USDA
United States Department of Agriculture

Rocky Mountain Research Station

New Publications

April–June 2017

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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

Mapping wilderness character in the Boundary Waters Canoe Area Wilderness

Online only

Mapping wilderness character in the Boundary Waters Canoe Area Wilderness. Tricker, James; Schwaller, Ann; Hanson, Teresa; Mejicano, Elizabeth; Landres, Peter. 2017. Gen. Tech. Rep. RMRS-GTR-357. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 80 p.

A GIS-based approach was used to depict how threats to wilderness character vary in extent and magnitude across the Boundary Waters Canoe Area Wilderness. Maps generated for each of the weighted measures were then added accumulatively to create a combined map delineating the overall spatial pattern and variation of threats to wilderness character across the Boundary Waters Canoe Area Wilderness. This combined map depicts a wilderness that has not been substantially impacted by threats, with the highest quality wilderness character primarily found away from entry points and travel routes. The map products presented in this report provide managers with a tool to better understand the extent and magnitude of threats to wilderness character, holistically evaluate tradeoffs associated with decisions and actions in wilderness, and ultimately improve wilderness stewardship.

https://www.treesearch.fs.fed.us/pubs/54089

Assessment of watershed vulnerability to climate change for the Unita-Wasatch-Cache and Ashley National Forests, Utah

Online only

Assessment of watershed vulnerability to climate change for the Uinta-Wasatch-Cache and Ashley National Forests, Utah. Rice, Janine; Bardsley, Tim; Gomben, Pete; Bambrough, Dustin; Weems, Stacey; Leahy, Sarah; Plunkett, Christopher; Condrat, Charles; Joyce, Linda A. 2017. Gen. Tech. Rep. RMRS-GTR-362. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 111 p.

Literature-based information and expert elicitation is used to define components of watershed sensitivity and exposure to climate change. We also define the capacity of watershed function, habitats, and biota to adapt to the expected changes. Watershed vulnerability is scored high for the Wasatch Mountain Range and moderate to high for the Uinta Mountains. These watersheds are driven by a snow-dominated hydrologic regime, and they have a high sensitivity to the projected increases in drought, heat, and flooding. More evaporation, snowpack loss, and earlier snowmelt are expected to shift the timing of runoff earlier and lower streamflow. Adaptation to these changes is enhanced when watersheds are in good functioning condition. Management actions can serve as an iterative process that builds resilience and can assist transitions to new states under a changing climate.

https://www.treesearch.fs.fed.us/pubs/54330

New RMRS Publication Series

Climate change and wildfire effects in aridland riparian ecosystems

Online only

Climate change and wildfire effects in aridland riparian ecosystems: An examination of current and future conditions. Smith, D. Max; Finch, Deborah M. 2017. Gen. Tech. Rep. RMRS-GTR-364. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 65 p.

To protect riparian ecosystems and organisms, we need to understand how they are affected by disturbance processes and stressors such as fire, drought, and non-native plant invasions. Riparian vegetation is critically important as foraging, resting, migrating, and breeding habitat to birds and other animal species in the southwestern United States. The structurally diverse, species-rich vegetation along many southwestern streams supports high densities of territories and nest sites for a variety of birds including several species of high conservation priority. In this report, we review the ecohydrology of southwestern streams and share results from our study sites along the Middle Rio Grande to describe effects of hydrological changes, wildfire, and invasions on plant communities and riparian-nesting birds. We also examine climate change projections and output from population models to gauge the future of aridland riparian ecosystems in an increasingly arid Southwest.

https://www.treesearch.fs.fed.us/pubs/54331

Journals and Other Publications

Online links are provided if available, but some are available only to Forest Service Personnel because of open access privilege. For the general public, some links may hit a pay wall. Please accept our apologies for any inconvenience.

Air, water, and aquatic environments

Climate change, fish, and aquatic habitat in the Blue Mountains [Chapter 5]. Isaak, Daniel J.; Ramsey, Katherine; Horan, Dona; [et al.]. 2017. In: Halofsky, Jessica E.; Peterson, David L., eds. Climate change vulnerability and adaptation in the Blue Mountains. Gen. Tech. Rep. PNW-GTR-939. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 91–148. https://www.treesearch.fs.fed.us/pubs/54096.

Climate change may restrict dryland forest regeneration in the 21st century. Petrie, M.D.; Bradford, J.B.; Hubbard, R.M.; [et al.]. 2017. Ecology. 98(6): 1548–1559. https://www.treesearch.fs.fed.us/pubs/54341.

A decade of streamwater nitrogen and forest dynamics after a mountain pine beetle outbreak at the Fraser Experimental Forest, Colorado. Rhoades, C.C.; Hubbard, R.M.; Elder, K. 2017. Ecosystems. 20: 380–392. https://www.treesearch.fs.fed.us/pubs/52450.

Environmental DNA assays for the sister taxa aauger (*Sander canadensis*) and walleye (*Sander vitreus*). Dysthe, Joseph C.; McKelvey, Kevin S.; Young, Michael K.; Schwartz, Michael K.; [et al.] 2017. PLoS ONE 12: e0176459. https://www.treesearch.fs.fed.us/pubs/54383.

Fine-scale characteristics of fluvial bull trout redds and adjacent sites in Rapid River, Idaho, 1993–2007. Guzevich, John W.; Thurow, Russell F. 2017. Northwest Science. 91(2): 198–213. https://www.treesearch.fs.fed.us/pubs/54340.

Forest management and the impact on water resources: A review of 13 countries. Garcia-Chevesich, Pablo A.; Neary, Daniel G.; Scott, David F.; [et al.], eds. 2017. IHP - VIII / Technical Document No. 37. Paris, France: United Nations Educational, Scientific, and Cultural Organization (UNESCO), International Hydrological Program. 203 p. https://www.treesearch.fs.fed.us/pubs/54133.

Forest management and water in the United States [Chapter 13]. Neary, Daniel G. 2017. In: Garcia-Chevesich, Pablo A.; Neary, Daniel G.; Scott, David F.; [et al.], eds. Forest management and the impact on water resources: A review of 13 countries. IHP - VIII / Technical Document No. 37. Paris, France: United Nations Educational, Scientific, and Cultural Organization (UNESCO), International Hydrological Program: 181–203. https://www.treesearch.fs.fed.us/pubs/54134.

A global index for mapping the exposure of water resources to wildfire. Robinne, Francois-Nicolas; Miller, Carol; Parisien, Marc-Andre; [et al.]. 2016. Forests. 7(1): 22. https://www.treesearch.fs.fed.us/pubs/54519.

Rill erosion in burned and salvage logged western montane forests: Effects of logging equipment type, traffic level, and slash treatment. Wagenbrenner, J. W.; Robichaud, P. R.; Brown, R. E. 2016. Journal of Hydrology. 541: 889–901. https://www.treesearch.fs.fed.us/pubs/54520.

Fire, fuel, and smoke

Emissions from prescribed burning of agricultural fields in the Pacific Northwest. Holder, A.L.; Urbanski, S.P.; Elleman, R.; [et al.]. 2017. Atmospheric Environment. 166: 22–33. https://www.treesearch.fs.fed.us/pubs/54497.

Fire and Smoke Model Evaluation Experiment (FASMEE): Modeling gaps and data needs. Liu, Yongqiang; Hudak, Andrew; Urbanski, Shawn; [et al.]. 2017. In: Proceedings for the 2nd International Smoke Symposium November; 2016 14–17; Long Beach, CA. Missoula, MT: International Association of Wildland Fire. 13 p. https://www.treesearch.fs.fed.us/pubs/54525.

Journals and Other Publications

Online links are provided if available, but some are available only to Forest Service Personnel because of open access privilege. For the general public, some links may hit a pay wall. Please accept our apologies for any inconvenience.

Learn from the burn: The High Park Fire 5 years later. Miller, Sue; Rhodes, Charles; Robichaud, Pete; [et al.]. 2017. Science You Can Use Bulletin. Issue 25. Fort Collins, CO: Rocky Mountain Research Station. 18 p. https://www.treesearch.fs.fed.us/pubs/54288.

Long-term effects of fuel treatments on aboveground biomass accumulation in ponderosa pine forests of the northern Rocky Mountains. Clyatt, Kate A.; Keyes, Christopher R.; Hood, Sharon M. 2017. Forest Ecology and Management. 400: 587–599. https://www.treesearch.fs.fed.us/pubs/54505.

Participatory Geographic Information Systems as an organizational platform for the integration of traditional and scientific knowledge in contemporary fire and fuels management. McBride, Brooke Balauf; Sanchez-Trigueros, Fernando; Watson, Alan E; [et al.]. 2016. Journal of Forestry. 115(1): 43–50. https://www.treesearch.fs.fed.us/pubs/54521.

Predicting post-fire tree mortality for 14 conifers in the Pacific Northwest, USA: Model evaluation, development, and thresholds. Grayson, Lindsay M.; Progar, Robert A.; Hood, Sharon M. 2017. Forest Ecology and Management. 399: 213–226. https://www.treesearch.fs.fed.us/pubs/54279.

Sustainability and wildland fire: The origins of Forest Service Wildland Fire Research. Smith, Diane M. 2017. FS-1085. Washington, DC: U.S. Department of Agriculture, Forest Service. 120 p. https://www.treesearch.fs.fed.us/pubs/54271.

Forest and woodland ecosystems

A Bayesian model to correct underestimated 3-D wind speeds from sonic anemometers increases turbulent components of the surface energy balance. Frank, John M.; Massman, William J.; Ewers, Brent E. 2016. Atmospheric Measurement Techniques. 9: 5933–5953. https://www.treesearch.fs.fed.us/pubs/54523.

Can spruce beetle (*Dendroctonus rufipennis* Kirky) pheromone trap catches or stand conditions predict Engelmann spruce (*Picea engelmannii* Parry ex *Engelm.*) tree mortality in Colorado? Negrón, J.F.; Popp, J.B. 2017. Agricultural and Forest Entomology. doi: 10.1111/afe. 12239. https://www.treesearch.fs.fed.us/pubs/54510.

Combined effect of pulse density and grid cell size on predicting and mapping aboveground carbon in fast-growing Eucalyptus forest plantation using airborne LiDAR data. Silva, Carlos Alberto; Hudak, Andrew Thomas; Klauberg, Carine; [et al.]. 2017. Carbon Balance Manage. 12: 13. https://www.treesearch.fs.fed.us/pubs/54507.

Competition amplifies drought stress in forests across broad climatic and compositional gradients. Gleason, Kelly E.; Bradford, John B.; Battaglia, Michael A.; [et al.]. 2017. Ecosphere. 8(7): Article e01849. https://www.treesearch.fs.fed.us/pubs/54493.

Diapause and overwintering of two spruce bark beetle species. Schebeck, Martin; Hansen, E. Matthew; Bentz, Barbara J.; [et al.]. 2017. Physiological Entomology. doi: 10.1111/phen.12200. https://www.treesearch.fs.fed.us/pubs/54498.

The ecological importance of mixed-severity fires: Nature's phoenix [Book Review]. Sieg, Carolyn H. 2016. Forest Science. 62(6): 710–711. https://www.treesearch.fs.fed.us/pubs/54524.

Insect outbreak shifts the direction of selection from fast to slow growth rates in the long-lived conifer *Pinus ponderosa*. de la Mata, Raul; Hood, Sharon; Sala, Anna. 2017.

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PNAS. doi: 10.1073/pnas.1700032114. https://www.treesearch.fs.fed.us/pubs/54506.

Insights into the phylogeny of Northern Hemisphere Armillaria: Neighbor-net and Bayesian analyses of translation elongation factor 1-α gene sequences. Klopfenstein, Ned B.; Stewart, Jane E.; Ota, Yuko; [et al.]. 2017. Mycologia. 109: 75–91. https://www.treesearch.fs.fed.us/pubs/54041.

Large-scale thinning, ponderosa pine, and mountain pine beetle in the Black Hills, USA. Negrón, Jose F.; Allen, Kurt K.; Ambourn, Angie; [et al.]. 2017. Forest Science. doi: http://dx.doi.org/10.5849/FS-2016-061. https://www.treesearch.fs.fed.us/pubs/54526.

Long-term precommercial thinning effects on *Larix occidentalis* (western larch) tree and stand characteristics. Schaedel, M.S.; Larson, A.J.; Sutherland, E.K.; [et al.]. 2017. Canadian Journal of Forest Research. 47: 861–874. https://www.treesearch.fs.fed.us/pubs/54381.

Multiple-scale prediction of forest loss risk across Borneo. Cushman, Samuel A.; Macdonald, Ewan A.; Landguth, Erin L.; [et al.]. 2017. Landscape Ecology. doi: 10.1007/s10980-017-0520-0. https://www.treesearch.fs.fed.us/pubs/54189.

Opportunities and uses of biochar on forest sites in North America [Chapter 15]. Page-Dumroese, Deborah S.; Coleman, Mark D.; Thomas, Sean C. 2017. In: Bruckman, Viktor; Varol, Esin Apaydin; Uzun, Basak; Liu, Jay, eds. Biochar: A regional supply chain approach in view of climate change mitigation. Cambridge, UK: Cambridge University Press: 315–335. https://www.treesearch.fs.fed.us/pubs/54277.

Planning the future's forests with assisted migration [Chapter 8]. Williams, Mary I.; Dumroese, R. Kasten. 2016. In: Sample, V. Alaric; Bixler, R. Patrick; Miller, Char, eds. Forest Conservation in the Anthropocene: Science, Policy, and Practice. Boulder, CO: University of Colorado Press: 113–123. https://www.treesearch.fs.fed.us/pubs/54514.

Predicting logging residue volumes in the Pacific Northwest. Berg, Erik C.; Morgan, Todd A.; Simmons, Eric A.; [et al.]. 2016. Forest Science. 62(5,7): 564–573. https://www.treesearch.fs.fed.us/pubs/52338.

Preempting the pathogen: Blister rust and proactive management of high-elevation pines. Schoettle, A.; Burns, K.; Sniezko, R.; [et al.]. 2017. Science You Can Use Bulletin. Issue 24. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 11 p. https://www.treesearch.fs.fed.us/pubs/54095.

Range-wide conservation of *Pinus aristata*: A genetic collection with ecological context for proactive management today and resources for tomorrow. Schoettle, A.W.; Coop, J.D. 2017. New Forests. 48: 181–199. https://www.treesearch.fs.fed.us/pubs/54193.

Relationships among vegetation structure, canopy composition, and avian richness patterns across an aspen-conifer forest gradient. Swift, Charles E.; Vierling, Kerri T.; Hudak, Andrew T.; [et al.]. 2017. Canadian Journal of Remote Sensing. 43(3): 231-243. https://www.treesearch.fs.fed.us/pubs/54508.

Sensitivity of resource selection and connectivity models to landscape definition. Zeller, Katherine A.; McGarigal, Kevin; Cushman, Samuel A.; [et al.]. 2017. Landscape Ecology. 32: 835–855. https://www.treesearch.fs.fed.us/pubs/54527.

Short-term ecological consequences of collaborative restoration treatments in ponderosa pine forests of Colorado. Briggs, Jennifer S.; Fornwalt, Paula J.; Feinstein, Jonas

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A. 2017. Forest Ecology and Management. 395: 69–80. https://www.treesearch.fs.fed.us/pubs/54343.

Snow duration effects on density of the alpine endemic plant *Packera franciscana*. Fowler, James F.; Overby, Steven. 2016. Western North American Naturalist. 76(3): 383-387. https://www.treesearch.fs.fed.us/pubs/54522.

Tree planting in Haiti: How to plant and care for your nursery grown seedlings. Hubbel, Kyrstan; Pinto, Jeremiah R.; Dumroese, R. Kasten; [et al.]. 2016. Bulletin 103. Moscow, ID: University of Idaho, Forest Wildlife and Range Experiment Station. 2 p. Includes Creole (Plante Pyebwa an Ayiti) and French (Plantation d'arbres en Haïti) translations. https://www.treesearch.fs.fed.us/pubs/54513.

Grasslands, shrublands, and desert ecosystems

Climate change vulnerability assessment of forests in the Southwest U.S. Thorne, J.H.; Choe, H.; Chambers, J.C.; [et al.]. 2017. Gutzler Special issue. Climate Change. doi: 10.1007/s10584-017-2010-4. https://www.treesearch.fs.fed.us/pubs/54501.

Cochliotoxin, a dihydropyranopyran-4,5-dione, and its analogues produced by *Cochliobolus australiensis* display phytotoxic activity against bullelgrass (*Cenchrus ciliaris*). Masi, M.; Meyer, S.; Clement, S.; [et al.]. 2017. Journal of Natural Products. 80: 1241–1247. https://www.treesearch.fs.fed.us/pubs/54278.

Genetic diversity and structure of an endangered desert shrub and the implications for conservation. Su, Z.; Richardson, B.A.; Zhuo, L.; [et al.]. 2017. AoB Plants. 9. plx016. doi:10.1093/aobpla/plx016. https://www.treesearch.fs.fed.us/pubs/54190.

GSD Update: Year in Review: Spotlight on 2016 research by the Grassland, Shrubland and Desert Ecosystems Science Program. Finch, Deborah. June 2017. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 19 p. https://www.treesearch.fs.fed.us/pubs/54499.

In this issue:
Restoring forbs benefits sagebrush-dependent species
Fire forensics: Deciphering the past using tree rings
Effects of prescribed fire on wildlife and wildlife habitat
Climate and grazing alter invasive and native perennial grasses
Cheatgrass succeeds through ecotypic variation
Looks aren't everything: Cytoplasmic markers detect cryptic hybridization in 'normal-looking' weeds
Floods create ecological diversity
Using volatiles to identify sagebrush species and subspecies
Influence of climate and seed weight for restoring sagebrush ecosystems
A science basis for conserving and restoring the sagebrush biome
The location of flowers and fruits in some species of arid land plants is determined by the position of the sun
The right seed at the right place
Understanding seedling physiology, biophysics, and edaphic environments to maximize restoration goals
Field testing provisional seed zones for basin wildrye
New *Hieracium* spp. discovered in South Dakota

Insights into the phylogeny of Northern Hemisphere Armillaria: Neighbor-net and Bayesian analyses of translation elongation factor 1-α gene sequences. Klopfenstein, Ned B.; Stewart, Jane E.; Ota, Yuko; [et al.]. 2017. Mycologia. 109: 75–91. https://www.treesearch.fs.fed.us/pubs/54041.

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Invasive species science update. RMRS Invasive Species Working Group. 2017. Number 9. Fort Collins, CO: U.S. Department of Agricultue, Forest Service, Rocky Mountain Research Station. 14 p. https://www.treesearch.fs.fed.us/pubs/53961.

In this issue:

Managing climate change risks in rangeland systems. Joyce, L.A.; Marshall, N.A. 2017. In: Briske, D.D., ed. Rangeland systems: Processes, management and challenges. Springer Series on Environmental Management. Cham, Switzerland: Springer Nature: 491–526. https://www.treesearch.fs.fed.us/pubs/54281.

Population genetic structure of *Bromus tectorum* in the mountains of western North America. Arnesen, Spencer; Coleman, Craig E.; Meyer, Susan E. 2017. American Journal of Botany. 104(6): 1–12. https://www.treesearch.fs.fed.us/pubs/54346.

Post-fire vegetation response at the woodland-shrubland interface is mediated by the pre-fire community. Urza, A.; Weisberg, P.J.; Chambers, J.C.; [et al.]. 2017. Ecosphere. 8(6): Article e01851. https://www.treesearch.fs.fed.us/pubs/54502.

Removal of perennail herbaceous species affects response of cold desert shrublands to fire. Chambers, J.C.; Board, D.E.; Roundy, B.A.; [et al.]. 2017. Journal of Vegetation Science. doi: 10.1111/jvs.12548. https://www.treesearch.fs.fed.us/pubs/54500.

The smell of environmental change: Using floral scent to explain shifts in pollinator attraction. Burkle, L.A.; Runyon, J.B. 2017. Applications in Plant Sciences. 5(6): 1600123. https://www.treesearch.fs.fed.us/pubs/54511.

Tree planting in Haiti: How to plant and care for your nursery grown seedlings. Hubbel, Kyrstan; Pinto, Jeremiah R.; Dumroese, R. Kasten; [et al.]. 2016. Bulletin 103. Moscow, ID: University of Idaho, Forest Wildlife and Range Experiment Station. 2 p. Includes Creole (Plante Pyebwa an Ayiti) and French (Plantation d'arbres en Haïti) translations. https://www.treesearch.fs.fed.us/pubs/54513.

Human dimensions

Function modeling improves the efficiency of spatial modeling using big data from remote sensing. Hogland, John; Anderson, Nathaniel. 2017. Big Data and Cognitive Computing. 1(3) :1–14. https://www.treesearch.fs.fed.us/pubs/54503.

Implementing climate change adaptation in forested regions in the western United States. Halofsky, J.E.; Joyce, L.A.; Millar, C.I.; [et al.]. 2017. In: Sample, V.A.; Bixler, R.P.; Miller, C., eds. Forest conservaton in the Anthropocene. Boulder, CO: University Press of Colorado: 165–178.

Journals and Other Publications

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Life cycle analysis of biochar [Chapter 3]. Bergman, Richard D.; Gu, Hongmei; Page-Dumroese, Deborah S.; Anderson, Nathaniel M. 2017. In: Bruckman, Viktor; Varol, Esin Apaydin; Uzun, Basak; Liu, Jay, eds. Biochar: A regional supply chain approach in view of climate change mitigation. Cambridge, UK: Cambridge University Press: 46–69. https://www.treesearch.fs.fed.us/pubs/54276.

Managing climate change risks in rangeland systems. Joyce, L.A.; Marshall, N.A. 2017. In: Briske, D.D., ed. Rangeland systems: Processes, management and challenges. Springer Series on Environmental Management. Cham, Switzerland: Springer Nature: 491–526. https://www.treesearch.fs.fed.us/pubs/54281.

A supply chain approach to biochar systems [Chapter 2]. Anderson, Nathaniel M.; Bergman, Richard D.; Page-Dumroese, Deborah S. 2017. In: Bruckman, Viktor; Varol, Esin Apaydin; Uzun, Basak; Liu, Jay, eds. Biochar: A regional supply chain approach in view of climate change mitigation. Cambridge, UK: Cambridge University Press: 25–45. https://www.treesearch.fs.fed.us/pubs/54270.

Understanding social-ecological vulnerability with Q-methodology: A case study of water-based ecosystem services in Wyoming, USA. Armatas, C.; Venn, T.; Watson, A. 2017. Sustainability Science. 12(1): 105–121.

Inventory and monitoring

Assessing the impact of a mountain pine beetle infestation on stand structure of lodgepole pine forests in Colorado using the Forest Inventory and Analysis Annual forest inventory. Thompson, Michael T. 2017. Journal of Forestry. doi: http://dx.doi.org/10.5849/jof.15-057. https://www.treesearch.fs.fed.us/pubs/54230.

Assessment of fire effects based on Forest Inventory and Analysis data and a long-term fire mapping data set. Shaw, John D.; Goeking, Sara A.; Menlove, James; Werstak, Charles E., Jr. 2017. Journal of Forestry. doi: http://dx.doi.org/10.5849/jof.2016-115. https://www.treesearch.fs.fed.us/pubs/54192.

Gridded snow water equivalent reconstruction for Utah using Forest Inventory and Analysis tree-ring data. Barandiaran, Daniel; Simon Wang, S.-Y.; DeRose, R. Justin. 2017. Water. 9: 403. https://www.treesearch.fs.fed.us/pubs/54504.

Introduction to the special section on forest inventory and analysis. Shaw, John D. 2017. Journal of Forestry. doi: http://dx.doi.org/10.5849/jof.2017-002R1. https://www.treesearch.fs.fed.us/pubs/54191.

Model-assisted survey regression estimation with the lasso. McConville, K.S.; Breidt, F.J.; Lee, T.C.M.; Moisen, G.G. 2017. Journal of Survey Statistics and Methodology. 5: 131–158. https://www.treesearch.fs.fed.us/pubs/54282.

Science application and communication

Don't bust the biological soil crust: Preserving and restoring an important desert resource. Miller, Sue; Warren, Steve; St. Clair, Larry. 2017. Science You Can Use Bulletin. 23. Fort Collins, CO: Rocky Mountain Research Station. 10 p. https://www.treesearch.fs.fed.us/pubs/53680.

Learn from the burn: The High Park Fire 5 years later. Miller, Sue; Rhodes, Charles; Robichaud, Pete; [et al.]. 2017. Science You Can Use Bulletin. 25. 18 p. https://www.fs.fed.us/rm/pubs_journals/2017/rmrs_2017_miller_s003. https://www.treesearch.fs.fed.us/pubs/54288.

Journals and Other Publications

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Preempting the pathogen: Blister rust and proactive management of high-elevation pines. Miller, Sue; Schoettle, Anna; Burns, Kelly; [et al.]. 2017. Science You Can Use Bulletin. 24. Fort Collins, CO: Rocky Mountain Research Station. 11 p. https://www.treesearch.fs.fed.us/pubs/54095.

Wilderness research

Mapping wilderness character in Denali National Park and Preserve. Burrows, Rob; Tricker, James; Landres, Peter; [et al.]. 2016. Natural Resource Report NPS/DENA/NRR-2016/1223. Fort Collins, CO: U.S. Department of the Interior, National Park Service, Natural Resource Stewardship and Science. 106 p. https://www.treesearch.fs.fed.us/pubs/54518.

The US Wilderness Managers Survey: Charting a path for the future. Dawson, Chad P.; Cordell, Ken; Watson, Alan E.; [et al.]. 2016. Journal of Forestry. 114(3): 298–304. https://www.treesearch.fs.fed.us/pubs/54538.

Using risk analysis to reveal opportunities for the management of unplanned ignitions in wilderness. Barnett, Kevin; Miller, Carol; Venn, Tyron J. 2016. Journal of Forestry. 114(6): 610–618. https://www.treesearch.fs.fed.us/pubs/54537.

Wildlife and terrestrial habitats

Abundance of black-backed woodpeckers and other birds in relation to disturbance and forest structure in the Black Hills and Bear Lodge Mountains of South Dakota and Wyoming. Matseur, E. 2017. Thesis. Columbia: University of Missouri. 100 p. https://www.treesearch.fs.fed.us/pubs/54347.

The importance of data quality for generating reliable distribution models for rare, elusive, and cryptic species. Aubry, Keith B.; Raley, Catherine M.; McKelvey, Kevin S. 2017. PLoS One. 12: e0179152. https://www.treesearch.fs.fed.us/pubs/54382.

Long-term demography of the northern goshawk in a variable environment. Reynolds, R.T.; Lambert, J.S.; Flather, C.H.; [et al.]. 2017. Wildlife Monographs. 197: 1–40. https://www.treesearch.fs.fed.us/pubs/54157.

Marine mammal subspecies in the age of genetics: Introductory remarks from the Associate Editor and Editor-in-Chief of Marine Mammal Science. Schwartz, Michael K.; Boness, Daryl J. 2017. Marine Mammal Science. 33(Special Issue): 7–11. https://www.treesearch.fs.fed.us/pubs/54512.

Sex-biased dispersal and spatial heterogeneity affect landscape resistance to gene flow in fisher. Tucker, Jody M.; Allendorf, Fred W.; Truex, Richard L.; Schwartz, Michael K. 2017. Ecosphere. 8(6): e01839. https://www.treesearch.fs.fed.us/pubs/54342.

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-environments. 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: https://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, management options and impacts, and 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 Communication

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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