

Post-fire forest regeneration shows limited climate tracking and potential for drought-induced type conversion

www.nrfirescience.org/resource/19037

Disturbance such as wildfire may create opportunities for plant communities to reorganize in response to climate change. The interaction between climate change and disturbance may be particularly important in forests, where many of the foundational plant species (trees) are long-lived and where poor initial tree establishment can...

Author(s): Derek J. N. Young, Chhaya M. Werner, Kevin R. Welch, Truman P. Young, Hugh Safford, Andrew Latimer

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Ponderosa Pine Regeneration, Wildland Fuels Management, and Habitat Conservation: Identifying Trade-Offs Following Wildfire

www.nrfirescience.org/resource/19304

Increasing wildfires in western North American conifer forests have led to debates surrounding the application of post-fire management practices. There is a lack of consensus on whether (and to what extent) post-fire management assists or hinders managers in achieving goals, particularly in understudied regions like eastern...

Author(s): Victoria M. Donovan, Caleb P. Roberts, Carissa L. Wonkka, David A. Wedin, Dirac Twidwell

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Vegetation succession in an old-growth ponderosa pine forest following structural restoration with fire: implications for retreatment and maintenance - JFSP Final Report

www.nrfirescience.org/resource/19272

Stand changes brought on by fire exclusion have contributed to reduced resilience to wildfire in ponderosa pine forests throughout the western US. Growing recognition of how structural attributes influence resilience has led to interest in restoring more heterogeneous conditions once common in these forests, but key information...

Author(s): Eric E. Knapp, Alan H. Taylor, Michelle Coppoletta, Natalie Pawlikowski

Year Published: 2019

Type: Document

Technical Report or White Paper

Whitebark and Foxtail Pine in Yosemite, Sequoia, and Kings Canyon National Parks: Initial Assessment of Stand Structure and Condition

www.nrfirescience.org/resource/18866

The Inventory & Monitoring Division of the U.S. National Park Service conducts long-term monitoring to provide park managers information on the status and trends in biological and environmental attributes including white pines. White pines are foundational species in many subalpine ecosystems and are currently experiencing...

Author(s): Jonathan C. B. Nesmith, Micah Wright, Erik S. Jules, Shawn T. McKinney

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Comparison and integration of lidar and photogrammetric point clouds for mapping pre-fire forest structure

www.nrfirescience.org/resource/19424

Lidar is an established tool for mapping forest structure, but its sparse spatial and temporal coverage often preclude its use in studying forest disturbance. In contrast, aerial imagery has been and continues to be regularly collected in many regions, and advances in stereo image matching have automated the creation of dense...

Author(s): Steven K. Filippelli, Michael A. Lefsky, Monique E. Rocca

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Belowground community responses to fire: meta-analysis reveals contrasting responses of soil microorganisms and mesofauna

www.nrfirescience.org/resource/19216

Global fire regimes are shifting due to climate and land use changes. Understanding the responses of belowground communities to fire is key to predicting changes in the ecosystem processes they regulate. We conducted a comprehensive meta-analysis of 1634 observations from 131 empirical studies to investigate the effect of fire on...

Author(s): Yamina Pressler, John C. Moore, M. Francesca Cotrufo

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

A physiological understanding of organismal responses to fire

www.nrfirescience.org/resource/19390

Devastation of both natural and human habitats due to wildfires is becoming an increasingly prevalent global issue. Fire-adapted and fire-prone regions, such as California and parts of Australia, are experiencing more frequent and increasingly destructive wildfires, accompanied by longer wildfire seasons. Further, wildfires are...

Author(s): Clare Stawski, Anna C. Doty

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Generalized fire response strategies in plants and animals

www.nrfirescience.org/resource/19088

Despite the existing large body of research on plant-animal interactions, plant research and animal research are still relatively independent and asymmetrical in relation to disturbance. Animals and plants are likely to have different fire responses, yet biodiversity studies in relation to disturbance may benefit from a more...

Author(s): Juli G. Pausas

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Historical patterns of fire severity and forest structure and composition in a landscape structured by frequent large fires: Pumice Plateau ecoregion, Oregon, USA

www.nrfirescience.org/resource/19358

Context: Lack of quantitative observations of extent, frequency, and severity of large historical fires constrains awareness of departure of contemporary conditions from those that demonstrated resistance and resilience to frequent fire and recurring drought. Objectives: Compare historical and contemporary fire and forest...

Author(s): R. Keala Hagmann, Andrew G. Merschel, Matthew J. Reilly
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Wildfire activity and land use drove 20th-century changes in forest cover in the Colorado front range

www.nrfirescience.org/resource/19049

Recent shifts in global forest area highlight the importance of understanding the causes and consequences of forest change. To examine the influence of several potential drivers of forest cover change, we used supervised classifications of historical (1938-1940) and contemporary (2015) aerial imagery covering a 2932-km² study area...

Author(s): Kyle Rodman, Thomas T. Veblen, Sara Saraceni, Teresa B. Chapman
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Combining optimization and simulation modelling to measure the cumulative impacts of prescribed fire and wildfire on vegetation species diversity

www.nrfirescience.org/resource/19332

Growth-stage optimization (GSO) offers a new approach to biodiversity conservation in fire-prone regions by estimating the optimal distribution of vegetation growth stages that maximize a species diversity index. This optimal growth-stage structure provides managers an operational goal explicitly linked to a positive...

Author(s): Matthew P. Chick, Alan York, Holly Sitters, Julian Di Stefano, Craig R. Nitschke
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Feast not famine: Nitrogen pools recover rapidly in 25-year-old postfire lodgepole pine

www.nrfirescience.org/resource/19281

The extent of young postfire conifer forests is growing throughout western North America as the frequency and size of high-severity fires increase, making it important to understand ecosystem structure and function in early seral forests. Understanding nitrogen (N) dynamics during postfire stand development is especially important...

Author(s): Monica G. Turner, Timothy G. Whitby, William H. Romme
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Wild bee diversity increases with local fire severity in a fire-prone landscape

www.nrfirescience.org/resource/19428

As wildfire activity increases in many regions of the world, it is imperative that we understand how key components of fire-prone ecosystems respond to spatial variation in fire characteristics. Pollinators provide a foundation for ecological communities by assisting in the reproduction of native plants, yet our understanding of...

Author(s): Sara M. Galbraith, James H. Cane, Andrew R. Moldenke, James W. Rivers
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Postwildfire seeding to restore native vegetation and limit exotic annuals: an evaluation in juniper-dominated sagebrush steppe

www.nrfirescience.org/resource/19222

Reestablishment of perennial vegetation is often needed after wildfires to limit exotic species and restore ecosystem services. However, there is growing body of evidence that questions if seeding after wildfires increases perennial vegetation and reduces exotic plants. The concern that seeding may not meet restoration goals is even...

Author(s): Kirk W. Davies, Jonathan D. Bates, Chad S. Boyd

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Future fire scenarios: predicting the effect of fire management strategies on the trajectory of high-quality habitat for threatened species

www.nrfirescience.org/resource/19421

Prescribed (or 'planned') burning is used by land managers to reduce fuel-loads in order to mitigate the spread of wildfire, thereby protecting life and property, and to promote environmental heterogeneity to enhance biodiversity. Globally, many fire management agencies focus on increasing extent and frequency of prescribed burning...

Author(s): Jemima Connell, Simon J. Watson, Rick S. Taylor, Sarah C. Avitabile, Natasha Schedvin, Kathryn Schneider, Michael F. Clarke

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Peatland vegetation change and establishment of re-introduced Sphagnum moss after prescribed burning

www.nrfirescience.org/resource/19377

Fire, including prescribed burning, is common on peatlands globally and can affect vegetation, including peat-forming Sphagnum mosses, and affect ecosystem services. We monitored vegetation in different burn-age categories at three UK peatland sites over a 19-month period. Half of the plots had Sphagnum fragments added and their...

Author(s): Alice Noble, Sheila M. Palmer, David J. Glaves, Alistair Crowle, Joseph Holden

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Wildfire activity and land use drove 20th-century changes in forest cover in the Colorado front range

www.nrfirescience.org/resource/19087

Recent shifts in global forest area highlight the importance of understanding the causes and consequences of forest change. To examine the influence of several potential drivers of forest cover change, we used supervised classifications of historical (1938-1940) and contemporary (2015) aerial imagery covering a 2932?km² study area...

Author(s): Kyle Rodman, Thomas T. Veblen, Sara Saraceni, Teresa B. Chapman

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Burning increases post-fire carbon emissions in a heathland and a raised bog, but experimental

manipulation of fire severity has no effect

www.nrfirescience.org/resource/19357

Large amounts of carbon are stored in northern peatlands. There is concern that greater wildfire severity following projected increases in summer drought will lead to higher post-fire carbon losses. We measured soil carbon dynamics in a Calluna heathland and a raised peat bog after experimentally manipulating fire severity. A...

Author(s): Roger Grau-Andrés, Alan Gray, G. Matt Davies, E. Marian Scott, Susan Waldron

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Plant community responses to historical wildfire in a shrubland–grassland ecotone reveal hybrid disturbance response

www.nrfirescience.org/resource/18067

Most ecotones include structural and taxonomic elements from both adjacent communities, but it remains unclear how these elements function and interact within ecotones. We investigated long-term plant community responses to wildfire in a 7000 km² ecotone between mixed-grass prairie and sagebrush steppe ecosystems, which have...

Author(s): Lauren M. Porensky, Justin D. Derner, David W. Pellatz

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Simulation of net ecosystem productivity of a lodgepole pine forest after mountain pine beetle attack using a modified version of 3-PG

www.nrfirescience.org/resource/17169

The most recent mountain pine beetle (MPB) (*Dendroctonus ponderosae*) outbreak in British Columbia (BC), which began in the late 1990s, killed 54% of the mature merchantable lodgepole pine and was expected to impact gross primary productivity (GPP), ecosystem respiration (R) and thus net ecosystem productivity (NEP) of infested...

Author(s): Gesa Meyer, T. Andrew Black, Rachhpal S. Jassal, Zoran Nesic, Nicholas C. Coops, Andreas Christen, Arthur L. Fredeen, David L. Spittlehouse, Nicholas J. Grant, Vanessa N. Foord, Rebecca Bowler

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Year in Review: Spotlight on 2017 Research by the Grassland, Shrubland and Desert Ecosystems Science Program

www.nrfirescience.org/resource/18044

In this issue of the GSD Update, we feature selected studies of the RMRS Grassland, Shrubland and Desert Ecosystems Science Program (GSD) that focus on the theme of fire. Significant results of recent research and science delivery by GSD scientists are highlighted. We feature program research that lines up with the strategic...

Year Published: 2018

Type: Document

Research Brief or Fact Sheet

Balancing ecological costs and benefits of fire for population viability of disturbance-dependent butterflies

www.nrfirescience.org/resource/17368

Disturbance is a fundamental ecological process and driver of population dynamics. Ecologists seek to understand the effects of disturbance on ecological systems and to use disturbance to modify habitats degraded by anthropogenic change. Demographic responses by plants to disturbance are often well described, but demographic...

Author(s): Norah Warchola, Elizabeth E. Crone, Cheryl B. Schultz

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Best friends forever: The whitebark pine and Clark's nutcracker

www.nrfirescience.org/resource/18338

The Clark's nutcracker has a mutualistic relationship with the whitebark pine, acting as the tree's main seed dispersal mechanism.

Author(s): Robert E. Keane, Samuel A. Cushman

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Detection of Annual Spruce Budworm Defoliation and Severity Classification Using Landsat Imagery

www.nrfirescience.org/resource/17947

Spruce budworm (SBW) is the most destructive forest pest in eastern forests of North America.

Mapping annual current-year SBW defoliation is challenging because of the large landscape scale of infestations, high temporal/spatial variability, and the short period of time when detection is possible. We used Landsat-5 and Landsat-MSS...

Author(s): Parinaz Rahimzadeh-Bajgiran, Aaron R. Weiskittel, Daniel Kneeshaw, David A. MacLean

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Wildfire-vegetation dynamics affect predictions of climate change impact on bird communities

www.nrfirescience.org/resource/17360

Community-level climate change indicators have been proposed to appraise the impact of global warming on community composition. However, non-climate factors may also critically influence species distribution and biological community assembly. The aim of this paper was to study how fire-vegetation dynamics can modify our ability to...

Author(s): Adrián Regos, Miguel Clavero, Manuela D'Amen, Antoine Guisan, Lluís Brotons

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Do Mixed Fire Regimes Shape Plant Flammability and Post-Fire Recovery Strategies?

www.nrfirescience.org/resource/18301

The development of frameworks for better-understanding ecological syndromes and putative evolutionary strategies of plant adaptation to fire has recently received a flurry of attention, including a new model hypothesizing that plants have diverged into three different plant flammability strategies due to natural selection. We...

Author(s): Helen M. Poulos, Andrew M. Barton, Jasper A. Slingsby, David M. J. S. Bowman

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Anticipating fire?mediated impacts of climate change using a demographic framework

www.nrfirescience.org/resource/17821

Climate change indirectly affects forest ecosystems through changes in the frequency, size, and/or severity of wildfires. In addition to its direct effects prior to fire, climate also influences immediate postfire recruitment, with consequences for future vegetation structure and fire activity. A major uncertainty, therefore...

Author(s): Kimberley T. Davis, Philip E. Higuera, Anna Sala

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Wyoming's forest resources, 2011-2015

www.nrfirescience.org/resource/18841

This report summarizes the most recent inventory of Wyoming's forests based on field data collected between 2011 and 2015. The report includes descriptive highlights and tables of area, numbers of trees, biomass, carbon, volume, growth, mortality, and removals. Most sections and tables are organized by forest type or forest-type...

Author(s): R. Justin DeRose, John D. Shaw, Sara A. Goeking, Kate Marcille, Chelsea P. McIver, James Menlove, Todd A. Morgan, Chris Witt

Year Published: 2018

Type: Document

Research Brief or Fact Sheet

Fire-induced change in floral abundance, density, and phenology benefits bumble bee foragers

www.nrfirescience.org/resource/17345

Fire is a dominant, and well-studied, structuring force in many temperate and semi-arid communities; yet, few studies have investigated the effects of fire on multi-trophic interactions. Here, we ask how fire-induced changes in flowering affect the abundance of bumble bee foragers (*Bombus vosnesenskii*) and whether differences in...

Author(s): John M. Mola, Neal M. Williams

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Common ground on the role of wildfire in forested landscapes of the Western US

www.nrfirescience.org/resource/18204

Wildfire affects the health and well-being of people, yet the science behind its management grapples with uncertainties that have led to scientific debates. In particular, diverging views over how "natural" highseverity fire is in conifer forests across the western US have, in some cases, impeded the effective integration of...

Year Published: 2018

Type: Document

Research Brief or Fact Sheet

Historic frequency and severity of fire in whitebark pine forests of the Cascade Mountain Range, USA

www.nrfirescience.org/resource/16810

Whitebark pine (*Pinus albicaulis* Engelm.) is a foundation species of high elevation forest ecosystems in the Cascade Mountain Range of Oregon, Washington, and British Columbia. We examined fire

evidence on 55 fire history sites located in the Cascade Range. To estimate dates of historic fires we analyzed 57 partial cross-sections...

Author(s): Michael P. Murray, Joel Siderius

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Fire-induced deforestation in drought-prone Mediterranean forests: drivers and unknowns from leaves to communities

www.nrfirescience.org/resource/17750

Over the past 15 years, 3 million hectares of forests have been converted into shrublands or grasslands in the Mediterranean countries of the European Union. Fire and drought are the main drivers underlying this deforestation. Here we present a conceptual framework for the process of fire-induced deforestation based on the...

Author(s): Asaf Karavani, Matthias M. Boer, Mara Baudena, Carlos Colinas, Rubén Díaz-Sierra, Jesús Pemán, Martín de Luis, Álvaro Enríquez-de-Salamanca, Víctor Resco de Dios

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Land surveys show regional variability of historical fire regimes and structure of dry forests of the western USA

www.nrfirescience.org/resource/16421

An understanding of how historical fire and structure in dry forests (ponderosa pine, dry mixed conifer) varied across the western USA remains incomplete. Yet, fire strongly affects ecosystem services, and forest restoration programs are underway. We used General Land Office survey reconstructions from the late-1800s across 11...

Author(s): William L. Baker, Mark A. Williams

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Snowshoe hare multi-level habitat use in a fire-adapted ecosystem

www.nrfirescience.org/resource/17333

Prescribed burning has the potential to improve habitat for species that depend on pyric ecosystems or other early successional vegetation types. For species that occupy diverse plant communities over the extent of their range, response to disturbances such as fire might vary based on post-disturbance vegetation dynamics among plant...

Author(s): Laura C. Gigliotti, Benjamin C. Jones, Matthew J. Lovallo, Duane R. Diefenbach

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Annual climate impacts on tree growth and post-fire regeneration in ponderosa pine and Douglas-fir in the northern Rocky Mountains

www.nrfirescience.org/resource/18153

This thesis includes two studies focused on quantifying the impacts of climate change, climate variability, and wildfires on forest dynamics. In Chapter 1, I compared the accuracy of field-based methods to precise dendrochronological techniques to age ponderosa pine and Douglas-fir seedlings sampled from three study regions across...

Author(s): Lacey Hankin

Year Published: 2018
Type: Document
Dissertation or Thesis

Do Perennial Bunchgrasses Competitively Exclude *Bromus tectorum* in Post-Fire Rehabilitation? - JFSP Final Report

www.nrfirescience.org/resource/17720

Globally, wildfire size and frequency has increased in the last thirty years across numerous ecosystems. Models predict that trend to continue with increases in temperature and shifts in seasonal precipitation caused by climate change. In the western United States, these trends are exacerbated by invasive annual grasses that create...

Author(s): Eva K. Strand, Beth A. Newingham, Chris Bowman-Prideaux

Year Published: 2018

Type: Document

Technical Report or White Paper

Effects of climate change on ecological disturbance in the Northern Rockies (Chapter 7)

www.nrfirescience.org/resource/17279

Disturbances alter ecosystem, community, or population structures and change elements of the biological and/or physical environment. Climate changes can alter the timing, magnitude, frequency, and duration of disturbance events, as well as the interactions of disturbances on a landscape, and climate change may already be affecting...

Author(s): Rachel A. Loehman, Barbara J. Bentz, Gregg DeNitto, Robert E. Keane, Mary Manning, Jacob P. Duncan, Joel M. Egan, Marcus B. Jackson, Sandra Kegley, I. Blakley Lockman, Dean E. Pearson, James A. Powell, Steve Shelly, Brytten E. Steed, Paul J. Zambino

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Multitemporal LiDAR improves estimates of fire severity in forested landscapes

www.nrfirescience.org/resource/18124

Landsat-based fire severity maps have limited ecological resolution, which can hinder assessments of change to specific resources. Therefore, we evaluated the use of pre- and post-fire LiDAR, and combined LiDAR with Landsat-based relative differenced Normalized Burn Ratio (RdNBR) estimates, to increase the accuracy and resolution of...

Author(s): Michael S. Hoe, Christopher J. Dunn, Hailemariam Temesgen

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Spectrophotometry of *Artemisia tridentata* to quantitatively determine subspecies

www.nrfirescience.org/resource/16752

Ecological restoration is predicated on our abilities to discern plant taxa. Taxonomic identification is a first step in ensuring that plants are appropriately adapted to the site. An example of the need to identify taxonomic differences comes from big sagebrush (*Artemisia tridentata*). This species is composed of three predominant...

Author(s): Bryce A. Richardson, Alicia A. Boyd, Tanner Tobiasson, Matthew J. Germino

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Composition and Structure of Forest Fire Refugia: What Are the Ecosystem Legacies across Burned Landscapes?

www.nrfirescience.org/resource/17619

Locations within forest fires that remain unburned or burn at low severity—known as fire refugia—are important components of contemporary burn mosaics, but their composition and structure at regional scales are poorly understood. Focusing on recent, large wildfires across the US Pacific Northwest (Oregon and Washington), our...

Author(s): Garrett W. Meigs, Meg A. Krawchuk

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Wildfires managed for restoration enhance ecological resilience

www.nrfirescience.org/resource/17222

Expanding the footprint of natural fire has been proposed as one potential solution to increase the pace of forest restoration programs in fire-adapted landscapes of the western USA. However, studies that examine the long-term socio-ecological trade-offs of expanding natural fire to reduce wildfire risk and create fire...

Author(s): Ana M. G. Barros, Alan A. Ager, Michelle A. Day, Meg A. Krawchuk, Thomas A. Spies

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Bridging the Divide: Integrating Animal and Plant Paradigms to Secure the Future of Biodiversity in Fire-Prone Ecosystems

www.nrfirescience.org/resource/18075

Conserving animals and plants in fire-prone landscapes requires evidence of how fires affect modified ecosystems. Despite progress on this front, fire ecology is restricted by a dissonance between two dominant paradigms: 'fire mosaics' and 'functional types'. The fire mosaic paradigm focuses on animal responses to fire...

Author(s): Luke T. Kelly, Lluís Brotons, Katherine M. Giljohann, Michael A. McCarthy, Juli G. Pausas, Annabel L. Smith

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Fire regimes approaching historic norms reduce wildfire-facilitated conversion from forest to non-forest

www.nrfirescience.org/resource/17545

Extensive high-severity wildfires have driven major losses of ponderosa pine and mixed-conifer forests in the southwestern United States, in some settings catalyzing enduring conversions to non-forested vegetation types. Management interventions to reduce the probability of stand-replacing wildfire have included mechanical...

Author(s): Ryan B. Walker, Jonathan D. Coop, Sean A. Parks, Laura Trader

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Ten Years of Monitoring Illustrates a Cascade of Effects of White Pine Blister Rust and Focuses Whitebark Pine Restoration in the Canadian Rocky and Columbia Mountains

www.nrfirescience.org/resource/17189

Whitebark pine forests are declining due to infection by white pine blister rust and mountain pine beetle, combined with the effects of climate change and fire suppression. The Canadian Rocky and Columbia Mountains represent a large portion of the whitebark range; a vast area, exemplifying the need for knowledge about whitebark pine...

Author(s): Brenda Shepherd, Brad Jones, Robert Sissons, Jed Cochrane, Jane Park, Cyndi M. Smith, Natalie Staff

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Change of clonal frequency in the second root sucker generation of hybrid aspen

www.nrfirescience.org/resource/16718

Two hybrid aspen (*Populus tremula* L. x *P. tremuloides* Michx.) trials in southern Sweden were used for studies of clonal composition in the second of two root sucker regenerations. Trial 1 was established in 1998 and originally included eight clones randomly distributed in four plots, each having 10x10 positions. Trial 2 was planted...

Author(s): Lars-Göran Stener, Dainis Rungis, Viktorija Belevich, Johan Malm

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Drought, tree mortality, and wildfire in forests adapted to frequent fire

www.nrfirescience.org/resource/17144

Massive tree mortality has occurred rapidly in frequent-fire-adapted forests of the Sierra Nevada, California. This mortality is a product of acute drought compounded by the long-established removal of a key ecosystem process: frequent, low- to moderate-intensity fire. The recent tree mortality has many implications for the future...

Author(s): Scott L. Stephens, Brandon M. Collins, Christopher J. Fettig, Mark A. Finney, Chad M. Hoffman, Eric E. Knapp, Malcolm P. North, Hugh Safford, Rebecca Bewley Wayman

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Does repeated high severity fire in dry mixed conifer forests homogenize vegetation characteristics across scales? - JFSP Final Report

www.nrfirescience.org/resource/18039

When disturbances recur at rates shorter than an ecosystems rate of recovery, it has the potential to result in significant changes to ecosystem structure and function. In western US forests, wildfire activity has increased and many severely burned areas are now re-burning before reforestation occurs. Historically, some of these...

Historically, some of these...

Author(s): Kristen L. Shive, Scott L. Stephens

Year Published: 2018

Type: Document

Technical Report or White Paper

Biological and geophysical feedbacks with fire in the Earth system

www.nrfirescience.org/resource/17407

Roughly 3% of the Earth's land surface burns annually, representing a critical exchange of energy and matter between the land and atmosphere via combustion. Fires range from slow smouldering peat fires, to low-intensity surface fires, to intense crown fires, depending on vegetation structure, fuel moisture,

prevailing climate, and...

Author(s): Sally Archibald, Caroline E. R. Lehmann, Claire M. Belcher, William J. Bond, Ross A. Bradstock, Anne Laure Daniau, K. G. Dexter, Elisabeth J. Forrestel, M. Greve, Tianhua He, Steven I. Higgins, William A. Hoffmann, Byron B. Lamont, D. J. McGlenn, G. R. Moncrieff, Colin P. Osborne, Juli G. Pausas, Owen F. Price, Brad S. Ripley, Brendan M. Rogers, Dylan W. Schwilk, M. F. Simon, Merritt R. Turetsky, Guido R. Van der Werf, Amy E. Zanne

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

It takes a few to tango: changing climate and fire regimes can cause regeneration failure of two subalpine conifers

www.nrfirescience.org/resource/18334

Environmental change is accelerating in the 21st century, but how multiple drivers may interact to alter forest resilience remains uncertain. In forests affected by large high-severity disturbances, tree regeneration is a resilience linchpin that shapes successional trajectories for decades. We modeled stands of two widespread...

Author(s): Winslow D. Hansen, Kristin H. Braziunas, Werner Rammer, Rupert Seidl, Monica G. Turner

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Anticipating fire-mediated impacts of climate change using a demographic framework

www.nrfirescience.org/resource/17910

Climate change indirectly affects forest ecosystems through changes in the frequency, size, and/or severity of wildfires. In addition to its direct effects prior to fire, climate also influences immediate postfire recruitment, with consequences for future vegetation structure and fire activity. A major uncertainty, therefore, is if...

Author(s): Kimberley T. Davis, Philip E. Higuera, Anna Sala

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Vertical distribution of foliar biomass in western larch (*Larix occidentalis*)

www.nrfirescience.org/resource/16444

Western larch (*Larix occidentalis* Nutt.) is an endemic pioneer species in northwestern North America and unique as a deciduous conifer and the most shade-intolerant, fastest growing, and most fire-resistant species in the northwestern United States. To better understand its production ecology, we used a multilevel modeling approach...

Author(s): Geoffrey M. Williams, Andrew S. Nelson, David L.R. Affleck

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Natural Areas Association Fire Compendium 2

www.nrfirescience.org/resource/18853

The Natural Areas Association Fire Compendium 2 compiles articles published in the Natural Areas Journal from 2010 to 2017. This is a supplement to the NAA Fire Compendium that was compiled in 2010 for articles published from 1983 to 2009. Like the first compendium, articles in the Fire Compendium 2 focus on fire ecology and...

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

Unearthing belowground bud banks in fire-prone ecosystems

www.nrfirescience.org/resource/17350

Despite long-time awareness of the importance of the location of buds in plant biology, research on belowground bud banks has been scant. Terms such as lignotuber, xylopodium and sobole, all referring to belowground bud-bearing structures, are used inconsistently in the literature. Because soil efficiently insulates meristems from...

Author(s): Juli G. Pausas, Byron B. Lamont, Susana Paula, Beatriz Appezzato-da-Glória, Alessandra Fidelis

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

Vegetation succession in post-fire seeding treatments - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/18258

Seed mixes used for post-fire seeding in the Great Basin are often selected based on short-term rehabilitation objectives, such as ability to rapidly establish and suppress invasive exotic annuals that drive altered fire-regimes via fine build-up (e.g. cheatgrass, *Bromus tectorum* L.), but longer-term considerations are also...

Author(s): Francis F. Kilkenny, Jeffrey E. Ott, Daniel D. Summers, Tyler W. Thompson

Year Published: 2018

Type: Document
Technical Report or White Paper

Modelling the management of forest ecosystems: Importance of wood decomposition

www.nrfirescience.org/resource/17790

Scarce and uncertain data on woody debris decomposition rates are available for calibrating forest ecosystem models, owing to the difficulty of their empirical estimations. Using field data from three experimental sites which are part of the North American Long-Term Soil Productivity (LTSP) Study in south-eastern British Columbia (...)

Author(s): Juan A. Blanco, Deborah S. Page-Dumroese, Martin F. Jurgensen, Michael P. Curran, Joanne M. Tirocke, Joanna Walitalo

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

Prescribed fire regimes subtly alter ponderosa pine forest plant community structure

www.nrfirescience.org/resource/18802

Prescribed fire is an active management tool used to address wildfire hazard and ecological concerns associated with fire exclusion and suppression over the past century. Despite widespread application in the United States, there is considerable inconsistency and lack of information regarding the extent to which specific outcomes...

Author(s): Becky K. Kerns, Michelle A. Day

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

Are germination cues for soil-stored seed banks different in structurally different fire-prone communities?

www.nrfirescience.org/resource/17336

Many plant species are dependent on soil-stored seeds for their persistence in fire-prone systems. Seed germination is often stimulated by fire-related cues including heat and smoke, but the way these cues promote germination may differ between structurally distinct plant communities with historically different fire regimes. In this...

Author(s): Gloria Neo Maikano, Janet S. Cohn, Julian Di Stefano

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Common ground on the role of wildfire in forested landscapes of the western United States

www.nrfirescience.org/resource/18203

For millennia, wildfires have markedly influenced forests and non-forested landscapes of the western United States (US), and they are increasingly seen as having substantial impacts on society and nature. There is growing concern over what kinds and amounts of fire will achieve desirable outcomes and limit harmful effects on people...

Author(s): Max A. Moritz, Christopher Topik, Craig D. Allen, Paul F. Hessburg, Penelope Morgan, Dennis C. Odion, Thomas T. Veblen, Ian M. McCullough

Year Published: 2018

Type: Document

Technical Report or White Paper

Fine-scale spatial climate variation and drought mediate the likelihood of reburning

www.nrfirescience.org/resource/16808

In many forested ecosystems, it is increasingly recognized that the probability of burning is substantially reduced within the footprint of previously burned areas. This self-limiting effect of wildland fire is considered a fundamental emergent property of ecosystems and is partly responsible for structuring landscape heterogeneity...

Author(s): Sean A. Parks, Marc-Andre Parisien, Carol Miller, Lisa M. Holsinger, Scott L. Baggett

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

From the stand?scale to the landscape?scale: predicting the spatial patterns of forest regeneration after disturbance

www.nrfirescience.org/resource/17733

Shifting disturbance regimes can have cascading effects on many ecosystems processes. This is particularly true when the scale of the disturbance no longer matches the regeneration strategy of the dominant vegetation. In the yellow pine and mixed conifer forests of California, over a century of fire exclusion and the warming climate...

Author(s): Kristen L. Shive, Haiganoush K. Preisler, Kevin R. Welch, Hugh Safford, Ramona J. Butz, Kevin L. O'Hara, Scott L. Stephens

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Survey design for precise fire management conservation targets

www.nrfirescience.org/resource/17305

Common goals of ecological fire management are to sustain biodiversity and minimize extinction risk. A

novel approach to achieving these goals determines the relative proportions of vegetation growth stages (equivalent to successional stages, which are categorical representations of time since fire) that maximize a biodiversity...

Author(s): Holly Sitters, Julian Di Stefano, Timothy J. Wills, Matthew Swan, Alan York

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Assessing High-Cost Wildfires in Relation to the Natural Distribution of Ponderosa Pine in the 11 Western States (2000-2017)

www.nrfirescience.org/resource/18147

This coarse-resolution assessment suggests that much of the West's wildfire problem traces to the deteriorated condition of its dry ponderosa pine sites.

Author(s): Jerry T. Williams, Matthew Panunto

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Dormant-Season Fire Inhibits Sixweeks Fescue and Enhances Forage Production in Shortgrass Steppe

www.nrfirescience.org/resource/17672

Semiarid rangelands experience substantial interannual variability in precipitation, which can determine the relative abundance of species in any given year and influence the way that fire affects plant community composition and productivity. Long-term studies are needed to examine potential interactions between fluctuating...

Author(s): N. A. Dufek, David J. Augustine, Dana M. Blumenthal, Julie A. Kray, Justin D. Derner

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Looking beyond the mean: Drivers of variability in postfire stand development of conifers in Greater Yellowstone

www.nrfirescience.org/resource/18421

High-severity, infrequent fires in forests shape landscape mosaics of stand age and structure for decades to centuries, and forest structure can vary substantially even among same-aged stands. This variability among stand structures can affect landscape-scale carbon and nitrogen cycling, wildlife habitat availability, and...

Author(s): Kristin H. Braziunas, Winslow D. Hansen, Rupert Seidl, Werner Rammer, Monica G. Turner

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Climate Change and Rocky Mountain Ecosystems

www.nrfirescience.org/resource/17274

Climate Change and Rocky Mountain Ecosystems describes the results of a cutting-edge effort to assess climate change vulnerabilities and develop adaptation options for ecosystems in the Northern Rocky Mountains region of the United States, focusing on national forests, grasslands, and parks in Northern Idaho, Montana, North Dakota,...

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Environmental, Structural, and Disturbance Influences over Forest Floor Components in Interior Douglas-Fir Forests of the Intermountain West, USA

www.nrfirescience.org/resource/18077

Downed woody material (DWM) is a key component in forest ecosystems with age, structure, and disturbance described as primary factors that influence DWM dynamics. In particular, much emphasis is placed on large coarse woody debris (CWD). Fine woody debris (FWD) (less than 7.62 cm diameter), duff, and litter also contribute to carbon...

Author(s): Andrew D. Giunta, John D. Shaw

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Fire Severity and Regeneration Strategy Influence Shrub Patch Size and Structure Following Disturbance

www.nrfirescience.org/resource/17204

Climate change is increasing the frequency and extent of high-severity disturbance, with potential to alter vegetation community composition and structure in environments sensitive to tipping points between alternative states. Shrub species display a range of characteristics that promote resistance and resilience to disturbance, and...

Author(s): Jesse Minor, Donald A. Falk, Greg A. Barron-Gafford

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Evidence of compounded disturbance effects on vegetation recovery following high-severity wildfire and spruce beetle outbreak

www.nrfirescience.org/resource/16510

Spruce beetle (*Dendroctonus rufipennis*) outbreaks are rapidly spreading throughout subalpine forests of the Rocky Mountains, raising concerns that altered fuel structures may increase the ecological severity of wildfires. Although many recent studies have found no conclusive link between beetle outbreaks and increased fire size or...

Author(s): Amanda R. Carlson, Jason S. Sibold, Timothy J. Assal, Jose F. Negrón

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Fires following Bark Beetles: Factors Controlling Severity and Disturbance Interactions in Ponderosa Pine

www.nrfirescience.org/resource/16727

Previous studies have suggested that bark beetles and fires can be interacting disturbances, whereby bark beetle–caused tree mortality can alter the risk and severity of subsequent wildland fires. However, there remains considerable uncertainty around the type and magnitude of the interaction between fires following bark beetle...

Author(s): Carolyn Hull Sieg, Rodman Linn, F. Pimont, Chad M. Hoffman, Joel D. McMillin, Judith Winterkamp, Scott L. Baggett

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Disturbance and productivity interactions mediate stability of forest composition and structure

www.nrfirescience.org/resource/16499

Fire is returning to many conifer-dominated forests where species composition and structure have been altered by fire exclusion. Ecological effects of these fires are influenced strongly by the degree of forest change during the fire-free period. Response of fire-adapted species assemblages to extended fire-free intervals is highly...

Author(s): Christopher D. O'Connor, Donald A. Falk, Ann M. Lynch, Thomas W. Swetnam, Craig P. Wilcox

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

A review and classification of interactions between forest disturbance from wind and fire

www.nrfirescience.org/resource/16702

Current research on interactions between ecological disturbances emphasizes the potential for greatly enhanced ecological effects that may occur when disturbances interact. Much less attention has focused on the possibility of disturbance interactions that buffer ecological change. In this review, we discuss and classify evidence...

Author(s): Jeffery B. Cannon, Chris J. Peterson, Joseph J. O'Brien, J. Steven Brewer

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Long-term impacts of wildfire on fuel loads, vegetation composition, and potential fire behavior and management in sagebrush-dominated ecosystems - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17010

An understanding of the long-term vegetation structure, patterns of fuel succession, and potential for reburn in sagebrush-dominated ecosystems is important for managing the landscape at a temporal scale that is appropriate for the ecological interactions in these systems. Our overarching research objective was to fill existing...

Author(s): Lisa M. Ellsworth, J. Boone Kauffman

Year Published: 2017

Type: Document

Technical Report or White Paper

Site preparation severity influences lodgepole pine plant community composition, diversity, and succession over 25 years

www.nrfirescience.org/resource/16474

Lodgepole pine (*Pinus contorta* var. *latifolia* Engelm.) ecosystems of central British Columbia face cumulative stresses, and management practices are increasingly scrutinized. We addressed trade-offs between "light-on-the-land" versus more aggressive silvicultural approaches by examining plant communities and indicator species (...)

Author(s): Sybille Haeussler, Torsten Kaffanke, Jacob O. Boateng, John McClarnon, Lorne Bedford

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Restoration of the iconic Pando aspen clone: emerging evidence of recovery

www.nrfirescience.org/resource/14933

Quaking aspen (*Populus tremuloides* Michx.) is being stressed across the America West from a variety

of sources including drought, herbivory, fire suppression, development, and past management practices. Rich assemblages of plants and animals that utilize aspen forests, as well as economic values of tourism, grazing, hunting,...

Author(s): Paul C. Rogers, Jody A. Gale

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Interactions of landscape disturbances and climate change dictate ecological pattern and process: spatial modeling of wildfire, insect, and disease dynamics under future climates

www.nrfirescience.org/resource/15531

Context: Interactions among disturbances, climate, and vegetation influence landscape patterns and ecosystem processes. Climate changes, exotic invasions, beetle outbreaks, altered fire regimes, and human activities may interact to produce landscapes that appear and function beyond historical analogs. Objectives We used the...

Author(s): Rachel A. Loehman, Robert E. Keane, Lisa M. Holsinger, Zhiwei Wu

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

Forest succession along a productivity gradient following fire exclusion

www.nrfirescience.org/resource/16658

Numerous studies have documented significant change in conifer forests of the American West following the cessation of recurrent fire at the end of the 19th century. But the successional dynamics that characterize different forested settings in the absence of fire remain poorly understood. This study reconstructs structural and...

Author(s): James D. Johnston

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Reburns and fire-on-fire interactions in the U.S. northern Rockies forests 1900-2014

www.nrfirescience.org/resource/15307

The interactions of fire on the landscape between 1900 and 2014 are explored in this master's thesis. A description of its content is not yet available from University of Idaho.

Author(s): Justin Barton Lauer

Year Published: 2017

Type: Document

Slow awakening: ecology's role in shaping forest fire policy

www.nrfirescience.org/resource/19236

Soon after its inception in the early 1900s the U.S. Forest Service adopted a policy that can be described as “fire exclusion,” based on the view that forest fires were unnecessary and a menace.¹ In the late 1970s, however, the agency was compelled by facts on the ground to begin transitioning to managing fire as an inherent...

Author(s): Stephen F. Arno

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Climatic conditions for emergence and flight of mountain pine beetle: implications for long-distance dispersal

www.nrfirescience.org/resource/16454

A significant shift in the mountain pine beetle (*Dendroctonus ponderosae* Hopkins, 1902) range has been attributed to long-distance dispersal from the observed spatiotemporal patterns of beetle infestations in the recent outbreak in western Canada. However, long-distance dispersal is still the least understood aspect of mountain pine...

Author(s): Huapeng Chen, Peter L. Jackson

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Estimating aboveground tree biomass for beetle-killed lodgepole pine in the Rocky Mountains of northern Colorado

www.nrfirescience.org/resource/16593

The recent mountain pine beetle (*Dendroctonus ponderosae* Hopkins) epidemic has affected millions of hectares of conifer forests in the Rocky Mountains. Land managers are interested in using biomass from beetle-killed trees for bioenergy and biobased products, but they lack adequate information to accurately estimate biomass in...

Author(s): Woodam Chung, Paul Evangelista, Nathaniel Anderson, Anthony Vorster, Hee Han, Krishna Poudel, Robert Sturtevant

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Fire regimes of ponderosa pine communities in the Black Hills and surrounding areas

www.nrfirescience.org/resource/16433

Wildfire is an important disturbance in ponderosa pine communities in the Black Hills and surrounding areas. Effective management of these communities requires an understanding of historical fire regimes. This review provides a synthesis of the available scientific literature on historical patterns and contemporary changes in fuels...

Author(s): Shannon K. Murphy

Year Published: 2017

Type: Document

Synthesis

Characterizing interactions between fire and other disturbances and their impacts on tree

mortality in western U.S. forests

www.nrfirescience.org/resource/16268

Increasing evidence that pervasive warming trends are altering disturbance regimes and their interactions with fire has generated substantial interest and debate over the implications of these changes. Previous work has primarily focused on conditions that promote non-additive interactions of linked and compounded disturbances, but...

Author(s): Jeffrey M. Kane, J. Morgan Varner, Margaret R. Metz, Phillip J. van Mantgem

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Using resilience and resistance concepts to manage persistent threats to sagebrush ecosystems and greater sage-grouse

www.nrfirescience.org/resource/16558

Conservation of imperiled species often demands addressing a complex suite of threats that undermine species viability. Regulatory approaches, such as the US Endangered Species Act (1973), tend to focus on anthropogenic threats through adoption of policies and regulatory mechanisms. However, persistent ecosystem-based threats, such...

Author(s): Jeanne C. Chambers, Jeremy D. Maestas, David A. Pyke, Chad S. Boyd, Michael L. Pellant, Amarina Wuenschel

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Pretreatment tree dominance and conifer removal treatments affect plant succession in sagebrush communities

www.nrfirescience.org/resource/16547

In sagebrush (*Artemisia tridentata* Nutt.) ecosystems, expansion and infilling of conifers decreases the abundance of understory perennial vegetation and lowers ecosystem resilience and resistance of the once shrub grass ? dominated state. We prescribed burned or cut juniper (*Juniperus* spp. L.) and pinyon (*Pinus* spp. L.) trees at...

Author(s): Rachel E. Williams, Bruce A. Roundy, April Hulet, Richard F. Miller, Robin J. Tausch, Jeanne C. Chambers, Jeffrey Matthews, Robert Schooley, Dennis Eggett

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Removal of perennial herbaceous species affects response of cold desert scrublands to fire

www.nrfirescience.org/resource/16529

Two of the primary global change factors that threaten shrublands worldwide are loss of native perennial herbaceous species due to inappropriate livestock grazing and loss of native shrubs due to altered fire regimes. We asked: (1) how do the separate and interacting effects of removal of perennial herbaceous species and burning...

Author(s): Jeanne C. Chambers, David Board, Bruce A. Roundy, Peter J. Weisberg

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Learn from the burn: The High Park Fire 5 years later

www.nrfirescience.org/resource/16520

It has been 5 years since the High Park Fire burned over 85,000 acres in Northern Colorado, causing

extensive property damage, loss of life, and severe impacts to the water quality of the Poudre River. In the fall of 2016, a conference was organized by the USFS Rocky Mountain Research Station and the Coalition for the Poudre River...

Author(s): Charles C. Rhoades, Peter R. Robichaud, Sandra E. Ryan, Jen Kovecses, Carl Chambers, Sara Rathburn, Jared Heath, Stephanie Kampf, Codie Wilson, Dan Brogan, Brad Piehl, Mary Ellen Miller, John Giordanengo, Erin Berryman, Monique E. Rocca

Year Published: 2017

Type: Document

Research Brief or Fact Sheet

The Influence of Western Spruce Budworm on Fire in Spruce-Fir Forests

www.nrfirescience.org/resource/16730

Western spruce budworm (*Choristoneura freemani* Razowski; WSBW) is the most significant defoliator of coniferous trees in the western United States. Despite its important influence on Western forests, there are still gaps in our knowledge of WSBW's impact on fire, and little research has been done on this relationship in high-...

Author(s): Eric Vane, Kristen M. Waring, Adam Polinko

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Guide to Quaking Aspen Ecology and Management

www.nrfirescience.org/resource/16371

In this field guide, I use a "systems approach" to aspen ecology and management. We have learned much, though perhaps not adequately communicated, about varying aspen types around our region (Rogers et al. 2014). For example, what new information is available about fire behavior in aspen, and how might we best apply that...

Author(s): Paul C. Rogers

Year Published: 2017

Type: Document

Technical Report or White Paper

Ecological effects of fire

www.nrfirescience.org/resource/16500

Fire is an enormously influential disturbance over large areas of land in the modern world. Vegetation burns because the Earth's atmosphere contains sufficient oxygen (415%) to support combustion (Pyne, 2001). Oxygen started to accumulate in the atmosphere about 2 billion years ago and, since the appearance of plants in the...

Author(s): William J. Bond, Robert E. Keane

Year Published: 2017

Type: Document

Synthesis

Climate variability and fire effects on quaking aspen in the central Rocky Mountains, USA

www.nrfirescience.org/resource/14978

Our understanding of how climate and fire have impacted quaking aspen (*Populus tremuloides* Michx.) communities prior to the 20th century is fairly limited. This study analysed the period between 4500 and 2000 cal. yr BP to assess the pre-historic role of climate and fire on an aspen community during an aspen-dominated period.

Author(s): Vachel A. Carter, Andrea R. Brunelle, John D. Shaw, Thomas A. Minckley, R. Justin DeRose, Simon C. Brewer

Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Simulations Inform Design Of Regional Occupancy-Based Monitoring For A Sparsely Distributed, Territorial Species

www.nrfirescience.org/resource/17463

Sparsely distributed species attract conservation concern, but insufficient information on population trends challenges conservation and funding prioritization. Occupancy-based monitoring is attractive for these species, but appropriate sampling design and inference depend on particulars of the study system. We employed spatially...

Author(s): Quresh Latif, Martha M. Ellis, Victoria A. Saab, Kim Mellen-McLean

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Fens and their rare plants in the Beartooth Mountains, Shoshone National Forest, Wyoming

www.nrfirescience.org/resource/15589

Fens are common wetlands in the Beartooth Mountains on the Shoshone National Forest, Clarks Fork Ranger District, in Park County, Wyoming. Fens harbor plant species found in no other habitats, and some rare plants occurring in Beartooth fens are found nowhere else in Wyoming. This report summarizes the studies on Beartooth fens from...

Author(s): Bonnie Heidel, Walter Fertig, Sabine Mellmann-Brown, Kent E. Houston, Kathleen A. Dwire

Year Published: 2017

Type: Document

Technical Report or White Paper

Post-fire vegetation response at the woodland-shrubland interface is mediated by the pre-fire community

www.nrfirescience.org/resource/16496

Understanding the drivers of ecosystem responses to disturbance is essential for management aimed at maintaining or restoring ecosystem processes and services, especially where invasive species respond strongly to disturbance. In this study, we used repeat vegetation surveys from a network of prescribed fire treatments at the...

Author(s): Alexandra K. Urza, Peter J. Weisberg, Jeanne C. Chambers, Jessica M. Dhaemers, David Board

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Populus tremuloides seedling establishment: An underexplored vector for forest type conversion after multiple disturbances

www.nrfirescience.org/resource/16697

Ecosystem resilience to climate change is contingent on post-disturbance plant regeneration. Sparse gymnosperm regeneration has been documented in subalpine forests following recent wildfires and compounded disturbances, both of which are increasing. In the US Intermountain West, this may cause a shift to non-forest in some areas,...

Author(s): Nathan S. Gill, Florencia Sangermano, Brian Buma, Dominik Kulakowski

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Post-fire forest regeneration in a changing climate - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17003

Severe disturbance such as wildfire may create important opportunities for plant communities to reorganize in response to environmental change, including climate change. Disturbance may be particularly important in forests where the foundational plant species (trees) are long-lived and usually establish soon after disturbance. The...

Author(s): Derek J. N. Young, Andrew Latimer

Year Published: 2017

Type: Document

Technical Report or White Paper

Indicators of burn severity at extended temporal scales: A decade of ecosystem response in mixed conifer forests of western Montana

www.nrfirescience.org/resource/15315

We collected field and remotely sensed data spanning 10 years after three 2003 Montana wildfires to monitor ecological change across multiple temporal and spatial scales. Multiple endmember spectral mixture analysis was used to create post-fire maps of: char, soil, green (GV) and non-photosynthetic (NPV) vegetation from high-...

Author(s): Sarah A. Lewis, Andrew T. Hudak, Peter R. Robichaud, Penelope Morgan, K.L. Satterberg, Eva K. Strand, Alistair M. S. Smith, J Zamudio, Leigh B. Lentile

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

A multicentury dendrochronological reconstruction of western spruce budworm outbreaks in the Okanogan Highlands, northeastern Washington

www.nrfirescience.org/resource/16464

The western spruce budworm (*Choristoneura occidentalis occidentalis* Freeman) is recognized as the most ecologically and economically damaging defoliator in western North America. Synchronous western spruce budworm outbreaks can occur over much of a host species' range, causing widespread limb and tree mortality, regeneration...

Author(s): Todd M. Ellis, Aquila Flower

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Prescribed fire in grassland butterfly habitat: targeting weather and fuel conditions to reduce soil temperature and burn severity

www.nrfirescience.org/resource/16319

Prescribed burning is a primary tool for habitat restoration and management in fire-adapted grasslands. Concerns about detrimental effects of burning on butterfly populations, however, can inhibit implementation of treatments. Burning in cool and humid conditions is likely to result in lowered soil temperatures and to produce...

Author(s): Kathryn C. Hill, Jonathan D. Bakker, Peter W. Dunwiddie

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Assessment of aspen ecosystem vulnerability to climate change for the Uinta-Wasatch-Cache and Ashley National Forests, Utah

www.nrfirescience.org/resource/16600

Aspen ecosystems are valued because they add biodiversity and ecological value to the landscape. They provide rich and productive habitats and increase aesthetic value. Climate change poses the risk of altering and disrupting these ecosystems, and it may worsen the effects of non-climate stressors. To provide scientific information...

Author(s): Janine Rice, Tim Bardsley, Pete Gomben, Dustin Bambrough, Stacey Weems, Allen Huber, Linda A. Joyce

Year Published: 2017

Type: Document

Technical Report or White Paper

Using landscape genetics simulations for planting blister rust resistant whitebark pine in the US northern Rocky Mountains

www.nrfirescience.org/resource/16568

Recent population declines to the high elevation western North America foundation species whitebark pine, have been driven by the synergistic effects of the invasive blister rust pathogen, mountain pine beetle (MPB), fire exclusion, and climate change. This has led to consideration for listing whitebark pine (WBP) as a threatened or...

Author(s): Erin L. Landguth, Zachary A. Holden, M. F. Mahalovich, Samuel A. Cushman

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Artemisia tridentata subsp. vaseyana (mountain big sagebrush)

www.nrfirescience.org/resource/16200

Mountain big sagebrush is a widely distributed shrub native to the western United States. Mountain big sagebrush ecosystems support hundreds of plant and animal species, including several sagebrush obligates. The distribution of mountain big sagebrush has been reduced since European-American settlement, and is likely to be further...

Author(s): Robin J. Innes

Year Published: 2017

Type: Document

Synthesis

GSD Update: Year in Review: Spotlight on 2016 Research by the Grassland, Shrubland and Desert Ecosystems Science Program

www.nrfirescience.org/resource/16548

In this issue of the GSD Update, we take a look back at selected studies of the Grassland, Shrubland and Desert Ecosystems Science Program (GSD) that depict its strengths and focus areas. Significant results of recent research and science delivery by GSD scientists are highlighted. We feature program research that lines up with the...

Author(s): Deborah M. Finch

Year Published: 2017

Type: Document

Management or Planning Document

Landscape-scale quantification of fire-induced change in canopy cover following mountain pine beetle outbreak and timber harvest

www.nrfirescience.org/resource/15137

Across the western United States, the three primary drivers of tree mortality and carbon balance are bark beetles, timber harvest, and wildfire. While these agents of forest change frequently overlap, uncertainty remains regarding their interactions and influence on specific subsequent fire effects such as change in canopy cover....

Author(s): T. Ryan McCarley, Crystal A. Kolden, Nicole M. Vaillant, Andrew T. Hudak, Alistair M. S. Smith, Jason Kreitler

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Pando's lessons: restoration of a giant aspen clone

www.nrfirescience.org/resource/16378

A 106 acre (43 ha) aspen clone lives in the Fishlake National Forest in south-central Utah. Clones are comprised of multiple aspen stems, called ramets, which are genetically identical. This particular colony of ramets was named "Pando" (Latin for "I spread") by researchers believing it to be the largest living organism on...

Year Published: 2017

Type: Document

Research Brief or Fact Sheet

Spatial patterns of ponderosa pine regeneration in high-severity burn patches

www.nrfirescience.org/resource/16541

Contemporary wildfires in southwestern US ponderosa pine forests can leave uncharacteristically large patches of tree mortality, raising concerns about the lack of seed-producing trees, which can prevent or significantly delay ponderosa pine regeneration. We established 4-ha plots in high-severity burn patches in two Arizona...

Author(s): Suzanne M. Owen, Carolyn Hull Sieg, Andrew Sanchez Meador, Peter Z. Fule, Jose M. Iniguez, Scott L. Baggett, Paula J. Fornwalt, Michael A. Battaglia

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Climate adaption and post-fire restoration of a foundational perennial in cold desert: Insights from intraspecific variation in response to weather

www.nrfirescience.org/resource/16523

1) The loss of foundational but fire-intolerant perennials such as sagebrush due to increases in fire size and frequency in semi-arid regions has motivated efforts to restore them, often with mixed or even no success. Seeds of sagebrush *Artemisia tridentata* and related species must be moved considerable distances from seed source to...

Author(s): Martha M. Brabec, Matthew J. Germino, Bryce A. Richardson

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Predicting Post-Fire Tree Mortality for 12 Western US Conifers Using the First Order Fire Effects Model (FOFEM)

www.nrfirescience.org/resource/16738

Accurate prediction of fire-caused tree mortality is critical for making sound land management decisions such as developing burning prescriptions and post-fire management guidelines. To improve efforts to predict post-fire tree mortality, we developed 3-year post-fire mortality models for 12 Western conifer species-white fir (*Abies...*

Author(s): Sharon M. Hood, Duncan C. Lutes
Year Published: 2017
Type: Document
Book or Chapter or Journal Article

A dynamical model for bark beetle outbreaks

www.nrfirescience.org/resource/14984

Tree-killing bark beetles are major disturbance agents affecting coniferous forest ecosystems. The role of environmental conditions on driving beetle outbreaks is becoming increasingly important as global climatic change alters environmental factors, such as drought stress, that, in turn, govern tree resistance. Furthermore,...

Author(s): Vlastimil Krivan, Mark Lewis, Barbara J. Bentz, Sharon Bewick, Suzanne M. Lenhart, Andrew Liebhold

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Forest disturbance interactions and successional pathways in the Southern Rocky Mountains

www.nrfirescience.org/resource/14423

The pine forests in the southern portion of the Rocky Mountains are a heterogeneous mosaic of disturbance and recovery. The most extensive and intensive stress and mortality are received from human activity, fire, and mountain pine beetles (MPB; *Dendroctonus ponderosae*). Understanding disturbance interactions and disturbance-...

Author(s): Lu Liang, Todd J. Hawbaker, Zhiliang Zhu, Xuecao Li, Peng Gong

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Bark beetle-induced tree mortality alters stand energy budgets due to water budget changes

www.nrfirescience.org/resource/14974

Insect outbreaks are major disturbances that affect a land area similar to that of forest fires across North America. The recent mountain pine bark beetle (*Dendroctonus ponderosae*) outbreak and its associated blue stain fungi (*Grosmannia clavigera*) are impacting water partitioning processes of forests in the Rocky Mountain region as...

Author(s): David E. Reed, Brent E. Ewers, Elise G. Pendall, John M. Frank, Robert Kelly

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Variables associated with the occurrence of Ips beetles, red turpentine beetle and wood borers in live and dead ponderosa pines with post-fire injury

www.nrfirescience.org/resource/14690

Recently, wildfires and prescribed burning have become more frequent in conifer forests of western North America. Most studies examining the impacts of insects on trees with post-fire injury have focused on contributions to tree mortality. Few studies have examined fire-caused injuries to estimate the probability of attack by...

Author(s): Jose F. Negron, Joel D. McMillin, Carolyn Hull Sieg, James F. Fowler, Kurt K. Allen, Linda L. Wadleigh, John A. Anhold, Ken E. Gibson

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Yellowstone fire history and fire ecology - Insights 27 years after the 1988 fires

www.nrfirescience.org/resource/14651

In 1988, fires burned 36% (about 800,000 acres) of Yellowstone National Park (YNP). At the time, the size and severity of these fires was greater than scientists and land managers were used to and they were attributed to excessive fuel loadings that were a result of past fire suppression. However, fire history and fire ecology...

Author(s): Corey L. Gucker

Year Published: 2016

Type: Document

Research Brief or Fact Sheet

Trajectories and resilience of stand structure in response to variable disturbance severities in northern hardwoods

www.nrfirescience.org/resource/16836

In late successional forests, stand development processes are often more easily monitored and are more closely related to key ecological parameters when using structural criteria rather than stand age or time since stand-replacing disturbance. In this paper, the effects of various disturbance regimes on long-term structural change...

Author(s): Corey R. Halpin, Craig G. Lorimer

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Deterministic and stochastic processes lead to divergence in plant communities 25 years after the 1988 Yellowstone fires

www.nrfirescience.org/resource/14620

Young, recently burned forests are increasingly widespread throughout western North America, but forest development after large wildfires is not fully understood, especially regarding effects of variable burn severity, environmental heterogeneity, and changes in drivers over time. We followed development of subalpine forests after...

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Fortifying the forest: thinning and burning increase resistance to a bark beetle outbreak and promote forest resilience

www.nrfirescience.org/resource/14810

Fire frequency in low-elevation coniferous forests in western North America has greatly declined since the late 1800s. In many areas, this has increased tree density and the proportion of shade-tolerant species, reduced resource availability, and increased forest susceptibility to forest insect pests and high-severity wildfire. In...

Author(s): Sharon M. Hood, Stephen P. Baker, Anna Sala

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Prescribed fire does not promote outbreaks of a primary bark beetle at low-density populations

www.nrfirescience.org/resource/13941

The causes of bark beetle outbreaks - particularly the role of disturbances - are poorly understood. Stand-scale disturbances, like fires, can suddenly improve local host susceptibility and may attract beetles; however, whether such increases can lead to outbreaks in post-disturbance stands is unclear. Using low-density *Dendroctonus*...

Author(s): Crisia A. Tabacaru, Jane Park, Nadir Erbilgin

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Mountain pine beetles: A century of knowledge, control attempts, and impacts central to the Black Hills

www.nrfirescience.org/resource/14583

This publication chronicles the understanding, controlling, and impacts of mountain pine beetles (MPB) central to the Black Hills of South Dakota and Wyoming from the time they were described by Hopkins in 1902, through the presentation of data from work started by Schmid and Mata in 1985. The plots established by these two men from...

Author(s): Russell T. Graham, Michael A. Battaglia, Theresa B. Jain, Lance A. Asherin, Stephen A. Mata

Year Published: 2016

Type: Document

Synthesis, Technical Report or White Paper

Changing disturbance regimes, climate warming and forest resilience

www.nrfirescience.org/resource/16807

Ecological memory is central to how ecosystems respond to disturbance and is maintained by two types of legacies – information and material. Species life-history traits represent an adaptive response to disturbance and are an information legacy; in contrast, the abiotic and biotic structures (such as seeds or nutrients) produced...

Author(s): Jill F. Johnstone, Craig D. Allen, Jerry F. Franklin, Lee E. Frelich, Brian J. Harvey, Philip E. Higuera, Michelle Mack, Ross K. Meentemeyer, Margaret R. Metz, George L.W. Perry, Tania L. Schoennagel, Monica G. Turner

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Shifting ecological filters mediate postfire expansion of seedling aspen (*Populus tremuloides*) in Yellowstone

www.nrfirescience.org/resource/13896

Determining how ecological filters (e.g., climate, soils, biotic interactions) influence where species succeed in heterogeneous landscapes is challenging for long-lived species (e.g., trees), because filters can vary over space and change slowly through time. Stand-replacing wildfires create opportunities for establishment of tree-...

Author(s): Winslow D. Hansen, William H. Romme, Aisha Ba, Monica G. Turner

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

A review of precipitation and temperature control on seedling emergence and establishment for ponderosa and lodgepole pine forest regeneration

www.nrfirescience.org/resource/14995

The persistence of ponderosa pine and lodgepole pine forests in the 21st century depends to a large extent on how seedling emergence and establishment are influenced by driving climate and environmental variables, which largely govern forest regeneration. We surveyed the literature, and identified 96 publications that reported data...

Author(s): M. D. Petrie, A. M. Wildeman, John Bradford, Robert M. Hubbard, William Lauenroth
Year Published: 2016
Type: Document
Book or Chapter or Journal Article, Synthesis

Cumulative disturbance on the landscape: lessons from the Pole Creek fire, Oregon

www.nrfirescience.org/resource/14519

Previous research has focused on quantifying fuel loadings and using operational fire behavior models to understand changes in fire severity following MPB outbreaks. In this study however, researchers used direct field measurements taken from the 2012 Pole Creek Fire that burned in lodgepole pine forests in central Oregon's...

Author(s): Northwest Fire Science Consortium
Year Published: 2016
Type: Document
Research Brief or Fact Sheet

Elevational shifts in thermal suitability for mountain pine beetle population growth in a changing climate

www.nrfirescience.org/resource/14987

Future forests are being shaped by changing climate and disturbances. Climate change is causing large-scale forest declines globally, in addition to distributional shifts of many tree species. Because environmental cues dictate insect seasonality and population success, climate change is also influencing tree-killing bark beetles....

Author(s): Barbara J. Bentz, Jacob P. Duncan, James A. Powell
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Spatial variability in tree regeneration after wildfire delays and dampens future bark beetle outbreaks

www.nrfirescience.org/resource/14737

Wildfires have increased in western North America, creating extensive areas of regenerating forests. There is concern that recent large, stand-replacing fires will synchronize forest development and commit landscapes to a future of increased disturbance, such as bark beetle outbreaks that require extensive, well-connected forests of...

Author(s): Rupert Seidl, Daniel C. Donato, Kenneth F. Raffa, Monica G. Turner
Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Conserving whitebark pine in ski areas - Demonstrations at Whitefish Mountain Resort

www.nrfirescience.org/resource/14705

As part of the Whitebark Pine Ecosystem Foundation's Annual Science and Management Workshop - Successes and Challenges in Managing the Jewel in the Crown of the Continent, participants saw first hand some of the challenges facing whitebark pine restoration, and they witnessed certification of the first Whitebark Pine Friendly Ski...

Author(s): Corey L. Gucker

Year Published: 2016

Type: Document

Research Brief or Fact Sheet

Using resilience and resistance concepts to manage threats to sagebrush ecosystems, Gunnison sage-grouse, and Greater sage-grouse in their eastern range: a strategic multi-scale approach

www.nrfirescience.org/resource/14967

This report provides a strategic approach developed by a Western Association of Fish and Wildlife Agencies interagency working group for conservation of sagebrush ecosystems, Greater sage-grouse, and Gunnison sage-grouse. It uses information on (1) factors that influence sagebrush ecosystem resilience to disturbance and resistance...

Author(s): Jeanne C. Chambers, Jeffrey L. Beck, Steven B. Campbell, John Carlson, Thomas J. Christiansen, Karen J. Clause, Jonathan B. Dinkins, Douglas W. Havlina, Kevin E. Doherty, Kathleen A. Griffin, Douglas W. Havlina, Kenneth F. Henke, Jacob D. Hennig, Laurie L. Kurth, Jeremy D. Maestas, Mary Manning, Kenneth E. Mayer, Brian A. Meador, Clinton McCarthy, Marco A. Perea, David A. Pyke

Year Published: 2016

Type: Document

Technical Report or White Paper

Community structure, biodiversity, and ecosystem services in treeline whitebark pine communities: Potential impacts from a non-native pathogen

www.nrfirescience.org/resource/14358

Whitebark pine (*Pinus albicaulis*) has the largest and most northerly distribution of any white pine (Subgenus *Strobus*) in North America, encompassing 18° latitude and 21° longitude in western mountains. Within this broad range, however, whitebark pine occurs within a narrow elevational zone, including upper subalpine and treeline...

Author(s): Diana F. Tomback, Lynn M. Resler, Robert E. Keane, Elizabeth R. Pansing, Andrew J. Andrade, Aaron C. Wagner

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Centrocercus minimus, Centrocercus urophasianus (Gunnison sage-grouse, greater sage-grouse)

www.nrfirescience.org/resource/10784

This FEIS species review synthesizes information on the relationship of *Centrocercus minimus*, *Centrocercus urophasianus* (Gunnison sage-grouse, greater sage-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...

Author(s): Robin J. Innes

Year Published: 2016

Type: Document

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

Relative importance of climate and mountain pine beetle outbreaks on the occurrence of large wildfires in the western USA

www.nrfirescience.org/resource/14899

Extensive outbreaks of bark beetles have killed trees across millions of hectares of forests and woodlands in western North America. These outbreaks have led to spirited scientific, public, and policy debates about consequential increases in fire risk, especially in the wildland–urban interface (WUI), where homes and communities...

Author(s): Dominik Kulakowski, Nathan Mietkiewicz

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Recent tree mortality in the western United States from bark beetles and forest fires

www.nrfirescience.org/resource/14323

Forests are substantially influenced by disturbances, and therefore accurate information about the location, timing, and magnitude of disturbances is important for understanding effects. In the western United States, the two major disturbance agents that kill trees are wildfire and bark beetle outbreaks. Our objective was to...

Author(s): Jeffrey A. Hicke, Arjan J. H. Meddens, Crystal A. Kolden

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Wildland fire limits subsequent fire occurrence

www.nrfirescience.org/resource/15303

Several aspects of wildland fire are moderated by site- and landscape-level vegetation changes caused by previous fire, thereby creating a dynamic where one fire exerts a regulatory control on subsequent fire. For example, wildland fire has been shown to regulate the size and severity of subsequent fire. However, wildland fire has...

Author(s): Sean A. Parks, Carol Miller, Lisa M. Holsinger, Scott L. Baggett, Benjamin J. Bird

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

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

Tamm Review: Management of mixed-severity fire regime forests in Oregon, Washington, and Northern California

www.nrfirescience.org/resource/13976

Increasingly, objectives for forests with moderate- or mixed-severity fire regimes are to restore successional diversity landscapes that are resistant and resilient to current and future stressors. Maintaining native species and characteristic processes requires this successional diversity, but methods to achieve it are poorly...

Author(s): Paul F. Hessburg, Thomas A. Spies, David A. Perry, Carl N. Skinner, Alan H. Taylor, Peter M. Brown, Scott L. Stephens, Andrew J. Larson, Derek J. Churchill, Nicholas A. Povak, Peter H. Singleton, Brenda McComb, William J. Zielinski, Brandon M. Collins, R. Brion Salter, Jerry F. Franklin, Gregg M. Riegel

Year Published: 2016

Type: Document

Book or Chapter or Journal Article, Synthesis

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

Forest health in a changing world: effects of globalization and climate change on forest insect and pathogen impacts

www.nrfirescience.org/resource/14992

Forests and trees throughout the world are increasingly affected by factors related to global change. Expanding international trade has facilitated invasions of numerous insects and pathogens into new regions. Many of these invasions have caused substantial forest damage, economic impacts and losses of ecosystem goods and services...

Author(s): T. D. Ramsfield, Barbara J. Bentz, M. Faccoli, H. Jactel, E. G. Brockerhoff

Year Published: 2016

Type: Document

Book or Chapter or Journal Article, Synthesis

Achievable future conditions as a framework for guiding forest conservation and management

www.nrfirescience.org/resource/13788

We contend that traditional approaches to forest conservation and management will be inadequate given the predicted scale of social-economic and biophysical changes in the 21st century. New approaches, focused on anticipating and guiding ecological responses to change, are urgently needed to ensure the full value of forest ecosystem...

Author(s): Stephen W. Golladay, Katherine L. Martin, James M. Vose, David N. Wear, Alan P. Covich, Richard J. Hobbs, Kier D. Klepzig, Gene E. Likens, Robert J. Naiman, Allan W. Shearer

Year Published: 2016

Type: Document

Book or Chapter or Journal Article, Synthesis

Wilderness in the 21st Century: A framework for testing assumptions about ecological intervention in wilderness using a case study of fire ecology in the Rocky Mountains

www.nrfirescience.org/resource/14471

Changes in the climate and in key ecological processes are prompting increased debate about ecological restoration and other interventions in wilderness. The prospect of intervention in wilderness raises legal, scientific, and values-based questions about the appropriateness of possible actions. In this article, we focus on the role...

Author(s): Cameron Naficy, Eric G. Keeling, Peter Landres, Paul F. Hessburg, Thomas T. Veblen, Anna Sala

Year Published: 2016

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

Climate Contributors to Forest Mosaics: Ecological Persistence

www.nrfirescience.org/resource/15625

It is hypothesized that climate impacts forest mosaics through dynamic ecological processes such as wildfires. However, climate-fire research has primarily focused on understanding drivers of fire

frequency and area burned, largely due to scale mismatches and limited data availability. Recent datasets, however, allow for the...

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Does wildfire likelihood or severity increase following insect outbreaks in conifer forests?

www.nrfirescience.org/resource/14153

Although there is acute concern that insect-caused tree mortality increases the likelihood or severity of subsequent wildfire, previous studies have been mixed, with findings typically based on stand-scale simulations or individual events. This study investigates landscape- and regional-scale wildfire likelihood following outbreaks...

Author(s): Garrett W. Meigs, John L. Campbell, Harold S. Zald, John D. Bailey, David C. Shaw, Robert E. Kennedy

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Belowground impacts of pile burning in the Inland Northwestern U.S.

www.nrfirescience.org/resource/15565

Forest restoration efforts require thinning operations to reduce tree density, wildfire risk, or insect and disease conditions to improve ecosystem processes and function. However, one issue with the thinned stands is to dispose of the residues. Slash pile burning is currently used on many forest sites as a preferred method for...

Author(s): Deborah S. Page-Dumroese, Christopher R. Keyes, Martin F. Jurgensen, William J. Massman, Bret W. Butler

Year Published: 2015

Type: Document

Technical Report or White Paper

Low-severity fire increases tree defense against bark beetle attacks

www.nrfirescience.org/resource/14366

Induced defense is a common plant strategy in response to herbivory. Although abiotic damage, such as physical wounding, pruning, and heating, can induce plant defense, the effect of such damage by large-scale abiotic disturbances on induced defenses has not been explored and could have important consequences for plant survival...

Author(s): Sharon M. Hood, Anna Sala, Emily K. Heyerdahl, Marion Boutin

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Proceedings of the large wildland fires conference

www.nrfirescience.org/resource/18395

Large fires or "megafires" have been a major topic in wildland fire research and management for over a decade. There is great debate regarding the impacts of large fires. Many believe that they (1) are occurring too frequently, (2) are burning abnormally large areas, (3) cause uncharacteristically adverse ecological harm, and (4...

Year Published: 2015

Type: Document

Paths of recovery: landscape variability in forest structure, function, and fuels after the 1988 Yellowstone Fires

www.nrfirescience.org/resource/13720

Understanding the rates, trajectories, and spatial variability in succession following severe wildfire is increasingly important for forest managers in western North America and critical for anticipating the resilience or vulnerability of forested landscapes to changing environmental conditions. However, few long-term...

Author(s): Monica G. Turner, William H. Romme, Daniel B. Tinker, Daniel C. Donato, Brian J. Harvey

Year Published: 2015

Type: Document

Technical Report or White Paper

Quantifying and predicting fuels and the effects of reduction treatments along successional and invasion gradients in sagebrush habitats - JFSP final report

www.nrfirescience.org/resource/15504

Sagebrush shrubland ecosystems in the Great Basin are prime examples of how altered successional trajectories can create dynamic fuel conditions and, thus, increase uncertainty about fire risk and behavior. Although fire is a natural disturbance in sagebrush, post-fire environments are highly susceptible to conversion to an invasive...

Author(s): Douglas J. Shinneman, David S. Pilliod, Robert S. Arkle, Nancy F. Glenn

Year Published: 2015

Type: Document

Technical Report or White Paper

Fire legacies impact conifer regeneration across environmental gradients in the U.S. northern Rockies

www.nrfirescience.org/resource/14018

Context: An increase in the incidence of large wildfires worldwide has prompted concerns about the resilience of forest ecosystems, particularly in the western U.S., where recent changes are linked with climate warming and 20th-century land management practices. Objectives: To study forest resilience to recent wildfires, we examined...

Author(s): Kerry Kemp, Philip E. Higuera, Penelope Morgan

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Simulated big sagebrush regeneration supports predicted changes at the trailing and leading edges of distribution shifts

www.nrfirescience.org/resource/15432

Many semi-arid plant communities in western North America are dominated by big sagebrush. These ecosystems are being reduced in extent and quality due to economic development, invasive species, and climate change. These pervasive modifications have generated concern about the long-term viability of sagebrush habitat and sagebrush-...

Author(s): Daniel Schlaepfer, Kyle A. Taylor, Victoria E. Pennington, Kellen N. Nelson, Trace E. Martyn, Caitlin M. Rottler, William Lauenroth, John Bradford

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

The role of fire in aspen ecology and restoration

www.nrfirescience.org/resource/16377

Quaking aspen is generally considered to be a fire-adapted species because it regenerates prolifically after fire, and it can be replaced by more shade-tolerant tree species in the absence of fire. As early-successional aspen stands transition to greater conifer-dominance, they become increasingly fire prone, until fire returns, and...

Author(s): Douglas J. Shinneman, Kevin Krasnow, Susan K. McIlroy

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

Short-interval disturbance in lodgepole pine forests, British Columbia, Canada: understory and overstory response to mountain pine beetle and fire

www.nrfirescience.org/resource/14159

The recent mountain pine beetle (MPB) outbreak across western North America's interior lodgepole pine forests has altered the landscape such that the majority of wildfires in the region will now burn through MPB-affected stands. Study of plant community response to these combined disturbances is critical for our understanding and...

Author(s): Marc Edwards, Meg A. Krawchuk, Philip J. Burton

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks

www.nrfirescience.org/resource/14154

In the western United States, mountain pine beetles (MPBs) have killed pine trees across 71,000 km² of forest since the mid-1990s, leading to widespread concern that abundant dead fuels may increase area burned and exacerbate fire behavior. Although stand-level fire behavior models suggest that bark beetle-induced tree mortality...

Author(s): Sarah Hart, Tania L. Schoennagel, Thomas T. Veblen, Teresa B. Chapman

Year Published: 2015

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

Bark beetles and wildfires: how does forest recovery change with repeated disturbances in mixed-conifer forests?

www.nrfirescience.org/resource/13329

Increased wildfire activity and recent bark beetle outbreaks in the western United States have increased the potential for interactions between disturbance types to influence forest characteristics. However, the effects of interactions between bark beetle outbreaks and subsequent wildfires on forest succession remain poorly...

Author(s): Camille Stevens-Rumann, Penelope Morgan, Chad M. Hoffman

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Temperate forest health in an era of emerging megadisturbance

www.nrfirescience.org/resource/13722

Although disturbances such as fire and native insects can contribute to natural dynamics of forest health, exceptional droughts, directly and in combination with other disturbance factors, are pushing some temperate forests beyond thresholds of sustainability. Interactions from increasing temperatures, drought, native insects and...

Author(s): Constance I. Millar, Nathan L. Stephenson

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Interactions among climate, wildfire and tree regeneration at lower treeline in the U.S. northern rockies

www.nrfirescience.org/resource/15564

Recent increases in area burned in the western U.S. have raised concerns about the resilience of forests to large wildfires, particularly in dry mixed-conifer forests, where climate change and 20th-century land management have altered species composition, fuel loads, and fire regimes. To study forest resilience to recent wildfires,...

Author(s): Philip E. Higuera, Kerry Kemp

Year Published: 2015

Type: Document

Technical Report or White Paper

Managing fire, understanding ourselves: human dimensions in safety and wildland fire

www.nrfirescience.org/resource/18394

Wildland fire management has risen to the forefront of land management and now receives greater social and political attention than ever before. As we progress through the 21st century, these areas of attention are continually presenting challenges never experienced before. We may consider ourselves well positioned to move into the...

Year Published: 2015

Type: Document

Conference Proceedings

Tree physiology and bark beetles

www.nrfirescience.org/resource/13305

Irruptive bark beetles usually co-occur with their co-evolved tree hosts at very low (endemic) population densities. However, recent droughts and higher temperatures have promoted widespread tree mortality with consequences for forest carbon, fire and ecosystem services (Kurz et al., 2008; Raffa et al., 2008; Jenkins et al., 2012)....

Author(s): Michael G. Ryan, Gerard Sapes, Anna Sala, Sharon M. Hood

Year Published: 2015

Type: Document

Book or Chapter or Journal Article, Synthesis

Corrigendum to - Challenges of establishing big sagebrush (*Artemisia tridentata*) in rangeland restoration: Effects of herbicide, mowing, whole-community seeding, and sagebrush seed sources

www.nrfirescience.org/resource/18934

The loss of big sagebrush (*Artemisia tridentata* Nutt.) on sites disturbed by fire has motivated restoration seeding and planting efforts. However, the resulting sagebrush establishment is often lower than desired, especially in dry areas. Sagebrush establishment may be increased by addressing factors such as seed source and...

Author(s): Martha M. Brabec, Matthew J. Germino, Douglas J. Shinneman, David S. Pilliod, Susan K. McIlroy, Robert S. Arkle

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Temperate forest health in an era of emerging megadisturbance

www.nrfirescience.org/resource/13501

Although disturbances such as fire and native insects can contribute to natural dynamics of forest health, exceptional droughts, directly and in combination with other disturbance factors, are pushing some temperate forests beyond thresholds of sustainability. Interactions from increasing temperatures, drought, native insects and...

Author(s): Constance I. Millar, Nathan L. Stephenson

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Modeling spatial and temporal dynamics of wind flow and potential fire behavior following a mountain pine beetle outbreak in a lodgepole pine forest

www.nrfirescience.org/resource/13298

Patches of live, dead, and dying trees resulting from bark beetle-caused mortality alter spatial and temporal variability in the canopy and surface fuel complex through changes in the foliar moisture content of attacked trees and through the redistribution of canopy fuels. The resulting heterogeneous fuels complexes alter within-...

Author(s): Chad M. Hoffman, Rodman Linn, Russell A. Parsons, Carolyn Hull Sieg, Judith Winterkamp

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

The ecological importance of mixed-severity fire: nature's phoenix

www.nrfirescience.org/resource/16303

If you are a curious reader with a knack for the analytical, you may be asking yourself, Why start a book about fire ecology with a mythological figure? And if you are a tried-and-true scientist, like we are, you may also be asking, Isn't it a bit risky to mix myth with science, fact with fiction, observation with mystique, nature...

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Forest resilience and tipping points at different spatio-temporal scales: approaches and

challenges

www.nrfirescience.org/resource/16830

1. Anthropogenic global change compromises forest resilience, with profound impacts to ecosystem functions and services. This synthesis paper reflects on the current understanding of forest resilience and potential tipping points under environmental change and explores challenges to assessing responses using experiments,...

Author(s): Christopher P. O. Reyer, Niels Brouwers, Anja Rammig, Barry W. Brook, Jackie Epila, Robert F. Grant, Milena Holmgren, Fanny Langerwisch, Sebastian Leuzinger, Wolfgang Lucht, Belinda Medlyn, Marion Pfeifer, Jorg Steinkamp, Mark C. Vanderwel, Hans Verbeeck, Dora M. Villela

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Tree mortality from drought, insects, and their interactions in a changing climate

www.nrfirescience.org/resource/13635

Climate change is expected to drive increased tree mortality through drought, heat stress, and insect attacks, with manifold impacts on forest ecosystems. Yet, climate-induced tree mortality and biotic disturbance agents are largely absent from process-based ecosystem models. Using data sets from the western USA and associated...

Author(s): William R.L. Anderegg, Jeffrey A. Hicke, Rosie A. Fisher, Craig D. Allen, Juliann Aukema, Barbara J. Bentz, Sharon M. Hood, Jeremy W. Lichstein, Alison K. Macalady, Nate McDowell, Yude Pan, Kenneth F. Raffa, Anna Sala, John D. Shaw, Nathan L. Stephenson, Christina Tague, Melanie Zeppel

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Postfire shrub cover dynamics: A 70-year fire chronosequence in mountain big sagebrush communities

www.nrfirescience.org/resource/15422

Fire is natural in sagebrush (*Artemisia* L.) communities. In this study, we quantify effects of time since last burn (TSLB) on shrub cover over a 70-year (yr) fire chronosequence. We sampled mountain big sagebrush communities with very large-scale aerial (VLSA) imagery and measured sagebrush, antelope bitterbrush (*Purshia tridentata*...

Author(s): Corey A. Moffet, J. Bret Taylor, D. Terrance Booth

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

Managing ungulate browsing for sustainable aspen

www.nrfirescience.org/resource/16376

In montane forests of the Intermountain West composition and function are often defined by what happens with quaking aspen. Aspen is a pioneer species that regenerates quickly following disturbance and then establishes ecological conditions under which the rest of the biological community develops. Quaking aspen forests have high...

Author(s): Samuel B. St. Clair, Paul C. Rogers, Michael R. Kuhns

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

Fuel loads and simulated fire behavior in 'old-stage' beetle-infested ponderosa pine of the Colorado Plateau

www.nrfirescience.org/resource/14527

Recent bark beetle outbreaks in western North America have led to concerns regarding changes in fuel profiles and associated changes in fire behavior. Data are lacking for a range of infestation severities and time since outbreak, especially for relatively arid cover types. We surveyed fuel loads and simulated fire behavior for...

Author(s): E. Matthew Hansen, Morris C. Johnson, Barbara J. Bentz, A. Steven Munson

Year Published: 2015

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

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

Ecological Consequences Of Mountain Pine Beetle Outbreaks For Wildlife In Western North American Forests

www.nrfirescience.org/resource/17469

Mountain pine beetle (*Dendroctonus ponderosae*) (MPB) outbreaks are increasingly prevalent in

western North America, causing considerable ecological change in pine (*Pinus* spp.) forests with important implications for wildlife. We reviewed studies examining wildlife responses to MPB outbreaks and postoutbreak salvage logging to inform...

Author(s): Victoria A. Saab, Quresh Latif, Mary M. Rowland, Tracey N. Johnson, Anna D. Chalfoun, Steven W. Buskirk, Joslin E. Heyward, Matthew A. Dresser

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Bromus tectorum response to fire varies with climate conditions

www.nrfirescience.org/resource/12979

The invasive annual grass *Bromus tectorum* (cheatgrass) forms a positive feedback with fire in some areas of western North America's sagebrush biome by increasing fire frequency and size, which then increases *B. tectorum* abundance post-fire and dramatically alters ecosystem structure and processes. However, this positive response to...

Author(s): Kimberly Taylor, Tyler Brummer, Lisa J. Rew, Matt Lavin, Bruce D. Maxwell

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Cattle grazing and vegetation succession on burned sagebrush steppe

www.nrfirescience.org/resource/12968

There is limited information about the effects of cattle grazing to longer-term plant community composition and herbage production following fire in sagebrush steppe. This study evaluated vegetation response to cattle grazing over 7 yr (2007-2013) on burned Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) [Beetle &...

Author(s): Jonathan D. Bates, Kirk W. Davies

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Vegetation response after post-fire mulching and native grass seeding

www.nrfirescience.org/resource/15317

Post-fire mulch and seeding treatments, often applied on steep, severely burned slopes immediately after large wildfires, are meant to reduce the potential of erosion and establishment of invasive plants, especially non-native plants, that could threaten values at risk. However, the effects of these treatments on native vegetation...

Author(s): Penelope Morgan, Marshall Moy, Christine A. Droske, Leigh B. Lentile, Sarah A. Lewis, Peter R. Robichaud, Andrew T. Hudak

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Fire severity and tree regeneration following bark beetle outbreaks: the role of outbreak stage and burning conditions

www.nrfirescience.org/resource/13328

The degree to which recent bark beetle (*Dendroctonus ponderosae*) outbreaks may influence fire severity and postfire tree regeneration is of heightened interest to resource managers throughout western North America, but empirical data on actual fire effects are lacking. Outcomes may depend on burning conditions (i.e., weather during...

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

Year Published: 2014
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

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

Fire activity and severity in the western US vary along proxy gradients representing fuel amount and fuel moisture

www.nrfirescience.org/resource/13016

Numerous theoretical and empirical studies have shown that wildfire activity (e.g., area burned) at regional to global scales may be limited at the extremes of environmental gradients such as productivity or moisture. Fire activity, however, represents only one component of the fire regime, and no studies to date have characterized...

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Western spruce budworm outbreaks did not increase fire risk over the last three centuries: a dendrochronological analysis of inter-disturbance synergism

www.nrfirescience.org/resource/13637

Insect outbreaks are often assumed to increase the severity or probability of fire occurrence through increased fuel availability, while fires may in turn alter susceptibility of forests to subsequent insect outbreaks through changes in the spatial distribution of suitable host trees. However, little is actually known about the...

Author(s): Aquila Flower, Daniel G. Gavin, Emily K. Heyerdahl, Russell A. Parsons, Greg M. Cohn

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Dry forest resilience varies under simulated climate-management scenarios in a central Oregon, USA landscape

www.nrfirescience.org/resource/14233

Determining appropriate actions to create or maintain landscapes resilient to climate change is challenging because of uncertainty associated with potential effects of climate change and their interactions with land management. We used a set of climate-informed state-and-transition models to explore the effects of management and...

Author(s): Joshua S. Halofsky, Jessica E. Halofsky, Theresa Burcsu, Miles A. Hemstrom

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Don't blame the beetles

www.nrfirescience.org/resource/13290

Tiny insects called bark beetles have devastated forests in western North America over the past decade. Life has drained from millions of hectares of forest so quickly that it seemed as if they had been abruptly unplugged, like a Christmas tree before bedtime. And many people have feared the infestation's fallout, worrying that the...

Author(s): Cally Carswell

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Quantifying restoration effectiveness using multi-scale habitat models: implications for sage-grouse in the Great Basin

www.nrfirescience.org/resource/12947

A recurrent challenge in the conservation of wide-ranging, imperiled species is understanding which habitats to protect and whether we are capable of restoring degraded landscapes. For Greater Sage-grouse (*Centrocercus urophasianus*), a species of conservation concern in the western United States, we approached this problem by...

Author(s): Robert S. Arkle, David S. Pilliod, Steven E. Hanser, Matthew L. Brooks, Jeanne C. Chambers, James B. Grace, Kevin C. Knutson, David A. Pyke, Justin L. Welty, Troy A. Wirth

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Preliminary resource vulnerability assessment

www.nrfirescience.org/resource/13409

This document is an assessment of the FS Northern Region's key water resources, tree species, wildlife species, and disturbances, which includes descriptions of the species' current condition, existing stressors, sensitivity to and expected effects of climate changes, and adaptive capacity.

Author(s): Northern Region Adaptation Partnership

Year Published: 2014

Type: Document

Technical Report or White Paper

Climate and very large wildland fires in the contiguous western USA

www.nrfirescience.org/resource/13009

Very large wildfires can cause significant economic and environmental damage, including destruction of homes, adverse air quality, firefighting costs and even loss of life. We examine how climate is

associated with very large wildland fires (VLWFs $>$ or $=$ 50,000 acres, or \sim 20,234 ha) in the western contiguous USA. We used composite...

Author(s): E. Natasha Stavros, John T. Abatzoglou, Narasimhan K. Larkin, Donald McKenzie, E. Ashley Steel

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Landsat time series and lidar as predictors of live and dead basal area across five bark beetle-affected forests

www.nrfirescience.org/resource/13623

Bark beetle-caused tree mortality affects important forest ecosystem processes. Remote sensing methodologies that quantify live and dead basal area (BA) in bark beetle-affected forests can provide valuable information to forest managers and researchers. We compared the utility of light detection and ranging (lidar) and the Landsat...

Author(s): Benjamin C. Bright, Andrew T. Hudak, Robert E. Kennedy, Arjan J. H. Meddens

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

Regional projections of the likelihood of very large wildland fires under a changing climate in the contiguous western United States

www.nrfirescience.org/resource/13006

Seasonal changes in the climatic potential for very large wildfires (VLWF $>$ or $=$ 50,000 ac \sim 20,234 ha) across the western contiguous United States are projected over the 21st century using generalized linear models and downscaled climate projections for two representative concentration pathways (RCPs). Significant ($p <$ or $=$ 0....

Author(s): E. Natasha Stavros, John T. Abatzoglou, Donald McKenzie, Narasimhan K. Larkin

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Patterns and mechanisms of plant succession after fire on Artemisia-grass sites in southeastern Idaho

www.nrfirescience.org/resource/15400

Cover data for plant species on eight environmentally similar sites that were each burned in a different year (from 2 to 36 years ago) were used to construct a composite sequence of vegetational change after fire on Artemisia-grassland sites in southeastern Idaho. Some species were early successional such as *Lithospermum ruderales*,...

Author(s): David L. Humphrey
Year Published: 2014
Type: Document
Book or Chapter or Journal Article

Building resilience into quaking aspen management

www.nrfirescience.org/resource/16373

Throughout the 20th century, forest scientists and land managers were guided by principles of succession with regard to aspen forests. The historical model depicted aspen as a "pioneer species" that colonizes a site following disturbance and is eventually overtopped by conifers. Aspen systems are more diverse, however, than...

Author(s): Paul C. Rogers
Year Published: 2014
Type: Document
Research Brief or Fact Sheet

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

Using resistance and resilience concepts to reduce impacts of invasive annual grasses and altered fire regimes on the sagebrush ecosystem and greater sage-grouse: a strategic multi-scale approach

www.nrfirescience.org/resource/12989

This Report provides a strategic approach for conservation of sagebrush ecosystems and Greater Sage- Grouse (sage-grouse) that focuses specifically on habitat threats caused by invasive annual grasses and altered fire regimes. It uses information on factors that influence (1) sagebrush ecosystem resilience to disturbance and...

Author(s): Jeanne C. Chambers, David A. Pyke, Jeremy D. Maestas, Michael L. Pellant, Chad S. Boyd, Steven B. Campbell, Shawn Espinosa, Douglas W. Havlina, Kenneth E. Mayer, Amarina Wuenschel
Year Published: 2014
Type: Document
Management or Planning Document

Climate change and United States forests

www.nrfirescience.org/resource/12393

This volume offers a scientific assessment of the effects of climatic variability and change on forest resources in the United States. Derived from a report that provides technical input to the 2013 U.S. Global Change Research Program National Climate Assessment, the book serves as a framework for managing U.S. forest resources in...

Author(s): David L. Peterson, James M. Vose, Toral Patel-Weynand
Year Published: 2014
Type: Document

Book or Chapter or Journal Article

Large wildfire trends in the western United States, 1984-2011

www.nrfirescience.org/resource/12971

We used a database capturing large wildfires (> 405 ha) in the western U.S. to document regional trends in fire occurrence, total fire area, fire size, and day of year of ignition for 1984-2011. Over the western U.S. and in a majority of ecoregions, we found significant, increasing trends in the number of large fires and/or total...

Author(s): Philip E. Dennison, Simon C. Brewer, James D. Arnold, Max A. Moritz

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

A new metric for quantifying burn severity: the relativized burn ratio

www.nrfirescience.org/resource/13053

Satellite-inferred burn severity data have become increasingly popular over the last decade for management and research purposes. These data typically quantify spectral change between pre-and post-fire satellite images (usually Landsat). There is an active debate regarding which of the two main equations, the delta normalized burn...

Author(s): Sean A. Parks, Gregory K. Dillon, Carol Miller

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

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

The ecological importance of severe fire - Site visits to Lolo Creek and Blue Mountain burned areas

www.nrfirescience.org/resource/12652

Dr. Dick Hutto, professor of Organismal Biology and Ecology at the University of Montana, took

participants of the May 2014 Large Wildland Fires Conference to recently burned sites to discuss fire effects. Hutto was enthused and excited about “the magical biology” occurring on recently burned sites. Magical biology includes...

Author(s): Corey L. Gucker

Year Published: 2014

Type: Document

Research Brief or Fact Sheet

Disturbance legacies increase the resilience of forest ecosystem structure, composition, and functioning

www.nrfirescience.org/resource/16854

Disturbances are key drivers of forest ecosystem dynamics, and forests are well adapted to their natural disturbance regimes. However, as a result of climate change, disturbance frequency is expected to increase in the future in many regions. It is not yet clear how such changes might affect forest ecosystems, and which mechanisms...

Author(s): Rupert Seidl, Werner Rammer, Thomas A. Spies

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Why firefighters should embrace fire ecology

www.nrfirescience.org/resource/19235

My first experience fighting a wildfire came in 1962; the same year naturalist Rachael Carson published *Silent Spring*, the book that jolted me and other Americans into awareness of ecological relationships and how important they are to life on earth. The following summer, as a trainee ranger in Sequoia-Kings Canyon national parks...

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 webinars 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

Characterizing spatial reference conditions in southwestern warm/dry mixed-conifer forests

www.nrfirescience.org/resource/12951

Reference conditions describe attributes of ecosystem structure, composition, and function and are used to inform ecological restoration efforts. Reference condition information on tree spatial patterns that occurred prior to wide-spread fire exclusion is limited for warm/dry mixed-conifer forests of the western U.S., particularly...

Author(s): Kyle Rodman, Andrew Sanchez Meador

Year Published: 2014

Type: Document

Research Brief or Fact Sheet

Resin duct size and density as ecophysiological traits in fire scars of *Pseudotsuga menziesii* and *Larix occidentalis*

www.nrfirescience.org/resource/13015

Background and Aims: Resin ducts (RDs) are features present in most conifer species as defence structures against pests and pathogens; however, little is known about RD expression in trees following fire injury. This study investigates changes in RD size and density in fire scars of Douglas fir (*Pseudotsuga menziesii*) and western...

Author(s): Estelle Arbella, Markus Stoffel, Elaine Kennedy Sutherland, Kevin T. Smith, Donald A. Falk

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

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

Contrasting effects of wildfire and ecological restoration in old-growth western larch forests

www.nrfirescience.org/resource/13003

The scientific basis for restoration of fire-excluded western larch/mixed-conifer forests is not as well developed as that for dry fire-frequent forests. We compared the effects of wildfire and restoration (combined thinning and prescribed fire) in fire-excluded western larch forests. In 2012, the wildfire site had more, taller, and...

Author(s): Taylor Hopkins, Andrew J. Larson, R. Travis Belote

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

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

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

Regional and forest-level estimates of carbon stored in harvested wood products from the United States Forest Service Northern Region, 1906-2010

www.nrfirescience.org/resource/13089

Global forests capture and store significant amounts of CO₂ through photosynthesis. When carbon is removed from forests through harvest, a portion of the harvested carbon is stored in wood products, often for many decades. The United States Forest Service (USFS) and other agencies are interested in accurately accounting for carbon...

Author(s): Nathaniel Anderson, Jesse Young, Keith Stockmann, Kenneth E. Skog, Sean P. Healey, Dan R. Loeffler, J. Greg Jones, James F. Morrison

Year Published: 2013

Type: Document

Technical Report or White Paper

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

Bark beetle effects on fuel profiles across a range of stand structures in Douglas-fir forests of Greater Yellowstone

www.nrfirescience.org/resource/13301

Consequences of bark beetle outbreaks for forest wildfire potential are receiving heightened attention, but little research has considered ecosystems with mixed-severity fire regimes. Such forests are widespread, variable in stand structure, and often fuel limited, suggesting that beetle outbreaks could substantially alter fire...

Author(s): Daniel C. Donato, Brian J. Harvey, William H. Romme, Martin Simard, Monica G. Turner

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Does *Kochia prostrata* spread from seeded sites? an evaluation from southwestern Idaho, USA

www.nrfirescience.org/resource/12145

Purposeful introductions of exotic species for rehabilitation efforts following wildfire are common on rangelands in the western United States, though ecological impacts of exotic species in novel environments are often poorly understood. One such introduced species, *Kochia prostrata* (L.) Schrad (forage kochia) has been seeded on...

Author(s): Erin C. Gray, Patricia S. Muir

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Progress in understanding bark beetle effects on fire behavior using physics-based models

www.nrfirescience.org/resource/13297

Bark beetle outbreaks are a major disturbance of forests throughout western North America affecting ecological processes and social and economic values (Amman 1977, Bond and Keeley 2005). Since the 1990s, bark beetle outbreaks have affected between 1.1 and 13.5 million acres in the western United States and an additional 13.5...

Author(s): Chad M. Hoffman, Carolyn Hull Sieg, Penelope Morgan, William E. Mell, Rodman Linn, Camille Stevens-Rumann, Joel D. McMillin, Russell A. Parsons, Helen Maffei

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Influence of recent bark beetle outbreak on fire severity and postfire tree regeneration in montane Douglas-fir forests

www.nrfirescience.org/resource/12029

Understanding how disturbances interact to shape ecosystems is a key challenge in ecology. In forests of western North America, the degree to which recent bark beetle outbreaks and subsequent fires may be linked (e.g., outbreak severity affects fire severity) and/or whether these two disturbances produce compound effects on postfire...

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

Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Resistance to invasives and altered fire regimes differs between cold and hot desert shrublands

www.nrfirescience.org/resource/12136

Settlement by Anglo-Americans in the desert shrublands of North America has resulted in the introduction and subsequent invasion of multiple nonnative invasive grass species. These invasions have altered pre-settlement fire regimes, converted native perennial shrublands to nonnative annual grasslands, and placed many native desert...

Author(s): Matthew L. Brooks, Jeanne C. Chambers

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Summary of science, activities, programs, and policies that influence the rangewide conservation of greater sage-grouse (*Centrocercus urophasianus*)

www.nrfirescience.org/resource/15420

Because of their broad range, variations in population traits and characteristics across this range, and the variability in habitat conditions and threats within this range, conservation of sage-grouse is a unique challenge compared to isolated or range-restricted species, primarily due to the scale of the effort. This complexity is...

Author(s): D.J. Manier, D.J.A. Wood, Z.H. Bowen, R.M. Donovan, M.J. Holloran, L.M. Juliusson, K.S. Mayne, S.J. Oyler-McCance, F.R. Quamen, D.J. Saher, A.J. Titolo

Year Published: 2013

Type: Document

Technical Report or White Paper

The many elements of traditional fire knowledge: synthesis, classification, and aids to cross-cultural problem solving in fire-dependent systems around the world

www.nrfirescience.org/resource/12537

I examined the hypothesis that traditional social-ecological fire systems around the world include common elements of traditional fire knowledge (TFK). I defined TFK as fire-related knowledge, beliefs, and practices that have been developed and applied on specific landscapes for specific purposes by long time inhabitants. In all, 69...

Author(s): Mary R. Huffman

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

A review of fire effects on vegetation and soils in the Great Basin Region: response and ecological site characteristics

www.nrfirescience.org/resource/12147

This review synthesizes the state of knowledge on fire effects on vegetation and soils in semi-arid ecosystems in the Great Basin Region, including the central and northern Great Basin and Range, Columbia River Basin, and the Snake River Plain. We summarize available literature related to: (1) the effects of environmental gradients...

Author(s): Richard F. Miller, Jeanne C. Chambers, David A. Pyke, Frederick B. Pierson

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

The impacts of changing disturbance regimes on serotinous plant populations and communities

www.nrfirescience.org/resource/12406

Climatic change is anticipated to alter disturbance regimes for many ecosystems. Among the most important effects are changes in the frequency, size, and intensity of wildfires. Serotiny (long-term canopy storage and the heat-induced release of seeds) is a fire-resilience mechanism found in many globally important terrestrial...

Author(s): Brian Buma, Carissa D. Brown, Daniel C. Donato, Joseph B. Fontaine, Jill F. Johnstone

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Eriophorum viridicarinatum (green-keeled cottongrass)

www.nrfirescience.org/resource/11521

This FEIS species review synthesizes information on the relationship of *Eriophorum viridicarinatum* (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

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

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

Carbon stocks of trees killed by bark beetles and wildfire in the western United States

www.nrfirescience.org/resource/13090

Forests are major components of the carbon cycle, and disturbances are important influences of forest carbon. Our objective was to contribute to the understanding of forest carbon cycling by quantifying the

amount of carbon in trees killed by two disturbance types, fires and bark beetles, in the western United States in recent...

Author(s): Jeffrey A. Hicke, Arjan J. H. Meddens, Craig D. Allen, Crystal A. Kolden

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Trial by fire

www.nrfirescience.org/resource/12135

1) Conservation partners across 11 western states are rallying in unprecedented fashion to reduce threats to sage-grouse and the sagebrush ecosystem they occupy. 2) Improvements made in the Bureau of Land Management's (BLM) wildfire policy are a tremendous step forward but the 2012 wildfire season is a harsh reminder that more...

Author(s): Tim Murphy, David E. Naugle, Randall Eardley, Jeremy D. Maestas, Tim Griffiths, Michael L. Pellant, San J. Stiver

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

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

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

Appendix 1: Regional summaries - Great Plains

www.nrfirescience.org/resource/11902

Natural vegetation of the Great Plains is primarily grassland and shrubland ecosystems with trees occurring in scattered areas along streams and rivers, on planted woodlots, as isolated forests such as the Black Hills of South Dakota, and near the biogeographic contact with Rocky Mountains and eastern deciduous forests. Trees are...

Author(s): Linda A. Joyce

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

Introduced annual grass increases regional fire activity across the arid western USA (1980-2009)

www.nrfirescience.org/resource/12110

Non-native, invasive grasses have been linked to altered grass-fire cycles worldwide. Although a few studies have quantified resulting changes in fire activity at local scales, and many have speculated about larger scales, regional alterations to fire regimes remain poorly documented. We assessed the influence of large-scale Bromus...

Author(s): Jennifer Balch, Bethany A. Bradley, Carla M. D'Antonio, Jose Gomez-Dans

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Using native annual plants to restore post-fire habitats in western North America

www.nrfirescience.org/resource/12139

Increasing fire frequencies and uncharacteristic severe fires have created a need for improved restoration methods across rangelands in western North America. Traditional restoration seed mixtures of native perennial mid- to late-seral plant species may not be suitable for intensely burned sites that have been returned to an early-...

Author(s): Christopher M. Herron, Jayne L. Jonas, Paul J. Meiman, Mark W. Paschke

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

Living dangerously on borrowed time during slow, unrecognized regime shifts

www.nrfirescience.org/resource/16806

Regime shifts from one ecological state to another are often portrayed as sudden, dramatic, and difficult to reverse. Yet many regime shifts unfold slowly and imperceptibly after a tipping point has been

exceeded, especially at regional and global scales. These long, smooth transitions between equilibrium states are easy to miss,...

Author(s): Terry P. Hughes, Cristina Linares, Vasilis Dakos, Ingrid A. van de Leemput, Egbert H. van Nes

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

The merits of prescribed fire outweigh potential carbon emission effects

www.nrfirescience.org/resource/12426

While North American ecosystems vary widely in their ecology and natural historical fire regimes, they are unified in benefitting from prescribed fire when judiciously applied with the goal of maintaining and restoring native ecosystem composition, structure, and function. On a modern landscape in which historical fire regimes...

Author(s): Association for Fire Ecology, International Association of Wildland Fire, Tall Timbers Research Station, The Nature Conservancy

Year Published: 2013

Type: Document

Technical Report or White Paper

Salix amygdaloides (peachleaf willow)

www.nrfirescience.org/resource/10658

This FEIS species review synthesizes information on the relationship of *Salix amygdaloides* (peachleaf 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): Janet L. Fryer

Year Published: 2012

Type: Document

Synthesis

What are Plants Doing and When? Using Plant Phenology to Promote Sustainable Natural Resources Management

www.nrfirescience.org/resource/18955

Climate change models for the northern Rocky Mountains predict changes in temperature and water availability that in turn will alter vegetation. Changes include timing of plant life-history events, or phenology, such as green-up, flowering and senescence, and shifts in species composition. Moreover, climate changes may favor...

Author(s): Geneva W. Chong, Leslie A. Allen

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

Fire-injured ponderosa pine provide a pulsed resource for bark beetles

www.nrfirescience.org/resource/8353

Bark beetles can cause substantial mortality of trees that would otherwise survive fire injuries. Resin response of fire-injured northern Rocky Mountain ponderosa pine (*Pinus ponderosa* Douglas ex P. Lawson...

Author(s): Ryan S. Davis, Sharon M. Hood, Barbara J. Bentz

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

A common-garden study of resource-island effects on a native and an exotic, annual grass after fire

www.nrfirescience.org/resource/11474

Plant-soil variation related to perennial-plant resource islands (coppices) interspersed with relatively bare interspaces is a major source of heterogeneity in desert rangelands. Our objective was to determine how native and exotic grasses vary on coppice mounds and interspaces (microsites) in unburned and burned sites and...

Author(s): Amber N. Hoover, Matthew J. Germino

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

A review of logistic regression models used to predict post-fire tree mortality of western North American conifers

www.nrfirescience.org/resource/8303

Logistic regression models used to predict tree mortality are critical to post-fire management, planning prescribed burns and understanding disturbance ecology. We review literature concerning post-fire mortality prediction using logistic regression models for coniferous tree species in the western USA. We include synthesis and...

Author(s): Travis J. Woolley, David C. Shaw, Lisa Ganio, Stephen A. Fitzgerald

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

Cheating cheatgrass: new research to combat a wily invasive weed

www.nrfirescience.org/resource/12130

Cheatgrass and its cousin, red brome, are exotic annual grasses that have invaded and altered ecosystem dynamics in more than 41 million acres of desert shrublands between the Rockies and the Cascade-Sierra chain. A fungus naturally associated with these Bromus species has been found lethal to the plants' soil-banked dormant seeds....

Author(s): Gail Wells

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

Spatially extensive reconstructions show variable-severity fire and heterogeneous structure in historical western United States dry forests

www.nrfirescience.org/resource/13484

Aim: Wildfire is often considered more severe now than historically in dry forests of the western United States. Tree-ring reconstructions, which suggest that historical dry forests were park-like with large, old trees maintained by low-severity fires, are from small, scattered studies. To overcome this limitation, we developed...

Author(s): William L. Baker, Mark A. Williams

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

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

Numerical simulation of crown fire hazard immediately after bark beetle-caused mortality in lodgepole pine forests

www.nrfirescience.org/resource/8325

Quantifying the effects of mountain pine beetle (MPB)-caused tree mortality on potential crown fire hazard has been challenging partly because of limitations in current operational fire behavior models. Such models are not capable of accounting for fuel heterogeneity resulting from an outbreak. Further, the coupled interactions...

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Wildfire triage: targeting mitigation based on social, economic, and ecological values

www.nrfirescience.org/resource/16178

Evaluating the risks of wildfire relative to the valuable resources found in any managed landscape requires an interdisciplinary approach. Researchers at the Rocky Mountain Research Station and Western Wildland Threat Assessment Center developed such a process, using a combination of techniques rooted in fire modeling and ecology,...

Author(s): Karl Malcolm, Matthew P. Thompson, David E. Calkin, Mark A. Finney, Alan A. Ager

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

An individual-based process model to simulate landscape-scale forest ecosystem dynamics

www.nrfirescience.org/resource/18461

Forest ecosystem dynamics emerges from nonlinear interactions between adaptive biotic agents (i.e., individual trees) and their relationship with a spatially and temporally heterogeneous abiotic environment. Understanding and predicting the dynamics resulting from these complex interactions is crucial for the sustainable stewardship...

Author(s): Rupert Seidl, Werner Rammer, Robert M. Scheller, Thomas A. Spies
Year Published: 2012
Type: Document
Book or Chapter or Journal Article

Fire effects on noxious weeds

www.nrfirescience.org/resource/12003

The Fire Effects Information System (FEIS, www.fs.fed.us/database/feis/) has been providing reviews of scientific knowledge about fire effects since 1986. FEIS is an online collection of literature reviews on more than 1,100 species and their relationships with fire. Reviews cover plants and animals throughout the United States,...

Author(s): Robin J. Innes
Year Published: 2012
Type: Document
Research Brief or Fact Sheet

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

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

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

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

Do mountain pine beetle outbreaks change the probability of active crown fire in lodgepole pine forests? Comment 1 & 2, Reply 1

www.nrfirescience.org/resource/13342

Comment 1 - Simard et al. (2011) have produced a comprehensive data set and analysis concerning mountain pine beetle (MPB; *Dendroctonus ponderosae*)-caused mortality and associated crown fire feedbacks in lodgepole pine (*Pinus contorta*)-dominated forests. Misapplication of the NEXUS fire modeling system (Scott and...

Author(s): Christopher J. Moran, Mark A. Cochrane, William Matt Jolly, Russell A. Parsons, J. Morgan Varner, Bret W. Butler, Kevin C. Ryan, Corey L. Gucker, Martin Simard, William H. Romme, Monica G. Turner

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

Fire as a dimension of historical ecology: a response to Bowman et al. (2011)

www.nrfirescience.org/resource/193

Bowman et al. (*Journal of Biogeography*, 2011, 38, 2223–2236) attempt a synthesis of the current status of study into human use of fire as an ecosystem management tool and provide a framework for guiding research on the human dimensions of global fire. While we applaud this ambitious effort, we believe the proposed 'pyric phase...

Author(s): Michael R. Coughlan, Aaron M. Petty

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Aquatic species invasions in the context of fire and climate change

www.nrfirescience.org/resource/11273

This paper focuses on the nexus among native and nonnative fishes with respect to fire and climate

change in the western United States. Although many taxa are involved, I emphasize native and nonnative salmonids because these are obligate coldwater species that might be expected to respond strongly to fire and because most research...

Author(s): Michael K. Young

Year Published: 2012

Type: Document

Technical Report or White Paper

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

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

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

Cascading impacts of bark beetle-caused tree mortality on coupled biogeophysical and biogeochemical processes

www.nrfirescience.org/resource/8345

Recent large-scale outbreaks of bark beetle infestations have affected millions of hectares of forest in western North America, covering an area similar in size to that impacted by fire. Bark beetles kill host trees in affected areas, thereby altering water supply, carbon storage, and nutrient cycling in forests; for example, the...

Author(s): Steven L. Edburg, Jeffrey A. Hicke, Paul D. Brooks, Elise G. Pendall, Brent E. Ewers,

Urszula Norton, David Gochis, Ethan D. Gutmann, Arjan J. H. Meddens
Year Published: 2012
Type: Document
Book or Chapter or Journal Article, Synthesis

Postfire downy brome (*Bromus tectorum*) invasion at high elevations in Wyoming

www.nrfirescience.org/resource/12122

The invasive annual grass downy brome is the most ubiquitous weed in sagebrush systems of western North America. The center of invasion has largely been the Great Basin region, but there is an increasing abundance and distribution in the Rocky Mountain States. We evaluated postfire vegetation change using very large-scale aerial (...)

Author(s): Brian A. Meador, Samuel Cox, D. Terrance Booth

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Toxicodendron radicans, Toxicodendron rydbergii (eastern poison-ivy, western poison-ivy)

www.nrfirescience.org/resource/10525

This FEIS species review synthesizes information on the relationship of *Toxicodendron radicans*, *Toxicodendron rydbergii* (eastern poison-ivy, western poison-ivy) 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...

Author(s): Robin J. Innes

Year Published: 2012

Type: Document

Synthesis

Relationships between moisture, chemistry, and ignition of *Pinus contorta* needles during the early stages of mountain pine beetle attack

www.nrfirescience.org/resource/8317

Very little is known about how foliar moisture and chemistry change after a mountain pine beetle attack and even less is known about how these intrinsic foliar characteristics alter foliage ignitability. Here, we examine the fuel characteristics and ignition potential of *Pinus contorta* (lodgepole pine) foliage during the early...

Author(s): William Matt Jolly, Russell A. Parsons, Ann M. Hadlow, Greg M. Cohn, Sara S. McAllister, John B. Popp, Robert M. Hubbard, Jose F. Negron

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Effects of bark beetle-caused tree mortality on wildfire

www.nrfirescience.org/resource/13294

Millions of trees killed by bark beetles in western North America have raised concerns about subsequent wildfire, but studies have reported a range of conclusions, often seemingly contradictory, about effects on fuels and wildfire. In this study, we reviewed and synthesized the published literature on modifications to fuels and fire...

Author(s): Jeffrey A. Hicke, Morris C. Johnson, Jane L. Hayes, Haiganoush K. Preisler

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

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

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

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

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

Picoides arcticus (black-backed woodpecker)

www.nrfirescience.org/resource/10857

This FEIS species review synthesizes information on the relationship of *Picoides arcticus* (black-backed woodpecker) 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): Katharine R. Stone

Year Published: 2011

Type: Document

Synthesis

Beyond fire behavior and fuels: learning from the past to help guide us in the future

www.nrfirescience.org/resource/18397

The third IAWF Fire Behavior and Fuels Conference was held in Spokane, Washington, October 25-29, 2010, and commemorated the 100th anniversary of the 1910 fires in the Northern Rocky Mountains.

The theme of the conference was appropriately titled 'Beyond Fire Behavior and Fuels: Learning from the Past to Help Guide Us in the...

Year Published: 2011

Type: Document

Conference Proceedings

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

Rocky Mountain Research Station invasive species visionary white paper

www.nrfirescience.org/resource/11236

Invasive species represent one of the single greatest threats to natural ecosystems and the services they provide. Effectively addressing the invasive species problem requires management that is based on sound research. We provide an overview of recent and ongoing invasive species research conducted by Rocky Mountain Research...

Author(s): Dean E. Pearson, Mee-Sook Kim, Jack L. Butler

Year Published: 2011

Type: Document

Technical Report or White Paper

The forgotten stage of forest succession: early?successional ecosystems on forest sites

www.nrfirescience.org/resource/17459

Early-successional forest ecosystems that develop after stand-replacing or partial disturbances are diverse in species, processes, and structure. Post-disturbance ecosystems are also often rich in biological legacies, including surviving organisms and organically derived structures, such as woody debris. These legacies and...

Author(s): Mark E. Swanson, Jerry F. Franklin, Robert L. Beschta, Charles M. Crisafulli, Dominick A. DellaSala, Richard L. Hutto, David B. Lindenmayer, Frederick J. Swanson

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Modeling effects of climate change and fire management on western white pine (*Pinus monticola*) in the northern rocky mountains, USA

www.nrfirescience.org/resource/13512

Climate change is 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. Mountainous...

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

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

Canyon grassland vegetation changes following fire in northern Idaho

www.nrfirescience.org/resource/12049

Native and nonnative vegetation mosaics are common in western rangelands. If land managers could better predict changes in the abundance of native and nonnative species following disturbances, maintenance of native plant cover and diversity may be improved. In August 2000, during suppression of a wildfire near Lewiston, Idaho, a...

Author(s): Corey L. Gucker, Stephen C. Bunting

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Economic and social impacts of wildfires and invasive plants in American deserts: lessons from the Great Basin

www.nrfirescience.org/resource/11463

Research on the impacts of wildfire and invasive plants in rangelands has focused on biophysical rather than human dimensions of these environmental processes. We offer a synthetic perspective on economic and social aspects of wildfire and invasive plants in American deserts, focusing on the Great Basin because greater research...

Author(s): Mark W. Brunson, John A. Tanaka

Year Published: 2011

Type: Document

Book or Chapter or Journal Article, Synthesis

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 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

***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

***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

Fire effects on the cheatgrass seed bank pathogen *Pyrenophora semeniperda*

www.nrfirescience.org/resource/11450

The generalist fungal pathogen *Pyrenophora semeniperda* occurs primarily in cheatgrass (*Bromus tectorum*) seed banks, where it causes high mortality. We investigated the relationship between this pathogen and its cheatgrass host in the context of fire, asking whether burning would facilitate host escape from the pathogen or increase...

Author(s): Julie Beckstead, Laura E. Street, Susan E. Meyer, Phil S. Allen

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

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

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

Quercus macrocarpa (bur oak)

www.nrfirescience.org/resource/10669

This FEIS species review synthesizes information on the relationship of *Quercus macrocarpa* (bur oak) 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: 2011

Type: Document

Synthesis

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

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

Fire, plant invasions, and erosion events on western rangelands

www.nrfirescience.org/resource/8290

Millions of hectares of rangeland in the western United States have been invaded by annual and woody plants that have increased the role of wildland fire. Altered fire regimes pose significant implications for runoff and erosion. In this paper we synthesize what is known about fire impacts on rangeland hydrology and erosion, and how...

Author(s): Frederick B. Pierson, Christopher Jason Williams, Stuart P. Hardegree, Mark A. Weltz, Jeffrey J. Stone, Patrick E. Clark

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

Fire and fish dynamics in a changing climate

www.nrfirescience.org/resource/13509

Wildland fire is a natural disturbance that affects the distribution and abundance of native fishes in the Rocky Mountain West (Rieman and others 2003). Fire can remove riparian vegetation, increasing direct solar radiation to the stream surface and leading to warmer summer water temperatures. Fire can also consume vegetation and...

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

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 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

Hieracium caespitosum (meadow hawkweed)

www.nrfirescience.org/resource/10473

This FEIS species review synthesizes information on the relationship of *Hieracium caespitosum* (meadow 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: 2011

Type: Document

Synthesis

Euphorbia esula (leafy spurge)

www.nrfirescience.org/resource/10451

This FEIS species review synthesizes information on the relationship of *Euphorbia esula* (leafy spurge) 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): Corey L. Gucker

Year Published: 2011

Type: Document

Synthesis

Amorpha canescens (leadplant)

www.nrfirescience.org/resource/10659

This FEIS species review synthesizes information on the relationship of *Amorpha canescens* (leadplant) 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: 2011

Type: Document

Synthesis

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

Do mountain pine beetle outbreaks change the probability of active crown fire in lodgepole pine forests?

www.nrfirescience.org/resource/13340

Disturbance interactions have received growing interest in ecological research in the last decade. Fire and bark beetle outbreaks have recently increased in severity and extent across western North America, raising concerns about their possible interactions. Although it is often presumed that bark beetle outbreaks increase...

Author(s): Martin Simard, William H. Romme, Jacob M. Griffin, Monica G. Turner

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

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

Post-wildfire seeding in forests of the western United States: an evidence-based review

www.nrfirescience.org/resource/12595

Broadcast seeding is one of the most widely used post-wildfire emergency response treatments intended to reduce soil erosion, increase vegetative ground cover, and minimize establishment and spread of non-native plant species. We conducted an evidence-based review to examine the effectiveness and effects of post-wildfire seeding...

Author(s): Donna Peppin, Peter Z. Fule, Carolyn Hull Sieg, Jan L. Beyers, Molly E. Hunter

Year Published: 2010
Type: Document
Book or Chapter or Journal Article, 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

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

Ailanthus altissima (tree-of-heaven)

www.nrfirescience.org/resource/10450

This FEIS species review synthesizes information on the relationship of *Ailanthus altissima* (tree-of-heaven) 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): Janet L. Fryer
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

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. Negrón, Steven J. Seybold

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Euphorbia cyparissias (cypress spruce)

www.nrfirescience.org/resource/10455

This FEIS species review synthesizes information on the relationship of *Euphorbia cyparissias* (cypress spruce) 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): Corey L. Gucker

Year Published: 2010

Type: Document

Synthesis

Prunus americana (American plum)

www.nrfirescience.org/resource/10661

This FEIS species review synthesizes information on the relationship of *Prunus americana* (American plum) 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

Coronilla varia (crownvetch)

www.nrfirescience.org/resource/10452

This FEIS species review synthesizes information on the relationship of *Coronilla varia* (crownvetch) 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): Corey L. Gucker

Year Published: 2010

Type: Document

Synthesis

Populus alba and hybrids

www.nrfirescience.org/resource/16368

This document covers several species of *Populus* and includes their general distribution, habitat types, plant communities, and fire adaptations.

Author(s): Corey L. Gucker

Year Published: 2010

Type: Document

Synthesis

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

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

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

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

Effect of fire on a seed bank pathogen and on seeds of its host *Bromus tectorum*

www.nrfirescience.org/resource/11462

The generalist pathogen *Pyrenophora semeniperda* (Brittlebank and Adam) Shoemaker occurs primarily in cheatgrass (*Bromus tectorum* L.) seed banks, where it causes high seed mortality

(Beckstead et al. 2007; Meyer et al. 2007). How does fire impact survival of a fungal seed pathogen, *P. semeniperda*, versus survival of the seeds of its...

Author(s): Julie Beckstead, Susan E. Meyer, Laura E. Street, Phil S. Allen

Year Published: 2010

Type: Document

Conference Proceedings

The forgotten stage of forest succession: early-successional ecosystems on forest sites

www.nrfirescience.org/resource/14597

Early-successional forest ecosystems that develop after stand-replacing or partial disturbances are diverse in species, processes, and structure. Post-disturbance ecosystems are also often rich in biological legacies, including surviving organisms and organically derived structures, such as woody debris. These legacies and...

Author(s): Mark E. Swanson, Jerry F. Franklin, Robert L. Beschta, Charles M. Crisafulli, Dominick A. DellaSala, Richard L. Hutto, David B. Lindenmayer, Frederick J. Swanson

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, 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

Disturbance and landscape dynamics in a changing world

www.nrfirescience.org/resource/13432

Disturbance regimes are changing rapidly, and the consequences of such changes for ecosystems and linked social-ecological systems will be profound. This paper synthesizes current understanding of disturbance with an emphasis on fundamental contributions to contemporary landscape and ecosystem ecology, then identifies future...

Author(s): Monica G. Turner

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Populus alba, Populus x canescens, Populus x heimbürgeri, Populus x rouleauiana, Populus x tomentosa (white poplar, gray poplar, Heimbürger's poplar, Roulwau's poplar, Chinese white poplar)

www.nrfirescience.org/resource/10457

This FEIS species review synthesizes information on the relationship of *Populus alba*, *Populus x canescens*, *Populus x heimbürgeri*, *Populus x rouleauiana*, *Populus x tomentosa* (white poplar, gray poplar, Heimbürger's poplar, Roulwau's poplar, Chinese white poplar) to fire--how fire affects the species and its habitat, invasiveness of...

Author(s): Corey L. Gucker

Year Published: 2010

Type: Document
Synthesis

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

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

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

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

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

Fire ecology in Rocky Mountain landscapes

www.nrfirescience.org/resource/15378

Fire Ecology in Rocky Mountain Landscapes brings a century of scientific research to bear on improving the relationship between people and fire. In recent years, some scientists have argued that current patterns of fire are significantly different from historical patterns, and that landscapes should be managed with an eye toward...

Author(s): William L. Baker

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Tanacetum vulgare (common tansy)

www.nrfirescience.org/resource/10453

This FEIS species review synthesizes information on the relationship of *Tanacetum vulgare* (common tansy) 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): Corey L. Gucker

Year Published: 2009

Type: Document

Synthesis

Isatis tinctoria (dyer's woad)

www.nrfirescience.org/resource/10498

This FEIS species review synthesizes information on the relationship of *Isatis tinctoria* (dyer's woad) 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: 2009

Type: Document

Synthesis

Grus canadensis, Grus canadensis canadensis, Grus canadensis nesiototes, Grus canadensis pratensis, Grus canadensis pulla, Grus canadensis rowani, Grus canadensis tabida (sandhill crane species)

www.nrfirescience.org/resource/10855

[Full Title: *Grus canadensis*, *Grus canadensis canadensis*, *Grus canadensis nesiototes*, *Grus canadensis pratensis*, *Grus canadensis pulla*, *Grus canadensis rowani*, *Grus canadensis tabida* (sandhill crane, lesser sandhill crane, Cuban sandhill crane, Florida sandhill crane, Mississippi sandhill crane, Canadian sandhill crane, greater...

Author(s): Katharine R. Stone

Year Published: 2009

Type: Document

Synthesis

Bark beetle responses to vegetation management treatments

www.nrfirescience.org/resource/11070

Native tree-killing bark beetles (Coleoptera: Curculionidae, Scolytinae) are a natural component of forest ecosystems. Eradication is neither possible nor desirable and periodic outbreaks will occur as long as susceptible forests and favorable climatic conditions co-exist. Recent changes in forest structure and tree composition by...

Author(s): Joel D. McMillin, Christopher J. Fettig

Year Published: 2009

Type: Document

Conference Proceedings, Technical Report or White Paper

Muhlenbergia cuspidata (stonyhills muhly)

www.nrfirescience.org/resource/10652

This FEIS species review synthesizes information on the relationship of *Muhlenbergia cuspidata* (stonyhills 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...

Author(s): Janet L. Fryer

Year Published: 2009

Type: Document

Synthesis

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

Carex inops subsp. heliophila, Carex inops subsp. inops (sun sedge, long-stolon sedge)

www.nrfirescience.org/resource/10649

This FEIS species review synthesizes information on the relationship of *Carex inops* subsp. *heliophila*, *Carex inops* subsp. *inops* (sun sedge, long-stolon 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...

Author(s): Janet L. Fryer

Year Published: 2009

Type: Document

Synthesis

Artemisia papposa (Owyhee sagebrush)

www.nrfirescience.org/resource/10799

This FEIS species review synthesizes information on the relationship of *Artemisia papposa* (Owyhee 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): Rachelle Meyer

Year Published: 2009

Type: Document

Synthesis

Berberis vulgaris (common barberry)

www.nrfirescience.org/resource/10454

This FEIS species review synthesizes information on the relationship of *Berberis vulgaris* (common barberry) 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): Corey L. Gucker

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

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. Negrón

Year Published: 2009

Type: Document

Conference Proceedings, Technical Report or White Paper

Artemisia nova (black sagebrush)

www.nrfirescience.org/resource/10650

This FEIS species review synthesizes information on the relationship of *Artemisia nova* (black 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, and...

Author(s): Janet L. Fryer

Year Published: 2009

Type: Document

Synthesis

Global warming and stress complexes in forests of western North America

www.nrfirescience.org/resource/8360

A warmer climate in western North America will likely affect forests directly through soil moisture stress and indirectly through increased extent and severity of disturbances. We propose that stress complexes, combinations of biotic and abiotic stresses, compromise the vigor and ultimate sustainability of forest ecosystems. Across...

Author(s): Donald McKenzie, David L. Peterson, Jeremy J. Littell

Year Published: 2009

Type: Document

Book or Chapter or Journal Article, Synthesis

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

The '88 Fires: Yellowstone and Beyond IAWF Conference Proceedings

www.nrfirescience.org/resource/18464

Description not available

Author(s): Ronald E. Masters, Krista E. M. Galley, Don G. Despain

Year Published: 2009

Type: Document

Conference Proceedings

Variable impacts of imazapic rate on downy brome (*Bromus tectorum*) and seeded species in two rangeland communities

www.nrfirescience.org/resource/8332

The herbicide imazapic is registered for use on rangelands and provides effective short-term control of certain invasive annual grasses. However, details about optimal application rates for downy brome and susceptibility of simultaneously seeded species are lacking. Thus, we investigated downy brome and seeded species responses to...

Author(s): Christo Morris, Thomas A. Monaco, Craig W. Rigby

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Review of literature on climate change and forest diseases of western North America

www.nrfirescience.org/resource/11232

A summary of the literature on relationships between climate and various types of tree diseases, and the potential effects of climate change on pathogens in western North American forests is provided. Climate change generally will lead to reductions in tree health and will improve conditions for some

highly damaging pathogens....

Author(s): John T. Kliejunas, Brian W. Geils, Jessie M. Glaeser, Ellen M. Goheen, Paul E. Hennon, Mee-Sook Kim, Harry Kope, Jeffry J. Stone, Rona Sturrock, Susan J. Frankel

Year Published: 2009

Type: Document

Synthesis, 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

Response of bark beetles and their natural enemies to fire and fire surrogate treatments in mixed-conifer forests in western Montana

www.nrfirescience.org/resource/13355

Four treatments (control, burn-only, thin-only, and thin-and-burn) were evaluated for their effects on bark beetle-caused mortality in both the short-term (one to four years) and the long-term (seven years) in mixed-conifer forests in western Montana, USA. In addition to assessing bark beetle responses to these treatments, we also...

Author(s): Diana L. Six, Kjerstin R. Skov

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

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

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

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

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

Cross-scale drivers of natural disturbances prone to anthropogenic amplification: the dynamics of bark beetle eruptions

www.nrfirescience.org/resource/16887

Biome-scale disturbances by eruptive herbivores provide valuable insights into species interactions, ecosystem function, and impacts of global change. We present a conceptual framework using one system as a model, emphasizing interactions across levels of biological hierarchy and spatiotemporal scales. Bark beetles are major natural...

Author(s): Kenneth F. Raffa, Brian H. Aukema, Barbara J. Bentz, Allan L. Carroll, Jeffrey A. Hicke, Monica G. Turner, William H. Romme

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Sanguisorba minor (small burnet)

www.nrfirescience.org/resource/10656

This FEIS species review synthesizes information on the relationship of *Sanguisorba minor* (small burnet) 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: 2008

Type: Document

Synthesis

Polytrichum juniperinum (juniper haircap moss)

www.nrfirescience.org/resource/10647

This FEIS species review synthesizes information on the relationship of *Polytrichum juniperinum* (juniper haircap 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...

Author(s): Janet L. Fryer

Year Published: 2008

Type: Document

Synthesis

Bark beetles, fuels, fires, and implications for forest management in the Intermountain West

www.nrfirescience.org/resource/8239

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, are poorly understood. We extensively sampled fuels in...

Author(s): Michael J. Jenkins, Elizabeth G. Hebertson, Wesley G. Page, C. Arik Jorgensen

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, 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

***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

The tao of treating weeds: reaching for restoration in the northern Rocky Mountains

www.nrfirescience.org/resource/11093

Noxious weeds are a serious problem that is spreading across the West. Herbicides such as Picloram have proven to be powerful tools in reducing weed invaders, although use of this tool has often produced unintended consequences. Broadleaf herbicides kill forbs, such as the noxious knapweed, but also harm native forbs such as...

Author(s): Lisa-Natalie Anjozian

Year Published: 2008
Type: Document
Research Brief or Fact Sheet

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

Wildland fire in ecosystems: fire and nonnative invasive plants

www.nrfirescience.org/resource/12531

This state-of-knowledge review of information on relationships between wildland fire and nonnative invasive plants can assist fire managers and other land managers concerned with prevention, detection, and eradication or control of nonnative invasive plants. The 16 chapters in this volume synthesize ecological and botanical...

Year Published: 2008
Type: Document
Synthesis, Technical Report or White Paper

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

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

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

Climate change impacts on northwestern and intermountain United States rangelands

www.nrfirescience.org/resource/8327

Our focus is on the Pacific Northwest and Intermountain Region including the Great Basin, Columbia Plateau, Colorado Plateau, and surrounding areas. The climate of this large, arid to semiarid region is defined by generally low and highly variable precipitation. Much of the yearly precipitation arrives as winter snow because most of...

Author(s): Jeanne C. Chambers, Michael L. Pellant

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Fire, native species, and soil resource interactions influence the spatio-temporal invasion pattern of *Bromus tectorum*

www.nrfirescience.org/resource/8362

Bromus tectorum (cheatgrass) is an invasive annual that occupies perennial grass and shrub communities throughout the western United States. *Bromus tectorum* exhibits an intriguing spatio-temporal pattern of invasion in low elevation ponderosa pine *Pinus ponderosa*/bunchgrass communities in western Montana where it forms dense rings...

Author(s): Michael J. Gundale, Steve Sutherland, Thomas H. DeLuca

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Cheatgrass and red brome; the history and biology of two invaders

www.nrfirescience.org/resource/11023

In recent history, there has not been a more ecologically important event than the introduction of cheatgrass (*Bromus tectorum*) and red brome (*Bromus rubens*) into the Intermountain West. These grasses are very similar in ecology and history and are separated mostly by function of elevation. Both species are from the Mediterranean...

Author(s): Chad R. Reid, Sherel Goodrich, James E. Bowns

Year Published: 2008

Type: Document

Conference Proceedings

***Cladonia arbuscula*, *Cladonia mitis*, *Cladonia rangiferia*, *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 rangiferia*, *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

The effects of hazardous fuel reduction treatments in the wildland urban interface on the activity of bark beetles infesting ponderosa pine

www.nrfirescience.org/resource/11479

Selective logging, fire suppression, forest succession, and climatic changes have resulted in high fire hazards over large areas of the western United States. Federal and state hazardous fuel reduction programs have increased accordingly to reduce the risk, extent and severity of these events, particularly in the wildland urban...

Author(s): Christopher J. Fettig, Joel D. McMillin, John A. Anhold, Shakeeb M. Hamud, Steven J. Seybold

Year Published: 2008

Type: Document

Conference Proceedings

Big changes in the Great Basin

www.nrfirescience.org/resource/12131

JFSP-funded researchers are exploring the ecological functioning of sagebrush-steppe communities in the Great Basin and other places in the dry Intermountain West. Their work is helping managers effectively use tools such as tree mastication and prescribed fire to help these communities become more resilient in the face of invasive...

Author(s): Gail Wells

Year Published: 2008

Type: Document

Research Brief or Fact Sheet

Chapter 16. Fire and nonnative plants—summary and conclusions

www.nrfirescience.org/resource/12583

This volume synthesizes scientific information about interactions between fire and nonnative invasive plants in wildlands of the United States. If the subject were clear and simple, this volume would be short; obviously, it is not.

Author(s): Jane Kapler Smith, Kristin L. Zouhar, Steve Sutherland, Matthew L. Brooks

Year Published: 2008

Type: Document

Synthesis, Technical Report or White Paper

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

Chapter 12. Gaps in scientific knowledge about fire and nonnative invasive plants

www.nrfirescience.org/resource/12563

The potential for nonnative, invasive plants to alter an ecosystem depends on species traits, ecosystem characteristics, and the effects of disturbances, including fire. This study identifies gaps in science-based knowledge about the relationships between fire and nonnative invasive plants in the United States. The literature was...

Author(s): Kristin L. Zouhar, Gregory T. Munger, Jane Kapler Smith

Year Published: 2008

Type: Document

Synthesis, Technical Report or White Paper

Zuckia brandegeei (siltbush)

www.nrfirescience.org/resource/10667

This FEIS species review synthesizes information on the relationship of *Zuckia brandegeei* (siltbush) 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: 2008

Type: Document

Synthesis

Influence of coarse wood and pine saplings on nitrogen mineralization and microbial communities in young post-fire *Pinus contorta*

www.nrfirescience.org/resource/18459

Nitrogen (N) limits productivity in many coniferous forests of the western US, but the influence of post-fire structure on N cycling rates in early successional stands is not well understood. We asked if the heterogeneity created by downed wood and regenerating pine saplings affected N mineralization and microbial community...

Author(s): Kristine L. Metzger, Erica A. H. Smithwick, Daniel B. Tinker, William H. Romme, Teri C. Balsler, Monica G. Turner

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Chapter 2. Effects of fire on nonnative invasive plants and invasibility of wildland ecosystems

www.nrfirescience.org/resource/12532

Considerable experimental and theoretical work has been done on general concepts regarding nonnative species and disturbance, but experimental research on the effects of fire on nonnative invasive species is sparse. We begin this chapter by connecting fundamental concepts from the literature of invasion ecology to fire. Then we...

Author(s): Kristin L. Zouhar, Jane Kapler Smith, Steve Sutherland

Year Published: 2008

Type: Document

Synthesis, Technical Report or White Paper

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

Great Basin aspen ecosystems

www.nrfirescience.org/resource/16372

The health of quaking aspen (*Populus tremuloides*) in the Great Basin is of growing concern. The following provides an overview of aspen decline and die-off in areas within and adjacent to the Great Basin and suggests possible directions for research and management. For more detailed information, please see the list of references and...

Author(s): Dale L. Bartos

Year Published: 2008

Type: Document

Technical Report or White Paper

Beetles are supercool! - Understanding the life cycle of mountain pine beetles

www.nrfirescience.org/resource/8330

As a global citizen, you know that people around the world share similar environmental concerns. The changing climate is one concern shared by people everywhere. Some Forest Service scientists are interested in studying climate change and its relationship to forests, grasslands, air, and water. You will learn about one of these...

Author(s): Barbara McDonald, Vicki Arthur, Jessica Nickelsen, Michelle Andrews

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

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

Geranium bicknellii (Bicknell's geranium)

www.nrfirescience.org/resource/10817

This FEIS species review synthesizes information on the relationship of *Geranium bicknellii* (Bicknell's geranium) 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: 2007

Type: Document

Synthesis

Predicting postfire Douglas-fir beetle attacks and tree mortality in the Northern Rocky Mountains

www.nrfirescience.org/resource/8363

Douglas-fir (*Pseudotsuga menziesii* (Mirb.) Franco) were monitored for 4 years following three wildfires. Logistic regression analyses were used to develop models predicting the probability of attack by Douglas-fir beetle (*Dendroctonus pseudotsugae* Hopkins, 1905) and the probability of Douglas-fir mortality within 4 years following...

Author(s): Sharon M. Hood, Barbara J. Bentz

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Assessing post-fire Douglas-fir mortality and Douglas-fir beetle attacks in the Northern Rocky Mountains

www.nrfirescience.org/resource/11126

Douglas-fir has life history traits that greatly enhance resistance to injury from fire, thereby increasing post-fire survival rates. Tools for predicting the probability of tree mortality following fire are important components of both pre-fire planning and post-fire management efforts. Using data from mixed-severity wildfire in...

Author(s): Sharon M. Hood, Barbara J. Bentz, Ken E. Gibson, Kevin C. Ryan, Gregg DeNitto

Year Published: 2007

Type: Document

Technical Report or White Paper

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

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

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

Symphoricarpos occidentalis (western snowberry)

www.nrfirescience.org/resource/10698

This FEIS species review synthesizes information on the relationship of *Symphoricarpos occidentalis* (western snowberry) 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): Alan S. Hauser

Year Published: 2007

Type: Document

Synthesis

Linum lewisii (Lewis flax)

www.nrfirescience.org/resource/10815

This FEIS species review synthesizes information on the relationship of *Linum lewisii* (Lewis flax) 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: 2007

Type: Document

Synthesis

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

Cynomys ludovicianus (black-tailed prairie dog)

www.nrfirescience.org/resource/10898

This FEIS species review synthesizes information on the relationship of *Cynomys ludovicianus* (black-tailed prairie dog) 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): 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

Predicted fire behavior in selected mountain pine beetle-infested lodgepole pine

www.nrfirescience.org/resource/12113

Using custom fuel models developed for use with Rothermel's surface fire spread model, we predicted and compared fire behavior in lodgepole pine (*Pinus contorta* Dougl. var. *latifolia* Engelm.) stands with endemic, current epidemic, and postepidemic mountain pine beetle (*Dendroctonus ponderosae* Hopkins) populations using standardized...

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

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Artemisia campestris (field sagewort)

www.nrfirescience.org/resource/10675

This FEIS species review synthesizes information on the relationship of *Artemisia campestris* (field sagewort) 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

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

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

Post-fire recovery of Wyoming big sagebrush shrub-steppe in central and southeast Montana

www.nrfirescience.org/resource/15386

Sagebrush is a widespread habitat throughout our study area and a number of species including Greater Sage-grouse, pronghorn, Brewers Sparrow, Sage Sparrow, Sage Thrasher and sagebrush vole are sagebrush dependent, at least at some stage of their life cycles. Fire constitutes an important driver in structuring sagebrush ecosystems;...

Author(s): Stephen V. Cooper, Peter Lesica, Greg Kudray

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

The fire environment--innovations, management, and policy; conference proceedings

www.nrfirescience.org/resource/18398

The International Association of Wildland Fire sponsored the second Fire Behavior and Fuels conference in Destin, Florida. The conference theme was 'Fire Environment--Innovations, Management, and Policy.' Over 450 attendees participated in presentations on the latest innovations in wildland fire management, examples of successful...

Author(s): Wayne A. Cook, Bret W. Butler

Year Published: 2007

Type: Document

Conference Proceedings

Sphaeralcea grossulariifolia (gooseberryleaf globemallow)

www.nrfirescience.org/resource/10894

This FEIS species review synthesizes information on the relationship of *Sphaeralcea grossulariifolia* (gooseberryleaf globemallow) 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): Jennifer E. Tollefson

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

Birds and burns of the Interior West: descriptions, habitats, and management in western forests

www.nrfirescience.org/resource/11123

This publication provides information about prescribed fire effects on habitats and populations of birds of the interior West and a synthesis of existing information on bird responses to fire across North America. Our literature synthesis indicated that aerial, ground, and bark insectivores favored recently burned habitats, whereas...

Author(s): Victoria A. Saab, William M. Block, Robin E. Russell, John F. Lehmkuhl, Lisa Bate, Rachel White

Year Published: 2007

Type: Document

Synthesis, Technical Report or White Paper

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

Postfire invasion potential of rush skeletonweed (*Chondrilla juncea*)

www.nrfirescience.org/resource/11455

North American sagebrush steppe communities have been transformed by the introduction of invasive annual grasses and subsequent increase in fire size and frequency. We examined the effects of wildfires and environmental conditions on the ability of rush skeletonweed (*Chondrilla juncea* L.), a perennial Eurasian composite, to invade...

Author(s): Cecilia Lynn Kinter, Brian A. Mealar, Nancy L. Shaw, Ann L. Hild

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

Poa bulbosa (bulbous bluegrass)

www.nrfirescience.org/resource/10682

This FEIS species review synthesizes information on the relationship of *Poa bulbosa* (bulbous bluegrass) 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: 2007

Type: Document

Synthesis

Salix discolor (pussy willow)

www.nrfirescience.org/resource/10679

This FEIS species review synthesizes information on the relationship of *Salix discolor* (pussy 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, and...

Author(s): Corey L. Gucker

Year Published: 2007

Type: Document

Synthesis

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

Rangifer tarandus (caribou)

www.nrfirescience.org/resource/10746

This FEIS species review synthesizes information on the relationship of *Rangifer tarandus* (caribou) 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): Peggy Luensmann

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

Mustela nigripes (black-footed ferret)

www.nrfirescience.org/resource/10903

This FEIS species review synthesizes information on the relationship of *Mustela nigripes* (black-footed ferret) 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

Acer grandidentatum (bigtooth maple)

www.nrfirescience.org/resource/10895

This FEIS species review synthesizes information on the relationship of *Acer grandidentatum* (bigtooth 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): Jennifer E. Tollefson

Year Published: 2006

Type: Document

Synthesis

The influence of previous mountain pine beetle (*Dendroctonus ponderosae*) activity on the 1988 Yellowstone fires

www.nrfirescience.org/resource/13565

We examined the historical record of mountain pine beetle (*Dendroctonus ponderosae* Hopkins) activity within Yellowstone National Park, Wyoming, for the 25-years period leading up to the 1988 Yellowstone fires (1963-86) to determine how prior beetle activity and the resulting tree mortality affected the spatial pattern of the 1988...

Author(s): Heather J. Lynch, Roy A. Renkin, Robert Crabtree, Paul R. Moorcroft

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

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

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

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

Frequent fire alters nitrogen transformations in ponderosa pine stands of the inland Northwest

www.nrfirescience.org/resource/7919

Recurrent, low-severity fire in ponderosa pine (*Pinus ponderosa*)/interior Douglas-fir (*Pseudotsuga menziesii* var. *glauca*) forests is thought to have directly influenced nitrogen (N) cycling and availability. However, no studies to date have investigated the influence of natural fire intervals on soil processes in undisturbed forests...

Author(s): Thomas H. DeLuca, Anna Sala

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Managing fire-prone forests in the Western United

www.nrfirescience.org/resource/16308

The management of fire-prone forests is one of the most controversial natural resource issues in the US today, particularly in the west of the country. Although vegetation and wildlife in these forests are adapted to fire, the historical range of fire frequency and severity was huge. When fire regimes are altered by human activity,...

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

Year Published: 2006

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

Cercocarpus montanus (true mountain-mahogany)

www.nrfirescience.org/resource/10673

This FEIS species review synthesizes information on the relationship of *Cercocarpus montanus* (true mountain-mahogany) 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): Corey L. Gucker

Year Published: 2006

Type: Document

Synthesis

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

Restoration treatment effects on the understory of ponderosa pine/Douglas-fir forests in western Montana, USA

www.nrfirescience.org/resource/7900

Fire exclusion and high-grade logging have altered the structure and function of ponderosa pine (*Pinus ponderosa*) forests across the American West. Restoration treatments are increasingly being used in these forests to move stand density, structure, and species composition toward more historically sustainable conditions. Yet little...

Author(s): Kerry L. Metlen, Carl E. Fiedler

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Distichlis spicata (saltgrass)

www.nrfirescience.org/resource/10695

This FEIS species review synthesizes information on the relationship of *Distichlis spicata* (saltgrass) 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

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

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

Nitrogen spatial heterogeneity influences diversity following restoration in a ponderosa pine forest, Montana

www.nrfirescience.org/resource/7898

The resource heterogeneity hypothesis (RHH) is frequently cited in the ecological literature as an important mechanism for maintaining species diversity. The RHH has rarely been evaluated in the context of restoration ecology in which a commonly cited goal is to restore diversity. In this study we focused on the spatial...

Author(s): Michael J. Gundale, Thomas H. DeLuca, Carl E. Fiedler, Kerry L. Metlen

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Opuntia humifusa (eastern pricklypear)

www.nrfirescience.org/resource/10863

This FEIS species review synthesizes information on the relationship of *Opuntia humifusa* (eastern pricklypear) 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): Jane E. Taylor

Year Published: 2006

Type: Document

Synthesis

Combustion properties of *Bromus tectorum* L.: influence of ecotype and growth under four CO₂ concentrations

www.nrfirescience.org/resource/11409

We grew from seed the exotic invasive annual grass *Bromus tectorum* L., collected from three elevation ecotypes in northern Nevada, USA. Plants were exposed to four CO₂ atmosphere concentrations: 270, 320, 370, and 420 $\mu\text{mol mol}^{-1}$. After harvest on day 87, above-ground tissue was milled, conditioned to 30% relative humidity, and...

Author(s): Robert R. Blank, Robert H. White, Lewis H. Ziska

Year Published: 2006
Type: Document
Book or Chapter or Journal Article

Complex interactions shaping aspen dynamics in the Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/7906

Loss of aspen (*Populus tremuloides*) has generated concern for aspen persistence across much of the western United States. However, most studies of aspen change have been at local scales and our understanding of aspen dynamics at broader scales is limited. At local scales, aspen loss has been attributed to fire exclusion, ungulate...

Author(s): K. Brown, Andrew J. Hansen, Robert E. Keane, Lisa Graumlich

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

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

Fire and restoration of sagebrush ecosystems

www.nrfirescience.org/resource/15377

Wildlife managers often resort to prescribed fire to restore sagebrush (*Artemisia* spp.) ecosystems thought to have been affected by fire exclusion. However, a fire mosaic of burned and unburned areas may be tolerated by certain wildlife but can be detrimental to sagebrush obligates. This article assesses evidence about the...

Author(s): William L. Baker

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Rosa arkansana (prairie rose)

www.nrfirescience.org/resource/10699

This FEIS species review synthesizes information on the relationship of *Rosa arkansana* (prairie 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

Sphaeralcea coccinea (scarlet globemallow)

www.nrfirescience.org/resource/10892

This FEIS species review synthesizes information on the relationship of *Sphaeralcea coccinea* (scarlet globemallow) 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): Jennifer E. Tollefson

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

Juniperus horizontalis (creeping juniper)

www.nrfirescience.org/resource/10671

This FEIS species review synthesizes information on the relationship of *Juniperus horizontalis* (creeping juniper) 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): Corey L. Gucker

Year Published: 2006

Type: Document

Synthesis

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

Prunus pumila (sand cherry)

www.nrfirescience.org/resource/10868

This FEIS species review synthesizes information on the relationship of *Prunus pumila* (sand 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): Jane E. Taylor

Year Published: 2006

Type: Document

Synthesis

Vulpia myuros (rattail sixweeks grass)

www.nrfirescience.org/resource/10460

This FEIS species review synthesizes information on the relationship of *Vulpia myuros* (rattail sixweeks grass) 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): Janet L. Howard

Year Published: 2006

Type: Document

Synthesis

Vulpia octoflora (sixweeks grass)

www.nrfirescience.org/resource/10710

This FEIS species review synthesizes information on the relationship of *Vulpia octoflora* (sixweeks grass) 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. Howard

Year Published: 2006

Type: Document

Synthesis

Ponderosa pine ecosystems

www.nrfirescience.org/resource/11142

Ponderosa pine is one of the most widely distributed tree species in western North America. It is highly-valued as a source of lumber, but also is key to the health and social value western forests, whether growing in pure stands or in mixture with other conifer and hardwood species. In recent years, management objectives for...

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

Year Published: 2006

Type: Document

Synthesis, Technical Report or White Paper

Cercocarpus ledifolius (curlleaf mountain-mahogany)

www.nrfirescience.org/resource/10678

This FEIS species review synthesizes information on the relationship of *Cercocarpus ledifolius* (curlleaf mountain-mahogany) 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): Corey L. Gucker

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

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

Artemisia norvegica (boreal sagebrush)

www.nrfirescience.org/resource/10865

This FEIS species review synthesizes information on the relationship of *Artemisia norvegica* (boreal 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): Jane E. Taylor

Year Published: 2006

Type: Document

Synthesis

Vulpia microstachys (small sixweeks grass)

www.nrfirescience.org/resource/10709

This FEIS species review synthesizes information on the relationship of *Vulpia microstachys* (small sixweeks grass) 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. Howard

Year Published: 2006

Type: Document

Synthesis

Apocynum cannabinum (Indianhemp)

www.nrfirescience.org/resource/10819

This FEIS species review synthesizes information on the relationship of *Apocynum cannabinum* (Indianhemp) 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

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

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

Impacts of restoration treatments on alien plant invasion in *Pinus ponderosa* forests, Montana, USA

www.nrfirescience.org/resource/7897

Invasion by alien plant species represents a challenge to land managers throughout the world as they attempt to restore frequent fire-adapted ecosystems following decades of fire exclusion. In ponderosa pine *Pinus ponderosa* forests of western North America, the response of alien species to restoration treatments has not been well...

Author(s): Erich K. Dodson, Carl E. Fiedler

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Fire management impacts on invasive plants in the western United States

www.nrfirescience.org/resource/12024

Fire management practices affect alien plant invasions in diverse ways. I considered the impact of six fire management practices on alien invasions: fire suppression, forest fuel reduction, prescription burning in crown-fire ecosystems, fuel breaks, targeting of noxious aliens, and postfire rehabilitation. Most western United States...

Author(s): Jon E. Keeley

Year Published: 2006

Type: Document

Book or Chapter or Journal Article, Synthesis

Gymnorhinus cyanocephalus (pinyon jay)

www.nrfirescience.org/resource/10904

This FEIS species review synthesizes information on the relationship of *Gymnorhinus cyanocephalus* (pinyon 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...

Author(s): Elena D. Ulev

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

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

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

Balsamorhiza hookeri (Hooker balsamroot)

www.nrfirescience.org/resource/10804

This FEIS species review synthesizes information on the relationship of *Balsamorhiza hookeri* (Hooker 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): Gregory T. Munger

Year Published: 2006

Type: Document

Synthesis

Artemisia pedatifida (birdfoot sagebrush)

www.nrfirescience.org/resource/10864

This FEIS species review synthesizes information on the relationship of Artemisia pedatifida (birdfoot 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...

Author(s): Jane E. Taylor

Year Published: 2006

Type: Document

Synthesis

Fuels Management - How to Measure Success: Conference Proceedings

www.nrfirescience.org/resource/18399

Fuels management programs are designed to reduce risks to communities and to improve and maintain ecosystem health. The International Association of Wildland Fire initiated the 1st Fire Behavior and Fuels Conference to address development, implementation, and evaluation of these programs. The focus was on how to measure success....

Author(s): Patricia L. Andrews, Bret W. Butler

Year Published: 2006

Type: Document

Conference Proceedings

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

Dalea purpurea (purple prairie clover)

www.nrfirescience.org/resource/10745

This FEIS species review synthesizes information on the relationship of Dalea purpurea (purple prairie clover) 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): Kevin R. League

Year Published: 2005

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

Effects of prescribed fire on the invasion of northern mixed-grass prairie by non-native plant species - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11162

We seek to measure the effects of fire and grazing on weeds of the northern mixed grass prairie. To accomplish this we are interpreting measurements from two management experiments, one at Lostwood National Wildlife Refuge (NWR) and one at Des Lacs NWR. At Lostwood we found a nearly balanced 2x7 treatment experiment with seven...

Author(s): Jennifer S. Hartz-Rubin, Tad Weaver, Cory S. Rubin, Jack Plaggemeyer
Year Published: 2005
Type: Document
Technical Report or White Paper

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

Recent history of large-scale ecosystem disturbances in North America derived from the AVHRR satellite record

www.nrfirescience.org/resource/11506

Ecosystem structure and function are strongly affected by disturbance events, many of which in North America are associated with seasonal temperature extremes, wildfires, and tropical storms. This study was conducted to evaluate patterns in a 19-year record of global satellite observations of vegetation phenology from the advanced...

Author(s): Christopher Potter, Tan Ping-Ning, Vipin Kumar, Chris J. Kucharik, Steven Klooster, Vanessa Genovese, Warren B. Cohen, Sean P. Healey
Year Published: 2005
Type: Document
Book or Chapter or Journal Article

A web-based information system for estimating fuel characteristics, fire hazard, and treatment effectiveness - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11879

This project has three objectives: 1) Classify ponderosa pine, Douglas-fir, and dry mixed-conifer forests types in Montana and New Mexico into appropriate fuel characteristic classes (FCC's), and display the results by forest type, density, and structural classes, 2) Develop web-based applications by which users can evaluate the...

Author(s): Carl E. Fiedler, Roger D. Ottmar
Year Published: 2005
Type: Document

Calamovilfa longifolia (prairie sandreed)

www.nrfirescience.org/resource/10697

This FEIS species review synthesizes information on the relationship of *Calamovilfa longifolia* (prairie sandreed) 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: 2005

Type: Document

Synthesis

Opuntia fragilis (brittle pricklypear)

www.nrfirescience.org/resource/10867

This FEIS species review synthesizes information on the relationship of *Opuntia fragilis* (brittle pricklypear) 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): Jane E. Taylor

Year Published: 2005

Type: Document

Synthesis

Yucca glauca (soapweed yucca)

www.nrfirescience.org/resource/10664

This FEIS species review synthesizes information on the relationship of *Yucca glauca* (soapweed yucca) 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): Amy H. Groen

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

Asclepias speciosa (showy milkweed)

www.nrfirescience.org/resource/10899

This FEIS species review synthesizes information on the relationship of *Asclepias speciosa* (showy milkweed) 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: 2005

Type: Document

Synthesis

Sagebrush steppe and pinyon-juniper ecosystems - effects of changing fire regimes, increased fuel loads, and invasive species - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11152

Pinyon-juniper woodlands and Wyoming big sagebrush ecosystems have undergone major changes in vegetation structure and composition since settlement by European Americans. These changes are resulting in dramatic shifts in fire frequency, size and severity. Effective management of these systems has been hindered by lack of information...

Author(s): Jeanne C. Chambers, E. Durant McArthur, Stephen B. Monsen, Susan E. Meyer, Nancy L. Shaw, Robin J. Tausch, Robert R. Blank, Stephen C. Bunting, Richard R. Miller, Michael L. Pellant, Bruce A. Roundy, Scott C. Walker

Year Published: 2005

Type: Document

Technical Report or White Paper

Hypericum perforatum (common St Johnswort)

www.nrfirescience.org/resource/10499

This FEIS species review synthesizes information on the relationship of *Hypericum perforatum* (common St Johnswort) 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): Kristin L. Zouhar

Year Published: 2005

Type: Document

Synthesis

Restoring dry and moist forests of the inland northwestern U. S.

www.nrfirescience.org/resource/7903

The complex topography of the inland northwestern U.S. (58.4 million ha) interacts with continental and maritime air masses to create a highly variable climate, which results in a variety of forest settings. Historically (1850 to 1900), approximately 20% of the area was covered by dry forests (*Pinus ponderosa*, *Pseudotsuga menziesii*...

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

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

Fall-prescribed burn and spring-applied herbicide effects on Canada thistle control and soil seedbank in a northern mixed-grass prairie

www.nrfirescience.org/resource/8280

Prescribed burning in Theodore Roosevelt National Park has played an important role in maintaining a natural ecosystem. However, changes in plant community dynamics caused by burning may have led to an invasion of weedy species such as Canada thistle (*Cirsium arvense* L.). The objectives of this research were to evaluate the effect...

Author(s): Andrea J. Travnicek, Rodney G. Lym, Chad Prosser

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Symphoricarpos longiflorus (longflower snowberry)

www.nrfirescience.org/resource/10790

This FEIS species review synthesizes information on the relationship of *Symphoricarpos longiflorus* (longflower snowberry) 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): Jack McWilliams

Year Published: 2005

Type: Document

Synthesis

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

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

Dry forests and wildland fires of the inland Northwest USA: contrasting the landscape ecology of the pre-settlement and modern eras

www.nrfirescience.org/resource/7941

Prior to Euro-American settlement, dry ponderosa pine and mixed conifer forests (hereafter, the 'dry forests') of the Inland Northwest were burned by frequent low- or mixed-severity fires. These mostly surface fires maintained low and variable tree densities, light and patchy ground fuels, simplified forest structure, and favored...

Author(s): Paul F. Hessburg, James K. Agee, Jerry F. Franklin

Year Published: 2005

Type: Document

Book or Chapter or Journal Article, 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

Artemisia dracunculus (tarragon)

www.nrfirescience.org/resource/10665

This FEIS species review synthesizes information on the relationship of Artemisia dracunculus (tarragon) 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): Amy H. Groen

Year Published: 2005

Type: Document

Synthesis

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

Elaeagnus angustifolia (Russian-olive)

www.nrfirescience.org/resource/10486

This FEIS species review synthesizes information on the relationship of *Elaeagnus angustifolia* (Russian-olive) 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: 2005

Type: Document

Synthesis

Psathyrostachys juncea (Russian wildrye)

www.nrfirescience.org/resource/10476

This FEIS species review synthesizes information on the relationship of *Psathyrostachys juncea* (Russian wildrye) 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): Jane E. Taylor

Year Published: 2005

Type: Document

Synthesis

Bouteloua barbata (sixweeks grama)

www.nrfirescience.org/resource/10703

This FEIS species review synthesizes information on the relationship of *Bouteloua barbata* (sixweeks grama) 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: 2005

Type: Document

Synthesis

Artemisia ludoviciana (prairie sage)

www.nrfirescience.org/resource/10605

This FEIS species review synthesizes information on the relationship of *Artemisia ludoviciana* (prairie sage) 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: 2005

Type: Document

Synthesis

Fire ecology of ponderosa pine and the rebuilding of fire-resilient ponderosa pine ecosystems

www.nrfirescience.org/resource/11074

The ponderosa pine ecosystems of the West have change dramatically since Euro-American settlement 140 years ago due to past land uses and the curtailment of natural fire. Today, ponderosa pine forests contain overabundance of fuel, and stand densities have increased from a range of 49-124 trees ha⁻¹ (20-50 trees acre⁻¹) to a range...

Author(s): Stephen A. Fitzgerald

Year Published: 2005

Type: Document
Conference Proceedings, Synthesis

Cytisus scoparius, Cytisus striatus (Scotch broom, Portuguese broom)

www.nrfirescience.org/resource/10488

This FEIS species review synthesizes information on the relationship of *Cytisus scoparius*, *Cytisus striatus* (Scotch broom, Portuguese broom) 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...

Author(s): Kristin L. Zouhar

Year Published: 2005

Type: Document

Synthesis

Plant succession and approaches to community restoration

www.nrfirescience.org/resource/8418

The processes of vegetation change over time, or plant succession, are also the processes involved in plant community restoration. Restoration efforts attempt to use designed disturbance, seedbed preparation and sowing methods, and selection of adapted and compatible native plant materials to enhance ecological function. The large...

Author(s): Bruce A. Roundy

Year Published: 2005

Type: Document

Conference Proceedings, Synthesis

The role of fire in structuring sagebrush habitats and bird communities

www.nrfirescience.org/resource/15408

Fire is a dominant and highly visible disturbance in sagebrush (*Artemisia* spp.) ecosystems. In lower elevation, xeric sagebrush communities, the role of fire has changed in recent decades from an infrequent disturbance maintaining a landscape mosaic and facilitating community processes to frequent events that alter sagebrush...

Author(s): Steve Knick, Aaron L. Holmes, Richard F. Miller

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Leucopoa kingii (spike fescue)

www.nrfirescience.org/resource/10599

This FEIS species review synthesizes information on the relationship of *Leucopoa kingii* (spike 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): Michelle B. Anderson

Year Published: 2005

Type: Document

Synthesis

Restoration treatments in a Montana ponderosa pine forest: effects on soil physical, chemical, and biological properties

www.nrfirescience.org/resource/7899

Low-elevation ponderosa pine ecosystems of the inland northwestern United States experienced frequent, low-severity fire that promoted open stands dominated by large diameter ponderosa pine (*Pinus ponderosa*). Fire exclusion has led to increased stand densities, often due to proliferation of less fire-tolerant species and an...

Author(s): Michael J. Gundale, Thomas H. DeLuca, Carl E. Fiedler, Philip W. Ramsey, Michael G. Harrington, James E. Gannon

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Five-year operational trial of verbenone to deter mountain pine beetle (*Dendroctonus ponderosae*; Coleoptera: Scolytidae) attack of lodgepole pine (*Pinus contorta*)

www.nrfirescience.org/resource/11410

The antiaggregation pheromone verbenone was operationally tested for 5 yr to deter mass attack by the mountain pine beetle on lodgepole pine in campgrounds and administrative areas surrounding Redfish and Little Redfish Lakes at the Sawtooth National Recreation Area in central Idaho. Each year, five-gram verbenone pouches were...

Author(s): Robert Progar

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

***Sarcobatus vermiculatus* (black greasewood)**

www.nrfirescience.org/resource/10592

This FEIS species review synthesizes information on the relationship of *Sarcobatus vermiculatus* (black greasewood) 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: 2004

Type: Document

Synthesis

Monitoring change in exotic plant abundance after fuel reduction/restoration treatments in ponderosa pine forests of western Montana

www.nrfirescience.org/resource/11279

Exotic species were monitored following treatments designed to reduce wildfire hazard and initiate restoration of forest structure and process in ponderosa pine (*Pinus ponderosa*)/Douglas-fir (*Pseudotsuga mensiezii*) forests to compare response among treatments. Treatments included: no treatment (control), prescribed burning,...

Author(s): Erich K. Dodson

Year Published: 2004

Type: Document

Dissertation or Thesis

***Asarum caudatum* (wild ginger)**

www.nrfirescience.org/resource/10674

This FEIS species review synthesizes information on the relationship of *Asarum caudatum* (wild ginger) 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: 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

Chondrilla juncea (rush skeletonweed)

www.nrfirescience.org/resource/10483

This FEIS species review synthesizes information on the relationship of *Chondrilla juncea* (rush skeletonweed) 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: 2004
Type: Document
Synthesis

How much do we know about the effects of wildfire on the occurrence and expansion of non-native plant species' distributions in natural areas?

www.nrfirescience.org/resource/10980

Invasion of non-native plant species into natural and managed ecosystems is a widespread problem, with potentially devastating ecological and economic consequences. Increased occurrence and severity of wildland fires has been identified as a potential threat to natural and managed ecosystems. Wildfire is often linked with the...

Author(s): Mara Johnson, Lisa J. Rew, Bruce D. Maxwell, Steve Sutherland
Year Published: 2004
Type: Document
Conference Proceedings, Synthesis

Convolvulus arvensis (field bindweed)

www.nrfirescience.org/resource/10487

This FEIS species review synthesizes information on the relationship of *Convolvulus arvensis* (field bindweed) 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: 2004
Type: Document
Synthesis

Leymus salinus (Salina wildrye)

www.nrfirescience.org/resource/10602

This FEIS species review synthesizes information on the relationship of *Leymus salinus* (Salina 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: 2004

Type: Document

Synthesis

Lepidium latifolium (perennial pepperweed)

www.nrfirescience.org/resource/10491

This FEIS species review synthesizes information on the relationship of *Lepidium latifolium* (perennial pepperweed) 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): Kristin L. Zouhar

Year Published: 2004

Type: Document

Synthesis

Cardaria chalapensis, Cardaria draba, Cardaria pubescens (lens-podded hoary cress, heart-podded hoary cress, globe-podded hoary cress)

www.nrfirescience.org/resource/10490

This FEIS species review synthesizes information on the relationship of *Cardaria chalapensis*, *Cardaria draba*, *Cardaria pubescens* (lens-podded hoary cress, heart-podded hoary cress, globe-podded hoary cress) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and fire...

Author(s): Kristin L. Zouhar

Year Published: 2004

Type: Document

Synthesis

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

The influence of fire interval, on post-fire understory communities in Yellowstone National Park (USA)

www.nrfirescience.org/resource/18427

Questions: How does the time interval between subsequent stand-replacing fire events affect post-fire understory cover and composition following the recent event? How important is fire interval relative to broad- or local-scale environmental variability in structuring post-fire understory communities?

Location: Subalpine plateaus...

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

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Rhus trilobata (skunkbush sumac)

www.nrfirescience.org/resource/10596

This FEIS species review synthesizes information on the relationship of *Rhus trilobata* (skunkbush sumac) 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

Monitoring changes in weed populations: post-fire and post-herbicide treatment

www.nrfirescience.org/resource/11040

Description not entered

Author(s): Elaine Kennedy Sutherland

Year Published: 2004

Type: Document

Conference Proceedings

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

Sorghum halepense (Johnson grass)

www.nrfirescience.org/resource/10459

This FEIS species review synthesizes information on the relationship of *Sorghum halepense* (Johnson grass) 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): Janet L. Howard

Year Published: 2004

Type: Document

Synthesis

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

Prescribed fire effects on dalmation toadflax

www.nrfirescience.org/resource/8281

Prescribed fires are important for rangeland restoration and affect plant community composition and species interactions. Many rangeland plant communities have been, or are under the threat of noxious weed invasion, however there is little information on how fire effects weeds. Our objective was to determine the effects of...

Author(s): James S. Jacobs, Roger L. Sheley

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

On the impact of fire suppression and BAER restoration on weeds

www.nrfirescience.org/resource/11043

In 2000, wildfires burned more than 200,000 acres on the Bitterroot National Forest of Montana and nearly 1.5 million acres in the Northern and Intermountain Regions. Management activities associated with fire suppression and post-fire restoration have had the unintentional consequence of promoting invasive weeds. As part of fire...

Author(s): Elaine Kennedy Sutherland

Year Published: 2003

Type: Document

Conference Proceedings

Pinus ponderosa var. scopulorum (interior ponderosa pine)

www.nrfirescience.org/resource/10718

This FEIS species review synthesizes information on the relationship of Pinus ponderosa var. scopulorum (interior ponderosa 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): Janet L. Howard

Year Published: 2003

Type: Document

Synthesis

Bouteloua gracilis (blue grama)

www.nrfirescience.org/resource/10604

This FEIS species review synthesizes information on the relationship of *Bouteloua gracilis* (blue grama) 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: 2003

Type: Document

Synthesis

The role of wildland fire and subsequent insect attack on ponderosa pine mortality

www.nrfirescience.org/resource/10990

Survival of ponderosa pine following wildfire events depends on a number of factors, including the level of injury to the tree from the fire and the environmental conditions following the fire. The unprecedented fire year of 2000 provided an opportunity to quantify cumulative impacts of wildland fires and subsequent insect attack on...

Author(s): Joel D. McMillin, Linda L. Wadleigh, Carolyn Hull Sieg, Jose F. Negron, Ken E. Gibson, Kurt K. Allen, John A. Anhold

Year Published: 2003

Type: Document

Conference Proceedings

Sisymbrium altissimum (tumble mustard)

www.nrfirescience.org/resource/10458

This FEIS species review synthesizes information on the relationship of *Sisymbrium altissimum* (tumble mustard) 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): Janet L. Howard

Year Published: 2003

Type: Document

Synthesis

Potentilla recta (sulfur cinquefoil)

www.nrfirescience.org/resource/10497

This FEIS species review synthesizes information on the relationship of *Potentilla recta* (sulfur cinquefoil) 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: 2003

Type: Document

Synthesis

Tamarix chinensis, Tamarix gallica, Tamarix parviflora, Tamarix ramosissima (tamarisk, French tamarisk, small-flowered tamarisk, saltcedar)

www.nrfirescience.org/resource/10485

This FEIS species review synthesizes information on the relationship of *Tamarix chinensis*, *Tamarix*

gallica, *Tamarix parviflora*, *Tamarix ramosissima* (tamarisk, French tamarisk, small-flowered tamarisk, saltcedar) to fire--how fire affects the species and its habitat, invasiveness of the species, effects of the species on fuels and...

Author(s): Kristin L. Zouhar

Year Published: 2003

Type: Document

Synthesis

***Acer platanoides* (Norway maple)**

www.nrfirescience.org/resource/10466

This FEIS species review synthesizes information on the relationship of *Acer platanoides* (Norway maple) 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: 2003

Type: Document

Synthesis

Wildfire and weeds in the Northern Rockies

www.nrfirescience.org/resource/8414

In 2000, wildfires burned more than 200,000 acres on the Bitterroot National Forest of Montana and nearly 1.5 million acres in the Northern and Intermountain Regions. These fires increased light and nutrient levels, reduced plant competition, and increased exposure of bare soil. These conditions favor the invasion and expansion of...

Author(s): Elaine Kennedy Sutherland

Year Published: 2003

Type: Document

Conference Proceedings

***Picrothamnus desertorum* (budsage)**

www.nrfirescience.org/resource/10791

This FEIS species review synthesizes information on the relationship of *Picrothamnus desertorum* (budsage) 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): Jack McWilliams

Year Published: 2003

Type: Document

Synthesis

***Bromus tectorum* (cheatgrass)**

www.nrfirescience.org/resource/10495

This FEIS species review synthesizes information on the relationship of *Bromus tectorum* (cheatgrass) 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: 2003

Type: Document

Synthesis

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

Artemisia rigida (stiff sagebrush)

www.nrfirescience.org/resource/10785

This FEIS species review synthesizes information on the relationship of *Artemisia rigida* (stiff 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

Atriplex canescens (fourwing saltbush)

www.nrfirescience.org/resource/10727

This FEIS species review synthesizes information on the relationship of *Atriplex canescens* (fourwing saltbush) 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. Howard

Year Published: 2003

Type: Document

Synthesis

Forest entomology in Yellowstone National Park, 1923-1957: a time of discovery and learning to let live

www.nrfirescience.org/resource/13567

For several decades after the creation of Yellowstone National Park in 1872, protection of its biological and other resources was haphazard. For example, elk and bison were exploited to near extinction, prompting aggressive protection of them, which included extermination of the native gray wolf from the park. In those...

Author(s): Malcolm M. Furniss, Roy A. Renkin

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Effects of prescribed fire and season of burn on recruitment of the invasive exotic plant, *Potentilla recta*, in a semiarid grassland

www.nrfirescience.org/resource/7944

Prescribed fire is often used to restore grassland systems to presettlement conditions; however, fire

also has the potential to facilitate the invasion of exotic plants. Managers of wildlands and nature reserves must decide whether and how to apply prescribed burning to the best advantage in the face of this dilemma. Herbicide is...

Author(s): Peter Lesica, B. Martin

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

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 digital terrain modeling and satellite imagery to map interactions among fire and forest microbes

www.nrfirescience.org/resource/10989

Behavior and biology of many forest pests are tied to major forest disturbances and succession. Fire is the principal disturbance in the forests of the western United States. Fire regimes as well as distribution and behavior of forest pests and beneficial microbes are all strongly associated with plant communities. Thus, mapping of...

Author(s): GERAL I. McDONALD, Jeffrey S. Evans, Thomas M. Rice, Eva K. Strand

Year Published: 2003

Type: Document

Conference Proceedings, Technical Report or White Paper

Linaria dalmatica, Linaria vulgaris (Dalmatian toadflax, yellow toadflax)

www.nrfirescience.org/resource/10489

This FEIS species review synthesizes information on the relationship of *Linaria dalmatica*, *Linaria vulgaris* (Dalmatian toadflax, yellow toadflax) 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): Kristin L. Zouhar

Year Published: 2003

Type: Document
Synthesis

Mapping the cheatgrass-caused departure from historical natural fire regimes in the Great Basin, USA

www.nrfirescience.org/resource/11490

Cheatgrass (*Bromus tectorum*) is an exotic grass that has increased fire hazard on millions of square kilometers of semi-arid rangelands in the western United States. Cheatgrass aggressively out competes native vegetation after fire and significantly enhances fire size and frequency. To evaluate the effect of cheatgrass on historical...

Author(s): James P. Menakis, Dianne Osborne, Melanie Miller

Year Published: 2003

Type: Document

Conference Proceedings

Schoenocrambe linifolia (flaxleaf plainsmustard)

www.nrfirescience.org/resource/10712

This FEIS species review synthesizes information on the relationship of *Schoenocrambe linifolia* (flaxleaf plainsmustard) 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): Janet L. Howard

Year Published: 2003

Type: Document

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

Artemisia filifolia (sand sagebrush)

www.nrfirescience.org/resource/10787

This FEIS species review synthesizes information on the relationship of *Artemisia filifolia* (sand 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

Descurainia pinnata (pinnate tansymustard)

www.nrfirescience.org/resource/10723

This FEIS species review synthesizes information on the relationship of *Descurainia pinnata* (pinnate tansymustard) 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. Howard

Year Published: 2003

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

***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

***Juniperus scopulorum* (Rocky Mountain juniper)**

www.nrfirescience.org/resource/10827

This FEIS species review synthesizes information on the relationship of *Juniperus scopulorum* (Rocky Mountain juniper) 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

***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

Pinus edulis (Colorado pinyon)

www.nrfirescience.org/resource/10598

This FEIS species review synthesizes information on the relationship of *Pinus edulis* (Colorado pinyon) 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

Tetradymia spinosa (spiny horsebrush)

www.nrfirescience.org/resource/10733

This FEIS species review synthesizes information on the relationship of *Tetradymia spinosa* (spiny horsebrush) 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. Howard

Year Published: 2002

Type: Document

Synthesis

Artemisia arbuscula (low sagebrush)

www.nrfirescience.org/resource/10854

This FEIS species review synthesizes information on the relationship of *Artemisia arbuscula* (low 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): Peter D. Steinberg

Year Published: 2002

Type: Document

Synthesis

Tetradymia nuttallii (Nuttall's horsebrush)

www.nrfirescience.org/resource/10734

This FEIS species review synthesizes information on the relationship of *Tetradymia nuttallii* (Nuttall's horsebrush) 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. Howard

Year Published: 2002

Type: Document

Synthesis

Centaurea solstitialis (yellow starthistle)

www.nrfirescience.org/resource/10484

This FEIS species review synthesizes information on the relationship of *Centaurea solstitialis* (yellow starthistle) 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): Kristin L. Zouhar

Year Published: 2002

Type: Document

Synthesis

Artemisia cana, Artemisia cana subsp. Bolanderi, Artemisia cana subsp. cana, Artemisia cana subsp. viscidula (silver sagebrush, Bolander silver sagebrush, plains silver sagebrush, mountain silver sagebrush)

www.nrfirescience.org/resource/10729

This FEIS species review synthesizes information on the relationship of Artemisia cana, Artemisia cana subsp. Bolanderi, Artemisia cana subsp. cana, Artemisia cana subsp. viscidula (silver sagebrush, Bolander silver sagebrush, plains silver sagebrush, mountain silver sagebrush) to fire--how fire affects the species and its habitat,...

Author(s): Janet L. Howard

Year Published: 2002

Type: Document

Synthesis

Carduus nutans (musk thistle)

www.nrfirescience.org/resource/10494

This FEIS species review synthesizes information on the relationship of Carduus nutans (musk 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

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

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

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

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

Cynoglossum officinale (houndstongue)

www.nrfirescience.org/resource/10500

This FEIS species review synthesizes information on the relationship of *Cynoglossum officinale* (houndstongue) 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

Schizachyrium scoparium (little bluestem)

www.nrfirescience.org/resource/10852

This FEIS species review synthesizes information on the relationship of *Schizachyrium scoparium* (little bluestem) 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): Peter D. Steinberg

Year Published: 2002

Type: Document

Synthesis

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

Tetradymia glabrata (littleleaf horsebrush)

www.nrfirescience.org/resource/10735

This FEIS species review synthesizes information on the relationship of *Tetradymia glabrata* (littleleaf horsebrush) 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. Howard

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

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

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

The role of postfire coarse woody debris in aspen regeneration

www.nrfirescience.org/resource/18643

The paucity of aspen (*Populus tremuloides*) regeneration in the western United States and on Yellowstone National Park's (YNP) northern range has been of concern to managers and scientists for much of the 20th century, with the effects of ungulate browsing, climate fluctuation, and fire suppression being vigorously debated. We...

Author(s): William J. Ripple, Eric J. Larsen

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Populus deltoides, Populus deltoides var. deltoides, Populus deltoides var. mislizeni, Populus deltoides var. monilifera (eastern cottonwood, eastern cottonwood, Rio Grande cottonwood, plains cottonwood)

www.nrfirescience.org/resource/10862

This FEIS species review synthesizes information on the relationship of *Populus deltoides*, *Populus deltoides* var. *deltoides*, *Populus deltoides* var. *mislizeni*, *Populus deltoides* var. *monilifera* (eastern cottonwood, eastern cottonwood, Rio Grande cottonwood, plains cottonwood) to fire--how fire affects the species and its habitat,...

Author(s): Jane E. Taylor

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

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

Sporobolus airoides (alkali sacaton)

www.nrfirescience.org/resource/10744

This FEIS species review synthesizes information on the relationship of *Sporobolus airoides* (alkali

sacaton) 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): Kathleen A. Johnson

Year Published: 2001

Type: Document

Synthesis

Post-fire runoff and erosion from rainfall simulation: contrasting forests with shrublands and grasslands

www.nrfirescience.org/resource/18566

Rainfall simulations allow for controlled comparisons of runoff and erosion among ecosystems and land cover conditions. Runoff and erosion can increase greatly following fire, yet there are few rainfall simulation studies for post-fire plots, particularly after severe fire in semiarid forest. We conducted rainfall simulations...

Author(s): Matthew P. Johansen, Thomas E. Hakonson, David D. Breshears

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

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

Bromus madritensis, Bromus rubens (foxtail chess, red brome)

www.nrfirescience.org/resource/10469

This FEIS species review synthesizes information on the relationship of *Bromus madritensis*, *Bromus rubens* (foxtail chess, red brome) 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...

Author(s): Kevin A. Simonin

Year Published: 2001

Type: Document

Synthesis

Tetradymia canescens (gray horsebrush)

www.nrfirescience.org/resource/10824

This FEIS species review synthesizes information on the relationship of *Tetradymia canescens* (gray horsebrush) 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: 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

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

Climate change and forest disturbances

www.nrfirescience.org/resource/13399

This article examines how eight disturbances influence forest structure, composition, and function, and how climate change may influence the severity, frequency, and magnitude of disturbances to forests. We focus on examples from the United States, although these influences occur worldwide. We also consider options for coping with...

Author(s): Virginia H. Dale, Linda A. Joyce, Ronald P. Neilson, Steven G. McNulty, Matthew P. Ayres, Michael D. Flannigan, Paul J. Hanson, Lloyd C. Irland, Ariel L. Lugo, Chris J. Peterson, Daniel Simberloff, Frederick J. Swanson, Brian J. Stocks, B. Mike Wotton

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Pinus monophylla (singleleaf pinyon)

www.nrfirescience.org/resource/10935

This FEIS species review synthesizes information on the relationship of *Pinus monophylla* (singleleaf pinyon) 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: 2001

Type: Document

Synthesis

Centaurea diffusa (diffuse knapweed)

www.nrfirescience.org/resource/10481

This FEIS species review synthesizes information on the relationship of *Centaurea diffusa* (diffuse knapweed) 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

Reproductive success of Lewis's woodpecker in burned pine and cottonwood riparian forests

www.nrfirescience.org/resource/11418

Lewis's Woodpecker (*Melanerpes lewis*) has been characterized as a "burn specialist" because of its preference for nesting within burned pine forests. No prior study, however, has demonstrated the relative importance of crown-burned forests to this woodpecker species by examining its reproductive success in different forest types. We...

Author(s): Victoria A. Saab, Kerri T. Vierling

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

***Nassella viridula* (green needlegrass)**

www.nrfirescience.org/resource/10869

This FEIS species review synthesizes information on the relationship of *Nassella viridula* (green needlegrass) 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): Jennifer L. Taylor

Year Published: 2001

Type: Document

Synthesis

***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

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

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

Aspen's ecological role in the West

www.nrfirescience.org/resource/11883

Aspen exhibits a variety of ecological roles. In southern Colorado, the 1880 landscape mosaic contained a range of stand ages, of which half were >70 years old and half were younger. Pure aspen stands in southern Colorado are widespread and may result from previous short fire intervals that eliminated local conifer seed sources....

Author(s): William H. Romme, Lisa Floyd-Hanna, David D. Hanna, Elisabeth Bartlett

Year Published: 2001

Type: Document

Conference Proceedings

Abies concolor (white fir)

www.nrfirescience.org/resource/10936

This FEIS species review synthesizes information on the relationship of Abies concolor (white 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, distribution, basic biology, and...

Author(s): Kristin L. Zouhar

Year Published: 2001

Type: Document

Synthesis

Ephedra viridis (green ephedra)

www.nrfirescience.org/resource/10603

This FEIS species review synthesizes information on the relationship of Ephedra viridis (green ephedra) 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: 2001

Type: Document

Synthesis

Atriplex confertifolia (shadscale)

www.nrfirescience.org/resource/10832

This FEIS species review synthesizes information on the relationship of Atriplex confertifolia (shadscale) 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): Kevin A. Simonin

Year Published: 2001

Type: Document

Synthesis

Populus angustifolia (narrowleaf cottonwood)

www.nrfirescience.org/resource/10829

This FEIS species review synthesizes information on the relationship of *Populus angustifolia* (narrowleaf 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, distribution, basic...

Author(s): Kevin A. Simonin

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

Centaurea maculosa (spotted knapweed)

www.nrfirescience.org/resource/10493

This FEIS species review synthesizes information on the relationship of *Centaurea maculosa* (spotted knapweed) 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

Acroptilon repens (Russian knapweed)

www.nrfirescience.org/resource/10496

This FEIS species review synthesizes information on the relationship of *Acroptilon repens* (Russian knapweed) 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

Whitebark pine communities: ecology and restoration

www.nrfirescience.org/resource/16422

Whitebark pine is a dominant feature of western high-mountain regions, offering an important source of food and high-quality habitat for species ranging from Clark's nutcracker to the grizzly bear. But in the northwestern United States and southwestern Canada, much of the whitebark pine is disappearing.

Why is a high-mountain...

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Elymus elymoides (bottlebrush squirreltail)

www.nrfirescience.org/resource/10834

This FEIS species review synthesizes information on the relationship of *Elymus elymoides* (bottlebrush squirreltail) 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): Kevin A. Simonin

Year Published: 2001

Type: Document

Synthesis

The relative importance of fire and watercourse proximity in determining stand composition in mixed conifer riparian forests

www.nrfirescience.org/resource/18653

Factors related to the composition of riparian forest stands on three streams in the northern Sierra Nevada mixed conifer forest type were related to proximity to the water course and years since fire. Using a linear regression analysis 46 variables were correlated to the natural log of distance from the thalweg "ln(distance)"...

Author(s): William H. Russell, Joe R. McBride

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

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

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

Sporobolus cryptandrus (sand dropseed)

www.nrfirescience.org/resource/10836

This FEIS species review synthesizes information on the relationship of *Sporobolus cryptandrus* (sand dropseed) 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): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

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

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

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

Achnatherum thurberiana (Thurber needlegrass)

www.nrfirescience.org/resource/10610

This FEIS species review synthesizes information on the relationship of *Achnatherum thurberiana*

(Thurber 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): Amy Archer

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

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

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

Restoration of whitebark pine ecosystems in western Montana and central Idaho

www.nrfirescience.org/resource/19232

No description available

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

Year Published: 2000

Type: Document

Conference Proceedings

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

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

Danthonia unispicata (onespike oatgrass)

www.nrfirescience.org/resource/10754

This FEIS species review synthesizes information on the relationship of *Danthonia unispicata* (onespike 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...

Author(s): Robin F. Matthews

Year Published: 2000

Type: Document

Synthesis

Pleuraphis jamesii (galleta)

www.nrfirescience.org/resource/10833

This FEIS species review synthesizes information on the relationship of *Pleuraphis jamesii* (galleta) 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): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

Danthonia spicata (poverty oatgrass)

www.nrfirescience.org/resource/10620

This FEIS species review synthesizes information on the relationship of *Danthonia spicata* (poverty 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 be...

Author(s): Daniel Covington

Year Published: 2000

Type: Document
Synthesis

Koeleria macrantha (prairie Junegrass)

www.nrfirescience.org/resource/10830

This FEIS species review synthesizes information on the relationship of *Koeleria macrantha* (prairie Junegrass) 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): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

Fallugia paradoxa (Apache plume)

www.nrfirescience.org/resource/10786

This FEIS species review synthesizes information on the relationship of *Fallugia paradoxa* (Apache plume) 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): Jack McWilliams

Year Published: 2000

Type: Document

Synthesis

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

Disturbance regimes of stream and riparian systems — a disturbance?cascade perspective

www.nrfirescience.org/resource/18615

Geomorphological processes that commonly transport soil down hillslopes and sediment and woody debris through stream systems in steep, mountainous, forest landscapes can operate in sequence down gravitational flowpaths, forming a cascade of disturbance processes that alters stream and riparian ecosystems. The affected stream and...

Author(s): FUTOSHI NAKAMURA, FREDERICK J. SWANSON, STEVEN M. WONDZELL

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

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

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

Miller Creek: ecosystem recovery in a western Montana forest 30 years after prescribed burning and wildfire

www.nrfirescience.org/resource/18682

Thirty years ago the effects of timber harvest, prescribed burning, and wildfire were investigated in a western larch/Douglas-fir forest on the Flathead National Forest in western Montana. The original study was designed to investigate the effects of prescribed burning on soil physical and biological properties, and on subsequent...

Author(s): Jonalea R. Tonn, Martin F. Jurgensen, G. D. Mroz, Deborah S. Page-Dumroese

Year Published: 2000

Type: Document

Conference Proceedings

Festuca altaica, Festuca campestris, Festuca hallii (northern rough fescue, alpine rough fescue, plains rough fescue)

www.nrfirescience.org/resource/10881

This FEIS species review synthesizes information on the relationship of *Festuca altaica*, *Festuca campestris*, *Festuca hallii* (northern rough fescue, alpine rough fescue, plains rough fescue) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy...

Author(s): D. A. Tirmenstein

Year Published: 2000

Type: Document

Synthesis

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

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

Quercus gambelii (Gambel oak)

www.nrfirescience.org/resource/10835

This FEIS species review synthesizes information on the relationship of *Quercus gambelii* (Gambel oak) 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): Kevin A. Simonin

Year Published: 2000

Type: Document

Synthesis

Protecting people and sustaining resources in fire-adapted ecosystems: a cohesive strategy

www.nrfirescience.org/resource/11223

This strategy is based on the premise that sustainable resources are predicated on healthy, resilient ecosystems. In fire-adapted ecosystems, some measure of fire use--at appropriate intensity, frequency, and time of year--should be included in management strategies intended to protect and sustain watersheds, species, and other...

Author(s): Lyle Laverty, Gerald W. Williams

Year Published: 2000

Type: Document

Technical Report or White Paper

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

Amelanchier utahensis (Utah serviceberry)

www.nrfirescience.org/resource/10588

This FEIS species review synthesizes information on the relationship of *Amelanchier utahensis* (Utah 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 review...

Author(s): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Juniperus occidentalis (western juniper)

www.nrfirescience.org/resource/10878

This FEIS species review synthesizes information on the relationship of *Juniperus occidentalis* (western juniper) 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): D. A. Tirmenstein

Year Published: 1999

Type: Document

Synthesis

White pine in the American West: a vanishing species - can we save it?

www.nrfirescience.org/resource/13112

Forest scientists ask that everyone, from the home gardener to the forest manager, help revive western white pine by planting it everywhere, even in nonforest environments such as our neighborhood streets, parks, and backyards. White pine, long ago considered the "King Pine," once dominated the moist inland forests of the Northwest...

Author(s): Leon F. Neuenschwander, James W. Byler, Alan E. Harvey, GERAL I. McDONALD, DENISE S. ORTIZ, HAROLD L. OSBORNE, GERRY C. SNYDER, ARTHUR ZACK

Year Published: 1999

Type: Document

Technical Report or White Paper

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

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. Tirmenstein

Year Published: 1999

Type: Document
Synthesis

Prescribed fire effects on biological control of leafy spurge

www.nrfirescience.org/resource/8282

The flea beetle, *Aphthona nigriscutis* Foudras, is a potentially useful agent for biological control of leafy spurge (*Euphorbia esula* L.) in grasslands devoted to wildlife conservation. However, effects of other grassland management practices on the persistence and dynamics of flea beetle populations are not well understood. We...

Author(s): David P. Fellows, Wesley E. Newton

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

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

The budgetary, ecological, and managerial impacts of pinyon-juniper and cheatgrass fires

www.nrfirescience.org/resource/12108

The 1996 fire season illustrated the potential impacts of wildland fires on the Bureau of Land Management (BLM) administered lands through numerous western states. During the 1996 fire season, over six million acres burned in the United States through unplanned ignitions (wildfires). Over two million acres burned on BLM administered...

Author(s): Thomas C. Roberts

Year Published: 1999

Type: Document

Conference Proceedings

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

Chrysothamnus nauseosus (rubber rabbitbrush)

www.nrfirescience.org/resource/10883

This FEIS species review synthesizes information on the relationship of *Chrysothamnus nauseosus*

(rubber rabbitbrush) 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: 1999

Type: Document

Synthesis

Proceedings: ecology and management of pinyon-juniper communities within the Interior West; September 15-18, 1997; Provo, UT

www.nrfirescience.org/resource/11884

A symposium held September 15-18, 1997, in Provo, UT, and Sanpete County, UT, provided information on the ecology, management, resource values, and restoration of pinyon-juniper communities in the Interior Western United States. The conference was hosted by the USDA Forest Service, Rocky Mountain Research Station and the Utah...

Author(s): Stephen B. Monsen, Richard Stevens

Year Published: 1999

Type: Document

Conference Proceedings

Western national forests: a cohesive strategy is needed to address catastrophic wildfire threats

www.nrfirescience.org/resource/11224

National forests of the dry, interior portion of the western United States that are managed by the Department of Agriculture's Forest Service have undergone significant changes over the last century and a half, becoming much denser, with fewer large trees and many more small, tightly spaced trees and underbrush. These changes have...

Author(s): United States General Accounting Office

Year Published: 1999

Type: Document

Technical Report or White Paper

Achnatherum hymenoides (Indian ricegrass)

www.nrfirescience.org/resource/10870

This FEIS species review synthesizes information on the relationship of Achnatherum hymenoides (Indian ricegrass) 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): D. A. Tirmenstein

Year Published: 1999

Type: Document

Synthesis

Elymus glaucus (blue wildrye)

www.nrfirescience.org/resource/10502

This FEIS species review synthesizes information on the relationship of Elymus glaucus (blue 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 used...

Author(s): Kathleen A. Johnson

Year Published: 1999

Type: Document

Synthesis

Juniperus osteosperma (Utah juniper)

www.nrfirescience.org/resource/10586

This FEIS species review synthesizes information on the relationship of *Juniperus osteosperma* (Utah juniper) 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): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Prescribed fire effects on herpetofauna: review and management implications

www.nrfirescience.org/resource/18650

Prescribed burning is used to achieve a variety of silvicultural objectives, including controlling heavy fuel accumulation, exposing mineral soil, releasing available nutrients for seedbed preparation, and controlling certain insects, diseases, and competing vegetation (Hunter 1990, Pyne et al. 1996). Prescribed burning also is an...

Author(s): Kevin R. Russell, David H. Van Lear, David C. Guynn, Jr.

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Gutierrezia sarothrae (broom snakeweed)

www.nrfirescience.org/resource/10880

This FEIS species review synthesizes information on the relationship of *Gutierrezia sarothrae* (broom snakeweed) 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

Hesperostipa comata (needle-and-thread grass)

www.nrfirescience.org/resource/10587

This FEIS species review synthesizes information on the relationship of *Hesperostipa comata* (needle-and-thread 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...

Author(s): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Artemisia tridentata subsp. wyomingensis (Wyoming big sagebrush)

www.nrfirescience.org/resource/10738

This FEIS species review synthesizes information on the relationship of *Artemisia tridentata* subsp. *wyomingensis* (Wyoming big sagebrush) 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...

Author(s): Janet L. Howard

Year Published: 1999

Type: Document

Synthesis

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

Birds in a sagebrush sea: Managing sagebrush habitat for bird communities

www.nrfirescience.org/resource/15329

This booklet presents land management recommendations to help bird communities in sagebrush habitats. It was prepared for the Western Working Group of Partners in Flight, a partnership of private citizens, industry groups, government agencies, universities, nongovernment organizations, and others interested in bird conservation. Why...

Author(s): Christine Paige, Sharon Ritter

Year Published: 1999

Type: Document

Management or Planning Document

Grayia spinosa (spiny hopsage)

www.nrfirescience.org/resource/10879

This FEIS species review synthesizes information on the relationship of *Grayia spinosa* (spiny hopsage) 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: 1999

Type: Document

Synthesis

Bouteloua hirsuta (hairy grama)

www.nrfirescience.org/resource/10583

This FEIS species review synthesizes information on the relationship of *Bouteloua hirsuta* (hairy grama) 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): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Muhlenbergia richardsonis (mat muhly)

www.nrfirescience.org/resource/10589

This FEIS species review synthesizes information on the relationship of *Muhlenbergia richardsonis* (mat 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): Keith Aleksoff

Year Published: 1999

Type: Document

Synthesis

Artemisia tridentata subsp. tridentata (basin big sagebrush)

www.nrfirescience.org/resource/10886

This FEIS species review synthesizes information on the relationship of *Artemisia tridentata* subsp. *tridentata* (basin big sagebrush) 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....

Author(s): D. A. Tirmenstein

Year Published: 1999

Type: Document

Synthesis

Yellowstone fires: a decade later

www.nrfirescience.org/resource/18476

Atop a ridge in Yellowstone National Park in 1984, a freak summer wind—perhaps a tornado or a downburst from a thunderstorm—leveled an ancient lodge-pole pine forest, piling up a head-high maze of logs. In the notorious summer of 1988, when wildfires burned one-third of the park, a fire front swept across the same ridge,...

Author(s): Y. Baskin

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Artemisia tripartita subsp. rupicola, Artemisia tripartita subsp. tripartita (Wyoming threetip sagebrush, tall threetip sagebrush)

www.nrfirescience.org/resource/10887

This FEIS species review synthesizes information on the relationship of *Artemisia tripartita* subsp. *rupicola*, *Artemisia tripartita* subsp. *tripartita* (Wyoming threetip sagebrush, tall threetip sagebrush) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the...

Author(s): D. A. Tirmenstein

Year Published: 1999

Type: Document

Synthesis

Purshia tridentata (antelope bitterbrush)

www.nrfirescience.org/resource/10584

This FEIS species review synthesizes information on the relationship of *Purshia tridentata* (antelope bitterbrush) 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): Elena Zlatnik

Year Published: 1999

Type: Document

Synthesis

Bromus tectorum expansion and biodiversity loss on the Snake River Plain, southern Idaho, U.S.A.

www.nrfirescience.org/resource/11420

The Snake River Plain forms a 6 million ha arc-shaped depression across southern Idaho. Basalt flows, fresh water sediments, loess and volcanic deposits cover its surface. Elevation increases eastward from 650 to 2,150 m altitude. Climate is semi-arid with annual precipitation ranging from 150 to 400 mm, arriving primarily in winter...

Author(s): Nancy L. Shaw, Victoria A. Saab, Stephen B. Monsen, T. D. Rich

Year Published: 1999

Type: Document

Conference Proceedings

Ecology and management of pinyon-juniper communities within the Interior West: Overview of the "Ecological Session" of the Symposium

www.nrfirescience.org/resource/11885

Categories of papers in the "Ecological Session" were history and ecological change, distribution, classification, ecology, and physiology, succession and diversity, and disease. Substantial changes have taken place in pinyon-juniper woodlands over the past 150 years. Coinciding with and following early extensive localized...

Author(s): W. A. Laycock

Year Published: 1999

Type: Document

Conference Proceedings

Transitions and thresholds: influences and implications for management in pinyon and juniper woodlands

www.nrfirescience.org/resource/12107

Thresholds are important to understanding Great Basin ecology. Once a threshold has been crossed, the new community may have very different functional capabilities than the previous community.

Management action needs to occur well before a threshold is crossed to be effective, and that action needs to reflect the scales of time and...

Author(s): Robin J. Tausch

Year Published: 1999

Type: Document

Conference Proceedings

Prefire heterogeneity, fire severity, and early postfire plant reestablishment in subalpine forests of Yellowstone National Park, Wyoming

www.nrfirescience.org/resource/8212

The 1988 fires in Yellowstone National Park provided an opportunity to study effects of a large infrequent disturbance on a natural community. This study addressed two questions: (1) How does prefire heterogeneity of the landscape affect postfire patterns of fire severity? and (2) How do postfire patterns of burn severity influence...

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

Year Published: 1999

Type: Document
Book or Chapter or Journal Article

Chrysothamnus viscidiflorus (green rabbitbrush)

www.nrfirescience.org/resource/10884

This FEIS species review synthesizes information on the relationship of *Chrysothamnus viscidiflorus* (green rabbitbrush) 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: 1999

Type: Document

Synthesis

Poa arida (plains bluegrass)

www.nrfirescience.org/resource/10715

This FEIS species review synthesizes information on the relationship of *Poa arida* (plains 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 used...

Author(s): Janet L. Howard

Year Published: 1998

Type: Document

Synthesis

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

Bromus hordeaceus (soft chess)

www.nrfirescience.org/resource/10461

This FEIS species review synthesizes information on the relationship of *Bromus hordeaceus* (soft chess) 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): Janet L. Howard

Year Published: 1998

Type: Document

Synthesis

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

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

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

Poa secunda (Sandberg bluegrass)

www.nrfirescience.org/resource/10716

This FEIS species review synthesizes information on the relationship of *Poa secunda* (Sandberg 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

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

Aristida purpurea (purple threeawn)

www.nrfirescience.org/resource/10728

This FEIS species review synthesizes information on the relationship of *Aristida purpurea* (purple threeawn) 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

Vegetation development of boreal riparian plant communities after flooding, fire, and logging, Peace River, Canada

www.nrfirescience.org/resource/18681

In this study vegetation development is compared and contrasted following natural and logging disturbances in a major boreal river valley in Alberta. Permanent sample plots and releves were established and sampled for vegetation and landscape attributes in the Peace River Lowlands, Wood Buffalo National Park (now a UNESCO World...

Author(s): Kevin P. Timoney, George Peterson, Ross W. Wein

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Fire and fish: issues of forest health and conservation of sensitive species

www.nrfirescience.org/resource/18636

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, James L. Clayton

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

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

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

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

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

Taxidea taxus (American badger)

www.nrfirescience.org/resource/10507

This FEIS species review synthesizes information on the relationship of Taxidea taxus (American badger) 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

Stand hazard rating for central Idaho forests

www.nrfirescience.org/resource/11254

Growing concern over sustainability of central Idaho forests has created a need to assess the health of forest stands on a relative basis. A stand hazard rating was developed as a composite of 11 individual ratings to compare the health hazards of different stands. The composite rating includes Douglas-fir beetle, mountain pine...

Author(s): Robert W. Steele, Ralph E. Williams, Julie C. Weatherby, Elizabeth D. Reinhardt, James T. Hoffman, R. W. Thier

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

Restoring historic landscape patterns through management: restoring fire mosaics on the landscape

www.nrfirescience.org/resource/11250

Seral, fire dependent lodgepole pine (*Pinus contorta* Dougl.) communities are an important component of upper elevation forests throughout the Northern Rockies, where they cover 4 million acres, or about 17 percent of the land base. On the Bitterroot National Forest, lodgepole pine occurs mostly between 5,500 and 7,500 feet.

Author(s): Catherine A. Stewart

Year Published: 1996

Type: Document

Technical Report or White Paper

Athene cunicularia (burrowing owl)

www.nrfirescience.org/resource/10726

This FEIS species review synthesizes information on the relationship of *Athene cunicularia* (burrowing 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 L. Howard

Year Published: 1996

Type: Document

Synthesis

Microtus pennsylvanicus (meadow vole)

www.nrfirescience.org/resource/10514

This FEIS species review synthesizes information on the relationship of *Microtus pennsylvanicus* (meadow vole) 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: 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

From the Background...'A rapid decline in whitebark pine has occurred during the last 60 years as a result of three interrelated factors: epidemics of mountain pine beetle (*Dendroctonus ponderosae*); the introduced disease white pine blister rust (*Cronartium ribicola*); and successional replacement by shade-tolerant conifers,...

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

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Perognathus parvus (Great Basin pocket mouse)

www.nrfirescience.org/resource/10719

This FEIS species review synthesizes information on the relationship of *Perognathus parvus* (Great Basin pocket 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...

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

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

The ecological implications of fire in Greater Yellowstone, proceedings of the second biennial conference on the Greater Yellowstone Ecosystem

www.nrfirescience.org/resource/11989

Proceedings of the second biennial conference on the Greater Yellowstone Ecosystem.

Author(s): Jason Greenlee

Year Published: 1996

Type: Document

Conference Proceedings

Scophiopus intermontanus (Great Basin spadefoot)

www.nrfirescience.org/resource/10713

This FEIS species review synthesizes information on the relationship of *Scophiopus intermontanus* (Great Basin spadefoot) 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: 1996

Type: Document

Synthesis

Spermophilus townsendii (Townsend's ground squirrel)

www.nrfirescience.org/resource/10711

This FEIS species review synthesizes information on the relationship of *Spermophilus townsendii* (Townsend's ground 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...

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Sylvilagus floridanus (eastern cottontail)

www.nrfirescience.org/resource/10508

This FEIS species review synthesizes information on the relationship of *Sylvilagus floridanus* (eastern cottontail) 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: 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

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

Shepherdia argentea (silver buffaloberry)

www.nrfirescience.org/resource/10634

This FEIS species review synthesizes information on the relationship of *Shepherdia argentea* (silver 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): Lora L. Esser

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

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

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

Schedonorus arundinaceus (tall fescue)

www.nrfirescience.org/resource/10479

This FEIS species review synthesizes information on the relationship of *Schedonorus arundinaceus* (tall

fescue) 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): Roberta A. Walsh

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

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

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

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

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

Ribes velutinum (desert gooseberry)

www.nrfirescience.org/resource/10750

This FEIS species review synthesizes information on the relationship of *Ribes velutinum* (desert gooseberry) 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): Anna Marshall

Year Published: 1995

Type: Document

Synthesis

Phasianus colchicus (ring-necked pheasant)

www.nrfirescience.org/resource/10535

This FEIS species review synthesizes information on the relationship of *Phasianus colchicus* (ring-necked pheasant) 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): 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

Lepus californicus (black-tailed jackrabbit)

www.nrfirescience.org/resource/10721

This FEIS species review synthesizes information on the relationship of *Lepus californicus* (black-tailed jackrabbit) 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: 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

Philadelphus lewisii (Lewis' mockorange)

www.nrfirescience.org/resource/10613

This FEIS species review synthesizes information on the relationship of *Philadelphus lewisii* (Lewis' mockorange) 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): Jennifer H. Carey

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

Antilocapra americana (pronghorn)

www.nrfirescience.org/resource/10731

This FEIS species review synthesizes information on the relationship of *Antilocapra americana* (pronghorn) 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: 1995

Type: Document

Synthesis

Dipodomys ordii (Ord's kangaroo rat)

www.nrfirescience.org/resource/10504

This FEIS species review synthesizes information on the relationship of *Dipodomys ordii* (Ord's kangaroo rat) 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

Urtica dioica (stinging nettle)

www.nrfirescience.org/resource/10612

This FEIS species review synthesizes information on the relationship of *Urtica dioica* (stinging nettle) 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): Jennifer H. Carey

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

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

Spiraea douglasii (Douglas' spirea)

www.nrfirescience.org/resource/10633

This FEIS species review synthesizes information on the relationship of *Spiraea douglasii* (Douglas' 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): Lora L. Esser

Year Published: 1995

Type: Document

Synthesis

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

Ribes oxycanthoides (northern gooseberry)

www.nrfirescience.org/resource/10611

This FEIS species review synthesizes information on the relationship of *Ribes oxycanthoides* (northern gooseberry) 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): Jennifer H. Carey

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

Restoration of upper subalpine whitebark pine ecosystems in western Montana

www.nrfirescience.org/resource/19233

Description not available

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

Year Published: 1995

Type: Document

Conference Proceedings

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

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...

Author(s): Janet Sullivan

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

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

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

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

Bos bison (American bison)

www.nrfirescience.org/resource/10549

This FEIS species review synthesizes information on the relationship of *Bos bison* (American bison) 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: 1995

Type: Document

Synthesis

Krascheninnikovia lanata (winterfat)

www.nrfirescience.org/resource/10614

This FEIS species review synthesizes information on the relationship of *Krascheninnikovia lanata* (winterfat) 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): Jennifer H. Carey

Year Published: 1995

Type: Document

Synthesis

Diatom assemblages of streams influenced by wildfire

www.nrfirescience.org/resource/18646

The Greater Yellowstone Area ecosystem experienced major wildfires in 1988, resulting in a substantial number of catchments being burned. We studied diatom assemblage structure at 14 sites over 5 years in catchments ranging from 0 to over 90% burned. Coefficients of variation for selected physical measures provided a good assessment...

Author(s): Christopher T. Robinson, Samuel R. Rushforth, G. Wayne Minshall

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

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

Asio flammeus (short-eared owl)

www.nrfirescience.org/resource/10725

This FEIS species review synthesizes information on the relationship of *Asio flammeus* (short-eared 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 used...

Author(s): Janet L. Howard

Year Published: 1994

Type: Document

Synthesis

Elaeagnus commutata (silverberry)

www.nrfirescience.org/resource/10632

This FEIS species review synthesizes information on the relationship of *Elaeagnus commutata* (silverberry) 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

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

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 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

Dumetella carolinensis (gray catbird)

www.nrfirescience.org/resource/10516

This FEIS species review synthesizes information on the relationship of *Dumetella carolinensis* (gray catbird) 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

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

Proceedings-ecology and management of annual rangelands; 1992 May 18-21; Boise, ID

www.nrfirescience.org/resource/12046

Annual weeds continue to expand throughout the West eliminating many desirable species and plant communities. Wildfires are now common on lands infested with annual weeds, causing a loss of wildlife habitat and other natural resources. Measures can be used to reduce burning and restore native plant communities, but restoration is...

Author(s): Stephen B. Monsen, Stanley G. Kitchen

Year Published: 1994

Type: Document

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

Chamaebatiaria millefolium (desert sweet)

www.nrfirescience.org/resource/10765

This FEIS species review synthesizes information on the relationship of Chamaebatiaria millefolium (desert sweet) 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

Brachylagus idahoensis (pygmy rabbit)

www.nrfirescience.org/resource/10550

This FEIS species review synthesizes information on the relationship of Brachylagus idahoensis (pygmy rabbit) 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: 1994

Type: Document

Synthesis

Bufo boreas (western toad)

www.nrfirescience.org/resource/10859

This FEIS species review synthesizes information on the relationship of Bufo boreas (western toad) 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 Sullivan

Year Published: 1994

Type: Document

Synthesis

Falco mexicanus (prairie falcon)

www.nrfirescience.org/resource/10541

This FEIS species review synthesizes information on the relationship of Falco mexicanus (prairie falcon) 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

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

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

Carex garberi (Garber sedge)

www.nrfirescience.org/resource/10924

This FEIS species review synthesizes information on the relationship of *Carex garberi* (Garber 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): Roberta A. Walsh

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

Agrostis stolonifera (creeping bentgrass)

www.nrfirescience.org/resource/10642

This FEIS species review synthesizes information on the relationship of *Agrostis stolonifera* (creeping 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...

Author(s): Lora L. Esser

Year Published: 1994

Type: Document

Synthesis

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

Carex capitata (capitate sedge)

www.nrfirescience.org/resource/10926

This FEIS species review synthesizes information on the relationship of *Carex capitata* (capitate 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): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

Festuca subulata (bearded fescue)

www.nrfirescience.org/resource/10644

This FEIS species review synthesizes information on the relationship of *Festuca subulata* (bearded 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): Lora L. Esser

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

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

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

Glycyrrhiza lepidota (wild licorice)

www.nrfirescience.org/resource/10631

This FEIS species review synthesizes information on the relationship of *Glycyrrhiza lepidota* (wild licorice) 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

Fire conditions and pre- and postoccurrence of annual grasses on the Snake River Plain

www.nrfirescience.org/resource/12047

Fire has been an important factor in the development of the vegetation of the Snake River Plain. Prior to Euro-American influence, fire helped determine the physiognomy and species composition of many communities. The occurrence of fire varied widely depending on the vegetation present, topography, and other factors. This impact can...

Author(s): Erin F. Peters, Stephen C. Bunting
Year Published: 1994
Type: Document
Conference Proceedings, Synthesis, Technical Report or White Paper

Hierochloe odorata (sweet grass)

www.nrfirescience.org/resource/10921

This FEIS species review synthesizes information on the relationship of Hierochloa 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

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

Buteo regalis (ferruginous hawk)

www.nrfirescience.org/resource/10545

This FEIS species review synthesizes information on the relationship of Buteo regalis (ferruginous 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

Buteo swainsoni (Swainson's hawk)

www.nrfirescience.org/resource/10546

This FEIS species review synthesizes information on the relationship of Buteo swainsoni (Swainson's 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 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

Alectoris chukar (chukar)

www.nrfirescience.org/resource/10860

This FEIS species review synthesizes information on the relationship of Alectoris chukar (chukar) 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 Sullivan
Year Published: 1994
Type: Document
Synthesis

Ratibida columnifera (upright prairie coneflower)

www.nrfirescience.org/resource/10911

This FEIS species review synthesizes information on the relationship of Ratibida columnifera (upright prairie coneflower) 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): Roberta A. Walsh
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

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

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

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

Anser albifrons (greater white-fronted goose)

www.nrfirescience.org/resource/10555

This FEIS species review synthesizes information on the relationship of *Anser albifrons* (greater white-fronted goose) 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: 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

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

Castor canadensis (American beaver)

www.nrfirescience.org/resource/10547

This FEIS species review synthesizes information on the relationship of *Castor canadensis* (American beaver) 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

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

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

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

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

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

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

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

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

Schoenoplectus tabernaemontani (soft-stem bulrush)

www.nrfirescience.org/resource/10839

This FEIS species review synthesizes information on the relationship of *Schoenoplectus tabernaemontani* (soft-stem bulrush) 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): S. A. Snyder

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

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

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

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

Circus cyaneus (northern harrier)

www.nrfirescience.org/resource/10845

This FEIS species review synthesizes information on the relationship of *Circus cyaneus* (northern harrier) 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

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

Helianthus maximiliani (Maximilian sunflower)

www.nrfirescience.org/resource/10912

This FEIS species review synthesizes information on the relationship of *Helianthus maximiliani* (Maximilian sunflower) 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): Roberta A. Walsh

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

***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

***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

***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

Chen caerulescens (snow goose)

www.nrfirescience.org/resource/10844

This FEIS species review synthesizes information on the relationship of *Chen caerulescens* (snow goose) 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): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Anas strepera (gadwall)

www.nrfirescience.org/resource/10553

This FEIS species review synthesizes information on the relationship of *Anas strepera* (gadwall) 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

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

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

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

Anas acuta (northern pintail)

www.nrfirescience.org/resource/10527

This FEIS species review synthesizes information on the relationship of *Anas acuta* (northern pintail) 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

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

Oplopanax horridus (devil's club)

www.nrfirescience.org/resource/10720

This FEIS species review synthesizes information on the relationship of *Oplopanax horridus* (devil's club) 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: 1993

Type: Document

Synthesis

Grus americana (whooping crane)

www.nrfirescience.org/resource/10540

This FEIS species review synthesizes information on the relationship of *Grus americana* (whooping crane) 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

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

Aythya valisineria (canvasback)

www.nrfirescience.org/resource/10552

This FEIS species review synthesizes information on the relationship of *Aythya valisineria* (canvasback) 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

Anas platyrhynchos (mallard)

www.nrfirescience.org/resource/10848

This FEIS species review synthesizes information on the relationship of *Anas platyrhynchos* (mallard) 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): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Zenaida macroura (mourning dove)

www.nrfirescience.org/resource/10531

This FEIS species review synthesizes information on the relationship of *Zenaida macroura* (mourning dove) 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

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

Lewisia rediviva (bitterroot)

www.nrfirescience.org/resource/10736

This FEIS species review synthesizes information on the relationship of *Lewisia rediviva* (bitterroot) 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

Atriplex gardneri (Gardner's saltbush)

www.nrfirescience.org/resource/10810

This FEIS species review synthesizes information on the relationship of *Atriplex gardneri* (Gardner's saltbush) 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): William R. Reed
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

Zigadenus paniculatus (foothill deathcamas)

www.nrfirescience.org/resource/10707

This FEIS species review synthesizes information on the relationship of *Zigadenus paniculatus* (foothill deathcamas) 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: 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

Grindelia squarrosa (curlycup gumweed)

www.nrfirescience.org/resource/10922

This FEIS species review synthesizes information on the relationship of *Grindelia squarrosa* (curlycup gumweed) 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: 1993

Type: Document

Synthesis

Amaranthus retroflexus (rough pigweed)

www.nrfirescience.org/resource/10480

This FEIS species review synthesizes information on the relationship of *Amaranthus retroflexus* (rough pigweed) 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): Roberta A. Walsh

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

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

Linnaea borealis (twinflower)

www.nrfirescience.org/resource/10737

This FEIS species review synthesizes information on the relationship of *Linnaea borealis* (twinflower) 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 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

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

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

Picea pungens (blue spruce)

www.nrfirescience.org/resource/10805

This FEIS species review synthesizes information on the relationship of *Picea pungens* (blue 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): Diane S. Pavsek

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

Anas discors (blue-winged teal)

www.nrfirescience.org/resource/10557

This FEIS species review synthesizes information on the relationship of *Anas discors* (blue-winged teal) 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

Branta canadensis (Canada goose)

www.nrfirescience.org/resource/10847

This FEIS species review synthesizes information on the relationship of *Branta canadensis* (Canada goose) 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

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

Liatris punctata (blazing star)

www.nrfirescience.org/resource/10920

This FEIS species review synthesizes information on the relationship of *Liatris punctata* (blazing star) 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): Roberta A. Walsh

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

Anas crecca (green-winged teal)

www.nrfirescience.org/resource/10556

This FEIS species review synthesizes information on the relationship of *Anas crecca* (green-winged teal) 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

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

Collema tenax (black lichen)

www.nrfirescience.org/resource/10764

This FEIS species review synthesizes information on the relationship of *Collema tenax* (black 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 be used...
Author(s): Robin F. Matthews
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

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

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...

Author(s): Lora L. Esser
Year Published: 1993
Type: Document
Synthesis

Pediomelum hypogaeum (subterranean Indian breadroot)

www.nrfirescience.org/resource/10714

This FEIS species review synthesizes information on the relationship of *Pediomelum hypogaeum* (subterranean Indian breadroot) 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): Janet L. Howard
Year Published: 1993
Type: Document
Synthesis

Panicum virgatum (switchgrass)

www.nrfirescience.org/resource/10580

This FEIS species review synthesizes information on the relationship of *Panicum virgatum* (switchgrass) 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: 1993

Type: Document

Synthesis

Pinus monticola (western white pine)

www.nrfirescience.org/resource/10663

This FEIS species review synthesizes information on the relationship of *Pinus monticola* (western white 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): Randy Scott Griffith

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

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

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

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

Meleagris gallopavo (wild turkey)

www.nrfirescience.org/resource/10841

This FEIS species review synthesizes information on the relationship of *Meleagris gallopavo* (wild turkey) 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: 1992

Type: Document

Synthesis

Salix monticola (mountain willow)

www.nrfirescience.org/resource/10639

This FEIS species review synthesizes information on the relationship of *Salix monticola* (mountain 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): Lora L. Esser

Year Published: 1992

Type: Document

Synthesis

Pinus ponderosa var. ponderosa (Pacific ponderosa pine)

www.nrfirescience.org/resource/10687

This FEIS species review synthesizes information on the relationship of *Pinus ponderosa* var. *ponderosa* (Pacific ponderosa 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...

Author(s): James R. Habeck

Year Published: 1992

Type: Document

Synthesis

Halogeton glomeratus (halogeton)

www.nrfirescience.org/resource/10468

This FEIS species review synthesizes information on the relationship of *Halogeton glomeratus* (halogeton) 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): Diane S. Pavek

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

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

Elymus repens (quackgrass)

www.nrfirescience.org/resource/10470

This FEIS species review synthesizes information on the relationship of *Elymus repens* (quackgrass) 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): S. A. Snyder

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

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

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

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

Symphiotrichum leave (smooth blue American-aster)

www.nrfirescience.org/resource/10861

This FEIS species review synthesizes information on the relationship of *Symphiotrichum leave* (smooth blue American-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...

Author(s): Janet Sullivan

Year Published: 1992

Type: Document

Synthesis

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

Schoenoplectus americanus (Olney's threesquare bulrush)

www.nrfirescience.org/resource/10565

This FEIS species review synthesizes information on the relationship of *Schoenoplectus americanus* (Olney's threesquare bulrush) 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): Ronald Uchytel
Year Published: 1992
Type: Document
Synthesis

Rhamnus purshiana (cascara)

www.nrfirescience.org/resource/10691

This FEIS species review synthesizes information on the relationship of *Rhamnus purshiana* (cascara) 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): James R. Habeck
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

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

Xanthium strumarium (common cocklebur)

www.nrfirescience.org/resource/10445

This FEIS species review synthesizes information on the relationship of *Xanthium strumarium* (common cocklebur) 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): Ronald Uchytel

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

***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

***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

***Achnatherum richardsonii* (Richardson needlegrass)**

www.nrfirescience.org/resource/10638

This FEIS species review synthesizes information on the relationship of *Achnatherum richardsonii* (Richardson 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): Lora L. Esser

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

Physocarpus malvaceus (ninebark)

www.nrfirescience.org/resource/10688

This FEIS species review synthesizes information on the relationship of *Physocarpus malvaceus* (ninebark) 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

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

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

Ambrosia psilostachya (western ragweed)

www.nrfirescience.org/resource/10807

This FEIS species review synthesizes information on the relationship of *Ambrosia psilostachya* (western ragweed) 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: 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

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

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

Sorghastrum nutans (Indiangrass)

www.nrfirescience.org/resource/10907

This FEIS species review synthesizes information on the relationship of *Sorghastrum nutans* (Indiangrass) 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

Hesperostipa spartea (porcupine grass)

www.nrfirescience.org/resource/10910

This FEIS species review synthesizes information on the relationship of *Hesperostipa spartea* (porcupine 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...

Author(s): Crystal J. Walkup

Year Published: 1991

Type: Document

Synthesis

Crataegus douglasii (Douglas hawthorn)

www.nrfirescience.org/resource/10690

This FEIS species review synthesizes information on the relationship of *Crataegus douglasii* (Douglas hawthorn) 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): James R. Habeck

Year Published: 1991

Type: Document

Synthesis

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

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

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

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

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

Carex lenticularis var. dolia (Kellog's sedge)

www.nrfirescience.org/resource/10934

This FEIS species review synthesizes information on the relationship of Carex lenticularis var. dolia (Kellog's 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...

Author(s): Tara Y. Williams, William C. Fischer

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

Symphoricarpos mollis (creeping snowberry)

www.nrfirescience.org/resource/10838

This FEIS species review synthesizes information on the relationship of *Symphoricarpos mollis* (creeping 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...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

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

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

Spartina pectinata (prairie cordgrass)

www.nrfirescience.org/resource/10906

This FEIS species review synthesizes information on the relationship of *Spartina pectinata* (prairie cordgrass) 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): Crystal J. Walkup
Year Published: 1991
Type: Document
Synthesis

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

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

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

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

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

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

***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

***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

***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

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

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

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

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

Vaccinium parvifolium (red huckleberry)

www.nrfirescience.org/resource/10888

This FEIS species review synthesizes information on the relationship of Vaccinium parvifolium (red

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 can...

Author(s): D. A. Tirmenstein

Year Published: 1990

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

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

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

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

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 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

Berberis nervosa (dwarf Oregon-grape)

www.nrfirescience.org/resource/10885

This FEIS species review synthesizes information on the relationship of *Berberis nervosa* (dwarf Oregon-grape) 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

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

Botrychium montanum (mountain moonwort)

www.nrfirescience.org/resource/10929

This FEIS species review synthesizes information on the relationship of *Botrychium montanum* (mountain 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 can...

Author(s): Tara Y. Williams

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

Lathyrus bijugatus (pinewoods sweetpea)

www.nrfirescience.org/resource/10931

This FEIS species review synthesizes information on the relationship of *Lathyrus bijugatus* (pinewoods sweetpea) 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

Celtis reticulata (netleaf hackberry)

www.nrfirescience.org/resource/10891

This FEIS species review synthesizes information on the relationship of *Celtis reticulata* (netleaf hackberry) 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

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

Oxytropis campestris var. columbiana (Columbia River crazyweed)

www.nrfirescience.org/resource/10927

This FEIS species review synthesizes information on the relationship of *Oxytropis campestris* var. *columbiana* (Columbia River crazyweed) 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...

Author(s): Tara Y. Williams

Year Published: 1990

Type: Document

Synthesis

Salix lucida subsp. lasiandra (Pacific willow)

www.nrfirescience.org/resource/10577

This FEIS species review synthesizes information on the relationship of *Salix lucida* subsp. *lasiandra* (Pacific 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...

Author(s): Ronald Uchytel

Year Published: 1989

Type: Document

Synthesis

Alnus rhombifolia (white alder)

www.nrfirescience.org/resource/10576

This FEIS species review synthesizes information on the relationship of *Alnus rhombifolia* (white 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 can be used...

Author(s): Ronald Uchytel

Year Published: 1989

Type: Document

Synthesis

Polystichum munitum (western sword fern)

www.nrfirescience.org/resource/10627

This FEIS species review synthesizes information on the relationship of *Polystichum munitum* (western sword 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: 1989

Type: Document

Synthesis

Rubus spectabilis (salmonberry)

www.nrfirescience.org/resource/10889

This FEIS species review synthesizes information on the relationship of *Rubus spectabilis* (salmonberry) 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: 1989

Type: Document

Synthesis

Rubus laciniatus (evergreen blackberry)

www.nrfirescience.org/resource/10478

This FEIS species review synthesizes information on the relationship of *Rubus laciniatus* (evergreen blackberry) 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): D. A. Tirmenstein

Year Published: 1989

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

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

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

Alnus rubra (red alder)

www.nrfirescience.org/resource/10571

This FEIS species review synthesizes information on the relationship of *Alnus rubra* (red 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 can be used for...

Author(s): Ronald Uchytel

Year Published: 1989

Type: Document

Synthesis

Salix lutea (yellow willow)

www.nrfirescience.org/resource/10567

This FEIS species review synthesizes information on the relationship of *Salix lutea* (yellow 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 for...

Author(s): Ronald Uchytel

Year Published: 1989

Type: Document

Synthesis

Rubus discolor (Himalayan blackberry)

www.nrfirescience.org/resource/10477

This FEIS species review synthesizes information on the relationship of *Rubus discolor* (Himalayan blackberry) 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): D. A. Tirmenstein

Year Published: 1989

Type: Document

Synthesis

Rubus ursinus (trailing blackberry)

www.nrfirescience.org/resource/10876

This FEIS species review synthesizes information on the relationship of *Rubus ursinus* (trailing blackberry) 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: 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

The role of disturbance in stream ecology

www.nrfirescience.org/resource/18630

We define disturbance in stream ecosystems to be: any relatively discrete event in time that is characterized by a frequency, intensity, and severity outside a predictable range, and that disrupts ecosystem, community, or population structure and changes resources or the physical environment. Of the three major hypotheses relating...

Author(s): Vincent H. Resh, Arthur V. Brown, Alan P. Covich, Martin E. Gurtz, Hiram Li, G. Wayne Minshall, Seth R. Reice, Andrew L. Sheldon, J. Bruce Wallace, Robert C. Wissmar

Year Published: 1988

Type: Document

Book or Chapter or Journal Article

Riparian vegetation dynamics in relation to channel shifting and fire

www.nrfirescience.org/resource/18466

The riparian vegetation along the Bighorn River in Wyoming forms a complex mosaic comprised of cottonwood (*Populus deltoides*) groves, meadows, marshes, and several kinds of shrubland. Changes in the riparian mosaic during the last 50 years were reconstructed using tree ring analysis and aerial photos taken over the river in 1938,...

Author(s): Y. Akashi, Dennis H. Knight

Year Published: 1988

Type: Document

Conference Proceedings

Acer negundo (boxelder)

www.nrfirescience.org/resource/10823

This FEIS species review synthesizes information on the relationship of *Acer negundo* (boxelder) 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): Lynn Rosario

Year Published: 1988

Type: Document

Synthesis

Andropogon gerardii (big bluestem)

www.nrfirescience.org/resource/10573

This FEIS species review synthesizes information on the relationship of *Andropogon gerardii* (big

bluestem) 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: 1988

Type: Document

Synthesis

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

Proceedings: Pinyon-Juniper Conference, Reno, NV, January 13-16, 1986

www.nrfirescience.org/resource/12117

Includes more than 90 papers bringing together research accomplishments of the last 10 years including ongoing research on the ecology and management of pinyon-juniper ecosystems. Scientist and management points of view are presented.

Author(s): Richard L. Everett

Year Published: 1987

Type: Document

Conference Proceedings, Technical Report or White Paper

Forest fire frequency and western spruce budworm outbreaks in western Montana

www.nrfirescience.org/resource/7908

Duration and intensity of western spruce budworm (*Christoneura occidentalis* Freeman) outbreaks have increased with the decrease in forest fire frequency in Montana since 1910. Frequency of budworm outbreaks, however, was not affected. Feeding activity and fire occurrence were measured in 20 mixed Douglas-fir (*Pseudotsuga menziesii*...

Author(s): Leslie Anderson, Clinton E. Carlson, Ronald H. Wakimoto

Year Published: 1987

Type: Document

Book or Chapter or Journal Article

Whitebark pine cone crops - a diminishing source of wildlife food

www.nrfirescience.org/resource/19234

Whitebark pine (*Pinus albicaulis*)s found at timberline and in subalpine forests from central California and western Wyoming north to British Columbia and Alberta. This species has been of little interest for commercial timber, but in recent years its large seeds(average 2 ,600/1bh) have been recognized as an important food source...

Author(s): Stephen F. Arno

Year Published: 1986

Type: Document

Book or Chapter or Journal Article

Effects of disturbance frequency on stream benthic community structure in relation to canopy cover and season

www.nrfirescience.org/resource/18645

Field experiments were conducted to examine the effects of disturbance frequency on invertebrates and periphyton colonizing bricks in a third order Rocky Mountain (USA) stream. After an initial colonization period (30 days), sets of bricks were turned over at intervals of 0, 3, 9, 27, or 54 days. Invertebrate species richness and...

Author(s): Christopher T. Robinson, G. Wayne Minshall

Year Published: 1986

Type: Document

Book or Chapter or Journal Article

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

Modeling shrub succession following clearcutting and broadcast burning

www.nrfirescience.org/resource/11060

This conceptual model of early seral shrub succession following clearcutting and broadcast burning synthesizes ideas from previous research and modeling approaches into a simple diagrammatic model of the critical successional influences and processes. Illustrative examples are drawn from observations...

Author(s): Penelope Morgan, Leon F. Neuenschwander

Year Published: 1985

Type: Document

Conference Proceedings, Technical Report or White Paper

Fire history at the forest-grassland ecotone in southwestern Montana

www.nrfirescience.org/resource/15375

The history and influence of fires was studied at the forest-grassland ecotone in high valleys of southwestern Montana. Investigations were focused upon several sites having early landscape photographs and modern retakes that allow for detection of vegetational changes. Fire intervals were determined for these sites by analyzing...

Author(s): Stephen F. Arno, George E. Gruell

Year Published: 1983

Type: Document

Book or Chapter or Journal Article

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

Fire frequency reduced two orders of magnitude in the Bitterroot Canyons, Montana

www.nrfirescience.org/resource/8231

The fire cycle in low-elevation mesic coniferous forests of the Bitterroot Canyons, Montana, has changed from about 60 years before European settlement to about 7500 years between 1910 and 1980. The decreased fire frequency may be responsible for increased severity of western spruce bud worm outbreaks (*Choristoneuraoccidentalis*...

Author(s): Bruce McCune

Year Published: 1983

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

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

Wildland fire research needs in the West: Forest Service managers' views

www.nrfirescience.org/resource/11910

This report discusses fire-related research needs in the western regions of the Forest Service. These needs were expressed by personnel at all management levels. Responses were one part of a more general study designed to establish information requirements for integrating fire into land management planning.

Author(s): Richard J. Barney

Year Published: 1979

Type: Document

Technical Report or White Paper

A review of some interactions between harvesting, residue management, fire, and forest insects and diseases

www.nrfirescience.org/resource/13140

Many species of insects and diseases create residues that predispose forests to fire. Conversely, natural factors such as fire, wind-throw, and other agents create forest residues that predispose forests to diseases and insects, including bark and cambium beetles, wood borers, and others. Man-made residues also predispose forests to...

Author(s): David G. Fellin

Year Published: 1979

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

Fire ecology questions survey: candid expressions of research needs by land managers and scientists in western North America

www.nrfirescience.org/resource/11907

Contains 910 sets of forest fire ecology questions mailed to the authors by 302 land managers and scientists throughout the western United States and Canada. Questions were submitted in response to a survey of important research needs for understanding the effects of fire and fire exclusion in western coniferous forest ecosystems....

Author(s): Alan R. Taylor, Ronald N. Kickert, David H. Firmage, Mark J. Behan

Year Published: 1975

Type: Document

Technical Report or White Paper

30 years of vegetation change following burning of sagebrush-grass range

www.nrfirescience.org/resource/15395

A sagebrush-grass range was burned according to plan in 1936. Long-term results show that sagebrush yields have increased while most other important shrub, grass, and forb yields have decreased. Evaluation by subspecies of sage-brush was helpful in interpreting sagebrush behavior. The return of sagebrush shows the need for planning...

Author(s): Roy O. Harniss, Robert B. Murray

Year Published: 1973

Type: Document

Book or Chapter or Journal Article

Functional role of whitebark pine at treeline across its Rocky Mountain range

www.nrfirescience.org/resource/14771

This presentation by Diana Tomback, Professor University of Colorado – Denver and Director of the Whitebark Pine Ecosystem 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...

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

Fire Modeling in the Wildland Fire Decision Support System - WFDSS

www.nrfirescience.org/resource/59

Mediasite video presentation given by Sam Amato, (National Fire Decision Support Center) at the 2011 Southwest Interagency Fuels Workshop, Flagstaff, AZ on March 10, 2011. The Wildland Fire Decision Support System (WFDSS) model uses different fire models to provide landscape scale fire modeling. This presentation defines the model...

Type: Media

Video

Western Aspen Alliance

www.nrfirescience.org/resource/16370

WESTERN ASPEN ALLIANCE is a joint venture between Utah State University's College of Natural Resources, USDI Bureau of Land Management, and the USDA Forest Service Rocky Mountain Research Station and National Forest Systems, whose purpose is to facilitate and coordinate research issues related to quaking aspen (*Populus tremuloides*...

Type: Website

Website

Mountain pine beetle and fire: the British Columbia experience

www.nrfirescience.org/resource/12872

Dana Hicks, a Regional Fire Management Specialist with the British Columbia Ministry of Forests and Range, presents a webinar on the British Columbia experience with an unprecedented infestation and the resulting wildfires in this new fuel complex. Lodgepole pine stands were always an aggressive burning forest fuel complex, but with...

Type: Media

Webinar

Mapping human or natural disturbance effects on coniferous forest canopies using field plot and Lidar data

www.nrfirescience.org/resource/13333

This Utah State University Learn and Lunch webinar featured information on using remote sensing, particularly lidar, to create predictive models and maps of forest biomass following anthropogenic activities (i.e. timber harvest), and naturally occurring disturbances (i.e. bark beetle infestation). Research Forester, Dr. Andrew Hudak...

Type: Media

Webinar

Ecology and silviculture of Northern Rockies forests

www.nrfirescience.org/resource/14728

This presentation by Melissa Jenkins, Forest Silviculturist on the Flathead National Forest, was given at the Adaptive Silviculture for Climate Change (ASCC) Northern Rockies Workshop was held June 28, 2016 at the Supervisor's Office of the Flathead National Forest in Kalispell, Montana, bringing together natural resource managers...

Type: Media

Webinar

How do we minimize the risk of catastrophic fires?

www.nrfirescience.org/resource/18966

Fires that burn vegetation on the forest floor are important for forest health and are much easier to manage. Doug Grafe, fire protection chief for the Oregon Department of Forestry, explains how fuel reduction through active management and through prescribed fire can help with the prevention of catastrophic wildfires. This 1.5...

Type: Media

Video

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

The ecology of dry mixed conifer forests—What makes them unique?

www.nrfirescience.org/resource/12809

This webinar is the first of a four-part series for managers and scientists to discuss up-to-date information regarding the benefits, challenges, opportunities, and trade-offs among the different strategies and tools related to fuel treatment applications within dry mixed conifer forests of the western United States. Presenters:...

Type: Media

Webinar

Lodgepole pine ecology & fire behavior

www.nrfirescience.org/resource/14098

This webinar was not recorded. Media link below is to a pdf of the webinar slide show. This presentation covers the following points: 1) Surprises/Lessons from the 1988 fires in Yellowstone National Park; 2) Resistance to an aggressive invasive species in post-fire lodgepole pine forests; 3) Interactions of mountain pine...

Type: Media

Webinar

Introduction to Fire Ecology

www.nrfirescience.org/resource/17987

This video provides a short answer to the question: what is fire ecology?

Type: Media

Webinar

Selection and propagation of native woody plants for the intermountain area

www.nrfirescience.org/resource/16343

This webinar will discuss efforts at Utah State University to select and propagate superior accessions of native woody plants. It will introduce the use of native plants in landscaping, including some of the advantages and disadvantages associated with them. There will also be in-depth discussion on selection and propagation of...

Type: Media

Webinar

Climate change and stress complexes in forests of western North America

www.nrfirescience.org/resource/13035

Stress complexes in Western forests are affected by a warmer climate, that is the interaction of fire, drought, insects, etc. can alter the vigor of forest ecosystems and potentially change their structure and function. This webinar will cover the concepts and present several case studies. The presenters will also discuss management...

Type: Media

Webinar

Evolving paradigms of aspen ecology and management

www.nrfirescience.org/resource/14331

The Evolving Paradigms of Aspen Ecology and Management webinar was part 2 of a longer recording. It starts at time 28:30. In recent years, fundamental assumptions concerning aspen clonal age, regeneration, and genetic diversity have been challenged, and these findings have important implications for management and persistence of...

Type: Media

Webinar

The many faces of quaking aspen: biogeography meets resilience management

www.nrfirescience.org/resource/14059

The many faces of quaking aspen: Biogeography meets resilience management. Paul Rogers, Director, Western Aspen Alliance. Recorded talk from 2013 Restoring the West Conference at Utah State University. The conference focused on forest resilience and change agents in the West. By Utah State University Extension Forestry. www....

Type: Media

Video

Resin duct defenses in ponderosa pine after a mountain pine beetle attack: genetic effects and relationships with growth

www.nrfirescience.org/resource/14875

Bark beetles are critical natural agents of tree mortality and ecosystem disturbance in coniferous forests. Despite formidable defenses, including resin produced in resin ducts, bark beetles have recently caused extensive outbreaks in western North America. Defenses, however, are costly to produce and trade-offs...

Type: Media

Webinar

Post-outbreak fire risk and behavior: insect affected fuels profiles

www.nrfirescience.org/resource/13032

This talk provides a perspective on what fire managers need in relation to insect affected fuels. This

webinar was hosted by the Southern Rockies Fire Science Network, and was presented by Paul Langowski.

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

Wildland fire in a changing world: a personal retrospective

www.nrfirescience.org/resource/14292

In October 1997, I attended a conference in Park City, Utah on the Future of Wildland Fire Research. Billed as 'an experiment, a beginning,' this seminal workshop developed action plans to create an interdepartmental competitive grants program, a coordinated response to managing fire regimes for ecosystem health, and a framework for...

Type: Media

Video

Breaking the synchrony: spatial variability in tree regeneration after wildfire delays and dampens future bark beetle outbreaks

www.nrfirescience.org/resource/15152

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

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

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

Aridity and competition drive fire resistance trait covariation in mountain trees

www.nrfirescience.org/resource/18745

Fire resistance traits drive tree species composition in surface?fire ecosystems, but how they covary at different scales of variation and with the environment is not well documented. We assessed the covariation of bark thickness (BT), tree height, and crown base?to?height ratio across Alpine forests, after accounting for the...

Author(s): Thibaut Fréjaville, Albert Vilà?Cabrera, Thomas Curt, Christopher Carcaillet

Type: Document

Book or Chapter or Journal Article

Ecology and management of bark beetles (and new technologies)

www.nrfirescience.org/resource/14212

This presentation was recorded during the 2016 State of the State and Forest Health Conference in Corvallis, OR.

Type: Media

Video

Hierarchical population structure in greater sage-grouse provides insight into management boundary delineation

www.nrfirescience.org/resource/15108

We genotyped 1499 greater sage- grouse from 297 leks across Montana, North Dakota and South Dakota using a 15-locus microsatellite panel, then examined spatial autocorrelation, spatial principal components analysis, and hierarchical Bayesian clustering to identify population structure. Our results show that at distances of up to...

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

Cramer Fire Case Study (2013 Refresher)

www.nrfirescience.org/resource/16004

Part 1: Past fires and lessons learned in the Salmon River Breaks of the Salmon-Challis NF. Part 2: Cramer Fire case study of the fire that killed two helitack crew members on July 22, 2003.

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

Restoration of frequent-fire forests: managing for resiliency - a science basis

www.nrfirescience.org/resource/13599

Ponderosa pine and dry mixed-conifer forests in the Southwest United States are experiencing, or have become increasingly susceptible to, large-scale severe wildfire, insect, and disease episodes resulting in altered plant and animal demographics, reduced productivity and biodiversity, and impaired ecosystem processes and functions...

Type: Media

Webinar

Impacts of climate, drought, and storms on trees and forests

www.nrfirescience.org/resource/14206

This presentation was recorded during the 2016 State of the State and Forest Health Conference in Corvallis, OR.

Type: Media

Video

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

Influence of recent bark beetle outbreaks on wildfire

www.nrfirescience.org/resource/13791

Dr. Sarah Hart, Department of Geography at the University of Colorado Boulder, presents on the influence of recent bark beetle outbreaks on wildfire. This webinar was hosted by the Northwestern Fire Science Consortium.

Type: Media

Webinar

Rangeland Management Strategies and Tools: Promoting Resiliency and Addressing Invasive Species

www.nrfirescience.org/resource/15931

The Western Governors' Association webinar "Rangeland Management Strategies and Tools: Promoting Resiliency and Addressing Invasive Species" examined new developments for increased resilience to the threats posed to western rangelands by invasive species, drought, wildfire and other stressors. Panelists discussed techniques that...

Type: Media

Webinar

Climate change, disturbances and landscape dynamics

www.nrfirescience.org/resource/18407

This chapter is within a book by Walker and Steffen that presents a collection of essays by leading authorities who address the current state of knowledge. The chapters bring together the early results of an international scientific research program designed to address what will happen to our ability to produce food and fiber...

Type: Document

Book or Chapter or Journal Article

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

Fortifying the forest: roles of tree defense, fire, and stand structure in resistance to bark beetles

www.nrfirescience.org/resource/13768

This seminar presented by Sharon Hood, Fire Ecologist at the University of Montana. It was presented as part of the 2015 RMRS Fire Sciences Laboratory's weekly seminar series.

Type: Media

Seminar

Patterns of Conifer Regeneration following High Severity Wildfire in Ponderosa Pine-Dominated Forests

www.nrfirescience.org/resource/15847

Wildfires in ponderosa pine - dominated forests of the southern Rocky Mountains are increasingly burning with a high severity component that is unprecedented in the available historical record. The ability of ponderosa pine and other co-occurring conifers (e.g., Douglas-fir, Rocky Mountain juniper, Colorado blue spruce) to...

Type: Media

Webinar

Fires, beetles, and droughts, oh my!

www.nrfirescience.org/resource/14449

At 24:00 the webinar transitions into another webinar topic. Healthy forests are vital to our future, and consistent, long-term monitoring of forest health indicators is necessary to identify forest resources deteriorating across large regions. The Forest Health Monitoring (FHM) Program of the USDA Forest Service, with cooperating...

Type: Media

Webinar

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

Fire, historical change, and resilience management in quaking aspen

www.nrfirescience.org/resource/13336

Utah State University Forestry Extension hosted this fifteenth "Learn at Lunch" webinar. Quaking Aspen forests are among the West's most iconic landscapes. In this month's Learn at Lunch webinar, three aspen experts will address fire regimes, ecosystem disturbances, and managing for aspen resilience. Douglas Shinneman...

Type: Media

Webinar

As wildfires burn, will the forests of Yellowstone remain?

www.nrfirescience.org/resource/18048

The fires that ravaged Yellowstone National Park in 1988 were large and severe, but they were still within the normal limits of fire patterns in the West. Following those fires 30 years ago, University of Wisconsin–Madison Professor of Integrative Biology, Monica Turner, immediately got to work studying the recovery of the forests...

Type: Media

Video

Why We Can't Just Let Fire Burn

www.nrfirescience.org/resource/18967

With the understanding the fire on the landscape is important to forest health, why aren't more fires allowed to burn? Colin Hardy, program manager at the U.S. Forest Service Rocky Mountain Research Station, explains the balance of improving forest health and protecting critical infrastructure from uncharacteristic fires. (video 3...

Type: Media

Video

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

Using resilience and resistance concepts to manage threats to sagebrush ecosystems and sage-grouse

www.nrfirescience.org/resource/14379

This webinar discusses a strategic approach developed by an interagency, Western Association of Fish and Wildlife Agencies working group for conservation of sagebrush ecosystems, Gunnison sage-grouse, and greater sage-grouse. It uses information on (1) factors that influence sagebrush ecosystem resilience to disturbance and...

Type: Media

Webinar

Can our forests take the heat? Fire, climate change and tree mortality in the western US

www.nrfirescience.org/resource/12814

As the climate gets warmer, many forests are feeling the heat. Impacts range from increased forest fire hazards and tree mortality to detrimental beetle outbreaks and alterations to leaf abundance and bloom. Persistent warming can lead to chronic stress on forest trees, resulting in higher sensitivity to fire-induced damage. So,...

Type: Media

Webinar

Proceedings of the fourth fire behavior and fuels conference

www.nrfirescience.org/resource/18396

The Fourth Fire Behavior and Fuels Conference was held in Raleigh, North Carolina, USA, February 18-22, 2013. The theme for this conference was At The Crossroads: Looking Toward the Future in a Changing Environment. Joint sponsorship of the conference was by the International Association of Wildland Fire (IAWF) and the International...

Author(s): Dale D. Wade, Rebekah L. Fox

Type: Document

Conference Proceedings

Post-outbreak fire risk and behavior: fire modeling in mountain pine beetle killed fuels

www.nrfirescience.org/resource/14129

This webinar was the third in a future forests webinar series addressing post-outbreak fire risk and behavior on October 18, 2011. The event was co-sponsored by the USDA Forest Service Rocky Mountain Research Station and the Southern Rockies Fire Science Network. There's this need for us to start being able to address the complexity...

Type: Media

Webinar

Misconceptions and Benefits of Fire

www.nrfirescience.org/resource/18964

This 2.5 minute video discusses the most common misconception of wildfire - that is, that all fire is bad. But there are important benefits that smaller and more frequent fires offer to the environment. Matt Jolly, an ecologist at the U.S. Forest Service Rocky Mountain Research Station, talks about the natural and important role of...

Type: Media

Video

Resilience and regeneration after wildfire in dry mixed-conifer forests of the US Northern Rockies

www.nrfirescience.org/resource/12801

Over the past several decades, increases in area burned in the western U.S. have caused considerable concern about forest resilience following large wildfires. This concern is especially pronounced in dry mixed-conifer forests, where the combined effects of 20th century land management and land use have altered species composition,...

Type: Media

Webinar

Longleaf and Ponderosa Pine Fire Ecology

www.nrfirescience.org/resource/19241

Longleaf pine and ponderosa pine in the same talk? Both of these forests were often described as open

and park-like. This presentation will provide a historical overview of these forests and a discussion of each species ecology and the relationship with fire. It is important to use history as a guide and an overview of the early...

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 & Ticks: The Impacts of Long-term Prescribed Fire on Tick Populations and Tick-borne Disease Risk

www.nrfirescience.org/resource/17971

Does prescribed fire help reduce ticks and tick-borne diseases? Lyme disease, Rocky Mountain spotted fever, human monocytic ehrlichiosis (HME), and Southern tick-associated rash illness (STARI). These are just a few of the tick-borne diseases that occur in the eastern United States; some you've probably heard of and others likely...

Type: Media

Webinar

Post-outbreak fire risk and behavior: mountain pine beetle influences on fuel characteristics and fire behavior

www.nrfirescience.org/resource/13033

This study attempts to understand how the Mountain Pine Beetle affects various fuels and how those various fuel changes actually affect fire behavior. This webinar was hosted by the Southern Rockies Fire Science Network, and was presented by Matt Jolly.

Type: Media

Webinar

Fire Management Lessons Learned when Burning Duff

www.nrfirescience.org/resource/17363

Presentation by Kevin Hiers of the Tall Timbers Research Station. Presents a review from an experienced manager turned wildland fire scientist, of concerns, strategies and opportunities for burning in sites with duff accumulations. From the October 2017 Southern Fire Exchange Duff Fire Science Workshop at the FSU Coastal and Marine...

Type: Media

Video

Sage steppe resilience mapping in the Green River Basin

www.nrfirescience.org/resource/15507

In partnership with the Southern Rockies and Great Northern Landscape Conservation Cooperatives, we are pleased to announce several upcoming webinars for the Green River Basin Landscape Conservation Design (GRB LCD). The purpose of these webinars is to share several spatial data products developed by Conservation Science Partner and...

Type: Media

Webinar

Managing for resilience through a "portfolio approach" to reducing climate risk

www.nrfirescience.org/resource/14057

Managing for resilience through a "portfolio approach" to reducing climate risk. Greg Aplet, Senior Director of Ecology, The Wilderness Society. Recorded talk from 2013 Restoring the West Conference at Utah State University. The conference focused on forest resilience and change agents in the West. By Utah State University Extension...

Type: Media

Video

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

Fire, carbon, and climate: past and future

www.nrfirescience.org/resource/13031

Fire has a short-term impact on the exchange of carbon between the forest and the atmosphere, but over a cycle of a stand-replacing fire and regrowth, the carbon balance is usually carbon neutral. The only ways to permanently lower forest carbon with fire or any other disturbance are if regeneration does not occur and the forest...

Type: Media

Webinar

Quaking aspen: a burning desire in an 'asbestos forest'

www.nrfirescience.org/resource/13673

Speaker: Paul Rogers, Director, Western Aspen Alliance, Adjunct Associate Professor, Utah State University. Event: Restoring the West Conference 2015 - Restoration and Fire in the Interior West.

Type: Media

Video

Bark Beetle Outbreaks in Western North America: Causes, Control and Consequences

www.nrfirescience.org/resource/15501

With climate warming and more frequent and severe droughts western North America has experienced increases in disturbances arising from native bark beetle outbreaks. The focus of the talk will be on common bark beetle species and their hosts, environmental triggers for beetle outbreaks, management options for bark beetles and the...

Type: Media

Webinar

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

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

Managing forests for fire resilience

www.nrfirescience.org/resource/14216

This presentation was recorded during the 2016 State of the State and Forest Health Conference in Corvallis, OR.

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

Tending the Wild

www.nrfirescience.org/resource/16099

Tending the Wild shines light on the environmental knowledge of indigenous peoples across California by exploring how they have actively shaped and tended the land for millennia, in the process developing a deep understanding of plant and animal life. This documentary examines how humans are necessary to live in balance with nature...

Type: Media

Video

Climate change impacts on forest and non-forest vegetation and disturbance interactions

www.nrfirescience.org/resource/13404

Note: Webinar recording includes a lot of logistics instruction at the beginning; webinar begins at time 11:00. This webinar was hosted by the Northern Rockies Adaptation Partnership, which is preparing for climate change through science-management collaboration. This webinar explores climate change effects on vegetation and...

Type: Media

Webinar

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

A resilience ecology framework for southwestern forests: ecosystem shifts, landscape disturbance, and climate change

www.nrfirescience.org/resource/13600

Webinar presented by Don Falk and hosted by the Southwest Fire Science Consortium.

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

Developing verbenone as a semiochemical tool to suppress mountain pine beetle

www.nrfirescience.org/resource/15089

The last outbreak of mountain pine beetle affected more than 27 million hectares of forest in western North America. This outbreak enabled further development of the semiochemical verbenone, a compound discovered in the late 1960's that is the antiaggregant for mountain pine beetle. Verbenone sends the signal "this tree is..."

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

Why can't we just put all the fires out?

www.nrfirescience.org/resource/19122

This collection of 33 slides was presented at a 2017_Conference on Fire_Planning. It presents reasons why fire should not be eliminated from a landscape when looking at management activities.

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

Using Fire and Grazing to Maintain Productive and Ecologically Resilient Grasslands

www.nrfirescience.org/resource/15936

Fire, grazing, and climate are the major forces that maintain ecological health in grasslands. Today's grasslands are increasingly threatened by climate change, habitat loss and fragmentation, and degradation of ecological processes and communities. The effective use of fire and grazing management to conserve remaining grassland...

Type: Media

Webinar

Bark beetle trends

www.nrfirescience.org/resource/14204

This presentation was recorded during the 2016 State of the State and Forest Health Conference in Corvallis, OR.

Type: Media

Video

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

Past, present, and future in the forests of California's Sierra Nevada: variability in forest response to environmental change, and the role of management in promoting ecosystem resilience

www.nrfirescience.org/resource/13224

During this Webinar, Dr. Safford contrasted the ecology and temporal trends (historical to current to projected future) of lower montane (oak woodland, yellow pine, mixed conifer) vs. upper montane (red fir) and subalpine forests in the Sierra Nevada, focusing on impacts of three classes of environmental stressors: climate change,...

Type: Media

Webinar

The Role of Insects and Diseases in Aspen Biology

www.nrfirescience.org/resource/17583

In part due to its vegetative strategy, western aspen is host to a large number of insects and diseases. However, only a few are agents of significant impact that can cause or warn of substantial changes in the condition of aspen clones. Environmental conditions, particularly drought stress, also play an integral role in the life...

Type: Media

Webinar

Engaging Stakeholders in Developing Adaptation Strategies

www.nrfirescience.org/resource/15856

This webinar was presented by Marcie Bidwell (Mountain Studies Institute) and Betsy Neely (The Nature Conservancy) and was part of the Social-Ecological Resilience and Changing Landscapes Webinar Series sponsored by the USDA Forest Service Rocky Mountain Research Station.

Type: Media

Webinar