ROCKY MOUNTAIN
Research Station

April–June 2004

New Publications

Second Quarter 2004

What's Inside . . .

- ***Wildfire behavior***
- ***Sampling and monitoring natural resources***
- ***Channel maintenance***
- ***Priest River Experiment Station: history***
- ***Comanche National Grassland plant list***
- ***Proceedings: nursery and five-needle pine***

. . . and much more

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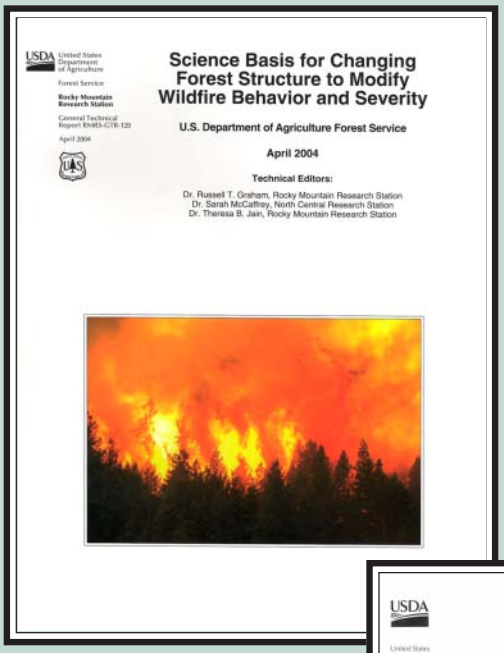

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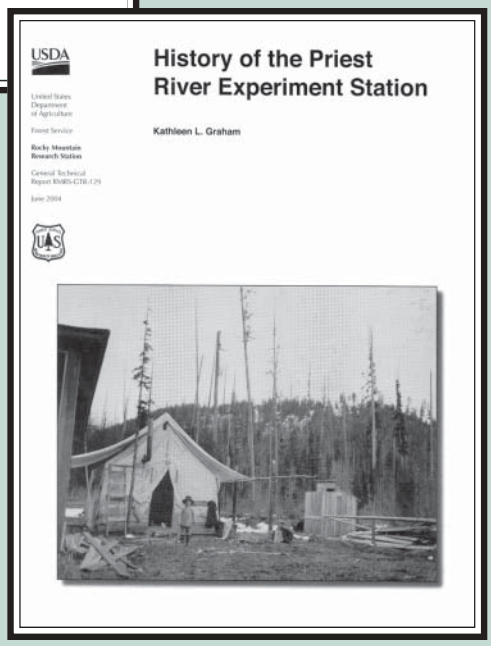

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	Order No.	
Field guide CD-ROM	**7**	**Field guide to forest plants of northern Idaho**. Patterson, Patricia A.; Neiman, Kenneth E.; Tonn, Jonalea R. 2004. Gen. Tech. Rep. RMRS-GTR-118-CD. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. (Revision of 1985 publication.) NOTE: This CD-ROM is for Windows-compatible computers. This field guide—designed for use by people with minimal botanical training—is an identification aid for nearly 200 plant species having ecological indicator value in northern Idaho forest habitat types. It contains line drawings, simplified taxonomic descriptions, characteristics tables, conspectuses, and keys. It emphasizes characteristics useful for field identification of many common and special interest plants. This is not a comprehensive taxonomy of northern Idaho flora. **NOTE**: To order this publication in its original paper format, General Technical Report INT-180, select Order Number 8 below.
Field guide paper copy	**8**	**Field guide to forest plants of northern Idaho**. Patterson, Patricia A.; Neiman, Kenneth E.; Tonn, Jonalea R. 1985. Gen. Tech. Rep. INT-180. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 246 p.
Wildfire behavior	**9**	**Science basis for changing forest structure to modify wildfire behavior and severity**. Graham, Russel 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. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr120.html This report describes the kinds, quality, amount, and gaps of scientific knowledge for making informed decisions on fuel treatments used to modify wildfire behavior and effects in dry forests of the interior Western United States (especially forests dominated by ponderosa pine and Douglas-fir). A review of scientific principles and applications relevant to fuel treatment primarily for the dry forests is provided for the following topics: fuels, fire hazard, fire behavior, fire effects, forest structure, treatment effects and longevity, landscape fuel patterns, and scientific tools useful for management and planning.

	Order No.	
Sampling and monitoring	10	**Statistical techniques for sampling and monitoring natural resources**. Schreuder, Hans T.; Ernst, Richard; Ramirez-Maldonado, Hugo. 2004. Gen. Tech. Rep. RMRS-GTR-126. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 111 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr126.html We present the statistical theory of inventory and monitoring from a probabilistic point of view. We start with the basics and show the interrelationships between designs and estimators illustrating the methods with a small artificial population as well as with a mapped realistic population. For such applications, useful open source software is given in Appendix 4. Various sources of ancillary information are described and applications of the sampling strategies are discussed. Classical and bootstrap variance estimators are discussed also. Numerous problems with solutions are given, often based on the experiences of the authors. Key additional references are cited as needed or desired.
Wildfire and fuels management	11	**Exploring information needs for wildland fire and fuels management**. Miller, Carol; Landres, Peter. 2004. Gen. Tech. Rep. RMRS-GTR-127. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 36 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr127.html We report the results of a questionnaire and workshop that sought to gain a better and deeper understanding of the contemporary information needs of wildland fire and fuels managers. Results from the questionnaire indicated that the decision to suppress a wildland fire was most often influenced by factors related to safety and that the decision to allow a fire to burn was influenced by a variety of factors that varied according to land management objectives. We also found that managers anticipated an increase in the use of wildland fire, but that these increases will be moderate due to a variety of constraints that will continue to limit the use of wildland fire. We suggest that effective fire management planning requires information on the benefits and risks to a wide variety of values at landscape scales, integration with land management objectives, and long-term perspectives.
Gravel-bed streams	12	**Quantifying channel maintenance instream flows: an approach for gravel-bed streams in the Western United States**. Schmidt, Lary J.; Potyondy, John P. 2004. Gen. Tech. Rep. RMRS-GTR-128. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 33 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr128.html This paper discusses one approach for quantifying channel maintenance instream flow necessary to achieve the Forest Service Organic Act purpose of securing favorable conditions of water flows. The approach is appropriate for quantifying channel maintenance flows on perennial, unregulated, snowmelt-dominated, gravel-bed streams with alluvial reaches. The approach identifies the minimum essential regime of streamflows necessary for the channel and its floodplain to remain fully functioning with respect to sediment and flow conveyance. The paper discusses the role of water, sediment, and vegetation in maintaining a channel and provides methodologies for estimating the upper and lower limits of the required sediment transporting flows. The paper also provides suggestions for analyzing and displaying results, implementing studies at the watershed scale, determining data needs, and post-project management and evaluation. Best application of the approach occurs at sites having long-term bedload data and streamflow records.

	Order No.	
Priest River Experiment Station	13	**History of the Priest River Experiment Station**. Graham, Kathleen L. 2004. Gen. Tech. Rep. RMRS-GTR-129. Ogden UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 71 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr129.html In 1911, the U.S. Forest Service established the Priest River Experimental Forest near Priest River, Idaho. The Forest served as headquarters for the Priest River Forest Experiment Station and continues to be used for forest research critical to understanding forest development and the many processes, structures, and functions occurring in them. At the time the Forest was created, Idaho had been a State for only 11 years. The early Forest Service leaders, such as Gifford Pinchot, Raphael Zon, and Henry Graves, were creating a new department and making decisions that would impact the culture, economics, and history of not only the State of Idaho and the Northwest, but the nation. Since the Forest's establishment, numerous Forest Service researchers, educators from colleges and universities across the nation, and State and private forestry personnel have used the Forest to solve problems impacting forests and economics, not only locally and regionally but also worldwide. Researchers such as Bob Marshall, Harry Gisborne, Richard Bingham, and Charles Wellner made enormous contributions to the forestry industry. Due to the importance of the research still being conducted, it continues to attract dedicated scientists today.
Comanche National Grassland	14	**Vascular plant species of the Comanche National Grassland in southeastern Colorado**. Hazlett, Donald L. 2004. Gen. Tech. Rep. RMRS-GTR-130. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 36 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_gtr130.html This checklist has 785 species and 801 taxa (for taxa, the varieties and subspecies are included in the count) in 90 plant families. The most common plant families are the grasses (Poaceae) and the sunflower family (Asteraceae). Of this total, 513 taxa are definitely known to occur on the Comanche National Grassland. The remaining 288 taxa occur in nearby areas of southeastern Colorado and may be discovered on the Comanche National Grassland.
Five-needle pine	15	**Breeding and genetic resources of five-needle pines: growth, adaptability, and pest resistance**; 2001 July 23–27; Medford, OR, USA. Sniezko, Richard A.; Samman, Safiya; Schlarbaum, Scott E.; Kriebel, Howard B., eds. 2004. IUFRO Working Party 2.02.15. Proceedings RMRS-P-32. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 259 p. Also available: http:www.fs.fed.us/rm/pubs/rmrs_p032.html This volume presents 29 overview and research papers on the breeding, genetic variation, genecology, gene conservation, and pest resistance of five-needle pines (*Pinus* L. subgenus *Strobus* Lemm.) from throughout the world. Overview papers provide information on past and present research as well as future needs for research on white pines from North America, Europe, and Asia. Research papers, more narrowly focused, cover various aspects of genetics. Studies on genetic resistance to *C. ribicola* are described in papers from different regions of the world. Use of *P. strobus* as an exotic species in Europe and Russia and corresponding problems with white pine blister rust are discussed in several papers. Other papers focus on examining and exploiting patterns of genetic variation of different species.

	Order No.	
Nursery proceedings: 2003	16	**National proceedings: Forest and Conservation Nursery Associations-2003**; 2003 June 9–12; Coeur d'Alene, ID; and 2003 July 14–17; Springfield, IL. Riley, Lee E.; Dumroese, R. Kasten; Landis, Thomas D., tech. coords. 2004. Proc. RMRS-P-33. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 156 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p033.html This proceedings is a compilation of 30 papers that were presented at the regional meetings of the Forest and Conservation Nursery Associations in the United States in 2003. The Western Forest and Conservation Nursery Association meeting was held at the Coeur d'Alene Inn in Coeur d'Alene, Idaho, June 9 to 12. The meeting was hosted by the USDA Forest Service, Coeur d'Alene Nursery. Morning technical sessions were followed by field trips to Coeur d'Alene Nursery, restoration outplantings on the Coeur d'Alene Indian Reservation, and Plants of the Wild Nursery. The Northeastern Forest and Conservation Nursery Association meeting occurred July 14 to 17 at the Crown Plaza Hotel in Springfield, Illinois. The meeting was hosted by the Illinois Department of Natural Resources, Mason State Nursery. In addition to technical sessions, a tour of the Mason State Nursery was included. Subject matter for both sessions included nursery culturing, harvesting, and storage; fertilization; seed transfer, collection, and processing; and native species propagation.

Previous nursery proceedings still available

Nursery proceedings: 1999, 2000, and 2001	17	**National proceedings: Forest and Conservation Nursery Associations—1999, 2000, and 2001.** Dumroese, R. K.; Riley, L. E.; Landis, T. D., tech. coords. 2002. Proceedings RMRS-P-24. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 403 p.
Nursery proceedings: 2002	18	**National proceedings: Forest and Conservation Nursery Associations—2002.** Riley, L. E.; Dumroese, R. K.; Landis, T. D., tech. coords. 2003. Proceedings RMRS-P-28. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 187 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p028.html

Order No.

Fire Reprint

The following RMRS publication has been reprinted and is available through our Distribution Center.

Wildfire and fuels management

19 **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.

This paper documents the methodology used to develop seven coarse-scale, 1-km^2 resolution, spatial data layers for the conterminous United States in support of national-level fire planning and risk assessments. Four of these layers were developed to evaluate ecological conditions and risk to ecosystem components. The remaining three layers were developed to support assessments of potential hazards and risks to public health and safety. In a Geographic Information System (GIS), we integrated biophysical and remote sensing data with disturbance and succession information by assigning characteristics to combinations of biophysical, current vegetation, and historical fire regime spatial datasets. Regional ecologists and fire managers reviewed and refined the data layers, developed succession diagrams, and assigned fire regime current condition classes. Managers can use these spatial data to describe regional trends in current conditions and to support fire and fuel management program development and resource allocation.

New Web Publication

The following RMRS publication is available on our Web site only. A copy can be downloaded from:
http:www.fs.fed.us/rm/pubs/rmrs_rp046.html

Forest inventory

Assessing soil compaction on forest inventory & analysis phase 3 field plots using a pocket penetrometer. Amacher, Michael C.; O'Neill, Katherine P. 2004. Res. Pap. RMRS-RP-46WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 7 p.

Soil compaction is an important indicator of soil quality, yet few practical methods are available to quantitatively measure this variable. Although an assessment of the areal extent of soil compaction is included as part of the soil indicator portion of the Forest Inventory 7 Analysis (FIA) program, no quantitative measurement of the degree of soil compaction is made. We tested a small, lightweight pocket penetrometer that measures soil compression strength as a simple, quantitative measure of the degree of compaction of mineral soils under forested conditions. A protocol is suggested for further pilot testing of this device as part of the soil indicator assessment. The main disadvantage of this device is that many of the compacted soils had compression strengths higher than the maximum measurable value of 4.5 tons/ft^2. Despite this limitation, this device can rapidly and easily distinguish between compacted and uncompacted areas in the field. Time previously spent by field crews trying to identify qualitative evidences of compaction can instead be used to provide a quantitative measure of the degree of compaction, which would strengthen the analysis and interpretation of the soil quality indicator.

Government publications still available while supplies last

Order #

20 **Personal, societal, and ecological values of wilderness: Sixth World Wilderness Congress proceedings on research, management, and allocation, Volume I**; 1997 October; Bangalore, India. Watson, Alan E.; Aplet, Greg H.; Hendee, John C., comps. 1998. Proceedings RMRS-P-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 158 p.

21 **Personal, societal, and ecological values of wilderness: sixth World Wilderness Congress proceedings on research, management, and allocation, Volume II**; 1998 October 24–29; Bangalore, India. Watson, Alan E.; Aplet, Greg H.; Hendee, John C., comps. 2000. Proceedings RMRS-P-14. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 248 p.

22 **Wilderness science in a time of change conference—Volume 1: Changing perspectives and future directions**; 1999 May 23–27; Missoula, MT. Cole, David N.; McCool, Stephen F.; Freimund, Wayne A.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 63 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p015_1.html

23 **Wilderness science in a time of change conference—Volume 2: Wilderness within the context of larger systems**; 1999 May 23–27; Missoula, MT. McCool, Stephen F.; Cole, David N.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 307 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p015_2.html

24 **Wilderness science in a time of change conference—Volume 3: Wilderness as a place for scientific inquiry**; 1999 May 23–27; Missoula, MT. McCool, Stephen F.; Cole, David N.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-3. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 275 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p015_3.html

25 **Wilderness science in a time of change conference—Volume 4: Wilderness visitors, experiences, and visitor management**; 1999 May 23–27; Missoula, MT. Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 273 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p015_4.html

26 **Wilderness science in a time of change conference—Volume 5: Wilderness ecosystems, threats, and management**; 1999 May 23–27; Missoula, MT. Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-5. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 381 p. Also available: http://www.fs.fed.us/rm/pubs/rmrs_p015_5.html

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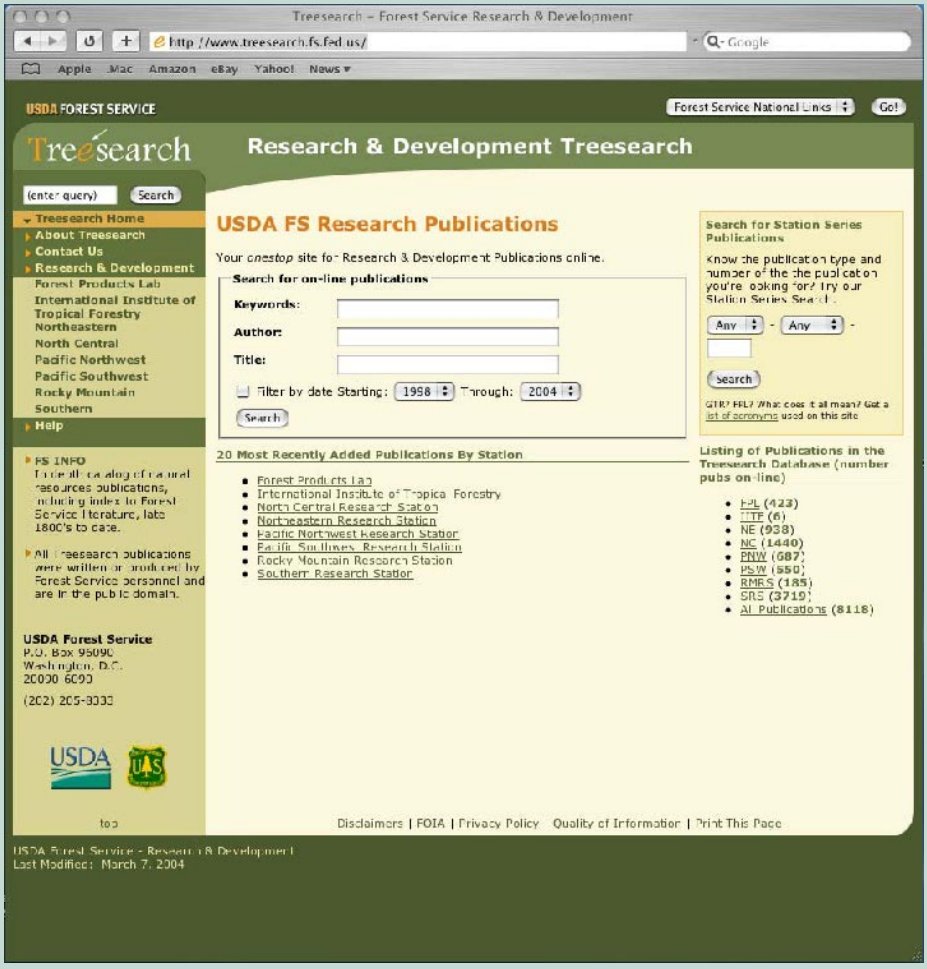

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Fire

Stand restoration burning in oak-pine forests in the southern Appalachians: effects on aboveground biomass and carbon and nitrogen cycling. Hubbard, Robert M.; Vose, James M.; Clinton, Barton D.; Elliott, Katherine J.; Knoepp, Jennifer D. 2004. Forest Ecology and Management. 190: 311–321.

Terminology and biology of fire scars in selected central hardwoods. Smith, Kevin T.; Sutherland, Elaine Kennedy. 2001. Tree-Ring Research. 57(2): 141–147.

Agroforestry

The National Agroforestry Center's valuable information is available to the public. Publications include:

Inside Agroforestry. The Center's newsletter.

Agroforestry Notes. Provides information in a useful "how-to" format.

Working trees brochures. Provides information on various uses of trees.

Special publications such as:

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- **Living snowfences**
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- **Agroforestry in the United States: research and technology transfer needs for the next millennium**

These and other Center publications are available in English, and some are available in Spanish. They may be reviewed and ordered by faxing your request to: (402) 437-5712 or logging on to: http://www.unl.edu/nac

Water/soils

Issues and recent advances in soil respiration. Hibbard, K. A.; Law, B. E.; Ryan, M. G.; Takle, E. S. 2004. Eos. 85(22): 220–221.

Disturbance ecology

Restoring conifers by natural regeneration on slopes exposed during highway reconstruction, Glacier National Park, Montana, USA. Shearer, Raymond C.; Asebrook, Jennifer M. 2003. Forestry. 76(2): 199–207.

Fish and wildlife

Assessing the consequences of nonnative trout in headwater ecosystems in Western North America. Dunham, Jason B.; Pilliod, David S.; Young, Michael K. 2004. Fisheries. 29(6): 18–26.

Transect versus grid trapping arrangements for sampling small mammal communities. Pearson, Dean E.; Ruggiero, Leonard F. 2003. Wildlife Society Bulletin. 31(2): 454–459.

Trap-induced mass declines in small mammals: mass as a population index. Pearson, Dean E.; Ortega, Yvette K.; Ruggiero, Leonard F. 2003. Journal of Wildlife Management. 67(4): 684–691.

Pests/diseases

Effects of biological control agents and exotic plant invasion on deer mouse populations. Ortega, Yvette K.; Pearson, Dean E.; McKelvey, Kevin S. 2004. Ecological Applications. 14(1): 241–253.

Foliar nutrients and induced susceptibility: genetic mechanisms of Douglas-fir resistance to western spruce budworm defoliation. Clancy, Karen M.; Chen, Zhong; Kolb, Thomas E. 2004. Canadian Journal of Forest Research. 34: 939–949.

Indirect effects of host-specific biological control agents. Pearson, Dean E.; Callaway, Ragan M. 2003. Trends in Ecology and Evolution. 18(9): 456–461.

New to Our Web Site

These publications have recently been made available electronically on our Web site:
http://www.fs.fed.us/rm/main/pubs/electronic.html

Aids to determining fuel models for estimating fire behavior. Anderson, Hal E. 1982. Gen. Tech. Rep. INT-122. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 22 p. Available: http://www.fs.fed.us/rm/pubs_int/int_gtr122.html

Estimating the number of tree species in forest populations using current vegetation survey and forest inventory and analysis approximation plots and grid intensities. Schreuder, Hans T.; Lin, Jin-Mann S.; Teply, John. 2000. Res. Note RMRS-RN-8. 7 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rn008.html

Management recommendations for the northern goshawk in the Southwestern United States. Reynolds, Richard T.; Graham, Russell T.; Reiser, M. Hildegard; and others. 1992. Gen. Tech. Rep. RM-217. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 90 p. Available: http://www.fs.fed.us/rm/pubs_rm/rm_gtr217.html

Roles of woody root-associated fungi in forest ecosystem processes: recent advances in fungal identification. Hoff, Jill A.; Klopfenstein, Ned B.; Tonn, Jonalea R.; McDonald Geral I.; Zambino, Paul J.; Rogers, Jack D.; Peever, Tobin L.; Carris, Lori M. 2004. Res. Pap. RMRS-RP-47. 6 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rp047.html

The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the Western United States. Ruggiero, Leonard F.; Aubry, Keith B.; Buskirk, Steven W.; Lyon, L. Jack; Zielinski, William J., tech. eds. 1994. Gen. Tech. Rep. RM-254. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 184 p. Available: http://www.fs.fed.us/rm/pubs_rm/rm_gtr254.html

Transpiration and multiple use management of thinned Emory oak coppice. Shipek, D. Catlow; Ffolliott, Peter F.; Gottfried, Gerald J.; DeBano, Leonard F. 2004. Res. Pap. RMRS-RP-48. 8 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_rp048.html

Wilderness science in a time of change conference—Volume 1: Changing perspectives and future directions; 1999 May 23–27; Missoula, MT. Cole, David N.; McCool, Stephen F.; Freimund, Wayne A.; O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-1. 63 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_p015_1.html

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Wilderness science in a time of change conference—Volume 5: Wilderness ecosystems, threats, and management; 1999 May 23–27; Missoula, MT. Cole, David N.; McCool, Stephen F.; Borrie, William T. O'Loughlin, Jennifer, comps. 2000. Proceedings RMRS-P-15-VOL-5. 381 p. Available: http://www.fs.fed.us/rm/pubs/rmrs_p015_5.html

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RM–RP–_____
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