overstory shade in the Grand Fir Mosaic ecosystem**. Ferguson, Dennis E.; Byrne, John C.; Coffen, Dale O. 2005. Res. Pap. RMRS-RP-53. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 16 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rp053.html This study tested reforestation practices recommended by previous research, tested hypotheses about the effects of overstory shade on regeneration success, and documented secondary succession.

Still Available—The publication below can be ordered as single or multiple copies (50, 100, or more copies)

Climate variability	7	**Forests: the potential consequences of climate variability and change**. 2001. Washington, DC: U.S. Department of Agriculture, Global Change Program. One 6-page foldout color pamphlet. This pamphlet reports the recent scientific assessment that analyzed how future climate variability and change may affect forests in the United States. The study was conducted by a team of scientists from academia, industry, and government laboratories. It summarizes the key findings of the Forest Sector team in four broad areas: (1) forest productivity and hydrology, (2) disturbances, (3) biodiversity, and (4) socioeconomic impacts.

New RMRS Series Web-Only Publications

These publications are available electronically on our Web site:
http://www.fs.fed.us/rm/main/pubs/electronic.html. No hard copy will be published.

Mexican spotted owl

Winter movements and range use of radio-marked Mexican spotted owls: an evaluation of current management recommendations. Ganey, Joseph L.; Block, William M. 2005. Gen. Tech. Rep. RMRS-GTR-148-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 9 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr148.html

We summarized existing knowledge on winter movements and range and habitat use of radio-marked Mexican spotted owls, and evaluated the adequacy of current management guidelines. Seasonal movement or "migration" appears to be a regular feature of the winter ecology of Mexican spotted owls.

Digital data logger

Measuring stream temperature with digital data loggers: a user's guide. Dunham, Jason; Chandler, Gwynne; Rieman, Bruce; Martin, Don. 2005. Gen. Tech. Rep. RMRS-GTR-150WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 15 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_gtr150.html

Digital data loggers (thermographs) are among the most widespread instruments in use for monitoring physical conditions in aquatic ecosystems. The intent of this protocol is to provide guidelines for selecting and programming data loggers, sampling water temperatures in the field, data screening and analysis, and data archiving.

Wildfire supression

Comparing resource values at risk from wildfires with Forest Service fire suppression expenditures: examples from 2003 western Montana wildfire season. Calkin, David; Hyde, Kevin; Gebert, Krista; Jones, Greg. 2005. Res. Note RMRS-RN-24WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 8 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn024.html

Determining the economic effectiveness of wildfire suppression activities is complicated by difficulties in identifying the area that would have burned and the associated resource value changes had suppression resources not been employed. We developed a case study using break-even analysis for two large wildfires from the 2003 fire season in western Montana—the Black Mountain and Crazy Horse Fires. We used GIS to identify the location and taxable value of private residences within perimeters expanding in a likely direction of fire spread for both fires. We identified the size of an expanded perimeter where the market values of private property equaled the amount of money spent suppressing a fire (the break even point).

Wildfire risk

Mitigation of wildfire risk by homeowners. Brenkert, Hannah; Champ, Patricia; Flores, Nicholas. 2005. Res. Note RMRS-RN-25WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 9 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn025.html

In-depth interviews conducted with homeowners in Larimer County's Wildland-Urban Interface revealed that homeowners face difficult decisions regarding the implementation of wildfire mitigation measures. Perceptions of wildfire mitigation options may be as important as perceptions of wildfire risk in determining likelihood of implementation. These mitigation options are often viewed as trade-offs between wildfire risk and preferred landscapes. Study participants reported, however, that one-on-one information sharing with fire experts as well as an increased understanding of the flexibility of mitigation options encourage implementation of wildfire mitigation measures.

New Fire Synthesis Fact Sheets

The current Research Notes in this series are available only in PDF format on our Web site:
http://www.fs.fed.us/rm/main/pubs/electronic/rmrs_fuels_plan.html; no hard copy will be published.

Economic uses

Fuels planning: science synthesis and integration; economic uses fact sheet 4: My Fuel Treatment Planner. 2005. Res. Note RMRS-RN-20-4-WWW Revised. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

My Fuel Treatment Planner (MyFTP) is a user-friendly spreadsheet application that helps the user answer the questions of which trees to cut, what material to utilize for forest products versus treatment in place, equipment options, what types of stands to treat, as well as provides a way to calculate cost or net revenue of treatments and fuel surface loads following treatment. This fact sheet identifies the intended users and uses, required inputs, what the model does and does not do, and tells the user how to obtain the model.

Forest structure and fire hazard

Fuels planning: science synthesis and integration; forest structure and fire hazard fact sheet 6: Guide to fuel treatments in dry forests of the Western United States: assessing forest structure and fire hazard. 2005. Res. Note RMRS-RN-22-6-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

The Guide to Fuel Treatments analyzes a range of potential silvicultural thinnings and surface fuel treatments for 25 representative dry-forest stands in the Western United States. The guide provides quantitative guidelines and visualization for treatment based on scientific principles identified for reducing potential crown fires. This fact sheet identifies the intended users and uses, required inputs, what the model does, and tells the user how to obtain the model.

Environmental consequences

Fuels planning: science synthesis and integration; environmental consequences fact sheet 8: Evaluating sedimentation risks associated with fuel management. Elliot, William; Robichaud, Pete. 2005. Res. Note RMRS-RN-23-8-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

This fact sheet describes the sources of sediment in upland forest watersheds in the context of fuel management activities. It presents the dominant forest soil erosion processes, and the principles behind the new sediment delivery interface developed to aid in erosion analysis of fuel management projects.

FFE-FVS

Fuels planning: science synthesis and integration; environmental consequences fact sheet 9: Fire and Fuels Extension to the Forest Vegetation Simulator (FFE-FVS). Reinhardt, Elizabeth. 2005. Res. Note RMRS-RN-23-9-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

FFE-FVS is a model linking stand development, fuel dynamics, fire behavior and fire effects. It allows comparison of mid- to long-term effects of management alternatives including harvest, mechanical fuel treatment, prescribed fire, salvage, and no action. This fact sheet identifies the intended users and uses, required inputs, what the model does, and tells the user how to obtain the model.

Understory Response Model

Fuel planning: science synthesis and integration; environmental consequences fact sheet 10: The Understory Response Model. Sutherland, Steve; Miller, Melanie. 2005. Res. Note RMRS-RN-23-10-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

The Understory Response Model is a species-specific computer model that qualitatively predicts change in total species biomass for grasses, forbs, and shrubs after thinning, prescribed fire, or wildfire. The model examines the effect of fuels management on plant survivorship and reproduction. This fact sheet identifies the intended users and uses, required inputs, what the model does and does not do, and tells the user how to obtain the model.

Smoke Impact Spreadsheet

Fuels planning: science synthesis and integration; environmental consequences fact sheet 11: Smoke Impact Spreadsheet (SIS) model. Wickman, Trent; Acheson, Ann. 2005. Res. Note RMRS-RN-23-11-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

The Smoke Impact Spreadsheet (SIS) is a simple-to-use planning model for calculating particulate matter (PM) emissions and concentrations downwind of wildland fires. This fact sheet identifies the intended users and uses, required inputs, what the model does and does not do, and tells the user how to obtain the model.

WEPP

Fuels planning: science synthesis and integration; environmental consequences fact sheet 12: Water Erosion Prediction Project (WEPP) Fuel Management (FuMe) tool. Elliot, William; Hall, David. 2005. Res. Note RMRS-RN-23-12-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

The Water Erosion Prediction Project (WEPP) Fuel Management (FuMe) tool was developed to estimate sediment generated by fuel management activities. WEPP FuMe estimates sediment generated for 12 fuel-related conditions from a single input. This fact sheet identifies the intended users and uses, required inputs, what the model does, and tells the user how to obtain the model.

***Armilaria* Response tool**

Fuels planning: science synthesis and integration; environmental consequences fact sheet 13: Root Disease Analyzer—*Armillaria* Response Tool (ART). McDonald, Geral I.; Tanimoto, Philip D.; Rice, Thomas M.; Hall, David E.; Stewart, Jane E.; Zambino, Paul J.; Tonn, Jonalea R.; Klopfenstein, Ned B.; Kim, Mee-Sook. 2005. Res. Note RMRS-RN-23-13-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p.

The Root Disease Analyzer—*Armillaria* Response Tool (ART)—is a Web-based tool that estimates *Armillaria* root disease risk in dry forests of the Western United States. This fact sheet identifies the intended users and uses, required inputs, what the model does and does not do, and tells the user how to obtain the model.

Publications Available From Other Sources

Obtain the following publications through university libraries, the publisher, or other outlets. Forest Service employees in RMRS, R-2, R-3, and R-4, and some selected WO-Detached units may request these items from the RMRS Library at cclay@fs.fed.us or telephone: (970) 498-1205.

Fire

Tongue-tied: Understanding intensity and severity within the fire disturbance continuum. Jain, Theresa B.; Pilliod, David S.; Graham, Russell T. 2004. Wildfire Magazine. July/August: 22–26.

Environmental management

The status and management of exotic and invasive species in National Wildlife Refuge Wilderness areas. Tempel, Douglas J.; Cilimburg, Amy B.; Wright, Vita. 2004. Natural Areas Journal. 24(4): 300–306.

Disturbance ecology

Restoring dry and moist forests of the inland northwestern U.S. Jain, Theresa B.; Graham, Russell T. 2005. In: Stanturf, John A.; Madsen, Palle, eds. Restoration of boreal and temperate forests. Boca Raton, FL: CRC Press: 463–480.

Ecosystem management

How do land managers adopt scientific knowledge and technology? Contributions of the *Diffusion of Innovations* theory. Wright, V. 2004. In: Munro, Neil; Dearden, Phil; Herman, Tom B.; Beazley, Karen; Sorun, Bondrup-Nielson, eds. Making ecosystem-based management work. Proceedings of the fifth international conference on science and management of protected areas; 2003 May 11–16; Victoria, BC. Wolfville, Nova Scotia: Science and Management of Protected Areas Association. 9 p.

Barriers to science-based management: What are they and what can we do about them? (Session Summary). Wright, Vita. 2004. In: Harmon, David; Kilgore, Bruce M.; Vietzke, Gay, eds. Protecting our diverse heritage: the role of parks, protected areas, and cultural sites. Hancock, MI: George Wright Society: 34–37.

Recreation/wilderness

Environmental impacts associated with recreational horse-riding. Newsome, David; Cole, David N.; Marion, Jeffrey L. 2004. In: Buckley, R., ed. Environmental impacts of ecotourism. CAB International: 61–82.

Environmental impacts of outdoor recreation in wildlands. Cole, David N. 2004. In: Manfredo, Michael J.; Vaske, Jerry J.; Bruyere, Brett L.; Field, Donald R.; Brown, Perry J., eds. Society and natural resources: a summary of knowledge. Jefferson, MO: Modern Litho: 107–116.

An exploratory study of the complexities of coping behavior in Adirondack wilderness. Johnson, Andrew K.; Dawson, Chad P. 2004. Leisure Sciences. 26: 281–293.

Impacts of hiking and camping on soils and vegetation: a review. Cole, David N. 2004. In: Buckley, R., ed. Environmental impacts of ecotourism. CAB International: 41–60.

Monitoring and management of recreation in protected areas: the contributions and limitations of science. Cole, David N. 2004. In: Slevanen, T.; Erkkonen, J.; Jokimaki, J.; Saarinen, J.; Tuulentie, S.; Virtanen, E., eds. Policies, methods and tools for visitor management; proceedings, second international conference on monitoring and management of visitor flows in recreational and protected areas; 2004 June 16–20; Rovaniemi, Finland. Working Papers of the Finnish Forest Research Institute: 9–16.

New tools to access wilderness research information. Wright, Vita. 2003. Park Science. 22(1): 7–8.

The relationship between Qikiktagrugmuit (Kotzebue tribal members) and the Western Arctic Parklands, Alaska, United States. Whiting, Alex. 2004. International Journal of Wilderness. 10(2): 28–31, 8.

A taste of the North: voices from the wilderness about the wilderness character of Alaska. Watson, Alan E.; Kneeshaw, Katie; Glaspell, Brian. 2004. International Journal of Wilderness. 10(2): 4–8.

Wilderness research in South Africa: defining priorities at the intersection of qualities, threats, values and stakeholders. Shroyer, Maretha; Watson, Alan; Muir, Andrew. 2003. International Journal of Wilderness. 9(1): 41–45.

Plant biology

The *Ribes* of Colorado and New Mexico and their rust fungi. Van Arsdel, Eugene P.; Geils, Brian W. 2004. FHTET 04-13. Fort Collins, CO: U.S. Deaprtment of Agriculture, Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 32 p. Available: http://www.fs.fed.us/foresthealth/technology/publications/ribesofcolorado.pdf

Western white pine growth relative to forest openings. Jain, Theresa B.; Graham, Russell T.; Morgan, Penelope. 2004. Canadian Journal of Forest Research. 34: 2187–2198.

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Studies accelerate solutions to problems involving ecosystems, range, forests, water, recreation, fire, resource inventory, land reclamation, community sustainability, forest engineering technology, multiple use economics, wildlife and fish habitat, and forest insects and diseases. Studies are conducted cooperatively, and applications can be found worldwide.

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9	28	47	66	85
10	29	48	67	86
11	30	49	68	87
12	31	50	69	88
13	32	51	70	89
14	33	52	71	90
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16	35	54	73	92
17	36	55	74	93
18	37	56	75	94
19	38	57	76	95

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