USDA
United States Department of Agriculture

Rocky Mountain Research Station

New Publications

October–December 2016

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The Rocky Mountain Research Station

The Rocky Mountain Research Station is one of five regional units that make up the U.S. 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 more than 400 permanent full-time employees, including about 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 Bureau of Land Management 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. These 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.

New RMRS Publication Series

Diseases of trees in the Great Plains

For printed copies, contact your State's Great Plains Tree Pest Council Representative, shown here

Diseases of trees in the Great Plains. Bergdahl, Aaron D.; Hill, Alison, tech. coords. 2016. Gen. Tech. Rep. RMRS-GTR-335. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 229 p.

Hosts, distribution, symptoms and signs, disease cycle, and management strategies are described for 84 hardwood and 32 conifer diseases in 56 chapters. Color illustrations are provided to aid in accurate diagnosis. A glossary of technical terms and indexes to hosts and pathogens also are included.

https://www.treesearch.fs.fed.us/pubs/53010.

Request paper copies from your State's Great Plains Tree Pest Council Representative:

Kansas	Kansas Forest Service: rarmbrust@ksu.edu
Minnesota	USFS Forest Health Protection, Northeastern Area: lhaugen@fs.fed.us
Missouri	Missouri Department of Conservation: simeon.wright@mdc.mo.gov
Montana	USFS Forest Health Protection, Northern & Intermountain Region: bjackson@fs.fed.us
Nebraska	Nebraska Forest Service: mharrell2@unl.edu
North Dakota	North Dakota Forest Service: lezlee.johnson@ndsu.edu
South Dakota	USFS Forest Health Protection, Rocky Mountain Region: jblodgett@fs.fed.us
Wyoming	Wyoming State Forestry Division: ryan.desantis@wyo.gov
USDA National Agroforestry Center	http://nac.unl.edu/publications/order/#Tree_Diseases

Using resilience and resistance concepts to manage threats to sagebrush ecosystems, Gunnison sage-grouse, and Greater sage-grouse in their eastern range

Limited number of paper copies available through RMRS Distribution

Using resilience and resistance concepts to manage threats to sagebrush ecosystems, Gunnison sage-grouse, and Greater sage-grouse in their eastern range: A strategic multi-scale approach. Chambers, Jeanne C.; Beck, Jeffrey L.; Campbell, Steve; [et al.] 2016. Gen. Tech. Rep. RMRS-GTR-356. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 143 p.

This report provides a strategic approach for conservation of sagebrush ecosystems, Greater sage-grouse, and Gunnison sage-grouse. It uses information on (1) factors that influence sagebrush ecosystem resilience to disturbance and resistance to nonnative invasive annual grasses and (2) distribution and relative abundance of sage-grouse populations to address persistent ecosystem threats. A sage-grouse habitat matrix links relative resilience and resistance of sagebrush ecosystems with modeled sage-grouse breeding habitat probabilities. Areas for targeted management are assessed and decision tools are discussed for determining the suitability of target areas for management and the most appropriate management actions.

https://www.treesearch.fs.fed.us/pubs/53201.

New RMRS Publication Series

Nevada's forest resources, 2004–2013

Contact Jim Menlove, jmenlove@fs.fed.us, for a paper copy.

Nevada's forest resources, 2004–2013. Menlove, Jim; Shaw, John D.; Witt, Chris; Werstak, Charles E., Jr.; DeRose, R. Justin; Goeking, Sara A.; Amacher, Michael C.; Morgan, Todd A.; Sorenson, Colin B. 2016. Resour. Bull. RMRS-RB-22. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 167 p.

This report presents a summary of the most recent inventory information for Nevada's forest lands. The report also describes inventory design, inventory terminology, and data reliability. Results show that Nevada's forest land totals 10.6 million acres. Sixty-three percent (6.7 million acres) of this forest land is administered by the Department of the Interior's Bureau of Land Management. Forest types in the pinyon/juniper group cover 8.6 million acres or 81 percent of Nevada's forest lands, making them the predominant forest type in the State. The woodland hardwoods forest-type group is the second most abundant, comprising 7 percent of Nevada's forest land. Utah juniper and singleleaf pinyon are the most abundant tree species in Nevada, whether measured by number of trees, volume, or biomass.

https://www.treesearch.fs.fed.us/pubs/53279.

Forest Service Publications Still Available

Field guide to Intermountain sedges

Limited number of paper copies are available through RMRS Distribution

Field guide to Intermountain sedges. Hurd, Emerenciana G.; Shaw, Nancy L.; Mastrogiuseppe, Joy; Smithman, Lynda C.; Goodrich, Sherel. 1998 (Reprinted 2016). Gen. Tech. Rep. RMRS-GTR-10. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 282 p.

Descriptions of morphological characteristics, habitat, and geographic distributions are provided for 114 sedges (Carex spp.) of the Intermountain area. A dichotomous key, color photographs, line drawings, and discussions highlighting differences among similar species aid identification. An illustrated morphology, glossary, and index of common names simplify use. The guide is not inclusive; comprehensive local floras should be checked to confirm identifications.

https://www.treesearch.fs.fed.us/pubs/6196

Forest Service Publications Still Available

Field guide to Intermountain rushes

Limited number of paper copies are available through RMRS Distribution

Field guide to lntermountain rushes. Hurd, Emerenciana G.; Goodrich, Sherel; Shaw, Nancy L. 1994. Gen. Tech. Rep. INT-GTR-306. Ogden, UT: U.S. Department of Agriculture, Forest Service, lntermountain Research Station. 56 p.

This guide provides technical descriptions of 23 Intermountain rushes (*Juncus* spp.), including the common and several less abundant species. Line drawings and color or black and white photos illustrate diagnostic characteristics of each species. An illustrated morphology and a glossary acquaint the layperson with terminology used to classify rushes. The guide is intended as a tool to aid in classification; it is not inclusive.

https://www.treesearch.fs.fed.us/pubs/24234

Journals and Other Publications

Air, water, and aquatic environments

Big biology meets microclimatology: Defining thermal niches of aquatic ectotherms at landscape scales for conservation planning. Isaak, D.J.; Wenger, S.J.; Young, M.K. 2017. Ecological Applications. 27: doi:10.1002/eap.1501. https://www.treesearch.fs.fed.us/pubs/53478.

Climate, demography, and zoogeography predict introgression thresholds in salmonid hybrid zones in Rocky Mountain streams. Young, Michael K.; Isaak, Daniel J.; McKelvey, Kevin S.; [et al.]. 2016. PLoS ONE. 11(11): e0163563. https://www.treesearch.fs.fed.us/pubs/53197.

Cumulative effects analysis of the water quality risk of herbicides used for site preparation in the Central North Island, New Zealand. Neary, Dan; Baillie, Brenda R. 2016. Water. 8: 573. https://www.treesearch.fs.fed.us/pubs/53263.

Development of online tools to support GIS watershed analyses. Elliot, William J. 2016. StreamNotes, August 2016. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, National Stream and Aquatic Ecology Center: 8–10. https://www.treesearch.fs.fed.us/pubs/53373.

Impact of surface coal mining on soil hydraulic properties. Liu, X.; Wu, J. Q.; Elliot, W. J.; [et al.]. 2016. Transactions of the Society for Mining, Metallurgy and Exploration. 338: 381-392. https://www.treesearch.fs.fed.us/pubs/53374.

Mountain peatlands range from CO_2 sinks at high elevations to sources at low elevations: Implications for a changing climate. Millar, David J.; Dwire, Kathleen A.; Hubbard, Robert M.; [et al.]. 2016. Ecosystems. doi: 10.1007/s10021-016-0034-7. https://www.treesearch.fs.fed.us/pubs/53377.

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Protecting the source: Tools to evaluate fuel treatment cost vs water quality protection. Cooke, Brian; Elliot, William; Miller, Mary Ellen; Finney, Mark; Thompson, Matthew. 2016. Science You Can Use Bulletin. 21. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 9 p. https://www.treesearch.fs.fed.us/pubs/53113.

A rapid response database in support of post-fire hydrological modeling. Miller, Mary Ellen; Elliot, William J. 2015. StreamNotes, February 2016. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, National Stream and Aquatic Ecology Center: 1–7. https://www.treesearch.fs.fed.us/pubs/53375.

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A review of precipitation and temperature control on seedling emergence and establishment for ponderosa and lodgepole pine forest regeneration. Petrie, M.D.; Wildeman, A.M.; Hubbard, R.M.; [et al.]. 2016. Forest Ecology and Management. 361: 328–338. https://www.treesearch.fs.fed.us/pubs/53378.

Targeting forest management through fire and erosion modeling. Elliot, William J.; Miller, Mary Ellen; Enstice, Nic. 2016. International Journal of Wildland Fire. 25: 876–887. https://www.treesearch.fs.fed.us/pubs/53372.

Fire, fuel, and smoke

Beyond fuel treatment effectiveness: Characterizing interactions between fire and treatments in the US. Barnett, Kevin; Parks, Sean A.; Miller, Carol; [et al.]. 2016. Forests. 7: 237. https://www.treesearch.fs.fed.us/pubs/53364.

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Grasslands, shrublands, and desert ecosystems

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Science Program Areas

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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/air-water-and-aquatic-environmentss. Contact Frank McCormick, Program Manager, for more information: 970-498-1175.

Aldo Leopold Wilderness Research Institute

The Aldo Leopold Wilderness Research Institute aims to provide scientific leadership by bringing diverse groups of scientists and managers together to develop and use the knowledge needed to assure wilderness ecosystems and values endure for generations to come. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/aldo-leopold-wilderness-research-institute. Contact Susan Fox, Program Director, for more information: 406-542-4193.

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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/fire-fuel-and-smoke. 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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/forest-and-woodland-ecosystems. Contact Alison Hill, Program Manager, for more information: 928-556-2105.

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. Webpage: hhttps://www.fs.fed.us/rmrs/science-program-areas/grassland-shrubland-and-desert-ecosystems. 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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/human-dimensions Contact David Chapman, Program Manager, for more information: 970-498-1378.

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 for forests, including the various management options and the threats and impacts of fire, insects, disease, and other natural processes. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/inventory-and-monitoring. Contact Michael Wilson, Program Manager, 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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/science-application-and-communication. Contact Jan Engert, Assistant Station Director, for more information: 970-498-1377.

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. Webpage: https://www.fs.fed.us/rmrs/science-program-areas/wildlife-and-terrestrial-ecosystems. Contact William Block, Program Manager, for more information: 928-556-2161.

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