



Rocky Mountain Research Station New Publications

January to March 2013

Integrated Science Working for You



Air, Water,
and Aquatic
Environments



Fire, Fuel,
and Smoke



Forest and
Woodland
Ecosystems



Grasslands,
Shrublands,
and Desert
Ecosystems



Human
Dimensions



Inventory,
Monitoring,
and Analysis



Science
Application
and Integration



Wildlife
and Terrestrial
Habitats

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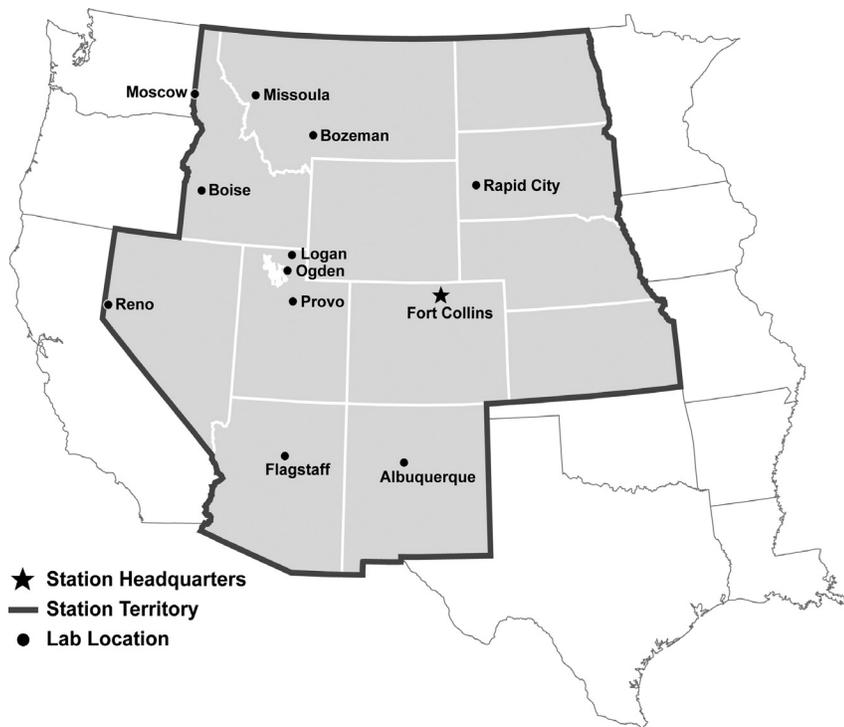
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Publications also available at:
<http://www.fs.fed.us/rm/publications>

The Rocky Mountain Research Station



The Rocky Mountain Research Station is one of five regional units that make up the US Forest Service Research and Development organization—the most extensive natural resources research organization in the world. We maintain 14 research locations throughout a 12 state territory encompassing the Great Basin, Southwest, Rocky Mountains and parts of the Great Plains. The Station employs over 400 permanent full-time employees, including roughly 100 research scientists.

Scientists conduct research that spans an area containing 52% of the nation's National Forest System lands (54 National Forests and Grasslands). In the lower 48 states, our territory also includes 55% of the nation's BLM lands; 48% of the designated wildernesses; 37% of National Park Service lands; numerous other public and tribal lands; and 41% of the non-urban/rural private lands.

We administer and conduct ecological research on 14 experimental forests, ranges, and watersheds over the long-term, even centuries, enabling us to learn how forests change as climate and other factors change over time.

We also oversee activities on several hundred research natural areas, a network of ecosystems set aside to conserve biological diversity. The areas represent a wide variety of habitats and ecosystems from alpine ecosystems to lowlands; and from coniferous forests of the Northern Rockies to semiarid deserts of the Southwest and prairie ecosystems of the Great Plains.



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New RMRS Series Publications

RPA Assessment: Wildlife population and harvest trends

Order 1

Wildlife population and harvest trends in the United States: A technical document supporting the Forest Service 2010 RPA Assessment. Flather, Curtis H.; Knowles, Michael S.; Jones, Martin F.; Schilli, Carol. 2013. Gen. Tech. Rep. RMRS-GTR-296. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 94 p.

Data from many sources were used to document recent historical trends in big game, small game, migratory game birds, furbearers, nongame, and imperiled species. Big game and waterfowl have generally increased in population and harvest trends. Many small upland and webless migratory game bird species have declined notably in population or harvest. Considerable declines in fur harvest since the 2000 RPA Assessment have occurred. A total of 1,368 bird species were formally listed as threatened or endangered under the Endangered Species Act - a net gain of 278 species since the 2000 RPA Assessment. Collaborative planning and management among private and public land owners, and which spans the research and management branches of the Forest Service, will be vital to conserving and sustaining the nation's wildlife resources.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr296.html.

Incident Management Organization

Order 2

Incident Management Organization succession planning stakeholder feedback. Black, Anne E. 2013. Gen. Tech. Rep. RMRS-GTR-297. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 322 p.

This report presents complete results of a 2011 stakeholder feedback effort conducted for the National Wildfire Coordination Group (NWCG) Executive Board concerning how best to organize and manage national wildland fire Incident Management Teams in the future to meet the needs of the public, agencies, fire service and Team members. Feedback was collected from 858 survey respondents and 57 email comments. In order to facilitate a more comprehensive understanding of the affected community and issues of relevance for implementation, the report includes: a final overview, complete narrative and survey responses, relevant statistical results and interpretation.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr297.html.

Wildfire in the wildland-urban interface

Order 3

Wildfire, wildlands, and people: understanding and preparing for wildfire in the wildland-urban interface - a Forests on the Edge report. Stein, S.M.; Menakis, J.; Carr, M.A.; Comas, S.J.; Stewart, S.I.; Cleveland, H.; Bramwell, L.; Radeloff, V.C. 2013. Gen. Tech. Rep. RMRS-GTR-299. Fort Collins, CO. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 36 p.

Fire has historically played a fundamental ecological role in many of America's wildland areas. However, the rising number of homes in the wildland-urban interface (WUI), associated impacts on lives and property from wildfire, and escalating costs of wildfire management have led to an urgent need for communities to become "fire-adapted." We present maps of the conterminous United States that illustrate historical natural fire regimes, the wildland-urban interface, and the number and location of structures burned since 1999. We outline a sampler of actions, programs, and community planning and development options to help decrease the risks of and damages from wildfire.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr299.html.

Evaluación de disturbios en suelos forestales

Order 4

Protocolo Nacional para la Evaluación de Disturbios en Suelos Forestales; Volumen II: Métodos complementarios, estadística y recolección de datos. Page-Dumroese, Deborah S.; Abbott, Ann M.; Rice, Thomas M. 2013. Gen. Tech. Rep. RMRS-GTR-301. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 61 p. [Spanish version only]

Este documento-El Volumen II: Métodos complementarios, estadística y recolección de datos- define las bases, los métodos estadísticos y de almacenamiento de datos de un Protocolo Nacional para la Evaluación de Disturbios en Suelos Forestales. Esta guía técnica proporciona las bases de un método consistente, con definiciones comunes, para generar datos de alta calidad, de tal manera que los responsables del manejo forestal puedan acceder a ellos y puedan emplearlos para la toma de decisiones. Este volumen, junto con el Volumen I: Evaluación rápida, puede ser empleado para valorar los efectos del manejo forestal sobre el recurso suelo. La información obtenida mediante este protocolo puede ser fácilmente transmitida y utilizada por el público en general para describir las clases de disturbio del suelo antes y después del manejo. El Volumen III: Antecedentes científicos para la evaluación del suelo de los bosques nacionales y praderas, incluye las investigaciones científicas más actuales presentadas en un taller.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr301.html.

Forest and conservation nursery associations Proceedings: 2011

Order 5

National proceedings: Forest and Conservation Nursery Associations-2011. Haase D. L.; Pinto, J. R.; Riley, L.E., tech. coords. 2012. Proc. RMRS-P-68. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 112 p.

The papers that were presented in these proceedings include information on history and current status of tree planting and nursery production, mine reclamation research and implementation, American chestnut restoration, soil fumigation regulations and alternatives, development of local genotypes for native plants, marketing strategies, nursery techniques and products, restoration strategies, insect and disease management, and nursery phytosanitation, propagation strategies for culturally important plant species, collaboration for conservation and education, seedling storage, and seed viability.

Online: http://www.fs.fed.us/rm/pubs/rmrs_p068.html.

Older RMRS Series Publications Still Available in Limited Quantities

Grassland ecosystems, 1

Order 6

Assessment of grassland ecosystem conditions in the southwestern United States. Volume 1. Finch, Deborah M., ed. 2004. Gen. Tech. Rep. RMRS-GTR-135-vol. 1. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 167 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr135_1.html.

Grassland ecosystems, 2

Order 7

Assessment of grassland ecosystem conditions in the southwestern United States: wildlife and fish. Volume 2. Finch, Deborah M., ed. 2005. Gen. Tech. Rep. RMRS-GTR-135-vol. 2. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 168 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr135_2.html.

Rangeland restoration, 1

Order 8

Restoring western ranges and wildlands, vol. 1. Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Gen. Tech. Rep. RMRS-GTR-136-vol-1. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pages 1-294 plus index.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr136_1.html.

Rangeland restoration, 2

Order 9

Restoring western ranges and wildlands, vol. 2. Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Gen. Tech. Rep. RMRS-GTR-136-vol-2. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pages 295-698 plus index.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr136_2.html.

Rangeland restoration, 3

Order 10

Restoring western ranges and wildlands, vol. 3. Monsen, Stephen B.; Stevens, Richard; Shaw, Nancy L., comps. 2004. Gen. Tech. Rep. RMRS-GTR-136-vol-3. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pages 699-884 plus appendices and index.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr136_3.html.

High Reliability Organization

Order 11

Managing the unexpected in prescribed fire and fire use operations: 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.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr137.html.

RPA: Harvest trends

Order 12

Population and harvest trends of big game and small game species: A technical document supporting the USDA Forest Service interim update of the 2000 RPA Assessment. Flather, Curtis H.; Knowles, Michael S.; Brady, Stephen J. 2009. Gen. Tech. Rep. RMRS-GTR-219. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 34 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr219.html.

LANDFIRE guidebook

Order 13

Guidebook on LANDFIRE fuels data acquisition, critique, modification, maintenance, and model calibration. Stratton, Richard D. 2009. Gen. Tech. Rep. RMRS-GTR-220. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 54 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr220.html.

Bed load transport

Order 14

Manual for computing bed load transport using BAGS (Bedload Assessment for Gravel-bed Streams) software. Pitlick, John; Cui, Yantao; Wilcock, Peter. 2009. Gen. Tech. Rep. RMRS-GTR-223. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 45 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr223.html.

Fuel loading models

Order 15

Field guide for identifying fuel loading models. Sikkink, Pamela G.; Lutes, Duncan C.; Keane, Robert E. 2009. Gen. Tech. Rep. RMRS-GTR-225. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 33 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr225.html.

Sediment transport

Order 16

Sediment transport primer: estimating bed-material transport in gravel-bed rivers. Wilcock, Peter; Pitlick, John; Cui, Yantao. 2009. Gen. Tech. Rep. RMRS-GTR-226. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 78 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr226.html.

Coexisting with fire

Order 17

Coexisting with fire: Ecosystems, people, and collaboration. Kaufmann, Merrill R.; Shlisky, Ayn; Brooks, Jeffrey J.; Kent, Brian. 2009. Gen. Tech. Rep. RMRS-GTR-227. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 15 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr227.html.

Postfire road treatments

Order 18

A synthesis of postfire road treatments for BAER teams: Methods, treatment effectiveness, and decisionmaking tools for rehabilitation. Foltz, Randy B.; Robichaud, Peter R.; Rhee, Hakjun. 2008. Gen. Tech. Rep. RMRS-GTR-228 Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 152 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr228.html.

Fuel treatment/fire suppression

Order 19

Fuel treatments, fire suppression, and their interaction with wildfire and its impacts: The Warm Lake experience during the Cascade Complex of wildfires in central Idaho, 2007. Graham, Russell T.; Jain, Theresa B.; Loseke, Mark. 2009. Gen. Tech. Rep. RMRS-GTR-229. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 36 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr229.html.

Watershed effects of fuel management

Order 20

Cumulative watershed effects of fuel management in the western United States. Elliot, William J.; Miller, Ina Sue; Audin, Lisa, eds. 2010. Gen. Tech. Rep. RMRS-GTR-231. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 299 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr231.html.

Whitebark pine ecosystem

Order 21

Management guide to ecosystem restoration treatments: Whitebark pine forests of the northern Rocky Mountains, U.S.A. Keane, Robert E.; Parsons, Russell A. 2010. Gen. Tech. Rep. RMRS-GTR-232. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 133 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr232.html.

Old tree mortality mitigation

Order 22

Mitigating old tree mortality in long-unburned, fire-dependent forests: a synthesis. Hood, Sharon M. 2010. Gen. Tech. Rep. RMRS-GTR-238. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 71 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr238.html.

Hillslope stabilization

Order 23

Post-fire treatment effectiveness for hillslope stabilization. Robichaud, Peter R.; Ashmun, Louise E.; Sims, Bruce D. 2010. Gen. Tech. Rep. RMRS-GTR-240. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 62 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr240.html.

Diseases & insects of Rocky Mountain Region

Order 24

Field guide to diseases & insects of the Rocky Mountain Region. Rocky Mountain Region, Forest Health Protection. 2010. Gen. Tech. Rep. RMRS-GTR-241. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 336 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr241.html.

Aquatic ecosystems

Order 25

Climate change, aquatic ecosystems, and fishes in the Rocky Mountain West: Implications and alternatives for management. Rieman, Bruce E.; Isaak, Daniel J. 2010. Gen. Tech. Rep. RMRS-GTR-250. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 46 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr250.html.

Watersheds condition

Order 26

Risk of impaired condition of watersheds containing National Forest lands. Brown, Thomas C.; Froemke, Pamela. 2010. Gen. Tech. Rep. RMRS-GTR-251. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 57 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr251.html.

Fire characteristics charts

Order 27

How to generate and interpret fire characteristics charts for surface and crown fire behavior. Andrews, Patricia L.; Heinsch, Faith Ann; Schelvan, Luke. 2011. Gen. Tech. Rep. RMRS-GTR-253. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 40 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr253.html

Great Basin meadows

Order 28

Geomorphology, hydrology, and ecology of Great Basin meadow complexes - implications for management and restoration. Chambers, Jeanne C.; Miller, Jerry R., eds. 2011. Gen. Tech. Rep. RMRS-GTR-258. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 125 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr258.html.

Wildfire analysis

Order 29

A qualitative and quantitative analysis of risk perception and treatment options as related to wildfires in the USDA FS Region 3 National Forests. Martin, Ingrid M.; Martin, Wade E.; Raish, Carol B. 2011. Gen. Tech. Rep. RMRS-GTR-260. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 57 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr260.html.

Wildland fire management

Order 30

A comparative risk assessment framework for wildland fire management: the 2010 cohesive strategy science report. Calkin, David E.; Ager, Alan A.; Thompson, Matthew P., eds. 2011. Gen. Tech. Rep. RMRS-GTR-262. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 63 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr262.html.

Raising native plants

Order 31

Raising native plants in nurseries: Basic concepts. Dumroese, R. Kasten; Landis, Thomas D.; Luna, Tara. 2012. Gen. Tech. Rep. RMRS-GTR-274. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 84 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_gtr274.html.

Madrean Archipelago II

Order 32

Connecting mountain islands and desert seas: Biodiversity and management of the Madrean Archipelago II; 2004 May 11-15; Tucson, AZ. Gottfried, Gerald J.; Gebow, Brooke S.; Eskew, Lane G.; and Edminster, Carleton B., comps. 2005. Proceedings RMRS-P-36. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 631 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_p036.html.

Piñon-juniper/ponderosa pine

Order 33

Ecology, management, and restoration of piñon-juniper and ponderosa pine ecosystems: combined proceedings of the 2005 St. George, Utah and 2006 Albuquerque, New Mexico workshops. Gottfried, Gerald J.; Shaw, John D.; Ford, Paulette L., comps. 2008. Proceedings RMRS-P-51. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 218 p.

Online: http://www.fs.fed.us/rm/pubs/rmrs_p051.html.

Journals and Other Publications

Obtain the following publications through university libraries, the publisher, or other outlets. Forest Service employees may request these items from the National Forest Service Library at FSLibrary-DocsFC@fs.fed.us or telephone: (970) 498-1205. We have also provided links to electronic copies when available.

Air, water, and aquatic environments

DNA barcoding at riverscape scales; Assessing biodiversity among fishes of the genus *Cottus* (Teleostei) in northern Rocky Mountain streams. Young, Michael K.; McKelvey, Kevin S.; Pilgrim, Kristine L.; Schwartz, Michael K. 2013. *Molecular Ecology Resources*. doi: 10.1111/1755-0998.12091.

Ecosystem resilience despite large-scale altered hydroclimatic conditions. Campos, Guillermo E. Ponce; Moran, M. Susan; Huete, Alfredo; Zhang, Yongguang; Bresloff, Cynthia; Huxman, Travis E.; Eamus, Derek; Bosch, David D.; Buda, Anthony R.; Gunter, Stacey A.; Scalley, Tamara Heartsill; Kitchen, Stanley G.; McClaran, Mitchel P.; McNab, W. Henry; Montoya, Diane S.; Morgan, Jack A.; Peters, Debra P. C.; Sadler, E. John; Seyfried, Mark S.; Starks, Patrick J. 2013. *Nature*. 494: 349-353. Online: <http://www.treesearch.fs.fed.us/pubs/43187>.

Effects of climatic variability and change. Ryan, Michael G.; Vose, James M. 2012. In: Vose, James M.; Peterson, David L.; Patel-Weynand, Toral, eds. *Effects of climatic variability and change on forest ecosystems: A comprehensive science synthesis for the U.S. forest sector*. Gen. Tech. Rep. PNW-GTR-870. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 7-95. Online: <http://www.treesearch.fs.fed.us/pubs/42651>.

Extreme precipitation patterns and reductions of terrestrial ecosystem production across biomes. Zhang, Yongguang; Moran, M. Susan; Nearing, Mark A.; Campos, Guillermo E. Ponce; Huete, Alfredo R.; Buda, Anthony R.; Bosch, David D.; Gunter, Stacey A.; Kitchen, Stanley G.; McNab, W. Henry; Morgan, Jack A.; McClaran, Mitchel P.; Montoya, Diane S.; Peters, Debra P. C.; Starks, Patrick J. 2013. *Journal of Geophysical Research: Biogeosciences*. 118: 1-10. doi: 10.1029/2012JG002136. Online: <http://www.treesearch.fs.fed.us/pubs/43259>.

Geomorphic classification of rivers. Buffington, J.M.; Montgomery, D.R. 2013. In: Shroder, J.; Wohl, E., eds. *Treatise on geomorphology: Vol. 9, Fluvial geomorphology*. San Diego, CA: Academic Press: 730-767.

Linking climate change and fish conservation efforts using spatially explicit decision support tools. Peterson, D.P.; Wenger, S.J.; Rieman, B.E.; Isaak, D.J. 2013. *Fisheries*. 38(3): 1111-127 + 58 page appendices..

Mechanisms of carbon storage in mountainous headwater rivers. Wohl, Ellen; Dwire, Kathleen; Sutfin, Nicholas; Polvi, Lina; Bazan, Roberto. 2012. *Nature Communications*. 3: 1263. Online: <http://www.treesearch.fs.fed.us/pubs/42782>.

Potential effects of climate change on streambed scour and risks to salmonid survival in snow-dominated mountain

basins. Goode, Jaime R.; Buffington, John M.; Tonina, Daniele; Isaak, Daniel J.; Thurow, Russell F.; Wenger, Seth; Nagel, David; Luce, Charlie; Tetzlaff, Doerthe; Soulsby, Chris. 2013. *Hydrological Processes*. 27: 750-765.

Public economics of hitchhiking species and tourism-based risk to ecosystem services. Warziniack, Travis W.; Finnoff, David; Shogren, Jason F. 2013. *Resource and Energy Economics*. 35: 277-294. Online: <http://www.treesearch.fs.fed.us/pubs/43264>.

Retreating or standing: Responses of forest species and steppe species to climate change in arid eastern central Asia. Zhang, Hong-Xiang; Zhang, Ming-Li; Sanderson, Stewart C. 2013. *PLoS ONE*. 8(4): e61954. doi:10.1371/journal.pone.0061954.

Using fire regimes to delineate zones in a high-resolution lake sediment record from the western United States. Morris, Jesse L.; Brunelle, Andrea; DeRose, R. Justin; Seppa, Heikki; Power, Mitchell J.; Carter, Vachel; Bares, Ryan. 2013. *Quaternary Research*. 79: 24-36. Online: <http://www.treesearch.fs.fed.us/pubs/42640>.

Fire, fuel, and smoke

Describing wildland surface fuel loading for fire management: A review of approaches, methods and systems. Keane, Robert E. 2013. *International Journal of Wildland Fire*. 22: 51-62. Online: <http://www.treesearch.fs.fed.us/pubs/41475>.

Developing a model framework for predicting effects of woody expansion and fire on ecosystem carbon and nitrogen in a pinyon-juniper woodland. Rau, B. M.; Tausch, R.; Reiner, A.; Johnson, D. W.; Chambers, J. C.; Blank, R. R. 2012. *Journal of Arid Environments*. 76: 97-104. Online: <http://www.treesearch.fs.fed.us/pubs/39878>.

Duff mound consumption and cambium injury for centuries-old western larch from prescribed burning in western Montana. Harrington, Michael G. 2012. *International Journal of Wildland Fire*. dx.doi.org/10.1071/WF12038.

Estimating US federal wildland fire managers' preferences toward competing strategic suppression objectives. Calkin, David E.; Venn, Tyron; Wibbenmeyer, Matthew; Thompson, Matthew P. 2012. *International Journal of Wildland Fire*. doi: 10.1071/WF11075. Online: <http://www.treesearch.fs.fed.us/pubs/42812>.

Fire effects on noxious weeds. Innes, Robin. 2012. *Weed Times*. 30(3): 8-9.

LANDFIRE—A national vegetation/fuels data base for use in fuels treatment, restoration, and suppression planning. Ryan, Kevin C.; Opperman, Tonja S. 2013. *Forest Ecology and Management*. dx.doi.org/10.1016/j.foreco.2012.11.003.

Measurements of reactive trace gases and variable O₃ formation rates in some South Carolina biomass burning plumes.

Akagi, S.K.; Yokelson, R.J.; Burling, I.R.; Meinardi, S. Simpson, I.; Blake, D.R.; McMeeking, G.R.; Sullivan, A.; Lee, T.; Kreidenweis, S.; Urbanski, S.; Reardon, J.; Griffith, D.W.T.; Johnson, T.J.; Weise, D.R. 2012. *Atmospheric Chemistry and Physics Discussions*. 12: 25255-25328.

Postfire changes in forest carbon storage over a 300-year chronosequence of *Pinus contorta*-dominated forests.

Kashian, Daniel M.; Romme, William H.; Tinker, Daniel B.; Turner, Monica G.; Ryan, Michael G. 2013. *Ecological Monographs*. 83(1): 49-66. Online: <http://www.treesearch.fs.fed.us/pubs/43265>,

Post-fire mulching for runoff and erosion mitigation Part I: Effectiveness in reducing hillslope erosion rates.

Robichaud, Peter R.; Lewis, Sarah A.; Wagenbrenner, Joseph W.; Ashmun, Louise E.; Brown, Robert E. 2013. *Catena*. 105: 75-92.

Post-fire mulching for runoff and erosion mitigation Part II: Effectiveness in reducing runoff and sediment yields from small catchments.

Robichaud, Peter R.; Wagenbrenner, Joseph W.; Lewis, Sarah A.; Ashmun, Louise E.; Brown, Robert E.; Wohlgemuth, Peter M. 2013. *Catena*. 105: 93-111.

Research and development supporting risk-based wildfire effects prediction for fuels and fire management: Status and needs.

Hyde, Kevin; Dickinson, Matthew B.; Bohrer, Gil; Calkin, David; Evers, Louisa; Gilbertson-Day, Julie; Nicolet, Tessa; Ryan, Kevin; Tague, Christina. 2013. *International Journal of Wildland Fire*. 22: 37-50. Online: <http://www.treesearch.fs.fed.us/pubs/42811>.

Yellowstone National Park and the summer of fire.

Smith, Diane. 2013. *Rural Connections*. January: 31-34.

Spatial scaling of wildland fuels for six forest and rangeland ecosystems of the northern Rocky Mountains, USA.

Keane, Robert E.; Gray, Kathy; Bacciu, Valentina; Leirfallom, Signe. 2012. *Landscape Ecology*. 27: 1213-1234. Online: <http://www.treesearch.fs.fed.us/pubs/41391>.

Forest and woodland ecosystems

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The Rocky Mountain Research Station is evolving from a Station with 30 research work units (including ecosystem management units and national programs) to a comprehensive programmatic structure consisting of eight Science Program areas and several Research, Development and Applications programs. Descriptions of the Science Program areas follow below.

Air, Water and Aquatic Environments

Air quality, water availability, water quality, and aquatic habitats are critical issues within the rapidly changing Western United States. The Air, Water and Aquatic Environments program is committed to the development of knowledge and science applications related to air and water quality, as well as the habitat quality, distribution, diversity, and persistence of fish and other aquatic species. Website: http://www.fs.fed.us/rm/boise/awae_home.shtml. Contact Frank McCormick, Program Manager, for more information: 208-373-4351.

Fire, Fuel and Smoke

The Fire, Fuel and Smoke program works to improve the safety and effectiveness of fire management through the creation and dissemination of basic fire science knowledge. The program investigates the impacts of fires on the environment by means of fundamental and applied research for understanding and predicting fire behavior, its effects on ecosystems, and its emissions into the atmosphere. Website: <http://www.firelab.org>. Contact Colin Hardy, Program Manager, for more information: 406-329-4978.

Forest and Woodland Ecosystems

Forests and woodlands are increasingly being impacted by large scale urbanization and human developments, uncharacteristically large and severe wildfires, insect and disease outbreaks, exotic species invasions, and drought, and interactions of multiple stressors at local, landscape, and regional scales. The Forest and Woodland Ecosystems program acquires, develops, and delivers the scientific knowledge for sustaining and restoring forests and woodlands landscape health, biodiversity, productivity, and ecosystem processes. Website: <http://www.fs.fed.us/rmrs/research/programs/forest-woodlands-ecosystem/>. Contact Tom Crow, Program Manager, for more information: 970-498-1378.

Grassland, Shrubland and Desert Ecosystems

Disruptions by large-scale clearing for agriculture, water diversions, extensive grazing, changes in the native fauna, the advent of alien weeds, altered fire regimes, and increases in human-caused insect and disease epidemics have contributed to produce areas that are in unsuitable condition. The Grassland, Shrubland and Desert Ecosystems program addresses the biology, use, management, and restoration of these grass and shrublands. Website: <http://www.fs.fed.us/rmrs/research/programs/grassland-shrubland-desert/>. Contact Debbie Finch, Program Manager, for more information: 505-724-3671.

Human Dimensions

The Human Dimensions program provides social and economic science based innovation to human societies as they develop a sustainable relationship with their environment. Major issues confronting societies across the globe such as global climate change, energy, fire, water, and ecosystem services all have important social-economic dimensions that will be explored and addressed by this program. Website: <http://www.fs.fed.us/rmrs/research/programs/social-economics-decision/>. Contact Cindy Swanson, Program Manager for more information: 406-329-3388.

Inventory, Monitoring and Analysis

The Inventory, Monitoring and Analysis program provides the resource data, analysis, and tools needed to effectively identify current status and trends, management options and impacts, and threats and impacts of fire, insects, disease, and other natural processes. Website: <http://www.fs.fed.us/rm/ogden/>. Contact Michael Wilson for more information: 801-625-5407.

Science Application and Integration

The Science Application and Integration program is a knowledge transfer unit that provides leadership for the integration and use of scientific information in natural resource planning and management across the Interior West.

Wildlife and Terrestrial Ecosystems

The Wildlife and Terrestrial Ecosystems program is engaged in sustaining species and ecosystems of concern through studies of ecological interactions within and between plant, aquatic, and terrestrial animal communities; understanding public use effects through studies elucidating social and economic values associated with consumptive and non-consumptive uses of fish and wildlife; managing terrestrial and aquatic habitats; and evaluating outcomes of land and water uses and natural disturbances. Website: <http://www.rmrs.nau.edu/wildlife/>. Contact William Block, Program Manager, for more information: 928-556-2161.

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3	9	15	21	27	33	
4	10	16	22	28		
5	11	17	23	29		
6	12	18	24	30		

January to March 2013

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