

The normal fire environment - modeling environmental suitability for large forest wildfires using past, present, and future climate normals

www.nrfirescience.org/resource/15206

We modeled the normal fire environment for occurrence of large forest wildfires (>40 ha) for the Pacific Northwest Region of the United States. Large forest wildfire occurrence data from the recent climate normal period (1971-2000) was used as the response variable and fire season precipitation, maximum temperature, slope,...

Author(s): Raymond J. Davis, Zhiqiang Yang, Cole Belongie, Warren B. Cohen

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Tree regeneration, understory development, and biomass dynamics following wildfire in a mountain hemlock (*Tsuga mertensiana*) forest

www.nrfirescience.org/resource/15021

Processes initiated by wildfire largely determine ecological characteristics of forested landscapes in subsequent decades, including vegetation composition, habitat quality, carbon balance, and probability of fire recurrence. Post-fire biomass dynamics have rarely been observed directly for high-elevation forests of the Pacific...

Author(s): Jane A. Kertis, Steven A. Acker, Robert J. Pabst

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

A range-wide restoration strategy for whitebark pine (*Pinus albicaulis*)

www.nrfirescience.org/resource/12690

Whitebark pine (*Pinus albicaulis*), an important component of western high-elevation forests, has been declining in both the United States and Canada since the early Twentieth Century from the combined effects of mountain pine beetle (*Dendroctonus ponderosae*) outbreaks, fire exclusion policies, and the spread of the exotic disease...

Author(s): Robert E. Keane, Diana F. Tomback, C. A. Aubry, A. D. Bower, Elizabeth M. Campbell, Cathy L. Cripps, M. B. Jenkins, M. F. Mahalovich, Mary Manning, Shawn T. McKinney, Michael P. Murray, Dana L. Perkins, C. A. Ryan, Anna W. Schoettle, Cyndi M. Smith

Year Published: 2017

Type: Document

Technical Report or White Paper

Fire history and fire-climate interactions in high elevation whitebark pine dominated forest

www.nrfirescience.org/resource/15767

The objectives of this study were to identify whitebark pine fire-climate interactions, and tree establishment and mortality patterns in a landscape context. Specific objectives were to : 1) develop a whitebark pine tree-ring chronology to date fire scar samples and reconstruct climate from tree rings; 2) identify fire climate...

Author(s): Alan H. Taylor, Catherine Airey Lauvaux

Year Published: 2017

Type: Document

Technical Report or White Paper

Quantifying the effect of elevation and aspect on fire return intervals in the Canadian Rocky Mountains

www.nrfirescience.org/resource/15032

The effect of topography on wildfire distribution in the Canadian Rockies has been the subject of debate. We suspect the size of the study area, and the assumption fire return intervals are distributed as a Weibull distribution used in many previous studies may have obscured the real effect of topography on these fire-regulated...

Author(s): Marie-Pierre Rogeau, Glen W. Armstrong

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Fire severity and cumulative disturbance effects in the post-mountain pine beetle lodgepole pine forests of the Pole Creek Fire

www.nrfirescience.org/resource/14007

Recent large scale mountain pine beetle (*Dendroctonus ponderosae* Hopkins, MPB) outbreaks have created concern regarding increased fuel loadings and exacerbated fire behavior and have prompted a desire to understand the effects of sequential disturbances on the landscape. However, previous research has focused on quantifying fuel...

Author(s): Michelle Agne, Travis J. Woolley, Stephen A. Fitzgerald

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Fuel size impacts on carbon residuals and combustion dynamics in masticated woody debris

www.nrfirescience.org/resource/14488

Mastication of standing trees to reduce crown fuel loading is an increasingly popular method of reducing wildfire hazard in the wildland-urban interface of Canada. Previous research has shown that masticated fuel beds can leave considerable pyrogenic and black carbon residuals after burning, though the impact of fuel particle size...

Author(s): Dan K. Thompson, Tom J. Schiks, B. Mike Wotton

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Complex challenges of maintaining whitebark pine in Greater Yellowstone under climate change: A call for innovative research, management, and policy approaches

www.nrfirescience.org/resource/14364

Climate suitability is projected to decline for many subalpine species, raising questions about managing species under a deteriorating climate. Whitebark pine (WBP) (*Pinus albicaulis*) in the Greater Yellowstone Ecosystem (GYE) crystallizes the challenges that natural resource managers of many high mountain ecosystems will likely face...

Author(s): Andrew J. Hansen, Kathryn Ireland, Kristin Legg, Robert E. Keane, Edward Barge, Martha Jenkins, Michiel Pillet

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Anthropogenic influence on wildfire activity in Alberta, Canada

www.nrfirescience.org/resource/14702

The boreal forest of Alberta, Canada, is under pressure from a rapid expansion of the wildland-human interface driven by natural resources exploitation. The specific impact of these changes on area burned remains poorly understood. We addressed this issue by modelling area burned for the 1980-2010 period using variables...

Author(s): Francois-Nicolas Robinne, Marc-Andre Parisien, Michael D. Flannigan
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Do insect outbreaks reduce the severity of subsequent forest fires?

www.nrfirescience.org/resource/14260

Understanding the causes and consequences of rapid environmental change is an essential scientific frontier, particularly given the threat of climate- and land use-induced changes in disturbance regimes. In western North America, recent widespread insect outbreaks and wildfires have sparked acute concerns about potential insect–...

Author(s): Garrett W. Meigs, Harold S. Zald, John L. Campbell, William S. Keeton, Robert E. Kennedy
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

A 20-year reassessment of the health and status of whitebark pine forests in the Bob Marshall Wilderness Complex, Montana

www.nrfirescience.org/resource/14676

Whitebark pine plays a prominent role in high elevation ecosystems of the northern Rocky Mountains. It is an important food source for many birds and mammals as well as an essential component of watershed stabilization. Whitebark pine is vanishing from the landscape due to three main factors: white pine blister rust, mountain pine...

Author(s): Signe B. Leirfallom, Robert E. Keane, Molly L. Retzlaff
Year Published: 2016
Type: Document
Technical Report or White Paper

Influences of vegetation disturbance on hydrogeomorphic response following wildfire

www.nrfirescience.org/resource/14186

Quantifying the linkages between vegetation disturbance by fire and the changes in hydrologic processes leading to post-fire erosional response remains a challenge. We measured the influence of fire severity, defined as vegetation disturbance (using a satellite-derived vegetation disturbance index, VDI), landscape features that...

Author(s): Kevin D. Hyde, Kelsey Jencso, Andrew C. Wilcox, Scott W. Woods
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Long-term soil changes from forest harvesting and residue management in the northern Rocky Mountains

www.nrfirescience.org/resource/14659

Soil changes associated with forest harvesting, differing utilization levels, and post-harvest prescribed burning were determined using an empirical study to investigate the long-term impacts on soil physical and chemical properties at Coram Experimental Forest in northwestern Montana. In 1974, two replications of three regeneration...

Author(s): Woongsoon Jang, Deborah S. Page-Dumroese, Christopher R. Keyes
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

The impact of aging on laboratory fire behaviour in masticated shrub fuelbeds of California and Oregon, USA

www.nrfirescience.org/resource/14580

Mastication of shrubs and small trees to reduce fire hazard has become a widespread management practice, yet many aspects of the fire behaviour of these unique woody fuelbeds remain poorly understood. To examine the effects of fuelbed aging on fire behaviour, we conducted laboratory burns with masticated *Arctostaphylos* spp. and...

Author(s): Jesse K. Kreye, J. Morgan Varner, Jeffrey M. Kane, Eric E. Knapp, Warren P. Reed

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Conservation and management of whitebark pine ecosystems

www.nrfirescience.org/resource/14563

This reference presents general guidelines for planning, implementing, and evaluating whitebark pine conservation and management activities on lands administered by the Bureau of Land Management.

Author(s): Dana L. Perkins, Robert E. Means, Alexia C. Cochrane

Year Published: 2016

Type: Document

Synthesis, Technical Report or White Paper

Effects of post-fire logging on fuel dynamics in a mixed-conifer forest, Oregon, USA: a 10-year assessment

www.nrfirescience.org/resource/14429

Removal of fire-killed trees (i.e. post-fire or salvage logging) is often conducted in part to reduce woody fuel loads and mitigate potential reburn effects. Studies of post-salvage fuel dynamics have primarily used chronosequence or modelling approaches, with associated limitations; longitudinal studies tracking fuels over time...

Author(s): John L. Campbell, Daniel C. Donato, Joseph B. Fontaine

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Effects of prescribed fire on wildlife and wildlife habitat in selected ecosystems of North America

www.nrfirescience.org/resource/14715

Prescribed fire is applied widely as a management tool in North America to meet various objectives such as reducing fuel loads and fuel continuity, returning fire to an ecosystem, enhancing wildlife habitats, improving forage, preparing seedbeds, improving watershed conditions, enhancing nutrient cycling, ...

Author(s): William M. Block, L. Mike Conner, Paul A. Brewer, Paulette Ford, Jonathan Haufler, Andrea Litt, Ronald E. Masters, Laura R. Mitchell, Jane Park

Year Published: 2016

Type: Document

Technical Report or White Paper

Detecting unburned areas within wildfire perimeters using Landsat and ancillary data across the northwestern United States

www.nrfirescience.org/resource/14897

Wildfires shape the distribution and structure of vegetation across the inland northwestern United

States. However, fire activity is expected to increase given the current rate of climate change, with uncertain outcomes. A fire impact that has not been widely addressed is the development of unburned islands; areas within the fire...

Author(s): Arjan J. H. Meddens, Crystal A. Kolden, James A. Lutz

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Spatial and temporal variations of fire regimes in the Canadian Rocky mountains and foothills of southern Alberta

www.nrfirescience.org/resource/14701

Like many fire-adapted ecosystems, decades of fire exclusion policy in the Rocky Mountains and Foothills natural regions of southern Alberta, Canada are raising concern over the loss of ecological integrity. Departure from historical conditions is evaluated using median fire return intervals (MdfRI) based on fire history data from...

Author(s): Michael D. Flannigan, Brad C. Hawkes, Marc-Andre Parisien, Marie-Pierre Rogeau, Rick Arthur

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Recovery and diversity of the forest shrub community 38 years after biomass harvesting in the northern Rocky Mountains

www.nrfirescience.org/resource/14660

We investigated the long-term impact of biomass utilization on shrub recovery, species composition, and biodiversity 38 years after harvesting at Coram Experimental Forest in northwestern Montana. Three levels of biomass removal intensity (high, medium, and low) treatments combined with prescribed burning treatment were nested...

Author(s): Woongsoon Jang, Christopher R. Keyes, Deborah S. Page-Dumroese

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Whitebark Pine Friendly Ski Area Certification Program launches this fall at Whitefish Mountain, Montana

www.nrfirescience.org/resource/14622

Where do most of the general public encounter whitebark pines? Ski areas! These recreational areas in high elevations allow many to encounter an otherwise remote and wilderness species. This accessibility of whitebark pines at ski areas serves as the motivation behind the Whitebark Pine Ecosystem Foundation's...

Author(s): Edie Dooley

Year Published: 2016

Type: Document

Research Brief or Fact Sheet

High and dry: post-fire tree seedling establishment in subalpine forests decreases with post-fire drought and large stand-replacing burn patches

www.nrfirescience.org/resource/14103

Total post-fire tree seedling establishment (all species combined) declined sharply with greater post-fire drought severity and with greater distance to seed sources (i.e. the interior of burn patches). Effects varied among key species groups. For conifers that dominate present-day subalpine forests (*Picea*

engelmannii...

Author(s): Brian J. Harvey, Daniel C. Donato, Monica G. Turner

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Climate influences on whitebark pine mortality from mountain pine beetle in the Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/14565

Extensive mortality of whitebark pine, beginning in the early to mid-2000s, occurred in the Greater Yellowstone Ecosystem (GYE) of the western US, primarily from mountain pine beetle but also from other threats such as white pine blister rust. The climatic drivers of this recent mortality and the potential for future whitebark pine...

Author(s): Polly C. Buotte, Jeffrey A. Hicke, Haiganoush K. Preisler, John T. Abatzoglou, Kenneth F. Raffa, Jesse A. Logan

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Complex response of white pines to past environmental variability increases understanding of future vulnerability

www.nrfirescience.org/resource/13522

Ecological niche models predict plant responses to climate change by circumscribing species distributions within a multivariate environmental framework. Most projections based on modern bioclimatic correlations imply that high-elevation species are likely to be extirpated from their current ranges as a result of rising growing...

Author(s): Virginia Iglesias, Teresa R. Krause, Cathy L. Whitlock

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

The effects of seed source health on whitebark pine (*Pinus albicaulis*) regeneration density after wildfire

www.nrfirescience.org/resource/13603

Whitebark pine (*Pinus albicaulis* Engelm.) populations are declining nearly rangewide from a combination of factors, including mountain pine beetle (*Dendroctonus ponderosae* Hopkins, 1902) outbreaks, the exotic pathogen *Cronartium ribicola* J.C. Fisch. 1872, which causes the disease white pine blister rust, and successional replacement...

Author(s): Signe B. Leirfallom, Robert E. Keane, Diana F. Tomback, Solomon Z. Dobrowski

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Fire enhances whitebark pine seedling establishment, survival, and growth

www.nrfirescience.org/resource/13456

Periodic fire is thought to improve whitebark pine (*Pinus albicaulis* Engelm.) regeneration by reducing competition and creating openings, but the mechanisms by which fire affects seedling establishment are poorly understood. I compared seedling vegetation production in adjacent sites, one last burned in 1880 and the other in 1988,...

Author(s): Judy L. Perkins

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Interactions among spruce beetle disturbance, climate change and forest dynamics captured by a forest landscape model

www.nrfirescience.org/resource/13909

The risk of bark beetle outbreaks is widely predicted to increase because of a warming climate that accelerates temperature-driven beetle population growth and drought stress that impairs host tree defenses. However, few if any studies have explicitly evaluated climatically enhanced beetle population dynamics in relation to climate-...

Author(s): Christian Temperli, Thomas T. Veblen, Sarah Hart, Dominik Kulakowski, Alan J. Tepley

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Observations of distributed snow depth and snow duration within diverse forest structures in a maritime mountain watershed

www.nrfirescience.org/resource/14278

Spatially distributed snow depth and snow duration data were collected over two to four snow seasons during water years 2011–2014 in experimental forest plots within the Cedar River Municipal Watershed, 50 km east of Seattle, Washington, USA. These 40 × 40 m forest plots, situated on the western slope of the Cascade Range,...

Author(s): Susan E. Dickerson-Lange, James A. Lutz, Rolf Gersonde, Kael A. Martin, Jenna E. Forsyth, Jessica D. Lundquist

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Fire severity unaffected by spruce beetle outbreak in spruce-fir forests in southwestern Colorado

www.nrfirescience.org/resource/14156

Recent large and severe outbreaks of native bark beetles have raised concern among the general public and land managers about potential for amplified fire activity in western North America. To date, the majority of studies examining bark beetle outbreaks and subsequent fire severity in the U.S. Rocky Mountains have focused on...

Author(s): Robert A. Andrus, Thomas T. Veblen, Brian J. Harvey, Sarah Hart

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Impacts of fire on snowshoe hares in Glacier National Park, Montana, USA

www.nrfirescience.org/resource/13460

Forest fires fundamentally shape the habitats available for wildlife. Current predictions for fire under a warming climate suggest larger and more severe fires may occur, thus challenging scientists and managers to understand and predict impacts of fire on focal species, especially species of management concern. Snowshoe hares (...)

Author(s): Ellen Cheng, Karen E. Hodges, Scott Mills

Year Published: 2015

Type: Document
Book or Chapter or Journal Article

Conflicting selection from fire and seed predation drives fine-scaled phenotypic variation in a widespread North American conifer

www.nrfirescience.org/resource/12964

Recent work has demonstrated that evolutionary processes shape ecological dynamics on relatively short timescales (eco-evolutionary dynamics), but demonstrating these effects at large spatial scales in natural landscapes has proven difficult. We used empirical studies and modeling to investigate how selective pressures from fire and...

Author(s): Matt V. Talluto, Craig W. Benkman

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

De-coupling seasonal changes in water content and dry matter to predict live conifer foliar moisture content

www.nrfirescience.org/resource/12959

Live foliar moisture content (LFMC) significantly influences wildland fire behaviour. However, characterising variations in LFMC is difficult because both foliar mass and dry mass can change throughout the season. Here we quantify the seasonal changes in both plant water status and dry matter partitioning. We collected new and old...

Author(s): William Matt Jolly, Ann M. Hadlow, Kathleen Huguet

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Stand density and age affect tree-level structural and functional characteristics of young, postfire lodgepole pine in Yellowstone National Park

www.nrfirescience.org/resource/12925

More frequent fire activity associated with climate warming is expected to increase the extent of young forest stands in fire-prone landscapes, yet growth rates and biomass allocation patterns in young forests that regenerated naturally following stand-replacing fire have not been well studied. We assessed the structural and...

Author(s): Paige E. Copenhaver, Daniel B. Tinker

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Interactions among the mountain pine beetle, fires, and fuels

www.nrfirescience.org/resource/12022

Bark beetle outbreaks and wildfires are principal drivers of change in western North American forests, and both have increased in severity and extent in recent years. These two agents of disturbance interact in complex ways to shape forest structure and composition. For example, mountain pine beetle, *Dendroctonus ponderosae* Hopkins...

Author(s): Michael J. Jenkins, Justin B. Runyon, Christopher J. Fettig, Wesley G. Page, Barbara J. Bentz

Year Published: 2014

Type: Document

Book or Chapter or Journal Article, Synthesis

Post-epidemic fire risk and behavior

www.nrfirescience.org/resource/13708

Citizens, government officials, and natural resource managers are greatly concerned about potential impacts of the mountain pine beetle (MPB) epidemic on fire hazards and risk. Some mountain towns are surrounded by dead and dying trees. In the Rocky Mountain Region of the Forest Service, the MPB epidemic threatens over 250,000 acres...

Author(s): Russell A. Parsons, William Matt Jolly, Paul G. Langowski, Megan Matonis, I. Sue Miller

Year Published: 2014

Type: Document

Conference Proceedings

Recent mountain pine beetle outbreaks, wildfire severity, and postfire tree regeneration in the US northern Rockies

www.nrfirescience.org/resource/13007

Widespread tree mortality caused by outbreaks of native bark beetles (Circulionidae: Scolytinae) in recent decades has raised concern among scientists and forest managers about whether beetle outbreaks fuel more ecologically severe forest fires and impair postfire resilience. To investigate this question, we collected extensive...

Author(s): Brian J. Harvey, Daniel C. Donato, Monica G. Turner

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Relative effects of climate change and wildfires on stream temperatures: a simulation modeling approach in a Rocky Mountain watershed

www.nrfirescience.org/resource/12998

Freshwater ecosystems are warming globally from the direct effects of climate change on air temperature and hydrology and the indirect effects on near-stream vegetation. In fire-prone landscapes, vegetative change may be especially rapid and cause significant local stream temperature increases but the importance of these increases...

Author(s): Lisa M. Holsinger, Robert E. Keane, Daniel J. Isaak, Lisa A. Eby, Michael K. Young

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

The temporal evolution of wildfire ash and implications for post-fire infiltration

www.nrfirescience.org/resource/12966

Changes in the properties of an ash layer with time may affect the amount of post-fire runoff, particularly by the formation of ash surface crusts. The formation of depositional crusts by ash have been observed at the pore and plot scales, but the causes and temporal evolution of ash layers and associated crusts have not yet been...

Author(s): Victoria N. Balfour, Stefan H. Doerr, Peter R. Robichaud

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Future Forests Webinar Series, webinar proceedings and summary: ongoing research and management responses to the mountain pine beetle outbreak

www.nrfirescience.org/resource/12963

The Future Forest Webinar Series facilitated dialogue between scientists and managers about the challenges and opportunities created by the mountain pine beetle (MPB) epidemic. The series consisted of six webinar facilitated by the USFS Rocky Mountain Research Station, the Northern and Rocky Mountain Regions, and the Colorado Forest...

Year Published: 2014
Type: Document
Conference Proceedings

Management for mountain pine beetle outbreak suppression: does relevant science support current policy?

www.nrfirescience.org/resource/13571

While the use of timber harvests is generally accepted as an effective approach to controlling bark beetles during outbreaks, in reality there has been a dearth of monitoring to assess outcomes, and failures are often not reported. Additionally, few studies have focused on how these treatments affect forest structure and function...

Author(s): Diana L. Six, Eric Biber, Elisabeth Long

Year Published: 2014

Type: Document

Book or Chapter or Journal Article, Synthesis

Integrating satellite imagery with simulation modeling to improve burn severity mapping

www.nrfirescience.org/resource/12957

Both satellite imagery and spatial fire effects models are valuable tools for generating burn severity maps that are useful to fire scientists and resource managers. The purpose of this study was to test a new mapping approach that integrates imagery and modeling to create more accurate burn severity maps. We developed and assessed...

Author(s): Eva C. Karau, Pamela G. Sikkink, Robert E. Keane, Gregory K. Dillon

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Crown fire potential in lodgepole pine forests during the red stage of mountain pine beetle attack

www.nrfirescience.org/resource/12926

Mountain pine beetle (MPB) outbreaks within the previous 10-15 years have affected millions of hectares of lodgepole pine forests in western North America. Concerns about the influence of recent tree mortality on changes in fire behaviour amongst firefighters and fire managers have led researchers to attempt to quantify the effects...

Author(s): Wesley G. Page, Michael J. Jenkins, Martin E. Alexander

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Northern Rockies pyrogeography: an example of fire atlas utility

www.nrfirescience.org/resource/12923

We demonstrated the utility of digital fire atlases by analyzing forest fire extent across cold, dry, and mesic forests, within and outside federally designated wilderness areas during three different fire management periods: 1900 to 1934, 1935 to 1973, and 1974 to 2008. We updated an existing atlas with a 12,070,086 ha recording...

Author(s): Penelope Morgan, Emily K. Heyerdahl, Carol Miller, Aaron M. Wilson, Carly E. Gibson

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Moving forward: responding to and mitigating effects of the MPB epidemic

www.nrfirescience.org/resource/13711

The final webinar in the Future Forest Webinar Series provided an example of how managers utilized available science to address questions about post-epidemic forest conditions. Assessments of current conditions and projected trends, and how these compare with historical patterns, provide important information for land management...

Author(s): Claudia Regan, Barry Bollenbacher, Rob Gump, Michael Hillis

Year Published: 2014

Type: Document

Conference Proceedings

Is proportion burned severely related to daily area burned?

www.nrfirescience.org/resource/13018

The ecological effects of forest fires burning with high severity are long-lived and have the greatest impact on vegetation successional trajectories, as compared to low-to-moderate severity fires. The primary drivers of high severity fire are unclear, but it has been hypothesized that wind-driven, large fire-growth days play a...

Author(s): Donovan Birch, Penelope Morgan, Crystal A. Kolden, Andrew T. Hudak, Alistair M. S. Smith

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Spectroscopic analysis of seasonal changes in live fuel moisture content and leaf dry mass

www.nrfirescience.org/resource/13001

Live fuel moisture content (LFMC), the ratio of water mass to dry mass contained in live plant material, is an important fuel property for determining fire danger and for modeling fire behavior. Remote sensing estimation of LFMC often relies on an assumption of changing water and stable dry mass over time.

Fundamental understanding...

Author(s): Yi Qi, Philip E. Dennison, William Matt Jolly, Rachel C. Kropp, Simon C. Brewer

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Previous fires moderate burn severity of subsequent wildland fires in two large western US wilderness areas

www.nrfirescience.org/resource/12051

Wildland fire is an important natural process in many ecosystems. However, fire exclusion has reduced frequency of fire and area burned in many dry forest types, which may affect vegetation structure and composition, and potential fire behavior. In forests of the western U.S., these effects pose a challenge for fire and land...

Author(s): Sean A. Parks, Carol Miller, Cara R. Nelson, Zachary A. Holden

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Challenges and opportunities for large landscape-scale management in a shifting climate: the importance of nested adaptation responses across geospatial and temporal scales

www.nrfirescience.org/resource/12994

The Yellowstone to Yukon Conservation Initiative (Y2Y) was established over 20 years ago as an experiment in large landscape conservation. Initially, Y2Y emerged as a response to large scale habitat fragmentation by advancing ecological connectivity. It also laid the foundation for large scale multi-

stakeholder conservation...

Author(s): Gary M. Tabor, Anne Carlson, R. Travis Belote

Year Published: 2014

Type: Document

Technical Report or White Paper

Whitebark pine restoration challenges - Restoration site visits in the Bridger Mountains

www.nrfirescience.org/resource/12929

As part of the 13th Whitebark Pine Ecosystem Science and Management Workshop - Challenges of Whitebark Pine Restoration, participants visited a whitebark pine restoration area near Fairy Lake in the Bridger Mountains north of Bozeman, MT (Figure 1). The restoration site at about 8,000 feet supports both whitebark pine (*Pinus...*

Author(s): Corey L. Gucker

Year Published: 2013

Type: Document

Research Brief or Fact Sheet

Appendix 2: Risk-based framework and risk case studies. Risk assessment for wildfire in the Western United States

www.nrfirescience.org/resource/11903

Wildfire is one of the two most significant disturbance agents (the other being insects) in forest ecosystems of the Western United States, and in a warmer climate, will drive changes in forest composition, structure, and function (Dale et al. 2001, McKenzie et al. 2004). Although wildfire is highly stochastic in space and time,...

Author(s): David L. Peterson, Jeremy S. Littell

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

Accipiter gentilis (northern goshawk)

www.nrfirescience.org/resource/10662

This FEIS species review synthesizes information on the relationship of *Accipiter gentilis* (northern goshawk) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Katharine R. Stone

Year Published: 2013

Type: Document

Synthesis

Foliar moisture content variations in lodgepole pine over the diurnal cycle during the red stage of mountain pine beetle attack

www.nrfirescience.org/resource/12141

Widespread outbreaks of the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) in the lodgepole pine (*Pinus contorta* Dougl. ex Loud. var. *latifolia* Engelm.) forests of North America have produced stands with significant levels of recent tree mortality. The needle foliage from recently attacked trees typically turns red within...

Author(s): Wesley G. Page, Michael J. Jenkins, Martin E. Alexander

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Corydalis sempervirens (pink corydalis)

www.nrfirescience.org/resource/10933

This FEIS species review synthesizes information on the relationship of *Corydalis sempervirens* (pink corydalis) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Rachelle Meyer

Year Published: 2013

Type: Document

Synthesis

Modelling conditional burn probability patterns for large wildland fires

www.nrfirescience.org/resource/12005

We present a technique for modelling conditional burn probability patterns in two dimensions for large wildland fires. The intended use for the model is strategic program planning when information about future fire weather and event durations is unavailable and estimates of the average probabilistic shape and extent of large fires...

Author(s): Pamela S. Ziesler, Douglas B. Rideout, Robin Reich

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Integrated fuel/restoration treatments - Field tour at the Priest River Experimental Forest

www.nrfirescience.org/resource/13694

Terrie Jain, Russell Graham, Andrew Hudak, and Bill Elliot with the United States Forest Service's (USFS) Rocky Mountain Research Station, led a tour of fuels treatments in mostly moist mixed-conifer forests in the Priest River Experimental Forest (PREF) near Priest River, Idaho. Site visits and discussions highlighted how...

Author(s): Corey L. Gucker

Year Published: 2013

Type: Document

Research Brief or Fact Sheet

Escape probability: an alternative risk metric to support and evaluate wilderness fire management decisions

www.nrfirescience.org/resource/13478

A goal of fire management in wilderness is to allow fire to play its natural ecological role without intervention. Unfortunately, most unplanned ignitions in wilderness are suppressed, in part because of the risk they might pose to values outside of the wilderness. Although the fire management community has embraced the concept of...

Author(s): Kevin M. Barnett

Year Published: 2013

Type: Document

Dissertation or Thesis

Landscape-scale eco-evolutionary dynamics: selection by seed predators and fire determine a major reproductive strategy

www.nrfirescience.org/resource/11982

Recent work in model systems has demonstrated significant effects of rapid evolutionary change on

ecological processes (eco-evolutionary dynamics). Fewer studies have addressed whether eco-evolutionary dynamics structure natural ecosystems. We investigated variation in the frequency of serotiny in lodgepole pine (*Pinus contorta*), a...

Author(s): Matt V. Talluto, Craig W. Benkman

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Characterizing wildfire hazard and risk in mountain pine beetle-affected stands and how to identify those characteristics at the landscape-scale

www.nrfirescience.org/resource/11977

The transformation of fuels resulting from the mountain pine beetle epidemic is unprecedented in its large geographic extent and the rapid pace of the transformation. This paper describes a proposed fire risk and hazard characterization system, as well as methodology for locating certain stand types on the landscape.

Author(s): Robert W. Gray

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Appendix 3: Response of western mountain ecosystems to climatic variability and change: a synthesis from the Western Mountain Initiative

www.nrfirescience.org/resource/11904

The Western Mountain Initiative (WMI), a consortium of research groups in the Western United States, focuses on understanding and predicting responses-especially sensitivities, thresholds, resistance, and resilience-of mountain ecosystems to climatic variability and change (Peterson et al. 2012). The WMI addresses how climatic...

Author(s): Crystal L. Raymond

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

Eriophorum viridicarinum (green-keeled cottongrass)

www.nrfirescience.org/resource/11521

This FEIS species review synthesizes information on the relationship of *Eriophorum viridicarinum* (green-keeled cottongrass) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution...

Author(s): Robin J. Innes

Year Published: 2013

Type: Document

Synthesis

Appendix 1: Regional summaries - Northwest

www.nrfirescience.org/resource/11901

The state of knowledge about climatic effects on forests of the Northwest region was recently summarized in a peer reviewed assessment of these effects in Washington (Littell et al. 2009, 2010) and a white paper on climatic effects on Oregon vegetation (Schafer et al. 2010). Recent PNW and West-wide modeling studies provide...

Author(s): Jeremy S. Littell

Year Published: 2013

Type: Document
Synthesis, Technical Report or White Paper

Climate and vegetation change during the late-glacial/early Holocene transition inferred from multiple proxy records from Blacktail Pond, Yellowstone National Park, USA

www.nrfirescience.org/resource/13523

A series of environmental changes from late-glacial ice recession through the early Holocene are revealed in a 7000-yr-long record of pollen, charcoal, geochemistry, and stable isotopes from Blacktail Pond, a closed-basin lake in Yellowstone National Park. Prior to 11,500 cal yr BP, cool conditions dominated, fire activity was low,...

Author(s): Teresa R. Krause, Cathy L. Whitlock

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Effectiveness of post-fire Burned Area Emergency Response (BAER) road treatments: results from three wildfires

www.nrfirescience.org/resource/12142

Wildland fires often cause extreme changes in the landscape that drastically influence surface runoff and soil erosion, which can impact forest resources, aquatic habitats, water supplies, public safety, and forest access infrastructure such as forest roads. Little information is available on the effectiveness of various post-fire...

Author(s): Randy B. Foltz, Peter R. Robichaud

Year Published: 2013

Type: Document

Technical Report or White Paper

Surface fire intensity influences simulated crown fire behavior in lodgepole pine forests with recent mountain pine beetle-caused tree mortality

www.nrfirescience.org/resource/12138

Recent bark beetle outbreaks have had a significant impact on forests throughout western North America and have generated concerns about interactions and feedbacks between beetle attacks and fire. However, research has been hindered by a lack of experimental studies and the use of fire behavior models incapable of accounting for the...

Author(s): Chad M. Hoffman, Penelope Morgan, William E. Mell, Russell A. Parsons, Eva K. Strand, Stephen Cook

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Health, reproduction, and fuels in whitebark pine in the Frank Church River of No Return Wilderness Area in central Idaho (Project INT-F-05-02)

www.nrfirescience.org/resource/12010

Whitebark pine (*Pinus albicaulis* Engelm.) is in serious decline across its range, largely due to the combined effects of *Cronartium ribicola* J. C. Fisch (an introduced fungal pathogen that causes white pine blister rust), replacement by late successional species, and widespread infestation of mountain pine beetle (*Dendroctonus*...

Author(s): Lauren Fins, Ben Hoppus

Year Published: 2013

Type: Document

Technical Report or White Paper

Bridging natural resource communication boundaries: public perceptions of smoke from wildland fires and forest managers' perspectives of climate change science

www.nrfirescience.org/resource/13479

Land managers of the northern Rocky Mountains and south-central U.S. are challenged with numerous social and ecological changes, many of which are linked to climate change. The work presented here focuses on two important research gaps: 1) managers do not understand public opinions toward smoke from prescribed fires (a necessary...

Author(s): Jarod Blades

Year Published: 2013

Type: Document

Dissertation or Thesis

Goodyera repens (northern rattlesnake plantain)

www.nrfirescience.org/resource/10928

This FEIS species review synthesizes information on the relationship of *Goodyera repens* (northern rattlesnake plantain) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Ilana L. Abrahamson

Year Published: 2013

Type: Document

Synthesis

Wilderness shapes contemporary fire size distributions across landscapes of the western United States

www.nrfirescience.org/resource/12682

In many U.S. federally designated wilderness areas, wildfires are likely to burn of their own accord due to favorable management policies and remote location. Previous research suggested that limitations on fire size can result from the evolution of natural fire regimes, specifically in places where fuels were...

Author(s): Sandra L. Haire, Kevin McGarigal, Carol Miller

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Developing a computerized approach for optimizing individual tree removal to efficiently reduce crown fire potential

www.nrfirescience.org/resource/11889

Thinning is a common silvicultural treatment being widely used to restore different types of overstocked forest stands in western U.S. because of its effect on changing fire behavior. Typically, thinning is applied at the stand level using prescriptions derived from sample plots that ignore variability in tree sizes and location...

Author(s): Marco A. Contreras, Woodam Chung

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Estimating critical climate-driven thresholds in landscape dynamics using spatial simulation modeling: climate change tipping points in fire management - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11983

Climate projections for the next 20-50 years forecast higher temperatures and variable precipitation for many landscapes in the western United States. Climate changes may cause or contribute to threshold shifts, or tipping points, where relatively small shifts in climate result in large, abrupt, and persistent changes in landscape...

Author(s): Robert E. Keane, Rachel A. Loehman

Year Published: 2013

Type: Document

Technical Report or White Paper

Betula occidentalis (water birch)

www.nrfirescience.org/resource/10582

This FEIS species review synthesizes information on the relationship of *Betula occidentalis* (water birch) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Corey L. Gucker

Year Published: 2012

Type: Document

Synthesis

The effects of forest fuel-reduction treatments in the United States

www.nrfirescience.org/resource/12579

The current conditions of many seasonally dry forests in the western and southern United States, especially those that once experienced low- to moderate-intensity fire regimes, leave them uncharacteristically susceptible to high-severity wildfire. Both prescribed fire and its mechanical surrogates are generally successful in meeting...

Author(s): Scott L. Stephens, James D. McIver, Ralph E. Boerner, Christopher J. Fettig, Joseph B. Fontaine, Bruce R. Hartsough, Patricia L. Kennedy, Dylan W. Schwilk

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

Fire-induced shifts in overstory tree species composition and associated understory plant composition in Glacier National Park, Montana

www.nrfirescience.org/resource/11980

In Rocky Mountain forests, fire can act as a mechanism of change in plant community composition if postfire conditions favor establishment of species other than those that dominated prefire tree communities. We sampled pre and postfire overstory and postfire understory species following recent (1988-2006) stand-replacing fires in...

Author(s): David A. McKenzie, Daniel B. Tinker

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Holocene seasonal variability inferred from multiple proxy records from Crevice Lake, Yellowstone National Park, USA

www.nrfirescience.org/resource/13531

A 9400-yr-old record from Crevice Lake, a semi-closed alkaline lake in northern Yellowstone National Park, was analyzed for pollen, charcoal, geochemistry, mineralogy, diatoms, and stable isotopes to develop a nuanced understanding of Holocene environmental history in a region of northern Rocky

Mountains that receives both summer...

Author(s): Cathy L. Whitlock, Walter E. Dean, Sherilyn C. Fritz, Lora R. Stevens, Jeffery R. Stone, Mitchell J. Power, Joseph R. Rosenbaum, Kenneth L. Pierce, Brandi B. Bracht-Flyr

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Cornus sericea (red-osier dogwood)

www.nrfirescience.org/resource/10629

This FEIS species review synthesizes information on the relationship of *Cornus sericea* (red-osier dogwood) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Corey L. Gucker

Year Published: 2012

Type: Document

Synthesis

Quantifying the threat of unsuppressed wildfires reaching the adjacent wildland-urban interface on the Bridger-Teton National Forest, Wyoming, USA

www.nrfirescience.org/resource/8349

An important objective for many federal land management agencies is to restore fire to ecosystems that have experienced fire suppression or exclusion over the last century. Managing wildfires for resource objectives (i.e., allowing wildfires to burn in the absence of suppression) is an important tool for restoring such fire-adapted...

Author(s): Joe H. Scott, Don Helmbrecht, Sean A. Parks, Carol Miller

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Odocoileus hemionus (mule deer)

www.nrfirescience.org/resource/10521

This FEIS species review synthesizes information on the relationship of *Odocoileus hemionus* (mule deer) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Robin J. Innes

Year Published: 2012

Type: Document

Synthesis

Wildfire provides refuge from local extinction but is an unlikely driver of outbreaks by mountain pine beetle

www.nrfirescience.org/resource/12013

Bark beetle outbreaks and wildfire are important disturbances in conifer ecosystems, yet their interactions are not well understood. We evaluated whether fire injury increased susceptibility of lodgepole pines (*Pinus contorta*) to mountain pine beetle (*Dendroctonus ponderosae* Hopkins), how it influenced beetle reproductive success,...

Author(s): Erinn N. Powell, Philip A. Townsend, Kenneth F. Raffa

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Interactions of whitepine blister rust and mountain pine beetle in whitebark pine ecosystems in the southern Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/12915

Whitebark pine (*Pinus albicaulis*) is a fundamental component of alpine and subalpine habitats in the Greater Yellowstone Ecosystem. The magnitude of current white pine blister rust (WPBR) infection caused by the pathogen *Cronartium ribicola* and mountain pine beetle (MPB; *Dendroctonus ponderosae*) impacts, combined with the effect of...

Author(s): Nancy K. Bockino, Daniel B. Tinker

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Mountain pine beetle attack alters the chemistry and flammability of lodgepole pine foliage

www.nrfirescience.org/resource/11488

During periods with epidemic mountain pine beetle (*Dendroctonus ponderosae* Hopkins) populations in lodgepole pine (*Pinus contorta* Dougl. ex Loud. var. *latifolia* Engelm.) forests, large amounts of tree foliage are thought to undergo changes in moisture content and chemistry brought about by tree decline and death. However, many of...

Author(s): Wesley G. Page, Michael J. Jenkins, Justin B. Runyon

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

National to local: a pre & post assessment of the Fuel Characteristic Classification System (FCCS) landscape variables for the Confederated Salish and Kootenai Tribes

www.nrfirescience.org/resource/13486

A modified Fuel Characteristic and Classification System (FCCS) fuelbed was created for the Confederated Salish & Kootenai Tribes (CSKT) of Montana. This crosswalk of data combined two principal sources of data: (1) locally the Bureau of Indian Affairs (BIA) Continuous Forest Inventory Data (CFI) and (2) nationally the US Forest...

Author(s): Laurel L. James

Year Published: 2012

Type: Document

Dissertation or Thesis

Characterizing fire-on-fire interactions in three large wilderness areas

www.nrfirescience.org/resource/8339

The interaction of fires, where one fire burns into another recently burned area, is receiving increased attention from scientists and land managers wishing to describe the role of fire scars in affecting landscape pattern and future fire spread. Here, we quantify fire-on-fire interactions in terms of frequency, size, and time-since...

Author(s): Casey Teske, Carl A. Seielstad, Lloyd P. Queen

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

***Cornus canadensis* (bunchberry)**

www.nrfirescience.org/resource/10680

This FEIS species review synthesizes information on the relationship of *Cornus canadensis* (bunchberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Corey L. Gucker

Year Published: 2012

Type: Document

Synthesis

Spatial bottom-up controls on fire likelihood vary across western North America

www.nrfirescience.org/resource/8311

The unique nature of landscapes has challenged our ability to make generalizations about the effects of bottom-up controls on fire regimes. For four geographically distinct fire-prone landscapes in western North America, we used a consistent simulation approach to quantify the influence of three key bottom-up factors, ignitions,...

Author(s): Sean A. Parks, Marc-Andre Parisien, Carol Miller

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Bark beetles and fire: two forces of nature transforming western forests

www.nrfirescience.org/resource/11984

Bark beetles are chewing a wide swath through forests across North America. Over the past few years, infestations have become epidemic in lodgepole and spruce-fir forests of the Intermountain West. The resulting extensive acreages of dead trees are alarming the public and raising concern about risk of severe fire. Researchers...

Author(s): Gail Wells

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

Rubus parviflorus (thimbleberry)

www.nrfirescience.org/resource/10676

This FEIS species review synthesizes information on the relationship of *Rubus parviflorus* (thimbleberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Corey L. Gucker

Year Published: 2012

Type: Document

Synthesis

Effects of climatic variability and change on forest ecosystems: a comprehensive science synthesis for the U.S. forest sector

www.nrfirescience.org/resource/12567

This report is a scientific assessment of the current condition and likely future condition of forest resources in the United States relative to climatic variability and change. It serves as the U.S. Forest Service forest sector technical report for the National Climate Assessment and includes descriptions of key regional issues and...

Year Published: 2012

Type: Document

Synthesis, Technical Report or White Paper

Management guide to ecosystem restoration treatments: two-aged lodgepole pine forests of central Montana, USA

www.nrfirescience.org/resource/11276

Lodgepole pine is one of the most widely distributed conifers in North America, with a mixed-severity rather than stand-replacement fire regime throughout much of its range. These lodgepole pine forests are patchy and often two-aged. Fire exclusion can reduce two-aged lodgepole pine heterogeneity. This management guide summarizes...

Author(s): Sharon M. Hood, Helen Y. Smith, David K. Wright, Lance S. Glasgow

Year Published: 2012

Type: Document

Synthesis, Technical Report or White Paper

Mapped versus actual burned area within wildfire perimeters: characterizing the unburned

www.nrfirescience.org/resource/8350

For decades, wildfire studies have utilized fire occurrence as the primary data source for investigating the causes and effects of wildfire on the landscape. Fire occurrence data fall primarily into two categories: ignition points and perimeter polygons which are used to calculate a 'burned area' for a fire. However, understanding...

Author(s): Crystal A. Kolden, James A. Lutz, Carl H. Key, Jonathan T. Kane, Jan W. van Wagtenonk

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Climate change, forests, fire, water, and fish: building resilient landscapes, streams, and managers

www.nrfirescience.org/resource/11270

Fire will play an important role in shaping forest and stream ecosystems as the climate changes. Historic observations show increased dryness accompanying more widespread fire and forest die-off. These events punctuate gradual changes to ecosystems and sometimes generate stepwise changes in ecosystems. Climate vulnerability...

Author(s): Charles H. Luce, Penelope Morgan, Kathleen A. Dwire, Daniel J. Isaak, Zachary A. Holden, Bruce E. Rieman

Year Published: 2012

Type: Document

Technical Report or White Paper

Bark beetle outbreaks, wildfires and defensible space: how much area do we need to treat to protect homes and communities?

www.nrfirescience.org/resource/8340

Extensive beetle outbreaks across western North American forests have spurred debates about how to best protect communities from wildfire. Previous work has found that fuels in the wildland-urban interface and especially in the defensible space (40-m radius) around structures are the most important determinants of the flammability...

Author(s): Glen Aronson, Dominik Kulakowski, Glen Aronson, Dominik Kulakowski

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Ranunculus glaberrimus (sagebrush buttercup)

www.nrfirescience.org/resource/10794

This FEIS species review synthesizes information on the relationship of *Ranunculus glaberrimus* (sagebrush buttercup) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Rachelle Meyer

Year Published: 2012

Type: Document

Synthesis

Fuels and fire behavior dynamics in bark beetle-attacked forests in Western North America and implications for fire management

www.nrfirescience.org/resource/8320

Declining forest health attributed to associations between extensive bark beetle-caused tree mortality, accumulations of hazardous fuels, wildfire, and climate change have catalyzed changes in forest health and wildfire protection policies of land management agencies. These changes subsequently prompted research to investigate the...

Author(s): Michael J. Jenkins, Wesley G. Page, Elizabeth G. Hebertson, Martin E. Alexander

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

The ecology of mixed severity fire regimes in Washington, Oregon, and Northern California

www.nrfirescience.org/resource/13580

Forests characterized by mixed-severity fires occupy a broad moisture gradient between lower elevation forests typified by low-severity fires and higher elevation forests in which high-severity, stand replacing fires are the norm. Mixed-severity forest types are poorly documented and little understood but likely occupy significant...

Author(s): David A. Perry, Paul F. Hessburg, Carl N. Skinner, Thomas A. Spies, Scott L. Stephens, Alan H. Taylor, Jerry F. Franklin, Brenda McComb, Gregg M. Riegel

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Effects of wildfire on stream temperatures in the Bitterroot River Basin, Montana

www.nrfirescience.org/resource/8269

Wildfire is a common natural disturbance that can influence stream ecosystems. Of particular concern are increases in water temperature during and following fires, but studies of these phenomena are uncommon. We examined effects of wildfires in 2000 on maximum water temperature for a suite of second- to fourth-order streams with a...

Author(s): Shad K. Mahlum, Lisa A. Eby, Michael K. Young, Chris G. Clancy, Mike Jakober

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Variation in aboveground cover influences soil nitrogen availability at fine spatial scales following severe fire in subalpine conifer forests

www.nrfirescience.org/resource/12031

Following fire, fine-scale variation in early successional vegetation and soil nutrients may influence development of ecosystem structure and function. We studied conifer forests burned by stand-replacing

wildfire in Greater Yellowstone (Wyoming, USA) to address two questions: (1) How do the variability and spatial structure of...

Author(s): Monica G. Turner, William H. Romme, Erica A. H. Smithwick, Daniel B. Tinker, Jun Zhu

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Cervus elaphus (elk)

www.nrfirescience.org/resource/10523

This FEIS species review synthesizes information on the relationship of *Cervus elaphus* (elk) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Robin J. Innes

Year Published: 2011

Type: Document

Synthesis

Restoration of whitebark pine forests in the northern Rocky Mountains, USA

www.nrfirescience.org/resource/11900

Whitebark pine (*Pinus albicaulis*) has been declining across much of its range in North America because of the combined effects of mountain pine beetle epidemics, fire exclusion policies, and widespread exotic blister rust infections. Whitebark pine seed is dispersed by a bird, the Clark's nutcracker, which caches seed in open,...

Author(s): Robert E. Keane

Year Published: 2011

Type: Document

Conference Proceedings

Antennaria parvifolia (littleleaf pussytoes)

www.nrfirescience.org/resource/10657

This FEIS species review synthesizes information on the relationship of *Antennaria parvifolia* (littleleaf pussytoes) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Janet L. Fryer

Year Published: 2011

Type: Document

Synthesis

Influence of fire on mycorrhizal colonization of planted and natural whitebark pine seedlings: ecology and management implications

www.nrfirescience.org/resource/11898

Whitebark pine (*Pinus albicaulis*) is a threatened keystone species in subalpine zones of Western North America that plays a role in watershed dynamics and maintenance of high elevation biodiversity (Schwandt, 2006). Whitebark pine has experienced significant mortality due to white pine blister rust, mountain pine beetle outbreaks...

Author(s): Paul E. Trusty, Cathy L. Cripps

Year Published: 2011

Type: Document

Conference Proceedings

A tool to estimate the impact of bark beetle activity on fuels and fire behavior

www.nrfirescience.org/resource/12129

Recent bark beetle outbreaks have resulted in the loss of hundreds of thousands of conifers on approximately 74 million acres (30 million hectares) of forest in western North America during the last decade. Stand conditions, drought, and warming temperatures have contributed to the severity of these outbreaks, particularly in high-...

Author(s): Michael J. Jenkins, Elizabeth G. Hebertson, Wesley G. Page, Wanda E. Lindquist

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Disturbance ecology of high-elevation five-needle pine ecosystems in western North America

www.nrfirescience.org/resource/11896

This paper synthesizes existing information about the disturbance ecology of high-elevation five-needle pine ecosystems, describing disturbance regimes, how they are changing or are expected to change, and the implications for ecosystem persistence. As it provides the context for ecosystem conservation/restoration programs, we...

Author(s): Elizabeth M. Campbell, Robert E. Keane, Evan R. Larson, Michael P. Murray, Anna W. Schoettle, Carmen Wong

Year Published: 2011

Type: Document

Conference Proceedings, Synthesis

The future of high-elevation, five-needle white pines in western North America: Proceedings of the High Five Symposium. 28-30 June 2010; Missoula, MT

www.nrfirescience.org/resource/11894

High elevation five-needle pines are rapidly declining throughout North America. The six species, whitebark (*Pinus albicaulis* Engelm.), limber (*P. flexilis* James), southwestern white (*P. strobiformis* Engelm.), foxtail (*P. balfouriana* Grev....

Author(s): Robert E. Keane, Diana F. Tomback, Michael P. Murray, Cyndi M. Smith

Year Published: 2011

Type: Document

Conference Proceedings

Fuel and fire behavior in high-elevation five-needle pines affected by mountain pine beetle

www.nrfirescience.org/resource/12112

Bark beetle-caused tree mortality in conifer forests affects the quantity and quality of forest fuels and has long been assumed to increase fire hazard and potential fire behavior. In reality, bark beetles and their effects on fuel accumulation and subsequent fire hazard have only recently been described. We have extensively sampled...

Author(s): Michael J. Jenkins

Year Published: 2011

Type: Document

Conference Proceedings

Bonasa umbellus (ruffed grouse)

www.nrfirescience.org/resource/10793

This FEIS species review synthesizes information on the relationship of *Bonasa umbellus* (ruffed grouse) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire

regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Rachelle Meyer

Year Published: 2011

Type: Document

Synthesis

Alnus incana, Alnus incana subsp. rugosa, Alnus incana subsp. tenuifolia (gray alder, speckled alder, thinleaf alder)

www.nrfirescience.org/resource/10660

This FEIS species review synthesizes information on the relationship of *Alnus incana*, *Alnus incana* subsp. *rugosa*, *Alnus incana* subsp. *tenuifolia* (gray alder, speckled alder, thinleaf alder) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations....

Author(s): Janet L. Fryer

Year Published: 2011

Type: Document

Synthesis

Oreamnos americanus (mountain goat)

www.nrfirescience.org/resource/10522

This FEIS species review synthesizes information on the relationship of *Oreamnos americanus* (mountain goat) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Robin J. Innes

Year Published: 2011

Type: Document

Synthesis

Muhlenbergia racemosa (green muhly)

www.nrfirescience.org/resource/10939

This FEIS species review synthesizes information on the relationship of *Muhlenbergia racemosa* (green muhly) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Kristin L. Zouhar

Year Published: 2011

Type: Document

Synthesis

Strategies, tools, and challenges for sustaining and restoring high elevation five-needle white pine forests in western North America

www.nrfirescience.org/resource/11899

Many ecologically important, five-needle white pine forests that historically dominated the high elevation landscapes of western North America are now being heavily impacted by mountain pine beetle (*Dendroctonus* spp.) outbreaks, the exotic disease white pine blister rust (WPBR), and altered high elevation fire regimes. Management...

Author(s): Robert E. Keane, Anna W. Schoettle

Year Published: 2011

Type: Document

Modeling climate changes and wildfire interactions: effects on whitebark pine (*Pinus albicaulis*) and implications for restoration, Glacier National Park, Montana, USA

www.nrfirescience.org/resource/11897

Climate changes are projected to profoundly influence vegetation patterns and community compositions, either directly through increased species mortality and shifts in species distributions, or indirectly through disturbance dynamics such as increased wildfire activity and extent, shifting fire regimes, and pathogenesis. High-...

Author(s): Rachel A. Loehman, Allissa Corrow, Robert E. Keane

Year Published: 2011

Type: Document

Conference Proceedings

Woodpecker habitat after the fire

www.nrfirescience.org/resource/13508

Public land managers are asked to minimize fuel levels after fires, including using techniques such as salvage logging. They are also responsible for maintaining suitable wildlife habitat, especially for species of concern to state and federal agencies. An area where these responsibilities could conflict is in the use of salvage...

Author(s): Victoria A. Saab

Year Published: 2011

Type: Document

Research Brief or Fact Sheet

The magnificent high-elevation five-needle white pines: ecological roles and future outlook

www.nrfirescience.org/resource/11895

The High Five symposium is devoted to exchanging information about a small group of pines with little commercial value but great importance to the ecology of high-mountain ecosystems of the West. These High Five pines include the subalpine and treeline species-whitebark (*Pinus albicaulis*), Rocky Mountain bristlecone (*P. aristata*),...

Author(s): Diana F. Tomback, Peter Achuff, Anna W. Schoettle, John W. Schwandt, Ron J. Mastrogiuseppe

Year Published: 2011

Type: Document

Conference Proceedings, Synthesis

Review of fuel treatment effectiveness in forests and rangelands and a case study from the 2007 megafires in central, Idaho, USA

www.nrfirescience.org/resource/11449

This report provides managers with the current state of knowledge regarding the effectiveness of fuel treatments for mitigating severe wildfire effects. A literature review examines the effectiveness of fuel treatments that had been previously applied and were subsequently burned through by wildfire in forests and rangelands. A case...

Author(s): Andrew T. Hudak, Ian Rickert, Penelope Morgan, Eva K. Strand, Sarah A. Lewis, Peter R. Robichaud, Chad M. Hoffman, Zachary A. Holden

Year Published: 2011

Type: Document

Synthesis, Technical Report or White Paper

Linking tree-ring and sediment-charcoal records to reconstruct fire occurrence and area burned in subalpine forests of Yellowstone National Park, USA

www.nrfirescience.org/resource/13602

Reconstructing specific fire-history metrics with charcoal records has been difficult, in part because calibration data sets are rare. We calibrated charcoal accumulation in sediments from three medium (14-19 ha) and one large (4250 ha) lake with a 300 yr tree-ring-based fire-history reconstruction from central Yellowstone National...

Author(s): Philip E. Higuera, Cathy L. Whitlock, Josh A. Gage

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Influence of fire on native and nonnative salmonid populations and habitat in a western Montana basin

www.nrfirescience.org/resource/8286

Anticipated increases in the frequency and severity of wildfire may threaten the persistence of native salmonid populations in headwater streams in western North America. This study used extensive pre- and postfire data to assess whether wildfire leads to hypothesized declines in native westslope cutthroat trout *Oncorhynchus clarkii*...

Author(s): Clint M. Sestrich, Thomas E. McMahon, Michael K. Young

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Melilotus alba, Melilotus officinalis (white sweetclover, yellow sweetclover)

www.nrfirescience.org/resource/10456

This FEIS species review synthesizes information on the relationship of *Melilotus alba*, *Melilotus officinalis* (white sweetclover, yellow sweetclover) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is...

Author(s): Corey L. Gucker

Year Published: 2010

Type: Document

Synthesis

Falco peregrinus (peregrine falcon)

www.nrfirescience.org/resource/10748

This FEIS species review synthesizes information on the relationship of *Falco peregrinus* (peregrine falcon) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Peggy Luensmann

Year Published: 2010

Type: Document

Synthesis

Schedonorus pratensis (meadow fescue)

www.nrfirescience.org/resource/10472

This FEIS species review synthesizes information on the relationship of *Schedonorus pratensis* (meadow fescue) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is

also provided on the species' taxonomy...

Author(s): Katharine R. Stone

Year Published: 2010

Type: Document

Synthesis

Blister rust and western forest biodiversity: ecology, values and outlook for white pines

www.nrfirescience.org/resource/8234

Eight white pine species are widely distributed among the forests of western Canada and the United States. The different forest communities with these species contribute biodiversity to the western landscape. The trees themselves provide various ecosystem services, including wildlife habitat and watershed protection. White pine...

Author(s): Diana F. Tomback, Peter Achuff

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Sink or source? Fire and the forest carbon cycle

www.nrfirescience.org/resource/12620

As the size and severity of fires in the western U.S. continue to increase, it has become ever more important to understand carbon dynamics in response to fire. Many subalpine forests experience stand-replacing wildfires, and these fires and subsequent recovery can change the amount of carbon released to the atmosphere...

Author(s): Christine Frame

Year Published: 2010

Type: Document

Research Brief or Fact Sheet

Effects of fuel treatments on carbon-disturbance relationships in forests of the Northern Rocky Mountains

www.nrfirescience.org/resource/8188

Fuel treatments alter conditions in forested stands at the time of the treatment and subsequently. Fuel treatments reduce on-site carbon and also change the fire potential and expected outcome of future wildfires, including their carbon emissions. We simulated effects of fuel treatments on 140 stands representing seven major habitat...

Author(s): Elizabeth D. Reinhardt, Lisa M. Holsinger

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Climate change and bark beetles of the western United States and Canada: direct and indirect effects

www.nrfirescience.org/resource/8219

Climatic changes are predicted to significantly affect the frequency and severity of disturbances that shape forest ecosystems. We provide a synthesis of climate change effects on native bark beetles, important mortality agents of conifers in western North America. Because of differences in temperature-dependent life-history...

Author(s): Barbara J. Bentz, Jacques Regniere, Christopher J. Fettig, E. Matthew Hansen, Jane L. Hayes, Jeffrey A. Hicke, Rick G. Kelsey, Jose F. Negron, Steven J. Seybold

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Alces americanus (moose)

www.nrfirescience.org/resource/10524

This FEIS species review synthesizes information on the relationship of *Alces americanus* (moose) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Robin J. Innes

Year Published: 2010

Type: Document

Synthesis

Burn severity mapping using simulation modelling and satellite imagery

www.nrfirescience.org/resource/8205

Although burn severity maps derived from satellite imagery provide a landscape view of fire impacts, fire effects simulation models can provide spatial fire severity estimates and add a biotic context in which to interpret severity. In this project, we evaluated two methods of mapping burn severity in the context of rapid post-fire...

Author(s): Eva C. Karau, Robert E. Keane

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Response of six non-native plant species to wildfires in the northern Rocky Mountains, USA

www.nrfirescience.org/resource/11216

This paper presents early results on the response of six non-native invasive plant species to eight wildfires on six National Forests (NFs) in the northern Rocky Mountains, USA. Stratified random sampling was used to choose 224 stands based on burn severity, habitat type series, slope steepness, stand height, and stand density. Data...

Author(s): Dennis E. Ferguson, Christine L. Craig

Year Published: 2010

Type: Document

Technical Report or White Paper

Management guide to ecosystem restoration treatments: whitebark pine forests of the Northern Rocky Mountains, U.S.A.

www.nrfirescience.org/resource/11143

Whitebark pine is declining across much of its range in North America because of the combined effects of mountain pine beetle epidemics, fire exclusion policies, and widespread exotic blister rust infections. This management guide summarizes the extensive data collected at whitebark pine treatment sites for three periods: (1) pre-...

Author(s): Robert E. Keane, Russell A. Parsons

Year Published: 2010

Type: Document

Technical Report or White Paper

Linanthus pungens (granite prickly-phlox)

www.nrfirescience.org/resource/10520

This FEIS species review synthesizes information on the relationship of *Linanthus pungens* (granite

prickly-phlox) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Robin J. Innes

Year Published: 2010

Type: Document

Synthesis

Hieracium aurantiacum (orange hawkweed)

www.nrfirescience.org/resource/10474

This FEIS species review synthesizes information on the relationship of Hieracium aurantiacum (orange hawkweed) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species'...

Author(s): Katharine R. Stone

Year Published: 2010

Type: Document

Synthesis

Holodiscus discolor (oceanspray)

www.nrfirescience.org/resource/10653

This FEIS species review synthesizes information on the relationship of Holodiscus discolor (oceanspray) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Janet L. Fryer

Year Published: 2010

Type: Document

Synthesis

Martes americana (American marten)

www.nrfirescience.org/resource/10856

This FEIS species review synthesizes information on the relationship of Martes americana (American marten) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Katharine R. Stone

Year Published: 2010

Type: Document

Synthesis

Polygonum aviculare (prostrate knotweed)

www.nrfirescience.org/resource/10471

This FEIS species review synthesizes information on the relationship of Polygonum aviculare (prostrate knotweed) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species'...

Author(s): Katharine R. Stone

Year Published: 2010

Type: Document

Synthesis

Evaluation of forest management systems under risk of wildfire

www.nrfirescience.org/resource/8336

We evaluate the economic efficiency of even- and uneven-aged management systems under risk of wildfire. The management problems are formulated for a mixed-conifer stand and approximations of the optimal solutions are obtained using simulation optimization. The Northern Idaho variant of the Forest Vegetation Simulator and its Fire...

Author(s): Kari Hyytiäinen, Robert G. Haight

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Restoring whitebark pine forests of the northern Rocky Mountains, USA

www.nrfirescience.org/resource/8394

Whitebark pine (*Pinus albicaulis*) has been declining across much of its range in North America because of the combined effects of mountain pine beetle (*Dendroctonus ponderosae*) epidemics, fire exclusion policies, and widespread exotic blister rust infections. Whitebark pine seed is dispersed by a bird, the Clark's nutcracker (...)

Author(s): Robert E. Keane, Russell A. Parsons

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Silvicultural management of white pines in western North America

www.nrfirescience.org/resource/8235

Since the introduction prior to 1915 of white pine blister rust (*Cronartium ribicola*) into the forests of western North America, many populations of native white pine species have seriously declined. Because western white pine (*Pinus monticola*) and sugar pine (*P. lambertiana*) are highly valued timber species, their silviculture...

Author(s): Stefan Zeglen, John Pronos, H. Merler

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Holodiscus dumosus (rockspirea)

www.nrfirescience.org/resource/10648

This FEIS species review synthesizes information on the relationship of *Holodiscus dumosus* (rockspirea) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Janet L. Fryer

Year Published: 2010

Type: Document

Synthesis

Effects of biomass removal treatments on stand-level fire characteristics in major forest types of the Northern Rocky Mountains

www.nrfirescience.org/resource/8189

Removal of dead and live biomass from forested stands affects subsequent fuel dynamics and fire potential. The amount of material left onsite after biomass removal operations can influence the

intensity and severity of subsequent unplanned wildfires or prescribed burns. We developed a set of biomass removal treatment scenarios and...

Author(s): Elizabeth D. Reinhardt, Lisa M. Holsinger, Robert E. Keane

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Current health issues and management strategies for white pines in the western United States and Canada

www.nrfirescience.org/resource/8233

The introduced pathogen *Cronartium ribicola*, cause of white pine blister rust, has spread across much of western North America and established known infestations within all but one species of white pine endemic to western Canada and the United States. Blister rust damage to severely diseased trees reduces reproduction and survival...

Author(s): John W. Schwandt, I. Blakley Lockman, John T. Kliejunas, J. A. Muir

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Using fuzzy C-means and local autocorrelation to cluster satellite-inferred burn severity classes

www.nrfirescience.org/resource/11447

Burn severity classifications derived from multitemporal Landsat Thematic Mapper images and the Normalised Burn Ratio (NBR) are commonly used to assess the post-fire ecological effects of wildfires. Ongoing efforts to retrospectively map historical burn severity require defensible, objective methods of classifying continuous...

Author(s): Zachary A. Holden, Jeffrey S. Evans

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/11435

Wildfires during the summer of 2007 burned over 500,000 acres within central Idaho. These fires burned around and through over 8,000 acres of fuel treatments designed to offer protection from wildfire to over 70 summer homes and other buildings located near Warm Lake. This area east of Cascade, Idaho, exemplifies the difficulty of...

Author(s): Russell T. Graham, Theresa B. Jain, Mark Loseke

Year Published: 2009

Type: Document

Technical Report or White Paper

Equations to convert compacted crown ratio to uncompacted crown ratio for trees in the Interior West

www.nrfirescience.org/resource/8368

Crown ratio is the proportion of total tree length supporting live foliage. Inventory programs of the US Forest Service generally define crown ratio in terms of compacted or uncompacted measurements. Measurement of compacted crown ratio (CCR) involves envisioning the transfer of lower branches of trees with asymmetric crowns to fill...

Author(s): Chris Toney, Matthew C. Reeves

Year Published: 2009

Type: Document
Book or Chapter or Journal Article

Fire and bark beetle interactions

www.nrfirescience.org/resource/11071

Bark beetle populations are at outbreak conditions in many parts of the western United States and causing extensive tree mortality. Bark beetles interact with other disturbance agents in forest ecosystems, one of the primary being fires. In order to implement appropriate post-fire management of fire-damaged ecosystems, we need a...

Author(s): Ken E. Gibson, Jose F. Negron

Year Published: 2009

Type: Document

Conference Proceedings, Technical Report or White Paper

Reciprocal interactions between bark beetles and wildfire in subalpine forests: landscape patterns and the risk of high-severity fire - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11136

The interactions of wildfire and bark beetle outbreaks and their reciprocal influences on fire behavior, bark beetle dynamics, and ecosystem structure are critical research issues in many coniferous forests of the Intermountain West. We combined field studies with new remote sensing methods to address three main questions regarding...

Author(s): Daniel B. Tinker

Year Published: 2009

Type: Document

Technical Report or White Paper

Festuca thurberi (Thurber fescue)

www.nrfirescience.org/resource/10797

This FEIS species review synthesizes information on the relationship of *Festuca thurberi* (Thurber fescue) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Rachelle Meyer

Year Published: 2009

Type: Document

Synthesis

Tree squirrel habitat selection and predispersal seed predation in a declining subalpine conifer

www.nrfirescience.org/resource/8395

Differential responses by species to modern perturbations in forest ecosystems may have undesirable impacts on plant-animal interactions. If such disruptions cause declines in a plant species without corresponding declines in a primary seed predator, the effects on the plant could be exacerbated. We examined one such interaction...

Author(s): Shawn T. McKinney, Carl E. Fiedler

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Invasive pathogen threatens bird-pine mutualism: implications for sustaining a high-elevation ecosystem

www.nrfirescience.org/resource/8190

Human-caused disruptions to seed-dispersal mutualisms increase the extinction risk for both plant and animal species. Large-seeded plants can be particularly vulnerable due to highly specialized dispersal systems and no compensatory regeneration mechanisms. Whitebark pine (*Pinus albicaulis*), a keystone subalpine species, obligately...

Author(s): Shawn T. McKinney, Carl E. Fiedler, Diana F. Tomback

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Widespread increase of tree mortality rates in the western United States

www.nrfirescience.org/resource/8321

Persistent changes in tree mortality rates can alter forest structure, composition, and ecosystem services such as carbon sequestration. Our analyses of longitudinal data from unmanaged old forests in the western United States showed that background (noncatastrophic) mortality rates have increased rapidly in recent decades, with...

Author(s): Phillip J. van Mantgem, Nathan L. Stephenson, John C. Byrne, Lori D. Daniels, Jerry F.

Franklin, Peter Z. Fule, Mark E. Harmon, Andrew J. Larson, Jeremy M. Smith, Alan H. Taylor, Thomas T. Veblen

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Effects of timber harvest following wildfire in western North America

www.nrfirescience.org/resource/11122

Timber harvest following wildfire leads to different outcomes depending on the biophysical setting of the forest, pattern of burn severity, operational aspects of tree removal, and other management activities. Fire effects range from relatively minor, in which fire burns through the understory and may kill a few trees, to severe, in...

Author(s): David L. Peterson, James K. Agee, Gregory H. Aplet, Dennis P. Dykstra, Russell T. Graham, John F. Lehmkuhl, David S. Pilliod, Donald F. Potts, Robert F. Powers, John D. Stuart

Year Published: 2009

Type: Document

Technical Report or White Paper

Ecological effects of prescribed fire season: a literature review and synthesis for managers

www.nrfirescience.org/resource/12616

This synthesis project on season of prescribed burning is to summarize results from studies to date in order to provide managers a resource for predicting fire effects and understanding what variables drive these fire effects in different areas of the country with varying fire regimes. A secondary objective will be to identify key...

Author(s): Eric E. Knapp, Becky L. Estes, Carl N. Skinner

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

From the ground up, way up: measuring live fuel moisture with satellite imagery to fine-tune fire modeling in western ecosystems

www.nrfirescience.org/resource/11431

Remote sensing from space may well become one of the world's most effective, accurate, and efficient ways to assess fire risk and thus manage large landscapes. The technology is evolving quickly, and

researchers are busy keeping up. Some major western U.S. landscapes are just now being assessed for integrating remote sensing data with...

Author(s): Rachel Clark

Year Published: 2009

Type: Document

Research Brief or Fact Sheet

Bark beetle conditions in western forests and formation of the Western Bark Beetle Research Group

www.nrfirescience.org/resource/11069

The recent dramatic impacts of bark beetle outbreaks across conifer forests of the West have been mapped and reported by entomology and pathology professionals with Forest Health Protection (FHP), a component of USDA Forest Service's State and Private Forestry, and their state counterparts. These forest conditions set the stage for...

Author(s): Robert J. Cain, Jane L. Hayes

Year Published: 2009

Type: Document

Conference Proceedings, Technical Report or White Paper

Holocene vegetation-fire-climate linkages in Northern Yellowstone National Park, USA

www.nrfirescience.org/resource/13519

Yellowstone National Park has been an important location for paleoecologic studies that focus on the use of charcoal data to reconstruct past fire activity and on the role of climate variations in shaping past vegetation and fire regimes. One hypothesis, which has been explored in other parts of the western U.S., is the idea that...

Author(s): Mariana A. Huerta, Cathy L. Whitlock, Jason Yale

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Lubrecht State Experimental Forest prescribed fire effects study 1973-2006

www.nrfirescience.org/resource/11134

This data product contains pre and post fires stand and fuels data collected over a 33 year period. Rod Norum as part of his PhD dissertation work, began this study in 1973. He laid out 32 small (25 by 25 meter) plots in a Douglas fir/western larch stand on the University of Montana's Lubrecht Experimental Forest. Twenty of the...

Author(s): Elizabeth D. Reinhardt

Year Published: 2009

Type: Document

Technical Report or White Paper

Potentilla hippiana (woolly cinquefoil)

www.nrfirescience.org/resource/10792

This FEIS species review synthesizes information on the relationship of *Potentilla hippiana* (woolly cinquefoil) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Rachelle Meyer

Year Published: 2009

Type: Document

Synthesis

Synthesis of knowledge on the effects of fire and fire surrogates on wildlife in U.S. dry forests

www.nrfirescience.org/resource/12617

Dry forests throughout the United States are fire-dependent ecosystems, and much attention has been given to restoring their ecological function. As such, land managers often are tasked with reintroducing fire via prescribed fire, wildland fire use, and fire-surrogate treatments such as thinning and mastication. During planning,...

Author(s): Patricia L. Kennedy, Joseph B. Fontaine

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

Biophysical controls on surface fuel litterfall and decomposition in the Northern Rocky Mountains, USA

www.nrfirescience.org/resource/8161

Litterfall and decomposition rates of the organic matter that comprise forest fuels are important to fire management, because they define fuel treatment longevity and provide parameters to design, test, and validate ecosystem models. This study explores the environmental factors that control litterfall and decomposition in the...

Author(s): Robert E. Keane

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Nucifraga columbiana (Clark's nutcracker)

www.nrfirescience.org/resource/10782

This FEIS species review synthesizes information on the relationship of *Nucifraga columbiana* (Clark's nutcracker) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Nancy E. McMurray

Year Published: 2008

Type: Document

Synthesis

Long-term fire history from alluvial fan sediments: the role of drought and climate variability, and implications for management of Rocky Mountain forests

www.nrfirescience.org/resource/8203

Alluvial fan deposits are widespread and preserve millennial-length records of fire. We used these records to examine changes in fire regimes over the last 2000 years in Yellowstone National Park mixed-conifer forests and drier central Idaho ponderosa pine forests. In Idaho, frequent, small, fire-related erosional events occurred...

Author(s): Jennifer L. Pierce, Grant A. Meyer

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Managing fire risk in the forests of the U.S. inland Northwest: a classic "wicked problem" in public land policy

www.nrfirescience.org/resource/11066

In their classic article published in the Journal of Forestry in 1986, Gerald Allen and Ernest Gould stated that the most daunting problems associated with public forest management have a "wicked" element: "Wicked problems share characteristics. Each can be considered as simply a symptom of some higher order problem-The definition...

Author(s): Matthew S. Carroll, Keith A. Blatner, Patricia J. Cohn, Charles E. Keegan, Todd A. Morgan

Year Published: 2008

Type: Document

Conference Proceedings, Synthesis, Technical Report or White Paper

Cladonia arbuscula, Cladonia mitis, Cladonia rangeferia, Cladonia stellaris (shrubby reindeer lichen, green reindeer lichen, gray reindeer lichen, alpine reindeer lichen)

www.nrfirescience.org/resource/10800

This FEIS species review synthesizes information on the relationship of Cladonia arbuscula, Cladonia mitis, Cladonia rangeferia, Cladonia stellaris (shrubby reindeer lichen, green reindeer lichen, gray reindeer lichen, alpine reindeer lichen) to fire--how fire affects the species and its habitat, effects of the species on fuels and...

Author(s): Gregory T. Munger

Year Published: 2008

Type: Document

Synthesis

Landscape heterogeneity following large fires: insights from Yellowstone National Park, USA

www.nrfirescience.org/resource/8198

We characterised the remarkable heterogeneity following the large, severe fires of 1988 in Yellowstone National Park (YNP), in the northern Rocky Mountains, Wyoming, USA, by focussing on spatial variation in post-fire structure, composition and ecosystem function at broad, meso, and fine scales. Ecological heterogeneity at multiple...

Author(s): Tania L. Schoennagel, Erica A. H. Smithwick, Monica G. Turner

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Potentilla glandulosa (sticky cinquefoil)

www.nrfirescience.org/resource/10822

This FEIS species review synthesizes information on the relationship of Potentilla glandulosa (sticky cinquefoil) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Sonja L. Reeves

Year Published: 2008

Type: Document

Synthesis

Sambucus racemosa (red elderberry)

www.nrfirescience.org/resource/10654

This FEIS species review synthesizes information on the relationship of Sambucus racemosa (red elderberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Janet L. Fryer

Year Published: 2008

Type: Document
Synthesis

Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States

www.nrfirescience.org/resource/8194

Many natural resource agencies and organizations recognize the importance of fuel treatments as tools for reducing fire hazards and restoring ecosystems. However, there continues to be confusion and misconception about fuel treatments and their implementation and effects in fire-prone landscapes across the United States. This paper...

Author(s): Elizabeth D. Reinhardt, Robert E. Keane, David E. Calkin, Jack D. Cohen

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, Synthesis

Market impacts of a multiyear mechanical fuel treatment program in the U.S.

www.nrfirescience.org/resource/8125

We describe a two-stage model of global log and chip markets that evaluates the spatial and temporal economic effects of government- subsidized fire-related mechanical fuel treatment programs in the U.S. West and South. The first stage is a goal program that allocates subsidies according to fire risk and location priorities, given a...

Author(s): Jeffrey P. Prestemon, Karen L. Abt, Robert J. Huggett

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Carex rossii (Ross's sedge)

www.nrfirescience.org/resource/10594

This FEIS species review synthesizes information on the relationship of *Carex rossii* (Ross's sedge) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Michelle B. Anderson

Year Published: 2008

Type: Document

Synthesis

Charcoal and carbon storage in forest soils of the Rocky Mountain West

www.nrfirescience.org/resource/7920

Charcoal represents a super-passive form of carbon (C) that is generated during fire events and is one of the few legacies of fire recorded in the soil profile; however, the importance of this material as a form of C storage has received only limited scientific attention. Here, we review the formation of charcoal in temperate and...

Author(s): Thomas H. DeLuca, Gregory H. Aplet

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, Synthesis

Aulacomnium palustre (ribbed bog moss)

www.nrfirescience.org/resource/10646

This FEIS species review synthesizes information on the relationship of *Aulacomnium palustre* (ribbed bog moss) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Janet L. Fryer

Year Published: 2008

Type: Document

Synthesis

Holocene records of *Dendroctonus* bark beetles in high elevation pine forests of Idaho and Montana, USA

www.nrfirescience.org/resource/8224

Paleoecological reconstructions from two lakes in the U.S. northern Rocky Mountain region of Idaho and Montana revealed the presence of bark beetle elytra and head capsules (cf. *Dendroctonus* spp., most likely *D. ponderosae*, mountain pine beetle). Occurrence of these macrofossils during the period of time associated with the 1920/...

Author(s): Andrea R. Brunelle, Gerald E. Rehfeldt, Barbara J. Bentz, A. Steven Munson

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Using bark char codes to predict post-fire cambium mortality

www.nrfirescience.org/resource/8171

Cambium injury is an important factor in post-fire tree survival. Measurements that quantify the degree of bark charring on tree stems after fire are often used as surrogates for direct cambium injury because they are relatively easy to assign and are non-destructive. However, bark char codes based on these measurements have been...

Author(s): Sharon M. Hood, Danny R. Cluck, Sheri L. Smith, Kevin C. Ryan

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Climate change effects on historical range and variability of two large landscapes in western Montana, USA

www.nrfirescience.org/resource/8162

Quantifying the historical range and variability of landscape composition and structure using simulation modeling is becoming an important means of assessing current landscape condition and prioritizing landscapes for ecosystem restoration. However, most simulated time series are generated using static climate conditions which fail...

Author(s): Robert E. Keane, Lisa M. Holsinger, Russell A. Parsons, Kathy L. Gray

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

***Gulo gulo* (wolverine)**

www.nrfirescience.org/resource/10747

This FEIS species review synthesizes information on the relationship of *Gulo gulo* (wolverine) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Peggy Luensmann

Year Published: 2008

Type: Document

Synthesis

Dryopteris campyloptera, Dryopteris carthusiana, Dryopteris expansa, Dryopteris intermedia (mountain woodfern, spinulose woodfern, spreading woodfern, fancy fern)

www.nrfirescience.org/resource/10803

This FEIS species review synthesizes information on the relationship of *Dryopteris campyloptera*, *Dryopteris carthusiana*, *Dryopteris expansa*, *Dryopteris intermedia* (mountain woodfern, spinulose woodfern, spreading woodfern, fancy fern) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire...

Author(s): Gregory T. Munger

Year Published: 2008

Type: Document

Synthesis

Long-term relations among fire, fuel, and climate in the north-western US based on lake-sediment studies

www.nrfirescience.org/resource/8202

Pollen and high-resolution charcoal records from the north-western USA provide an opportunity to examine the linkages among fire, climate, and fuels on multiple temporal and spatial scales. The data suggest that general charcoal levels were low in the late-glacial period and increased steadily through the last 11 000 years with...

Author(s): Cathy L. Whitlock, Jennifer R. Marlon, Christy E. Briles, Andrea R. Brunelle, Colin J. Long, Patrick J. Bartlein

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Arctostaphylos rubra (red fruit bearberry)

www.nrfirescience.org/resource/10655

This FEIS species review synthesizes information on the relationship of *Arctostaphylos rubra* (red fruit bearberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Janet L. Fryer

Year Published: 2008

Type: Document

Synthesis

Carex rostrata, Carex utriculata (swollen beaked sedge, Northwest Territory sedge)

www.nrfirescience.org/resource/10595

This FEIS species review synthesizes information on the relationship of *Carex rostrata*, *Carex utriculata* (swollen beaked sedge, Northwest Territory sedge) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the...

Author(s): Michelle B. Anderson

Year Published: 2008

Type: Document

Synthesis

Spatial characteristics of fire severity in relation to fire growth in a Rocky Mountain subalpine forest

www.nrfirescience.org/resource/11485

We compared the spatial characteristics of fire severity patches within individual fire "runs" (contiguous polygons burned during a given day) resulting from a 72,000 ha fire in central Idaho in 1994. Our hypothesis was that patch characteristics of four fire severity classes (high, moderate, low, and unburned), as captured by five...

Author(s): Calvin A. Farris, Ellis Q. Margolis, John A. Kupfer

Year Published: 2008

Type: Document

Conference Proceedings, Technical Report or White Paper

Surface fuel litterfall and decomposition in the Northern Rocky Mountains, U.S.A.

www.nrfirescience.org/resource/11125

Surface fuel deposition and decomposition rates are important to fire management and research because they can define the longevity of fuel treatments in time and space and they can be used to design, build, test, and validate complex fire and ecosystem models useful in evaluating management alternatives. We determined rates of...

Author(s): Robert E. Keane

Year Published: 2008

Type: Document

Technical Report or White Paper

Hedysarum alpinum (alpine sweetvetch)

www.nrfirescience.org/resource/10672

This FEIS species review synthesizes information on the relationship of *Hedysarum alpinum* (alpine sweetvetch) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Corey L. Gucker

Year Published: 2007

Type: Document

Synthesis

Simulation of long-term landscape-level fuel treatment effects on large wildfires

www.nrfirescience.org/resource/8166

A simulation system was developed to explore how fuel treatments placed in topologically random and optimal spatial patterns affect the growth and behaviour of large fires when implemented at different rates over the course of five decades. The system consisted of a forest and fuel dynamics simulation module (Forest Vegetation...

Author(s): Mark A. Finney, Robert C. Seli, Charles W. McHugh, Alan A. Ager, Bernhard Bahro, James K. Agee

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Pyrola asarifolia (pink wintergreen)

www.nrfirescience.org/resource/10668

This FEIS species review synthesizes information on the relationship of *Pyrola asarifolia* (pink wintergreen) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire

regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Corey L. Gucker

Year Published: 2007

Type: Document

Synthesis

Simulation of the consequences of different fire regimes to support wildland fire use decisions

www.nrfirescience.org/resource/11429

The strategy known as wildland fire use, in which lightning-ignited fires are allowed to burn, is rapidly gaining momentum in the fire management community. Managers need to know the consequences of an increase in area burned that might result from an increase in wildland fire use. One concern of land managers as they consider...

Author(s): Carol Miller

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Evaluation of a post-fire tree mortality model for western USA conifers

www.nrfirescience.org/resource/8364

Accurately predicting fire-caused mortality is essential to developing prescribed fire burn plans and post-fire salvage marking guidelines. The mortality model included in the commonly used USA fire behaviour and effects models, the First Order Fire Effects Model (FOFEM), BehavePlus, and the Fire and Fuels Extension to the Forest...

Author(s): Sharon M. Hood, Charles W. McHugh, Kevin C. Ryan, Elizabeth D. Reinhardt, Sheri L. Smith

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Betula glandulosa (bog birch)

www.nrfirescience.org/resource/10740

This FEIS species review synthesizes information on the relationship of *Betula glandulosa* (bog birch) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Jennifer E. Tollefson

Year Published: 2007

Type: Document

Synthesis

Fragaria vesca (woodland strawberry)

www.nrfirescience.org/resource/10802

This FEIS species review synthesizes information on the relationship of *Fragaria vesca* (woodland strawberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Gregory T. Munger

Year Published: 2007

Type: Document

Synthesis

Restoration classes based on blister rust infection and grizzly bear recovery zones - Map

www.nrfirescience.org/resource/11509

Mapped locations of restoration classes based on blister rust infection and grizzly bear recovery zones within the western United States.

Author(s): Fire Modeling Institute

Year Published: 2007

Type: Document

Research Brief or Fact Sheet

Forest fire and climate change in western North America: insights from sediment charcoal records

www.nrfirescience.org/resource/7930

Millennial-scale records of forest fire provide important baseline information for ecosystem management, especially in regions with too few recent fires to describe the historical range of variability. Charcoal records from lake sediments and soil profiles are well suited for reconstructing the incidence of past fire and its...

Author(s): Daniel G. Gavin, Douglas J. Hallett, Feng S. Hu, Kenneth P. Lertzman, Susan J. Prichard, Kendrick J. Brown, Jason A. Lynch, Patrick J. Bartlein, David L. Peterson

Year Published: 2007

Type: Document

Book or Chapter or Journal Article, Synthesis

Neotoma cinerea (bushy-tailed woodrat)

www.nrfirescience.org/resource/10902

This FEIS species review synthesizes information on the relationship of *Neotoma cinerea* (bushy-tailed woodrat) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

Strix nebulosa (great gray owl)

www.nrfirescience.org/resource/10900

This FEIS species review synthesizes information on the relationship of *Strix nebulosa* (great gray owl) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

The relation between tree burn severity and forest structure in the Rocky Mountains

www.nrfirescience.org/resource/11987

Many wildfire events have burned thousands of hectares across the western United States, such as the Bitterroot (Montana), Rodeo-Chediski (Arizona), Hayman (Colorado), and Biscuit (Oregon) fires. These events led to Congress enacting the Healthy Forest Restoration Act of 2003, which, with other policies, encourages federal and state...

Author(s): Theresa B. Jain, Russell T. Graham
Year Published: 2007
Type: Document
Conference Proceedings, Technical Report or White Paper

Hieracium albiflorum (white hawkweed)

www.nrfirescience.org/resource/10816

This FEIS species review synthesizes information on the relationship of Hieracium albiflorum (white hawkweed) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Sonja L. Reeves

Year Published: 2007

Type: Document

Synthesis

Tough trees at timberline - whitebark pines in peril

www.nrfirescience.org/resource/8392

This article describes the whitebark pine tree and the tough environment it lives in, the hazards it faces, and how it fits the environment ecologically.

Author(s): Jane Kapler Smith

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

The photoload sampling technique: estimating surface fuel loadings from downward-looking photographs of synthetic fuelbeds

www.nrfirescience.org/resource/11128

Fire managers need better estimates of fuel loading so they can more accurately predict the potential fire behavior and effects of alternative fuel and ecosystem restoration treatments. This report presents a new fuel sampling method, called the photoload sampling technique, to quickly and accurately estimate loadings for six common...

Author(s): Robert E. Keane, Laura J. Dickinson

Year Published: 2007

Type: Document

Technical Report or White Paper

Arctostaphylos patula (greenleaf manzanita)

www.nrfirescience.org/resource/10705

This FEIS species review synthesizes information on the relationship of Arctostaphylos patula (greenleaf manzanita) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Alan S. Hauser

Year Published: 2007

Type: Document

Synthesis

CCE fire regimes and their management

www.nrfirescience.org/resource/8369

A spectacular forest in the center of the Crown of the Continent Ecosystem (CCE) cuts a 15- by 5-km swath along the Flathead River's South Fork around Big Prairie in the middle of the Bob Marshall Wilderness Area in Montana (Figure 13- 1). This wide valley bottom, which contains two patches (of about 1,000 ha each) of the last...

Author(s): Robert E. Keane, Carl H. Key

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Whitebark ecosystem displayed indoors

www.nrfirescience.org/resource/11091

If you had never seen a high-elevation whitebark pine community, if you had never picked up a whitebark cone emptied by nutcrackers, if you had never stepped over (or into) a bear scat full of pine nut shells, how could you appreciate the intricacy of whitebark pine habitat? How could you care about this beautiful, imperiled...

Author(s): Jane Kapler Smith

Year Published: 2007

Type: Document

Research Brief or Fact Sheet

Runoff and erosion effects after prescribed fire and wildfire on volcanic ash-cap soils

www.nrfirescience.org/resource/11041

After prescribed burns at three locations and one wildfire, rainfall simulations studies were completed to compare postfire runoff rates and sediment yields on ash-cap soil in conifer forest regions of northern Idaho and western Montana. The measured fire effects were differentiated by burn severity (unburned, low, moderate, and...

Author(s): Peter R. Robichaud, Frederick B. Pierson, Robert E. Brown

Year Published: 2007

Type: Document

Conference Proceedings

Mertensia paniculata (tall bluebells)

www.nrfirescience.org/resource/10821

This FEIS species review synthesizes information on the relationship of *Mertensia paniculata* (tall bluebells) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Sonja L. Reeves

Year Published: 2007

Type: Document

Synthesis

Cone production in young post-fire *Pinus contorta* stands in Greater Yellowstone (USA)

www.nrfirescience.org/resource/8248

Spatial and temporal variability in cone production may influence post-disturbance succession, yet it is not well understood. We sampled 15-year old lodgepole pine (*Pinus contorta* var. *latifolia*) stands ($n = 16$) that regenerated naturally after the 1988 Yellowstone fires and varied in stand density (566-545,200 stems ha⁻¹) and...

Author(s): Monica G. Turner, Devin M. Turner, William H. Romme, Daniel B. Tinker

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Martes pennanti (fisher)

www.nrfirescience.org/resource/10796

This FEIS species review synthesizes information on the relationship of *Martes pennanti* (fisher) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Rachelle Meyer

Year Published: 2007

Type: Document

Synthesis

Lynx canadensis (Canada lynx)

www.nrfirescience.org/resource/10897

This FEIS species review synthesizes information on the relationship of *Lynx canadensis* (Canada lynx) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

The fire-climate connection

www.nrfirescience.org/resource/11985

JFSP-funded research is exploring and quantifying relationships among the large-scale drivers of climate and the occurrence and extent of wildfire in the various regions of the western United States.

Author(s): Gail Wells

Year Published: 2007

Type: Document

Research Brief or Fact Sheet

The influence of white pine blister rust on seed dispersal in whitebark pine

www.nrfirescience.org/resource/8391

We tested the hypotheses that white pine blister rust (*Cronartium ribicola* J.C. Fisch.) damage in whitebark pine (*Pinus albicaulis* Engelm.) stands leads to reduced (1) seed cone density, (2) predispersal seed survival, and (3) likelihood of Clark's Nutcracker (*Nucifraga columbiana* (Wilson, 1811)) seed dispersal. We gathered data...

Author(s): Shawn T. McKinney, Diana F. Tomback

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Zigadenus venenosus (meadow deathcamas)

www.nrfirescience.org/resource/10704

This FEIS species review synthesizes information on the relationship of *Zigadenus venenosus* (meadow deathcamas) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Alan S. Hauser
Year Published: 2006
Type: Document
Synthesis

Amount, position, and age of coarse wood influence litter decomposition in postfire *Pinus contorta* stands

www.nrfirescience.org/resource/8222

Spatial variation in vegetation and coarse wood is a major source of forest heterogeneity, yet little is known about how this affects ecosystem processes. In 15-year-old postfire lodgepole pine (*Pinus contorta* var. *latifolia* Englem.) stands in Yellowstone National Park, Wyoming, we investigated how the decomposition rate varies with...

Author(s): Alysa J. Remsburg, Monica G. Turner
Year Published: 2006
Type: Document
Book or Chapter or Journal Article

Two-aged silvicultural treatments in lodgepole pine stands can be economically viable

www.nrfirescience.org/resource/11103

Economically viable silvicultural options are critical for management activities that provide wood products, reduce forest fuels, improve forest health, and enhance wildlife habitat. The Tenderfoot Research Project was developed in the late 1990s to evaluate and quantify ecological and biological effects of two-aged silvicultural...

Author(s): Ward W. McCaughey, Steven J. Martin, Dean A. Blomquist
Year Published: 2006
Type: Document
Research Brief or Fact Sheet

The use of silviculture and prescribed fire to manage stand structure and fuel profiles in a multi-aged lodgepole pine forest

www.nrfirescience.org/resource/10964

This paper presents several components of a multi-disciplinary project designed to evaluate the ecological and biological effects of two innovative silvicultural treatments coupled with prescribed fire in an attempt to both manage fuel profiles and create two-aged stand structures in lodgepole pine. Two shelterwood silvicultural...

Author(s): Colin C. Hardy, Helen Y. Smith, Ward W. McCaughey
Year Published: 2006
Type: Document
Conference Proceedings

***Carex filifolia* (threadleaf sedge)**

www.nrfirescience.org/resource/10696

This FEIS species review synthesizes information on the relationship of *Carex filifolia* (threadleaf sedge) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Alan S. Hauser
Year Published: 2006
Type: Document
Synthesis

Carex aquatilis (leafy tussock sedge)

www.nrfirescience.org/resource/10693

This FEIS species review synthesizes information on the relationship of *Carex aquatilis* (leafy tussock sedge) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Alan S. Hauser

Year Published: 2006

Type: Document

Synthesis

Whitebark pine in peril: a case for restoration

www.nrfirescience.org/resource/12917

The purpose of this paper is to: 1) provide a range-wide assessment of whitebark pine health, 2) describe range-wide restoration strategies for conserving and restoring whitebark pine, 3) provide a brief managers guide for selecting restoration strategies, and 4) describe information needs and challenges to...

Author(s): John W. Schwandt

Year Published: 2006

Type: Document

Technical Report or White Paper

Comparison of crown fire modeling systems used in three fire management applications

www.nrfirescience.org/resource/11200

The relative behavior of surface-crown fire spread rate modeling systems used in three fire management applications--CFIS (Crown Fire Initiation and Spread), FlamMap and NEXUS-- is compared using fire environment characteristics derived from a dataset of destructively measured canopy fuel and associated stand characteristics. Although...

Author(s): Joe H. Scott

Year Published: 2006

Type: Document

Technical Report or White Paper

Goodyera oblongifolia (western rattlesnake plantain)

www.nrfirescience.org/resource/10820

This FEIS species review synthesizes information on the relationship of *Goodyera oblongifolia* (western rattlesnake plantain) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution...

Author(s): Sonja L. Reeves

Year Published: 2006

Type: Document

Synthesis

Piranga ludoviciana (western tanager)

www.nrfirescience.org/resource/10795

This FEIS species review synthesizes information on the relationship of *Piranga ludoviciana* (western tanager) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Rachelle Meyer
Year Published: 2006
Type: Document
Synthesis

Whitebark pine guidelines for planting prescriptions

www.nrfirescience.org/resource/11005

This paper reviews general literature, research studies, field observations, and standard Forest Service survival surveys of high-elevation whitebark pine plantations and presents a set of guidelines for outplanting prescriptions. When planting whitebark pine, the recommendations are: 1) reduce overstory competition; 2) reduce...

Author(s): Joe H. Scott, Ward W. McCaughey
Year Published: 2006
Type: Document
Conference Proceedings

Evaluation of silvicultural treatments and biomass use for reducing fire hazard in western states

www.nrfirescience.org/resource/11189

Several analysis have shown that fire hazard is a concern for substantial areas of forestland, shrubland, grassland, and range in the western United States. In response, broadscale management strategies, such as the National Fire Plan, established actions to reduce the threat of undesirable fire. Available budgets are insufficient...

Author(s): Kenneth E. Skog, R. James Barbour, Karen L. Abt, Edward M. Bilek, Frank Burch, Roger D. Fight, Robert J. Huggett, Patrick D. Miles, Elizabeth D. Reinhardt, Wayne D. Shepperd
Year Published: 2006
Type: Document
Technical Report or White Paper

Patagioenas fasciata (band-tailed pigeon)

www.nrfirescience.org/resource/10896

This FEIS species review synthesizes information on the relationship of Patagioenas fasciata (band-tailed pigeon) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Elena D. Ulev
Year Published: 2006
Type: Document
Synthesis

Calamagrostis montanensis (plains reedgrass)

www.nrfirescience.org/resource/10702

This FEIS species review synthesizes information on the relationship of Calamagrostis montanensis (plains reedgrass) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Alan S. Hauser
Year Published: 2006
Type: Document
Synthesis

Ledum groenlandicum (bog Labrador tea)

www.nrfirescience.org/resource/10670

This FEIS species review synthesizes information on the relationship of *Ledum groenlandicum* (bog Labrador tea) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Corey L. Gucker

Year Published: 2006

Type: Document

Synthesis

Foliar nitrogen patterns following stand-replacing fire in lodgepole pine (*Pinus contorta* var. *latifolia*) forests of the Rocky Mountains, USA

www.nrfirescience.org/resource/8268

Little previous work has been conducted on effects of natural, high-severity wildfires on nitrogen (N) dynamics. We measured aboveground plant biomass, foliar N, and net N mineralization 2 years after stand-replacing fires in lodgepole pine (*Pinus contorta* var. *latifolia*) forests in Grand Teton National Park, Wyoming, USA. We...

Author(s): Kristine L. Metzger, William H. Romme, Monica G. Turner

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Rosa woodsii (Wood's rose)

www.nrfirescience.org/resource/10700

This FEIS species review synthesizes information on the relationship of *Rosa woodsii* (Wood's rose) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Alan S. Hauser

Year Published: 2006

Type: Document

Synthesis

Response of western mountain ecosystems to climatic variability and change: the Western Mountain Initiative

www.nrfirescience.org/resource/8157

Mountain ecosystems within our national parks and other protected areas provide valuable goods and services such as clean water, biodiversity conservation, and recreational opportunities, but their potential responses to expected climatic changes are inadequately understood. The Western Mountain Initiative (WMI) is a collaboration...

Author(s): Nathan L. Stephenson, David L. Peterson, Daniel B. Fagre, Craig D. Allen, Donald McKenzie, Jill Baron

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Eleocharis palustris (common spikerush)

www.nrfirescience.org/resource/10694

This FEIS species review synthesizes information on the relationship of *Eleocharis palustris* (common spikerush) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire

regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Alan S. Hauser

Year Published: 2006

Type: Document

Synthesis

Empirical analyses of plant-climate relationships for the western United States

www.nrfirescience.org/resource/11512

The Random Forests multiple-regression tree was used to model climate profiles of 25 biotic communities of the western United States and nine of their constituent species. Analyses of the communities were based on a gridded sample of ca. 140,000 points, while those for the species used presence-absence data from ca. 120,000...

Author(s): Gerald E. Rehfeldt, Nicholas L. Crookston, Marcus V. Warwell, Jeffrey S. Evans

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Geum triflorum (prairie smoke)

www.nrfirescience.org/resource/10801

This FEIS species review synthesizes information on the relationship of *Geum triflorum* (prairie smoke) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Gregory T. Munger

Year Published: 2006

Type: Document

Synthesis

Financial analysis of fuel treatments on national forests in the Western United States

www.nrfirescience.org/resource/12020

The purpose of this note is to provide a starting point for discussion of fire hazard reduction treatments that meet the full range of management objectives, including budget priorities. Thoughtful design requires an understanding not only of the physical and biological outcomes, but also the costs and potential revenues of applying...

Author(s): Roger D. Fight, R. James Barbour

Year Published: 2006

Type: Document

Research Brief or Fact Sheet

Berberis repens (Oregon grape)

www.nrfirescience.org/resource/10905

This FEIS species review synthesizes information on the relationship of *Berberis repens* (Oregon grape) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Elena D. Ulev

Year Published: 2006

Type: Document

Synthesis

Perisoreus canadensis (gray jay)

www.nrfirescience.org/resource/10901

This FEIS species review synthesizes information on the relationship of *Perisoreus canadensis* (gray jay) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Elena D. Ulev

Year Published: 2006

Type: Document

Synthesis

Snow accumulation in thinned lodgepole pine stands, Montana, USA

www.nrfirescience.org/resource/8192

Alternative silvicultural treatments such as thinning can be used to restore forested watersheds and reduce wildfire hazards, but the hydrologic effects of these treatments are not well defined. We evaluated the effect of two shelterwood-with-reserve silvicultural prescriptions, one leaving residual trees evenly distributed (SE) and...

Author(s): Scott W. Woods, Robert S. Ahl, Jason Sappington, Ward W. McCaughey

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Calypso bulbosa (fairy slipper)

www.nrfirescience.org/resource/10818

This FEIS species review synthesizes information on the relationship of *Calypso bulbosa* (fairy slipper) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Sonja L. Reeves

Year Published: 2006

Type: Document

Synthesis

Interactions among fire, insects, and pathogens in coniferous forests of the interior western United States and Canada

www.nrfirescience.org/resource/8120

Natural and recurring disturbances caused by fire, native forest insects and pathogens have interacted for millennia to create and maintain forests dominated by seral or pioneering species of conifers in the interior regions of the western United States and Canada. Changes in fire suppression and other factors in the last century...

Author(s): Thomas J. Parker, Karen M. Clancy, Robert L. Mathiasen

Year Published: 2006

Type: Document

Book or Chapter or Journal Article, Synthesis

Ecological science relevant to management policies for fire-prone forests of the western United States, Society for Conservation Biology scientific panel of fire in western U.S. forests

www.nrfirescience.org/resource/11190

Fire is a primary natural disturbance in most forests of western North America and has shaped their plant and animal communities for millions of years. Native species and fundamental ecological

processes are dependent on conditions created by fire. However, many western forests have experienced shifts in wildfire regimes and forest...

Author(s): Reed F. Noss, Jerry F. Franklin, William L. Baker, Tania L. Schoennagel, Peter B. Moyle

Year Published: 2006

Type: Document

Technical Report or White Paper

Wilderness fire management in a changing world

www.nrfirescience.org/resource/7963

Several strategies are available for reducing accumulated forest fuels and their associated risks, including naturally or accidentally ignited wildland fires, management ignited prescribed fires, and a variety of mechanical and chemical methods (Omi 1996). However, a combination of policy, law, philosophy, and logistics suggest...

Author(s): Carol Miller

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Bromus carinatus var. carinatus, Bromus carinatus var. marginatus (California brome, mountain brome)

www.nrfirescience.org/resource/10893

This FEIS species review synthesizes information on the relationship of Bromus carinatus var. carinatus, Bromus carinatus var. marginatus (California brome, mountain brome) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also...

Author(s): Jennifer E. Tollefson

Year Published: 2006

Type: Document

Synthesis

Juncus balticus (Baltic rush)

www.nrfirescience.org/resource/10701

This FEIS species review synthesizes information on the relationship of Juncus balticus (Baltic rush) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Alan S. Hauser

Year Published: 2005

Type: Document

Synthesis

Fish and stream habitat risks from uncharacteristic wildfire: observations from 17 years of fire-related disturbances on the Boise National Forest, Idaho

www.nrfirescience.org/resource/11451

Several large, uncharacteristic wildfires occurred on the Boise National Forest in Southwest Idaho, from 1986 to 2003. From 1987 to 1994, severe wildfires burned almost 50% of the ponderosa pine forest types (about 200,000 ha). The intensity of the fires varied across the landscape, with a mix of low to moderate severity, and lesser...

Author(s): Timothy A. Burton

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Testing transferability of willingness to pay for forest fire prevention among three states of California, Florida, and Montana

www.nrfirescience.org/resource/7960

The equivalency of willingness to pay between the states of California, Florida and Montana is tested. Residents in California, Florida and Montana have an average willingness to pay of \$417, \$305, and \$382 for prescribed burning program, and \$403, \$230, and \$208 for mechanical fire fuel reduction program, respectively. Due to wide...

Author(s): John B. Loomis, Le Trong Hung, Armando Gonzalez-Caban

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Distribution of bark beetle attacks after whitebark pine restoration treatments: a case study

www.nrfirescience.org/resource/8366

Whitebark pine (*Pinus albicaulis* Engelm.), an important component of high elevation ecosystems in the western United States and Canada, is declining due to fire exclusion, white pine blister rust (*Cronartium ribicola* J.C. Fisch.), and mountain pine beetle (*Dendroctonus ponderosae* Hopkins). This study was conducted to evaluate the...

Author(s): Kristen M. Waring, Diana L. Six

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Root diseases in coniferous forests of the Inland Northwest: potential implications of fuels treatments

www.nrfirescience.org/resource/11172

After nearly 100 years of fire exclusion, introduced pests, and selective harvesting, a change in forest composition has occurred in many Inland West forests of North America. This change in forest structure has frequently been accompanied by increases in root diseases and/or an unprecedented buildup of fuels. Consequently, many...

Author(s): Raini C. Rippey, Jane E. Stewart, Paul J. Zambino, Ned B. Klopfenstein, Joanne M. Tirocke, Mee-Sook Kim, Walter G. Thies

Year Published: 2005

Type: Document

Technical Report or White Paper

Apocynum androsaemifolium (spreading dogbane)

www.nrfirescience.org/resource/10666

This FEIS species review synthesizes information on the relationship of *Apocynum androsaemifolium* (spreading dogbane) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Amy H. Groen

Year Published: 2005

Type: Document

Synthesis

Carbon cycling at the landscape scale: the effect of changes in climate and fire frequency on

age distribution, stand structure, and net ecosystem production - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11151

We are working in Yellowstone National Park to determine how initial post-fire structural heterogeneity controls carbon dynamics over the full cycle of individual forest stands, and how climate-mediated changes in the fire regime could potentially alter the behavior of the entire Yellowstone ecosystem as a net sink or net source in...

Author(s): Michael G. Ryan, Daniel M. Kashian, Erica A. H. Smithwick, William H. Romme, Monica G. Turner, Daniel B. Tinker

Year Published: 2005

Type: Document

Technical Report or White Paper

Variation in fire regimes of the Rocky Mountains: implications for avian communities and fire management

www.nrfirescience.org/resource/8144

Information about avian responses to fire in the U.S. Rocky Mountains is based solely on studies of crown fires. However, fire management in this region is based primarily on studies of low-elevation ponderosa pine (*Pinus ponderosa*) forests maintained largely by frequent understory fires. In contrast to both of these trends, most...

Author(s): Victoria A. Saab, Hugh D. W. Powell, Natasha B. Kotliar, Karen R. Newlon

Year Published: 2005

Type: Document

Book or Chapter or Journal Article, Synthesis

Effect of alternative silvicultural treatments on snow accumulation in lodgepole pine stands, Montana, U.S.A.

www.nrfirescience.org/resource/8413

Alternative silvicultural treatments such as thinning can restore the productivity and diversity of forested watersheds and reduce wildfire hazards, but the hydrologic effects of these treatments are not well defined. We evaluated the effect of even thinning (SE) and group-retention thinning (SG), both with ~ 60 % basal area removal...

Author(s): Scott W. Woods, Ward W. McCaughey, Robert S. Ahl, Jason Sappington

Year Published: 2005

Type: Document

Conference Proceedings

Clintonia uniflora (queencup beadlily)

www.nrfirescience.org/resource/10798

This FEIS species review synthesizes information on the relationship of *Clintonia uniflora* (queencup beadlily) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Rachelle Meyer

Year Published: 2005

Type: Document

Synthesis

Stereo photo guide for estimating canopy fuel characteristics in conifer stands

www.nrfirescience.org/resource/11199

Stereo photographs, hemispherical photographs, and stand data are presented with associated

biomass and canopy fuel characteristics for five Interior West conifer stands. Canopy bulk density, canopy base height, canopy biomass by component, available canopy fuel load, and vertical distribution of canopy fuel are presented for each...

Author(s): Joe H. Scott, Elizabeth D. Reinhardt

Year Published: 2005

Type: Document

Technical Report or White Paper

Cornus nuttallii (Pacific dogwood)

www.nrfirescience.org/resource/10681

This FEIS species review synthesizes information on the relationship of *Cornus nuttallii* (Pacific dogwood) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Corey L. Gucker

Year Published: 2005

Type: Document

Synthesis

Lonicera fragrantissima, Lonicera maackii, Lonicera morrowii, Lonicera tatarica, Lonicera x bella, Lonicera xylosteum (winter honeysuckle, Amur honeysuckle, Morrow's honeysuckle, Tatarian honeysuckle, Bell's honeysuckle, European fly honeysuckle)

www.nrfirescience.org/resource/10465

This FEIS species review synthesizes information on the relationship of *Lonicera fragrantissima*, *Lonicera maackii*, *Lonicera morrowii*, *Lonicera tatarica*, *Lonicera x bella*, *Lonicera xylosteum* (winter honeysuckle, Amur honeysuckle, Morrow's honeysuckle, Tatarian honeysuckle, Bell's honeysuckle, European fly honeysuckle) to fire--how...

Author(s): Gregory T. Munger

Year Published: 2005

Type: Document

Synthesis

Galium aparine (stickywilly)

www.nrfirescience.org/resource/10677

This FEIS species review synthesizes information on the relationship of *Galium aparine* (stickywilly) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Corey L. Gucker

Year Published: 2005

Type: Document

Synthesis

Role of fire in determining annual water yield in mountain watersheds

www.nrfirescience.org/resource/7901

This paper presents the computation procedures for estimating average annual water yields based on annual precipitation and vegetation cover types. This procedure allows for an estimation of water yields under current conditions, under various levels of vegetation management, or under historic water yield based on fire history. Two...

Author(s): Phillip E. Farnes, Ward W. McCaughey, Katherine J. Hansen

Year Published: 2004

Type: Document
Book or Chapter or Journal Article

Prunus pensylvanica (pin cherry)

www.nrfirescience.org/resource/10607

This FEIS species review synthesizes information on the relationship of *Prunus pensylvanica* (pin cherry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Michelle B. Anderson

Year Published: 2004

Type: Document

Synthesis

Global warming's unlikely harbingers

www.nrfirescience.org/resource/11497

The lodgepole pines are dying. Inside the bark of the trees, tens of millions of beetles are tunneling, birthing, hatching, maturing. In early May, when Forest Service researcher Jesse Logan drives through the Stanley Valley to inspect the damage, more than half the lodgepole pines display dull red foliage - the signal flag of...

Author(s): Michelle Nijhuis

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Sonchus arvensis (perennial sowthistle)

www.nrfirescience.org/resource/10464

This FEIS species review synthesizes information on the relationship of *Sonchus arvensis* (perennial sowthistle) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species'...

Author(s): Jack McWilliams

Year Published: 2004

Type: Document

Synthesis

The interaction of fire, fuels, and climate across Rocky Mountain forests

www.nrfirescience.org/resource/13583

Understanding the relative influence of fuels and climate on wildfires across the Rocky Mountains is necessary to predict how fires may respond to a changing climate and to define effective fuel management approaches to controlling wildfire in this increasingly populated region. The idea that decades of fire suppression have...

Author(s): Tania L. Schoennagel, Thomas T. Veblen, William H. Romme

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Red Lodge, Montana: steps to improve community preparedness for wildfire

www.nrfirescience.org/resource/11104

This is a government publication outlining the steps to wildfire preparedness in Red Lodge, MT. The

key features include homeowners' associations, which lead in fuel reduction around properties; USFS recreation residences, which conduct fuel reduction projects; evacuation plans and fuel breaks; regulations; and relationships, which...

Author(s): Victoria Sturtevant, Linda E. Kruger

Year Published: 2004

Type: Document

Research Brief or Fact Sheet

Effects of tree density and stand age on carbon allocation patterns in postfire lodgepole pine

www.nrfirescience.org/resource/8263

Validating the components of the carbon (C) budget in forest ecosystems is essential for developing allocation rules that allow accurate predictions of C pools and fluxes. In addition, a better understanding of the effects of natural disturbances on C cycling is critical, particularly in light of alterations to disturbance regimes...

Author(s): Creighton M. Litton, Michael G. Ryan, Dennis H. Knight

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Spatial heterogeneity of lodgepole pine sapling densities following the 1988 fires in Yellowstone National Park, Wyoming, USA

www.nrfirescience.org/resource/8255

Large disturbances create spatial heterogeneity in vegetation re-establishment, and documenting such variability is critical for understanding and predicting succession. We quantified the spatial heterogeneity of lodgepole pine sapling densities 10 years after the 1988 fires in Yellowstone National Park using color infrared...

Author(s): Daniel M. Kashian, Daniel B. Tinker, Monica G. Turner, Frank L. Scarpace

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Leymus ambiguus (Colorado wildrye)

www.nrfirescience.org/resource/10600

This FEIS species review synthesizes information on the relationship of *Leymus ambiguus* (Colorado wildrye) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Michelle B. Anderson

Year Published: 2004

Type: Document

Synthesis

Temperature-dependent rate models of vascular cambium cell mortality

www.nrfirescience.org/resource/7922

We use two rate-process models to describe cell mortality at elevated temperatures as a means of understanding vascular cambium cell death during surface fires. In the models, cell death is caused by irreversible damage to cellular molecules that occurs at rates that increase exponentially with temperature. The models differ in...

Author(s): Matthew B. Dickinson, Edward A. Johnson

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Artemisia frigida (fringed sagebrush)

www.nrfirescience.org/resource/10788

This FEIS species review synthesizes information on the relationship of Artemisia frigida (fringed sagebrush) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology...

Author(s): Jack McWilliams

Year Published: 2003

Type: Document

Synthesis

Using simulation to map fire regimes: an evaluation of approaches, strategies, and limitations

www.nrfirescience.org/resource/7951

Spatial depictions of fire regimes are indispensable to fire management because they portray important characteristics of wildland fire, such as severity, intensity, and pattern, across a landscape that serves as important reference for future treatment activities. However, spatially explicit fire regime maps are difficult and...

Author(s): Robert E. Keane, Geoffrey J. Cary, Russell A. Parsons

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Vegetation dynamics under fire exclusion and logging in a Rocky Mountain watershed, 1856-1996

www.nrfirescience.org/resource/8264

How have changes in land management practices affected vegetation patterns in the greater Yellowstone ecosystem? This question led us to develop a deterministic, successional, vegetation model to 'turn back the clock' on a study area and assess how patterns in vegetation cover type and structure have changed through different...

Author(s): Alisa L. Gallant, Andrew J. Hansen, John S. Councilman, Duane K. Monte, David W. Betz

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

The influence of fire interval and serotiny on postfire lodgepole pine density in Yellowstone National Park

www.nrfirescience.org/resource/8259

The time interval between stand-replacing fires can influence patterns of initial postfire succession if the abundance of postfire propagules varies with prefire stand age. We examined the effect of fire interval on initial postfire lodgepole pine (*Pinus contorta* var. *latifolia* Engelm.) density in Yellowstone National Park (YNP)...

Author(s): Tania L. Schoennagel, Monica G. Turner, William H. Romme

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Status of native fishes in the western United States and issues for fire and fuels management

www.nrfirescience.org/resource/8131

Conservation of native fishes and changing patterns in wildfire and fuels are defining challenges for managers of forested landscapes in the western United States. Many species and populations of native fishes have declined in recorded history and some now occur as isolated remnants of what once were larger more complex systems....

Author(s): Bruce E. Rieman, Danny C. Lee, Denver P. Burns, Robert E. Gresswell, Michael K. Young, Rick Stowell, John N. Rinne, Phil Howell

Year Published: 2003

Type: Document

Book or Chapter or Journal Article, Synthesis

Pinus contorta var. latifolia (Rocky Mountain lodgepole pine)

www.nrfirescience.org/resource/10597

This FEIS species review synthesizes information on the relationship of Pinus contorta var. latifolia (Rocky Mountain lodgepole pine) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,...

Author(s): Michelle B. Anderson

Year Published: 2003

Type: Document

Synthesis

The spatial context of fire: a new approach for predicting fire occurrence

www.nrfirescience.org/resource/10993

Across North America, decades of fire suppression and recent patterns of human settlement have combined to increase the risks that wildland fires pose to human life, property, and natural resource values. Various methods can be used to reduce fuel hazards and mitigate these risks, but funding and other constraints require that these...

Author(s): Carol Miller

Year Published: 2003

Type: Document

Conference Proceedings, Technical Report or White Paper

Assessing canopy fuel stratum characteristics in crown fire prone fuel types of western North America

www.nrfirescience.org/resource/7917

Application of crown fire behavior models in fire management decision-making have been limited by the difficulty of quantitatively describing fuel complexes, specifically characteristics of the canopy fuel stratum. To estimate canopy fuel stratum characteristics of four broad fuel types found in the western United States and...

Author(s): Martin E. Alexander, Ronald H. Wakimoto

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Key issues in fire regime research for fuels management and ecological restoration

www.nrfirescience.org/resource/11025

The premise behind many projects aimed at wildfire hazard reduction and ecological restoration in forests of the western United States is the idea that unnatural fuel buildup has resulted from suppression of formerly frequent fires. This premise and its implications need to be critically evaluated by conducting area-specific...

Author(s): Thomas T. Veblen

Year Published: 2003
Type: Document
Conference Proceedings

Descurainia sophia (flixweed tansymustard)

www.nrfirescience.org/resource/10463

This FEIS species review synthesizes information on the relationship of *Descurainia sophia* (flixweed tansymustard) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species'...

Author(s): Janet L. Howard
Year Published: 2003
Type: Document
Synthesis

Effects of wildfire and post-fire salvage logging on avian communities in conifer-dominated forests of the western United States

www.nrfirescience.org/resource/7956

Description not entered

Author(s): Natasha B. Kotliar, Sallie Hejl, Richard L. Hutton, Victoria A. Saab, C. P. Melcher, Mary E. McFadzen
Year Published: 2002
Type: Document
Book or Chapter or Journal Article

Cirsium vulgare (bull thistle)

www.nrfirescience.org/resource/10492

This FEIS species review synthesizes information on the relationship of *Cirsium vulgare* (bull thistle) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,...

Author(s): Kristin L. Zouhar
Year Published: 2002
Type: Document
Synthesis

Larix occidentalis (western larch)

www.nrfirescience.org/resource/10826

This FEIS species review synthesizes information on the relationship of *Larix occidentalis* (western larch) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Janette S. Scher
Year Published: 2002
Type: Document
Synthesis

Landscape-scale controls over 20th century fire occurrence in two large Rocky Mountain (USA) wilderness areas

www.nrfirescience.org/resource/8140

Topography, vegetation, and climate act together to determine the spatial patterns of fires at landscape scales. Knowledge of landscape-fire-climate relations at these broad scales (1,000s ha to 100,000s ha) is limited and is largely based on inferences and extrapolations from fire histories reconstructed from finer scales. In this...

Author(s): Matthew G. Rollins, Penelope Morgan

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

Leymus cinereus (basin wildrye)

www.nrfirescience.org/resource/10601

This FEIS species review synthesizes information on the relationship of *Leymus cinereus* (basin wildrye) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Michelle B. Anderson

Year Published: 2002

Type: Document

Synthesis

Pseudotsuga menziesii var. glauca (Rocky Mountain Douglas-fir)

www.nrfirescience.org/resource/10853

This FEIS species review synthesizes information on the relationship of *Pseudotsuga menziesii* var. *glauca* (Rocky Mountain Douglas-fir) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,...

Author(s): Peter D. Steinberg

Year Published: 2002

Type: Document

Synthesis

Pinus albicaulis (whitebark pine)

www.nrfirescience.org/resource/10651

This FEIS species review synthesizes information on the relationship of *Pinus albicaulis* (whitebark pine) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Janet L. Fryer

Year Published: 2002

Type: Document

Synthesis

Lythrum salicaria (purple loosestrife)

www.nrfirescience.org/resource/10467

This FEIS species review synthesizes information on the relationship of *Lythrum salicaria* (purple loosestrife) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy...

Author(s): Gregory T. Munger

Year Published: 2002

Type: Document

Synthesis

Balsamorhiza sagittata (arrowleaf balsamroot)

www.nrfirescience.org/resource/10789

This FEIS species review synthesizes information on the relationship of *Balsamorhiza sagittata* (arrowleaf balsamroot) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Jack McWilliams

Year Published: 2002

Type: Document

Synthesis

Cascading effects of fire exclusion in Rocky Mountain ecosystems: a literature review

www.nrfirescience.org/resource/11187

The health of many Rocky Mountain ecosystems is in decline because of the policy of excluding fire in the management of these ecosystems. Fire exclusion has actually made it more difficult to fight fires, and this poses greater risks to the people who fight fires and for those who live in and around Rocky Mountain forests and...

Author(s): Robert E. Keane, Kevin C. Ryan, Thomas T. Veblen, Craig D. Allen, Jesse A. Logan, Brad C. Hawkes

Year Published: 2002

Type: Document

Synthesis, Technical Report or White Paper

Use of fire and silvicultural techniques for whitebark pine restoration successes, caveats, and assessment techniques

www.nrfirescience.org/resource/10982

Whitebark pine (*Pinus albicaulis*) is a keystone species in upper subalpine forests of many parts of the northern Rocky Mountains and Cascades in the United States and Canada. These diverse ecosystems have been declining in parts of its range because of recent mountain pine beetle (*Dendroctonus ponderosae*) and blister rust (...)

Author(s): Robert E. Keane, Katherine Kendall, Robert Crabtree

Year Published: 2002

Type: Document

Conference Proceedings

Carex geyeri (elk sedge)

www.nrfirescience.org/resource/10615

This FEIS species review synthesizes information on the relationship of *Carex geyeri* (elk sedge) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Amy C. Chadwick

Year Published: 2002

Type: Document

Synthesis

Assessment of the line transect method: an examination of the spatial patterns of down and standing dead wood

www.nrfirescience.org/resource/13159

The line transect method, its underlying assumptions, and the spatial patterning of down and standing pieces of dead wood were examined at the Tenderfoot Creek Experimental Forest in central Montana. The accuracy of the line transect method was not determined due to conflicting results of t-tests and ordinary least squares...

Author(s): Duncan C. Lutes

Year Published: 2002

Type: Document

Conference Proceedings

Elymus lanceolatus (thickspike wheatgrass)

www.nrfirescience.org/resource/10825

This FEIS species review synthesizes information on the relationship of *Elymus lanceolatus* (thickspike wheatgrass) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Janette S. Scher

Year Published: 2002

Type: Document

Synthesis

Acer glabrum (Rocky Mountain maple)

www.nrfirescience.org/resource/10609

This FEIS species review synthesizes information on the relationship of *Acer glabrum* (Rocky Mountain maple) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Michelle B. Anderson

Year Published: 2001

Type: Document

Synthesis

Water use by whitebark pine and subalpine fir: potential consequences of fire exclusion in the Northern Rocky Mountains

www.nrfirescience.org/resource/8146

In subalpine forests of the northern Rocky Mountains, fire exclusion has contributed to large-scale shifts from early-successional whitebark pine (*Pinus albicaulis* Engelm.) to late-successional subalpine fir (*Abies lasiocarpa* (Hook.) Nutt.), a species assumed to be more shade tolerant than whitebark pine and with leaf to sapwood...

Author(s): Anna Sala, Elieen V. Carey, Robert E. Keane, Ragan M. Callaway

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Infiltration rates after wildfires in the Bitterroot Valley

www.nrfirescience.org/resource/8425

Recent fires have renewed interest in fire's effect on different components of the ecosystem, in particular fire's effects on infiltration and runoff. Forests subjected to high severity burns often develop water repellent soil conditions. Under this condition, the infiltration of water into the soil is lowered and consequently...

Author(s): Juli A. Brady, Peter R. Robichaud, Frederick B. Pierson

Year Published: 2001
Type: Document
Conference Proceedings

Educational program about wildland fire integrates plant science into curriculum

www.nrfirescience.org/resource/8386

A science fiction story by Edmond Hamilton entitled 'Alien Earth' (Hamilton 1949) describes the experience of a young scientist in a tropical country. The scientist obtains a potion that slows his physiology to a rate at which he can perceive plant growth and interactions between plants in rapid, aggressive, even violent motion. He...

Author(s): Jane Kapler Smith, Nancy E. McMurray, Garon C. Smith

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Strategies for managing whitebark pine in the presence of white pine blister rust

www.nrfirescience.org/resource/7902

Description not entered

Author(s): Raymond J. Hoff, Dennis E. Ferguson, GERAL I. McDONALD, Robert E. Keane

Year Published: 2001

Type: Document

Book or Chapter or Journal Article, Synthesis

Taeniatherum caput-medusae (medusahead)

www.nrfirescience.org/resource/10447

This FEIS species review synthesizes information on the relationship of *Taeniatherum caput-medusae* (medusahead) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species'...

Author(s): Amy Archer

Year Published: 2001

Type: Document

Synthesis

Pinus flexilis (limber pine)

www.nrfirescience.org/resource/10741

This FEIS species review synthesizes information on the relationship of *Pinus flexilis* (limber pine) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and...

Author(s): Kathleen A. Johnson

Year Published: 2001

Type: Document

Synthesis

Dasiphora floribunda (shrubby cinquefoil)

www.nrfirescience.org/resource/10608

This FEIS species review synthesizes information on the relationship of *Dasiphora floribunda* (shrubby cinquefoil) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,

distribution, basic...

Author(s): Michelle B. Anderson

Year Published: 2001

Type: Document

Synthesis

Vaccinium scoparium (grouse whortleberry)

www.nrfirescience.org/resource/10501

This FEIS species review synthesizes information on the relationship of *Vaccinium scoparium* (grouse whortleberry) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Kathleen A. Johnson

Year Published: 2001

Type: Document

Synthesis

Salix scouleriana (Scouler willow)

www.nrfirescience.org/resource/10606

This FEIS species review synthesizes information on the relationship of *Salix scouleriana* (Scouler willow) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology,...

Author(s): Michelle B. Anderson

Year Published: 2001

Type: Document

Synthesis

Cirsium arvense (Canada thistle)

www.nrfirescience.org/resource/10482

This FEIS species review synthesizes information on the relationship of *Cirsium arvense* (Canada thistle) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,...

Author(s): Kristin L. Zouhar

Year Published: 2001

Type: Document

Synthesis

Evaluating a century of fire patterns in two Rocky Mountain wilderness areas using digital fire atlases

www.nrfirescience.org/resource/8139

Changes in fire size, shape, and frequency under different fire-management strategies were evaluated using time series of fire perimeter data (fire atlases) and mapped potential vegetation types (PVTs) in the Gila-Aldo Leopold Wilderness Complex (GALWC) in New Mexico and the Selway-Bitterroot Wilderness Complex (SBWC) in Idaho and...

Author(s): Matthew G. Rollins, Thomas W. Swetnam, Penelope Morgan

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Can the fire-dependent whitebark pine be saved?

www.nrfirescience.org/resource/7927

In recent decades, whitebark pine has been declining due to epidemics and fire exclusion (Keane and Arno 1993; Kendall and Arno 1990). In the northern Rocky Mountains, a project is underway to explore the feasibility of using fire and silviculture to restore the tree's high-elevation habitat.

Author(s): Robert E. Keane

Year Published: 2001

Type: Document

Book or Chapter or Journal Article, Synthesis

Restoration concepts and techniques

www.nrfirescience.org/resource/8399

Innovative techniques are needed to restore the health of whitebark pine (*Pinus albicaulis*) communities in the northern Rocky Mountains of the United States, inland West, and adjacent areas of Canada, because of the detrimental effects of the exotic disease white pine blister rust (*Cronartium ribicola*) coupled with fire exclusion...

Author(s): Robert E. Keane, Stephen F. Arno

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

***Populus balsamifera* subsp. *trichocarpa* (black cottonwood)**

www.nrfirescience.org/resource/10851

This FEIS species review synthesizes information on the relationship of *Populus balsamifera* subsp. *trichocarpa* (black cottonwood) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy,...

Author(s): Peter D. Steinberg

Year Published: 2001

Type: Document

Synthesis

***Ceanothus velutinus* (snowbrush ceanothus)**

www.nrfirescience.org/resource/10593

This FEIS species review synthesizes information on the relationship of *Ceanothus velutinus* (snowbrush ceanothus) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic...

Author(s): Michelle B. Anderson

Year Published: 2001

Type: Document

Synthesis

Delayed seed germination in whitebark pine and regeneration patterns following the Yellowstone fires

www.nrfirescience.org/resource/8185

Whitebark pine (*Pinus albicaulis*) seeds are dispersed by Clark's Nutcracker (*Nucifraga columbiana*), a bird that makes caches under 2-3 cm of soil. Cached seeds may delay germination for one or more years in part because of underdeveloped embryos at the time of seed dispersal. Consequently, whitebark pine may show a soil seed bank...

Author(s): Diana F. Tomback, Angela J. Anderies, Katherine S. Carsey, Mary L. Powell, Sabine Mellmann-Brown
Year Published: 2001
Type: Document
Book or Chapter or Journal Article

Are old forests underestimated as global carbon sinks?

www.nrfirescience.org/resource/7916

Old forests are important carbon pools, but are thought to be insignificant as current atmospheric carbon sinks. This perception is based on the assumption that changes in productivity with age in complex, multiaged, multispecies natural forests can be modelled simply as scaled-up versions of individual trees or even-aged stands....

Author(s): Elieen V. Carey, Anna Sala, Robert E. Keane, Ragan M. Callaway
Year Published: 2001
Type: Document
Book or Chapter or Journal Article

FireWorks curriculum featuring ponderosa, lodgepole, and whitebark pine forests

www.nrfirescience.org/resource/11238

FireWorks is an educational program for students in grades 1-10. The program consists of the curriculum in this report and a trunk of laboratory materials, specimens, and reference materials. It provides interactive, hands-on activities for studying fire ecology, fire behavior, and the influences of people on three fire-dependent...

Author(s): Jane Kapler Smith, Nancy E. McMurray
Year Published: 2000
Type: Document
Technical Report or White Paper

Fire in western forest ecosystems

www.nrfirescience.org/resource/11115

Description not entered

Author(s): Stephen F. Arno
Year Published: 2000
Type: Document
Technical Report or White Paper

Comparing historic and modern forests on the Bitterroot Front

www.nrfirescience.org/resource/10967

A study was initiated in 1995 to measure landscape changes in forest structures between 1900 and 1995. A systematic sampling system was used to collect data on three forested faces on the Bitterroot Front. Over 1,200 tree cores were taken on 216 plots between the elevation range of 4,500 to 7,500 feet. Historic forests were...

Author(s): Michael G. Hartwell, Paul B. Alaback, Stephen F. Arno
Year Published: 2000
Type: Document
Conference Proceedings

Variations in fire frequency and climate over the last 17,000 years in central Yellowstone National Park

www.nrfirescience.org/resource/13533

A 17000 yr fire history from Yellowstone National Park demonstrates a strong link between changes in climate and variations in fire frequency on millennial time scales. The fire history reconstruction is based on a detailed charcoal stratigraphy from Cygnet Lake in the rhyolite plateau region. Macroscopic charcoal particles were...

Author(s): Sarah H. Millspaugh, Cathy L. Whitlock, Patrick J. Bartlein

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Ceanothus sanguineus (redstem ceanothus)

www.nrfirescience.org/resource/10742

This FEIS species review synthesizes information on the relationship of *Ceanothus sanguineus* (redstem ceanothus) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Kathleen A. Johnson

Year Published: 2000

Type: Document

Synthesis

Prunus virginiana (chokecherry)

www.nrfirescience.org/resource/10503

This FEIS species review synthesizes information on the relationship of *Prunus virginiana* (chokecherry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Kathleen A. Johnson

Year Published: 2000

Type: Document

Synthesis

Elymus canadensis (Canada wildrye)

www.nrfirescience.org/resource/10831

This FEIS species review synthesizes information on the relationship of *Elymus canadensis* (Canada wildrye) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

Fuel: logs, sticks, needles, duff, and much more

www.nrfirescience.org/resource/10957

Fuels burned by either prescribed or wildfires are complex and important components of forested ecosystems. Fine fuels consisting of fallen limbs, twigs, and leaves of shrubs and trees are rich in nutrients. If these fuels are not immediately burned, nutrients can leach from these materials into the forest floor, especially if they...

Author(s): Russell T. Graham, Theresa B. Jain, Alan E. Harvey

Year Published: 2000

Type: Document

Achnatherum nelsonii (Columbia needlegrass)

www.nrfirescience.org/resource/10938

This FEIS species review synthesizes information on the relationship of *Achnatherum nelsonii* (Columbia needlegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Kristin L. Zouhar

Year Published: 2000

Type: Document

Synthesis

Measuring and modelling soil erosion processes in forests

www.nrfirescience.org/resource/7923

A prime forest resource is clean water for downstream beneficial uses. Sediment from forests may impair those beneficial uses. Sedimentation by water erosion is rare unless road activities, timber harvesting, or fire disturb the forest. We have been researching forest soil erosion processes and developing erosion prediction models...

Author(s): William J. Elliot, Randy B. Foltz, Peter R. Robichaud

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Calamagrostis rubescens (pinegrass)

www.nrfirescience.org/resource/10755

This FEIS species review synthesizes information on the relationship of *Calamagrostis rubescens* (pinegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 2000

Type: Document

Synthesis

Landscape trends (1753-1993) of whitebark pine (*Pinus albicaulis*) forests in the west big hole range of Idaho/Montana

www.nrfirescience.org/resource/7965

Pinus albicaulis (whitebark pine) is an important tree species in subalpine forests of the Northern Rocky Mountains. Populations have been declining at unprecedented rates due to the introduction of an exotic pathogen and fire suppression. We initiated this study to evaluate historical trends in *Pinus albicaulis* abundance along with...

Author(s): Michael P. Murray, Stephen C. Bunting, Michael P. Murray

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

The Bitterroot Ecosystem Management Research Project: what we have learned, symposium proceedings; May 18-20, 1999; Missoula, MT

www.nrfirescience.org/resource/11890

The varied topics presented in these symposium proceedings represent the diverse nature of the Bitterroot Ecosystem Management Research Project (BEMRP). Separated into six sections, the papers cover the different themes researched by BEMRP collaborators as well as brief overviews of five other ecosystem management projects. The...

Author(s): Helen Y. Smith

Year Published: 2000

Type: Document

Conference Proceedings

Fire-climate interactions in the Selway-Bitterroot Wilderness area

www.nrfirescience.org/resource/11887

Tree-ring reconstructed summer drought was examined in relation to the occurrence of 15 fires in the Selway-Bitterroot Wilderness Area (SBW). The ten largest fire years between 1880 and 1995 were selected from historical fire atlas data; five additional fire years were selected from a fire history completed in a subalpine forest...

Author(s): Kurt F. Kipfmüller, Thomas W. Swetnam

Year Published: 2000

Type: Document

Conference Proceedings

Fire and invasive species within the temperate and boreal coniferous forests of western North America

www.nrfirescience.org/resource/10966

Invasive, nonnative plant species have been a concern of land managers within the temperate and boreal coniferous forest eco-region for nearly a century. Fire management, timber harvest, grazing, mining, recreation, and agriculture have not only exacerbated invasive species establishment and spread, but have been impacted by such...

Author(s): Richy J. Harrod, Sarah Reichard

Year Published: 2000

Type: Document

Conference Proceedings, Synthesis

Symphoricarpos albus (common snowberry)

www.nrfirescience.org/resource/10783

This FEIS species review synthesizes information on the relationship of *Symphoricarpos albus* (common snowberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Jack McWilliams

Year Published: 2000

Type: Document

Synthesis

Ecosystem-based management in the lodgepole pine zone

www.nrfirescience.org/resource/10963

The significant geographic extent of lodgepole pine (*Pinus contorta*) in the interior West and the large proportion within the mixed-severity fire regime has led to efforts for more ecologically based management of lodgepole pine. New research and demonstration activities are presented that may provide knowledge and techniques to...

Author(s): Colin C. Hardy, Robert E. Keane, Catherine A. Stewart

Year Published: 2000

Type: Document
Conference Proceedings

Vaccinium membranaceum (big huckleberry)

www.nrfirescience.org/resource/10828

This FEIS species review synthesizes information on the relationship of *Vaccinium membranaceum* (big huckleberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

Abies grandis (grand fir)

www.nrfirescience.org/resource/10739

This FEIS species review synthesizes information on the relationship of *Abies grandis* (grand fir) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): Janet L. Howard, Keith Aleksoff

Year Published: 2000

Type: Document

Synthesis

Achnatherum lettermanii (Letterman's needlegrass)

www.nrfirescience.org/resource/10866

This FEIS species review synthesizes information on the relationship of *Achnatherum lettermanii* (Letterman's needlegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Jane E. Taylor

Year Published: 2000

Type: Document

Synthesis

Festuca idahoensis (Idaho fescue)

www.nrfirescience.org/resource/10937

This FEIS species review synthesizes information on the relationship of *Festuca idahoensis* (Idaho fescue) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Kristin L. Zouhar

Year Published: 2000

Type: Document

Synthesis

Ecosystem-based management in the whitebark pine zone

www.nrfirescience.org/resource/11892

Declining whitebark pine (*Pinus albicaulis*) forests have necessitated development of innovative

methods to restore these ecologically valuable, high elevation ecosystems. We have begun an extensive restoration study using prescribed fire and silvicultural cuttings to return native ecological processes to degenerating whitebark pine...

Author(s): Robert E. Keane, Stephen F. Arno, Catherine A. Stewart

Year Published: 2000

Type: Document

Conference Proceedings

Twentieth-century fire patterns in the Selway-Bitterroot Wilderness Area, Idaho/ Montana, and the Gila/Aldo Leopold Wilderness Complex, New Mexico

www.nrfirescience.org/resource/11001

Twentieth century fire patterns were analyzed for two large, disparate wilderness areas in the Rocky Mountains. Spatial and temporal patterns of fires were represented as GIS-based digital fire atlases compiled from archival Forest Service data. We find that spatial and temporal fire patterns are related to landscape features and...

Author(s): Matthew G. Rollins, Thomas W. Swetnam, Penelope Morgan

Year Published: 2000

Type: Document

Conference Proceedings

Fire, competition, and forest pests: landscape treatment to sustain ecosystem function

www.nrfirescience.org/resource/10988

Fire, competition for light and water, and native forest pests have interacted for millennia in western forests to produce a countryside dominated by seral species of conifers. These conifer-dominated ecosystems exist in six kinds of biotic communities. We divided one of these communities, the Rocky Mountain Montane Conifer Forest,...

Author(s): GERAL I. McDONALD, ALAN E. HARVEY, JONALEA R. TONN

Year Published: 2000

Type: Document

Conference Proceedings

Danthonia intermedia (timber oatgrass)

www.nrfirescience.org/resource/10882

This FEIS species review synthesizes information on the relationship of *Danthonia intermedia* (timber oatgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): D. A. TIRMINSTEIN

Year Published: 1999

Type: Document

Synthesis

Flumes, historic water yield and climatological data for Tenderfoot Creek Experimental Forest, Montana

www.nrfirescience.org/resource/11275

The objectives of this Research Joint Venture Agreement were to install and calibrate three flumes on the Tenderfoot Creek Experimental Forest (TCEF) in central Montana; check calibration of the existing seven flumes on TCEF; estimate the influence of fire on water yields over the 400-year fire history period; and estimate back...

Author(s): PHILLIP E. FARNES, WARD W. MCCOUGHEY, KATHERINE J. HANSEN

Year Published: 1999

Type: Document
Technical Report or White Paper

Achillea millefolium (western yarrow)

www.nrfirescience.org/resource/10591

This FEIS species review synthesizes information on the relationship of *Achillea millefolium* (western yarrow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Keith Aleksoff

Year Published: 1999

Type: Document

Synthesis

Pseudoroegneria spicata (bluebunch wheatgrass)

www.nrfirescience.org/resource/10585

This FEIS species review synthesizes information on the relationship of *Pseudoroegneria spicata* (bluebunch wheatgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Pascopyrum smithii (western wheatgrass)

www.nrfirescience.org/resource/10877

This FEIS species review synthesizes information on the relationship of *Pascopyrum smithii* (western wheatgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): D. A. Tirmenstein

Year Published: 1999

Type: Document

Synthesis

Symphoricarpos oreophilus (mountain snowberry)

www.nrfirescience.org/resource/10590

This FEIS species review synthesizes information on the relationship of *Symphoricarpos oreophilus* (mountain snowberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Keith Aleksoff

Year Published: 1999

Type: Document

Synthesis

Assessing simulated ecosystem processes for climate variability research at Glacier National Park, USA

www.nrfirescience.org/resource/8378

Glacier National Park served as a test site for ecosystem analyses that involved a suite of integrated models embedded within a geographic information system. The goal of the exercise was to provide managers with maps that could illustrate probable shifts in vegetation, net primary production (NPP), and hydrologic responses...

Author(s): Joseph D. White, Steven W. Running, Peter Thornton, Robert E. Keane, Kevin C. Ryan, Daniel B. Fagre, Carl H. Key

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

Environmental assessment: Tenderfoot Creek Experimental Forest - Vegetative treatment research project, Kings Hill Ranger District, Lewis and Clark National Forest, Meagher County, Montana

www.nrfirescience.org/resource/11513

Environmental assessment of the Tenderfoot Research Project. This research project proposes to harvest timber in two treatment subwatersheds, Spring Park Creek and Sun Creek. The silvicultural system proposed is a two-aged system termed 'shelterwood with reserves,' that uses even distribution of single or small groups and uneven...

Author(s): Gloria E. Flora, Ward W. McCaughey

Year Published: 1998

Type: Document

Management or Planning Document

Modeling effects of prescribed fire on wildlife habitat: stand structure, snag recruitment and coarse woody debris

www.nrfirescience.org/resource/11027

Tenderfoot Creek Experimental Forest is used as a case study to model the effects of prescribed fire and silvicultural treatments on stand structure, snag recruitment, and coarse woody debris. The Forest Vegetation Simulator (FVS) and the Fire and Fuels Extension simulate the effects of the following treatment prescriptions:...

Author(s): Colin C. Hardy, Elizabeth D. Reinhardt

Year Published: 1998

Type: Document

Conference Proceedings

Mycorrhization, physiognomy, and first-year survivability of conifer seedlings following natural fire in Grand Teton National Park

www.nrfirescience.org/resource/11448

Ectomycorrhiza formation, survivability, and physiognomic characteristics were assessed for conifer seedlings encountered 1 and 2 years postfire in the Huck burn site near Grand Teton National Park. *Pinus contorta* Dougl. ex Loud. germinated and was abundant throughout the first growing season. *Abies lasiocarpa* (Hook.) Nutt. ...

Author(s): Steven L. Miller, Therese M. McClean, Nancy L. Stanton, Stephen E. Williams

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

Development of input data layers for the FARSITE fire growth model for the Selway-Bitterroot Wilderness Complex, USA

www.nrfirescience.org/resource/11240

Fuel and vegetation spatial data layers required by the spatially explicit fire growth model FARSITE

were developed for all lands in and around the Selway-Bitterroot Wilderness Area in Idaho and Montana. Satellite imagery and terrain modeling were used to create the three base vegetation spatial data layers of potential vegetation,...

Author(s): Robert E. Keane, Janice L. Garner, Kirsten M. Schmidt, Donald G. Long, James P. Menakis, Mark A. Finney

Year Published: 1998

Type: Document

Technical Report or White Paper

Fire history of an isolated subalpine mountain range of the intermountain region, United States

www.nrfirescience.org/resource/11438

Fire has historically been an important ecological component of forests in the Intermountain Region of the northwestern United States. This study is set in a small biogeographically disjunct mountain range. Our research objectives were to (1) investigate the historical frequency, severity, size, and spatial pattern of fire; (2)...

Author(s): Michael P. Murray, Stephen C. Bunting, Penelope Morgan

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

Patterns of lodgepole pine regeneration following the 1988 Yellowstone fires

www.nrfirescience.org/resource/8276

In 1988, fires killed extensive lodgepole pine (*Pinus contorta* Dougl. ex. Loud) in Yellowstone National Park. This species bears both serotinous and non-serotinous cones, with the former most common in fire-origin stands of an even-aged character. Reconnaissance of burned stands indicated that former even-aged communities...

Author(s): Ralph D. Nyland

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

Fire and insects in northern and boreal forest ecosystems of North America

www.nrfirescience.org/resource/7945

Fire and insects are natural disturbance agents in many forest ecosystems, often interacting to affect succession, nutrient cycling, and forest species composition. We review literature pertaining to effects of fire-insect interactions on ecological succession, use of prescribed fire for insect pest control, and effects of fire on...

Author(s): Deborah G. McCullough, Richard A. Werner, David Neumann

Year Published: 1998

Type: Document

Book or Chapter or Journal Article, Synthesis

Mapping historic fire regimes for the western United States: integrating remote sensing and biophysical data

www.nrfirescience.org/resource/7937

We have developed a spatial database of historic natural fire regimes for the eleven western States to provide information in support of expected national increases in prescribed burning. Fire regimes are described in terms both of frequency and severity, and we have classified five distinct fire regimes:

Author(s): Colin C. Hardy, James P. Menakis, Donald G. Long, James K. Brown, David L. Bunnell

Year Published: 1998

Type: Document

Appendix A - Biological assessment, TCEF research project for Lewis and Clark National Forest

www.nrfirescience.org/resource/11505

An environmental analysis has been prepared which describes and evaluates the management alternatives for the timber harvest and burning within the Tenderfoot Creek Experimental Forest (TCEF) project area. The project area lies within the headwaters of the Tenderfoot drainage of the Lewis and Clark National Forest. The purpose of...

Author(s): Donald Godtel

Year Published: 1998

Type: Document

Management or Planning Document

Fire ecology of the forest habitat types of northern Idaho

www.nrfirescience.org/resource/11234

Provides information on fire ecology in forest habitat and community types occurring in northern Idaho. Identifies fire groups based on presettlement fire regimes and patterns of succession and stand development after fire. Describes forest fuels and suggests considerations for fire management.

Author(s): Jane Kapler Smith, William C. Fischer

Year Published: 1997

Type: Document

Synthesis, Technical Report or White Paper

Plant species richness and composition following the 1988 Yellowstone fires

www.nrfirescience.org/resource/8341

How do plant species richness and community composition vary during initial postfire succession in relation to fire severity and local environmental conditions? We recorded vascular plant species present within 10-m² plots at 589 permanent sampling points distributed throughout nine patches of crown fire from the 1988 Yellowstone...

Author(s): William H. Romme, Robert H. Gardner, Monica G. Turner, Daniel B. Tinker, Rebecca A. Reed

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Amelanchier alnifolia (Saskatoon serviceberry)

www.nrfirescience.org/resource/10730

This FEIS species review synthesizes information on the relationship of Amelanchier alnifolia (Saskatoon serviceberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet L. Howard

Year Published: 1997

Type: Document

Synthesis

Effects of fire size and pattern on early succession in Yellowstone National Park

www.nrfirescience.org/resource/8238

The Yellowstone fires of 1988 affected >250000 ha, creating a mosaic of burn severities across the landscape and providing an ideal opportunity to study effects of fire size and pattern on postfire

succession. We asked whether vegetation responses differed between small and large burned patches within the fire-created mosaic in...

Author(s): Monica G. Turner, William H. Romme, Robert H. Gardner, William W. Hargrove

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Poa fendleriana (Fendler bluegrass)

www.nrfirescience.org/resource/10708

This FEIS species review synthesizes information on the relationship of *Poa fendleriana* (Fendler bluegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet L. Howard

Year Published: 1997

Type: Document

Synthesis

Fire episodes in the Inland Northwest (1540-1940) based on fire history data

www.nrfirescience.org/resource/11233

Presents maps of major fire episodes in the inland northwestern United States between 1540 and 1940 based on a compilation of fire history studies. Estimates annual acreage historically burned in this region and compares that with recent fire years.

Author(s): Stephen W. Barrett, Stephen F. Arno, James P. Menakis

Year Published: 1997

Type: Document

Technical Report or White Paper

Methods for the quantification of coarse woody debris and an examination of its spatial patterning: a study from the Tenderfoot Creek Experimental Forest, MT.

www.nrfirescience.org/resource/13157

Methods for the quantification of coarse woody debris volume and the description of spatial patterning were studied in the Tenderfoot Creek Experimental Forest, Montana. The line transect method was found to be an accurate, unbiased estimator of down debris volume (>10cm diameter) on ½ hectare fixed area plots, when...

Author(s): Paul B. Alaback, Duncan C. Lutes

Year Published: 1997

Type: Document

Technical Report or White Paper

Managerial and institutional factors affect prescribed burning costs

www.nrfirescience.org/resource/7931

Prescribed burning costs are extremely variable, even if conditions are similar. This variability complicates planning and evaluation of prescribed burning programs and budgets, resulting in imprecise projections of their economic benefits. Evaluating the worth of prescribed burning efforts in objective terms is difficult, but the...

Author(s): Armando Gonzalez-Caban

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Ambystoma macrodactylum (long-toed salamander)

www.nrfirescience.org/resource/10732

This FEIS species review synthesizes information on the relationship of *Ambystoma macrodactylum* (long-toed salamander) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet L. Howard

Year Published: 1997

Type: Document

Synthesis

Wildfire and native fish: issues of forest health and conservation of sensitive species

www.nrfirescience.org/resource/8129

Issues related to forest health and the threat of larger, more destructive wildfires have led to major new initiatives to restructure and recompose forest communities in the western United States. Proposed solutions will depend, in part, on silvicultural treatments and prescribed burning. Large fires can produce dramatic changes in...

Author(s): Bruce E. Rieman, Jim Clayton

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Betula nana L. and Betula glandulosa Michx.

www.nrfirescience.org/resource/7918

Species descriptions for *Betula nana* and *Betula glandulosa*.

Author(s): William J. de Groot, P. A. Thomas, Ross W. Wein

Year Published: 1997

Type: Document

Book or Chapter or Journal Article, Synthesis

Poa cusickii (Cusick's bluegrass)

www.nrfirescience.org/resource/10706

This FEIS species review synthesizes information on the relationship of *Poa cusickii* (Cusick's bluegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet L. Howard

Year Published: 1997

Type: Document

Synthesis

FIRE-BGC - a mechanistic ecological process model for simulating fire succession on coniferous forest landscapes of the northern Rocky Mountains

www.nrfirescience.org/resource/11182

An ecological process model of vegetation dynamics mechanistically simulates long-term stand dynamics on coniferous landscapes of the Northern Rocky Mountains. This model is used to investigate and evaluate cumulative effects of various fire regimes, including prescribed burning and fire exclusion, on the vegetation and fuel complex...

Author(s): Robert E. Keane, Penelope Morgan, Steven W. Running

Year Published: 1996

Type: Document
Technical Report or White Paper

Urocyon cinereoargenteus (common gray fox)

www.nrfirescience.org/resource/10506

This FEIS species review synthesizes information on the relationship of *Urocyon cinereoargenteus* (common gray fox) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Janet Sullivan

Year Published: 1996

Type: Document

Synthesis

Simulation of crown fire effects on canopy seed bank in lodgepole pine

www.nrfirescience.org/resource/8215

Analysis of video footage taken of crown fires during the 1988 fire season in Yellowstone National Park indicated that the most frequent length of time required to completely burn tree crowns was 15-20 seconds. Lodge-pole pine (*Pinus contorta* Laws.) seeds were tested for ability to germinate after exposing both serotinous and...

Author(s): Don G. Despain, D. L. Clark, James J. Reardon

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Whitebark pine ecosystem restoration in western Montana

www.nrfirescience.org/resource/11251

Whitebark pine (*Pinus albicaulis*) is a major tree species of upper subalpine forests of the northern Rocky Mountains (Schmidt and McDonald 1990). It is an important nutritional and structural component of wildlife habitat (Arno and Hoff 1990; Schmidt and McDonald 1990). Its large, nutlike seeds are a major food source for many birds...

Author(s): Robert E. Keane, Stephen F. Arno

Year Published: 1996

Type: Document

Technical Report or White Paper

Mustela vison (American mink)

www.nrfirescience.org/resource/10513

This FEIS species review synthesizes information on the relationship of *Mustela vison* (American mink) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Janet Sullivan

Year Published: 1996

Type: Document

Synthesis

The use of fire in forest restoration

www.nrfirescience.org/resource/11235

The 26 papers in this document address the current knowledge of fire as a disturbance agent, fire

history and fire regimes, applications of prescribed fire for ecological restoration, and the effects of fire on the various forested ecosystems of the north-western United States. The main body of this document is organized in three...

Author(s): Colin C. Hardy, Stephen F. Arno

Year Published: 1996

Type: Document

Technical Report or White Paper

Consequences of fire on aquatic nitrate and phosphate dynamics in Yellowstone National Park

www.nrfirescience.org/resource/11990

Airborne remotely sensed data were collected and analyzed during and following the 1988 Greater Yellowstone Ecosystem (GYE) fires in order to characterize the fire front movements, burn intensities and various vegetative components of selected watersheds. Remotely sensed data were used to categorize the burn intensities as: severely...

Author(s): James A. Brass, Vincent G. Ambrosia, Philip J. Riggan, Paul D. Sebesta

Year Published: 1996

Type: Document

Conference Proceedings

Examples of fire restoration in Glacier National Park

www.nrfirescience.org/resource/11252

Covering just over 1 million acres, Glacier National Park straddles the Continental Divide in northwestern Montana. Diverse vegetation communities include moist western cedar- western hemlock (Thuja plicata - Tsuga heterophylla) old growth forests similar to those of the Pacific Coast, dry western grasslands and prairies, dense...

Author(s): Laurie L. Kurth

Year Published: 1996

Type: Document

Technical Report or White Paper

Populus tremuloides (quaking aspen)

www.nrfirescience.org/resource/10717

This FEIS species review synthesizes information on the relationship of Populus tremuloides (quaking aspen) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Coarse-scale restoration planning and design in Interior Columbia River Basin ecosystems: an example for restoring declining whitebark pine forests

www.nrfirescience.org/resource/11243

During the last 2 years, many people from numerous government agencies and private institutions compiled a scientific assessment of the natural and human resources of the Interior Columbia River Basin (Jensen and Bourgeron 1993). This assessment is meant to guide the development of a coarse-scale Environmental Impact Statement for...

Author(s): Robert E. Keane, James P. Menakis, Wendel J. Hann

Year Published: 1996

Type: Document

Sialia currucoides (mountain bluebird)

www.nrfirescience.org/resource/10510

This FEIS species review synthesizes information on the relationship of *Sialia currucoides* (mountain bluebird) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Muhlenbergia montana (mountain muhly)

www.nrfirescience.org/resource/10919

This FEIS species review synthesizes information on the relationship of *Muhlenbergia montana* (mountain muhly) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Roberta A. Walsh

Year Published: 1995

Type: Document

Synthesis

Lynx rufus (bobcat)

www.nrfirescience.org/resource/10526

This FEIS species review synthesizes information on the relationship of *Lynx rufus* (bobcat) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for fire...

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Prunus emarginata (bitter cherry)

www.nrfirescience.org/resource/10635

This FEIS species review synthesizes information on the relationship of *Prunus emarginata* (bitter cherry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Lora L. Esser

Year Published: 1995

Type: Document

Synthesis

Deschampsia cespitosa (tufted hairgrass)

www.nrfirescience.org/resource/10913

This FEIS species review synthesizes information on the relationship of *Deschampsia cespitosa* (tufted hairgrass) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Roberta A. Walsh

Year Published: 1995

Type: Document

Synthesis

Buteo lagopus (rough-legged hawk)

www.nrfirescience.org/resource/10517

This FEIS species review synthesizes information on the relationship of Buteo lagopus (rough-legged hawk) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Ribes lacustre (bristly black currant)

www.nrfirescience.org/resource/10752

This FEIS species review synthesizes information on the relationship of Ribes lacustre (bristly black currant) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Anna Marshall

Year Published: 1995

Type: Document

Synthesis

Procyon lotor (northern raccoon)

www.nrfirescience.org/resource/10533

This FEIS species review synthesizes information on the relationship of Procyon lotor (northern raccoon) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Poecile atricapillus (black-capped chickadee)

www.nrfirescience.org/resource/10511

This FEIS species review synthesizes information on the relationship of Poecile atricapillus (black-capped chickadee) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Ribes aureum (golden currant)

www.nrfirescience.org/resource/10749

This FEIS species review synthesizes information on the relationship of *Ribes aureum* (golden currant) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Anna Marshall

Year Published: 1995

Type: Document

Synthesis

Tamiasciurus hudsonicus (red squirrel)

www.nrfirescience.org/resource/10509

This FEIS species review synthesizes information on the relationship of *Tamiasciurus hudsonicus* (red squirrel) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Sialia mexicana (western bluebird)

www.nrfirescience.org/resource/10505

This FEIS species review synthesizes information on the relationship of *Sialia mexicana* (western bluebird) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

A 750-year fire history based on lake sediment records in central Yellowstone National Park

www.nrfirescience.org/resource/13532

A 750-year fire history was reconstructed for the Central Plateau of Yellowstone National Park from the deep-water sediments of five lakes. The charcoal record from a large lake provided a chronology of regional fires. Data from four small lakes were used to study local and extralocal fires. The co-occurrence of abundant charcoal...

Author(s): Sarah H. Millspaugh, Cathy L. Whitlock

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Dichanthelium acuminatum (woolly panicum)

www.nrfirescience.org/resource/10914

This FEIS species review synthesizes information on the relationship of *Dichanthelium acuminatum* (woolly panicum) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Roberta A. Walsh
Year Published: 1995
Type: Document
Synthesis

Canis latrans (coyote)

www.nrfirescience.org/resource/10548

This FEIS species review synthesizes information on the relationship of *Canis latrans* (coyote) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for fire...

Author(s): Julie L. Tesky
Year Published: 1995
Type: Document
Synthesis

Heracleum lanatum (cow parsnip)

www.nrfirescience.org/resource/10630

This FEIS species review synthesizes information on the relationship of *Heracleum lanatum* (cow parsnip) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Lora L. Esser
Year Published: 1995
Type: Document
Synthesis

Molothrus ater (brown-headed cowbird)

www.nrfirescience.org/resource/10444

This FEIS species review synthesizes information on the relationship of *Molothrus ater* (brown-headed cowbird) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Janet Sullivan
Year Published: 1995
Type: Document
Synthesis

Bubo virginianus (great horned owl)

www.nrfirescience.org/resource/10518

This FEIS species review synthesizes information on the relationship of *Bubo virginianus* (great horned owl) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan
Year Published: 1995
Type: Document
Synthesis

Lepus americanus (snowshoe hare)

www.nrfirescience.org/resource/10515

This FEIS species review synthesizes information on the relationship of *Lepus americanus* (snowshoe hare) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Ribes cereum (wax currant)

www.nrfirescience.org/resource/10753

This FEIS species review synthesizes information on the relationship of *Ribes cereum* (wax currant) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): Anna Marshall

Year Published: 1995

Type: Document

Synthesis

Puma concolor (mountain lion)

www.nrfirescience.org/resource/10534

This FEIS species review synthesizes information on the relationship of *Puma concolor* (mountain lion) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Peromyscus maniculatus (deer mouse)

www.nrfirescience.org/resource/10512

This FEIS species review synthesizes information on the relationship of *Peromyscus maniculatus* (deer mouse) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Festuca rubra (red fescue)

www.nrfirescience.org/resource/10923

This FEIS species review synthesizes information on the relationship of *Festuca rubra* (red fescue) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): Roberta A. Walsh

Year Published: 1995

Type: Document
Synthesis

Ribes montigenum (gooseberry currant)

www.nrfirescience.org/resource/10751

This FEIS species review synthesizes information on the relationship of *Ribes montigenum* (gooseberry currant) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Anna Marshall
Year Published: 1995
Type: Document
Synthesis

Agrostis exarata (spike bentgrass)

www.nrfirescience.org/resource/10641

This FEIS species review synthesizes information on the relationship of *Agrostis exarata* (spike bentgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Lora L. Esser
Year Published: 1994
Type: Document
Synthesis

Solidago missouriensis (prairie goldenrod)

www.nrfirescience.org/resource/10917

This FEIS species review synthesizes information on the relationship of *Solidago missouriensis* (prairie goldenrod) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Roberta A. Walsh
Year Published: 1994
Type: Document
Synthesis

Comparing the prescribed natural fire program with presettlement fires in the Selway-Bitterroot Wilderness

www.nrfirescience.org/resource/8217

The severity and extent of recent fires (1979-1990) were compared with that of presettlement fires (pre-1935) by eight major forest types in the Selway-Bitterroot Wilderness (SBW) in Idaho and Montana. Presettlement fire intervals were determined for estimating area burned. Presettlement annual area burned for the entire SBW was 4,...

Author(s): James K. Brown, Stephen F. Arno, Stephen W. Barrett, James P. Menakis
Year Published: 1994
Type: Document
Book or Chapter or Journal Article

Bromus pumpellianus (Pumpelly brome)

www.nrfirescience.org/resource/10915

This FEIS species review synthesizes information on the relationship of *Bromus pumpellianus* (Pumpelly brome) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

***Buteo jamaicensis* (red-tailed hawk)**

www.nrfirescience.org/resource/10551

This FEIS species review synthesizes information on the relationship of *Buteo jamaicensis* (red-tailed hawk) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

***Chimaphila menziesii* (little prince's-pine)**

www.nrfirescience.org/resource/10780

This FEIS species review synthesizes information on the relationship of *Chimaphila menziesii* (little prince's-pine) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Robin F. Matthews

Year Published: 1994

Type: Document

Synthesis

***Falco sparverius* (American kestrel)**

www.nrfirescience.org/resource/10542

This FEIS species review synthesizes information on the relationship of *Falco sparverius* (American kestrel) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

***Accipiter striatus* (sharp-shinned hawk)**

www.nrfirescience.org/resource/10519

This FEIS species review synthesizes information on the relationship of *Accipiter striatus* (sharp-shinned hawk) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Janet Sullivan

Year Published: 1994

Type: Document

Synthesis

Carex concinna (low northern sedge)

www.nrfirescience.org/resource/10925

This FEIS species review synthesizes information on the relationship of *Carex concinna* (low northern sedge) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

Chimaphila umbellata (prince's-pine)

www.nrfirescience.org/resource/10772

This FEIS species review synthesizes information on the relationship of *Chimaphila umbellata* (prince's-pine) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1994

Type: Document

Synthesis

Hierochloe odorata (sweet grass)

www.nrfirescience.org/resource/10921

This FEIS species review synthesizes information on the relationship of *Hierochloe odorata* (sweet grass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

Rudbeckia hirta (black-eyed Susan)

www.nrfirescience.org/resource/10918

This FEIS species review synthesizes information on the relationship of *Rudbeckia hirta* (black-eyed Susan) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

Bromus ciliatus (fringed brome)

www.nrfirescience.org/resource/10640

This FEIS species review synthesizes information on the relationship of *Bromus ciliatus* (fringed brome) to fire--how fire affects the species and its habitat, and fire management considerations. Information is

also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Lora L. Esser

Year Published: 1994

Type: Document

Synthesis

Bromus vulgaris (Columbia brome)

www.nrfirescience.org/resource/10916

This FEIS species review synthesizes information on the relationship of Bromus vulgaris (Columbia brome) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

Comparisons of particulate-emissions and smoke impacts from presettlement, full suppression, and prescribed natural fire period in the Selway-Bitterroot Wilderness

www.nrfirescience.org/resource/8216

Total particulate matter (PM) emissions were estimated for recent fires (1979-1990) and the presettlement period (prior to 1935) in the Selway-Bitterroot Wilderness (SBW) in Idaho and Montana. Recent period emissions were calculated by 10-day periods for surface fire and crown fire based on estimates of percentage fuel consumption...

Author(s): James K. Brown, Larry S. Bradshaw

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

Aquila chrysaetos (golden eagle)

www.nrfirescience.org/resource/10554

This FEIS species review synthesizes information on the relationship of Aquila chrysaetos (golden eagle) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Geranium richardsonii (Richardson's geranium)

www.nrfirescience.org/resource/10636

This FEIS species review synthesizes information on the relationship of Geranium richardsonii (Richardson's geranium) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Lora L. Esser

Year Published: 1994

Type: Document

Synthesis

Fire regimes on andesitic mountain terrain in northeastern Yellowstone National Park, Wyoming

www.nrfirescience.org/resource/8196

A fire history investigation was conducted for three forest community types in the Absaroka Mountains of Yellowstone National Park, Wyoming. Master fire chronologies were based on fire-initiated age classes and tree fire scars. The area's major forest type, lodgepole pine (*Pinus contorta* Dougl. var. *latifolia*) ecosystems, revealed a...

Author(s): Stephen W. Barrett

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

Deschampsia elongata (slender hairgrass)

www.nrfirescience.org/resource/10645

This FEIS species review synthesizes information on the relationship of *Deschampsia elongata* (slender hairgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Lora L. Esser

Year Published: 1994

Type: Document

Synthesis

Tympanuchus phasianellus (sharp-tailed grouse)

www.nrfirescience.org/resource/10532

This FEIS species review synthesizes information on the relationship of *Tympanuchus phasianellus* (sharp-tailed grouse) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Haliaeetus leucocephalus (bald eagle)

www.nrfirescience.org/resource/10843

This FEIS species review synthesizes information on the relationship of *Haliaeetus leucocephalus* (bald eagle) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Vicia americana (American vetch)

www.nrfirescience.org/resource/10616

This FEIS species review synthesizes information on the relationship of *Vicia americana* (American vetch) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general

management. This species review can be...

Author(s): Milo Coladonato

Year Published: 1993

Type: Document

Synthesis

Blechnum spicant (deer fern)

www.nrfirescience.org/resource/10767

This FEIS species review synthesizes information on the relationship of *Blechnum spicant* (deer fern) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Taraxacum officinale (common dandelion)

www.nrfirescience.org/resource/10448

This FEIS species review synthesizes information on the relationship of *Taraxacum officinale* (common dandelion) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Lora L. Esser

Year Published: 1993

Type: Document

Synthesis

Lonicera utahensis (Utah honeysuckle)

www.nrfirescience.org/resource/10806

This FEIS species review synthesizes information on the relationship of *Lonicera utahensis* (Utah honeysuckle) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Diane S. Pavek

Year Published: 1993

Type: Document

Synthesis

Claytonia perfoliata (miner's-lettuce)

www.nrfirescience.org/resource/10763

This FEIS species review synthesizes information on the relationship of *Claytonia perfoliata* (miner's-lettuce) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Poa pratensis (Kentucky bluegrass)

www.nrfirescience.org/resource/10446

This FEIS species review synthesizes information on the relationship of *Poa pratensis* (Kentucky bluegrass) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management...

Author(s): Ronald Uchytel

Year Published: 1993

Type: Document

Synthesis

Fire history of Tenderfoot Creek Experimental Forest Lewis and Clark National Forest

www.nrfirescience.org/resource/13158

The landscape and stand-level fire history of lodgepole pine dominated forest in Tenderfoot Creek Experimental Forest is assessed. Primary objective were to: 1) determine pre-1900 fire periodicities, severities, and burning patterns in the area's lodgepole pine dominated stands, and 2) document and map the forest age class mosaic,...

Author(s): Stephen W. Barrett

Year Published: 1993

Type: Document

Technical Report or White Paper

Dracocephalum parviflorum (American dragonhead)

www.nrfirescience.org/resource/10761

This FEIS species review synthesizes information on the relationship of *Dracocephalum parviflorum* (American dragonhead) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Cygnus columbianus (tundra swan)

www.nrfirescience.org/resource/10544

This FEIS species review synthesizes information on the relationship of *Cygnus columbianus* (tundra swan) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Linnaea borealis (twinline)

www.nrfirescience.org/resource/10737

This FEIS species review synthesizes information on the relationship of *Linnaea borealis* (twinline) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Janet L. Howard

Year Published: 1993

Type: Document

Synthesis

Delphinium bicolor (low larkspur)

www.nrfirescience.org/resource/10778

This FEIS species review synthesizes information on the relationship of *Delphinium bicolor* (low larkspur) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Lycopodium annotinum (stiff clubmoss)

www.nrfirescience.org/resource/10759

This FEIS species review synthesizes information on the relationship of *Lycopodium annotinum* (stiff clubmoss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Postglacial vegetation and climate of Grand Teton and southern Yellowstone National Parks

www.nrfirescience.org/resource/13516

Pollen records from northern Grand Teton National Park, the Pinyon Peak Highlands, and southern Yellowstone National Park were examined to study the pattern of reforestation and climatic change following late--Pinedale Glaciation. The vegetational reconstruction was aided by analyses of associated plant macrofossils and the modern...

Author(s): Cathy L. Whitlock

Year Published: 1993

Type: Document

Book or Chapter or Journal Article

Equisetum arvense (field horsetail)

www.nrfirescience.org/resource/10858

This FEIS species review synthesizes information on the relationship of *Equisetum arvense* (field horsetail) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Janet Sullivan

Year Published: 1993

Type: Document

Synthesis

Equisetum sylvaticum (wood horsetail)

www.nrfirescience.org/resource/10776

This FEIS species review synthesizes information on the relationship of *Equisetum sylvaticum* (wood horsetail) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Marchantia polymorpha (liverwort)

www.nrfirescience.org/resource/10757

This FEIS species review synthesizes information on the relationship of *Marchantia polymorpha* (liverwort) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Lutra canadensis (northern river otter)

www.nrfirescience.org/resource/10538

This FEIS species review synthesizes information on the relationship of *Lutra canadensis* (northern river otter) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Lupinus sericeus (silky lupine)

www.nrfirescience.org/resource/10774

This FEIS species review synthesizes information on the relationship of *Lupinus sericeus* (silky lupine) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Ovis canadensis (bighorn sheep)

www.nrfirescience.org/resource/10536

This FEIS species review synthesizes information on the relationship of *Ovis canadensis* (bighorn sheep) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Salix brachycarpa (barren-ground willow)

www.nrfirescience.org/resource/10619

This FEIS species review synthesizes information on the relationship of *Salix brachycarpa* (barren-ground willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Milo Coladonato

Year Published: 1993

Type: Document

Synthesis

Rosa nutkana (Nootka rose)

www.nrfirescience.org/resource/10813

This FEIS species review synthesizes information on the relationship of *Rosa nutkana* (Nootka rose) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): William R. Reed

Year Published: 1993

Type: Document

Synthesis

Antennaria racemosa (raceme pussytoes)

www.nrfirescience.org/resource/10770

This FEIS species review synthesizes information on the relationship of *Antennaria racemosa* (raceme pussytoes) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Oxytropis sericea (whitepoint locoweed)

www.nrfirescience.org/resource/10643

This FEIS species review synthesizes information on the relationship of *Oxytropis sericea* (whitepoint locoweed) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Lora L. Esser

Year Published: 1993

Type: Document

Synthesis

Trifolium repens (white clover)

www.nrfirescience.org/resource/10617

This FEIS species review synthesizes information on the relationship of *Trifolium repens* (white clover) to fire--how fire affects the species and its habitat, and fire management considerations. Information is

also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Milo Coladonato

Year Published: 1993

Type: Document

Synthesis

Arnica cordifolia (heartleaf arnica)

www.nrfirescience.org/resource/10811

This FEIS species review synthesizes information on the relationship of *Arnica cordifolia* (heartleaf arnica) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): William R. Reed

Year Published: 1993

Type: Document

Synthesis

Gymnocarpium dryopteris (oak fern)

www.nrfirescience.org/resource/10842

This FEIS species review synthesizes information on the relationship of *Gymnocarpium dryopteris* (oak fern) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Antennaria microphylla (rosy pussytoes)

www.nrfirescience.org/resource/10768

This FEIS species review synthesizes information on the relationship of *Antennaria microphylla* (rosy pussytoes) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Phleum pratense (timothy)

www.nrfirescience.org/resource/10449

This FEIS species review synthesizes information on the relationship of *Phleum pratense* (timothy) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This...

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This...

Author(s): Lora L. Esser

Year Published: 1993

Type: Document

Synthesis

Aralia nudicaulis (wild sarsaparilla)

www.nrfirescience.org/resource/10808

This FEIS species review synthesizes information on the relationship of *Aralia nudicaulis* (wild sarsaparilla) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Diane S. Pavek

Year Published: 1993

Type: Document

Synthesis

Poa compressa (Canada bluegrass)

www.nrfirescience.org/resource/10578

This FEIS species review synthesizes information on the relationship of *Poa compressa* (Canada bluegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Ronald Uchytel

Year Published: 1993

Type: Document

Synthesis

Sorbus sitchensis (Sitka mountain-ash)

www.nrfirescience.org/resource/10781

This FEIS species review synthesizes information on the relationship of *Sorbus sitchensis* (Sitka mountain-ash) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Corydalis aurea (golden corydalis)

www.nrfirescience.org/resource/10762

This FEIS species review synthesizes information on the relationship of *Corydalis aurea* (golden corydalis) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Cetraria islandica (Iceland moss)

www.nrfirescience.org/resource/10779

This FEIS species review synthesizes information on the relationship of *Cetraria islandica* (Iceland moss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews
Year Published: 1993
Type: Document
Synthesis

Iliamna rivularis (wild hollyhock)

www.nrfirescience.org/resource/10760

This FEIS species review synthesizes information on the relationship of *Iliamna rivularis* (wild hollyhock) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews
Year Published: 1993
Type: Document
Synthesis

Cygnus buccinator (trumpeter swan)

www.nrfirescience.org/resource/10543

This FEIS species review synthesizes information on the relationship of *Cygnus buccinator* (trumpeter swan) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky
Year Published: 1993
Type: Document
Synthesis

Delphinium occidentale (duncecap larkspur)

www.nrfirescience.org/resource/10777

This FEIS species review synthesizes information on the relationship of *Delphinium occidentale* (duncecap larkspur) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Robin F. Matthews
Year Published: 1993
Type: Document
Synthesis

Rapid decline of whitebark pine in western Montana: evidence from 20-year re-measurements

www.nrfirescience.org/resource/12916

Whitebark pine (*Pinus albicaulis*), an important producer of food for wildlife, is decreasing in abundance in western Montana due to attacks by the white pine blister rust fungus (*Cronartium ribicola*), epidemics of mountain pine beetle (*Dendroctonus ponderosae*) and successional replacement mainly by subalpine fir (*Abies lasiocarpa*)....

Author(s): Robert E. Keane, Stephen F. Arno
Year Published: 1993
Type: Document
Book or Chapter or Journal Article

Camassia quamash (common camas)

www.nrfirescience.org/resource/10724

This FEIS species review synthesizes information on the relationship of *Camassia quamash* (common camas) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Janet L. Howard

Year Published: 1993

Type: Document

Synthesis

Lupinus caudatus (tailcup lupine)

www.nrfirescience.org/resource/10775

This FEIS species review synthesizes information on the relationship of *Lupinus caudatus* (tailcup lupine) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Tortula ruralis (twisted moss)

www.nrfirescience.org/resource/10756

This FEIS species review synthesizes information on the relationship of *Tortula ruralis* (twisted moss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Pandion haliaetus (osprey)

www.nrfirescience.org/resource/10537

This FEIS species review synthesizes information on the relationship of *Pandion haliaetus* (osprey) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Peltigera aphthosa (green dog lichen)

www.nrfirescience.org/resource/10773

This FEIS species review synthesizes information on the relationship of *Peltigera aphthosa* (green dog lichen) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document
Synthesis

Rosa gymnocarpa (baldhip rose)

www.nrfirescience.org/resource/10814

This FEIS species review synthesizes information on the relationship of Rosa gymnocarpa (baldhip rose) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): William R. Reed

Year Published: 1993

Type: Document

Synthesis

Aix sponsa (wood duck)

www.nrfirescience.org/resource/10849

This FEIS species review synthesizes information on the relationship of Aix sponsa (wood duck) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for fire...

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Wyethia amplexicaulis (mules-ears)

www.nrfirescience.org/resource/10771

This FEIS species review synthesizes information on the relationship of Wyethia amplexicaulis (mules-ears) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

Solidago canadensis (Canada goldenrod)

www.nrfirescience.org/resource/10618

This FEIS species review synthesizes information on the relationship of Solidago canadensis (Canada goldenrod) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Milo Coladonato

Year Published: 1993

Type: Document

Synthesis

Eurybia conspicua (showy aster)

www.nrfirescience.org/resource/10812

This FEIS species review synthesizes information on the relationship of Eurybia conspicua (showy

aster) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): William R. Reed

Year Published: 1993

Type: Document

Synthesis

Agrostis scabra (ticklegrass)

www.nrfirescience.org/resource/10769

This FEIS species review synthesizes information on the relationship of *Agrostis scabra* (ticklegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Robin F. Matthews

Year Published: 1992

Type: Document

Synthesis

Calamagrostis canadensis (bluejoint reedgrass)

www.nrfirescience.org/resource/10558

This FEIS species review synthesizes information on the relationship of *Calamagrostis canadensis* (bluejoint reedgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Ceratodon purpureus (fire moss)

www.nrfirescience.org/resource/10529

This FEIS species review synthesizes information on the relationship of *Ceratodon purpureus* (fire moss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Chamerion angustifolium (fireweed)

www.nrfirescience.org/resource/10809

This FEIS species review synthesizes information on the relationship of *Chamerion angustifolium* (fireweed) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Diane S. Pavek

Year Published: 1992

Type: Document

Synthesis

Salix boothii (Booth willow)

www.nrfirescience.org/resource/10637

This FEIS species review synthesizes information on the relationship of *Salix boothii* (Booth willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Lora L. Esser

Year Published: 1992

Type: Document

Synthesis

When it's hot, it's hot... or maybe it's not! (Surface flaming may not portend extensive soil heating)

www.nrfirescience.org/resource/7939

Fire effects on a plant community, soil, and air are not apparent when judged only by surface fire intensity. The fire severity or fire impact can be described by the temperatures reached within the forest floor and the duration of heating experienced in the vegetation, forest floor, and underlying mineral soil. Temporal...

Author(s): Roberta A. Hartford, William H. Frandsen

Year Published: 1992

Type: Document

Book or Chapter or Journal Article

Deterioration of fire-killed and fire-damaged timber in the Western United States

www.nrfirescience.org/resource/11159

Fire-killed and fire-damaged timber are an important source of fiber and are becoming more important because of a decrease in the land base available for timber harvest. Forest managers need to know the causes of deterioration and degrade, the expected losses in product volume and value, and the impact of time on deterioration. This...

Author(s): Eini C. Lowell, Susan A. Willits, Robert L. Krahmer

Year Published: 1992

Type: Document

Technical Report or White Paper

Medicago sativa (alfalfa)

www.nrfirescience.org/resource/10475

This FEIS species review synthesizes information on the relationship of *Medicago sativa* (alfalfa) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This...

Author(s): Janet Sullivan

Year Published: 1992

Type: Document

Synthesis

Luzula hitchcockii (smooth woodrush)

www.nrfirescience.org/resource/10685

This FEIS species review synthesizes information on the relationship of *Luzula hitchcockii* (smooth woodrush) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): James R. Habeck

Year Published: 1992

Type: Document

Synthesis

Elymus trachycaulus (slender wheatgrass)

www.nrfirescience.org/resource/10722

This FEIS species review synthesizes information on the relationship of Elymus trachycaulus (slender wheatgrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Janet L. Howard

Year Published: 1992

Type: Document

Synthesis

Salix bebbiana (Bebb willow)

www.nrfirescience.org/resource/10563

This FEIS species review synthesizes information on the relationship of Salix bebbiana (Bebb willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Thuja plicata (western redcedar)

www.nrfirescience.org/resource/10561

This FEIS species review synthesizes information on the relationship of Thuja plicata (western redcedar) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Erodium cicutarium (cutleaf filaree)

www.nrfirescience.org/resource/10462

This FEIS species review synthesizes information on the relationship of Erodium cicutarium (cutleaf filaree) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Janet L. Howard

Year Published: 1992

Type: Document

Synthesis

Tsuga mertensiana (mountain hemlock)

www.nrfirescience.org/resource/10559

This FEIS species review synthesizes information on the relationship of *Tsuga mertensiana* (mountain hemlock) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Hylocomium splendens (splendid feather moss)

www.nrfirescience.org/resource/10530

This FEIS species review synthesizes information on the relationship of *Hylocomium splendens* (splendid feather moss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Salix glauca (grayleaf willow)

www.nrfirescience.org/resource/10581

This FEIS species review synthesizes information on the relationship of *Salix glauca* (grayleaf willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Ronald Uchytel

Year Published: 1992

Type: Document

Synthesis

Pleurozium schreberi (Schreber's moss)

www.nrfirescience.org/resource/10528

This FEIS species review synthesizes information on the relationship of *Pleurozium schreberi* (Schreber's moss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Carex bigelowii (Bigelow sedge)

www.nrfirescience.org/resource/10766

This FEIS species review synthesizes information on the relationship of *Carex bigelowii* (Bigelow sedge) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Robin F. Matthews
Year Published: 1992
Type: Document
Synthesis

Maianthemum stellatum (starry Solomon's-seal)

www.nrfirescience.org/resource/10686

This FEIS species review synthesizes information on the relationship of *Maianthemum stellatum* (starry Solomon's-seal) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): James R. Habeck
Year Published: 1992
Type: Document
Synthesis

Viburnum edule (highbush cranberry)

www.nrfirescience.org/resource/10758

This FEIS species review synthesizes information on the relationship of *Viburnum edule* (highbush cranberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Robin F. Matthews
Year Published: 1992
Type: Document
Synthesis

Hordeum jubatum (foxtail barley)

www.nrfirescience.org/resource/10539

This FEIS species review synthesizes information on the relationship of *Hordeum jubatum* (foxtail barley) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky
Year Published: 1992
Type: Document
Synthesis

Menziesia ferruginea (menziesia)

www.nrfirescience.org/resource/10684

This FEIS species review synthesizes information on the relationship of *Menziesia ferruginea* (menziesia) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): James R. Habeck
Year Published: 1992
Type: Document
Synthesis

Fire ecology of the forest habitat types of eastern Idaho and western Wyoming

www.nrfirescience.org/resource/12116

This report summarizes the available fire ecology and management information relating to the forest habitat types of eastern Idaho and western Wyoming, west of the crest of the Wind River Mountain.

Author(s): Anne F. Bradley, William C. Fischer, Nonan V. Noste

Year Published: 1992

Type: Document

Technical Report or White Paper

Calamagrostis purpurascens (purple pinegrass)

www.nrfirescience.org/resource/10562

This FEIS species review synthesizes information on the relationship of *Calamagrostis purpurascens* (purple pinegrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Tsuga heterophylla (western hemlock)

www.nrfirescience.org/resource/10560

This FEIS species review synthesizes information on the relationship of *Tsuga heterophylla* (western hemlock) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Julie L. Tesky

Year Published: 1992

Type: Document

Synthesis

Bark beetle-fire associations in the greater Yellowstone area

www.nrfirescience.org/resource/12033

The large forest fires in and around Yellowstone National Park in 1988 bring up many ecological questions, including the role of bark beetles. Bark beetles may contribute to fuel buildup over the years preceding a fire, resulting in stand replacement fires. Fire is important to the survival of seral tree species and bark beetles...

Author(s): Gene D. Amman

Year Published: 1991

Type: Document

Synthesis, Technical Report or White Paper

Odocoileus virginianus (white-tailed deer)

www.nrfirescience.org/resource/10840

This FEIS species review synthesizes information on the relationship of *Odocoileus virginianus* (white-tailed deer) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Picea glauca (white spruce)

www.nrfirescience.org/resource/10579

This FEIS species review synthesizes information on the relationship of *Picea glauca* (white spruce) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Twenty-year natural regeneration following five silvicultural prescriptions in spruce-fir forests of the intermountain west

www.nrfirescience.org/resource/11965

No single combination of five cutting-site preparation treatments resulted in superior natural regeneration in spruce-fir stands in Wyoming, Utah, and Idaho. Best results were generally obtained by partial cutting, with minimal disturbance of litter and organic matter, especially on harsh, high-elevation sites. Most sites remained...

Author(s): Ward W. McCaughey, Carl E. Fiedler, Wyman C. Schmidt

Year Published: 1991

Type: Document

Technical Report or White Paper

User's guide to version 2 of the Regeneration Establishment Model: part of the Prognosis Model

www.nrfirescience.org/resource/11148

Version 2 of the Regeneration Establishment Model is part of version 6 of the Prognosis Model for Stand Development. The regeneration model predicts results of regeneration harvests for most site and stand conditions found in the Northern Rocky Mountains. The model is based on analysis of 12,128 1/300-acre plots sampled in forests...

Author(s): Dennis E. Ferguson, Nicholas L. Crookston

Year Published: 1991

Type: Document

Technical Report or White Paper

Postfire growth of *Pseudotsuga menziesii* and *Pinus contorta* in the Northern Rocky Mountains, USA

www.nrfirescience.org/resource/8253

Dendroecological methods were used to study the effects of wildfire on radial growth of *Pseudotsuga menziesii* (Douglas-fir) and *Pinus contorta* (lodgepole pine) in the northern Rocky Mountains. Mean basal area increment during a 4-year postfire period declined relative to prefire growth in 75% of burned *P. menziesii* trees and 70% of *P...*

Author(s): David L. Peterson, Michael J. Arbaugh, George H. Pollock, Lindsay J. Robinson

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

***Larix lyallii* (alpine larch)**

www.nrfirescience.org/resource/10689

This FEIS species review synthesizes information on the relationship of *Larix lyallii* (alpine larch) to

fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): James R. Habeck

Year Published: 1991

Type: Document

Synthesis

Athyrium filix-femina (lady fern)

www.nrfirescience.org/resource/10908

This FEIS species review synthesizes information on the relationship of *Athyrium filix-femina* (lady fern) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Crystal J. Walkup

Year Published: 1991

Type: Document

Synthesis

Picea engelmannii (Engelmann spruce)

www.nrfirescience.org/resource/10569

This FEIS species review synthesizes information on the relationship of *Picea engelmannii* (Engelmann spruce) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

The 1985 Butte fire in central Idaho: a Canadian perspective on the associated burning conditions

www.nrfirescience.org/resource/11055

During the afternoon of August 29, 1985, the Butte Fire made a high-intensity crown fire run, covering a distance of 2.22 km in one hour and 40 minutes, and forcing 73 fire fighters to deploy their protective fire shelters. This paper presents a retrospective analysis of the fire behavior in terms of the two major subsystems of the...

Author(s): Martin E. Alexander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

Arctostaphylos uva-ursi (kinnikinnick)

www.nrfirescience.org/resource/10626

This FEIS species review synthesizes information on the relationship of *Arctostaphylos uva-ursi* (kinnikinnick) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Marilyn F. Crane

Year Published: 1991

Type: Document

Synthesis

Initial floristics in lodgepole pine (*Pinus contorta*) forests following the 1988 Yellowstone fires

www.nrfirescience.org/resource/8251

The Yellowstone fires of 1988 produced a mosaic of *Pinus contorta* stands subjected to fire of varying severities. In August, 1989, we inventoried density of vascular plants in paired plots at seven burned stands. One plot was in a severe canopy burn; the paired plot was in an adjacent area that burned at moderate severity. Density of...

Author(s): Jay E. Anderson, William H. Romme

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

***Salix drummondiana* (Drummond willow)**

www.nrfirescience.org/resource/10566

This FEIS species review synthesizes information on the relationship of *Salix drummondiana* (Drummond willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Predicting behavior and size of crown fires in the northern Rocky Mountains

www.nrfirescience.org/resource/11195

Assessment of crown fire conditions calls for two important judgments: (1) identifying conditions for the onset of severe fires, and (2) predicting the spread rate, intensity, and size of expected crown fires. This paper addresses the second problem and provides methods for making a first approximation of the behavior of a running...

Author(s): Richard C. Rothermel

Year Published: 1991

Type: Document

Technical Report or White Paper

***Spiraea betulifolia* (white spirea)**

www.nrfirescience.org/resource/10683

This FEIS species review synthesizes information on the relationship of *Spiraea betulifolia* (white spirea) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): James R. Habeck

Year Published: 1991

Type: Document

Synthesis

***Paxistima myrsinites* (Oregon boxwood)**

www.nrfirescience.org/resource/10850

This FEIS species review synthesizes information on the relationship of *Paxistima myrsinites* (Oregon boxwood) to fire--how fire affects the species and its habitat, and fire management considerations.

Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Canis lupus (gray wolf)

www.nrfirescience.org/resource/10846

This FEIS species review synthesizes information on the relationship of *Canis lupus* (gray wolf) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used for...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Lodgepole pine arthropod litter community structure one year after the 1988 Yellowstone fires

www.nrfirescience.org/resource/12034

Litter arthropod data was collected every 10 days from nine intensively burned forest stands, five lightly burned stands, and nine unburned forest stands. For burned forest stands (n=540 samples, there were decreases in insect density (87 percent), noninsect density (67 Percent), noninsect taxa (63 percent), and noninsect diversity...

Author(s): Tim A. Christiansen, Robert J. Lavigne, Jeffrey A. Lockwood

Year Published: 1991

Type: Document

Technical Report or White Paper

Ursus arctos horribilis (grizzly bear)

www.nrfirescience.org/resource/10837

This FEIS species review synthesizes information on the relationship of *Ursus arctos horribilis* (grizzly bear) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

GIS applications to the indirect effects of forest fires in mountainous terrain

www.nrfirescience.org/resource/12032

Snow-avalanche paths and landslides are common geomorphic features in Glacier National Park (GNP), Montana, and represent hazards to human occupancy and utilization of the park. Forest fires have been spatially extensive there, and it is well documented that areas subjected to forest fires become increasingly susceptible to...

Author(s): David R. Butler, Stephen J. Walsh, George P. Malanson

Year Published: 1991

Type: Document

Technical Report or White Paper

Abies lasiocarpa, Abies lasiocarpa var. arizonica, Abies lasiocarpa var. lasiocarpa (subalpine fir, corkbark fir, subalpine fir)

www.nrfirescience.org/resource/10574

This FEIS species review synthesizes information on the relationship of *Abies lasiocarpa*, *Abies lasiocarpa* var. *arizonica*, *Abies lasiocarpa* var. *lasiocarpa* (subalpine fir, corkbark fir, subalpine fir) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Natural revegetation of burned and unburned clearcuts in western larch forests of northwest Montana

www.nrfirescience.org/resource/12028

In 1967 and 1968, seven south- and east-facing units, averaging 4-ha each, in a western larch forest of northwest Montana were (1) clearcut and burned by prescribed fire or wildfire, (2) clearcut and unburned, or (3) uncut and burned by wildfire. More than 20 years of forest succession data from permanent transects show that fire...

Author(s): Raymond C. Shearer, Peter F. Stickney

Year Published: 1991

Type: Document

Technical Report or White Paper

Shepherdia canadensis (russet buffaloberry)

www.nrfirescience.org/resource/10909

This FEIS species review synthesizes information on the relationship of *Shepherdia canadensis* (russet buffaloberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Crystal J. Walkup

Year Published: 1991

Type: Document

Synthesis

Betula papyrifera (paper birch)

www.nrfirescience.org/resource/10570

This FEIS species review synthesizes information on the relationship of *Betula papyrifera* (paper birch) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Fire damage on extensively vs. intensively managed forest stands within the North Fork Fire, 1988

www.nrfirescience.org/resource/8342

The Greater Yellowstone fires of 1988 provide an opportunity to study important distinctions between

lands managed for preservation versus multiple uses. We surveyed fuel loadings, fire severity, and fire damage to extensively managed, mature forest and to intensively managed, clearcut reproduction areas. Unburned, mature forests...

Author(s): Philip N. Omi, Kostas D. Kalabokidis

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

Predicting behavior of the 1988 Yellowstone fires: projections versus reality

www.nrfirescience.org/resource/8252

An account is presented of the initial long range, 30-day, projections of fire growth of the wildfires in the Greater Yellowstone Area in 1988. The request for information, the method of prediction, and the actual fire growth are discussed and documented with maps. The difficulties and uncertainties of long-range fire prediction...

Author(s): Richard C. Rothermel

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

Salix planifolia (planeleaf willow)

www.nrfirescience.org/resource/10568

This FEIS species review synthesizes information on the relationship of *Salix planifolia* (planeleaf willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Salix geyeriana (Geyer willow)

www.nrfirescience.org/resource/10564

This FEIS species review synthesizes information on the relationship of *Salix geyeriana* (Geyer willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Ronald Uchytel

Year Published: 1991

Type: Document

Synthesis

Rubus idaeus (red raspberry)

www.nrfirescience.org/resource/10875

This FEIS species review synthesizes information on the relationship of *Rubus idaeus* (red raspberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Vaccinium myrtilloides (velvetleaf blueberry)

www.nrfirescience.org/resource/10873

This FEIS species review synthesizes information on the relationship of *Vaccinium myrtilloides* (velvetleaf blueberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Vaccinium caespitosum (dwarf bilberry)

www.nrfirescience.org/resource/10871

This FEIS species review synthesizes information on the relationship of *Vaccinium caespitosum* (dwarf bilberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Pteridium aquilinum (western bracken fern)

www.nrfirescience.org/resource/10624

This FEIS species review synthesizes information on the relationship of *Pteridium aquilinum* (western bracken fern) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document

Synthesis

Botrychium paradoxum (peculiar moonwort)

www.nrfirescience.org/resource/10930

This FEIS species review synthesizes information on the relationship of *Botrychium paradoxum* (peculiar moonwort) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Tara Y. Williams

Year Published: 1990

Type: Document

Synthesis

Selaginella densa (little spikemoss)

www.nrfirescience.org/resource/10622

This FEIS species review synthesizes information on the relationship of *Selaginella densa* (little spikemoss) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general

management. This species review can be...

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document

Synthesis

Taxus brevifolia (Pacific yew)

www.nrfirescience.org/resource/10890

This FEIS species review synthesizes information on the relationship of *Taxus brevifolia* (Pacific yew) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Vaccinium ovalifolium (ovalleaf huckleberry)

www.nrfirescience.org/resource/10874

This FEIS species review synthesizes information on the relationship of *Vaccinium ovalifolium* (ovalleaf huckleberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Predicting equilibrium moisture content of some foliar forest litter in the northern Rocky Mountains

www.nrfirescience.org/resource/11964

Forest foliage that comprises much of the forest floor litter has higher equilibrium moisture content, EMC, than woody components. The EMC's at 300 °K were found to increase as follows: grasses...

Author(s): Hal E. Anderson

Year Published: 1990

Type: Document

Technical Report or White Paper

Vaccinium myrtillus (dwarf bilberry)

www.nrfirescience.org/resource/10872

This FEIS species review synthesizes information on the relationship of *Vaccinium myrtillus* (dwarf bilberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be...

Author(s): D. A. Tirmenstein

Year Published: 1990

Type: Document

Synthesis

Populus balsamifera subsp. balsamifera (balsam poplar)

www.nrfirescience.org/resource/10692

This FEIS species review synthesizes information on the relationship of *Populus balsamifera* subsp. *balsamifera* (balsam poplar) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This...

Author(s): Holly T. Harris

Year Published: 1990

Type: Document

Synthesis

Actaea rubra (red baneberry)

www.nrfirescience.org/resource/10625

This FEIS species review synthesizes information on the relationship of *Actaea rubra* (red baneberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document

Synthesis

Erythronium grandiflorum (glacier lily)

www.nrfirescience.org/resource/10932

This FEIS species review synthesizes information on the relationship of *Erythronium grandiflorum* (glacier lily) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can...

Author(s): Tara Y. Williams

Year Published: 1990

Type: Document

Synthesis

Rosa acicularis (prickly rose)

www.nrfirescience.org/resource/10623

This FEIS species review synthesizes information on the relationship of *Rosa acicularis* (prickly rose) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document

Synthesis

Xerophyllum tenax (beargrass)

www.nrfirescience.org/resource/10621

This FEIS species review synthesizes information on the relationship of *Xerophyllum tenax* (beargrass) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document
Synthesis

Salix lemmonii (Lemmons willow)

www.nrfirescience.org/resource/10575

This FEIS species review synthesizes information on the relationship of *Salix lemmonii* (Lemmons willow) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review can be used...

Author(s): Ronald Uchytel
Year Published: 1989
Type: Document
Synthesis

Alnus viridis subsp. sinuata (Sitka alder)

www.nrfirescience.org/resource/10572

This FEIS species review synthesizes information on the relationship of *Alnus viridis* subsp. *sinuata* (Sitka alder) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Ronald Uchytel
Year Published: 1989
Type: Document
Synthesis

Sambucus nigra subsp. cerulea (blue elderberry)

www.nrfirescience.org/resource/10628

This FEIS species review synthesizes information on the relationship of *Sambucus nigra* subsp. *cerulea* (blue elderberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Marilyn F. Crane
Year Published: 1989
Type: Document
Synthesis

FIRESUM-an ecological process model for fire succession in western conifer forests

www.nrfirescience.org/resource/11917

Describes an ecological process model of succession that simulates long-term stand dynamics in forests of the Northern Rocky Mountains. This model is used to evaluate the effects of various fire regimes, including prescribed burning and fire suppression, on the vegetation and fuel complex of a simulation stand. This report documents...

Author(s): Robert E. Keane, Stephen F. Arno, James K. Brown
Year Published: 1989
Type: Document
Technical Report or White Paper

Fire ecology of western Montana forest habitat types

www.nrfirescience.org/resource/11257

Provides information on fire as an ecological factor for forest habitat types in western Montana.

Identifies Fire Groups of habitat types based on fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.

Author(s): William C. Fischer, Anne F. Bradley

Year Published: 1987

Type: Document

Technical Report or White Paper

Site treatments influence development of a young mixed-species western larch stand

www.nrfirescience.org/resource/13136

More intensive management could be applied to many young stands in conifer forests of the Northern Rockies. Vast areas are stocked with stands that contain a mixture of conifer species. An important mixed species cover type in this region is the western larch type (formerly called the larch-Douglas-fir type...

Author(s): Dennis M. Cole, Wyman C. Schmidt

Year Published: 1986

Type: Document

Technical Report or White Paper

First decade plant succession following the Sundance forest fire, northern Idaho

www.nrfirescience.org/resource/11915

Describes the first 10 years of vegetation development following disturbance by a holocaustic forest fire in a western redcedar-western hemlock type in the Selkirk Range. Postfire development of vegetation is represented as life-form stages and predominant cover species. Differential development of plant species established in the...

Author(s): Peter F. Stickney

Year Published: 1986

Type: Document

Technical Report or White Paper

Fire ecology of the forest habitat types of central Idaho

www.nrfirescience.org/resource/11258

Discusses fire as an ecological factor for forest habitat types occurring in central Idaho. Identifies "Fire Groups" of habitat types based on fire's role in forest succession. Considerations for fire management are suggested.

Author(s): Marilyn F. Crane, William C. Fischer

Year Published: 1986

Type: Document

Technical Report or White Paper

Surface fuel loadings and predicted fire behavior for vegetation types in the northern Rocky Mountains

www.nrfirescience.org/resource/11930

Means, standard deviations, and quartiles of fuel loadings were determined for litter, for downed woody material of 0 to one-fourth inch, one-fourth to 1 inch, 0 to 1 inch, and 1 to 3 inches, for herbaceous vegetation, and for shrubs by cover types and fire groups. The studies were conducted at four locations in northwestern Wyoming...

Author(s): James K. Brown, Collin D. Bevins

Year Published: 1986

Type: Document

Research Brief or Fact Sheet

Data base for early postfire succession on the Sundance Burn, northern Idaho

www.nrfirescience.org/resource/11914

Provides baseline data on secondary plant succession and the development of plant species and life forms for the initial 6 to 15 years following a stand-replacing forest fire in the western redcedar-western hemlock type in northern Idaho. Information pertaining to plant cover (m²/0.01 ha) and volume of space occupied (m³/0.01 ha) is...

Author(s): Peter F. Stickney

Year Published: 1985

Type: Document

Technical Report or White Paper

Timber net value and physical output changes following wildfire in the northern rocky mountains: estimates for specific fire situations

www.nrfirescience.org/resource/11219

In the last decade, the fire management program of the Forest Service, U.S. Department of Agriculture, has come under closer scrutiny because of ever-rising program costs. The Forest Service has responded by conducting several studies analyzing the economic efficiency of its fire management program. Some components of the analytical...

Author(s): Patrick J. Flowers, Patricia B. Shinkle, Daria A. Cain, Thomas J. Mills

Year Published: 1985

Type: Document

Technical Report or White Paper

Predicting duff and woody fuel consumed by prescribed fire in the Northern Rocky Mountains

www.nrfirescience.org/resource/11265

Relationships for predicting duff reduction, mineral soil exposure, and consumption of downed woody fuel were determined to assist in planning prescribed fires. Independent variables included lower and entire duff moisture contents, loadings of downed woody fuels, duff depth, National Fire-Danger Rating System 1,000-hour moisture...

Author(s): James K. Brown, Michael A. Marsden, Kevin C. Ryan, Elizabeth D. Reinhardt

Year Published: 1985

Type: Document

Technical Report or White Paper

Watershed modeling for fire management planning in the Northern Rocky Mountains

www.nrfirescience.org/resource/11220

Water yield and sediment production almost always increase after wildfire has destroyed vegetative cover. The value of water generally is not as much appreciated in the water-rich northern Rocky Mountains as it is elsewhere. Increased water yield becomes economically beneficial, however, when its potential for consumptive and...

Author(s): Donald F. Potts, David L. Peterson, Hans R. Zuuring

Year Published: 1985

Type: Document

Technical Report or White Paper

Influence of fire severity on response of evergreen ceanothus

www.nrfirescience.org/resource/11061

Fire plays an important role in *Ceanothus velutinus* habitat. Its impact varies with season and severity of fire. Knowledge of the interaction between fire severity and evergreen ceanothus habitat can assist managers in estimating the effect of fire on evergreen ceanothus and in developing burning

prescriptions.

Author(s): Nonan V. Noste

Year Published: 1985

Type: Document

Conference Proceedings, Technical Report or White Paper

Fire's effects on a small bird population

www.nrfirescience.org/resource/11188

Changes in bird populations as a result of a 122 ha forest fire are evaluated. There is little evidence of any drastic effect on numbers of birds, species, or species diversity in the year of the fire or 2 years later.

Author(s): L. Jack Lyon, John M. Marzluff

Year Published: 1985

Type: Document

Technical Report or White Paper

The Sleeping Child Burn - 21 years of postfire change

www.nrfirescience.org/resource/11961

In early August 1961, more than 26,000 acres (10,500 ha) of upper montane and subalpine forest on the Bitterroot National Forest burned in a lightning-caused wildfire. At the time, the Sleeping Child Burn represented the single largest forest fire in the Northern Rocky Mountains in more than 20 years.

Historically, large wildfires...

Author(s): L. Jack Lyon

Year Published: 1984

Type: Document

Technical Report or White Paper

Fire and vegetative trends in the Northern Rockies: interpretations from 1871-1982 photographs

www.nrfirescience.org/resource/11260

Interprets changes in forest and range vegetation resulting from the absence of fire. Eighty-six matched photographs covering the period 1871-1982 provide the basis for describing how vegetation has changed in various plant communities. These scenes show that woody vegetation has increased markedly as a result of reduced wildfire....

Author(s): George E. Gruell

Year Published: 1983

Type: Document

Technical Report or White Paper

Fire ecology of Montana forest habitat types east of the Continental Divide

www.nrfirescience.org/resource/11261

Provides information on fire as an ecological factor for forest habitat types occurring east of the Continental Divide in Montana. Identifies "Fire Groups" of habitat types based on fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.

Author(s): William C. Fischer, Bruce D. Clayton

Year Published: 1983

Type: Document

Synthesis, Technical Report or White Paper

Variation in estimates of fire intervals: a closer look at fire history on the Bitterroot National Forest

www.nrfirescience.org/resource/11958

The authors examine variation in the length of mean intervals between fires (occurring between the years 1600 and 1910) in sample units of various sizes, ranging from a point on the ground (single tree) to a large stand (200 to 800 acres; 80 to 320 hectares). Recommendations are made regarding appropriate sizes of sample units for...

Author(s): Stephen F. Arno, Terry D. Petersen

Year Published: 1982

Type: Document

Technical Report or White Paper

Downed and dead woody fuel and biomass in the northern Rocky Mountains

www.nrfirescience.org/resource/11881

Weights and volumes of downed woody material in diameter classes of one-fourth to 1, 1 to 3, and greater than 3 inches and forest floor duff depths were summarized from extensive inventories in northern Idaho and Montana. Biomass loadings are shown by cover types and habitat types within National Forests. Total downed woody biomass...

Author(s): James K. Brown, Thomas E. See

Year Published: 1981

Type: Document

Technical Report or White Paper

Fire intensity and frequency as factors in the distribution and structure of northern ecosystems

www.nrfirescience.org/resource/8406

Most presettlement Canadian and Alaskan boreal forests and Rocky Mountain subalpine forests had lightning fire regimes of large-scale crown fires and high-intensity surface fires, causing total stand replacement on fire rotations (or cycles) to 50 to 200 years. Cycles and fire size varied with latitude, elevation, and topographic...

Author(s): Miron L. Heinselman

Year Published: 1981

Type: Document

Conference Proceedings

Residue characteristics in the Northern Rocky Mountains

www.nrfirescience.org/resource/11131

ANNOTATION: In the northern Rocky Mountains, 350-450 million cubic feet (9.9 to 12.7 million cubic meters) of logging residue is generated each year. Up to 60 percent of the residue material is technologically suitable for wood products, but condition, size and product potential vary among forest types. Other factors which influence...

Author(s): Robert E. Benson, Joyce A. Schlieter

Year Published: 1981

Type: Document

Conference Proceedings, Technical Report or White Paper

Intensive utilization with conventional harvesting systems

www.nrfirescience.org/resource/11130

ANNOTATION: Forest residues utilization research has included case studies of the efficiency of existing harvesting systems in achieving close fiber utilization. Field evaluations included the use of in-woods chipping systems in gentle terrain; crawler skidder systems in gentle terrain; and skyline systems in steep terrain. In each...

Author(s): Roland L. Barger, Robert E. Benson

Year Published: 1981

Type: Document
Conference Proceedings, Technical Report or White Paper

Fire frequency in subalpine forests of Yellowstone National Park

www.nrfirescience.org/resource/12042

Dead woody fuels were sampled in 16 upland forest stands representing a chronosequence of forest successional stages. Different fuel components show different temporal patterns, but adequate levels of all components necessary for an intense crown fire are not present simultaneously until stand age 300-400 yr. Therefore, the average...

Author(s): William H. Romme

Year Published: 1980

Type: Document

Conference Proceedings, Technical Report or White Paper

Database for post-fire succession, first 6 to 9 years, in Montana larch-fir forests

www.nrfirescience.org/resource/11909

Base line data on species cover (m²/0.01 ha) and volume of space occupied (m³/0.01 ha) for the initial 6 to 9 years of secondary forest succession for western larch-Douglas-fir forests is presented in tabular form for 20 study areas in western Montana. Disturbance treatments include wildfire and clearcutting followed by broadcast...

Author(s): Peter F. Stickney

Year Published: 1980

Type: Document

Technical Report or White Paper

Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming - Volume I: photographic record and analysis

www.nrfirescience.org/resource/12151

The Bridger-Teton National Forest in the Jackson Hole Region of Wyoming has long been recognized for its wildlife resource. Management efforts have emphasized the measurement of forage utilization by elk (*Cervus canadensis nelsoni*) and their effect on summer and winter ranges. Less consideration has been given to other biotic and...

Author(s): George E. Gruell

Year Published: 1980

Type: Document

Technical Report or White Paper

Fire history of a western larch/Douglas-fir forest type in northwestern Montana

www.nrfirescience.org/resource/12044

Mean frequencies were about 120 years for valleys and montane slopes and 150 years for subalpine slopes in this western larch/Douglas-fir forest from 1735 to 1976. Fires were small and moderately intense with occasional high intensity runs. Single burns thinned the overstory favoring mixed conifer regeneration. Multiple burns...

Author(s): Kathleen M. Davis

Year Published: 1980

Type: Document

Conference Proceedings, Technical Report or White Paper

Fire ecology of Lolo National Forest habitat types

www.nrfirescience.org/resource/11913

This report summarizes available information on fire as an ecological factor for forest habitat types occurring on the Lolo National Forest. The Lolo National Forest habitat types are grouped into 10 Fire Groups based primarily on fire's role in forest succession. For each Fire Group, information is presented on (1) the relationship...

Author(s): Kathleen M. Davis, Bruce D. Clayton, William C. Fischer

Year Published: 1980

Type: Document

Technical Report or White Paper

Forest fire history in the Northern Rockies

www.nrfirescience.org/resource/13121

Recent fire-scar studies in the northern Rocky Mountains have documented forest fire history over the past few centuries. They reveal that in some forest types fire maintained many-aged open stands of seral trees. In other types, major fires caused replacement of the stands. Often, however, fires burned at variable intensities,...

Author(s): Stephen F. Arno

Year Published: 1980

Type: Document

Book or Chapter or Journal Article

Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming - Volume II: changes and causes, management implications

www.nrfirescience.org/resource/12126

Provides information on wildlife habitat condition and trend on the Bridger-Teton National Forest in the Jackson Hole Region of Wyoming by analysis of broad plant communities. Visual evidence of condition and trend are provided in Volume I, The Photo Record. Management implications are included.

Author(s): George E. Gruell

Year Published: 1980

Type: Document

Technical Report or White Paper

Predicting slash depth for fire modeling

www.nrfirescience.org/resource/11954

Development of equations for predicting fuel bed depth (called "bulk depth" herein) appropriate for modeling fire behavior in slash is described. Bulk depth (y) was correlated with the expected number of 1/4-to 1-inch-diameter particle intercepts per foot of vertical plane transect (x) by regressions of the form $y = a \cdot x$. Values of "...

Author(s): Frank A. Albini, James K. Brown

Year Published: 1978

Type: Document

Technical Report or White Paper

Weight and density of crowns of Rocky Mountain conifers

www.nrfirescience.org/resource/11205

ANNOTATION: Relationships between live and dead crown weight and DBH, crown length, tree height, and crown ratio are presented for 11 Rocky Mountain conifers. Also included are partitioned estimates of crown foliage and branchwood. This study shows a high correlation between DBH and crown weight.

Author(s): James K. Brown

Year Published: 1978

Type: Document

Technical Report or White Paper

Pre-feasibility assessment: small diameter underutilized (SDU) wood feedstock for a 10 MW co-generation facility at the Milltown dam site

www.nrfirescience.org/resource/11206

ANNOTATION: A pre-feasibility assessment is an early stage and limited analysis of the probable risks and returns of an investment. Focused on gathering preliminary information, it helps decision makers determine if there is a basis for investing additional capital and time in the proposed project. This pre-feasibility assessment to...

Author(s): James K. Brown, J. A. Kendall Snell, David L. Bunnell

Year Published: 1977

Type: Document

Technical Report or White Paper

Fire effects on marten habitat in the Selway-Bitterroot Wilderness

www.nrfirescience.org/resource/7955

In an area of 21 km² where fires have produced a mosaic of forest communities, including subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*) and lodgepole pine, results from 255 track observations, 80 captures of 13 live-trapped martens, and scat analysis, over a 13 month period in 1973-1974, suggest that the...

Author(s): Gary M. Koehler, Maurice G. Hornocker

Year Published: 1977

Type: Document

Book or Chapter or Journal Article

A method for determining fire history in coniferous forests in the Mountain West

www.nrfirescience.org/resource/11176

An improved version is presented of a method previously used [see FA 40, 169]. Instructions are given for: laying out transects; gathering stand data, including documenting fire-scarred trees; sampling fire-scarred trees; laboratory analysis of tree cross-sections; correlating fire chronologies; and calculating fire frequency. The...

Author(s): Stephen F. Arno, Kathy M. Sneck

Year Published: 1977

Type: Document

Technical Report or White Paper

The historical role of fire on the Bitterroot National Forest

www.nrfirescience.org/resource/11175

Presents frequencies, intensities, and influences of fire on stand structure and composition on the Bitterroot National Forest in west-central Montana. Three study areas were established, each having a wide range of elevations and forest types. Findings are based upon study of nearly 900 individual fire scars on living trees, and on...

Author(s): Stephen F. Arno

Year Published: 1976

Type: Document

Technical Report or White Paper

Estimating fuel weights of grasses, forbs, and small woody plants

www.nrfirescience.org/resource/11923

Equations were developed for estimating fuel loading (g/m²) of grasses, narrow-leaved forbs, broad-leaved forbs, and small woody plants common to western Montana and north Idaho. Independent

variables were plant height and percentage of ground covered. R2 for the equations ranged from 0.30 to 0.91. The equations provide reasonable...

Author(s): James K. Brown, Michael A. Marsden

Year Published: 1976

Type: Document

Research Brief or Fact Sheet

Vegetal development on the Sleeping Child burn in western Montana, 1961 to 1973

www.nrfirescience.org/resource/11951

In the year following the 1961 Sleeping Child forest fire on the Bitterroot National Forest, Montana, 11 permanent transects were established within the burn. Vegetation development was recorded through 1973, but only four transects were considered indicative of seral forest succession independent of superimposed management...

Author(s): L. Jack Lyon

Year Published: 1976

Type: Document

Technical Report or White Paper

Wildland fires and dwarf mistletoes: a literature review of ecology and prescribed burning

www.nrfirescience.org/resource/12412

Wildfires play a multiple role in the distribution of dwarf mistletoes - they may either inhibit or encourage these parasites depending primarily on the size and intensity of the burn. Many reports suggest that fire exclusion policies of the past half century have resulted in increased dwarf mistletoe levels as, well as increased...

Author(s): Martin E. Alexander, Frank G. Hawksworth

Year Published: 1975

Type: Document

Synthesis, Technical Report or White Paper

Seedbed characteristics in western larch forests after prescribed burning

www.nrfirescience.org/resource/11948

Establishment of western larch (*Larix occidentalis* Nutt.) seedlings is favored by site preparation that reduces both the duff layer and the sprouting potential of competing vegetation. A cooperative study of the use of fire in silviculture in northwestern Montana provided conditions to research the effectiveness of prescribed...

Author(s): Raymond C. Shearer

Year Published: 1975

Type: Document

Technical Report or White Paper

Lodgepole pine logging residues: management alternatives

www.nrfirescience.org/resource/12125

The dollar and nondollar effects of alternative levels of residue utilization in mature lodgepole pine are compared. Net dollar returns were greater in conventional logging (removal of green sawlogs to a 6-inch top, with slash piled and burned) than in near-complete harvesting (sawlog removal followed by field chipping of remaining...

Author(s): Robert E. Benson

Year Published: 1974

Type: Document

Technical Report or White Paper

Smoke column height related to fire intensity

www.nrfirescience.org/resource/11946

Height of slash fire smoke columns, commonly thought to be a function of atmospheric conditions alone, through a series of 10-acre experimental fires is shown to be strongly related to fire intensity. By conducting intense fires, land managers can possibly burn forest debris and still maintain air quality when atmospheric conditions...

Author(s): Rodney A. Norum

Year Published: 1974

Type: Document

Technical Report or White Paper

Fire-dependent forests in the Northern Rocky Mountains

www.nrfirescience.org/resource/7935

One objective of wilderness and parkland fire ecology research is to describe the relationships between fire and unmanaged ecosystems, so that strategies can be determined that will provide a more nearly natural incidence of fire. More than 50 years of efforts directed toward exclusion of wildland fires in the Northern Rocky...

Author(s): James R. Habeck, Robert W. Mutch

Year Published: 1973

Type: Document

Book or Chapter or Journal Article

Airborne infrared forest fire detection system: final report

www.nrfirescience.org/resource/11942

This work was undertaken because of a mutual interest of the Department of Defense, Advanced Research Projects Agency (ARPA), and the USDA Forest Service in the problems of detecting hot targets against natural terrain backgrounds using airborne infrared (IR) line scanning instrumentation. The study objectives were broadly defined...

Author(s): Ralph A. Wilson, Stanley N. Hirsch, Forrest H. Madden, John B. Losensky

Year Published: 1971

Type: Document

Technical Report or White Paper

Sundance Fire: an analysis of fire phenomena

www.nrfirescience.org/resource/11229

The Sundance Fire on September 1, 1967, made a spectacular run of 16 miles in 9 hours and destroyed more than 50,000 acres. This run became the subject of a detailed research analysis of the environmental, topographic, and vegetation variables aimed at reconstructing and describing fire phenomena. This report details the fire's...

Author(s): Hal E. Anderson

Year Published: 1968

Type: Document

Technical Report or White Paper

Death in Blackwater Canyon

www.nrfirescience.org/resource/11494

On August 21, 1937, the tragic Blackwater Fire caused the death of 15 firefighters, burning approximately 1,700 acres of National Forest System lands on the Shoshone National Forest, near Cody, Wyoming. An electrical storm occurred in the general vicinity of Blackwater Creek on Wednesday, August 18th causing a fire, which was not...

Author(s): Erle Kauffman
Year Published: 1937
Type: Document
Book or Chapter or Journal Article

Rapidly emerging trends in southeast British Columbia

www.nrfirescience.org/resource/14783

This presentation by Michael Murray, Forest Pathologist, BC Ministry of Forests, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Disturbances across boundaries: forest structure, wildfire severity, and post-fire resilience following recent bark beetle outbreaks in forests of Greater Yellowstone

www.nrfirescience.org/resource/13283

This is a recording from the 12th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. The talk focused on research designed to: understand the effects of pine beetle outbreaks on the structure, fire severity, and post-fire recovery in lodgepole pine and Douglas-fir forests in the GYE.

Type: Media

Video

Key considerations for managing the Clark's nutcracker-whitebark pine mutualism

www.nrfirescience.org/resource/14778

This presentation by Taza Schaming, Northern Rockies Conservation Cooperative, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Does wildfire likelihood or severity increase following insect outbreaks in conifer forests of the Pacific Northwest?

www.nrfirescience.org/resource/13804

Video starts at 1:51 - This webinar was hosted by the Northwest Fire Science Consortium.

Type: Media

Webinar

Climate change, mountain pine beetles, and whitebark pine forests of the Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/13281

This is a recording from the 12th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. The talk focused on research designed to: understand causes of recent mountain pine beetle outbreaks in whitebark pine in the GYE and estimate historical, current, and future weather suitability for whitebark pine beetle attacks....

Type: Media

Video

The ecosystem function of whitebark pine and pathogen disturbance in the Greater Yellowstone

www.nrfirescience.org/resource/15149

This presentation was part of the 13th Biennial Scientific Conference on the Greater Yellowstone Ecosystem held at Jackson Lake Lodge in Grand Teton National Park, October 4-6, 2016. The conference theme was Building on the Past, Leading into the Future: Sustaining the Greater Yellowstone Ecosystem in the Coming Century.

Type: Media

Webinar

Effects of fire in whitebark pine communities of the alpine-treeline ecotone

www.nrfirescience.org/resource/14775

In this presentation by C. Alina Cansler, Research Ecologist, University of Washington, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Mountain pine beetle in Greater Yellowstone Ecosystem whitebark pine: the fire that doesn't go out

www.nrfirescience.org/resource/13737

Since 2004 the Greater Yellowstone Inventory and Monitoring Network has been monitoring the condition of individual whitebark pine (*Pinus albicaulis*) trees over time at 176 sites across the Greater Yellowstone Ecosystem. Since 2007 a mountain pine beetle (*Dendroctonus ponderosae*) epidemic swept through the...

Type: Media

Video

The viability of evolutionary rescue in natural populations

www.nrfirescience.org/resource/15103

Extinction under environmental change is a race between demography and adaptive evolution. Evolutionary rescue (ER) occurs when genetic adaptation allows a population to recover from near extinction following rapid environmental change, with evidence coming from laboratory experiments and simulation modeling. Is ER feasible in...

Type: Media

Webinar

Combining dendrochronology and aerial photography to reconstruct spatiotemporal patterns of fire severity in mixed-severity fire regimes of the northern Rockies

www.nrfirescience.org/resource/14341

This webinar was presented as part of the 2015-2016 RMRS Fire Sciences Laboratory's weekly seminar series.

Type: Media

Seminar

Will whitebark pine restoration still work in the crown under future climates?

www.nrfirescience.org/resource/14772

This presentation by Bob Keane, Supervisory Research Ecologist, USFS Rocky Mountain Research Station, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that

occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Clark's nutcracker demography and habitat selection in the face of whitebark pine decline

www.nrfirescience.org/resource/13734

Over five years (2009-2013), through radio tracking and conducting occupancy, fledgling and habitat surveys, I documented nutcracker reproductive success, habitat selection, movement patterns, foraging ecology, and occupancy in areas with variable WBP mortality. (1) Clark's nutcrackers at the site experienced...

Type: Media

Video

Multi-scale analysis of fire effects in alpine treeline ecotones

www.nrfirescience.org/resource/14333

Although direct effects of climate change have been studied through observational and experimental methods in alpine treeline ecotones (ATEs), indirect effects due to shifts in disturbance regimes have received less attention, despite evidence that the frequency and extent of large disturbances are increasing in...

Type: Media

Webinar

Vulnerability of tree species and biome types to climate change in the U.S. Northern Rocky Mountains and Yellowstone

www.nrfirescience.org/resource/13043

This presentation assesses components of vulnerability of tree species and biome types to projected future climate within the Great Northern Landscape Conservation Cooperative (GNLCC) in the US Northern Rockies and the ecosystems surrounding Glacier and Yellowstone/Grand Teton National Parks. We drew on the results of five published...

Type: Media

Webinar

Using state and transition simulation models to guide sustainable management of ecosystems: three case studies from across the US

www.nrfirescience.org/resource/14867

This webinar was conducted as a part of the Climate Change Science and Management Webinar Series, put on by the USGS National Climate Change and Wildlife Science Center and the FWS National Conservation Training Center. Sustainable management of natural resources under competing demands is challenging, particularly when facing novel...

Type: Media

Webinar

Successes and challenges of whitebark pine restoration in Glacier National Park

www.nrfirescience.org/resource/14791

This presentation by Jen Asebrook, Botanist, Glacier NP, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Inoculation of whitebark pine seedlings with native ectomycorrhizal fungi

www.nrfirescience.org/resource/14787

This presentation by Cathy L. Cripps, Associate Professor, Montana State University, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Why were they entrapped? Lessons from the "near miss" Madison Arm fire entrapment

www.nrfirescience.org/resource/14121

How did two engine crews become entrapped on the Madison Arm Fire? This is a story of survival inside the transition from initial to extended attack.

Type: Media

Video

Geologic and genetic implications of restoring whitebark pine under climate change

www.nrfirescience.org/resource/14784

This presentation by Mary Frances Mahalovich, Regional Geneticist, Northern, Rocky Mountain, Southwestern and Intermountain Regions, USFS, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred...

Type: Media

Webinar

Is there a case for restoration to subalpine forests following bark beetle mortality

www.nrfirescience.org/resource/14065

Is there a case for restoration to regenerate subalpine forests following bark beetle-caused mortality? Kristen Pelz, Graduate Research Assistant and PhD Candidate, Colorado State University. Recorded talk from 2013 Restoring the West Conference at Utah State University. The conference focused on forest resilience and change agents...

Type: Media

Video

Fire and beetles and climate, oh my!

www.nrfirescience.org/resource/13284

This is a recording of a keynote lecture from the 12th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. The talk focused on Yellowstone fire history, fire regimes, and post-fire regeneration as well as the impacts of bark beetle outbreaks on fire severity, fire effects, and ecosystem resilience.

Type: Media

Video

20-year reassessment of the health and status of whitebark pine in the Bob Marshall Wilderness

www.nrfirescience.org/resource/14782

This presentation by Carol Treadwell, Executive Director, Bob Marshall Wilderness Foundation was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Mountain pine beetle in whitebark pine: the fire that never goes out

www.nrfirescience.org/resource/13282

This is a recording from the 12th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. The talk focused on research designed to provide background on the impact of mountain pine beetles in whitebark pine trees in the GYE.

Type: Media

Video

Forest health threats cascade upwards: modeling whitebark pine treeline community response to exotic disease and diminished seed production in the Greater Yellowstone

www.nrfirescience.org/resource/15150

This presentation was part of the 13th Biennial Scientific Conference on the Greater Yellowstone Ecosystem held at Jackson Lake Lodge in Grand Teton National Park, October 4-6, 2016. The conference theme was Building on the Past, Leading into the Future: Sustaining the Greater Yellowstone Ecosystem in the Coming Century.

Type: Media

Webinar

Species Status Assessment (SSA) for whitebark pine

www.nrfirescience.org/resource/14777

This presentation by Amy C Nicholas, Biologist, U.S. Fish and Wildlife Service, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent on September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Ecology and restoration in mixed severity fire regimes: climate thresholds, beta diversity, and collaboration in Montana forests

www.nrfirescience.org/resource/13775

Mixed severity fire regimes historically maintained landscape heterogeneity in fuels and ecological conditions, which limited fire spread and supported diverse species assemblages. Setting goals for ecosystem management and restoration targets in in these forests, where the frequency, severity, and effects of...

Type: Media

Webinar

Culturally peeled trees handbook

www.nrfirescience.org/resource/12391

This guide was developed to help identify Culturally Peeled Trees. Culturally Peeled Trees are a specific type of Culturally Modified Tree. The term is used to describe the mostly pre-reservation practice by aboriginal or native people of 'peeling,' or removing, the bark/cambium layer of a tree for a variety of procurement and...

Author(s): Marcy Reiser, Laurie S. Huckaby

Type: Document

Technical Report or White Paper

Putting climate change on the map: developing specific, spatial management strategies for whitebark pine in the Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/15148

This presentation was part of the 13th Biennial Scientific Conference on the Greater Yellowstone Ecosystem held at Jackson Lake Lodge in Grand Teton National Park, October 4-6, 2016. The conference theme was Building on the Past, Leading into the Future: Sustaining the Greater Yellowstone Ecosystem in the Coming Century.

Type: Media

Webinar

Recent forest research on the Flathead Indian Reservation: It's not just for driving through any more

www.nrfirescience.org/resource/14343

The Flathead Indian Reservation spreads over 1.3 million acres of western Montana valleys and mountains; over 780,000 acres of these lands are managed as forest resources by the Confederated Salish and Kootenai Tribes (CSKT). Tribal Forestry has been, especially since the 1999-2000 Forest Management Plan and Fire...

Type: Media

Webinar

Future climate suitability for mountain pine beetle outbreaks in the Crown of the Continent

www.nrfirescience.org/resource/14773

This presentation by Polly C. Buotte, Postdoc, University of Idaho, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent on September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Whitebark pine genetic restoration program for the Northern Rockies

www.nrfirescience.org/resource/13735

As a keystone species whitebark pine maintains biodiversity and its nuts provide a nutritional food for several wildlife species. As a foundation species it protects watersheds and promotes post-fire regeneration. Restoring whitebark pine is by definition multidisciplinary, and the complex linkages to other plants and wildlife,...

Type: Media

Webinar

The effects of seed source health on whitebark pine (*Pinus albicaulis*) regeneration density after wildfire

www.nrfirescience.org/resource/14339

Whitebark pine (*Pinus albicaulis* Engelm.) populations are declining nearly rangewide from a combination of factors, including mountain pine beetle (*Dendroctonus ponderosae* Hopkins, 1902) outbreaks, the exotic pathogen *Cronartium ribicola* J.C. Fisch. 1872, which causes the disease white pine blister rust, and successional replacement due...

Type: Media

Webinar

Adaptation to climate change: embracing natural selection and genetics in restoration

www.nrfirescience.org/resource/14792

This presentation by Diana L. Six, Professor at University of Montana, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Fuels patterns and a fire following mountain pine beetle mortality in the climax lodgepole pine forests of southern central Oregon

www.nrfirescience.org/resource/13707

The last of three Northwest Fire Science Consortium webinars focusing on insects and fire, Dr. Dave Shaw and Michelle Agne, Department of Forest Engineering, Resources & Management at Oregon State University, presented on November 23rd - Fuels patterns and a fire following mountain pine beetle mortality in the climax lodgepole...

Type: Media

Webinar

A system in transition? Our high elevation forests

www.nrfirescience.org/resource/14210

This presentation was recorded during the 2016 State of the State and Forest Health Conference in Corvallis, OR.

Type: Media

Video

Simulating vegetation, fire, and climate dynamics in a Northern Rocky Mountain landscape

www.nrfirescience.org/resource/12873

Robert Keane presents a webinar on the results of research using models to assess potential interacting effects of climate changes, pathogens, and wildfire on the distribution and density of whitebark pine in a high-elevation watershed in Glacier National Park, Montana, USA. Climate changes are projected to profoundly influence...

Type: Media

Webinar

Is British Columbia the black sheep of whitebark pine?

www.nrfirescience.org/resource/14789

This presentation by Randy Moody, Chair Whitebark Pine Ecosystem Foundation Canada, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Restoring whitebark pine ecosystems of the West in the face of climate change

www.nrfirescience.org/resource/13665

Speaker: Robert Keane, Research Ecologist, Rocky Mountain Research Station, USDA Forest Service, Missoula, Montana. Event: Restoring the West Conference 2015 - Restoration and Fire in the Interior West.

Type: Media

Video

Blister rust infection in whitebark and limber pine in the Canadian Rocky Mtns (2003-2014)

www.nrfirescience.org/resource/14786

This presentation by Brenda Shepherd, Conservation Biologist, Jasper National Park of Canada, was part of the 2016 Whitebark Pine Ecosystem Foundation Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent that occurred September 16, 2016 in Whitefish, MT.

Type: Media

Webinar

Whitebark pine response to past climate change and fire activity: are we underestimating the resilience of the species?

www.nrfirescience.org/resource/13287

This is a video recording of a presentation from the 12th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. The presentation focused on using paleoecological records to inform potential future changes in whitebark pine with climate change predictions.

Type: Media

Video