ROCKY MOUNTAIN
Research Station

October–December 2004

New Publications

Fourth Quarter 2004

What's Inside . . .

- *Prescribed fire workshop*
- *Riparian vegetation sampling methods*
- *Idaho's forest products industry*
- *New fact sheets on fuels planning*
- *Middle Rio Grande fuels reduction study*

. . . and much more

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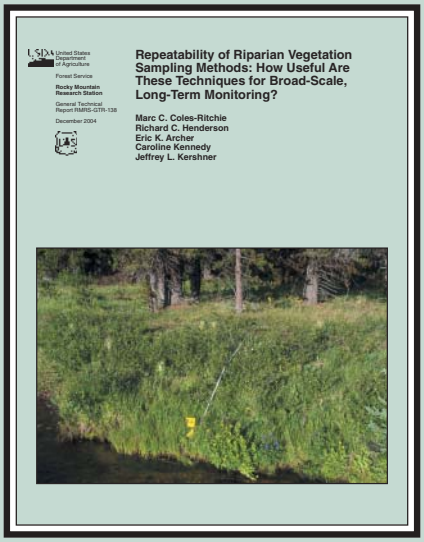

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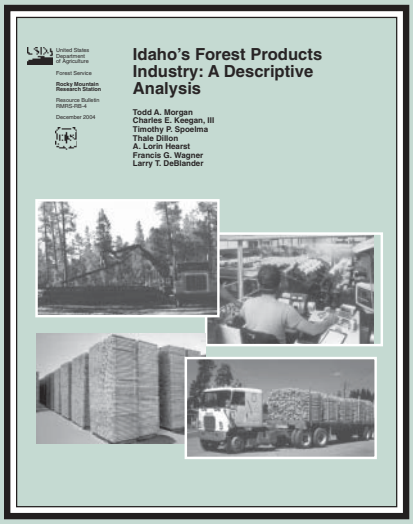

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	Order No.	
Prescribed fire	41	**Managing the unexpected in prescribed fire and fire use options: a workshop on the high reliability organization**. Keller, Paul, tech. ed. 2004. Gen. Tech. Rep. RMRS-GTR-137. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 73 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr137.html Fire management, and forest and rangeland fuels management, over the past century have altered the wildland fire situation dramatically, thus also altering the institutional approach to how to deal with the changing landscape. Also, climate change, extended drought, increased insect and disease outbreaks, and invasions of exotic plant species have added complications to fire management on public and private lands. In an effort at a national campaign to deal with the overall issue of fire management, eight Federal and nongovernmental organizations met in Santa Fe, NM, for 4 days in May 2004 to explore cooperative efforts and alternative options. The "Managing the Unexpected Workshop" goal was to explore and possibly adopt the concepts of the "High Reliability Organization" to managing for unexpected fire events and plan for fire uses. This publication includes presentation material, discussion points, alternatives explored, and planning efforts.
Riparian sampling methods	42	**Repeatability of riparian vegetation sampling methods: how useful are these techniques for broad-scale, long-term monitoring?** Coles-Ritchie, Marc C.; Henderson, Richard C.; Archer, Eric K.; Kennedy, Caroline; Kershner, Jeffrey L. 2004. Gen. Tech. Rep. RMRS-GTR-138. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 18 p. Tests were conducted to evaluate variability among observers for riparian vegetation data collection methods and data reduction techniques. The methods are used as part of a large-scale monitoring program designed to detect changes in riparian resource conditions on Federal lands. Methods were evaluated using agreement matrices, the Bray-Curtis dissimilarity metric, the coefficient of variation, the percentage of total variability attributed to observers, and estimates of the number of sites needed to detect change. Studies that seek to detect change at a single site would need to take into account the observer variability described here. Studies that seek to detect differences between populations of sites could detect relatively large changes with these methods and ratings. Small differences among populations would be difficult to detect with a high degree of confidence, unless hundreds of sites were sampled.

Idaho's forest products industry

Order No. 43

Idaho's forest products industry: a descriptive analysis. Morgan, Todd A.; Keegan, Charles E., III; Spoelma, Timothy P.; Dillon, Thale; Hearst, A. Lorin; Wagner, Francis G.; DeBlander, Larry T. 2004. Resour. Bull. RMRS-RB-4. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 31 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_rb004.html

This report provides a description of the structure, capacity, and condition of Idaho's primary forest products industry; traces the flow of Idaho's 2001 timber harvest through the primary sectors; and quantifies volumes and uses of wood fiber. The economic contribution of the forest products industry to the State and historical industry changes are discussed, as well as trends in timber harvest, production, and sales.

Government publications still available while supplies last

Order No.

44 **Assessing crown fire potential by linking models of surface and crown fire behavior.** Scott, Joe H.; Reinhardt, Elizabeth D. 2001. Res. Pap. RMRS-RP-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 59 p.

45 **Development of coarse-scale spatial data for wildland fire and fuel management.** Schmidt, Kirsten M.; Menakis, James P.; Hardy, Colin C.; Hann, Wendel J.; Bunnell, David L. 2002. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 p. + CD.

46 **Fire, fuel treatments, and ecological restoration: conference proceedings;** 2002 16-18 April; Fort Collins, CO. Omi, Philip N.; Joyce, Linda A., tech. eds. 2003. Proceedings RMRS-P-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 475 p.

47 **Hayman Fire Case Study**. Graham, Russell T., tech. ed. 2003. Gen. Tech. Rep. RMRS-GTR-114. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 396 p.

48 **Hayman Fire Case Study: summary**. Graham, Russell T., tech. ed. 2003. Gen. Tech. Rep. RMRS-GTR-115. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 32 p.

49 **Hayman Fire Case Study [CD].** Graham, Russell T., tech. ed. 2003. Gen. Tech. Rep. RMRS-GTR-114,115 CD. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. GTR-114: 396 p.; GTR-115: 32 p. One CD.

Order No.

50 **Mistletoes of North American conifers**. Geils, Brian W.; Cibrián Tovar, Jose; Moody, Benjamin, tech. coords. 2002. Gen. Tech. Rep. RMRS-GTR-98. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 123 p.

51 **Proceedings: shrubland ecotones**; 1998 August 12–14; Ephraim, UT. McArthur, E. Durant: Ostler, W. Kent; Wambolt, Carl L., comps. 1999. Proc. RMRS-P-11. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 299 p.

52 **Proceedings: wildland shrub and arid land restoration symposium**; 1993 October 19-21; Las Vegas, NV. Roundy, Bruce A.; McArthur, E. Durant; Haley, Jennifer S.; Mann, David K., comps. 1995. Gen. Tech. Rep. INT-GTR-315. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 384 p.

53 **Sampling surface and subsurface particle-size distributions in wadable gravel-and cobble-bed streams for analyses in sediment transport, hydraulics, and streambed monitoring.** Bunte, Kristin; Abt, Steven R. 2001. Gen. Tech. Rep. RMRS-GTR-74. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 428 p.

54 **Science basis for changing forest structure to modify wildfire behavior and severity**. Graham, Russell T.; McCaffrey, Sarah; Jain, Theresa B., tech. eds. 2004. Gen. Tech. Rep. RMRS-GTR-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 43 p.

55 **Seed and soil dynamics in shrubland ecosystems: proceedings;** 2002 August 12–16; Laramie, WY. Hild, Ann L.; Shaw, Nancy L.; Meyer, Susan E.; Booth, D. Terrance; McArthur, E. Durant, comps. 2004. Proc. RMRS-P-31. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 216 p.

New to Our Web Site: Fuels Planning Fact Sheets

The geographic focus of the "Fuels Planning Science Synthesis and Integration" project (known as the Fuels Synthesis Project) is on the dry forests of the Western United States. Project goals include developing accessible analyses, protocols, and tools; writing peer-reviewed documents that synthesize and integrate the ecological and social science relevant to fuels treatments; and delivering these products in a user-friendly format. Target audiences include fuels management specialists, resource specialists, National Environmental Policy Act (NEPA) planning team leaders, line officers in the USDA Forest Service and the Department of the Interior; community leaders; and educators.

Teams of scientific experts from public agencies, their management counterparts, and university researchers across the country are working in the four key topic areas to develop a variety of information products for the target audiences. The fact sheets are part of the ongoing information program. Look for current and future fact sheets in the Rocky Mountain Research Station (RMRS) Research Note (RN) series:

RMRS-RN-19: Overview of the Project
RMRS-RN-20: Economic Uses
RMRS-RN-21: Social Issues
RMRS-RN-22: Forest Structure and Fire Hazards
RMRS-RN-23: Environmental Consequences

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. Check the Web site frequently for more fact sheets in the next few months.

New Fact Sheets

Economic uses

Fuels planning: science synthesis and integration; economic uses fact sheet 8: prescribed fire costs. 2004. Res. Note RMRS-RN-20-8-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn020_08.pdf

Although the use of prescribed fire as a management tool is widespread, there is great variability and uncertainty in the treatment costs. Given specific site variables and management objectives, how much will it cost to use prescribed fire? This paper describes the FASTRACS database, a tool that has been developed to aid managers in answering this question.

Forest structure and fire hazard

Fuels planning: science synthesis and integration; forest structure and fire hazard fact sheet 5: fuel treatment principles for complex landscapes. 2004. Res. Note RMRS-RN-22-5-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn022_05.pdf

Appropriate types of thinning and surface fuel treatments are clearly useful in reducing surface and crown fire hazards under a wide range of fuels and topographic situations. This paper provides well-established scientific principles and simulation tools that can be used to adjust fuel treatments to attain specific risk levels.

Environmental consequences

Fuels planning: science synthesis and integration; environmental consequences fact sheet 4: wildlife responses to fuels treatments: key considerations. Pilliod, David. 2004. Res. Note RMRS-RN-23-4-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn023_04.pdf

Managers face a difficult task in predicting the effects of fuels treatments on wildlife populations, mostly because information on how animals respond to fuels treatments is unavailable or does not exist. This paper discusses key considerations—aspects of an animal's ecology and available information—that despite this scarcity of information, may make predictions of effects possible.

Fuels planning: science synthesis and integration; environmental consequences fact sheet 5: prescriptions and fire effects. Miller, Melanie. 2004. Res. Note RMRS-RN-23-5-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn023_05.pdf

While our understanding of the causes for variation in postfire effects is increasing, burn prescriptions may not always include parameters that control the long-term heat pulse from fire. This paper discusses (1) fuel consumption and fire effects, (2) prescription design considerations, and (3) planning a prescribed fire.

Fuels planning: science synthesis and integration; environmental consequences fact sheet 6: wildland fire use: the "other" treatment option. Black, Anne. 2004. Res. Note RMRS-RN-23-6-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn023_06.pdf

Fire suppression has reduced acres burned to an average of 2 million acres a year. An unfortunate result of this has been the accumultaion of even more above-normal fuel loads in many areas. This paper discusses (1) the important ecological role of fire, (2) using fire as a fuels treatment, and (3) the benefits and risks of fire.

Fuels planning: science synthesis and integration; environmental consequences fact sheet 7: fire and weeds. Sutherland, Steve. 2004. Res. Note RMRS-RN-23-7-WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 2 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn023_07.pdf

Weed infestations cause an economic loss of $13 billion per year even though $9.5 billion per year is spent on weed control measures. In addition to these economic costs, weeds are replacing native species, altering native plant and animal communities, affecting ecosystem health and function, threatening biodiversity and Threatened, Endangered, and Sensitive (TES) species, altering fire behavior and fire regimes, and reducing wildland productivity. This paper discusses (1) where weeds are found, (2) what promotes weed invasions, and (3) how to incorporate weed management into fuel treatment activities.

Other Fact Sheet Titles

Fuels synthesis project overview. Res. Note RMRS-RN-19-WWW.

Economic uses

Mastication treatments and costs. Res. Note RMRS-RN-20-1-WWW.

Log hauling cost. Res. Note RMRS-RN-20-2-WWW.

Economic impacts of fuel treatments. Res. Note RMRS-RN-20-3-WWW.

My Fuel Treatment Planner. Res. Note RMRS-RN-20-4-WWW.

NEPA and economics. Res. Note RMRS-RN-20-5-WWW.

Selection criteria analysis. Res. Note RMRS-RN-20-6-WWW.

Markets and log prices. Res. Note RMRS-RN-20-7-WWW.

Social issues

Developing personal responsibility for fuels reduction: building a successful program to engage property owners. 2004. Res. Note RMRS-RN-21-1-WWW.

Developing personal responsibility for fuels reduction: types of information to encourage proactive behavior. 2004. Res. Note RMRS-RN-21-2-WWW.

Developing personal responsibility for fuels reduction: more ways to catch and hold people's attention. 2004. Res. Note RMRS-RN-21-3-WWW.

Three critical topics to cover when talking about hazards. 2004. Res. Note RMRS-RN-21-4-WWW.

The importance of working locally. 2004. Res. Note RMRS-RN-21-5-WWW.

Important considerations for communicating about hazards. 2004. Res. Note RMRS-RN-21-6-WWW.

The "laws" of effective public education about fire hazards. 2004. Res. Note RMRS-RN-21-7-WWW.

The "Golden Rule" and other lessons on communicating about hazards. 2004. Res. Note RMRS-RN-21-8-WWW.

Forest structure and fire hazard

Forest structure and fire hazard overview. 2004. Res. Note RMRS-RN-22-1-WWW.

Fire hazard. 2004. Res. Note RMRS-RN-22-2-WWW.

Visualizing forest structure and fuels. 2004. Res. Note RMRS-RN-22-3-WWW.

Role of silviculture in fuel treatments. 2004. Res. Note RMRS-RN-22-4-WWW.

Environmental consequences

Fire Effects Information System (FEIS). Sutherland, Steve. 2004. Res. Note RMRS-RN-23-1-WWW.

First Order Fire Effects Model (FOFEM). Sutherland, Steve. 2004. Res. Note RMRS-RN-23-2-WWW.

Structure fires in the wildland-urban interface. Sutherland, Steve. 2004. Res. Note RMRS-RN-23-3-WWW.

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.

Atmosphere/climate

Assessing population responses to climate in *Pinus sylvestris* and *Larix* spp. of Eurasia with climate-transfer models. Rehfeldt, Gerald E.; Tchebakova, Nadejda M.; Milyutin, Leonid I.; Parfenova, Elena I.; Wykoff, William R.; Kouzmina, Nina A. 2003. Eurasian Journal of Forest Research. 6-2: 83–98.

Developing a long-term, high-resolution, continental-scale, spatially distributed time-series of topographically corrected solar radiation. Hobbins, Michael T.; Ramirez, Jorge A.; Brown, Thomas C. 2004. In: Ramirez, J. A., comp. Proceedings of the 24th annual American Geophysical Union hydrology days; Fort Collins: Colorado State University: 103–119. Available: http://hydrologydays.colostate.edu/Proceedings.htm [December 14, 2004].

Genetic responses to climate and climate-change in conifers of the temperate and boreal forests. Rehfeldt, Gerald E.; Tchebakova, Nadezda M.; Parfenova, Elena I. 2004. Recent Research Development in Genetic Breeding. 1: 113–130.

Patterns and sources of multidecadal oscillations in drought-sensitive tree-ring records from the central and southern Rocky Mountains. Gray, Stephen T.; Betancourt, Julio L.; Fastie, Christopher L.; Jackson, Stephen T. 2003. Geophysical Research Letters. 30(6): 49-1–49-4.

Sublimation of intercepted snow within a subalpine forest canopy at two elevations. Montesi, James; Elder, Kelly; Schmidt, R. A.; Davis, Robert E. 2004. Journal of Hydrometeorology—Special Section. 5: 763–773.

Trends in pan evaporation and actual evapotranspiration across the conterminous U.S.: paradoxical or complementary? Hobbins, Michael T.; Ramirez, Jorge A.; Brown, Thomas C. 2004. Geophysical Research Letters. 31: L13503, doi:10.1029/2004GL019846.

Fire

Analysis of algorithms for predicting canopy fuel. Gray, Katharine L.; Reinhardt, Elizabeth. 2003. In: Second international wildland fire ecology and fire management congress and fifth symposium on fire and forest meteorology; 2003 November 16–20; Orlando, FL. Boston, MA: American Meteorological Society. P5.8. 11 p. Available: http://ams.confex.com/ams/FIRE2003/techprogram/program_160.htm. [December 17, 2004].

Bulk density and fuel loads of ponderosa pine and white fir forest floors: impacts of leaf morphology. Stephens, Scott L.; Finney, Mark A.; Schantz, Heidi. 2004. Northwest Science. 78(2): 93–100.

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Douglas-fir beetle attack and tree mortality following wildfire. Hood, Sharon M.; Bentz, Barbara; Ryan, Kevin C. 2003. In: Second international wildland fire ecology and fire management congress and fifth symposium on fire and forest meteorology; 2003 November 16–20; Orlando, FL. Boston, MA: American Meteorological Society. 6B.3. 6 p. Available: http://ams.confex.com/ams/FIRE2003/techprogram/program_160.htm. [December 17, 2004].

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Factors influencing occupancy of nest cavities in recently burned forests. Saab, Victoria A.; Dudley, Jonathan; Thompson, William L. 2004. The Condor. 106: 20–36.

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Foreword. Smith, Jane Kapler. 2004. In: Cottrell, William H., Jr. The book of fire. 2d ed. Missoula, MT: Mountain Press Publishing Company: iv–v.

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Fire Effects Information Database

The Fire Effects Information database is available online through the Rocky Mountain Research Station Web site: http://www.fs.fed.us/database/feis/. FEIS provides up-to-date information about fire effects on plants and animals. It was developed at the USDA Forest Service Rocky Mountain Research Station's Fire Sciences Laboratory in Missoula, Montana. The FEIS database contains literature reviews, taken from current English-language literature of almost 900 plant species, about 100 animal species, and 16 Küchler plant communities found on the North American continent. The emphasis of each review is fire and how it affects each species. Background information on taxonomy, distribution, basic biology and ecology of each species is also included. Reviews are thoroughly documented, and each contains a complete bibliography. Managers from several land management agencies (U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Indian Affairs, Bureau of Land management, Fish and Wildlife Service, and National Park Service) identified the species to be included in the database. Those agencies funded the original work and continue to support maintenance and updating of the database. Species recently added include:

Species name	Common name
Ailanthus altissima	tree-of-heaven, tee of heaven, smoke tree, stink tree, Chinese sumac
Artemisia filifolia	sand sagebrush, sand sage, old-man sagebrush
Artemisia rigida	stiff sagebrush, scabland sagebrush
Arundo donax	giant reed, arundo grass, donax cane
Atriplex canescens	fourwing saltbush, four-wing saltbush, chamiso, chamiza, thinleaf fourwing saltbush (*Atriplex canescens* var. *linearis*)
Cardaria spp.	hoary cress, globe-pod hoarycress,– hairy whitetop, heart-pod hoarycress, lens-pod hoarycress, lenspod whitetop, whitetop
Chondrilla juncea	rush skeletonweed, hogbite, nakedweed, skeletonweed
Convolvulus arvensis	field bindweed, field morning-glory, morning glory, small bindweed, devil's guts
Elaeagnus umbellata	autumn-olive, autumn olive
Juniperus virginiana	eastern redcedar, red cedar, aromatic cedar
Lespedeza cuneata	sericea lespedeza, sericea, Chinese bush clover, Chinese bushclover, Chinese bush-clover, Chinese lespedeza, common lespedeza
Leymus ambiguus	Colorado wildrye
Leymus salinus	Salina wildrye, Salinus wildrye, saline wildrye, salt wildrye
Linaria spp.	toadflax, Dalmatian toadflax, dalmatian toadflax, yellow toadflax, butter-and-eggs, common toadflax
Pinus balfouriana	foxtail pine, southern foxtail pine, northern foxtail pine, Sierra foxtail pine, Klamath foxtail pine
Pinus contorta var. *latifolia*	Rocky Mountain lodgepole pine, interior lodgepole pine, tall lodgepole pine
Potentilla recta	sulphur cinquefoil, rough-fruited cinquefoil, upright cinquefoil
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