

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

[www.nrfirescience.org/resource/12690](http://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

### **Impacts of fire radiative flux on mature *Pinus ponderosa* growth and vulnerability to secondary mortality agents**

[www.nrfirescience.org/resource/14915](http://www.nrfirescience.org/resource/14915)

Recent studies have highlighted the potential of linking fire behaviour to plant ecophysiology as an improved route to characterising severity, but research to date has been limited to laboratory-scale investigations. Fine-scale fire behaviour during prescribed fires has been identified as a strong predictor of post-fire tree...

Author(s): Aaron M. Sparks, Alistair M. S. Smith, Alan F. Talhelm, Crystal A. Kolden, Kara M. Yedinak, Daniel M. Johnson

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/15206](http://www.nrfirescience.org/resource/15206)

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/15032](http://www.nrfirescience.org/resource/15032)

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Effects of fire radiative energy density dose on *Pinus contorta* and *Larix occidentalis* seedling**

### **physiology and mortality**

[www.nrfirescience.org/resource/14914](http://www.nrfirescience.org/resource/14914)

Climate change is projected to exacerbate the intensity of heat waves and drought, leading to a greater incidence of large and high-intensity wildfires in forested ecosystems. Predicting responses of seedlings to such fires requires a process-based understanding of how the energy released during fires affects plant physiology and...

Author(s): Alistair M. S. Smith, Alan F. Talhelm, Daniel M. Johnson, Aaron M. Sparks, Crystal A. Kolden, Kara M. Yedinak, Kent G. Apostol, Wade T. Tinkham, John T. Abatzoglou, James A. Lutz, Anthony S. Davis, Kurt S. Pregitzer, Henry D. Adams, Robert L. Kremens

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Influences of vegetation disturbance on hydrogeomorphic response following wildfire**

[www.nrfirescience.org/resource/14186](http://www.nrfirescience.org/resource/14186)

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

Author(s): Kevin D. Hyde, Kelsey Jencso, Andrew C. Wilcox, Scott W. Woods

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14715](http://www.nrfirescience.org/resource/14715)

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

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

Year Published: 2016

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/14660](http://www.nrfirescience.org/resource/14660)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Regeneration of montane forests 24 years after the 1988 Yellowstone fires: A fire-catalyzed shift in lower treelines?**

[www.nrfirescience.org/resource/14619](http://www.nrfirescience.org/resource/14619)

Forests near the lower limit of montane tree cover are expected to be particularly vulnerable to warming climate, potentially converting to non-forest for prolonged periods if affected by canopy-removing disturbances. Such disturbance-catalyzed shifts are by nature stochastic, offering few opportunities to test these predictions. We...

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Burning the legacy? Influence of wildfire reburn on dead wood dynamics in a temperate conifer forest**

[www.nrfirescience.org/resource/14473](http://www.nrfirescience.org/resource/14473)

Dynamics of dead wood, a key component of forest structure, are not well described for mixed-severity fire regimes with widely varying fire intervals. A prominent form of such variation is when two stand-replacing fires occur in rapid succession, commonly termed an early-seral "reburn." These events are thought to strongly...

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **A guide to fuels management in riparian areas of the Interior West**

[www.nrfirescience.org/resource/12632](http://www.nrfirescience.org/resource/12632)

Fuel treatments in riparian areas pose distinct challenges. Riparian areas are protected by administrative regulations, many of which are largely custodial and restrict active management. However, riparian areas have also been affected by fire suppression, land use, and disturbance and manipulative treatments of fuels...

Author(s): Kathleen A. Dwire, Kristen E. Meyer, Sandra E. Ryan, Gregg M. Riegel, Timothy A. Burton

Year Published: 2016

Type: Document

Synthesis, 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](http://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

### **Emissions from prescribed burning of timber slash piles in Oregon**

[www.nrfirescience.org/resource/14886](http://www.nrfirescience.org/resource/14886)

Emissions from burning piles of post-harvest timber slash (Douglas-fir) in Grande Ronde, Oregon were sampled using an instrument platform lofted into the plume using a tether-controlled aerostat or balloon. Emissions of carbon monoxide, carbon dioxide, methane, particulate matter (PM<sub>2.5</sub>), black carbon, ultraviolet absorbing PM,...

Author(s): Johanna Aurell, Brian K. Gullett, Dennis Tabor, Nick Yonker  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Do insect outbreaks reduce the severity of subsequent forest fires?**

[www.nrfirescience.org/resource/14260](http://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

### **Prior wildfires influence burn severity of subsequent large fires**

[www.nrfirescience.org/resource/14814](http://www.nrfirescience.org/resource/14814)

With longer and more severe fire seasons predicted, the incidence and extent of fires are expected to increase in western North America. As more area is burned, past wildfires may influence the spread and burn severity of subsequent fires, with implications for ecosystem resilience and fire management. We examined how previous burn...

Author(s): Camille Stevens-Rumann, Susan J. Prichard, Eva K. Strand, Penelope Morgan  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Burn me twice, shame on who? Interactions between successive forest fires across a temperate mountain region**

[www.nrfirescience.org/resource/14793](http://www.nrfirescience.org/resource/14793)

Increasing rates of natural disturbances under a warming climate raise important questions about how multiple disturbances interact. Escalating wildfire activity in recent decades has resulted in some forests re-burning in short succession, but how the severity of one wildfire affects that of a subsequent wildfire is not fully...

Author(s): Brian J. Harvey, Daniel C. Donato, Monica G. Turner  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

### **Altered mixed-severity fire regime has homogenised montane forests of Jasper National Park**

[www.nrfirescience.org/resource/14201](http://www.nrfirescience.org/resource/14201)

Fire suppression has altered the historical mixed-severity fire regime and homogenised forest structures in Jasper National Park, Canada. We used dendrochronology to reconstruct fire history and assess forest dynamics at 29 sites in the montane forests. Based on fire scars and even-aged post-fire cohorts, we determined 18 sites had...

Author(s): Raphael D. Chavardes, Lori D. Daniels  
Year Published: 2016  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14701](http://www.nrfirescience.org/resource/14701)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14007](http://www.nrfirescience.org/resource/14007)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14659](http://www.nrfirescience.org/resource/14659)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13976](http://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

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

[www.nrfirescience.org/resource/14580](http://www.nrfirescience.org/resource/14580)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14429](http://www.nrfirescience.org/resource/14429)

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/14897](http://www.nrfirescience.org/resource/14897)

Wildfires shape the distribution and structure of vegetation across the inland northwestern United States. However, fire activity is expected to increase given the current rate of climate change, with uncertain outcomes. A fire impact that has not been widely addressed is the development of unburned islands; areas within the fire...

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

## **Sensitivity of reconstructed fire histories to detection criteria in mixed-severity landscapes**

[www.nrfirescience.org/resource/14818](http://www.nrfirescience.org/resource/14818)

In heterogeneous forest landscapes prone to wildfires, accurate classification of the fire regime beyond direct observations and records is difficult. This is in part due to the methods used to reconstruct historical fires in complex, heterogeneous landscapes with varying fire severities. Mixed-severity fire regimes, defined as...

Author(s): Vanessa Stretch, Ze'ev Gedalof, Jacklyn Cockburn, Michael F. Pisaric

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

## **Tree mortality and structural change following mixed-severity fire in *Pseudotsuga* forests of Oregon's western Cascades, USA**

[www.nrfirescience.org/resource/14256](http://www.nrfirescience.org/resource/14256)



Mixed-severity fires are increasingly recognized as common in *Pseudotsuga* forests of the Pacific Northwest and may be an important mechanism for developing or maintaining their structural diversity and complexity. Questions remain about how tree mortality varies and forest structure is altered across the disturbance gradient imposed...

Author(s): Christopher J. Dunn, John D. Bailey

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Repeated wildfires alter forest recovery of mixed-conifer ecosystems**

[www.nrfirescience.org/resource/14805](http://www.nrfirescience.org/resource/14805)

Most models project warmer and drier climates that will contribute to larger and more frequent wildfires. However, it remains unknown how repeated wildfires alter post-fire successional patterns and forest structure. Here, we test the hypothesis that the number of wildfires, as well as the order and severity of wildfire events...

Author(s): Camille Stevens-Rumann, Penelope Morgan

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Management impacts on carbon dynamics in a Sierra Nevada mixed conifer forest**

[www.nrfirescience.org/resource/14230](http://www.nrfirescience.org/resource/14230)

Forest ecosystems can act as sinks of carbon and thus mitigate anthropogenic carbon emissions. When forests are actively managed, treatments can alter forests carbon dynamics, reducing their sink strength and switching them from sinks to sources of carbon. These effects are generally characterized by fast temporal dynamics. Hence...

Author(s): Sabina Dore, Danny L. Fry, Brandon M. Collins, Rodrigo Vargas, Robert A. York, Scott L. Stephens

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Post-wildfire debris flows in southern British Columbia, Canada**

[www.nrfirescience.org/resource/12886](http://www.nrfirescience.org/resource/12886)

Several post-wildfire debris flows and other landslides occurred after the extreme wildfire season of 2003 in the southern interior of British Columbia. Such events had not been previously reported in Canada, although they are common in lower latitudes. Severe wildfire seasons also were experienced in 2007 and 2009, and additional...

Author(s): Peter Jordan

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](http://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

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

[www.nrfirescience.org/resource/13460](http://www.nrfirescience.org/resource/13460)

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **A case study comparison of LANDFIRE fuel loading and emissions on a mixed conifer forest in northern Idaho, USA**

[www.nrfirescience.org/resource/13750](http://www.nrfirescience.org/resource/13750)

The use of fire as a land management tool is well recognized for its ecological benefits in many natural systems. To continue to use fire while complying with air quality regulations, land managers are often tasked with modeling emissions from fire during the planning process. To populate such models, the Landscape Fire...

Author(s): Joshua C. Hyde, Eva K. Strand, Andrew T. Hudak, Dale Hamilton

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](http://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

### **Collaborative fuels reduction and restoration - Experiences from the Southwestern Crown of the Continent**

[www.nrfirescience.org/resource/13064](http://www.nrfirescience.org/resource/13064)

Forests that historically burned in mixed-severity fire regimes prove difficult to manage, especially when they border homes and prized recreation areas. This management challenge was the focus of the Fuels Reduction and Restoration in Mixed-Conifer Forests of the Southwestern Crown of the Continent field trip, following the May...

Author(s): Corey L. Gucker

Year Published: 2015

Type: Document

Research Brief or Fact Sheet



**Too hot to trot? Evaluating the effects of wildfire on patterns of occupancy and abundance for a climate-sensitive habitat specialist**

[www.nrfirescience.org/resource/13185](http://www.nrfirescience.org/resource/13185)

Wildfires are increasing in frequency and severity as a result of climate change in many ecosystems; however, effects of altered disturbance regimes on wildlife remain poorly quantified. Here, we leverage an unexpected opportunity to investigate how fire affects the occupancy and abundance of a climate-sensitive habitat specialist,...

Author(s): Johanna Varner, Mallory S. Lambert, Joshua J. Horns, Sean Laverty, Laurie Dizney, Erik A. Beever, M. Denise Dearing

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

**Effects of tree cutting and fire on understory vegetation in mixed conifer forests**

[www.nrfirescience.org/resource/12896](http://www.nrfirescience.org/resource/12896)

Mixed conifer forests of western North America are challenging for fire management, as historical fire regimes were highly variable in severity, timing, and spatial extent. Complex fire histories combined with site factors and other disturbances, such insect outbreaks, led to great variation in understory plant communities, and...

Author(s): Scott R. Abella, Judith D. Springer

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

**Mixed severity fire effects within the Rim fire: relative importance of local climate, fire weather, topography, and forest structure**

[www.nrfirescience.org/resource/13857](http://www.nrfirescience.org/resource/13857)

Recent and projected increases in the frequency and severity of large wildfires in the western U.S. makes understanding the factors that strongly affect landscape fire patterns a management priority for optimizing treatment location. We compared the influence of variations in the local environment on burn severity patterns on the...

Author(s): Van R. Kane, C. Alina Cansler, Nicholas A. Povak, Jonathan T. Kane, Bob McGaughey, James A. Lutz, Derek J. Churchill, Malcolm P. North

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

**Climate, snowpack, and streamflow of Priest River Experimental Forest, revisited**

[www.nrfirescience.org/resource/13114](http://www.nrfirescience.org/resource/13114)

The climate record of Priest River Experimental Forest has the potential to provide a century-long history of northern Rocky Mountain forest ecosystems. The record, which began in 1911 with the Benton Flat Nursery control weather station, included observations of temperature, precipitation, humidity, and wind. Later, other...

Author(s): Wade T. Tinkham, Robert Denner, Russell T. Graham

Year Published: 2015

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/14278](http://www.nrfirescience.org/resource/14278)

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **A state-and-transition simulation modeling approach for estimating the historical range of variability**

[www.nrfirescience.org/resource/13078](http://www.nrfirescience.org/resource/13078)

Reference ecological conditions offer important context for land managers as they assess the condition of their landscapes and provide benchmarks for desired future conditions. State-and-transition simulation models (STSMs) are commonly used to estimate reference conditions that can be used to evaluate current ecosystem conditions...

Author(s): Kori Blankenship, Leonardo Frid, James L. Smith

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Long-term effects on distribution of forest biomass following different harvesting levels in the Northern Rocky Mountains**

[www.nrfirescience.org/resource/13625](http://www.nrfirescience.org/resource/13625)

With increasing public demand for more intensive biomass utilization from forests, the concerns over adverse impacts on productivity by nutrient depletion are increasing. We remeasured the 1974 site of the Forest Residues Utilization Research and Development in northwestern Montana to investigate long-term impacts of intensive...

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

Year Published: 2015

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](http://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

### **Examining historical and current mixed-severity fire regimes in ponderosa pine and mixed-conifer forests of western north America**

[www.nrfirescience.org/resource/12904](http://www.nrfirescience.org/resource/12904)

There is widespread concern that fire exclusion has led to an unprecedented threat of uncharacteristically severe fires in ponderosa pine (*Pinus ponderosa* Dougl. ex. Laws) and mixed-

conifer forests of western North America. These extensive montane forests are considered to be adapted to a low/moderate-severity fire regime that...

Author(s): Dennis C. Odion, Chad T. Hanson, Andre Arsenault, William L. Baker, Dominick A. DellaSala, Richard L. Hutto, Walt Klenner, Max A. Moritz, Rosemary L. Sherriff, Thomas T. Veblen, Mark A. Williams

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/12998](http://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

### **Tables for estimating canopy fuel characteristics from stand variables in four interior west conifer forest types**

[www.nrfirescience.org/resource/12975](http://www.nrfirescience.org/resource/12975)

Tables have been constructed for use in making quick estimates of canopy base height, canopy fuel load, and canopy bulk density from visual observations or field measurements of stand height, basal area, and stand density for pure stands of ponderosa pine (*Pinus ponderosa* Dougl. ex Laws.), lodgepole pine (*Pinus contorta* Dougl. ex...

Author(s): Martin E. Alexander, Miguel G. Cruz

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](http://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

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

[www.nrfirescience.org/resource/12051](http://www.nrfirescience.org/resource/12051)

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

for fire and land...

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/12959](http://www.nrfirescience.org/resource/12959)

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **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](http://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](http://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

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

[www.nrfirescience.org/resource/12926](http://www.nrfirescience.org/resource/12926)

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

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

Year Published: 2014

Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13015](http://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

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

[www.nrfirescience.org/resource/13571](http://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

### **Northern Rockies pyrogeography: an example of fire atlas utility**

[www.nrfirescience.org/resource/12923](http://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

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

[www.nrfirescience.org/resource/13001](http://www.nrfirescience.org/resource/13001)

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

Author(s): Yi Qi, Philip E. Dennison, William Matt Jolly, Rachel C. Kropp, Simon C. Brewer  
Year Published: 2014

Type: Document  
Book or Chapter or Journal Article

### **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](http://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

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

[www.nrfirescience.org/resource/12966](http://www.nrfirescience.org/resource/12966)

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/12963](http://www.nrfirescience.org/resource/12963)

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

Year Published: 2014

Type: Document

Conference Proceedings

### **Integrating satellite imagery with simulation modeling to improve burn severity mapping**

[www.nrfirescience.org/resource/12957](http://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

### **Is proportion burned severely related to daily area burned?**

[www.nrfirescience.org/resource/13018](http://www.nrfirescience.org/resource/13018)

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

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



Year Published: 2014  
Type: Document  
Book or Chapter or Journal Article

### **Interactions among the mountain pine beetle, fires, and fuels**

[www.nrfirescience.org/resource/12022](http://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

### **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](http://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

### **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](http://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

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

[www.nrfirescience.org/resource/12142](http://www.nrfirescience.org/resource/12142)

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

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

Year Published: 2013  
Type: Document  
Technical Report or White Paper

### **Goodyera repens (northern rattlesnake plantain)**

[www.nrfirescience.org/resource/10928](http://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

### **Modelling conditional burn probability patterns for large wildland fires**

[www.nrfirescience.org/resource/12005](http://www.nrfirescience.org/resource/12005)

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11904](http://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

### **Restoring forest resilience: from reference spatial patterns to silvicultural prescriptions and monitoring**

[www.nrfirescience.org/resource/14006](http://www.nrfirescience.org/resource/14006)

Stand-level spatial pattern influences key aspects of resilience and ecosystem function such as disturbance behavior, regeneration, snow retention, and habitat quality in frequent-fire pine and mixed-conifer forests. Reference sites, from both pre-settlement era reconstructions and contemporary forests with active fire regimes,...

Author(s): Derek J. Churchill, Andrew J. Larson, Matthew C. Dahlgreen, Jerry F. Franklin, Paul F. Hessburg, James A. Lutz

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Appendix 1: Regional summaries - Northwest**

[www.nrfirescience.org/resource/11901](http://www.nrfirescience.org/resource/11901)

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

Author(s): Jeremy S. Littell

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

### **Accipiter gentilis (northern goshawk)**

[www.nrfirescience.org/resource/10662](http://www.nrfirescience.org/resource/10662)

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

Author(s): Katharine R. Stone

Year Published: 2013

Type: Document

Synthesis

### **Post-fire mulching for runoff and erosion mitigation; Part I: effectiveness at reducing hillslope erosion rates**

[www.nrfirescience.org/resource/11994](http://www.nrfirescience.org/resource/11994)

Mulch treatments often are used to mitigate post-fire increases in runoff and erosion rates but the comparative effectiveness of various mulches is not well established. The ability of mulch treatments to reduce sediment yields from natural rainfall and resulting overland flow was measured using hillslope plots on areas burned at...

Author(s): Peter R. Robichaud, Sarah A. Lewis, Joseph W. Wagenbrenner, Louise E. Ashmun, Robert E. Brown

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13479](http://www.nrfirescience.org/resource/13479)

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

Author(s): Jarod Blades

Year Published: 2013

Type: Document

Dissertation or Thesis

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

[www.nrfirescience.org/resource/11889](http://www.nrfirescience.org/resource/11889)

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

sizes and location...

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11983](http://www.nrfirescience.org/resource/11983)

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

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

Year Published: 2013

Type: Document

Technical Report or White Paper

**Fuel moisture influences on fire-altered carbon in masticated fuels: an experimental study**

[www.nrfirescience.org/resource/12021](http://www.nrfirescience.org/resource/12021)

Biomass burning is a significant contributor to atmospheric carbon emissions, but may also provide an avenue in which fire-affected ecosystems can accumulate carbon over time, through the generation of highly resistant fire-altered carbon. Identifying how fuel moisture, and subsequent changes in the fire behavior, relates to the...

Author(s): Nolan W. Brewer, Alistair M. S. Smith, Jeff A. Hatten, Philip E. Higuera, Andrew T. Hudak, Roger D. Ottmar, Wade T. Tinkham

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

**Interactive effects of wildfire, forest management, and isolation on amphibian and parasite abundance**

[www.nrfirescience.org/resource/11970](http://www.nrfirescience.org/resource/11970)

Projected increases in wildfire and other climate-driven disturbances will affect populations and communities worldwide, including host-parasite relationships. Research in temperate forests has shown that wildfire can negatively affect amphibians, but this research has occurred primarily outside of managed landscapes where...

Author(s): Blake R. Hossack, Winsor H. Lowe, R. Ken Honeycutt, Sean A. Parks, Paul S. Corn

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

**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](http://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

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

[www.nrfirescience.org/resource/11903](http://www.nrfirescience.org/resource/11903)

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

Author(s): David L. Peterson, Jeremy S. Littell  
Year Published: 2013  
Type: Document  
Synthesis, Technical Report or White Paper

## **Combustion efficiency and emission factors for wildfire-season fires in mixed conifer forests of the northern Rocky Mountains, US**

[www.nrfirescience.org/resource/13481](http://www.nrfirescience.org/resource/13481)

In the US, wildfires and prescribed burning present significant challenges to air regulatory agencies attempting to achieve and maintain compliance with air quality regulations. Fire emission factors (EF) are essential input for the emission models used to develop wildland fire emission inventories. Most previous studies quantifying...

Author(s): Shawn P. Urbanski  
Year Published: 2013  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/12682](http://www.nrfirescience.org/resource/12682)

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

Author(s): Sandra L. Haire, Kevin McGarigal, Carol Miller  
Year Published: 2013  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13478](http://www.nrfirescience.org/resource/13478)

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

Author(s): Kevin M. Barnett  
Year Published: 2013  
Type: Document  
Dissertation or Thesis

### **Consequences of spatial heterogeneity for ecosystem services in changing forest landscapes: priorities for future research**

[www.nrfirescience.org/resource/13431](http://www.nrfirescience.org/resource/13431)

Changes in key drivers (e.g., climate, disturbance regimes and land use) may affect the sustainability of forest landscapes and set the stage for increased tension among competing ecosystem services. We addressed two questions about a suite of supporting, regulating and provisioning ecosystem services in each of two well-studied...

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Eriophorum viridicarinatum (green-keeled cottongrass)**

[www.nrfirescience.org/resource/11521](http://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

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

[www.nrfirescience.org/resource/13694](http://www.nrfirescience.org/resource/13694)

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

Author(s): Corey L. Gucker

Year Published: 2013

Type: Document

Research Brief or Fact Sheet

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

[www.nrfirescience.org/resource/11982](http://www.nrfirescience.org/resource/11982)

Recent work in model systems has demonstrated significant effects of rapid evolutionary change on ecological processes (eco-evolutionary dynamics). Fewer studies have addressed whether eco-evolutionary dynamics structure natural ecosystems. We investigated variation in the frequency of serotiny in lodgepole pine (*Pinus contorta*), a...

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8325](http://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

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

[www.nrfirescience.org/resource/11488](http://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

### **Rubus parviflorus (thimbleberry)**

[www.nrfirescience.org/resource/10676](http://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

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

[www.nrfirescience.org/resource/8320](http://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

### **Pattern and process of prescribed fires influence effectiveness at reducing wildfire severity in dry coniferous forests**

[www.nrfirescience.org/resource/11476](http://www.nrfirescience.org/resource/11476)

We examined the effects of three early season (spring) prescribed fires on burn severity patterns of summer wildfires that occurred 1-3 years post-treatment in a mixed conifer forest in central Idaho. Wildfire and prescribed fire burn severities were estimated as the difference in normalized burn ratio (dNBR) using Landsat imagery....

Author(s): Robert S. Arkle, David S. Pilliod, Justin L. Welty  
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](http://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](http://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. Negrón  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8350](http://www.nrfirescience.org/resource/8350)

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

Author(s): Crystal A. Kolden, James A. Lutz, Carl H. Key, Jonathan T. Kane, Jan W. van Wageningen  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13486](http://www.nrfirescience.org/resource/13486)

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

Author(s): Laurel L. James  
Year Published: 2012  
Type: Document  
Dissertation or Thesis

### **Betula occidentalis (water birch)**

[www.nrfirescience.org/resource/10582](http://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

### **Evaluating regression model estimates of canopy fuel stratum characteristics in four crown fire-prone fuel types in western North America**

[www.nrfirescience.org/resource/8312](http://www.nrfirescience.org/resource/8312)

Two evaluations were undertaken of the regression equations developed by M. Cruz, M. Alexander and R. Wakimoto (2003, *International Journal of Wildland Fire* 12, 39-50) for estimating canopy fuel stratum characteristics from stand structure variables for four broad coniferous forest fuel types found in western North America. The...

Author(s): Miguel G. Cruz, Martin E. Alexander

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Odocoileus hemionus (mule deer)**

[www.nrfirescience.org/resource/10521](http://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

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

[www.nrfirescience.org/resource/8303](http://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

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

[www.nrfirescience.org/resource/8345](http://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

### **Salix amygdaloides (peachleaf willow)**

[www.nrfirescience.org/resource/10658](http://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

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

[www.nrfirescience.org/resource/12579](http://www.nrfirescience.org/resource/12579)

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

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

[www.nrfirescience.org/resource/8339](http://www.nrfirescience.org/resource/8339)

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Measurements of convective and radiative heating in wildland fires**

[www.nrfirescience.org/resource/8374](http://www.nrfirescience.org/resource/8374)

Time-resolved irradiance and convective heating and cooling of fast-response thermopile sensors were measured in 13 natural and prescribed wildland fires under a variety of fuel and ambient conditions. It was shown that a sensor exposed to the fire environment was subject to rapid fluctuations of convective transfer whereas...

Author(s): David Frankman, Brent W. Webb, Bret W. Butler, Daniel M. Jimenez, Jason M. Forthofer,

Paul Sopko, Kyle S. Shannon, J. Kevin Hiers, Roger D. Ottmar  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

**Properties affecting the consumption of sound and rotten coarse woody debris in northern Idaho: a preliminary investigation using laboratory fires**

[www.nrfirescience.org/resource/8333](http://www.nrfirescience.org/resource/8333)

This study evaluates the consumption of coarse woody debris in various states of decay. Samples from a northern Idaho mixed-conifer forest were classified using three different classification methods, ignited with two different ignition methods and consumption was recorded. Intrinsic properties that change with decay were measured...

Author(s): Joshua C. Hyde, Alistair M. S. Smith, Roger D. Ottmar  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11980](http://www.nrfirescience.org/resource/11980)

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

Author(s): David A. McKenzie, Daniel B. Tinker  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/12013](http://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

**A comparison of two methods for estimating conifer live foliar moisture content**

[www.nrfirescience.org/resource/8319](http://www.nrfirescience.org/resource/8319)

Foliar moisture content is an important factor regulating how wildland fires ignite in and spread through live fuels but moisture content determination methods are rarely standardised between studies. One such difference lies between the uses of rapid moisture analysers or drying ovens. Both of these methods are commonly used in...

Author(s): William Matt Jolly, Ann M. Hadlow  
Year Published: 2012  
Type: Document  
Book or Chapter or Journal Article

### **Utility of remotely sensed imagery for assessing the impact of salvage logging after forest fires**

[www.nrfirescience.org/resource/8352](http://www.nrfirescience.org/resource/8352)

Remotely sensed imagery provides a useful tool for land managers to assess the extent and severity of post-wildfire salvage logging disturbance. This investigation uses high resolution QuickBird and National Agricultural Imagery Program (NAIP) imagery to map soil exposure after ground-based salvage operations. Three wildfires with...

Author(s): Sarah A. Lewis, Peter R. Robichaud, Andrew T. Hudak, Brian Austin, Robert J. Liebermann

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8349](http://www.nrfirescience.org/resource/8349)

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8311](http://www.nrfirescience.org/resource/8311)

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Roads impact the distribution of noxious weeds more than restoration treatments in a lodgepole pine forest in Montana, U.S.A.**

[www.nrfirescience.org/resource/8346](http://www.nrfirescience.org/resource/8346)

A century of fire suppression has created unnaturally dense stands in many western North American forests, and silviculture treatments are being increasingly used to reduce fuels to mitigate wildfire hazards and manage insect infestations. Thinning prescriptions have the potential to restore forests to a more historically...

Author(s): Jennifer L. Birdsall, Ward W. McCaughey, Justin B. Runyon

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11270](http://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

### **Ranunculus glaberrimus (sagebrush buttercup)**

[www.nrfirescience.org/resource/10794](http://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

### **Cornus sericea (red-osier dogwood)**

[www.nrfirescience.org/resource/10629](http://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

### **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](http://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

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

[www.nrfirescience.org/resource/11984](http://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

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

[www.nrfirescience.org/resource/12567](http://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

**Cornus canadensis (bunchberry)**

[www.nrfirescience.org/resource/10680](http://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

**Euphorbia esula (leafy spurge)**

[www.nrfirescience.org/resource/10451](http://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

**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](http://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

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

[www.nrfirescience.org/resource/12129](http://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

### **Fire and fish dynamics in a changing climate**

[www.nrfirescience.org/resource/13509](http://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

### **Cervus elaphus (elk)**

[www.nrfirescience.org/resource/10523](http://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

### **Bonasa umbellus (ruffed grouse)**

[www.nrfirescience.org/resource/10793](http://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

### **Human relationships to fire prone ecosystems: mapping values at risk on contested landscapes**

[www.nrfirescience.org/resource/13510](http://www.nrfirescience.org/resource/13510)

A key problem in developing a better understanding of different responses to landscape level management actions, such as fuel treatments, is being able to confidently record and accurately spatially delineate the meanings stakeholders ascribe to the landscape. To more accurately understand these relationships with the Bitterroot...

Author(s): Kari Gunderson, Stephen J. Carver, Brett Davis

Year Published: 2011

Type: Document  
Conference Proceedings

### **Woodpecker habitat after the fire**

[www.nrfirescience.org/resource/13508](http://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

### **Picoides arcticus (black-backed woodpecker)**

[www.nrfirescience.org/resource/10857](http://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

### **Oreamnos americanus (mountain goat)**

[www.nrfirescience.org/resource/10522](http://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

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

[www.nrfirescience.org/resource/10660](http://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

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

[www.nrfirescience.org/resource/12112](http://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

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

[www.nrfirescience.org/resource/8286](http://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

### **Antennaria parvifolia (littleleaf pussytoes)**

[www.nrfirescience.org/resource/10657](http://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

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

[www.nrfirescience.org/resource/8269](http://www.nrfirescience.org/resource/8269)

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

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

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/13580](http://www.nrfirescience.org/resource/13580)

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

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

Year Published: 2011  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8189](http://www.nrfirescience.org/resource/8189)

Removal of dead and live biomass from forested stands affects subsequent fuel dynamics and fire potential. The amount of material left onsite after biomass removal operations can influence the intensity and severity of subsequent unplanned wildfires or prescribed burns. We developed a set of biomass removal treatment scenarios and...

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

**Hieracium aurantiacum (orange hawkweed)**

[www.nrfirescience.org/resource/10474](http://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

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

[www.nrfirescience.org/resource/8234](http://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

**Polygonum aviculare (prostrate knotweed)**

[www.nrfirescience.org/resource/10471](http://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

**Martes americana (American marten)**

[www.nrfirescience.org/resource/10856](http://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

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

[www.nrfirescience.org/resource/8219](http://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

### **Carbon concentrations and carbon pool distributions in dry, moist, and cold mid-aged forests of the Rocky Mountains**

[www.nrfirescience.org/resource/8416](http://www.nrfirescience.org/resource/8416)

Although 'carbon' management may not be a primary objective in forest management, influencing the distribution, composition, growth, and development of biomass to fulfill multiple objectives is; therefore, given a changing climate, managing carbon could influence future management decisions. Also, typically, the conversion from...

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

Year Published: 2010

Type: Document

Conference Proceedings

### **Falco peregrinus (peregrine falcon)**

[www.nrfirescience.org/resource/10748](http://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

### **Silvicultural management of white pines in western North America**

[www.nrfirescience.org/resource/8235](http://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

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

[www.nrfirescience.org/resource/8188](http://www.nrfirescience.org/resource/8188)

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

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **Prescribed fires as ecological surrogates for wildfires: a stream and riparian perspective**

[www.nrfirescience.org/resource/11444](http://www.nrfirescience.org/resource/11444)

Forest managers use prescribed fire to reduce wildfire risk and to provide resource benefits, yet little information is available on whether prescribed fires can function as ecological surrogates for wildfire in fire-prone landscapes. Information on impacts and benefits of this management tool on stream and riparian ecosystems is...

Author(s): Robert S. Arkle, David S. Pilliod

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **Schedonorus pratensis (meadow fescue)**

[www.nrfirescience.org/resource/10472](http://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

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

[www.nrfirescience.org/resource/8233](http://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

### **Alces americanus (moose)**

[www.nrfirescience.org/resource/10524](http://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

### **Mitigating old tree mortality in long-unburned, fire-dependent forests: a synthesis**

[www.nrfirescience.org/resource/12618](http://www.nrfirescience.org/resource/12618)

This report synthesizes the literature and current state of knowledge pertaining to reintroducing fire in stands where it has been excluded for long periods and the impact of these introductory fires on overstory tree injury and mortality. Only forested ecosystems in the United States that are adapted to survive frequent fire are...

Author(s): Sharon M. Hood

Year Published: 2010

Type: Document

Synthesis, Technical Report or White Paper

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

[www.nrfirescience.org/resource/11216](http://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

### **Holodiscus discolor (oceanspray)**

[www.nrfirescience.org/resource/10653](http://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

### **Burn severity mapping using simulation modelling and satellite imagery**

[www.nrfirescience.org/resource/8205](http://www.nrfirescience.org/resource/8205)

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

context of rapid post-fire...

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **Evaluation of forest management systems under risk of wildfire**

[www.nrfirescience.org/resource/8336](http://www.nrfirescience.org/resource/8336)

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

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **Holodiscus dumosus (rockspirea)**

[www.nrfirescience.org/resource/10648](http://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

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

[www.nrfirescience.org/resource/10456](http://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

### **Lubrecht State Experimental Forest prescribed fire effects study 1973-2006**

[www.nrfirescience.org/resource/11134](http://www.nrfirescience.org/resource/11134)

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

Author(s): Elizabeth D. Reinhardt

Year Published: 2009

Type: Document

Technical Report or White Paper

## **Mapping tradeoffs in values at risk at the interface between wilderness and non-wilderness lands**

[www.nrfirescience.org/resource/11063](http://www.nrfirescience.org/resource/11063)

On the Flathead Indian Reservation in Montana, U.S., the Mission Mountains Tribal Wilderness is bordered by a buffer zone. To successfully improve forest health within that buffer zone and restore fire in the wilderness, the managing agency and the public need to work together to find solutions to increasingly threatening fuel...

Author(s): Alan E. Watson, Roian Matt, Tim Waters, Kari Gunderson, Stephen J. Carver, Brett Davis

Year Published: 2009

Type: Document

Conference Proceedings

## **Global warming and stress complexes in forests of western North America**

[www.nrfirescience.org/resource/8360](http://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

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

[www.nrfirescience.org/resource/11431](http://www.nrfirescience.org/resource/11431)

Remote sensing from space may well become one of the world's most effective, accurate, and efficient ways to assess fire risk and thus manage large landscapes. The technology is evolving quickly, and researchers are busy keeping up. Some major western U.S. landscapes are just now being assessed for integrating remote sensing data with...

Author(s): Rachel Clark

Year Published: 2009

Type: Document

Research Brief or Fact Sheet

## **Effects of timber harvest following wildfire in western North America**

[www.nrfirescience.org/resource/11122](http://www.nrfirescience.org/resource/11122)

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

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

Year Published: 2009

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/12617](http://www.nrfirescience.org/resource/12617)

Dry forests throughout the United States are fire-dependent ecosystems, and much attention has been given to restoring their ecological function. As such, land managers often are tasked with reintroducing

fire via prescribed fire, wildland fire use, and fire-surrogate treatments such as thinning and mastication. During planning,...

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

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

### **Thermal characteristics of amphibian microhabitats in a fire-disturbed landscape**

[www.nrfirescience.org/resource/8402](http://www.nrfirescience.org/resource/8402)

Disturbance has long been a central issue in amphibian conservation, often regarding negative effects of logging or other forest management activities, but some amphibians seem to prefer disturbed habitats. After documenting increased use of recently burned forests by boreal toads (*Bufo boreas*), we hypothesized that burned habitats...

Author(s): Blake R. Hossack, Lisa A. Eby, C. Gregory Guscio, Paul S. Corn

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

### **Listening to the message of the Black-backed Woodpecker, a hot fire specialist**

[www.nrfirescience.org/resource/11083](http://www.nrfirescience.org/resource/11083)

The Black-backed Woodpecker is an uncommon bird of the northern coniferous forests of North America. It is one of several species of fauna that are considered fire specialists. This woodpecker nests in cavities it creates in dead standing trees and feeds on wood-boring beetles and their larvae, which are also attracted to stressed...

Author(s): Elise LeQuire

Year Published: 2009

Type: Document

Research Brief or Fact Sheet

### **Artemisia nova (black sagebrush)**

[www.nrfirescience.org/resource/10650](http://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

### **Fire and bark beetle interactions**

[www.nrfirescience.org/resource/11071](http://www.nrfirescience.org/resource/11071)

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

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

Year Published: 2009

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Berberis vulgaris (common barberry)**

[www.nrfirescience.org/resource/10454](http://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

### **Equations to convert compacted crown ratio to uncompact crown ratio for trees in the Interior West**

[www.nrfirescience.org/resource/8368](http://www.nrfirescience.org/resource/8368)

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

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

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

### **Widespread increase of tree mortality rates in the western United States**

[www.nrfirescience.org/resource/8321](http://www.nrfirescience.org/resource/8321)

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

Author(s): Phillip J. van Mantgem, Nathan L. Stephenson, John C. Byrne, Lori D. Daniels, Jerry F. Franklin, Peter Z. Fule, Mark E. Harmon, Andrew J. Larson, Jeremy M. Smith, Alan H. Taylor, Thomas T. Veblen

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

### **Fuel treatments, fire suppression, and their interaction with wildfire and its impacts: the Warm Lake experience during the Cascade Complex of wildfires in central Idaho, 2007**

[www.nrfirescience.org/resource/11435](http://www.nrfirescience.org/resource/11435)

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

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

Year Published: 2009

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/12616](http://www.nrfirescience.org/resource/12616)

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

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

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

### **Potentilla hippiana (woolly cinquefoil)**

[www.nrfirescience.org/resource/10792](http://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

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

[www.nrfirescience.org/resource/11069](http://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

### **Nucifraga columbiana (Clark's nutcracker)**

[www.nrfirescience.org/resource/10782](http://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

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

[www.nrfirescience.org/resource/8239](http://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

**Carex rossii (Ross's sedge)**

[www.nrfirescience.org/resource/10594](http://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

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

[www.nrfirescience.org/resource/10803](http://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

**Using bark char codes to predict post-fire cambium mortality**

[www.nrfirescience.org/resource/8171](http://www.nrfirescience.org/resource/8171)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

**Potentilla glandulosa (sticky cinquefoil)**

[www.nrfirescience.org/resource/10822](http://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 effects on historical range and variability of two large landscapes in western Montana, USA**

[www.nrfirescience.org/resource/8162](http://www.nrfirescience.org/resource/8162)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

### **Sambucus racemosa (red elderberry)**

[www.nrfirescience.org/resource/10654](http://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

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

[www.nrfirescience.org/resource/7920](http://www.nrfirescience.org/resource/7920)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, Synthesis

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

[www.nrfirescience.org/resource/8203](http://www.nrfirescience.org/resource/8203)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

### **Polytrichum juniperinum (juniper haircap moss)**

[www.nrfirescience.org/resource/10647](http://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

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

[www.nrfirescience.org/resource/8198](http://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

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

[www.nrfirescience.org/resource/11066](http://www.nrfirescience.org/resource/11066)

In their classic article published in the Journal of Forestry in 1986, Gerald Allen and Ernest Gould stated that the most daunting problems associated with public forest management have a "wicked" element:

"Wicked problems share characteristics. Each can be considered as simply a symptom of some higher order problem-The definition...

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

Year Published: 2008

Type: Document

Conference Proceedings, Synthesis, Technical Report or White Paper

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

[www.nrfirescience.org/resource/8194](http://www.nrfirescience.org/resource/8194)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, Synthesis

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

[www.nrfirescience.org/resource/10595](http://www.nrfirescience.org/resource/10595)

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

Author(s): Michelle B. Anderson

Year Published: 2008

Type: Document

Synthesis

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

[www.nrfirescience.org/resource/11485](http://www.nrfirescience.org/resource/11485)

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

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

Year Published: 2008

Type: Document

Conference Proceedings, Technical Report or White Paper

### **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](http://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

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

[www.nrfirescience.org/resource/8125](http://www.nrfirescience.org/resource/8125)

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

### **A comparison of five sampling techniques to estimate surface fuel loading in montane forests**

[www.nrfirescience.org/resource/8164](http://www.nrfirescience.org/resource/8164)

Designing a fuel-sampling program that accurately and efficiently assesses fuel load at relevant spatial scales requires knowledge of each sample method's strengths and weaknesses. We obtained loading values for six fuel components using five fuel load sampling techniques at five locations in western Montana, USA. The techniques...

Author(s): Pamela G. Sikkink, Robert E. Keane

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11125](http://www.nrfirescience.org/resource/11125)

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

alternatives. We determined rates of...

Author(s): Robert E. Keane

Year Published: 2008

Type: Document

Technical Report or White Paper

### **Restoration of northern Rocky Mountain moist forests: integrating fuel treatments from the site to the landscape**

[www.nrfirescience.org/resource/11991](http://www.nrfirescience.org/resource/11991)

Restoration and fuel treatments in the moist forests of the northern Rocky Mountains are complex and far different from those applicable to the dry ponderosa pine forests. In the moist forests, clearcuts are the favored method to use for growing early-seral western white pine and western larch. Nevertheless, clearcuts and their...

Author(s): Theresa B. Jain, Russell T. Graham, Robert Denner, Jonathan Sandquist, Jeffrey S. Evans, Matthew Butler, Karen Brockus, David Cobb, Daniel Frigard, Han-Sup Han, Jeff Halbrook

Year Published: 2008

Type: Document

Conference Proceedings, Technical Report or White Paper

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

[www.nrfirescience.org/resource/8161](http://www.nrfirescience.org/resource/8161)

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

Author(s): Robert E. Keane

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

### **Gulo gulo (wolverine)**

[www.nrfirescience.org/resource/10747](http://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

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

[www.nrfirescience.org/resource/8202](http://www.nrfirescience.org/resource/8202)

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

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

Year Published: 2008  
Type: Document  
Book or Chapter or Journal Article

### **Neotoma cinerea (bushy-tailed woodrat)**

[www.nrfirescience.org/resource/10902](http://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

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

[www.nrfirescience.org/resource/8364](http://www.nrfirescience.org/resource/8364)

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

Author(s): Sharon M. Hood, Charles W. McHugh, Kevin C. Ryan, Elizabeth D. Reinhardt, Sheri L. Smith  
Year Published: 2007  
Type: Document  
Book or Chapter or Journal Article

### **Strix nebulosa (great gray owl)**

[www.nrfirescience.org/resource/10900](http://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

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

[www.nrfirescience.org/resource/8166](http://www.nrfirescience.org/resource/8166)

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

Author(s): Mark A. Finney, Robert C. Seli, Charles W. McHugh, Alan A. Ager, Bernhard Bahro, James K. Agee  
Year Published: 2007  
Type: Document  
Book or Chapter or Journal Article

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

## **Mountains**

[www.nrfirescience.org/resource/11126](http://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

## **Treatments that enhance the decomposition of forest fuels for use in partially harvested stands in the moist forests of the Northern Rocky Mountains - Final report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/13115](http://www.nrfirescience.org/resource/13115)

The moist forests of the Rocky Mountains typically support late seral western hemlock, moist grand fir, or western redcedar forests. In addition to these species, Douglas-fir, western white pine, western larch, ponderosa pine, and lodgepole pine can occur creating a multitude of species compositions, structures, and successional...

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

Year Published: 2007

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/12113](http://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

## **Geranium bicknellii (Bicknell's geranium)**

[www.nrfirescience.org/resource/10817](http://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

## **The fire-climate connection**

[www.nrfirescience.org/resource/11985](http://www.nrfirescience.org/resource/11985)

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

Author(s): Gail Wells



Year Published: 2007  
Type: Document  
Research Brief or Fact Sheet

### **Development and evaluation of the photoload sampling technique**

[www.nrfirescience.org/resource/11204](http://www.nrfirescience.org/resource/11204)

Wildland fire managers need better estimates of fuel loading so they can accurately predict potential fire behavior and effects of alternative fuel and ecosystem restoration treatments. This report presents the development and evaluation of a new fuel sampling method, called the photoload sampling technique, to quickly and...

Author(s): Robert E. Keane, Laura J. Dickinson  
Year Published: 2007  
Type: Document  
Technical Report or White Paper

### **Rangifer tarandus (caribou)**

[www.nrfirescience.org/resource/10746](http://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

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

[www.nrfirescience.org/resource/8363](http://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

### **Symphoricarpos occidentalis (western snowberry)**

[www.nrfirescience.org/resource/10698](http://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

### **Lynx canadensis (Canada lynx)**

[www.nrfirescience.org/resource/10897](http://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](http://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

### **Fragaria vesca (woodland strawberry)**

[www.nrfirescience.org/resource/10802](http://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

### **Post-fire burn severity and vegetation response following eight large wildfires across the western United States**

[www.nrfirescience.org/resource/8168](http://www.nrfirescience.org/resource/8168)

Vegetation response and burn severity were examined following eight large wildfires that burned in 2003 and 2004: two wildfires in California chaparral, two each in dry and moist mixed-conifer forests in Montana, and two in boreal forests in interior Alaska. Our research objectives were: 1) to characterize one year post-fire...

Author(s): Leigh B. Lentile, Penelope Morgan, Andrew T. Hudak, Michael J. Bobbitt, Sarah A. Lewis, Alistair M. S. Smith, Peter R. Robichaud

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11128](http://www.nrfirescience.org/resource/11128)

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

loadings for six common...

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

Year Published: 2007

Type: Document

Technical Report or White Paper

### **Mertensia paniculata (tall bluebells)**

[www.nrfirescience.org/resource/10821](http://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

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

[www.nrfirescience.org/resource/11429](http://www.nrfirescience.org/resource/11429)

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

Author(s): Carol Miller

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

### **Martes pennanti (fisher)**

[www.nrfirescience.org/resource/10796](http://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

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

[www.nrfirescience.org/resource/11041](http://www.nrfirescience.org/resource/11041)

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

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

Year Published: 2007

Type: Document

Conference Proceedings

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

[www.nrfirescience.org/resource/11987](http://www.nrfirescience.org/resource/11987)

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

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

Year Published: 2007

Type: Document

Conference Proceedings, Technical Report or White Paper

## **Hieracium albiflorum (white hawkweed)**

[www.nrfirescience.org/resource/10816](http://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

## **Poa bulbosa (bulbous bluegrass)**

[www.nrfirescience.org/resource/10682](http://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

## **Arctostaphylos patula (greenleaf manzanita)**

[www.nrfirescience.org/resource/10705](http://www.nrfirescience.org/resource/10705)

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

Author(s): Alan S. Hauser

Year Published: 2007

Type: Document

Synthesis

## **CCE fire regimes and their management**

[www.nrfirescience.org/resource/8369](http://www.nrfirescience.org/resource/8369)

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

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

Year Published: 2007  
Type: Document  
Book or Chapter or Journal Article

### **Calamagrostis montanensis (plains reedgrass)**

[www.nrfirescience.org/resource/10702](http://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

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

[www.nrfirescience.org/resource/12020](http://www.nrfirescience.org/resource/12020)

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

Author(s): Roger D. Fight, R. James Barbour  
Year Published: 2006  
Type: Document  
Research Brief or Fact Sheet

### **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](http://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

### **Rosa woodsii (Wood's rose)**

[www.nrfirescience.org/resource/10700](http://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

### **Ledum groenlandicum (bog Labrador tea)**

[www.nrfirescience.org/resource/10670](http://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

### **Effects of slash, machine passes, and soil moisture on penetration resistance in a cut-to-length harvesting**

[www.nrfirescience.org/resource/7936](http://www.nrfirescience.org/resource/7936)

Multiple entries into forest stands are often needed for fire hazard reduction and ecosystem restoration treatments in the Inland Northwest U.S.A. region. However, soil compaction occurring from mechanized harvesting operations often remains for many years and may contribute to a decline in long-term site productivity. A controlled...

Author(s): Han-Sup Han, Deborah S. Page-Dumroese, S-K Han, Joanne M. Tirocke

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **Integrating fuel treatments into comprehensive ecosystem management**

[www.nrfirescience.org/resource/10973](http://www.nrfirescience.org/resource/10973)

To plan fuel treatments in the context of comprehensive ecosystem management, forest managers must meet multiple-use and environmental objectives, address administrative and budget constraints, and reconcile performance measures from multiple policy directives. We demonstrate a multiple criteria approach to measuring success of fuel...

Author(s): Kevin D. Hyde, J. Greg Jones, Robin P. Silverstein, Keith Stockmann, Dan R. Loeffler

Year Published: 2006

Type: Document

Conference Proceedings

### **Eleocharis palustris (common spikerush)**

[www.nrfirescience.org/resource/10694](http://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

### **Patagioenas fasciata (band-tailed pigeon)**

[www.nrfirescience.org/resource/10896](http://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

### **Geum triflorum (prairie smoke)**

[www.nrfirescience.org/resource/10801](http://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

### **Estimating canopy fuel characteristics in five conifer stands in the western United States using tree and stand measurements**

[www.nrfirescience.org/resource/8128](http://www.nrfirescience.org/resource/8128)

Assessment of crown fire potential requires quantification of canopy fuels. In this study, canopy fuels were measured destructively on plots in five Interior West conifer stands. Observed canopy bulk density, canopy fuel load, and vertical profiles of canopy fuels are compared with those estimated from stand data using several...

Author(s): Elizabeth D. Reinhardt, Joe H. Scott, Kathy L. Gray, Robert E. Keane

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **Wildfire, timber salvage, and the economics of expediency**

[www.nrfirescience.org/resource/8124](http://www.nrfirescience.org/resource/8124)

Administrative planning rules and legal challenges can have significant economic impacts on timber salvage programs on public lands. This paper examines the costs of the delay in salvage caused by planning rules and the costs associated with the volume reductions forced by legal challenges in one case study. The fires on the...

Author(s): Jeffrey P. Prestemon, David N. Wear, Fred J. Stewart, Thomas P. Holmes

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **Goodyera oblongifolia (western rattlesnake plantain)**

[www.nrfirescience.org/resource/10820](http://www.nrfirescience.org/resource/10820)

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

Author(s): Sonja L. Reeves

Year Published: 2006

Type: Document

Synthesis

### **Piranga ludoviciana (western tanager)**



[www.nrfirescience.org/resource/10795](http://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

### **Wilderness fire management in a changing world**

[www.nrfirescience.org/resource/7963](http://www.nrfirescience.org/resource/7963)

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

Author(s): Carol Miller

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8157](http://www.nrfirescience.org/resource/8157)

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

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

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### ***Vulpia octoflora* (sixweeks grass)**

[www.nrfirescience.org/resource/10710](http://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

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

[www.nrfirescience.org/resource/8268](http://www.nrfirescience.org/resource/8268)

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

Park, Wyoming, USA. We...

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

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11200](http://www.nrfirescience.org/resource/11200)

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

Author(s): Joe H. Scott

Year Published: 2006

Type: Document

Technical Report or White Paper

### **Zigadenus venenosus (meadow deathcamas)**

[www.nrfirescience.org/resource/10704](http://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

### **Berberis repens (Oregon grape)**

[www.nrfirescience.org/resource/10905](http://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

### **The relation between forest structure and soil burn severity**

[www.nrfirescience.org/resource/10978](http://www.nrfirescience.org/resource/10978)

A study funded through National Fire Plan evaluates the relation between pre-wildfire forest structure and post-wildfire soil burn severity across three forest types: dry, moist, and cold forests. Over 73 wildfires were sampled in Idaho, Oregon, Montana, Colorado, and Utah, which burned between 2000 and 2003. Because of the study's...

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

Year Published: 2006

Type: Document

Conference Proceedings

### **Perisoreus canadensis (gray jay)**

[www.nrfirescience.org/resource/10901](http://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

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

[www.nrfirescience.org/resource/11189](http://www.nrfirescience.org/resource/11189)

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

Author(s): Kenneth E. Skog, R. James Barbour, Karen L. Abt, Edward M. Bilek, Frank Burch, Roger D. Fight, Robert J. Huggett, Patrick D. Miles, Elizabeth D. Reinhardt, Wayne D. Shepperd

Year Published: 2006

Type: Document

Technical Report or White Paper

### **Carex aquatilis (leafy tussock sedge)**

[www.nrfirescience.org/resource/10693](http://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

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

[www.nrfirescience.org/resource/10893](http://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

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

[www.nrfirescience.org/resource/8222](http://www.nrfirescience.org/resource/8222)

Spatial variation in vegetation and coarse wood is a major source of forest heterogeneity, yet little is known about how this affects ecosystem processes. In 15-year-old postfire lodgepole pine (*Pinus*

contorta var. latifolia Englem.) stands in Yellowstone National Park, Wyoming, we investigated how the decomposition rate varies with...

Author(s): Alysa J. Remsburg, Monica G. Turner

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8120](http://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

### **Mastication: a fuel reduction and site preparation alternative**

[www.nrfirescience.org/resource/10959](http://www.nrfirescience.org/resource/10959)

During the fall of 2005, a study was conducted at Priest River Experimental Forest (PREF) in northern Idaho to investigate the economics of mastication used to treat activity and standing live fuels. In this study, a rotary head masticator was used to crush and chop activity fuels within harvest units on 37.07 acres. Production...

Author(s): Jeff Halbrook, Han-Sup Han, Russell T. Graham, Theresa B. Jain, Robert Denner

Year Published: 2006

Type: Document

Conference Proceedings

### **Calypso bulbosa (fairy slipper)**

[www.nrfirescience.org/resource/10818](http://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

### **Vulpia myuros (rattail sixweeks grass)**

[www.nrfirescience.org/resource/10460](http://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 microstachys (small sixweeks grass)**

[www.nrfirescience.org/resource/10709](http://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

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

[www.nrfirescience.org/resource/11512](http://www.nrfirescience.org/resource/11512)

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

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

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **The effects of postfire salvage logging on cavity-nesting birds**

[www.nrfirescience.org/resource/12933](http://www.nrfirescience.org/resource/12933)

We investigated the effects of postfire salvage logging on cavity-nesting birds by comparing nest densities and patterns of nest reuse over a three-year period in seven logged and eight unlogged patches of mixed-conifer forest in the Blackfoot-Clearwater Wildlife Management Area, Montana. We found 563 active nests of 18 cavity-...

Author(s): Richard L. Hutto, Susan M. Gallo

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **Estimation of biophysical characteristics for highly variable mixed-conifer stands using small-footprint lidar**

[www.nrfirescience.org/resource/8254](http://www.nrfirescience.org/resource/8254)

Although lidar data are widely available from commercial contractors, operational use in North America is still limited by both cost and the uncertainty of large-scale application and associated model accuracy issues. We analyzed whether small-footprint lidar data obtained from five noncontiguous geographic areas with varying...

Author(s): Jennifer L. Rooker Jensen, Karen S. Humes, Tamara Conner, Christopher Jason Williams, John DeGroot

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

### **Stereo photo guide for estimating canopy fuel characteristics in conifer stands**

[www.nrfirescience.org/resource/11199](http://www.nrfirescience.org/resource/11199)

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

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

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

Year Published: 2005

Type: Document

Technical Report or White Paper

### **Apocynum androsaemifolium (spreading dogbane)**

[www.nrfirescience.org/resource/10666](http://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

### **Application of free selection in mixed forests of the inland northwestern United States**

[www.nrfirescience.org/resource/7933](http://www.nrfirescience.org/resource/7933)

Forest management objectives continue to evolve as the desires and needs of society change. The practice of silviculture has risen to the challenge by supplying silvicultural methods and systems to produce desired stand and forest structures and compositions to meet these changing objectives. For the most part, the practice of...

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

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

### **Clintonia uniflora (queencup beadlily)**

[www.nrfirescience.org/resource/10798](http://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

### **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](http://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

### **Hypericum perforatum (common St Johnswort)**

[www.nrfirescience.org/resource/10499](http://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

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

[www.nrfirescience.org/resource/11172](http://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. Rippy, 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

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

[www.nrfirescience.org/resource/7960](http://www.nrfirescience.org/resource/7960)

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

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

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

### **Estimating forest canopy bulk density using six indirect methods**

[www.nrfirescience.org/resource/7952](http://www.nrfirescience.org/resource/7952)

Canopy bulk density (CBD) is an important crown characteristic needed to predict crown fire spread, yet it is difficult to measure in the field. Presented here is a comprehensive research effort to evaluate six indirect sampling techniques for estimating CBD. As reference data, detailed crown fuel biomass measurements were taken on...

Author(s): Robert E. Keane, Elizabeth D. Reinhardt, Joe H. Scott, Kathy L. Gray, James J. Reardon

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

### **Stand establishment and tending in the inland northwest**



[www.nrfirescience.org/resource/11141](http://www.nrfirescience.org/resource/11141)

The moist, cold, and dry forests of the Inland Northwest occupy approximately 144 million acres. Ponderosa pine, lodgepole pine, western white pine, western larch, and Douglas-fir are usually the preferred commercial species of the area. These early-seral species are relatively resistant to endemic levels of insects and diseases....

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

Year Published: 2005

Type: Document

Technical Report or White Paper

### **Cornus nuttallii (Pacific dogwood)**

[www.nrfirescience.org/resource/10681](http://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

### **Changes in bird abundance after wildfire: importance of fire severity and time since fire**

[www.nrfirescience.org/resource/8256](http://www.nrfirescience.org/resource/8256)

Fire can cause profound changes in the composition and abundance of plant and animal species, but logistics, unpredictability of weather, and inherent danger make it nearly impossible to study high-severity fire effects experimentally. We took advantage of a unique opportunity to use a before-after/control-impact (BACI) approach to...

Author(s): Kristina M. Smucker, Richard L. Hutto, Brian M. Steele

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

### **Galium aparine (stickywilly)**

[www.nrfirescience.org/resource/10677](http://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

### **Restoring dry and moist forests of the inland northwestern U. S.**

[www.nrfirescience.org/resource/7903](http://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

### **Juncus balticus (Baltic rush)**

[www.nrfirescience.org/resource/10701](http://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

### **Landscape fragmentation and forest fuel accumulation: effects of fragment size, age, and climate - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/12115](http://www.nrfirescience.org/resource/12115)

Landscape fragmentation can affect fuel accumulation, increase the spatial variability of fuel loads, and affect the susceptibility of forests to fire. Fragmentation creates a complex environment in which to manage forests in the United States and Puerto Rico and few studies have related the combined effects of fragmentation,...

Author(s): William A. Gould, Grizelle Gonzalez, Andrew T. Hudak  
Year Published: 2005  
Type: Document  
Technical Report or White Paper

### **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](http://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

### **Characterizing and mapping forest fire fuels using ASTER imagery and gradient modeling**

[www.nrfirescience.org/resource/7925](http://www.nrfirescience.org/resource/7925)

Land managers need cost-effective methods for mapping and characterizing forest fuels quickly and accurately. The launch of satellite sensors with increased spatial resolution may improve the accuracy and reduce the cost of fuels mapping. The objective of this research is to evaluate the accuracy and utility of imagery from the...

Author(s): Michael J. Falkowski, Paul E. Gessler, Penelope Morgan, Andrew T. Hudak, Alistair M. S. Smith  
Year Published: 2005  
Type: Document  
Book or Chapter or Journal Article

### **Photo series for major natural fuel types of the United States - Phase II -- Progress Report**

[www.nrfirescience.org/resource/11170](http://www.nrfirescience.org/resource/11170)

The natural fuels stereo photo series is a collection of geo-referenced data and photographs that display a range of natural conditions, fuel loadings, and other fuelbed characteristics in a wide variety of forest-, woodland-, shrub-, and grass-dominated ecosystem types. The photo series are useful tools for quickly and...

Author(s): Roger D. Ottmar

Year Published: 2005

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/8144](http://www.nrfirescience.org/resource/8144)

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

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

Year Published: 2005

Type: Document

Book or Chapter or Journal Article, Synthesis

### **Role of fire in determining annual water yield in mountain watersheds**

[www.nrfirescience.org/resource/7901](http://www.nrfirescience.org/resource/7901)

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

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

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Is forest structure related to fire severity? Yes, no, and maybe: methods and insights in quantifying the answer**

[www.nrfirescience.org/resource/10977](http://www.nrfirescience.org/resource/10977)

Wildfires in 2000 burned over 500,000 forested ha in the Northern Rocky Mountains. In 2001, National Fire Plan funding became available to evaluate the influence of pre-wildfire forest structure on post wildfire fire severity. Results from this study will provide information on forest structures that are resilient to wildfire. Three...

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

Year Published: 2004

Type: Document

Conference Proceedings

### **The relationship of field burn severity measures to satellite-derived Burned Area Reflectance Classification (BARC) maps**

[www.nrfirescience.org/resource/10971](http://www.nrfirescience.org/resource/10971)

Preliminary results are presented from ongoing research on spatial variability of fire effects on soils and

vegetation from the Black Mountain Two and Cooney Ridge wildfires, which burned in western Montana during the 2003 fire season. Extensive field fractional cover data were sampled to assess the efficacy of quantitative...

Author(s): Andrew T. Hudak, Penelope Morgan, Carter Stone, Peter R. Robichaud, Theresa B. Jain, Jess T. Clark

Year Published: 2004

Type: Document

Conference Proceedings

### **Mountains, fire, fire suppression, and the carbon cycle in the western United States**

[www.nrfirescience.org/resource/11044](http://www.nrfirescience.org/resource/11044)

Most mountain regions in the western United States are covered by forests, which are for the most part recovering from historical harvesting and have been experiencing active fire suppression over approximately the past 100 years (Tilman and others 2000). Whereas many western landscapes are currently perceived as pristine natural...

Author(s): David S. Schimel

Year Published: 2004

Type: Document

Technical Report or White Paper

### **Restoring vigor and reducing hazard in an old growth western larch stand (Montana)**

[www.nrfirescience.org/resource/7926](http://www.nrfirescience.org/resource/7926)

Description not entered

Author(s): Carl E. Fiedler, Michael G. Harrington

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Sonchus arvensis (perennial sowthistle)**

[www.nrfirescience.org/resource/10464](http://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

### **Analysis of algorithms for predicting canopy fuel**

[www.nrfirescience.org/resource/10958](http://www.nrfirescience.org/resource/10958)

We compared observed canopy fuel characteristics with those predicted by existing biomass algorithms. We specifically examined the accuracy of the biomass equations developed by Brown (1978). We used destructively sampled data obtained at 5 different study areas. We compared predicted and observed quantities of foliage and crown...

Author(s): Kathy L. Gray, Elizabeth D. Reinhardt

Year Published: 2004

Type: Document

Conference Proceedings

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

[www.nrfirescience.org/resource/11104](http://www.nrfirescience.org/resource/11104)

This is a government publication outlining the steps to wildfire preparedness in Red Lodge, MT. The key features include homeowners' associations, which lead in fuel reduction around properties; USFS recreation residences, which conduct fuel reduction projects; evacuation plans and fuel breaks; regulations; and relationships, which...

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

Year Published: 2004

Type: Document

Research Brief or Fact Sheet

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

[www.nrfirescience.org/resource/13583](http://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

### **Western white pine growth relative to forest openings**

[www.nrfirescience.org/resource/7946](http://www.nrfirescience.org/resource/7946)

In northern Rocky Mountains moist forests, timber harvesting, fire exclusion, and an introduced stem disease have contributed to the decline in western white pine (*Pinus monticola* Dougl. ex D. Don) abundance (from 90% to 10% of the area). Relations between canopy openings (0.1-15 ha) and western white pine growth within different...

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

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Leymus ambiguus (Colorado wildrye)**

[www.nrfirescience.org/resource/10600](http://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

### **Asarum caudatum (wild ginger)**

[www.nrfirescience.org/resource/10674](http://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

### **Enhancing moist forest restoration opportunities in riparian systems**

[www.nrfirescience.org/resource/10976](http://www.nrfirescience.org/resource/10976)

In northern Rocky Mountain moist forests, riparian systems contain many attributes that create unique biophysical conditions that alter disturbances and microenvironments; thus creating distinct forest structures, species composition, and management challenges. For example, browsing, limited opening size, competition from...

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

Year Published: 2004

Type: Document

Conference Proceedings, Synthesis

### **Field validation of Burned Area Reflectance Classification (BARC) products for post fire assessment**

[www.nrfirescience.org/resource/10972](http://www.nrfirescience.org/resource/10972)

The USFS Remote Sensing Applications Center (RSAC) and the USGS EROS Data Center (EDC) produce Burned Area Reflectance Classification (BARC) maps for use by Burned Area Emergency Rehabilitation (BAER) teams in rapid response to wildfires. BAER teams desire maps indicative of soil burn severity, but photosynthetic and...

Author(s): Andrew T. Hudak, Peter R. Robichaud, Jeffrey B. Evans, Jess T. Clark, Keith Lannom, Penelope Morgan, Carter Stone

Year Published: 2004

Type: Document

Conference Proceedings

### **Temperature-dependent rate models of vascular cambium cell mortality**

[www.nrfirescience.org/resource/7922](http://www.nrfirescience.org/resource/7922)

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

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

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Prunus pensylvanica (pin cherry)**

[www.nrfirescience.org/resource/10607](http://www.nrfirescience.org/resource/10607)

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

Author(s): Michelle B. Anderson

Year Published: 2004

Type: Document

Synthesis

### **Global warming's unlikely harbingers**

[www.nrfirescience.org/resource/11497](http://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

### **Smoke produced from residual combustion**

[www.nrfirescience.org/resource/11140](http://www.nrfirescience.org/resource/11140)

Considerable research has been carried out to estimate the chemical composition and the amount of trace gases and particulate matter emitted during short-duration flaming and smoldering combustion of fuels in the fire-prone forest and grassland ecosystems. For other forest ecosystems, where long-duration residual smoldering...

Author(s): Ronald E. Babbitt, Wei Min Hao

Year Published: 2004

Type: Document

Technical Report or White Paper

### **Postfire management on forested public lands of the western United States**

[www.nrfirescience.org/resource/7913](http://www.nrfirescience.org/resource/7913)

Forest ecosystems in the western United States evolved over many millennia in response to disturbances such as wildfires. Land use and management practices have altered these ecosystems, however, including fire regimes in some areas. Forest ecosystems are especially vulnerable to postfire management practices because such practices...

Author(s): Robert L. Beschta, Jonathan J. Rhodes, J. Boone Kauffman, Robert E. Gresswell, G. Wayne Minshall, James R. Karr, David A. Perry, F. Richard Hauer, Christopher A. Frissell

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Pinus contorta var. latifolia (Rocky Mountain lodgepole pine)**

[www.nrfirescience.org/resource/10597](http://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

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

[www.nrfirescience.org/resource/8131](http://www.nrfirescience.org/resource/8131)

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



Author(s): Bruce E. Rieman, Danny C. Lee, Denver P. Burns, Robert E. Gresswell, Michael K. Young, Rick Stowell, John N. Rinne, Phil Howell  
Year Published: 2003  
Type: Document  
Book or Chapter or Journal Article, Synthesis

### **Comparing two methods of identifying ecological restoration opportunities**

[www.nrfirescience.org/resource/8430](http://www.nrfirescience.org/resource/8430)

Two methods for identifying ecological restoration opportunities in the Northern Region of the Forest Service are compared. Different analysis methods are often used to address issues at different planning scales. The first method is a nonspatial characterization of current vegetation conditions using Forest Inventory and Analysis (...)

Author(s): Jimmie D. Chew

Year Published: 2003

Type: Document

Conference Proceedings

### **Acer platanoides (Norway maple)**

[www.nrfirescience.org/resource/10466](http://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

### **Sisymbrium altissimum (tumble mustard)**

[www.nrfirescience.org/resource/10458](http://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

### **Using digital terrain modeling and satellite imagery to map interactions among fire and forest microbes**

[www.nrfirescience.org/resource/10989](http://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

### **Descurainia pinnata (pinnate tansymustard)**

[www.nrfirescience.org/resource/10723](http://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

### **Climatic controls on fire-induced sediment pulses in Yellowstone National Park and central Idaho: a long-term perspective**

[www.nrfirescience.org/resource/7962](http://www.nrfirescience.org/resource/7962)

Fire management addressing postfire erosion and aquatic ecosystems tends to focus on short-term effects persisting up to about a decade after fire. A longer perspective is important in understanding natural variability in postfire erosion and sedimentation, the role of these processes in structuring habitat, and future expectations...

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

Year Published: 2003

Type: Document

Book or Chapter or Journal Article, Synthesis

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

[www.nrfirescience.org/resource/11025](http://www.nrfirescience.org/resource/11025)

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

Author(s): Thomas T. Veblen

Year Published: 2003

Type: Document

Conference Proceedings

### **Descurainia sophia (flixweed tansymustard)**

[www.nrfirescience.org/resource/10463](http://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

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

[www.nrfirescience.org/resource/8264](http://www.nrfirescience.org/resource/8264)

How have changes in land management practices affected vegetation patterns in the greater Yellowstone ecosystem? This question led us to develop a deterministic, successional, vegetation

model to 'turn back the clock' on a study area and assess how patterns in vegetation cover type and structure have changed through different...

Author(s): Alisa L. Gallant, Andrew J. Hansen, John S. Councilman, Duane K. Monte, David W. Betz  
Year Published: 2003

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/7917](http://www.nrfirescience.org/resource/7917)

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

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

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

### **Artemisia frigida (fringed sagebrush)**

[www.nrfirescience.org/resource/10788](http://www.nrfirescience.org/resource/10788)

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

Author(s): Jack McWilliams

Year Published: 2003

Type: Document

Synthesis

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

[www.nrfirescience.org/resource/7951](http://www.nrfirescience.org/resource/7951)

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

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

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/10993](http://www.nrfirescience.org/resource/10993)

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

Author(s): Carol Miller

Year Published: 2003

Type: Document

Conference Proceedings, Technical Report or White Paper

**Larix occidentalis (western larch)**

[www.nrfirescience.org/resource/10826](http://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](http://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

**Balsamorhiza sagittata (arrowleaf balsamroot)**

[www.nrfirescience.org/resource/10789](http://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

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

[www.nrfirescience.org/resource/8140](http://www.nrfirescience.org/resource/8140)

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

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

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

**Juniperus scopulorum (Rocky Mountain juniper)**

[www.nrfirescience.org/resource/10827](http://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

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

[www.nrfirescience.org/resource/11187](http://www.nrfirescience.org/resource/11187)

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

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

Year Published: 2002

Type: Document

Synthesis, Technical Report or White Paper

### **Elymus lanceolatus (thickspike wheatgrass)**

[www.nrfirescience.org/resource/10825](http://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

### **Lythrum salicaria (purple loosestrife)**

[www.nrfirescience.org/resource/10467](http://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

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

[www.nrfirescience.org/resource/10853](http://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

### **Estimating canopy fuels in conifer forests**

[www.nrfirescience.org/resource/8403](http://www.nrfirescience.org/resource/8403)

Crown fires occur in a variety of coniferous forest types (Agee 1993), including some that are not historically prone to crown fire, such as ponderosa pine (Mutch and others 1993). The head fire spread rate of a crown fire is usually several times faster than that of a surface fire burning under the same conditions, which leads to a...

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

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

### **Carduus nutans (musk thistle)**

[www.nrfirescience.org/resource/10494](http://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

### **Cirsium vulgare (bull thistle)**

[www.nrfirescience.org/resource/10492](http://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

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

[www.nrfirescience.org/resource/7956](http://www.nrfirescience.org/resource/7956)

Description not entered

Author(s): Natasha B. Kotliar, Sallie Hejl, Richard L. Hutton, Victoria A. Saab, C. P. Melcher, Mary E. McFadzen

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

### **Using FVS and its fire and fuels extension in the context of uncertain climate**

[www.nrfirescience.org/resource/11011](http://www.nrfirescience.org/resource/11011)

While the prospect of a static climate is no longer tenable, the direction of change for particular localities is not yet clear. Modelling vulnerability of silvicultural options to various scenarios of climate change requires a modelling system that can represent major processes affected by climatic variability. The Forest...

Author(s): Albert R. Stage  
Year Published: 2002  
Type: Document  
Conference Proceedings

### **Fire as a coarse filter for snags and logs**

[www.nrfirescience.org/resource/11075](http://www.nrfirescience.org/resource/11075)

Fire played an important role in maintaining and creating conditions suitable for native flora and fauna in the forests of western North America. Recent coarse filter conservation strategies have advocated creating future landscapes that incorporate historic or natural ranges of variability, including fire regimes. Historic fire...

Author(s): James K. Agee  
Year Published: 2002  
Type: Document  
Conference Proceedings, Technical Report or White Paper

### **Leymus cinereus (basin wildrye)**

[www.nrfirescience.org/resource/10601](http://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

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

[www.nrfirescience.org/resource/10851](http://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

### **Centaurea maculosa (spotted knapweed)**

[www.nrfirescience.org/resource/10493](http://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

### **Dasiphora floribunda (shrubby cinquefoil)**



[www.nrfirescience.org/resource/10608](http://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

### ***Cirsium arvense* (Canada thistle)**

[www.nrfirescience.org/resource/10482](http://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

### ***Salix scouleriana* (Scouler willow)**

[www.nrfirescience.org/resource/10606](http://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

### ***Abies concolor* (white fir)**

[www.nrfirescience.org/resource/10936](http://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

### ***Taeniatherum caput-medusae* (medusahead)**

[www.nrfirescience.org/resource/10447](http://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

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

[www.nrfirescience.org/resource/10593](http://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

### **Vaccinium scoparium (grouse whortleberry)**

[www.nrfirescience.org/resource/10501](http://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](http://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

### **Educational program about wildland fire integrates plant science into curriculum**

[www.nrfirescience.org/resource/8386](http://www.nrfirescience.org/resource/8386)

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

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

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

### **Centaurea diffusa (diffuse knapweed)**

[www.nrfirescience.org/resource/10481](http://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

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

[www.nrfirescience.org/resource/8139](http://www.nrfirescience.org/resource/8139)

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

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

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/10988](http://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

### **Water repellency by laboratory burning of four Northern Rocky Mountain forest soils**

[www.nrfirescience.org/resource/8133](http://www.nrfirescience.org/resource/8133)

Highly variable water repellent soil conditions have been reported after forest fires. We examined interactions among heating, soil water content and soil texture on water repellency. Undisturbed, 305-mm diameter cores were collected in the field from four soils commonly referred to as ash-cap, mixed ash-cap, no ash-cap and granitic...

Author(s): PETER R. ROBICHAUD, ROGER D. HUNGERFORD

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

### **Vaccinium membranaceum (big huckleberry)**

[www.nrfirescience.org/resource/10828](http://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

### **Achnatherum lettermanii (Letterman's needlegrass)**

[www.nrfirescience.org/resource/10866](http://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

### **Prunus virginiana (chokecherry)**

[www.nrfirescience.org/resource/10503](http://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

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

[www.nrfirescience.org/resource/10966](http://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

### **Calamagrostis rubescens (pinegrass)**

[www.nrfirescience.org/resource/10755](http://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

### **An overview of the fire and fuels extension to the forest vegetation simulator**

[www.nrfirescience.org/resource/11037](http://www.nrfirescience.org/resource/11037)

The Fire and Fuels Extension (FFE) to the Forest Vegetation Simulator (FVS) has been developed to

assess the risk, behavior, and impact of fire in forest ecosystems. This extension to the widely-used stand-dynamics model FVS simulates the dynamics of snags and surface fuels as they are affected by stand management (of trees or fuels...

Author(s): Sarah J. Beukema, Elizabeth D. Reinhardt, Werner A. Kurz, Nicholas L. Crookston

Year Published: 2000

Type: Document

Conference Proceedings

### **Measuring and modelling soil erosion processes in forests**

[www.nrfirescience.org/resource/7923](http://www.nrfirescience.org/resource/7923)

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

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

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

### **Achnatherum nelsonii (Columbia needlegrass)**

[www.nrfirescience.org/resource/10938](http://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

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

[www.nrfirescience.org/resource/11001](http://www.nrfirescience.org/resource/11001)

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

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

Year Published: 2000

Type: Document

Conference Proceedings

### **Symphoricarpos albus (common snowberry)**

[www.nrfirescience.org/resource/10783](http://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

### **Abies grandis (grand fir)**

[www.nrfirescience.org/resource/10739](http://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](http://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

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

[www.nrfirescience.org/resource/11890](http://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

### **Comparing historic and modern forests on the Bitterroot Front**

[www.nrfirescience.org/resource/10967](http://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

### **Mixed-severity fire regimes in the Northern Rocky Mountains: consequences of fire exclusion and options for the future**

[www.nrfirescience.org/resource/8426](http://www.nrfirescience.org/resource/8426)

Findings from fire history studies have increasingly indicated that many forest ecosystems in the northern Rocky Mountains were shaped by mixed-severity fire regimes, characterized by fires of variable severities at intervals averaging between about 30 and 100 years. Perhaps because mixed-severity fire regimes and their resulting...

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

Year Published: 2000

Type: Document

Conference Proceedings, Synthesis

### **Fire-climate interactions in the Selway-Bitterroot Wilderness area**

[www.nrfirescience.org/resource/11887](http://www.nrfirescience.org/resource/11887)

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

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

Year Published: 2000

Type: Document

Conference Proceedings

### **Fire in western forest ecosystems**

[www.nrfirescience.org/resource/11115](http://www.nrfirescience.org/resource/11115)

Description not entered

Author(s): Stephen F. Arno

Year Published: 2000

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/10957](http://www.nrfirescience.org/resource/10957)

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

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

Year Published: 2000

Type: Document

Conference Proceedings, Synthesis

### **Festuca altaica, Festuca campestris, Festuca hallii (northern rough fescue, alpine rough fescue, plains rough fescue)**

[www.nrfirescience.org/resource/10881](http://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



**Festuca idahoensis (Idaho fescue)**

[www.nrfirescience.org/resource/10937](http://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

**Database for early postfire succession in Northern Rocky Mountain forests**

[www.nrfirescience.org/resource/11201](http://www.nrfirescience.org/resource/11201)

Provided data on quantitative postfire changes of plant species and forest vegetation components for up to the first 25 years of secondary plant succession for 55 forest sites in northern Idaho and northwestern Montana. Cover (aerial crown) and volume (aerial crown space occupied) data are presented as percent cover (m<sup>2</sup>/0.01 ha) and...

Author(s): Peter F. Stickney, Robert B. Campbell

Year Published: 2000

Type: Document

Technical Report or White Paper

**Ceanothus sanguineus (redstem ceanothus)**

[www.nrfirescience.org/resource/10742](http://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

**Natural regeneration after harvest and residue treatment in a mixed-conifer forest of northwestern Montana**

[www.nrfirescience.org/resource/13147](http://www.nrfirescience.org/resource/13147)

In 1974, two clearcuts, two shelterwoods, and two sets of eight group selections (equally divided between two elevation zones) were harvested on the Coram Experimental Forest in northwestern Montana. Four levels of tree and residue utilization were compared. Moist fuels on approximately half of each area were poorly burned by...

Author(s): Raymond C. Shearer, Jack A. Schmidt

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

**Achillea millefolium (western yarrow)**

[www.nrfirescience.org/resource/10591](http://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

### **The effects of thinning and similar stand treatments on fire behavior in western forests**

[www.nrfirescience.org/resource/11183](http://www.nrfirescience.org/resource/11183)

In the West, thinning and partial cuttings are being considered for treating millions of forested acres that are overstocked and prone to wildfire. The objectives of these treatments include tree growth redistribution, tree species regulation, timber harvest, wildlife habitat improvement, and wildfire-hazard reduction. Depending on...

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

Year Published: 1999

Type: Document

Technical Report or White Paper

### **White pine in the American West: a vanishing species - can we save it?**

[www.nrfirescience.org/resource/13112](http://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

### **Danthonia intermedia (timber oatgrass)**

[www.nrfirescience.org/resource/10882](http://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

### **Pascopyrum smithii (western wheatgrass)**

[www.nrfirescience.org/resource/10877](http://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

### **Spatial interpolation and simulation of post-burn duff thickness after prescribed fire**

[www.nrfirescience.org/resource/8132](http://www.nrfirescience.org/resource/8132)

Prescribed fire is used as a site treatment after timber harvesting. These fires result in spatial patterns with some portions consuming all of the forest floor material (duff) and others consuming little. Prior to the burn, spatial sampling of duff thickness and duff water content can be used to generate geostatistical spatial...

Author(s): Peter R. Robichaud, S. M. Miller

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

### **Pseudoroegneria spicata (bluebunch wheatgrass)**

[www.nrfirescience.org/resource/10585](http://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

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

[www.nrfirescience.org/resource/7945](http://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

### **Miller Creek Demonstration Forest - A forest born of fire: a field guide**

[www.nrfirescience.org/resource/11239](http://www.nrfirescience.org/resource/11239)

Miller Creek, on the Flathead National Forest in northwest Montana, is a demonstration forest, showing up to 30 years of forest change after clearcutting and a wide range of fire treatments in 1967 and 1968. Differences in tree regeneration and vegetation development are explained for units that were clearcut and prescribed burned,...

Author(s): Penelope A. Latham, Raymond C. Shearer, Kevin L. O'Hara

Year Published: 1998

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/11438](http://www.nrfirescience.org/resource/11438)

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

Author(s): Michael P. Murray, Stephen C. Bunting, Penelope Morgan  
Year Published: 1998  
Type: Document  
Book or Chapter or Journal Article

### **Patterns of lodgepole pine regeneration following the 1988 Yellowstone fires**

[www.nrfirescience.org/resource/8276](http://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

### **Seventeen years of forest succession following the Waterfalls Canyon Fire in Grand Teton National Park, Wyoming**

[www.nrfirescience.org/resource/8214](http://www.nrfirescience.org/resource/8214)

Plant species composition has been sampled periodically since the 1974 Waterfalls Canyon Fire in Grand Teton National Park, Wyoming. Prior to the fire, the forests were dominated by mature *Abies lasiocarpa*, *Picea engelmannii* and *Pinus contorta*. All three tree species have reestablished. After 17 years, *P. engelmannii* sapling density...

Author(s): Kathleen M. Doyle, Dennis H. Knight, Dale L. Taylor, William J. Barmore, James M. Benedict  
Year Published: 1998  
Type: Document  
Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/11513](http://www.nrfirescience.org/resource/11513)

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

Author(s): Gloria E. Flora, Ward W. McCaughey  
Year Published: 1998  
Type: Document  
Management or Planning Document

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

[www.nrfirescience.org/resource/11505](http://www.nrfirescience.org/resource/11505)

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

Author(s): Donald Godtel  
Year Published: 1998  
Type: Document  
Management or Planning Document

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

[www.nrfirescience.org/resource/11240](http://www.nrfirescience.org/resource/11240)

Fuel and vegetation spatial data layers required by the spatially explicit fire growth model FARSITE were developed for all lands in and around the Selway-Bitterroot Wilderness Area in Idaho and Montana. Satellite imagery and terrain modeling were used to create the three base vegetation spatial data layers of potential vegetation,...

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

Year Published: 1998

Type: Document

Technical Report or White Paper

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

[www.nrfirescience.org/resource/7937](http://www.nrfirescience.org/resource/7937)

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

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

Year Published: 1998

Type: Document

Conference Proceedings

### **Germination and initial growth of four coniferous species on varied duff depths in northern Idaho**

[www.nrfirescience.org/resource/13129](http://www.nrfirescience.org/resource/13129)

Four conifer species [Douglas-fir (*Pseudotsuga menziesii* var. *glauca* (Beissn.) Franco), ponderosa pine (*Pinus ponderosa* Dougl. ex. Laws.), western larch (*Larix occidentalis* Nutt.), and western white pine (*Pinus monticola* Dougl. ex. D. Don)], growing on three different duff depths on burned and unburned seedbeds, were examined for...

Author(s): Brian P. Oswald, Kent Wellner, Robin Boyce, Leon F. Neuenschwander

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

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

[www.nrfirescience.org/resource/8378](http://www.nrfirescience.org/resource/8378)

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

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

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

### **Amelanchier alnifolia (Saskatoon serviceberry)**

[www.nrfirescience.org/resource/10730](http://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

### **Fire ecology of the forest habitat types of northern Idaho**

[www.nrfirescience.org/resource/11234](http://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

### **Restoring fire in lodgepole pine forests of the Intermountain West**

[www.nrfirescience.org/resource/8347](http://www.nrfirescience.org/resource/8347)

We are developing new management treatments for regenerating and sustaining lodgepole pine (Pinus contorta) forests through emulation of natural disturbance processes. Lodgepole pine is the principal forest cover on over 26 million hectares in western North America. While infrequent, stand replacing fires following mountain pine...

Author(s): Colin C. Hardy, Ward W. McCaughey

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

### **Plant species richness and composition following the 1988 Yellowstone fires**

[www.nrfirescience.org/resource/8341](http://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-m<sup>2</sup> 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 cusickii (Cusick's bluegrass)**

[www.nrfirescience.org/resource/10706](http://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

### **Vegetation structure in old-growth stands in the Coram Research Natural Area in northwestern Montana**

[www.nrfirescience.org/resource/13138](http://www.nrfirescience.org/resource/13138)

Forest stand structure, understory composition, and tree seedling composition are described for eight permanent tenth-hectare plots established in Engelmann spruce/subalpine fir, western larch, and interior Douglas-fir forest cover types in northwestern Montana. Sites have been protected as examples of old-growth stands since the...

Author(s): Caryl L. Elzinga, Raymond C. Shearer

Year Published: 1997

Type: Document

Technical Report or White Paper

### **Ambystoma macrodactylum (long-toed salamander)**

[www.nrfirescience.org/resource/10732](http://www.nrfirescience.org/resource/10732)

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

Author(s): Janet L. Howard

Year Published: 1997

Type: Document

Synthesis

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

[www.nrfirescience.org/resource/8129](http://www.nrfirescience.org/resource/8129)

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

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

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

### **Aristida purpurea (purple threeawn)**

[www.nrfirescience.org/resource/10728](http://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

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



[www.nrfirescience.org/resource/11233](http://www.nrfirescience.org/resource/11233)

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

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

Year Published: 1997

Type: Document

Technical Report or White Paper

### **Managerial and institutional factors affect prescribed burning costs**

[www.nrfirescience.org/resource/7931](http://www.nrfirescience.org/resource/7931)

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

Author(s): Armando Gonzalez-Caban

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

### **Examples of fire restoration in Glacier National Park**

[www.nrfirescience.org/resource/11252](http://www.nrfirescience.org/resource/11252)

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

Author(s): Laurie L. Kurth

Year Published: 1996

Type: Document

Technical Report or White Paper

### **Urocyon cinereoargenteus (common gray fox)**

[www.nrfirescience.org/resource/10506](http://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

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

[www.nrfirescience.org/resource/11990](http://www.nrfirescience.org/resource/11990)

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

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

Year Published: 1996

Type: Document

**Mustela vison (American mink)**

[www.nrfirescience.org/resource/10513](http://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

**Stand hazard rating for central Idaho forests**

[www.nrfirescience.org/resource/11254](http://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

**The use of fire in forest restoration**

[www.nrfirescience.org/resource/11235](http://www.nrfirescience.org/resource/11235)

The 26 papers in this document address the current knowledge of fire as a disturbance agent, fire history and fire regimes, applications of prescribed fire for ecological restoration, and the effects of fire on the various forested ecosystems of the north-western United States. The main body of this document is organized in three...

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

Year Published: 1996

Type: Document

Technical Report or White Paper

**Populus tremuloides (quaking aspen)**

[www.nrfirescience.org/resource/10717](http://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

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

[www.nrfirescience.org/resource/8215](http://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

### **Remote sensing of forest fire severity and vegetation recovery**

[www.nrfirescience.org/resource/8152](http://www.nrfirescience.org/resource/8152)

Burned forested areas have patterns of varying burn severity as a consequence of various topographic, vegetation, and meteorological factors. These patterns are detected and mapped using satellite data. Other ecological information can be abstracted from satellite data regarding rates of recovery of vegetation foliage and variation...

Author(s): Joseph D. White, Kevin C. Ryan, Carl H. Key, Steven W. Running

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

### ***Sialia currucoides* (mountain bluebird)**

[www.nrfirescience.org/resource/10510](http://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

### ***Prunus emarginata* (bitter cherry)**

[www.nrfirescience.org/resource/10635](http://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

### ***Canis latrans* (coyote)**

[www.nrfirescience.org/resource/10548](http://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

**Urtica dioica (stinging nettle)**

[www.nrfirescience.org/resource/10612](http://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

**Bubo virginianus (great horned owl)**

[www.nrfirescience.org/resource/10518](http://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

**Ribes lacustre (bristly black currant)**

[www.nrfirescience.org/resource/10752](http://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

**Heracleum lanatum (cow parsnip)**

[www.nrfirescience.org/resource/10630](http://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

**Dichanthelium acuminatum (woolly panicum)**

[www.nrfirescience.org/resource/10914](http://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

### **The composition of bird communities following stand-replacement fires in northern Rocky Mountain (U.S.A.) conifer forests**

[www.nrfirescience.org/resource/12934](http://www.nrfirescience.org/resource/12934)

During the two breeding seasons immediately following the numerous and widespread fires of 1988, I estimated bird community composition in each of 34 burned-forest sites in western Montana and northern Wyoming. I detected an average of 45 species per site and a total of 87 species in the sites combined. A compilation of these data...

Author(s): Richard L. Hutto

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

### **Puma concolor (mountain lion)**

[www.nrfirescience.org/resource/10534](http://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

### **Poecile atricapillus (black-capped chickadee)**

[www.nrfirescience.org/resource/10511](http://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

### **Lynx rufus (bobcat)**

[www.nrfirescience.org/resource/10526](http://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

**Tamiasciurus hudsonicus (red squirrel)**

[www.nrfirescience.org/resource/10509](http://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

**Festuca rubra (red fescue)**

[www.nrfirescience.org/resource/10923](http://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

**Molothrus ater (brown-headed cowbird)**

[www.nrfirescience.org/resource/10444](http://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

**Sialia mexicana (western bluebird)**

[www.nrfirescience.org/resource/10505](http://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

**Muhlenbergia montana (mountain muhly)**

[www.nrfirescience.org/resource/10919](http://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

**Lepus californicus (black-tailed jackrabbit)**

[www.nrfirescience.org/resource/10721](http://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

**Philadelphus lewisii (Lewis' mockorange)**

[www.nrfirescience.org/resource/10613](http://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 cereum (wax currant)**

[www.nrfirescience.org/resource/10753](http://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

**Spiraea douglasii (Douglas' spirea)**

[www.nrfirescience.org/resource/10633](http://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

**Buteo lagopus (rough-legged hawk)**



[www.nrfirescience.org/resource/10517](http://www.nrfirescience.org/resource/10517)

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

### **Ribes aureum (golden currant)**

[www.nrfirescience.org/resource/10749](http://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

### **Deschampsia cespitosa (tufted hairgrass)**

[www.nrfirescience.org/resource/10913](http://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

### **Lepus americanus (snowshoe hare)**

[www.nrfirescience.org/resource/10515](http://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

### **Procyon lotor (northern raccoon)**

[www.nrfirescience.org/resource/10533](http://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

**Schedonorus arundinaceus (tall fescue)**

[www.nrfirescience.org/resource/10479](http://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

**Peromyscus maniculatus (deer mouse)**

[www.nrfirescience.org/resource/10512](http://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

**Deschampsia elongata (slender hairgrass)**

[www.nrfirescience.org/resource/10645](http://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

**Fire regimes on andesitic mountain terrain in northeastern Yellowstone National Park, Wyoming**

[www.nrfirescience.org/resource/8196](http://www.nrfirescience.org/resource/8196)

A fire history investigation was conducted for three forest community types in the Absaroka Mountains of Yellowstone National Park, Wyoming. Master fire chronologies were based on fire-initiated age classes and tree fire scars. The area's major forest type, lodgepole pine (*Pinus contorta* Dougl. var. *latifolia*) ecosystems, revealed a...

Author(s): Stephen W. Barrett

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

**Chimaphila menziesii (little prince's-pine)**

[www.nrfirescience.org/resource/10780](http://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

### **Carex garberi (Garber sedge)**

[www.nrfirescience.org/resource/10924](http://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

### **Bromus ciliatus (fringed brome)**

[www.nrfirescience.org/resource/10640](http://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

### **Hierochloe odorata (sweet grass)**

[www.nrfirescience.org/resource/10921](http://www.nrfirescience.org/resource/10921)

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

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

### **Rudbeckia hirta (black-eyed Susan)**

[www.nrfirescience.org/resource/10918](http://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

**Aquila chrysaetos (golden eagle)**

[www.nrfirescience.org/resource/10554](http://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

**Bromus vulgaris (Columbia brome)**

[www.nrfirescience.org/resource/10916](http://www.nrfirescience.org/resource/10916)

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

Author(s): Roberta A. Walsh

Year Published: 1994

Type: Document

Synthesis

**Comparisons of particulate-emissions and smoke impacts from presettlement, full suppression, and prescribed natural fire period in the Selway-Bitterroot Wilderness**

[www.nrfirescience.org/resource/8216](http://www.nrfirescience.org/resource/8216)

Total particulate matter (PM) emissions were estimated for recent fires (1979-1990) and the presettlement period (prior to 1935) in the Selway-Bitterroot Wilderness (SBW) in Idaho and Montana. Recent period emissions were calculated by 10-day periods for surface fire and crown fire based on estimates of percentage fuel consumption...

Author(s): James K. Brown, Larry S. Bradshaw

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

**Chimaphila umbellata (prince's-pine)**

[www.nrfirescience.org/resource/10772](http://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

**Falco sparverius (American kestrel)**

[www.nrfirescience.org/resource/10542](http://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

### **Onsite sediment production and nutrient losses from a low-severity burn in the interior northwest**

[www.nrfirescience.org/resource/11013](http://www.nrfirescience.org/resource/11013)

Postharvest residue burning is a common site preparation treatment used in the interior Northwest to reduce forest fuels and prepare sites for tree regeneration. A study was conducted to measure runoff, sediment production, and nutrient changes caused by broadcast burning of logging slash. The site was a northern Idaho mixed conifer...

Author(s): Peter R. Robichaud, Russell T. Graham, Roger D. Hungerford

Year Published: 1994

Type: Document

Conference Proceedings

### **Dumetella carolinensis (gray catbird)**

[www.nrfirescience.org/resource/10516](http://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

### **Festuca subulata (bearded fescue)**

[www.nrfirescience.org/resource/10644](http://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

### **Carex concinna (low northern sedge)**

[www.nrfirescience.org/resource/10925](http://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

**Agrostis exarata (spike bentgrass)**

[www.nrfirescience.org/resource/10641](http://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

**Bufo boreas (western toad)**

[www.nrfirescience.org/resource/10859](http://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

**Geranium richardsonii (Richardson's geranium)**

[www.nrfirescience.org/resource/10636](http://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

**Solidago missouriensis (prairie goldenrod)**

[www.nrfirescience.org/resource/10917](http://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](http://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

### **Comparing the prescribed natural fire program with presettlement fires in the Selway-Bitterroot Wilderness**

[www.nrfirescience.org/resource/8217](http://www.nrfirescience.org/resource/8217)

The severity and extent of recent fires (1979-1990) were compared with that of presettlement fires (pre-1935) by eight major forest types in the Selway-Bitterroot Wilderness (SBW) in Idaho and Montana. Presettlement fire intervals were determined for estimating area burned. Presettlement annual area burned for the entire SBW was 4,...

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

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

### **Accipiter striatus (sharp-shinned hawk)**

[www.nrfirescience.org/resource/10519](http://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

### **Bromus pumpellianus (Pumpelly brome)**

[www.nrfirescience.org/resource/10915](http://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

### **Aralia nudicaulis (wild sarsaparilla)**

[www.nrfirescience.org/resource/10808](http://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. Pavsek

Year Published: 1993

Type: Document

Synthesis



**Linnaea borealis (twinflower)**

[www.nrfirescience.org/resource/10737](http://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

**Corydalis aurea (golden corydalis)**

[www.nrfirescience.org/resource/10762](http://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

**Oxytropis sericea (whitepoint locoweed)**

[www.nrfirescience.org/resource/10643](http://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

**Anas acuta (northern pintail)**

[www.nrfirescience.org/resource/10527](http://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

**Taraxacum officinale (common dandelion)**

[www.nrfirescience.org/resource/10448](http://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

**Delphinium bicolor (low larkspur)**

[www.nrfirescience.org/resource/10778](http://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

**Poa pratensis (Kentucky bluegrass)**

[www.nrfirescience.org/resource/10446](http://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

**Iliamna rivularis (wild hollyhock)**

[www.nrfirescience.org/resource/10760](http://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

**Anas discors (blue-winged teal)**

[www.nrfirescience.org/resource/10557](http://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

**Camassia quamash (common camas)**

[www.nrfirescience.org/resource/10724](http://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

### **Equisetum arvense (field horsetail)**

[www.nrfirescience.org/resource/10858](http://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

### **Trifolium repens (white clover)**

[www.nrfirescience.org/resource/10617](http://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

### **Equisetum sylvaticum (wood horsetail)**

[www.nrfirescience.org/resource/10776](http://www.nrfirescience.org/resource/10776)

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

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

### **Marchantia polymorpha (liverwort)**

[www.nrfirescience.org/resource/10757](http://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

**Poa compressa (Canada bluegrass)**

[www.nrfirescience.org/resource/10578](http://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

**Lupinus sericeus (silky lupine)**

[www.nrfirescience.org/resource/10774](http://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

**Oplopanax horridus (devil's club)**

[www.nrfirescience.org/resource/10720](http://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

**Aix sponsa (wood duck)**

[www.nrfirescience.org/resource/10849](http://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

**Rosa gymnocarpa (baldhip rose)**

[www.nrfirescience.org/resource/10814](http://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

### **Antennaria racemosa (raceme pussytoes)**

[www.nrfirescience.org/resource/10770](http://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

### **Haliaeetus leucocephalus (bald eagle)**

[www.nrfirescience.org/resource/10843](http://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

### **Eurybia conspicua (showy aster)**

[www.nrfirescience.org/resource/10812](http://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

### **Amaranthus retroflexus (rough pigweed)**

[www.nrfirescience.org/resource/10480](http://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

**Antennaria microphylla (rosy pussytoes)**

[www.nrfirescience.org/resource/10768](http://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

**Claytonia perfoliata (miner's-lettuce)**

[www.nrfirescience.org/resource/10763](http://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

**Sorbus sitchensis (Sitka mountain-ash)**

[www.nrfirescience.org/resource/10781](http://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

**Phleum pratense (timothy)**

[www.nrfirescience.org/resource/10449](http://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

**Lonicera utahensis (Utah honeysuckle)**

[www.nrfirescience.org/resource/10806](http://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

### **Cetraria islandica (Iceland moss)**

[www.nrfirescience.org/resource/10779](http://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

### **Dracocephalum parviflorum (American dragonhead)**

[www.nrfirescience.org/resource/10761](http://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

### **Solidago canadensis (Canada goldenrod)**

[www.nrfirescience.org/resource/10618](http://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

### **Delphinium occidentale (duncecap larkspur)**

[www.nrfirescience.org/resource/10777](http://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



**Lycopodium annotinum (stiff clubmoss)**

[www.nrfirescience.org/resource/10759](http://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

**Anas crecca (green-winged teal)**

[www.nrfirescience.org/resource/10556](http://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

**Vicia americana (American vetch)**

[www.nrfirescience.org/resource/10616](http://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

**Lupinus caudatus (tailcup lupine)**

[www.nrfirescience.org/resource/10775](http://www.nrfirescience.org/resource/10775)

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

Author(s): Robin F. Matthews

Year Published: 1993

Type: Document

Synthesis

**Tortula ruralis (twisted moss)**

[www.nrfirescience.org/resource/10756](http://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

### **Peltigera aphthosa (green dog lichen)**

[www.nrfirescience.org/resource/10773](http://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

### **Castor canadensis (American beaver)**

[www.nrfirescience.org/resource/10547](http://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

### **Wyethia amplexicaulis (mules-ears)**

[www.nrfirescience.org/resource/10771](http://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

### **Pandion haliaetus (osprey)**

[www.nrfirescience.org/resource/10537](http://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

### **Rosa nutkana (Nootka rose)**

[www.nrfirescience.org/resource/10813](http://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

### **Gymnocarpium dryopteris (oak fern)**

[www.nrfirescience.org/resource/10842](http://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

### **Arnica cordifolia (heartleaf arnica)**

[www.nrfirescience.org/resource/10811](http://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

### **Blechnum spicant (deer fern)**

[www.nrfirescience.org/resource/10767](http://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...

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

### **Ceratodon purpureus (fire moss)**

[www.nrfirescience.org/resource/10529](http://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

### **Thuja plicata (western redcedar)**

[www.nrfirescience.org/resource/10561](http://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

### **When it's hot, it's hot... or maybe it's not! (Surface flaming may not portend extensive soil heating)**

[www.nrfirescience.org/resource/7939](http://www.nrfirescience.org/resource/7939)

Fire effects on a plant community, soil, and air are not apparent when judged only by surface fire intensity. The fire severity or fire impact can be described by the temperatures reached within the forest floor and the duration of heating experienced in the vegetation, forest floor, and underlying mineral soil. Temporal...

Author(s): Roberta A. Hartford, William H. Frandsen

Year Published: 1992

Type: Document

Book or Chapter or Journal Article

### **Tsuga mertensiana (mountain hemlock)**

[www.nrfirescience.org/resource/10559](http://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

### **Rhamnus purshiana (cascara)**

[www.nrfirescience.org/resource/10691](http://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

### **Fire ecology of the forest habitat types of eastern Idaho and western Wyoming**

[www.nrfirescience.org/resource/12116](http://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

### **Salix boothii (Booth willow)**

[www.nrfirescience.org/resource/10637](http://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

### **Elymus trachycaulus (slender wheatgrass)**

[www.nrfirescience.org/resource/10722](http://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

### **Pinus ponderosa var. ponderosa (Pacific ponderosa pine)**

[www.nrfirescience.org/resource/10687](http://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

### **Luzula hitchcockii (smooth woodrush)**

[www.nrfirescience.org/resource/10685](http://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

**Erodium cicutarium (cutleaf filaree)**

[www.nrfirescience.org/resource/10462](http://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

**Deterioration of fire-killed and fire-damaged timber in the Western United States**

[www.nrfirescience.org/resource/11159](http://www.nrfirescience.org/resource/11159)

Fire-killed and fire-damaged timber are an important source of fiber and are becoming more important because of a decrease in the land base available for timber harvest. Forest managers need to know the causes of deterioration and degrade, the expected losses in product volume and value, and the impact of time on deterioration. This...

Author(s): Eini C. Lowell, Susan A. Willits, Robert L. Krahmer

Year Published: 1992

Type: Document

Technical Report or White Paper

**Hylocomium splendens (splendid feather moss)**

[www.nrfirescience.org/resource/10530](http://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

**Chamerion angustifolium (fireweed)**

[www.nrfirescience.org/resource/10809](http://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

**Calamagrostis purpurascens (purple pinegrass)**

[www.nrfirescience.org/resource/10562](http://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

### **Pleurozium schreberi (Schreber's moss)**

[www.nrfirescience.org/resource/10528](http://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

### **Tsuga heterophylla (western hemlock)**

[www.nrfirescience.org/resource/10560](http://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

### **Medicago sativa (alfalfa)**

[www.nrfirescience.org/resource/10475](http://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

### **Calamagrostis canadensis (bluejoint reedgrass)**

[www.nrfirescience.org/resource/10558](http://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

### **Salix monticola (mountain willow)**

[www.nrfirescience.org/resource/10639](http://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 monticola* (western white pine)**

[www.nrfirescience.org/resource/10663](http://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

### ***Physocarpus malvaceus* (ninebark)**

[www.nrfirescience.org/resource/10688](http://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

### ***Maianthemum stellatum* (starry Solomon's-seal)**

[www.nrfirescience.org/resource/10686](http://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

### ***Menziesia ferruginea* (menziesia)**

[www.nrfirescience.org/resource/10684](http://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

### **Effects of the Gates Park Fire on recreation choices**

[www.nrfirescience.org/resource/11094](http://www.nrfirescience.org/resource/11094)

The 1988 Gates Park Fire, along the North Fork of the Sun River in the Bob Marshall Wilderness, provided an opportunity to explore fire effects on wilderness visitor choices. Recreation visitors along the North and South Fork drainages were interviewed to assess the effects of 1988 fires on their 1989 visits. The Gates Park fire had...

Author(s): Timothy G. Love, Alan E. Watson

Year Published: 1992

Type: Document

Research Brief or Fact Sheet

### **Agrostis scabra (ticklegrass)**

[www.nrfirescience.org/resource/10769](http://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

### **Ursus arctos horribilis (grizzly bear)**

[www.nrfirescience.org/resource/10837](http://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

### **Woody fuel and duff consumption by prescribed fire in northern Idaho mixed conifer logging slash**

[www.nrfirescience.org/resource/11966](http://www.nrfirescience.org/resource/11966)

Describes results of prescribed burning 36 plots in northern Idaho mixed conifer logging slash. Fuel characteristics and methods for predicting duff and woody fuel consumption are reported. Guidelines are included for developing fire prescriptions.

Author(s): Elizabeth D. Reinhardt

Year Published: 1991

Type: Document

Technical Report or White Paper

### **The effect of fire on soil properties**

[www.nrfirescience.org/resource/12001](http://www.nrfirescience.org/resource/12001)

Fire affects nutrient cycling and the physical, chemical, and biological properties of soils occupied by western montane forests. Combustion of litter and soil organic matter (OM) increases the availability of

some nutrients, although others are volatilized (for example, N, P, S). Soil OM loss also affects cation exchange capacity,...

Author(s): Leonard F. DeBano

Year Published: 1991

Type: Document

Conference Proceedings

### **The 1985 Butte fire in central Idaho: a Canadian perspective on the associated burning conditions**

[www.nrfirescience.org/resource/11055](http://www.nrfirescience.org/resource/11055)

During the afternoon of August 29, 1985, the Butte Fire made a high-intensity crown fire run, covering a distance of 2.22 km in one hour and 40 minutes, and forcing 73 fire fighters to deploy their protective fire shelters. This paper presents a retrospective analysis of the fire behavior in terms of the two major subsystems of the...

Author(s): Martin E. Alexander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Spiraea betulifolia (white spirea)**

[www.nrfirescience.org/resource/10683](http://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

### **Shepherdia canadensis (russet buffaloberry)**

[www.nrfirescience.org/resource/10909](http://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

### **Natural revegetation of burned and unburned clearcuts in western larch forests of northwest Montana**

[www.nrfirescience.org/resource/12028](http://www.nrfirescience.org/resource/12028)

In 1967 and 1968, seven south- and east-facing units, averaging 4-ha each, in a western larch forest of northwest Montana were (1) clearcut and burned by prescribed fire or wildfire, (2) clearcut and unburned, or (3) uncut and burned by wildfire. More than 20 years of forest succession data from permanent transects show that fire...

Author(s): Raymond C. Shearer, Peter F. Stickney

Year Published: 1991

Type: Document

**Betula papyrifera (paper birch)**

[www.nrfirescience.org/resource/10570](http://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

**Arctostaphylos uva-ursi (kinnikinnick)**

[www.nrfirescience.org/resource/10626](http://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

**Predicting duff and woody fuel consumption in northern Idaho prescribed fires**

[www.nrfirescience.org/resource/7914](http://www.nrfirescience.org/resource/7914)

Experimental burns were conducted on 36 plots in mixed conifer logging slash in northern Idaho to investigate consumption of duff and woody fuel. Fires were conducted in spring and fall, in YUM (yarded unmerchantable material) and non-YUM clearcuts and seed-tree cuts. Preburn duff depth averaged 3.8 cm and consisted of a shallow...

Author(s): James K. Brown, Elizabeth D. Reinhardt, William C. Fischer

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

**Odocoileus virginianus (white-tailed deer)**

[www.nrfirescience.org/resource/10840](http://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

**Postfire growth of *Pseudotsuga menziesii* and *Pinus contorta* in the Northern Rocky Mountains, USA**

[www.nrfirescience.org/resource/8253](http://www.nrfirescience.org/resource/8253)

Dendroecological methods were used to study the effects of wildfire on radial growth of *Pseudotsuga*

mniesii (Douglas-fir) and Pinus contorta (lodgepole pine) in the northern Rocky Mountains. Mean basal area increment during a 4-year postfire period declined relative to prefire growth in 75% of burned P. menziesii trees and 70% of P...

Author(s): David L. Peterson, Michael J. Arbaugh, George H. Pollock, Lindsay J. Robinson

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

### **Predicting behavior and size of crown fires in the northern Rocky Mountains**

[www.nrfirescience.org/resource/11195](http://www.nrfirescience.org/resource/11195)

Assessment of crown fire conditions calls for two important judgments: (1) identifying conditions for the onset of severe fires, and (2) predicting the spread rate, intensity, and size of expected crown fires. This paper addresses the second problem and provides methods for making a first approximation of the behavior of a running...

Author(s): Richard C. Rothermel

Year Published: 1991

Type: Document

Technical Report or White Paper

### **Influence of fire on factors that affect site productivity**

[www.nrfirescience.org/resource/12002](http://www.nrfirescience.org/resource/12002)

Presettlement fire played an important role in nutrient conversion, plant succession, diversity, and stand dynamics in coniferous forests of western North America. Prescribed fire can maintain site quality and contribute to control of insect and disease problems while reducing wildfire hazard. Fire effects on soils are largely...

Author(s): Roger D. Hungerford, Michael G. Harrington, William H. Frandsen, Kevin C. Ryan, Gerald J. Niehoff

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Management and productivity of western-montane forest soils, proceedings**

[www.nrfirescience.org/resource/12000](http://www.nrfirescience.org/resource/12000)

Includes 35 papers and six poster synopses presenting state-of-the-art knowledge on the nature and problems of integrating soils information and expertise into management of inland western forest resources. Papers emphasize regional information, but include data from world literature and previously unpublished material from regional...

Author(s): Alan E. Harvey, Leon F. Neuenschwander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Picea glauca (white spruce)**

[www.nrfirescience.org/resource/10579](http://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

### **Fire damage on extensively vs. intensively managed forest stands within the North Fork Fire, 1988**

[www.nrfirescience.org/resource/8342](http://www.nrfirescience.org/resource/8342)

The Greater Yellowstone fires of 1988 provide an opportunity to study important distinctions between lands managed for preservation versus multiple uses. We surveyed fuel loadings, fire severity, and fire damage to extensively managed, mature forest and to intensively managed, clearcut reproduction areas. Unburned, mature forests...

Author(s): Philip N. Omi, Kostas D. Kalabokidis

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

### **Paxistima myrsinites (Oregon boxwood)**

[www.nrfirescience.org/resource/10850](http://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

### **Abies lasiocarpa, Abies lasiocarpa var. arizonica, Abies lasiocarpa var. lasiocarpa (subalpine fir, corkbark fir, subalpine fir)**

[www.nrfirescience.org/resource/10574](http://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

### **Canis lupus (gray wolf)**

[www.nrfirescience.org/resource/10846](http://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

### **Natural revegetation of burned and unburned clearcuts in western larch forests of northwest Montana**

[www.nrfirescience.org/resource/13293](http://www.nrfirescience.org/resource/13293)

In 1967 and 1968, seven south- and east-facing units, averaging 4-ha each, in a western larch forest of northwest Montana were (1) clearcut and burned by prescribed fire or wildfire, (2) clearcut and unburned, or (3) uncut and burned by wildfire. More than 20 years of forest succession data from permanent transects show that fire...

Author(s): Raymond C. Shearer, Peter F. Stickney

Year Published: 1991

Type: Document

Conference Proceedings

### **User's guide to version 2 of the Regeneration Establishment Model: part of the Prognosis Model**

[www.nrfirescience.org/resource/11148](http://www.nrfirescience.org/resource/11148)

Version 2 of the Regeneration Establishment Model is part of version 6 of the Prognosis Model for Stand Development. The regeneration model predicts results of regeneration harvests for most site and stand conditions found in the Northern Rocky Mountains. The model is based on analysis of 12,128 1/300-acre plots sampled in forests...

Author(s): Dennis E. Ferguson, Nicholas L. Crookston

Year Published: 1991

Type: Document

Technical Report or White Paper

### **Bark beetle-fire associations in the greater Yellowstone area**

[www.nrfirescience.org/resource/12033](http://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

### **Athyrium filix-femina (lady fern)**

[www.nrfirescience.org/resource/10908](http://www.nrfirescience.org/resource/10908)

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

Author(s): Crystal J. Walkup

Year Published: 1991

Type: Document

Synthesis

### **Picea engelmannii (Engelmann spruce)**

[www.nrfirescience.org/resource/10569](http://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

**Vaccinium myrtillus (dwarf bilberry)**

[www.nrfirescience.org/resource/10872](http://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

**Rosa acicularis (prickly rose)**

[www.nrfirescience.org/resource/10623](http://www.nrfirescience.org/resource/10623)

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

Author(s): Marilyn F. Crane

Year Published: 1990

Type: Document

Synthesis

**Xerophyllum tenax (beargrass)**

[www.nrfirescience.org/resource/10621](http://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

**Taxus brevifolia (Pacific yew)**

[www.nrfirescience.org/resource/10890](http://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 parvifolium (red huckleberry)**

[www.nrfirescience.org/resource/10888](http://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](http://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

### **Botrychium montanum (mountain moonwort)**

[www.nrfirescience.org/resource/10929](http://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

### **Vaccinium myrtilloides (velvetleaf blueberry)**

[www.nrfirescience.org/resource/10873](http://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

### **Pteridium aquilinum (western bracken fern)**

[www.nrfirescience.org/resource/10624](http://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 caespitosum (dwarf bilberry)**

[www.nrfirescience.org/resource/10871](http://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

**Selaginella densa (little spikemoss)**

[www.nrfirescience.org/resource/10622](http://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

**Predicting equilibrium moisture content of some foliar forest litter in the northern Rocky Mountains**

[www.nrfirescience.org/resource/11964](http://www.nrfirescience.org/resource/11964)

Forest foliage that comprises much of the forest floor litter has higher equilibrium moisture content, EMC, than woody components. The EMC's at 300 °K were found to increase as follows: grasses...

Author(s): Hal E. Anderson

Year Published: 1990

Type: Document

Technical Report or White Paper

**Berberis nervosa (dwarf Oregon-grape)**

[www.nrfirescience.org/resource/10885](http://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

**Erythronium grandiflorum (glacier lily)**

[www.nrfirescience.org/resource/10932](http://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

**Vaccinium ovalifolium (ovalleaf huckleberry)**

[www.nrfirescience.org/resource/10874](http://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

**Actaea rubra (red baneberry)**

[www.nrfirescience.org/resource/10625](http://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

**Rubus discolor (Himalayan blackberry)**

[www.nrfirescience.org/resource/10477](http://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

**Salix lemmonii (Lemmons willow)**

[www.nrfirescience.org/resource/10575](http://www.nrfirescience.org/resource/10575)

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

Author(s): Ronald Uchytel  
Year Published: 1989  
Type: Document  
Synthesis

**Alnus viridis subsp. sinuata (Sitka alder)**

[www.nrfirescience.org/resource/10572](http://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 Uchytíl

Year Published: 1989

Type: Document

Synthesis

### ***Sambucus nigra* subsp. *cerulea* (blue elderberry)**

[www.nrfirescience.org/resource/10628](http://www.nrfirescience.org/resource/10628)

This FEIS species review synthesizes information on the relationship of *Sambucus nigra* subsp. *cerulea* (blue elderberry) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Marilyn F. Crane

Year Published: 1989

Type: Document

Synthesis

### **FIRESUM-an ecological process model for fire succession in western conifer forests**

[www.nrfirescience.org/resource/11917](http://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

### **Effects of fire retardant on water quality**

[www.nrfirescience.org/resource/11139](http://www.nrfirescience.org/resource/11139)

Ammonium-based fire retardants are important in managing wildfires, but their use can adversely affect water quality. Their entry, fate, and impact were studied in five forest streams. Initial retardant concentrations in water approached levels which could damage fish, but no distressed fish were found. Concentrations decreased...

Author(s): Logan A. Norris, Warren L. Webb

Year Published: 1989

Type: Document

Technical Report or White Paper

### ***Rubus laciniatus* (evergreen blackberry)**

[www.nrfirescience.org/resource/10478](http://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

### **The effects of fire on watersheds: a summary**

[www.nrfirescience.org/resource/11049](http://www.nrfirescience.org/resource/11049)

Over the past three days we have been presented with the results of a most impressive quantity and quality of research on the effects of fire on watersheds. My attempt to summarize these papers will hardly do them justice, but hopefully will recapitulate some of their more important and generalizable findings. My comments are...

Author(s): Nicholas Dennis  
Year Published: 1989  
Type: Document  
Conference Proceedings

### **Rubus spectabilis (salmonberry)**

[www.nrfirescience.org/resource/10889](http://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

### **Salix lucida subsp. lasiandra (Pacific willow)**

[www.nrfirescience.org/resource/10577](http://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 rubra (red alder)**

[www.nrfirescience.org/resource/10571](http://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

### **Rubus ursinus (trailing blackberry)**

[www.nrfirescience.org/resource/10876](http://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

### **Polystichum munitum (western sword fern)**

[www.nrfirescience.org/resource/10627](http://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

### **Comparative vegetational recovery on firelines cleared with explosives and with handtools**

[www.nrfirescience.org/resource/11932](http://www.nrfirescience.org/resource/11932)

Vegetational recovery was compared on firelines constructed in three ground fuel cover types, using conventional hand tools and two types of fireline explosives. Measurement of ground coverage of shrub and herb species before and after disturbance indicated similar vegetational recover on blasted and hand-dug fireline.

Author(s): Timothy E. Paysen, Richard J. Barney

Year Published: 1987

Type: Document

Research Brief or Fact Sheet

### **Fire ecology of western Montana forest habitat types**

[www.nrfirescience.org/resource/11257](http://www.nrfirescience.org/resource/11257)

Provides information on fire as an ecological factor for forest habitat types in western Montana. Identifies Fire Groups of habitat types based on fire's role in forest succession. Describes forest fuels and suggests considerations for fire management.

Author(s): William C. Fischer, Anne F. Bradley

Year Published: 1987

Type: Document

Technical Report or White Paper

### **Site treatments influence development of a young mixed-species western larch stand**

[www.nrfirescience.org/resource/13136](http://www.nrfirescience.org/resource/13136)

More intensive management could be applied to many young stands in conifer forests of the Northern Rockies. Vast areas are stocked with stands that contain a mixture of conifer species. An important mixed species cover type in this region is the western larch type (formerly called the larch-Douglas-fir type...

Author(s): Dennis M. Cole, Wyman C. Schmidt

Year Published: 1986

Type: Document

Technical Report or White Paper



### **Fire ecology of the forest habitat types of central Idaho**

[www.nrfirescience.org/resource/11258](http://www.nrfirescience.org/resource/11258)

Discusses fire as an ecological factor for forest habitat types occurring in central Idaho. Identifies "Fire Groups" of habitat types based on fire's role in forest succession. Considerations for fire management are suggested.

Author(s): Marilyn F. Crane, William C. Fischer

Year Published: 1986

Type: Document

Technical Report or White Paper

### **Surface fuel loadings and predicted fire behavior for vegetation types in the northern Rocky Mountains**

[www.nrfirescience.org/resource/11930](http://www.nrfirescience.org/resource/11930)

Means, standard deviations, and quartiles of fuel loadings were determined for litter, for downed woody material of 0 to one-fourth inch, one-fourth to 1 inch, 0 to 1 inch, and 1 to 3 inches, for herbaceous vegetation, and for shrubs by cover types and fire groups. The studies were conducted at four locations in northwestern Wyoming...

Author(s): James K. Brown, Collin D. Bevins

Year Published: 1986

Type: Document

Research Brief or Fact Sheet

### **First decade plant succession following the Sundance forest fire, northern Idaho**

[www.nrfirescience.org/resource/11915](http://www.nrfirescience.org/resource/11915)

Describes the first 10 years of vegetation development following disturbance by a holocaustic forest fire in a western redcedar-western hemlock type in the Selkirk Range. Postfire development of vegetation is represented as life-form stages and predominant cover species. Differential development of plant species established in the...

Author(s): Peter F. Stickney

Year Published: 1986

Type: Document

Technical Report or White Paper

### **Modeling shrub succession following clearcutting and broadcast burning**

[www.nrfirescience.org/resource/11060](http://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's effects on a small bird population**

[www.nrfirescience.org/resource/11188](http://www.nrfirescience.org/resource/11188)

Changes in bird populations as a result of a 122 ha forest fire are evaluated. There is little evidence of any drastic effect on numbers of birds, species, or species diversity in the year of the fire or 2 years later.

Author(s): L. Jack Lyon, John M. Marzluff

Year Published: 1985  
Type: Document  
Technical Report or White Paper

**Timber net value and physical output changes following wildfire in the northern rocky mountains: estimates for specific fire situations**

[www.nrfirescience.org/resource/11219](http://www.nrfirescience.org/resource/11219)

In the last decade, the fire management program of the Forest Service, U.S. Department of Agriculture, has come under closer scrutiny because of ever-rising program costs. The Forest Service has responded by conducting several studies analyzing the economic efficiency of its fire management program. Some components of the analytical...

Author(s): Patrick J. Flowers, Patricia B. Shinkle, Daria A. Cain, Thomas J. Mills

Year Published: 1985

Type: Document

Technical Report or White Paper

**Predicting duff and woody fuel consumed by prescribed fire in the Northern Rocky Mountains**

[www.nrfirescience.org/resource/11265](http://www.nrfirescience.org/resource/11265)

Relationships for predicting duff reduction, mineral soil exposure, and consumption of downed woody fuel were determined to assist in planning prescribed fires. Independent variables included lower and entire duff moisture contents, loadings of downed woody fuels, duff depth, National Fire-Danger Rating System 1,000-hour moisture...

Author(s): James K. Brown, Michael A. Marsden, Kevin C. Ryan, Elizabeth D. Reinhardt

Year Published: 1985

Type: Document

Technical Report or White Paper

**Crown scorch volume and scorch height: estimates of postfire tree condition**

[www.nrfirescience.org/resource/8385](http://www.nrfirescience.org/resource/8385)

In salvage operations after wildfire, timber managers need to identify those trees most likely to die. Crown scorch volume and scorch height are commonly used to estimate damage to conifers after fire. Calculated crown scorch volume based on scorch height and tree dimensions was compared with observed crown scorch volume for four...

Author(s): David L. Peterson

Year Published: 1985

Type: Document

Book or Chapter or Journal Article

**Data base for early postfire succession on the Sundance Burn, northern Idaho**

[www.nrfirescience.org/resource/11914](http://www.nrfirescience.org/resource/11914)

Provides baseline data on secondary plant succession and the development of plant species and life forms for the initial 6 to 15 years following a stand-replacing forest fire in the western redcedar-western hemlock type in northern Idaho. Information pertaining to plant cover (m<sup>2</sup>/0.01 ha) and volume of space occupied (m<sup>3</sup>/0.01 ha) is...

Author(s): Peter F. Stickney

Year Published: 1985

Type: Document

Technical Report or White Paper

**Influence of fire severity on response of evergreen ceanothus**

[www.nrfirescience.org/resource/11061](http://www.nrfirescience.org/resource/11061)

Fire plays an important role in *Ceanothus velutinus* habitat. Its impact varies with season and severity of fire. Knowledge of the interaction between fire severity and evergreen ceanothus habitat can assist managers in estimating the effect of fire on evergreen ceanothus and in developing burning prescriptions.

Author(s): Nonan V. Noste

Year Published: 1985

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Fire, logging, and white-tailed deer interrelationships in the Swan Valley, northwestern Montana**

[www.nrfirescience.org/resource/11056](http://www.nrfirescience.org/resource/11056)

The historical importance of fire was investigated on the upper Swan Valley winter white-tailed deer range in northwestern Montana. The relatively recent impacts of logging on winter range quality were also included in these studies. Fire exclusion has led to successional development of once open-canopied mature seral forests, and...

Author(s): June D. Freedman, James R. Habeck

Year Published: 1985

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Size class structure and tree dispersion patterns in old-growth cedar-hemlock forests of the Northern Rocky Mountains**

[www.nrfirescience.org/resource/13118](http://www.nrfirescience.org/resource/13118)

Tree population size structures and dispersion patterns were studied using stem maps in three old-growth western hemlock (*Tsuga heterophylla* Sarg.)—western redcedar (*Thuja plicata* Donn.) stands in the Rocky Mountains of northern Idaho and adjacent Washington. The two species were codominant in one stand, hemlock dominated the...

Author(s): David Turner, Eldon H. Franz

Year Published: 1985

Type: Document

Book or Chapter or Journal Article

### **Watershed modeling for fire management planning in the Northern Rocky Mountains**

[www.nrfirescience.org/resource/11220](http://www.nrfirescience.org/resource/11220)

Water yield and sediment production almost always increase after wildfire has destroyed vegetative cover. The value of water generally is not as much appreciated in the water-rich northern Rocky Mountains as it is elsewhere. Increased water yield becomes economically beneficial, however, when its potential for consumptive and...

Author(s): Donald F. Potts, David L. Peterson, Hans R. Zuuring

Year Published: 1985

Type: Document

Technical Report or White Paper

### **Characteristics of fireline blasted with linear explosives: initial test results**

[www.nrfirescience.org/resource/11929](http://www.nrfirescience.org/resource/11929)

Based on limited data, water-gel provided a slightly wider and deeper fireline with more feathering of ejected material than did Ensign-Bickford cord. Soil moisture conditions, closeness of blasting material to the ground, and other factors may explain these differences.

Author(s): Richard J. Barney

Year Published: 1984

Type: Document  
Research Brief or Fact Sheet

### **Modeling behavior of prescribed fires in Yosemite National Park**

[www.nrfirescience.org/resource/8313](http://www.nrfirescience.org/resource/8313)

The National Fire Danger Rating System and the Fire Behavior Prediction System were tested on prescribed fires burning underneath canopies in six fuel types in Yosemite National Park, California. The mean error for rate of spread was +0.03 foot per minute for the NFDRS and -0.15 foot for the FBPS. For flame length factors for...

Author(s): Jan W. van Wagtendonk, Stephen J. Botti

Year Published: 1984

Type: Document

Book or Chapter or Journal Article

### **Fire frequency reduced two orders of magnitude in the Bitterroot Canyons, Montana**

[www.nrfirescience.org/resource/8231](http://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 budworm outbreaks (*Choristoneura occidentalis*...

Author(s): Bruce McCune

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](http://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 and vegetative trends in the Northern Rockies: interpretations from 1871-1982 photographs**

[www.nrfirescience.org/resource/11260](http://www.nrfirescience.org/resource/11260)

Interprets changes in forest and range vegetation resulting from the absence of fire. Eighty-six matched photographs covering the period 1871-1982 provide the basis for describing how vegetation has changed in various plant communities. These scenes show that woody vegetation has increased markedly as a result of reduced wildfire....

Author(s): George E. Gruell

Year Published: 1983

Type: Document

Technical Report or White Paper

### **Variation in estimates of fire intervals: a closer look at fire history on the Bitterroot National Forest**

[www.nrfirescience.org/resource/11958](http://www.nrfirescience.org/resource/11958)

The authors examine variation in the length of mean intervals between fires (occurring between the

years 1600 and 1910) in sample units of various sizes, ranging from a point on the ground (single tree) to a large stand (200 to 800 acres; 80 to 320 hectares). Recommendations are made regarding appropriate sizes of sample units for...

Author(s): Stephen F. Arno, Terry D. Petersen

Year Published: 1982

Type: Document

Technical Report or White Paper

### **Intensive utilization with conventional harvesting systems**

[www.nrfirescience.org/resource/11130](http://www.nrfirescience.org/resource/11130)

ANNOTATION: Forest residues utilization research has included case studies of the efficiency of existing harvesting systems in achieving close fiber utilization. Field evaluations included the use of in-woods chipping systems in gentle terrain; crawler skidder systems in gentle terrain; and skyline systems in steep terrain. In each...

Author(s): Roland L. Barger, Robert E. Benson

Year Published: 1981

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Downed and dead woody fuel and biomass in the northern Rocky Mountains**

[www.nrfirescience.org/resource/11881](http://www.nrfirescience.org/resource/11881)

Weights and volumes of downed woody material in diameter classes of one-fourth to 1, 1 to 3, and greater than 3 inches and forest floor duff depths were summarized from extensive inventories in northern Idaho and Montana. Biomass loadings are shown by cover types and habitat types within National Forests. Total downed woody biomass...

Author(s): James K. Brown, Thomas E. See

Year Published: 1981

Type: Document

Technical Report or White Paper

### **Residue characteristics in the Northern Rocky Mountains**

[www.nrfirescience.org/resource/11131](http://www.nrfirescience.org/resource/11131)

ANNOTATION: In the northern Rocky Mountains, 350-450 million cubic feet (9.9 to 12.7 million cubic meters) of logging residue is generated each year. Up to 60 percent of the residue material is technologically suitable for wood products, but condition, size and product potential vary among forest types. Other factors which influence...

Author(s): Robert E. Benson, Joyce A. Schlieter

Year Published: 1981

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Clearcutting and fire in the larch/Douglas-fir forests of western Montana: a multifaceted research summary**

[www.nrfirescience.org/resource/11180](http://www.nrfirescience.org/resource/11180)

Logging slash on 73 clearcuts was broadcast burned over a wide range of conditions, achieving a broad array of fire intensities and effects. An intense wildfire was also evaluated. Fire effectiveness was measured and related to preburn conditions and fire intensity. Treatment effects on air quality, forest regeneration, vegetation...

Author(s): Norbert V. DeByle

Year Published: 1981

Type: Document

Technical Report or White Paper

**Photo guide for appraising downed woody fuels in Montana forests: Grand fir - larch - Douglas-fir, western hemlock, western redcedar - western hemlock, and western redcedar cover types**

[www.nrfirescience.org/resource/11264](http://www.nrfirescience.org/resource/11264)

Four series of color photographs show different levels of downed woody material resulting from natural processes in four forest cover types in Montana. Each photo is supplemented by fuel inventory data and potential fire behavior ratings.

Author(s): William C. Fischer

Year Published: 1981

Type: Document

Technical Report or White Paper

**Fire ecology of Lolo National Forest habitat types**

[www.nrfirescience.org/resource/11913](http://www.nrfirescience.org/resource/11913)

This report summarizes available information on fire as an ecological factor for forest habitat types occurring on the Lolo National Forest. The Lolo National Forest habitat types are grouped into 10 Fire Groups based primarily on fire's role in forest succession. For each Fire Group, information is presented on (1) the relationship...

Author(s): Kathleen M. Davis, Bruce D. Clayton, William C. Fischer

Year Published: 1980

Type: Document

Technical Report or White Paper

**Forest fire history in the Northern Rockies**

[www.nrfirescience.org/resource/13121](http://www.nrfirescience.org/resource/13121)

Recent fire-scar studies in the northern Rocky Mountains have documented forest fire history over the past few centuries. They reveal that in some forest types fire maintained many-aged open stands of seral trees. In other types, major fires caused replacement of the stands. Often, however, fires burned at variable intensities,...

Author(s): Stephen F. Arno

Year Published: 1980

Type: Document

Book or Chapter or Journal Article

**Fire history of western redcedar/hemlock forests in northern Idaho**

[www.nrfirescience.org/resource/12041](http://www.nrfirescience.org/resource/12041)

Evidence of fire history over the past few centuries was gathered in two areas (totaling 30,000 acres; 6000 ha) for fire management planning. Findings are some of the first detailed data for western redcedar-hemlock forests. On upland habitat types fires of variable intensities generally occurred at 50-to-150-year intervals, often...

Author(s): Stephen F. Arno, Dan H. Davis

Year Published: 1980

Type: Document

Conference Proceedings, Technical Report or White Paper

**Postharvest residue burning under alternative silvicultural practices**

[www.nrfirescience.org/resource/11927](http://www.nrfirescience.org/resource/11927)

Prescribed burning of logging slash was done in clearcut, overstory removal, and understory cutting units in a Douglas-fir stand on the Lubrecht Experimental Forest near Missoula, Mont. The burning

prescriptions and actual burning conditions are described. Data on preharvest, post-harvest, and postburn conditions are reported.

Author(s): Robert W. Steele

Year Published: 1980

Type: Document

Research Brief or Fact Sheet

### **Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming - Volume I: photographic record and analysis**

[www.nrfirescience.org/resource/12151](http://www.nrfirescience.org/resource/12151)

The Bridger-Teton National Forest in the Jackson Hole Region of Wyoming has long been recognized for its wildlife resource. Management efforts have emphasized the measurement of forage utilization by elk (*Cervus canadensis nelsoni*) and their effect on summer and winter ranges. Less consideration has been given to other biotic and...

Author(s): George E. Gruell

Year Published: 1980

Type: Document

Technical Report or White Paper

### **Database for post-fire succession, first 6 to 9 years, in Montana larch-fir forests**

[www.nrfirescience.org/resource/11909](http://www.nrfirescience.org/resource/11909)

Base line data on species cover (m<sup>2</sup>/0.01 ha) and volume of space occupied (m<sup>3</sup>/0.01 ha) for the initial 6 to 9 years of secondary forest succession for western larch-Douglas-fir forests is presented in tabular form for 20 study areas in western Montana. Disturbance treatments include wildfire and clearcutting followed by broadcast...

Author(s): Peter F. Stickney

Year Published: 1980

Type: Document

Technical Report or White Paper

### **Influence of harvesting and residues on fuels and fire management**

[www.nrfirescience.org/resource/13134](http://www.nrfirescience.org/resource/13134)

Fuel and fire behavior potential in clearcut lodgepole pine and in Douglas-fir/larch under clearcutting, group selection, and shelterwood silvicultural systems were compared after logging to near-complete and conventional utilization standards. Fuels and fire behavior potentials were unaffected by silvicultural...

Author(s): James K. Brown

Year Published: 1980

Type: Document

Technical Report or White Paper

### **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](http://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



### **Damage from logging and prescribed burning in partially cut Douglas-fir stands**

[www.nrfirescience.org/resource/11928](http://www.nrfirescience.org/resource/11928)

Damage from tractor logging and slash burning in a Douglas-fir stand on gentle terrain was measured for three different types of timber harvesting. Logging damage was light in the selection-cut and understory-removal cutting units. In the overstory-removal unit, about 11 percent of the leave trees were killed by logging. Little...

Author(s): Robert E. Benson

Year Published: 1980

Type: Document

Research Brief or Fact Sheet

### **Fire history of a western larch/Douglas-fir forest type in northwestern Montana**

[www.nrfirescience.org/resource/12044](http://www.nrfirescience.org/resource/12044)

Mean frequencies were about 120 years for valleys and montane slopes and 150 years for subalpine slopes in this western larch/Douglas-fir forest from 1735 to 1976. Fires were small and moderately intense with occasional high intensity runs. Single burns thinned the overstory favoring mixed conifer regeneration. Multiple burns...

Author(s): Kathleen M. Davis

Year Published: 1980

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Predicting slash depth for fire modeling**

[www.nrfirescience.org/resource/11954](http://www.nrfirescience.org/resource/11954)

Development of equations for predicting fuel bed depth (called "bulk depth" herein) appropriate for modeling fire behavior in slash is described. Bulk depth (y) was correlated with the expected number of 1/4-to 1-inch-diameter particle intercepts per foot of vertical plane transect (x) by regressions of the form  $y = ax$ . Values of "...

Author(s): Frank A. Albini, James K. Brown

Year Published: 1978

Type: Document

Technical Report or White Paper

### **Weight and density of crowns of Rocky Mountain conifers**

[www.nrfirescience.org/resource/11205](http://www.nrfirescience.org/resource/11205)

ANNOTATION: Relationships between live and dead crown weight and DBH, crown length, tree height, and crown ratio are presented for 11 Rocky Mountain conifers. Also included are partitioned estimates of crown foliage and branchwood. This study shows a high correlation between DBH and crown weight.

Author(s): James K. Brown

Year Published: 1978

Type: Document

Technical Report or White Paper

### **A method for determining fire history in coniferous forests in the Mountain West**

[www.nrfirescience.org/resource/11176](http://www.nrfirescience.org/resource/11176)

An improved version is presented of a method previously used [see FA 40, 169]. Instructions are given for: laying out transects; gathering stand data, including documenting fire-scarred trees; sampling fire-scarred trees; laboratory analysis of tree cross-sections; correlating fire chronologies; and calculating fire frequency. The...

Author(s): Stephen F. Arno, Kathy M. Sneck  
Year Published: 1977  
Type: Document  
Technical Report or White Paper

**Pre-feasibility assessment: small diameter underutilized (SDU) wood feedstock for a 10 MW co-generation facility at the Milltown dam site**

[www.nrfirescience.org/resource/11206](http://www.nrfirescience.org/resource/11206)

ANNOTATION: A pre-feasibility assessment is an early stage and limited analysis of the probable risks and returns of an investment. Focused on gathering preliminary information, it helps decision makers determine if there is a basis for investing additional capital and time in the proposed project. This pre-feasibility assessment to...

Author(s): James K. Brown, J. A. Kendall Snell, David L. Bunnell  
Year Published: 1977  
Type: Document  
Technical Report or White Paper

**Nutrient content of forest shrubs following burning**

[www.nrfirescience.org/resource/8151](http://www.nrfirescience.org/resource/8151)

Prescribed burning under mature Larch/Douglas-fir forests produced changes in elemental uptake. Elemental analyses of individual species and existing biomass three years post-burn from hot, medium, and lightly burned sites and unburned controls showed a significant shift in species composition with burn intensity. Few species from...

Author(s): Nellie M. Stark, R. Steel  
Year Published: 1977  
Type: Document  
Book or Chapter or Journal Article

**Fire and nutrient cycling in a Douglas-fir/larch forest**

[www.nrfirescience.org/resource/8136](http://www.nrfirescience.org/resource/8136)

Twenty control burns performed with a wide range of fuel loadings and moisture conditions were used to study the effectiveness of old fuel reduction under standing Douglas-fir/larch forest. This paper reports the influence of burning on nutrient retention and loss from the soil. Sixty % of the fires were successful in reducing...

Author(s): Nellie M. Stark  
Year Published: 1977  
Type: Document  
Book or Chapter or Journal Article

**The historical role of fire on the Bitterroot National Forest**

[www.nrfirescience.org/resource/11175](http://www.nrfirescience.org/resource/11175)

Presents frequencies, intensities, and influences of fire on stand structure and composition on the Bitterroot National Forest in west-central Montana. Three study areas were established, each having a wide range of elevations and forest types. Findings are based upon study of nearly 900 individual fire scars on living trees, and on...

Author(s): Stephen F. Arno  
Year Published: 1976  
Type: Document  
Technical Report or White Paper

### **Estimating fuel weights of grasses, forbs, and small woody plants**

[www.nrfirescience.org/resource/11923](http://www.nrfirescience.org/resource/11923)

Equations were developed for estimating fuel loading (g/m<sup>2</sup>) of grasses, narrow-leaved forbs, broad-leaved forbs, and small woody plants common to western Montana and north Idaho. Independent variables were plant height and percentage of ground covered. R<sup>2</sup> for the equations ranged from 0.30 to 0.91. The equations provide reasonable...

Author(s): James K. Brown, Michael A. Marsden

Year Published: 1976

Type: Document

Research Brief or Fact Sheet

### **Clearcutting and burning slash alter quality of stream water in northern Idaho**

[www.nrfirescience.org/resource/11949](http://www.nrfirescience.org/resource/11949)

Three cutting units of varying size, soil, and aspect located along streams in the Priest River Experimental Forest in northern Idaho were chosen for evaluation of changes in water quality caused by clearcutting and subsequent burning of slash. Water sampling stations were established on each creek-upstream, downstream, and on the...

Author(s): Gordon G. Snyder, Harold F. Haupt, George H. Belt

Year Published: 1975

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](http://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

### **Lodgepole pine logging residues: management alternatives**

[www.nrfirescience.org/resource/12125](http://www.nrfirescience.org/resource/12125)

The dollar and nondollar effects of alternative levels of residue utilization in mature lodgepole pine are compared. Net dollar returns were greater in conventional logging (removal of green sawlogs to a 6-inch top, with slash piled and burned) than in near-complete harvesting (sawlog removal followed by field chipping of remaining...

Author(s): Robert E. Benson

Year Published: 1974

Type: Document

Technical Report or White Paper

### **The ecological role of fire in natural conifer forests of western and northern North America**

[www.nrfirescience.org/resource/7940](http://www.nrfirescience.org/resource/7940)

Contains an introductory paper by the editors, and, in addition to papers separately noticed [see the next three abstracts], the following: Fire in the virgin forests of the Boundary Waters Canoe Area, Minnesota (M.L. Heinselman, 99 ref.); The importance of fire as a natural ecological factor in Itasca State Park, Minnesota (S.S....

Author(s): Miron L. Heinselman, Herbert E. Wright

Year Published: 1973  
Type: Document  
Book or Chapter or Journal Article

### **Fire-dependent forests in the Northern Rocky Mountains**

[www.nrfirescience.org/resource/7935](http://www.nrfirescience.org/resource/7935)

One objective of wilderness and parkland fire ecology research is to describe the relationships between fire and unmanaged ecosystems, so that strategies can be determined that will provide a more nearly natural incidence of fire. More than 50 years of efforts directed toward exclusion of wildland fires in the Northern Rocky...

Author(s): James R. Habeck, Robert W. Mutch  
Year Published: 1973  
Type: Document  
Book or Chapter or Journal Article

### **Fire and smoke in Montana forests**

[www.nrfirescience.org/resource/13133](http://www.nrfirescience.org/resource/13133)

The concept of forest fire is especially difficult to deal with in an objective manner because fire has deep psychological associations for most animals, especially man. Moreover, attitudes toward forest fires have been greatly conditioned by what has been called the most effective advertising campaign in history...

Author(s): William R. Beaufait  
Year Published: 1971  
Type: Document  
Book or Chapter or Journal Article

### **Vegetal development following prescribed burning of Douglas-fir in south-central Idaho**

[www.nrfirescience.org/resource/12124](http://www.nrfirescience.org/resource/12124)

In 1966, preliminary results of this study were reported by Lyon in Research Paper INT-29, Initial Vegetal Development Following Prescribed Burning of Douglas-fir in South-Central Idaho. Because of a misplaced decimal point in that report, data for density and volume of shrubs 2 years after the fire are incorrect. Although the...

Author(s): L. Jack Lyon  
Year Published: 1971  
Type: Document  
Technical Report or White Paper

### **Airborne infrared forest fire detection system: final report**

[www.nrfirescience.org/resource/11942](http://www.nrfirescience.org/resource/11942)

This work was undertaken because of a mutual interest of the Department of Defense, Advanced Research Projects Agency (ARPA), and the USDA Forest Service in the problems of detecting hot targets against natural terrain backgrounds using airborne infrared (IR) line scanning instrumentation. The study objectives were broadly defined...

Author(s): Ralph A. Wilson, Stanley N. Hirsch, Forrest H. Madden, John B. Losensky  
Year Published: 1971  
Type: Document  
Technical Report or White Paper

### **Sundance Fire: an analysis of fire phenomena**

[www.nrfirescience.org/resource/11229](http://www.nrfirescience.org/resource/11229)

The Sundance Fire on September 1, 1967, made a spectacular run of 16 miles in 9 hours and destroyed more than 50,000 acres. This run became the subject of a detailed research analysis of the environmental, topographic, and vegetation variables aimed at reconstructing and describing fire phenomena. This report details the fire's...

Author(s): Hal E. Anderson

Year Published: 1968

Type: Document

Technical Report or White Paper

### **Death in Blackwater Canyon**

[www.nrfirescience.org/resource/11494](http://www.nrfirescience.org/resource/11494)

On August 21, 1937, the tragic Blackwater Fire caused the death of 15 firefighters, burning approximately 1,700 acres of National Forest System lands on the Shoshone National Forest, near Cody, Wyoming. An electrical storm occurred in the general vicinity of Blackwater Creek on Wednesday, August 18th causing a fire, which was not...

Author(s): Erle Kauffman

Year Published: 1937

Type: Document

Book or Chapter or Journal Article

### **Mapping evidence of historical and potential wildfire for climate change and fuels mitigation in the montane forests of the Colorado Front Range**

[www.nrfirescience.org/resource/14067](http://www.nrfirescience.org/resource/14067)

Mapping evidence of historical and potential wildfire for climate change and fuels mitigation in the montane forests of the Colorado Front Range. Rosemary Sherriff, Associate Professor, Humboldt State University. Recorded talk from 2013 Restoring the West Conference at Utah State University. The conference focused on forest...

Type: Media

Video

### **Fire history and regeneration dynamics of low-elevation Douglas-fir forests in the Grand Teton area**

[www.nrfirescience.org/resource/15153](http://www.nrfirescience.org/resource/15153)

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

### **Does wildfire likelihood or severity increase following insect outbreaks in conifer forests of the Pacific Northwest?**

[www.nrfirescience.org/resource/13804](http://www.nrfirescience.org/resource/13804)

Video starts at 1:51 - This webinar was hosted by the Northwest Fire Science Consortium.

Type: Media

Webinar

### **Combining dendrochronology and aerial photography to reconstruct spatiotemporal patterns of fire severity in mixed-severity fire regimes of the northern Rockies**

[www.nrfirescience.org/resource/14341](http://www.nrfirescience.org/resource/14341)

This webinar was presented as part of the 2015-2016 RMRS Fire Sciences Laboratory's weekly seminar series.

Type: Media

Seminar

### **Fire and beetles and climate, oh my!**

[www.nrfirescience.org/resource/13284](http://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

### **Vulnerability of tree species and biome types to climate change in the U.S. Northern Rocky Mountains and Yellowstone**

[www.nrfirescience.org/resource/13043](http://www.nrfirescience.org/resource/13043)

This presentation assesses components of vulnerability of tree species and biome types to projected future climate within the Great Northern Landscape Conservation Cooperative (GNLCC) in the US Northern Rockies and the ecosystems surrounding Glacier and Yellowstone/Grand Teton National Parks. We drew on the results of five published...

Type: Media

Webinar

### **Whitebark pine on the Flathead Indian Reservation: re-evaluating the resource for the 21st century**

[www.nrfirescience.org/resource/14774](http://www.nrfirescience.org/resource/14774)

This presentation by Rick Everett, Program Director Wildland Fire Sciences, Department of Forestry, Salish Kootenai College 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...

Type: Media

Webinar

### **Integrating wildlife habitat and forest resilience with fuels reduction - Ecosystem management concepts for mixed-conifer forests**

[www.nrfirescience.org/resource/14125](http://www.nrfirescience.org/resource/14125)

This talk covers the background and motivation for creating the USFS General Technical Report 220 before explaining the justifications and applications of the treatment guidelines included in the report.

Type: Media

Webinar

### **The ability of wildfire to act as a fuel treatment**

[www.nrfirescience.org/resource/12802](http://www.nrfirescience.org/resource/12802)

This webinar highlighted results from a study investigating the ability of wildfire to act as a fuel treatment. The study evaluated whether or not wildfires limited the occurrence, size, and severity of subsequent wildfires in four large wilderness complexes in Idaho, Montana, and New Mexico. The study focused on protected areas to...

Type: Media

Webinar

**Ecology and restoration in mixed severity fire regimes: climate thresholds, beta diversity, and collaboration in Montana forests**

[www.nrfirescience.org/resource/13775](http://www.nrfirescience.org/resource/13775)

Mixed severity fire regimes historically maintained landscape heterogeneity in fuels and ecological conditions, which limited fire spread and supported diverse species assemblages. Setting goals for ecosystem management and restoration targets in these forests, where the frequency, severity, and effects of...

Type: Media

Webinar

**Restoration guidelines for creating resilient whitebark pine ecosystems using spatial simulation modeling**

[www.nrfirescience.org/resource/13044](http://www.nrfirescience.org/resource/13044)

To address declining whitebark pine ecosystems, a 2012 report A Range-Wide Restoration Strategy for Whitebark Pine Forests presents a strategy for restoring these ecosystems across their entire range. However, this report did not address changing climates in the implementation of a range-wide strategy. The Great Northern LCC has...

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](http://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

**Culturally peeled trees handbook**

[www.nrfirescience.org/resource/12391](http://www.nrfirescience.org/resource/12391)

This guide was developed to help identify Culturally Peeled Trees. Culturally Peeled Trees are a specific type of Culturally Modified Tree. The term is used to describe the mostly pre-reservation practice by aboriginal or native people of 'peeling,' or removing, the bark/cambium layer of a tree for a variety of procurement and...

Author(s): Marcy Reiser, Laurie S. Huckaby

Type: Document

Technical Report or White Paper

**The ecological effects of thinning treatments to restore whitebark pine**

[www.nrfirescience.org/resource/14780](http://www.nrfirescience.org/resource/14780)

This presentation by Colin Maher, Ph.D. Candidate, Department of Ecosystem and Conservation Sciences 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...

Type: Media

Webinar