

Wildfire and fire mosaic effects on bird species richness and community composition in south-western Australia

www.nrfirescience.org/resource/20654

Background: A fire management strategy of deliberate patch-mosaic burning (PMB) is postulated to promote biodiversity by providing a range of habitat patches with different fire histories, habitat qualities, and vegetation ages at a given scale. We investigated the response of avian fauna to fire, particularly species richness and...

Author(s): Allan J. Wills, Graeme Liddelow, Verna Tunsell

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Disturbance history modulates how litter and herbaceous cover influence conifer regeneration after fire

www.nrfirescience.org/resource/21417

Climate-driven increases in disturbance frequency and extent augment the potential for compounded disturbances. Drawing on well-studied forests that experienced successive disturbances, we asked: (1) how does post-fire cover of litter, herbaceous cover and bare ground vary between stands affected by combinations of blow-down, insect...

Author(s): Nathan S. Gill, Daniel Jarvis, John Rogan, Dominik Kulakowski

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Fire weather drives daily area burned and observations of fire behavior in mountain pine beetle affected landscapes

www.nrfirescience.org/resource/21279

In the western United States, mountain pine beetles (MPBs) have caused tree mortality across 7% of the forested area over the past three decades, leading to concerns of increased fire activity in MPB-affected landscapes. While fire behavior modeling suggests MPB-associated changes in fuels may influence fire behavior, retrospective...

Author(s): Sarah J. Hart, Daniel L. Preston

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Predator responses to fire: a global systematic review and meta-analysis

www.nrfirescience.org/resource/21121

Knowledge of how disturbances such as fire shape habitat structure and composition, and affect animal interactions, is fundamental to ecology and ecosystem management. Predators also exert strong effects on ecological communities, through top-down regulation of prey and competitors, which can result in trophic cascades. Despite...

Author(s): William L. Geary, Tim S. Doherty, Dale G. Nimmo, Ayesha I. T. Tulloch, Euan G. Ritchie

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Effects of restoration and fire on habitats and populations of western hummingbirds: A literature review

www.nrfirescience.org/resource/21030

To inform future restoration efforts, we reviewed the known effects of fire and habitat management and

restoration on hummingbirds in four key habitat types in North America. We examined seven species that most commonly occur west of the Rocky Mountains: Rufous (*Selasphorus rufus*), Calliope (*Selasphorus calliope*), Broad-tailed (...)

Author(s): John D. Alexander, Elizabeth Williams, Caitlyn R. Gillespie, Sarahy Contreras-Martínez, Deborah M. Finch

Year Published: 2020

Type: Document

Technical Report or White Paper

Taking the Long View: Mountain Pine Beetles as Agents of Change

www.nrfirescience.org/resource/21008

Mountain pine beetles (MPB) are a constant presence in the Rocky Mountain Region, with a long history of periodic outbreaks. The latest beetle epidemic, which lasted from the late 1990s until about 2012, was particularly impactful in Colorado, where an estimated 800 million lodgepole and ponderosa pine trees were killed. However, as...

Author(s): Jose F. Negron, Robert J. Cain

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Temporal and energetic drivers of seed resource use by Clark's nutcracker, keystone seed disperser of coniferous forests

www.nrfirescience.org/resource/20923

Clark's nutcracker (*Nucifraga columbiana*) functions as a keystone seed disperser and ecological mobile link for many western conifers. The bird is the primary seed disperser for limber pine (*Pinus flexilis*), which is an important seed resource for the bird. In the Southern Rocky Mountains, annual variation in limber pine cone...

Author(s): Tyler J. Williams, Diana F. Tomback, Nels Grevstad, Kristin Broms

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Trends in carnivore and ungulate fire ecology research in North American conifer forests

www.nrfirescience.org/resource/20840

Shifting fire regimes are substantially changing North American forests. It is thus critical to understand how wildfires affect forest wildlife, especially for species managed for harvest and for species at risk of extinction. In particular, many populations of carnivores and ungulates are actively managed, so being able to...

Author(s): Logan A. Volkmann, Jenna Hutchen, Karen E. Hodges

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Patterns of bird species occurrence in relation to anthropogenic and wildfire disturbance: management implications

www.nrfirescience.org/resource/20763

We used a chronosequence approach to investigate the relationship between existing conditions of forested land that burned at some point between 1984 and 2014 in western Montana and the abundances of various bird species based on 7533 point-counts. Twelve of 68 bird species occurred significantly more frequently in burned mixed-...

Author(s): Richard L. Hutto, Russell R. Hutto, Paul L. Hutto

Year Published: 2020
Type: Document
Book or Chapter or Journal Article

Fire and distance from unburned forest influence bird assemblages in Southern Andean Yungas of Northwest Argentina: a case study

www.nrfirescience.org/resource/21412

Background: Wildfires affect vegetation structure, functions, and other attributes of forest ecosystems. Among these attributes, bird assemblages may be influenced by the distance from undisturbed to fire-disturbed forests. Information about this influence is essential for designing management plans aimed at conserving birds'...

Author(s): Adriana Marisel Morales, Natalia Politi, Luis Osvaldo Rivera, Constanza Guadalupe Vivanco, Guillermo E. Defosse

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Animals as agents in fire regimes

www.nrfirescience.org/resource/21116

Fire is a powerful ecological and evolutionary force. Animals that modify drivers of fire behaviour could therefore have far-reaching effects on ecosystems. Yet, with a few notable exceptions, effects of animals on fire have been often overlooked. We show how animals can affect fire behaviour by modifying the amount, structure, or...

Author(s): Claire N. Foster, Sam C. Banks, Geoffrey J. Cary, Christopher N. Johnson, David B. Lindenmayer, Leonie E. Valentine

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Mountain pine beetle in Colorado: A story of changing forests

www.nrfirescience.org/resource/21010

The mountain pine beetle (MPB) (*Dendroctonus ponderosae*) is one of the most prevalent disturbance agents in western conifer forests. It utilizes various species of pines (*Pinus* spp.) as host trees. Eruptive populations can cause extensive tree mortality. Since the late 1990s, extensive outbreaks have occurred from the southern...

Author(s): Jose F. Negron, Bob Cain

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Bark beetle infestation of western US forests: A context for assessing and evaluating impacts

www.nrfirescience.org/resource/21007

Bark beetles are primary disturbance agents in western US forests. Outbreaks affect goods and services associated with forest ecosystems including timber, water, fish and wildlife habitats and populations, recreation opportunities, and many others. They can also affect wildfire behavior and its intensity. Assessments and evaluations...

Author(s): Daniel W. McCollum, John E. Lundquist

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Vegetation dynamics following compound disturbance in a dry pine forest: fuel treatment then bark beetle outbreak

www.nrfirescience.org/resource/20918

In the western United States, restoration of forests with historically frequent, low-severity fire regimes often includes fuel reduction that reestablish open, early-seral conditions while reducing fuel continuity and loading. Between 2001 and 2016, fuel reduction (e.g., thinning, prescribed burning, etc.) was implemented on...

Author(s): Justin S. Crotteau, Christopher R. Keyes, Sharon M. Hood, Andrew J. Larson

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

High-severity wildfire limits available floral pollen quality and bumble bee nutrition compared to mixed-severity burns

www.nrfirescience.org/resource/20835

High-severity wildfires, which can homogenize floral communities, are becoming more common relative to historic mixed-severity fire regimes in the Northern Rockies of the U.S. High-severity wildfire could negatively affect bumble bees, which are typically diet generalists, if floral species of inadequate pollen quality dominate the...

Author(s): Michael P. Simanonok, Laura A. Burkle

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Is fire “for the birds”? How two rare species influence fire management across the US

www.nrfirescience.org/resource/20165

The US Endangered Species Act has enabled species conservation but has differentially impacted fire management and rare bird conservation in the southern and western US. In the South, prescribed fire and restoration-based forest thinning are commonly used to conserve the endangered red-cockaded woodpecker (*Picoides borealis*; RCW...

Author(s): Scott L. Stephens, Leda N. Kobziar, Brandon M. Collins, Raymond J. Davis, Peter Z. Fule, William L. Gaines, Joseph L. Ganey, James M. Guldin, Paul F. Hessburg, J. Kevin Hiers, Serra Hoagland, John J. Keane, Ronald E. Masters, Ann E. McKellar, Warren G. Montague, Malcolm P.

North, Thomas A. Spies

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Immediate fire-induced changes in soil microbial community composition in an outdoor experimental controlled system

www.nrfirescience.org/resource/20601

Short-term fire-induced changes to the soil microbial community are usually closely associated to fire severity, which essentially consists in the fire-induced loss or decomposition of organic matter above ground and below ground. Many functional processes and soil properties, including plant recolonization and soil microorganism...

Author(s): Manuel E. Lucas-Borja, Isabel Miralles, Raul Ortega, Pedro A. Plaza-Álvarez, Javier González-Romero, Javier Sagra Cózar, Miguel Soriano-Rodríguez, Giacomo Certini, Daniel Moya, Jorge de las Heras

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Ponderosa pine regeneration, wildland fuels management, and habitat conservation: identifying trade-offs following wildfire

www.nrfirescience.org/resource/19304

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

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

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Is fire “for the birds”? How two rare species influence fire management across the US

www.nrfirescience.org/resource/20125

The US Endangered Species Act has enabled species conservation but has differentially impacted fire management and rare bird conservation in the southern and western US. In the South, prescribed fire and restoration-based forest thinning are commonly used to conserve the endangered red-cockaded woodpecker (*Picoides borealis*; RCW...

Author(s): Scott L. Stephens, Leda N. Kobziar, Brandon M. Collins, Raymond J. Davis, Peter Z. Fule, William L. Gaines, Joseph L. Ganey, James M. Guldin, Paul F. Hessburg, J. Kevin Hiers, Serra Hoagland, John J. Keane, Ronald E. Masters, Ann E. McKellar, Warren G. Montague, Malcolm P.

North, Thomas A. Spies

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

TRIA-Net: 10 years of collaborative research on turning risk into action for the mountain pine beetle epidemic

www.nrfirescience.org/resource/20547

Forest insects are showing increasing intensity of outbreaks and expanded ranges, and this has become a major challenge for forest managers. An understanding of these systems often depends upon detailed examination of complex interactions involving multiple organisms. In 2013, a team of researchers formed TRIA-Net, an NSERC support...

Author(s): Patrick M.A. James, Dezene P.W. Huber

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Nesting success of wood-cavity-nesting bees declines with increasing time since wildfire

www.nrfirescience.org/resource/20488

Bees require distinct foraging and nesting resources to occur in close proximity. However, spatial and temporal patterns in the availability and quantity of these resources can be affected by disturbances like wildfire. The potential for spatial or temporal separation of foraging and nesting resources is of particular concern for...

Author(s): Michael P. Simanonok, Laura A. Burkle

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

The potential importance of unburned islands as refugia for the persistence of wildlife species in fire-prone ecosystems

www.nrfirescience.org/resource/20040

The persistence of wildlife species in fire-prone ecosystems is under increasing pressure from global change, including alterations in fire regimes caused by climate change. However, unburned islands might act to mitigate negative effects of fire on wildlife populations by providing habitat in which species can survive and...

Author(s): Jasper Steenvoorden, Arjan J. H. Meddens, Anthony Martinez, Lee J. Foster, W. Daniel Kissling

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Drivers of lodgepole pine recruitment across a gradient of bark beetle outbreak and wildfire in British Columbia

www.nrfirescience.org/resource/20390

Seedbanks are essential for forest resilience, and disturbance interactions could potentially modify seedbank availability, subsequent forest regeneration patterns, and successional trajectories. Regional mountain pine beetle outbreaks have altered forest structure and seedbanks in fire-prone-landscapes across western North America...

Author(s): Anna C. Talucci, Kenneth P. Lertzman, Meg A. Krawchuk

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

The ecological uncertainty of wildfire fuel breaks: examples from the sagebrush steppe

www.nrfirescience.org/resource/19738

Fuel breaks are increasingly being implemented at broad scales (100s to 10,000s of square kilometers) in fire-prone landscapes globally, yet there is little scientific information available regarding their ecological effects (eg habitat fragmentation). Fuel breaks are designed to reduce flammable vegetation (ie fuels), increase...

Author(s): Douglas J. Shinneman, Matthew J. Germino, David S. Pilliod, Cameron L. Aldridge, Nicole M. Vaillant, Peter S. Coates

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Relations among cheatgrass-driven fire, climate, and sensitive-status birds across the Great Basin - Final Report to the Joint Fire Sciences Program

www.nrfirescience.org/resource/20384

The principal aim of this project was to project changes in fuels, fire dynamics, and associated responses of vegetation and breeding birds that might inform selection and prioritization of management actions in the Great Basin. Our original six objectives were to model percent cover of cheatgrass (*Bromus tectorum*) across the Great...

Author(s): Erica Fleishman, Jennifer Balch, Bethany A. Bradley, Ned Horning, Matthias Leu

Year Published: 2019

Type: Document

Technical Report or White Paper

Biological Aspects of Mountain Pine Beetle in Lodgepole Pine Stands of Different Densities in Colorado, USA

www.nrfirescience.org/resource/18813

Research highlights: The biology of mountain pine beetle (MPB), *Dendroctonus ponderosae* Hopkins, in Colorado's lodgepole pine forests exhibits similarities and differences to other parts of its range. Brood emergence was not influenced by stand density nor related to tree diameter. The probability of individual tree attack is...

Author(s): Jose F. Negron

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Are reptile responses to fire shaped by forest type and vegetation structure? Insights from the Mediterranean basin

www.nrfirescience.org/resource/19480

Socioeconomic factors (e.g. rural abandonment, monoculture plantations) and global warming are changing fire regimes (fire intensity, extent, and frequency) in fire-prone regions such as the Mediterranean Basin. Understanding the factors that shape responses of animal communities to fire is a key objective for biodiversity...

Author(s): Brahim Chergui, Soumia Fahd, Xavier Santos

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Impact of wildfire size on snowshoe hare relative abundance in southern British Columbia, Canada

www.nrfirescience.org/resource/20355

Background: Large wildfires result in more heterogeneous fire scars than do smaller fires because of differences in landscape context and high variability in burn intensity and severity. Previous research on mammal response to wildfire has often considered all fires as comparable disturbances regardless of size. Here, we explicitly...

Author(s): Jenna Hutchen, Karen E. Hodges

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/19428

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

Author(s): Sara M. Galbraith, James H. Cane, Andrew R. Moldenke, James W. Rivers

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

A global synthesis of fire effects on pollinators

www.nrfirescience.org/resource/20328

Aim: Understanding fire effects on pollinators is critical in the context of fire regime changes and the global pollination crisis. Through a systematic and quantitative review of the literature, we provide the first global assessment of pollinator responses to fire. We hypothesize that pollinators increase after fire and during the...

Author(s): Lucas M. Carbone, Julia Tavella, Juli G. Pausas, Ramiro Aguilar
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Large, high-severity burn patches limit fungal recovery 13 years after wildfire in a ponderosa pine forest

www.nrfirescience.org/resource/20607

Over the past three decades, wildfires in southwestern US ponderosa pine (*Pinus ponderosa* Lawson & C. Lawson) forests have increased in size and severity. These wildfires can remove large, contiguous patches of mature forests, alter dominant plant communities and increase woody debris, potentially altering fungal community...

Author(s): Suzanne M. Owen, Adair M. Patterson, Catherine A. Gehring, Carolyn Hull Sieg, L. Scott Baggett, Peter Z. Fule
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Post-spruce beetle timber salvage drives short-term surface fuel increases and understory vegetation shifts

www.nrfirescience.org/resource/19317

Recent, widespread spruce beetle (*Dendroctonus rufipennis*) outbreaks have driven extensive tree mortality across western North America. Post-disturbance forest management often includes salvage logging to capture economic value of dead timber, reduce fire hazard, and meet other social or ecological objectives. Little is known about...

Author(s): Lucas R. Mattson, Jonathan D. Coop, Michael A. Battaglia, Anthony S. Cheng, Jason S. Sibold, Sara Viner
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Designing multi-scale hierarchical monitoring frameworks for wildlife to support management: a sage-grouse case study

www.nrfirescience.org/resource/20130

Population monitoring is integral to the conservation and management of wildlife; yet, analyses of population demographic data rarely consider processes occurring across spatial scales, potentially limiting the effectiveness of adaptive management. Therefore, we developed a method to identify hierarchical levels of organization (i.e...

Author(s): Michael S. O'Donnell, David R. Edmunds, Cameron L. Aldridge, Julie A. Heinrichs, Peter S. Coates, Brian G. Prochazka, Steven E. Hanser
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Salvage logging reduces wild bee diversity, but not abundance, in severely burned mixed-conifer forest

www.nrfirescience.org/resource/20575

Natural disturbances are critical for supporting biodiversity in many ecosystems, but subsequent management actions can influence the quality of habitat that follow these events. Post-disturbance salvage logging has negative consequences on certain components of forest biodiversity, but populations of some early seral-adapted...

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

Beyond red crowns: complex changes in surface and crown fuels and their interactions 32 years following mountain pine beetle epidemics in south-central Oregon, USA

www.nrfirescience.org/resource/19250

Background: Mountain pine beetle (*Dendroctonus ponderosae* Hopkins; MPB), a bark beetle native to western North America, has caused vast areas of tree mortality over the last several decades. The majority of this mortality has been in lodgepole pine (*Pinus contorta* Douglas ex Loudon) forests and has heightened concerns over the...

Author(s): Travis J. Woolley, David C. Shaw, LaWen Hollingsworth, Michelle Agne, Stephen A. Fitzgerald, Andris Eglitis, Laurie L. Kurth
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Effects of variable density thinning and burning treatments - JFSP Final Report

www.nrfirescience.org/resource/20111

Over recent decades, increases in substantial tree mortality events have coincided with severe drought and bark beetle outbreak. This has prompted forest managers to find treatments that enhance resistance to disturbances. Variable density thinning is an alternative management method intended to increase spatial heterogeneity, with...

Author(s): Jeffrey M. Kane, Alexis Bernal
Year Published: 2019
Type: Document
Technical Report or White Paper

Spatial-Temporal Patterns of Spruce Budworm Defoliation within Plots in Québec

www.nrfirescience.org/resource/19062

We investigated the spatial-temporal patterns of spruce budworm (*Choristoneura fumiferana* (Clem.); SBW) defoliation within 57 plots over 5 years during the current SBW outbreak in Québec. Although spatial-temporal variability of SBW defoliation has been studied at several scales, the spatial dependence between individual defoliated...

Author(s): Mingke Li, David A. MacLean, Chris R. Hennigar, Jae Ogilvie
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Habitat use at fire edges: Does animal activity follow temporal patterns of habitat change?

www.nrfirescience.org/resource/20393

Edges are ecologically important environmental features that have been well researched in agricultural and urban landscapes. However, little work has been conducted in flammable ecosystems where spatially and temporally dynamic fire edges are expected to influence animal activity patterns, particularly for animals reliant on...

Author(s): Kate Parkins, Amy Scott, Julian Di Stefano, Matthew Swan, Holly Sitters, Alan York
Year Published: 2019
Type: Document
Book or Chapter or Journal Article

Assessing the resistance of a breeding amphibian community to a large wildfire

www.nrfirescience.org/resource/20025

Socioeconomic and global climate changes are modifying fire regimes towards larger and more intense fires. Studying the response of organisms to the occurrence of large fires is crucial to anticipate shifts in patterns of biodiversity in fire-prone regions. Amphibia is the most threatened terrestrial vertebrate taxon, although it is...

Author(s): Alberto Muñoz, Ángel M. Felicísimo, Xavier Santos

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Modelling landscape genetic connectivity of the mountain pine beetle in western Canada

www.nrfirescience.org/resource/20388

The current mountain pine beetle (MPB; *Dendroctonus ponderosae* Hopkins, 1902) outbreak has reached more than 25 million hectares of forests in North America, affecting pine species throughout the region and substantially changing landscapes. However, landscape features that enhance or limit dispersal during the geographic expansion...

Author(s): Julian Wittische, Jasmine K. Janes, Patrick M.A. James

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Mountain pine beetle outbreak enhanced resin duct-defenses of lodgepole pine trees

www.nrfirescience.org/resource/19737

Millions of hectares of lodgepole pine trees have been affected by the recent mountain pine beetle outbreaks, which also left significant numbers of live host trees in some areas. Studies have primarily focused on the changes of forest conditions in post-outbreak stands, but whether such changes impact the growth, defense, and their...

Author(s): Shiyang Zhao, Jennifer G. Klutsch, Jonathan A. Cale, Nadir Erbilgin

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Spatiotemporal variability of fire characteristics affect animal responses in pyric landscapes

www.nrfirescience.org/resource/20364

Background: Behavioral responses are the most immediate ways animals interact with their environment, and are primary mechanisms by which individuals mitigate mortality risk while ensuring reproductive success. In disturbance-driven landscapes, animals must adjust behaviors both spatially and temporally to maximize individual...

Author(s): Bradley S. Cohen, Thomas J. Prebyl, Bret A. Collier, Michael J. Chamberlain

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

A long-term evaluation of the interacting effects of fire and white-nose syndrome on endangered bats: final report to JFSP

www.nrfirescience.org/resource/19455

Habitat use of bats may shift following population-level impacts of white-nose syndrome (WNS).

Specifically, the effect of WNS across forest landscapes is unclear in relation to prescribed fire.

Mammoth Cave National Park (MACA) has employed a prescribed fire regime since 2002, and WNS

was detected on MACA in 2013. Thus, project #14...

Author(s): Luke E. Dodd, Matthew B. Dickinson, Michael J. Lacki, Lynne K. Rieske, Nick Skowronski, Steven C. Thomas, Rickard S. Toomey III

Year Published: 2019

Type: Document

Technical Report or White Paper

Wildfire alters the structure and seasonal dynamics of nocturnal pollen-transport networks

www.nrfirescience.org/resource/20335

Wildfires drive global biodiversity patterns and affect plant–pollinator interactions, and are expected to become more frequent and severe under climate change. Post-fire plant communities often have increased floral abundance and diversity, but the effects of wildfires on the ecological process of pollination are poorly...

Author(s): Paula Banza, Callum J. Macgregor, Anabela D. F. Belo, Richard Fox, Michael J. O. Pocock, Darren M. Evans

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Interacting and non-linear avian responses to mixed-severity wildfire and time since fire

www.nrfirescience.org/resource/17993

Non-linear and interacting effects of fire severity and time since fire may help explain how pyrodiversity promotes biodiversity in fire-adapted systems. We built on previous research on avian responses to fire by investigating how complex effects of burn severity and time since fire influenced avian community composition across...

Author(s): Paul J. Taillie, Ryan D. Burnett, Lance J. Roberts, Brent R. Campos, M. Nils Peterson, Christopher E. Moorman

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Whitebark Pine Prevalence and Ecological Function in Treeline Communities of the Greater Yellowstone Ecosystem, U.S.A.: Potential Disruption by White Pine Blister Rust

www.nrfirescience.org/resource/18305

In the northern Rocky Mountains of the U.S. and Canada, whitebark pine (*Pinus albicaulis* Engelm.) is a functionally important species in treeline communities. The introduced fungal pathogen *Cronartium ribicola*, which causes white pine blister rust, has led to extensive whitebark pine mortality nearly rangewide. We examined four...

Author(s): Aaron C. Wagner, Diana F. Tomback, Lynn M. Resler, Elizabeth R. Pansing

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/17345

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

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

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

A conservation planning tool for Greater Sage-grouse using indices of species distribution, resilience, and resistance

www.nrfirescience.org/resource/17958

Managers require quantitative yet tractable tools that identify areas for restoration yielding effective benefits for targeted wildlife species and the ecosystems they inhabit. As a contemporary example of high national significance for conservation, the persistence of Greater Sage-grouse (*Centrocercus urophasianus*) in the Great...

Author(s): Mark A. Ricca, Peter S. Coates, K. Benjamin Gustafson, Brianne E. Brussee, Jeanne C. Chambers, Shawn Espinosa, Scott C. Gardner, Sherri Lisius, Pilar Ziegler, David J. Delehanty, Michael L. Casazza

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

Conventional fire behavior modeling systems are inadequate for predicting fire behavior in bark beetle-impacted forests (Project INT-EM-F-11-03) - Chapter 13

www.nrfirescience.org/resource/17919

Understanding the impacts of mountain pine beetle (MPB; *Dendroctonus ponderosae* Hopkins) on fire behavior is important from both an ecological and land management viewpoint. However, numerous uncertainties exist in the linkages of MPB-caused tree mortality to changes in canopy and surface fuels (e.g., fuel loading, arrangement, and...

Author(s): Sharon M. Hood, Robert E. Keane, Helen Y. Smith, Joel M. Egan, Lisa M. Holsinger

Year Published: 2018

Type: Document
Technical Report or White Paper

Bird conservation potential of fire and herbicide treatments in thinned pine stands

www.nrfirescience.org/resource/17324

Fire-maintained pine (*Pinus* spp.) forests, characterized by a diverse herbaceous layer, sparse midstory layer, and a dominant pine overstory, once covered approximately 30 million ha in the southeastern United States. Fire suppression, landscape changes, and land management changes have contributed to reduced suitability of many...

Author(s): Raymond B. Igley, Rachel E. Greene, Bruce D. Leopold, Darren A. Miller

Year Published: 2018

Type: Document
Book or Chapter or Journal Article

A conservation paradox in the Great Basin—Altering sagebrush landscapes with fuel breaks to reduce habitat loss from wildfire

www.nrfirescience.org/resource/18949

Interactions between fire and nonnative, annual plant species (that is, “the grass/fire cycle”) represent one of the greatest threats to sagebrush (*Artemisia* spp.) ecosystems and associated wildlife, including the greater sage-grouse (*Centrocercus urophasianus*). In 2015, U.S. Department of the Interior called for a “science-...

Author(s): Douglas J. Shinneman, Cameron L. Aldridge, Peter S. Coates, Matthew J. Germino, David S. Pilliod, Nicole M. Vaillant

Year Published: 2018

Type: Document

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

www.nrfirescience.org/resource/17169

The most recent mountain pine beetle (MPB) (*Dendroctonus ponderosae*) outbreak in British Columbia (BC), which began in the late 1990s, killed 75% of the mature merchantable lodgepole pine and was expected to impact gross primary productivity (GPP), ecosystem respiration (R) and thus net ecosystem productivity (NEP) of infested...

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Prescribed Fire in Grassland Butterfly Habitat: Targeting Weather and Fuel Conditions to Reduce Soil Temperatures and Burn Severity

www.nrfirescience.org/resource/17497

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

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Landscape Topoedaphic Features Create Refugia from Drought and Insect Disturbance in a Lodgepole and Whitebark Pine Forest

www.nrfirescience.org/resource/18867

Droughts and insect outbreaks are primary disturbance processes linking climate change to tree mortality in western North America. Refugia from these disturbances—locations where impacts are less severe relative to the surrounding landscape—may be priorities for conservation, restoration, and monitoring. In this study,...

Author(s): Jennifer Cartwright

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Greater sage-grouse science (2015–17)—Synthesis and potential management implications

www.nrfirescience.org/resource/16961

The greater sage-grouse (*Centrocercus urophasianus*; hereafter called “sage-grouse”), a species that requires sagebrush (*Artemisia* spp.), has experienced range-wide declines in its distribution and abundance. These declines have prompted substantial research and management investments to improve the understanding of sage-grouse...

Author(s): Steven E. Hanser, Patricia A. Deibert, John C. Tull, Natasha B. Carr, Cameron L. Aldridge, Travis D. Bargsten, Thomas J. Christiansen, Peter S. Coates, Michele R. Crist, Kevin E. Doherty, Ethan A. Ellsworth, Lee J. Foster, Vicki A. Herren, Kevin H. Miller, Ann Moser, Robin M. Naeve, Karen L. Prentice, Thomas E. Remington, Mark A. Ricca, Douglas J. Shinneman, Richard L. Truex, Lief A. Wiechman, Dereck C. Wilson, Z.H. Bowen

Year Published: 2018

Type: Document

Synthesis

Cross-scale occupancy dynamics of a postfire specialist in response to variation across a fire regime

www.nrfirescience.org/resource/18083

Fire creates challenges and opportunities for wildlife through rapid destruction, modification and creation of habitat. Fire has spatially variable effects on landscapes; however, for species that benefit from the ephemeral resource patches created by fire, it is critical to understand characteristics of fires that promote postfire...

Author(s): Morgan W. Tingley, Andrew N. Stillman, Robert L. Wilkerson, Christine A. Howell, Sarah C. Sawyer, Rodney B. Siegel

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Fuel dynamics after a bark beetle outbreak impacts experimental fuel treatments

www.nrfirescience.org/resource/18779

Background: Fuel reduction treatments have been widely implemented across the western US in recent decades for both fire protection and restoration. Although research has demonstrated that combined thinning and burning effectively reduces crown fire potential in the few years immediately following treatment, little research has...

Author(s): Justin S. Crotteau, Christopher R. Keyes, Sharon M. Hood, David L.R. Affleck, Anna Sala

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/17368

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

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Ecological effects and effectiveness of silvicultural restoration treatments in whitebark pine forests

www.nrfirescience.org/resource/18064

Silvicultural thinning treatments to restore whitebark pine (*Pinus albicaulis*) are widely used in subalpine forests throughout the western United States (US) and Canada. The objectives of these treatments are to (1) improve the condition of whitebark pine at all ages, (2) to improve seedling recruitment processes, and (3) mitigate...

Author(s): Colin T. Maher, Cara R. Nelson, Andrew J. Larson, Anna Sala

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Severity of Overstory Mortality Influences Conifer Recruitment and Growth in Mountain Pine Beetle-Affected Forests

www.nrfirescience.org/resource/18310

The severity of lodgepole pine mortality from mountain pine beetle outbreaks varies with host tree diameter, density, and other structural characteristics, influencing subcanopy conditions and tree regeneration. We measured density and leader growth of shade-intolerant lodgepole pine, shade-tolerant Engelmann spruce, and very shade-...

Author(s): Kristen Pelz, Charles C. Rhoades, Robert M. Hubbard, Frederick W. Smith

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/17360

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

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

The genetic network of greater sage-grouse: Range-wide identification of keystone hubs of connectivity

www.nrfirescience.org/resource/17968

Genetic networks can characterize complex genetic relationships among groups of individuals, which can be used to rank nodes most important to the overall connectivity of the system. Ranking allows scarce resources to be guided toward nodes integral to connectivity. The greater sage-grouse (*Centrocercus urophasianus*) is a species of...

Author(s): Todd Cross, Michael K. Schwartz, David E. Naugle, Brad C. Fedy, Jeffrey R. Row, S.J. Oyster-McCance

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Avian demographic responses to drought and fire: a community-level perspective

www.nrfirescience.org/resource/18277

Drought stress is an important consideration for wildlife in arid and semiarid regions under climate change. Drought can impact plant and animal populations directly, through effects on their physiology, as well as indirectly through effects on vegetation productivity and resource availability, and by creating conditions conducive...

Author(s): James F. Saracco, Stephen M. Fetting, George L. San Miguel, David W. Mehlman, Brent E. Thompson, Steven K. Albert

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Importance of internal refuges and the external unburnt area in the recovery of rodent

populations after wildfire

www.nrfirescience.org/resource/17934

Rodent populations respond quickly to changes in habitat structure and composition resulting from disturbances such as wildfires. Rodents may recolonise burnt areas from individuals that survived the wildfire in 'internal refuges' or from the surrounding unburnt area (i.e. external colonisation). With the aim of assessing the...

Author(s): Roger Puig-Gironès, Miguel Clavero, Pere Pons

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/17333

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

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

U.S. Geological Survey Sage-Grouse and Sagebrush Ecosystem Research Annual Report for 2018

www.nrfirescience.org/resource/21258

The sagebrush (*Artemisia* spp.) ecosystem extends across a large portion of the Western United States, and the greater sage-grouse (*Centrocercus urophasianus*) is one of the iconic species of this ecosystem. Greater sage-grouse populations occur in 11 States and are dependent on relatively large expanses of sagebrush-dominated habitat...

Author(s): Steven E. Hanser

Year Published: 2018

Type: Document

Technical Report or White Paper

Avian demographic responses to drought and fire: a community?level perspective

www.nrfirescience.org/resource/17740

Drought stress is an important consideration for wildlife in arid and semi-arid regions under climate change. Drought can impact plant and animal populations directly, through effects on their physiology, as well as indirectly through effects on vegetation productivity and resource availability, and by creating conditions...

Author(s): James F. Saracco, Stephen M. Fettig, George L. San Miguel, David W. Mehlman, Steven K. Albert

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Trophic cascades at multiple spatial scales shape recovery of young aspen in Yellowstone

www.nrfirescience.org/resource/17170

Throughout much of the 20th century, the heights of young quaking aspen (*Populus tremuloides*) in Yellowstone National Park's northern ungulate winter range were suppressed due to intensive herbivory by Rocky Mountain elk (*Cervus elaphus*). However, following the 1995–96 reintroduction of

gray wolves (*Canis lupus*), completing the...

Author(s): Robert L. Beschta, Luke E. Painter, William J. Ripple

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Effects of Disturbance on Tree Community Dynamics in Whitebark Pine (*Pinus albicaulis* Engelm.) Ecosystems

www.nrfirescience.org/resource/18870

Whitebark pine (*Pinus albicaulis* Engelm.), an ecologically important tree species in high-elevation ecosystems of western North America, is threatened by white pine blister rust (*Cronartium ribicola* Fischer) and increased pressure from mountain pine beetle (*Dendroctonus ponderosae* Hopkins) due to climate warming. In addition, there...

Author(s): Jeremy T. Amberson, Megan P. Keville, Cara R. Nelson

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Annotated Bibliography: Research on Greater Sage-grouse since January 2015

www.nrfirescience.org/resource/16966

The greater sage-grouse (*Centrocercus urophasianus*; hereafter GRSG) has been a focus of scientific investigation and management action for the past two decades. The 2015 U.S. Fish and Wildlife Service listing determination of “not warranted” was in part due to a large-scale collaborative effort to develop strategies to conserve...

Author(s): Sarah Carter, D.J. Manier, Robert S. Arkle, A.N. Johnston, Susan L. Phillips, Steven E. Hanser, Z.H. Bowen

Year Published: 2018

Type: Document

Technical Report or White Paper

Recovering from the mountain pine beetle

www.nrfirescience.org/resource/18838

Beginning in the late 1990s, the pine forests of Montana began to experience the largest mountain pine beetle outbreak in recorded history. Large swaths of forests began to turn red, then gray as the beetles ate their way through Pacific Northwest stands. At their peak in 2009, this native insect infested nearly 3.7 million acres...

Author(s): Dan R. Loeffler, Nathaniel Anderson

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Fire history influences large herbivore behavior at circadian, seasonal, and successional scales

www.nrfirescience.org/resource/18797

Recurrent environmental changes often prompt animals to alter their behavior leading to predictable patterns across a range of temporal scales. The nested nature of circadian and seasonal behavior complicates tests for effects of rarer disturbance events like fire. Fire can dramatically alter plant community structure, with...

Author(s): Derek B. Spitz, Darren A. Clark, Michael J. Wisdom, Mary M. Rowland, Bruce K. Johnson, Ryan A. Long, Taal Levi

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

A conservation paradox in the Great Basin-altering sagebrush landscapes with fuel breaks to reduce habitat loss from wildfire

www.nrfirescience.org/resource/17420

Interactions between fire and nonnative, annual plant species (that is, 'the grass/fire cycle') represent one of the greatest threats to sagebrush (*Artemisia* spp.) ecosystems and associated wildlife, including the greater sage-grouse (*Centrocercus urophasianus*). In 2015, U.S. Department of the Interior called for a 'science-based...

Author(s): Douglas J. Shinneman, Cameron L. Aldridge, Peter S. Coates, Matthew J. Germino, David S. Pilliod, Nicole M. Vaillant

Year Published: 2018

Type: Document

Technical Report or White Paper

Prairie dogs and wildfires shape vegetation structure in a sagebrush grassland more than does rest from ungulate grazing

www.nrfirescience.org/resource/18069

Understanding drivers of vegetation structure has direct implications for wildlife conservation and livestock management, but the relative importance of multiple disturbances interacting within the same system to shape vegetation structure remains unclear. We investigated the separate and interactive effects of multiple disturbance...

Author(s): L.C. Connell, John Derek Scasta, Lauren M. Porensky

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/18338

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

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

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Overlapping bark beetle outbreaks, salvage logging and wildfire restructure a lodgepole pine ecosystem

www.nrfirescience.org/resource/17365

The 2010 Church's Park Fire burned beetle-killed lodgepole pine stands in Colorado, including recently salvage-logged areas, creating a fortuitous opportunity to compare the effects of salvage logging, wildfire and the combination of logging followed by wildfire. Here, we examine tree regeneration, surface fuels, understory plants...

Author(s): Charles C. Rhoades, Kristen Pelz, Paula J. Fornwalt, Brett Wolk, Anthony S. Cheng

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Recent and future climate suitability for whitebark pine mortality from mountain pine beetles varies across the western US

www.nrfirescience.org/resource/16680

Recent mountain pine beetle outbreaks in whitebark pine forests have been extensive and severe. Understanding the climate influences on these outbreaks is essential for developing management plans that account for potential future mountain pine beetle outbreaks, among other threats, and informing listing decisions under the...

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Long-term demography of the Northern Goshawk in a variable environment

www.nrfirescience.org/resource/16619

The Nearctic northern goshawk (*Accipiter gentilis atricapillis*) is a resident of conifer, broadleaf, and mixed forests from the boreal to the southwestern montane regions of North America. We report on a 20-year mark-recapture investigation (1991-2010) of the distribution and density of breeders, temporal and spatial variability in...

Author(s): Richard T. Reynolds, Jeffrey Lambert, Curtis H. Flather, Gary C. White, Benjamin J. Bird, Scott L. Baggett, Carrie Lambert, Shelley Bayard de Volo

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/15531

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16593

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Native bee nesting habitat use after wildfire in Montana - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17561

Changing fire regimes are leading to increasing scale and severity of burns, which may affect habitat for species of concern. Wood-cavity nesting bees are one such community, in that they have discrete foraging and nesting habitats which can both be maintained or removed by wildfire. Our objective is to provide data on how different...

Author(s): Michael P. Simanonok, Laura A. Burkle

Year Published: 2017

Type: Document

Technical Report or White Paper

Separating Trends in Whitebark Pine Radial Growth Related to Climate and Mountain Pine Beetle Outbreaks in the Northern Rocky Mountains, USA

www.nrfirescience.org/resource/17206

Drought and mountain pine beetle (*Dendroctonus ponderosae* Hopkins) outbreaks have affected millions of hectares of high-elevation conifer forests in the Northern Rocky Mountains during the past century. Little research has examined the distinction between mountain pine beetle outbreaks and climatic influence on radial growth in...

Author(s): Saskia L. van de Gevel, Evan R. Larson, Henri D. Grissino-Mayer

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16558

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16510

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Effects of time since burn, spatial scale and post-fire treatments on rainfall thresholds to produce runoff and erosion from plot to watershed-scale - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/16994

Colorado's Front Range forested watersheds provide municipal water supplies for downstream

communities. Many of these watersheds have been affected by wildfires and subsequent runoff, erosion and sedimentation of waterways. Natural resource managers need information on the frequency and duration of post-fire runoff and erosion,...

Author(s): Stephanie Kampf, Codie Wilson, Joseph W. Wagenbrenner

Year Published: 2017

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/17463

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16464

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Effects of fire on pollinators and pollination

www.nrfirescience.org/resource/15080

Summary: 1) Increased incidence of landscape fire and pollinator declines with co-extinctions of dependent plant species are both globally significant. Fire can alter species distributions, but its effects on plant-pollinator interactions are poorly understood so its present and future role in coupled plant-pollinator declines...

Author(s): Julian Brown, Alan York, Fiona J. Christie, Michael A. McCarthy

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16319

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

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

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

Montana Climate Assessment VIGNETTE: forest Management and a Changing Climate with Diana Six

www.nrfirescience.org/resource/15727

Diana Six has been studying pine bark beetles for 25 years, and still can't say she completely understands them. Lately, she's been diving into a topic she has always found even more confounding - forest management. This article describes an interview with Six that describes forest resilience in face of climate change.

Year Published: 2017
Type: Document
Research Brief or Fact Sheet

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

www.nrfirescience.org/resource/16727

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

Author(s): Carolyn Hull Sieg, Rodman Linn, F. Pimont, Chad M. Hoffman, Joel D. McMillin, Judith Winterkamp, Scott L. Baggett
Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Uneven-aged silviculture can reduce negative effects of forest management on beetles

www.nrfirescience.org/resource/16656

Decline in biodiversity have increased the interest in alternative forest management approaches. Unevenaged silviculture has been proposed as a mean to maintain continuity of forest canopy cover, mimic small-scale disturbances and provide a stratified forest structure similar to that of old-growth forests and therefore better...

Author(s): Klara Joelsson, Joakim Hjältén, Timothy Work, Heloise Gibb, Jean-Michel Roberge, Therese Löfroth
Year Published: 2017
Type: Document
Book or Chapter or Journal Article

Emerging technology to measure habitat quality and behavior of grouse: Examples from studies of greater sage-grouse

www.nrfirescience.org/resource/16612

An increasing number of threats, both natural (e.g. fires, drought) and anthropogenic (e.g. agriculture, infrastructure development), are likely to affect both availability and quality of plants that grouse rely on for cover and food. As such, there is an increasing need to monitor plants and their use by grouse over space and time...

Author(s): Jennifer Sorensen Forbey, Gail L. Patricelli, Donna M. Delparte, Alan H. Krakauer, Peter J. Olsoy, Marcella R. Fremgen, Jordan D. Nobler, Lucas P. Spaete, Lisa A. Shipley, Janet L. Rachlow, Amy K. Dirksen, Anna Perry, Bryce A. Richardson, Nancy F. Glenn
Year Published: 2017

Type: Document
Book or Chapter or Journal Article

Genetic recapture identifies long-distance breeding dispersal in Greater Sage-Grouse (*Centrocercus urophasianus*)

www.nrfirescience.org/resource/16573

Dispersal can strongly influence the demographic and evolutionary trajectory of populations. For many species, little is known about dispersal, despite its importance to conservation. The Greater Sage-Grouse (*Centrocercus urophasianus*) is a species of conservation concern that ranges across 11 western U.S. states and 2 Canadian...

Author(s): Todd Cross, David E. Naugle, John Carlson, Michael K. Schwartz

Year Published: 2017

Type: Document
Book or Chapter or Journal Article

Western Spruce Budworm and Wildfire: Is There a Connection?

www.nrfirescience.org/resource/17546

In the interior Pacific Northwest, extensive defoliation of mixed conifer forests during outbreaks of western spruce budworm (WSB) may leave the visual impression of a tinderbox with trees primed to burst into flame. But is this the case? We addressed this question with funding from the USDA/U.S. Department of the Interior Joint...

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

Year Published: 2017

Type: Document
Book or Chapter or Journal Article

Climate change and wildfire effects in aridland riparian ecosystems: An examination of current and future conditions

www.nrfirescience.org/resource/16556

Aridland riparian ecosystems are limited, the climate is changing, and further hydrological change is likely in the American Southwest. To protect riparian ecosystems and organisms, we need to understand how they are affected by disturbance processes and stressors such as fire, drought, and non-native plant invasions. Riparian...

Author(s): D. Max Smith, Deborah M. Finch

Year Published: 2017

Type: Document
Technical Report or White Paper

Restoring Sage-Grouse Habitat after Fire: Success of Different Restoration Methods across an Elevation Gradient - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/17006

Greater sage-grouse (*Centrocercus urophasianus*) are threatened by a continued loss of sagebrush (*Artemisia* spp.) habitat. Recent, large scale wildfires have elevated the risk to sage-grouse as it may take up to several decades to more than a century for naturally recovery of sage-grouse habitat (i.e. reestablishment of sagebrush)....

Author(s): Kirk W. Davies, Matthew Madsen, Chad S. Boyd, Michael A. Gregg, April Hulet, Urban Strachan

Year Published: 2017

Type: Document
Technical Report or White Paper

Conflicting Perspectives on Spotted Owls, Wildfire, and Forest Restoration

www.nrfirescience.org/resource/16339

Evidence of increasing fire extent and severity in the western US in recent decades has raised concern over the effects of fire on threatened species such as the spotted owl (*Strix occidentalis* Xantus de Vesey), which nests in forests with large trees and high canopy cover that are vulnerable to high-severity wildfire. A dichotomy...

Author(s): Joseph L. Ganey, Ho Yi Wan, Samuel A. Cushman, Christina D. Vojta

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Fires following bark beetles: factors controlling severity and disturbance interactions in ponderosa pine

www.nrfirescience.org/resource/16316

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/16730

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

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

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Conservation and restoration of sagebrush ecosystems and sage-grouse: an assessment of USDA Forest Service Science

www.nrfirescience.org/resource/14004

Sagebrush ecosystems are among the largest and most threatened ecosystems in North America. Greater sage-grouse has served as the bellwether for species conservation in these ecosystems and has been considered for listing under the Endangered Species Act eight times. In September 2015, the decision was made not to list greater sage-...

Author(s): Deborah M. Finch, Douglas A. Boyce, Jeanne C. Chambers, Chris J. Colt, R. Kasten Dumroese, Stanley G. Kitchen, Clinton McCarthy, Susan E. Meyer, Bryce A. Richardson, Mary M. Rowland, Mark A. Rumble, Michael K. Schwartz, Monica S. Tomosy, Michael J. Wisdom

Year Published: 2016

Type: Document

Synthesis, Technical Report or White Paper

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

America

www.nrfirescience.org/resource/14715

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

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

Year Published: 2016

Type: Document

Technical Report or White Paper

The Influence of fuel moisture and flammable monoterpenes on the combustibility of conifer fuels

www.nrfirescience.org/resource/15574

Bark beetle-caused tree mortality and its effect on both the fuels complex and potential fire behavior in affected forests, particularly lodgepole pine forests, has been a topic of much debate in recent years (Hicke et al. 2012; Jenkins et al. 2012; Black et al. 2013). Early research on the subject seemed to suggest a...

Author(s): Michael J. Jenkins, Justin B. Runyon, Martin E. Alexander, Wesley G. Page, Andrew Guinta

Year Published: 2016

Type: Document

Technical Report or White Paper

Short-term effects of early fall prescribed fire on herbaceous species and arthropods important in the diet of greater sage-grouse in Wyoming big sagebrush habitats

www.nrfirescience.org/resource/18267

This document summarizes information from a project at Hart Mountain National Antelope Refuge, Oregon, that studied the effects of prescribed fires on important foods of prelaying greater sage-grouse females and chicks. As of 2007, prescribed fire is no longer used in sagebrush communities on this refuge in order to preserve...

Year Published: 2016

Type: Document

Synthesis

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

www.nrfirescience.org/resource/14676

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

Author(s): Signe B. Leirfallom, Robert E. Keane, Molly L. Retzlaff

Year Published: 2016

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/10784

This FEIS species review synthesizes information on the relationship of *Centrocercus minimus*,

Centrocercus urophasianus (Gunnison sage-grouse, greater sage-grouse) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided...

Author(s): Robin J. Innes

Year Published: 2016

Type: Document

Synthesis

Avian relationships with wildfire at two dry forest locations with different historical fire regimes

www.nrfirescience.org/resource/14479

Wildfire is a key factor influencing bird community composition in western North American forests. We need to understand species and community responses to wildfire and how responses vary regionally to effectively manage dry conifer forests for maintaining biodiversity. We compared avian relationships with wildfire burn severity...

Author(s): Quresh Latif, Jamie Sanderlin, Victoria A. Saab, William M. Block, Jonathan G. Dudley

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/14967

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

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

Year Published: 2016

Type: Document

Technical Report or White Paper

Burned forest characterization at single-tree level with airborne laser scanning for assessing wildlife habitat

www.nrfirescience.org/resource/14180

Abundance, size, and spatial distribution of standing dead trees (snags), are key indicators of forest biodiversity and ecosystem health. These metrics represent critical habitat components for various wildlife species of conservation concern, including the Black-backed Woodpecker (*Picoides arcticus*), which is strongly associated...

Author(s): Angeles Casas, Mariano Garcia, Rodney B. Siegel, Alexander Koltunov, Carlos Ramirez, Susan L. Ustin

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Short-term impacts of fire-mediated habitat alterations on an isolated bighorn sheep population

www.nrfirescience.org/resource/14889

Habitat alterations may improve and expand wildlife habitats, and bolster waning wildlife populations.

We used global positioning system (GPS) locations to monitor 38 bighorn sheep (*Ovis canadensis* Shaw) that were translocated to the Seminoe Mountains, Wyoming, USA, in 2009 and 2010, and 24 bighorns captured in 2011 to investigate...

Author(s): Justin G. Clapp, Jeffrey L. Beck

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

The integrated rangeland fire management strategy actionable science plan

www.nrfirescience.org/resource/14697

The Integrated Rangeland Fire Management Strategy (hereafter Strategy, DOI 2015) outlined the need for coordinated, science-based adaptive management to achieve long-term protection, conservation, and restoration of the sagebrush (*Artemisia* spp.) ecosystem. A key component of this management approach is the...

Author(s): Integrated Rangeland Fire Management Strategy Actionable Science Plan Team

Year Published: 2016

Type: Document

Management or Planning Document

Positive effects of fire on birds may appear only under narrow combinations of fire severity and time-since-fire

www.nrfirescience.org/resource/14642

We conducted bird surveys in 10 of the first 11 years following a mixed-severity fire in a dry, low-elevation mixed-conifer forest in western Montana, United States. By defining fire in terms of fire severity and time-since-fire, and then comparing detection rates for species inside 15 combinations of fire severity and time-since-...

Author(s): Richard L. Hutto, David A. Patterson

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Where do animals come from during post-fire population recovery? Implications for ecological and genetic patterns in post-fire landscapes

www.nrfirescience.org/resource/17232

Identifying where animals come from during population recovery can help to understand the impacts of disturbance events and regimes on species distributions and genetic diversity. Alternative recovery processes for animal populations affected by fire include external recolonization, nucleated recovery from refuges, or in situ...

Author(s): Sam C. Banks, Lachlan McBurney, David Blair, Ian D. Davies, David B. Lindenmayer

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Should scientists be required to use a model-based solution to adjust for possible distance-based detectability bias?

www.nrfirescience.org/resource/14590

The most popular method used to gain an understanding of population trends or of differences in bird abundance among land condition categories is to use information derived from point counts.

Unfortunately, various factors can affect one's ability to detect birds, and those factors need to be controlled or accounted for so that any...

Author(s): Richard L. Hutto

Year Published: 2016
Type: Document
Book or Chapter or Journal Article

Occupancy and Abundance of American Badgers and Piute Ground Squirrels in the Sagebrush-Steppe: Implications of the Fire-Cheatgrass Cycle

www.nrfirescience.org/resource/18945

Sagebrush-steppe is experiencing vast changes due to biological invasions and changing fire characteristics. Understanding how these changes influence functionally important animals is essential for ecosystem management. American Badgers (*Taxidea taxus*) are an apex predator and ecosystem engineer within sagebrush ecosystems. Piute...

Author(s): Joseph D. Holbrook, Robert S. Arkle, Kerri T. Vierling, Janet L. Rachlow, David S. Pilliod, Michelle Wiest

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/14565

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Quaking aspen in Utah: integrating recent science with management

www.nrfirescience.org/resource/15175

Quaking aspen is widely regarded as a key resource for humans, livestock, and wildlife with these values often competing with each other, leading to overuse of aspen in some locations and declines. We review trends in aspen science and management, particularly in Utah. Historically, research conducted here holds a prestigious place...

Author(s): Paul C. Rogers, Sam St. Clair

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

Transferability of habitat suitability models for nesting woodpeckers associated with wildfire

www.nrfirescience.org/resource/15000

Following wildfire, forest managers are challenged with meeting both socioeconomic demands (e.g., salvage logging) and mandates requiring habitat conservation for disturbance-associated wildlife (e.g., woodpeckers). Habitat suitability models for nesting woodpeckers can be informative, but tests of model transferability are needed...

Author(s): Quresh Latif, Victoria A. Saab, Jeff P. Hollenbeck, Jonathan G. Dudley

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

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

Indicators of climate change in Idaho: an assessment framework for coupling biophysical change and social perception

www.nrfirescience.org/resource/15637

Climate change is well documented at the global scale, but local and regional changes are not as well understood. Finer, local- to regional-scale information is needed for creating specific, place-based planning and adaptation efforts. Here the development of an indicator-focused climate change assessment in Idaho is described. This...

Author(s): P. Zion Klos

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Predicting spatial distribution of postfire debris flows and potential consequences for native trout in headwater streams

www.nrfirescience.org/resource/20530

Habitat fragmentation and degradation and invasion of nonnative species have restricted the distribution of native trout. Many trout populations are limited to headwater streams where negative effects of predicted climate change, including reduced stream flow and increased risk of catastrophic fires, may further jeopardize their...

Author(s): Edwin R. Sedell, Robert E. Gresswell, Thomas E. McMahon

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/13460

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/14527

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Temperate forest health in an era of emerging megadisturbance

www.nrfirescience.org/resource/13722

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

Using bird ecology to learn about the benefits of severe fire

www.nrfirescience.org/resource/15556

In this chapter in the book "The Ecological Importance of Mixed Severity Fires: Nature's Phoenix, the authors do not provide an encyclopedic review of the more than 450 published papers that describe some kind of effect of fire on birds. Instead, they chose to highlight underappreciated principles or lessons that emerge from...

Author(s): Richard L. Hutto, Monica L. Bond, Dominick A. DellaSala

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/15504

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

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

Year Published: 2015

Type: Document

Technical Report or White Paper

Fire effects on aquatic ecosystems: an assessment of the current state of the science

www.nrfirescience.org/resource/20528

Fire is a prevalent feature of many landscapes and has numerous and complex effects on geological, hydrological, ecological, and economic systems. In some regions, the frequency and intensity of wildfire have increased in recent years and are projected to escalate with predicted climatic and landuse changes. In addition, prescribed...

Author(s): Rebecca J. Bixby, Scott D. Cooper, Robert E. Gresswell, Lee E. Brown, Clifford N. Dahm,

Kathleen A. Dwire
Year Published: 2015
Type: Document
Book or Chapter or Journal Article

Temperate forest health in an era of emerging megadisturbance

www.nrfirescience.org/resource/13501

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

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

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

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

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

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

www.nrfirescience.org/resource/12963

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

Year Published: 2014

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/13711

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

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

Year Published: 2014

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/13623

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Forest Structure, Health, and Mortality in Two Rocky Mountain Whitebark Pine Ecosystems: Implications for Restoration

www.nrfirescience.org/resource/20067

Whitebark pine (*Pinus albicaulis* Engelm.) forests in western North America are increasingly threatened by the exotic pathogen white pine blister rust (*Cronartium ribicola* J.C. Fisch.). Whitebark pine is designated a high priority species on the candidate list of Endangered or Threatened species, spurring activity to monitor the rust...

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/18932

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/13007

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Conflicting selection from fire and seed predation drives fine-scaled phenotypic variation in a

widespread North American conifer

www.nrfirescience.org/resource/12964

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/12947

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Post-epidemic fire risk and behavior

www.nrfirescience.org/resource/13708

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

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

Year Published: 2014

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/12652

Dr. Dick Hutto, professor of Organismal Biology and Ecology at the University of Montana, took participants of the May 2014 Large Wildland Fires Conference to recently burned sites to discuss fire effects. Hutto was enthused and excited about "the magical biology" occurring on recently burned sites. Magical biology includes...

Author(s): Corey L. Gucker

Year Published: 2014

Type: Document

Research Brief or Fact Sheet

Preliminary resource vulnerability assessment

www.nrfirescience.org/resource/13409

This document is an assessment of the FS Northern Region's key water resources, tree species, wildlife species, and disturbances, which includes descriptions of the species' current condition, existing

stressors, sensitivity to and expected effects of climate changes, and adaptive capacity.

Author(s): Northern Region Adaptation Partnership

Year Published: 2014

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/17469

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

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

The role of wildfire, prescribed fire, and mountain pine beetle infestations on the population dynamics of black-backed woodpeckers in the Black Hills, South Dakota

www.nrfirescience.org/resource/18216

Wildfire and mountain pine beetle infestations are naturally occurring disturbances in western North American forests. Black-backed woodpeckers (*Picoides arcticus*) are emblematic of the role these disturbances play in creating wildlife habitat, since they are strongly associated with recently-killed forests. However, management...

Author(s): Christopher T. Rota, Joshua J. Millsaugh, Mark A. Rumble, Chad P. Lehman, Dillon C. Kesler

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Simulated western spruce budworm defoliation reduces torching and crowning potential: a sensitivity analysis using a physics-based fire model

www.nrfirescience.org/resource/16893

The widespread, native defoliator western spruce budworm (*Choristoneura occidentalis* Freeman) reduces canopy fuels, which might affect the potential for surface fires to torch (ignite the crowns of individual trees) or crown (spread between tree crowns). However, the effects of defoliation on fire behaviour are poorly understood. We...

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

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

Interactions among the mountain pine beetle, fires, and fuels

www.nrfirescience.org/resource/12022

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

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

Bentz

Year Published: 2014

Type: Document

Book or Chapter or Journal Article, Synthesis

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

www.nrfirescience.org/resource/12989

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

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

Year Published: 2014

Type: Document

Management or Planning Document

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

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

Trial by fire

www.nrfirescience.org/resource/12135

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/15420

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

Author(s): D.J. Manier, D.J.A. Wood, Z.H. Bowen, R.M. Donovan, M.J. Holloran, L.M. Juliusson, K.S.

Mayne, S.J. Oyler-McCance, F.R. Quamen, D.J. Saher, A.J. Titolo
Year Published: 2013
Type: Document
Technical Report or White Paper

Reduced ectoparasite loads of deer mice in burned forest: from fleas to trees?

www.nrfirescience.org/resource/12030

We tested whether reduced parasite loads might contribute to high post-fire abundances of deer mice (*Peromyscus maniculatus*). We performed parasite examinations of 54 mice captured in burned forest in the area of Davis Fire (western Montana, USA), and 26 mice captured in nearby unburned forest. Mean abundance of ectoparasites (fleas...

Author(s): Rafal Zwolak, S. Meagher, J. W. Vaughn, S. Dziemian, Elizabeth E. Crone

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Managing high-elevation sagebrush steppe: do conifer encroachment and prescribed fire affect habitat for pygmy rabbits?

www.nrfirescience.org/resource/11999

Both fire and conifer encroachment can markedly alter big sagebrush communities and thus habitat quality and quantity for wildlife. We investigated how conifer encroachment and spring prescribed burning affected forage and cover resources for a sagebrush specialist, the pygmy rabbit. We studied these dynamics at spring prescribed...

Author(s): Bonnie A. Woods, Janet L. Rachlow, Stephen C. Bunting, Timothy R. Johnson, Kelly Bocking

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

A technical guide for monitoring wildlife habitat

www.nrfirescience.org/resource/12383

Information about status and trend of wildlife habitat is important for the U.S. Department of Agriculture, Forest Service to accomplish its mission and meet its legal requirements. As the steward of 193 million acres (ac) of Federal land, the Forest Service needs to evaluate the status of wildlife habitat and how it compares with...

Author(s): Mary M. Rowland, Christina D. Vojta

Year Published: 2013

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/11982

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Comparing the effect of salvage logging on birds in the Mediterranean Basin and the Rocky Mountains: common patterns, different conservation implications

www.nrfirescience.org/resource/12016

Postfire salvage logging is currently a controversial issue because of the impact that the removal of snags has on ecosystem structure and function. Although it is a common practice worldwide, the absence of comparisons across regions hinders the development of broad generalizations. Here we compare bird response to postfire salvage...

Author(s): Josep Rost, Richard L. Hutto, Lluís Brotons, Pere Pons

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/11977

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

Author(s): Robert W. Gray

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Restoring habitat for the northern Idaho ground squirrel (*Urocitellus brunneus brunneus*): effects of prescribed burning on dwindling habitat

www.nrfirescience.org/resource/12137

Land use and fire exclusion have contributed to an increase in ponderosa pine (*Pinus ponderosa*) forest extent and density in west-central Idaho. Open areas within ponderosa pine forests are decreasing, thus reducing habitat for the endemic northern Idaho ground squirrel (NIDGS; *Urocitellus brunneus brunneus*). In 2000, the NIDGS was...

Author(s): E. F. Suronen, Beth A. Newingham

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Summary of science, activities, programs, and policies that influence the rangewide conservation of Greater Sage-Grouse (*Centrocercus urophasianus*)

www.nrfirescience.org/resource/20533

The Greater Sage-Grouse, has been observed, hunted, and counted for decades. The sagebrush biome, home to the Greater Sage-Grouse, includes sagebrush-steppe and Great Basin sagebrush communities, interspersed with grasslands, salt flats, badlands, mountain ranges, springs, intermittent creeks and washes, and major river systems, and...

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

Year Published: 2013

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/10662

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

Author(s): Katharine R. Stone

Year Published: 2013

Type: Document

Synthesis

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

www.nrfirescience.org/resource/13297

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

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

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Disease in a dynamic landscape: host behavior and wildfire reduce amphibian chytrid infection

www.nrfirescience.org/resource/12017

Disturbances are often expected to magnify effects of disease, but these effects may depend on the ecology, behavior, and life history of both hosts and pathogens. In many ecosystems, wildfire is the dominant natural disturbance and thus could directly or indirectly affect dynamics of many diseases. To determine how probability of...

Author(s): Blake R. Hossack, Winsor H. Lowe, Joy L. Ware, Paul S. Corn

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

Effects of ungulate herbivory on aspen, cottonwood, and willow development under forest fuels treatment regimes

www.nrfirescience.org/resource/8337

Herbivory by domestic and wild ungulates can dramatically affect vegetation structure, composition and dynamics in nearly every terrestrial ecosystem of the world. These effects are of particular concern in forests of western North America, where intensive herbivory by native and domestic ungulates has the potential to substantially...

Author(s): Bryan A. Endress, Michael J. Wisdom, Martin Vavra, Catherine G. Parks, Brian L. Dick, Bridgett J. Naylor, Jennifer M. Boyd

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8340

Extensive beetle outbreaks across western North American forests have spurred debates about how to best protect communities from wildfire. Previous work has found that fuels in the wildland-urban

interface and especially in the defensible space (40-m radius) around structures are the most important determinants of the flammability...

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Effects of bark beetle-caused tree mortality on wildfire

www.nrfirescience.org/resource/13294

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

Rapid increases and time-lagged declines in amphibian occupancy after wildfire

www.nrfirescience.org/resource/11998

Climate change is expected to increase the frequency and severity of drought and wildfire. Aquatic and moisture-sensitive species, such as amphibians, may be particularly vulnerable to these modified disturbance regimes because large wildfires often occur during extended droughts and thus may compound environmental threats. However...

Author(s): Blake R. Hossack, Winsor H. Lowe, Paul S. Corn

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8320

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

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

Year Published: 2012

Type: Document

Book or Chapter or Journal Article, Synthesis

Fire and fish: a synthesis of observation and experience

www.nrfirescience.org/resource/11271

The effects of wildfire on aquatic systems and fishes occurring in them has been linked to the direct or immediate influence of the fire on water quality and the indirect or subsequent effects on watershed characteristics and processes that influence water quality and quantity, stream channels, and aquatic biota (Gresswell 1999)....

Author(s): Bruce E. Rieman, Robert E. Gresswell, John N. Rinne

Year Published: 2012

Type: Document

Synthesis, Technical Report or White Paper

Whitebark Pine Stand Condition, Tree Abundance, and Cone Production as Predictors of Visitation by Clark's Nutcracker

www.nrfirescience.org/resource/20066

Background: Accurately quantifying key interactions between species is important for developing effective recovery strategies for threatened and endangered species. Whitebark pine (*Pinus albicaulis*), a candidate species for listing under the Endangered Species Act, depends on Clark's nutcracker (*Nucifraga columbiana*) for seed...

Author(s): L.E. Barringer, Diana F. Tomback, Michael B. Wunder, Shawn T. McKinney

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Odocoileus hemionus (mule deer)

www.nrfirescience.org/resource/10521

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

Author(s): Robin J. Innes

Year Published: 2012

Type: Document

Synthesis

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

www.nrfirescience.org/resource/11984

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

Author(s): Gail Wells

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

A new forest fire paradigm: the need for high-severity fires

www.nrfirescience.org/resource/14505

During the 2012 fire season from June through August, wildfires in the droughtstricken western and central United States burned more than 3.6 million acres of forest and shrubland. In the hot, dry, windy conditions seen that season, a single spark can start an understory fire that ascends into the...

Author(s): Monica L. Bond, Rodney B. Siegel, Richard L. Hutto, Victoria A. Saab, Stephen A. Shunk

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

Predicted fates of ground-nesting bees in soil heated by wildfire: thermal tolerances of life stages and a survey of nesting depths

www.nrfirescience.org/resource/12144

Periodic wildfire defines plant community composition and dynamics in many of the world's semi-arid biomes, whose climates and floras also favor wild bee diversity. Invasive flammable grasses,

deforestation, historical fire suppression and human ignition are increasing fire frequency and intensifying its severity, as well as...

Author(s): James H. Cane, John L. Neff

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/11894

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

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

Year Published: 2011

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/11900

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

Author(s): Robert E. Keane

Year Published: 2011

Type: Document

Conference Proceedings

Woodpecker habitat after the fire

www.nrfirescience.org/resource/13508

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

Author(s): Victoria A. Saab

Year Published: 2011

Type: Document

Research Brief or Fact Sheet

Cervus elaphus (elk)

www.nrfirescience.org/resource/10523

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

Author(s): Robin J. Innes

Year Published: 2011

Type: Document

Synthesis

Amphibian responses to wildfire in the western United States: emerging patterns from short-term studies

www.nrfirescience.org/resource/8285

The increased frequency and severity of large wildfires in the western United States is an important ecological and management issue with direct relevance to amphibian conservation. Although the knowledge of fire effects on amphibians in the region is still limited relative to most other vertebrate species, we reviewed the current...

Author(s): Blake R. Hossack, David S. Pilliod

Year Published: 2011

Type: Document

Book or Chapter or Journal Article, Synthesis

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

www.nrfirescience.org/resource/13340

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

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

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

The beauty of a burned forest

www.nrfirescience.org/resource/14506

In the Northern Rockies, forests that have escaped fire are rare. In the Crown, fire is just as important as rainfall and sunlight are to plants and animals. For the vast majority of forest types within the region, the predominant fire regime is one of infrequent, intense, stand-replacement fires—not one of...

Author(s): Richard L. Hutto

Year Published: 2011

Type: Document

Research Brief or Fact Sheet

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

www.nrfirescience.org/resource/12112

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

Author(s): Michael J. Jenkins

Year Published: 2011

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/12129

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

outbreaks, particularly in high-...

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

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Picoides arcticus (black-backed woodpecker)

www.nrfirescience.org/resource/10857

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

Author(s): Katharine R. Stone

Year Published: 2011

Type: Document

Synthesis

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

www.nrfirescience.org/resource/11895

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

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

Year Published: 2011

Type: Document

Conference Proceedings, Synthesis

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

www.nrfirescience.org/resource/8286

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

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

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Oreamnos americanus (mountain goat)

www.nrfirescience.org/resource/10522

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

Author(s): Robin J. Innes

Year Published: 2011

Type: Document

Synthesis

Effects of post-fire salvage logging on cavity-nesting birds and small mammals in southeastern Montana

www.nrfirescience.org/resource/12052

We investigated how post-fire salvage logging of Ponderosa Pine (*Pinus ponderosa*) affected populations of cavity-nesting birds and small mammals in southeastern Montana in 2004 and 2005. We examined two salvage and two control plots with three point-count stations and one small mammal trap site randomly distributed across each plot...

Author(s): William J. Kronland, Marco Restani

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Bonasa umbellus (ruffed grouse)

www.nrfirescience.org/resource/10793

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

Author(s): Rachelle Meyer

Year Published: 2011

Type: Document

Synthesis

Martes americana (American marten)

www.nrfirescience.org/resource/10856

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

Author(s): Katharine R. Stone

Year Published: 2010

Type: Document

Synthesis

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

www.nrfirescience.org/resource/8234

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

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Alces americanus (moose)

www.nrfirescience.org/resource/10524

This FEIS species review synthesizes information on the relationship of *Alces americanus* (moose) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire

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

Author(s): Robin J. Innes

Year Published: 2010

Type: Document

Synthesis

Restoring whitebark pine forests of the northern Rocky Mountains, USA

www.nrfirescience.org/resource/8394

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

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8233

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

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

Year Published: 2010

Type: Document

Book or Chapter or Journal Article, Synthesis

Fire and mice: seed predation moderates fire's influence on conifer recruitment

www.nrfirescience.org/resource/8207

In fire-adapted ecosystems, fire is presumed to be the dominant ecological force, and little is known about how consumer interactions influence forest regeneration. Here, we investigated seed predation by deer mice (*Peromyscus maniculatus*) and its effects on recruitment of ponderosa pine (*Pinus ponderosa*) and Douglas-fir (...)

Author(s): Rafal Zwolak, Dean E. Pearson, Yvette K. Ortega, Elizabeth E. Crone

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Falco peregrinus (peregrine falcon)

www.nrfirescience.org/resource/10748

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

Author(s): Peggy Luensmann

Year Published: 2010

Type: Document

Synthesis

Wildfire and management of forests and native fishes: conflict or opportunity for convergent solutions?

www.nrfirescience.org/resource/18722

Wildfire is a critical land management issue in the western United States. Efforts to mitigate the effects of altered fire regimes have led to debate over ecological restoration versus species conservation framed at the juncture of terrestrial and aquatic ecosystems and their respective management regimes. Fire-related management...

Author(s): Bruce E. Rieman, Paul F. Hessburg, Charles H. Luce, Matthew R. Dare

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

Integrated analysis for management of fire and fuels, terrestrial and aquatic - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/12111

The potential for fire to negatively impact habitat that supports a threatened or endangered species, either directly or indirectly through phenomena such as debris flows, presents resource managers with a tough choice: treat fuels to reduce the risk of fire but potentially degrade stream habitat or do not treat fuels knowing an...

Author(s): Charles H. Luce, Bruce E. Rieman, Paul F. Hessburg, Anne E. Black, Matthew R. Dare

Year Published: 2009

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/11136

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

Author(s): Daniel B. Tinker

Year Published: 2009

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/12617

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

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

Year Published: 2009

Type: Document

Synthesis, Technical Report or White Paper

Influences of postfire salvage logging on forest birds in the Eastern Cascades, Oregon, USA

www.nrfirescience.org/resource/17447

In coniferous forests of western North American, fire is an important disturbance that influences the structure and composition of floral and faunal communities. The impacts of postfire management, including salvage logging and replanting, on these forests are not well known. We compared densities and relative abundances of forest...

Author(s): Rebecca Cahall, John P. Hayes

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Nest-site selection by cavity-nesting birds in relation to postfire salvage logging

www.nrfirescience.org/resource/8383

Large wildfire events in coniferous forests of the western United States are often followed by postfire timber harvest. The long-term impacts of postfire timber harvest on fire-associated cavity-nesting bird species are not well documented. We studied nest-site selection by cavity-nesting birds over a 10-year period (1994-2003),...

Author(s): Victoria A. Saab, Robin E. Russell, Jonathan G. Dudley

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Effects of timber harvest following wildfire in western North America

www.nrfirescience.org/resource/11122

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

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

Year Published: 2009

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/10855

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

Author(s): Katharine R. Stone

Year Published: 2009

Type: Document

Synthesis

Bark beetle responses to vegetation management treatments

www.nrfirescience.org/resource/11070

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

Author(s): Joel D. McMillin, Christopher J. Fettig
Year Published: 2009
Type: Document
Conference Proceedings, Technical Report or White Paper

The effects of fire on avian communities: spatio-temporal attributes of the literature 1912-2003

www.nrfirescience.org/resource/12608

We reviewed the temporal, geographic, and biogeographic distribution, as well as relevant research and publication attributes, of 512 documents addressing the effects of fire on avian communities, to provide an assessment of the scope of this literature and recommendations for future research. We summarized relevant attributes of...

Author(s): Andreas Leidolf, John A. Bissonette
Year Published: 2009
Type: Document
Book or Chapter or Journal Article, Synthesis

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

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

Thermal characteristics of amphibian microhabitats in a fire-disturbed landscape

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

Recovery of greater sage-grouse habitat features in Wyoming big sagebrush following prescribed fire

www.nrfirescience.org/resource/12127

The ability of prescribed fire to enhance habitat features for Greater Sage-Grouse (*Centrocercus urophasianus*) in Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) in western North America is poorly understood. We evaluated recovery of habitat features important to wintering, nesting, and early brood-rearing Sage-Grouse in...

Author(s): Jeffrey L. Beck, John W. Connelly, Kerry P. Reese
Year Published: 2009
Type: Document
Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8395

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

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

Year Published: 2009

Type: Document

Book or Chapter or Journal Article

Postfire recovery of sagebrush communities: assessment using spot-5 and very large-scale aerial imagery

www.nrfirescience.org/resource/8278

Much interest lies in long-term recovery rates of sagebrush communities after fire in the western United States, as sagebrush communities comprise millions of hectares of rangelands and are an important wildlife habitat. Little is known about postfire changes in sagebrush canopy cover over time, especially at a landscape scale. We...

Author(s): Temuulen T. Sankey, Corey A. Moffet, Keith T. Weber

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Indirect effects of fire severity on avian communities in ponderosa pine and aspen forests in western North America: a review

www.nrfirescience.org/resource/8365

description

Author(s): Kerri T. Vierling, Leigh B. Lentile

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

The ecological importance of severe wildfires: some like it hot

www.nrfirescience.org/resource/8229

Many scientists and forest land managers concur that past fire suppression, grazing, and timber harvesting practices have created unnatural and unhealthy conditions in the dry, ponderosa pine forests of the western United States. Specifically, such forests are said to carry higher fuel loads and experience fires that are more severe...

Author(s): Richard L. Hutto

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Recoupling fire and aspen recruitment after wolf reintroduction in Yellowstone National Park, USA

www.nrfirescience.org/resource/8232

We report on the recent growth of upland aspen (*Populus tremuloides* Michx.) thickets in northwestern Yellowstone National Park, USA following wolf (*Canis lupus* L.) reintroduction in 1995. We compared aspen growth patterns in an area burned by the 1988 fires to aspen growth patterns in an adjacent unburned area. Elk (*Cervus elaphus* L...

Author(s): Joshua S. Halofsky, William J. Ripple, Robert L. Beschta

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

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

www.nrfirescience.org/resource/16887

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Nucifraga columbiana (Clark's nutcracker)

www.nrfirescience.org/resource/10782

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

Author(s): Nancy E. McMurray

Year Published: 2008

Type: Document

Synthesis

Fire is for the birds in northern mixed-grass prairie

www.nrfirescience.org/resource/11082

Roughly 25,000 acres of grassland in the National Wildlife Refuges of North Dakota and eastern Montana are treated every year with prescribed fire, mostly on northern mixed-grass prairie. Although this shrinking ecosystem is fire-adapted, there have been very few studies of the effects of prescribed fire on wildlife, introduced and...

Author(s): Marjie Brown

Year Published: 2008

Type: Document

Research Brief or Fact Sheet

Gulo gulo (wolverine)

www.nrfirescience.org/resource/10747

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

Author(s): Peggy Luensmann

Year Published: 2008

Type: Document

Synthesis

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

www.nrfirescience.org/resource/8239

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article, Synthesis

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

www.nrfirescience.org/resource/8224

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

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

Year Published: 2008

Type: Document

Book or Chapter or Journal Article

Burn and they will come! The western regional birds and burns study examines bird responses to prescribed fire

www.nrfirescience.org/resource/11088

Although prescribed fire is increasingly being used in ponderosa pine forests as a management tool to reduce the risk of future high-severity wildfire, its effects on wildlife habitat have rarely been examined. The Birds and Burns Network was created to assist managers in planning prescribed fire projects that will reduce fuels and...

Author(s): Jonathan Thompson

Year Published: 2008

Type: Document

Research Brief or Fact Sheet

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

www.nrfirescience.org/resource/11126

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

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

Year Published: 2007

Type: Document

Technical Report or White Paper

Rangifer tarandus (caribou)

www.nrfirescience.org/resource/10746

This FEIS species review synthesizes information on the relationship of *Rangifer tarandus* (caribou) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire

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

Author(s): Peggy Luensmann

Year Published: 2007

Type: Document

Synthesis

Mustela nigripes (black-footed ferret)

www.nrfirescience.org/resource/10903

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

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

Cynomys ludovicianus (black-tailed prairie dog)

www.nrfirescience.org/resource/10898

This FEIS species review synthesizes information on the relationship of *Cynomys ludovicianus* (black-tailed prairie dog) to fire--how fire affects the species and its habitat, effects of the species on fuels and fire regimes, and fire management considerations. Information is also provided on the species' taxonomy, distribution,...

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

Strix nebulosa (great gray owl)

www.nrfirescience.org/resource/10900

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

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document

Synthesis

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

www.nrfirescience.org/resource/15386

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

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

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Responses of western toads (*Bufo boreas*) to changes in terrestrial habitat resulting from wildfire

www.nrfirescience.org/resource/18212

Physical disturbances can play a major role in the creation and maintenance of landscape heterogeneity, ecosystem processes, and population and community dynamics. Pickett and White (1985:7) defined disturbance as "any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes..."

Author(s): C. Gregory Guscio

Year Published: 2007

Type: Document

Dissertation or Thesis

Nest densities of cavity-nesting birds in relation to postfire salvage logging and time since wildfire

www.nrfirescience.org/resource/8145

We monitored the nest densities and nest survival of seven cavity-nesting bird species, including four open-space foragers (American Kestrel [*Falco sparverius*], Lewis's Woodpecker [*Melanerpes lewis*], Western Bluebird [*Sialia mexicana*], and Mountain Bluebird [*S. currucoides*]) and three wood-foragers (Hairy Woodpecker [*Picoides*...

Author(s): Victoria A. Saab, Robin E. Russell, Jonathan G. Dudley

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/12113

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

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

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/11123

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

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

Year Published: 2007

Type: Document

Synthesis, Technical Report or White Paper

Home range size of Black-backed Woodpeckers in burned forests of southwestern Idaho

www.nrfirescience.org/resource/11416

We examined home range size of Black-backed Woodpeckers (*Picoides arcticus*) in burned ponderosa

pine (*Pinus ponderosa*) / Douglas-fir (*Pseudotsuga menziesii*) forests of southwestern Idaho during 2000 and 2002 (6 and 8 years following fire). Home range size for 4 adult males during the post-fledging period was 115.6-420.9 ha using the...

Author(s): Jonathan G. Dudley, Victoria A. Saab

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Understanding the influence of local and landscape conditions on the occurrence and abundance of Black-backed Woodpeckers in burned forest patches

www.nrfirescience.org/resource/15635

Wildfire is the predominant disturbance agent in the Northern Rockies. The nearly annual occurrence of wildfire at some point in a larger landscape has served as the environmental backdrop against which our native wildlife species have evolved. A number of native species have, in fact, become dependent on wildfires or wildfire-...

Author(s): Richard L. Hutto, Deborah Austin, Sallie Hejl

Year Published: 2007

Type: Document

Technical Report or White Paper

Habitat suitability models for cavity-nesting birds in a postfire landscape

www.nrfirescience.org/resource/11411

Models of habitat suitability in postfire landscapes are needed by land managers to make timely decisions regarding postfire timber harvest and other management activities. Many species of cavity-nesting birds are dependent on postfire landscapes for breeding and other aspects of their life history and are responsive to postfire...

Author(s): Robin E. Russell, Victoria A. Saab, Jonathan G. Dudley

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

Do high-density patches of coarse wood and regenerating saplings create browsing refugia for aspen (*Populus tremuloides*) in Yellowstone National Park (USA)?

www.nrfirescience.org/resource/13546

Following the extensive 1988 fires in Yellowstone, a mosaic of high-density patches of fallen logs and regenerating lodgepole pine (*Pinus contorta* var. *latifolia* Engelm. ex Wats.) saplings developed in the landscape. Such patches could potentially provide browsing refugia for post-fire aspen (*Populus tremuloides* Michx.)...

Author(s): James D. Forester, Dean P. Anderson, Monica G. Turner

Year Published: 2007

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/10902

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

Author(s): Elena D. Ulev

Year Published: 2007

Type: Document
Synthesis

Lynx canadensis (Canada lynx)

www.nrfirescience.org/resource/10897

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

Author(s): Elena D. Ulev
Year Published: 2007
Type: Document
Synthesis

Martes pennanti (fisher)

www.nrfirescience.org/resource/10796

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

Author(s): Rachelle Meyer
Year Published: 2007
Type: Document
Synthesis

Responses of pond-breeding amphibians to wildfire: short-term patterns in occupancy and colonization

www.nrfirescience.org/resource/8249

Wildland fires are expected to become more frequent and severe in many ecosystems, potentially posing a threat to many sensitive species. We evaluated the effects of a large, stand-replacement wildfire on three species of pond-breeding amphibians by estimating changes in occupancy of breeding sites during the three years before and...

Author(s): Blake R. Hossack, Paul S. Corn
Year Published: 2007
Type: Document
Book or Chapter or Journal Article

Changes in downed wood and forest structure after prescribed fire in ponderosa pine forests

www.nrfirescience.org/resource/11002

Most prescribed fire plans focus on reducing wildfire hazards with little consideration given to effects on wildlife populations and their habitats. To evaluate effectiveness of prescribed burning in reducing fuels and to assess effects of fuels reduction on wildlife, we began a large-scale study known as the Birds and Burns Network...

Author(s): Victoria A. Saab, Lisa Bate, John F. Lehmkuhl, Brett G. Dickson, Scott Story, Stephanie Jentsch, William M. Block
Year Published: 2006
Type: Document
Conference Proceedings

Wildlife and invertebrate response to fuel reduction treatments in dry coniferous forests of the

Western United States: a synthesis

www.nrfirescience.org/resource/11192

This paper synthesizes available information on the effects of hazardous fuel reduction treatments on terrestrial wildlife and invertebrates in dry coniferous forest types in the West. We focused on thinning and/or prescribed fire studies in ponderosa pine (*Pinus ponderosa*) and dry-type Douglas-fir (*Pseudotsuga menziesii*), lodgepole...

Author(s): David S. Pilliod, Evelyn L. Bull, Jane L. Hayes, Barbara C. Wales

Year Published: 2006

Type: Document

Synthesis, Technical Report or White Paper

Perisoreus canadensis (gray jay)

www.nrfirescience.org/resource/10901

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

Author(s): Elena D. Ulev

Year Published: 2006

Type: Document

Synthesis

Snag longevity in relation to wildfire and postfire salvage logging

www.nrfirescience.org/resource/8142

Snags create nesting, foraging, and roosting habitat for a variety of wildlife species. Removal of snags through postfire salvage logging reduces the densities and size classes of snags remaining after wildfire. We determined important variables associated with annual persistence rates (the probability a snag remains standing from 1...

Author(s): Robin E. Russell, Victoria A. Saab, Jonathan G. Dudley, Jay J. Rotella

Year Published: 2006

Type: Document

Book or Chapter or Journal Article

Piranga ludoviciana (western tanager)

www.nrfirescience.org/resource/10795

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

Author(s): Rachelle Meyer

Year Published: 2006

Type: Document

Synthesis

The effects of postfire salvage logging on cavity-nesting birds

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

Patagioenas fasciata (band-tailed pigeon)

www.nrfirescience.org/resource/10896

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

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

Gymnorhinus cyanocephalus (pinyon jay)

www.nrfirescience.org/resource/10904

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

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

Toward meaningful snag-management guidelines for postfire salvage logging in North American conifer forests

www.nrfirescience.org/resource/14507

The bird species in western North America that are most restricted to, and therefore most dependent on, severely burned conifer forests during the first years following a fire event depend heavily on the abundant standing snags for perch sites, nest sites, and food resources. Thus, it is critical to develop and apply appropriate...

Author(s): Richard L. Hutto
Year Published: 2006
Type: Document
Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8120

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

Author(s): Thomas J. Parker, Karen M. Clancy, Robert L. Mathiasen
Year Published: 2006
Type: Document
Book or Chapter or Journal Article, Synthesis

Developing statistical wildlife habitat relationships for assessing cumulative effects of fuels treatments - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11160

The primary weakness in our current ability to evaluate future landscapes in terms of wildlife lies in the lack of quantitative models linking wildlife to forest stand conditions, including fuels treatments. This project focuses on 1) developing statistical wildlife habitat relationships models (WHR) utilizing Forest Inventory and...

Author(s): Samuel A. Cushman, Kevin S. McKelvey

Year Published: 2006

Type: Document

Technical Report or White Paper

Fire on the mountain: birds and burns in the Rocky Mountains

www.nrfirescience.org/resource/14591

Here we review the current state of knowledge about past fire regimes and how they have been altered by human activities. We also highlight the limited information on how avian communities respond to fire. We conclude with implications for fire management programs in the Rocky Mountains. See Kotliar et al. (...)

Author(s): Natasha B. Kotliar, Victoria A. Saab, Richard L. Hutto

Year Published: 2005

Type: Document

Technical Report or White Paper

The response of mammals to forest fire and timber harvest in the North American boreal forest

www.nrfirescience.org/resource/18219

1. This paper reviews and compares the effects of forest fire and timber harvest on mammalian abundance and diversity, throughout successional time in the boreal forest of North America. 2. Temporal trends in mammal abundance and diversity are generally similar for both harvested and burned stands, with some differences occurring...

Author(s): Jason T. Fisher, Lisa Wilkinson

Year Published: 2005

Type: Document

Book or Chapter or Journal Article

Prescribed fire for fuel reduction in northern mixed-grass prairie: influence on habitat and population dynamics of indigenous wildlife - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11171

Prescribed fire is used increasingly to reduce accumulated fuels on National Wildlife Refuges (NWRs) and other reserves in the mixed-grass prairie region of the northern Great Plains. There is sparse documentation, however, on effects of prescribed fire on habitat and population dynamics of wildlife in the region. This multi-...

Author(s): Robert K. Murphy, Todd A. Grant, Elizabeth M. Madden

Year Published: 2005

Type: Document

Technical Report or White Paper

Prescribed fire strategies to restore wildlife habitat in ponderosa pine forests of the intermountain west (birds and burns network) - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11400

The goal of this project was to help evaluate the effectiveness of prescribed fire in reducing fuels, and to assess the effects of fuel reduction on habitats and populations of birds in ponderosa pine forests

throughout the Interior West. Known as the Birds and Burns Network, we have study areas located on National Forest and The...

Author(s): Victoria A. Saab, William M. Block

Year Published: 2005

Type: Document

Technical Report or White Paper

Effects of prescribed and wildland fire on aquatic ecosystems in western forests - Final Report to the Joint Fire Science Program

www.nrfirescience.org/resource/11161

The goal of the project is to understand how fire in upland and riparian forests influence stream communities and whether prescription burning mimics the ecological function of fire in a watershed. The project has two components: wildland fire and prescribed fire. To document the range of biotic and abiotic responses to wildland...

Author(s): David S. Pilliod, R. Bruce Bury, Paul S. Corn

Year Published: 2005

Type: Document

Technical Report or White Paper

Wildfire, channel disturbance, and stream temperature: spatio-temporal patterns and associations with the distribution of fish and amphibians in central Idaho

www.nrfirescience.org/resource/8407

Temperature is a critical factor in stream ecosystems, and one that is very likely to be altered by wildfire and associated channel disturbance. In central Idaho streams, temperatures after wildfires may increase following loss of shade from riparian vegetation, and changes in channel structure that increase exposure to solar...

Author(s): Jason B. Dunham, Charles H. Luce, Amanda E. Rosenberger, B. Gutierrez-Teira, David E. Nagel, Bruce E. Rieman

Year Published: 2005

Type: Document

Conference Proceedings

Home range size and foraging habitat of Black-backed Woodpeckers

www.nrfirescience.org/resource/11417

We examined home range size of Black-backed Woodpeckers (*Picoides arcticus*) in burned ponderosa pine (*Pinus ponderosa*) / Douglas-fir (*Pseudotsuga menziesii*) forests of southwestern Idaho during 2000 and 2002 (6 and 8 years following fire). Home range size for 4 adult males during the post-fledging period was 115.6-420.9 ha using the...

Author(s): Jonathan G. Dudley

Year Published: 2005

Type: Document

Dissertation or Thesis

Effective management strategies for sage-grouse and sagebrush: a question of triage?

www.nrfirescience.org/resource/8367

The sagebrush (*Artemisia* spp.) ecosystem once occupied over 150 million acres of western North America (Barbour and Billings 1988). The ecosystem still occupies over 100 million acres (Connelly et al. 2004, Wisdom et al. 2005), but the abundance and condition of sagebrush communities is declining rapidly in response to a variety of...

Author(s): Michael J. Wisdom, Mary M. Rowland, Robin J. Tausch

Year Published: 2005

Type: Document
Book or Chapter or Journal Article

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

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

The role of fire in structuring sagebrush habitats and bird communities

www.nrfirescience.org/resource/15408

Fire is a dominant and highly visible disturbance in sagebrush (*Artemisia* spp.) ecosystems. In lower elevation, xeric sagebrush communities, the role of fire has changed in recent decades from an infrequent disturbance maintaining a landscape mosaic and facilitating community processes to frequent events that alter sagebrush...

Author(s): Steve Knick, Aaron L. Holmes, Richard F. Miller

Year Published: 2005

Type: Document
Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8144

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

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

Year Published: 2005

Type: Document
Book or Chapter or Journal Article, Synthesis

Five-year operational trial of verbenone to deter mountain pine beetle (*Dendroctonus ponderosae*; Coleoptera: Scolytidae) attack of lodgepole pine (*Pinus contorta*)

www.nrfirescience.org/resource/11410

The antiaggregation pheromone verbenone was operationally tested for 5 yr to deter mass attack by the mountain pine beetle on lodgepole pine in campgrounds and administrative areas surrounding Redfish and Little Redfish Lakes at the Sawtooth National Recreation Area in central Idaho. Each year, five-gram verbenone pouches were...

Author(s): Robert Progar

Year Published: 2005

Type: Document
Book or Chapter or Journal Article

Sage-grouse habitat restoration symposium proceedings

www.nrfirescience.org/resource/11007

Declines in habitat of greater sage-grouse and Gunnison sage-grouse across the western United States are related to degradation, loss, and fragmentation of sagebrush ecosystems resulting from development of agricultural lands, grazing practices, changes in wildfire regimes, increased spread of invasive species, gas and oil...

Author(s): Nancy L. Shaw, Michael L. Pellant, Stephen B. Monsen

Year Published: 2005

Type: Document

Conference Proceedings

Incorporating wildlife habitat needs into restoration and rehabilitation projects

www.nrfirescience.org/resource/11119

Description not entered

Author(s): Richard Stevens

Year Published: 2004

Type: Document

Technical Report or White Paper

Forbs for seeding range and wildlife habitats

www.nrfirescience.org/resource/11120

Description not entered

Author(s): Richard Stevens, Stephen B. Monsen

Year Published: 2004

Type: Document

Technical Report or White Paper

Lewis's Woodpecker (*Melanerpes lewis*): a technical conservation assessment

www.nrfirescience.org/resource/11498

Lewis's woodpecker (*Melanerpes lewis*) is a locally common but patchily distributed woodpecker species usually seen in open forests of western North America. The combination of its sporadic distribution, its diet of adult-stage free-living insects (primarily aerial), its preference to nest in burned landscapes, and its variable...

Author(s): Stephen C. Abele, Victoria A. Saab, Edward O. Garton

Year Published: 2004

Type: Document

Technical Report or White Paper

Factors influencing occupancy of nest cavities in recently burned forests

www.nrfirescience.org/resource/8143

Recently burned forests in western North America provide nesting habitat for many species of cavity-nesting birds. However, little is understood about the time frame and the variables affecting occupancy of postfire habitats by these birds. We studied factors influencing the occupancy and reuse of nest cavities from 1-7 years after...

Author(s): Victoria A. Saab, Jonathan G. Dudley, William L. Thompson

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

Fuels planning: science synthesis and integration; environmental consequences fact sheet 4: wildlife responses to fuels treatments: key considerations

www.nrfirescience.org/resource/14942

Managers face a difficult task in predicting the effects of fuels treatments on wildlife populations, mostly because information on how animals respond to fuels treatments is scarce or does not exist. This paper discusses key considerations-aspects of an animal's ecology and available information-that, despite the scarcity of...

Author(s): David S. Pilliod

Year Published: 2004

Type: Document

Research Brief or Fact Sheet

Effects of fire on fish populations: landscape perspectives on persistence of native fishes and non-native fish invasions

www.nrfirescience.org/resource/18537

Our limited understanding of the short and long-term effects of fire on fish contributes to considerable uncertainty in assessments of the risks and benefits of fire management alternatives. A primary concern among the many potential effects of fire is the effects of fire and fire management on persistence of native fish populations...

Author(s): Jason B. Dunham, Michael K. Young, Robert E. Gresswell, Bruce E. Rieman

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

Effects of thinning and prescribed burning on birds and small mammals

www.nrfirescience.org/resource/11504

Land management agencies are restoring ponderosa pine forests and reducing fuel loads by thinning followed by prescribed burning. However, little is known about how this combination of treatments will affect local wildlife. In this study, I focus on the following short-term wildlife responses: 1) differences in avian and small-...

Author(s): Jennifer Woolf

Year Published: 2003

Type: Document

Dissertation or Thesis

Fire and amphibians in North America

www.nrfirescience.org/resource/16476

Information on amphibian responses to fire and fuel reduction practices is critically needed due to potential declines of species and the prevalence of new, more intensive fire management practices in North American forests. The goals of this review are to summarize the known and potential effects of fire and fuels management on...

Author(s): David S. Pilliod, R. Bruce Bury, Erin J. Hyde, Christopher A. Pearl, Paul S. Corn

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8131

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

Author(s): Bruce E. Rieman, Danny C. Lee, Denver P. Burns, Robert E. Gresswell, Michael K. Young,

Rick Stowell, John N. Rinne, Phil Howell
Year Published: 2003
Type: Document
Book or Chapter or Journal Article, Synthesis

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

www.nrfirescience.org/resource/11187

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

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

Year Published: 2002

Type: Document

Synthesis, Technical Report or White Paper

Bird counts of burned versus unburned big sagebrush sites

www.nrfirescience.org/resource/11090

Burned-over big sagebrush sites dominated by perennial grasses supported fewer species of birds and fewer total number of birds than sites of unburned big sagebrush sites.

Author(s): Bruce L. Welch

Year Published: 2002

Type: Document

Research Brief or Fact Sheet

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

www.nrfirescience.org/resource/7956

Description not entered

Author(s): Natasha B. Kotliar, Sallie Hejl, Richard L. Hutton, Victoria A. Saab, C. P. Melcher, Mary E. McFadzen

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

Frogs flee from the sound of fire

www.nrfirescience.org/resource/18555

Fire has an important role in the sensory ecology of many animals. Using acoustic cues to detect approaching fires may give slow-moving animals a head start when fleeing from fires. We report that aestivating juvenile reed frogs (*Hyperolius nitidulus*) respond to playbacks of the sound of fire by fleeing in the direction of...

Author(s): T. Ulmar Grafe, Stefanie Dobler, K. Eduard Linsenmair

Year Published: 2002

Type: Document

Book or Chapter or Journal Article

Selection of fire-created snags at two spatial scales by cavity-nesting birds

www.nrfirescience.org/resource/11198

We examined the use of snag stands by seven species of cavity-nesting birds from 1994-1998.

Selection of snags was studied in logged and unlogged burned forests at two spatial scales: microhabitat (local vegetation characteristics) and landscape (composition and patterning of surrounding vegetation types). We modeled nest occurrence...

Author(s): Victoria A. Saab, Ree Brannon, Jonathan G. Dudley, Larry Donohoo, Dave Vanderzanden, Vicky Johnson, Henry Lachowski

Year Published: 2002

Type: Document

Technical Report or White Paper

Conservation of greater sage-grouse on public lands in the Western U.S.: implications of recovery and management policies

www.nrfirescience.org/resource/11076

The role of the Policy Analysis Center for Western Public Lands is to provide integrated social, economic and ecological analyses of public land policies that affect communities in the West. Its mission is to help rural communities, policy makers, resource managers, resource users and others understand, analyze and engage...

Author(s): Carl L. Wambolt, Aaron J. Harp, Bruce L. Welch, Nancy L. Shaw, John W. Connelly, Kerry P. Reese, Clait E. Braun, Donald A. Klebenow, E. Durant McArthur, James G. Thompson, L. Allen Torell, John A. Tanaka

Year Published: 2002

Type: Document

Management or Planning Document

Response of the Cache Creek macroinvertebrates during the first 10 years following disturbance by the 1988 Yellowstone wildfires

www.nrfirescience.org/resource/18604

We evaluated the effects of disturbance on stream benthic macroinvertebrates at the ecological scales of time, stream size, and burn extent in six segments of Cache Creek over the first 10 postfire years. Postfire changes in macroinvertebrate taxa richness, density, and dominant taxa in the burn streams were significantly different...

Author(s): G. Wayne Minshall, Todd V. Royer, Christopher T. Robinson

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Reproductive success of Lewis's woodpecker in burned pine and cottonwood riparian forests

www.nrfirescience.org/resource/11418

Lewis's Woodpecker (*Melanerpes lewis*) has been characterized as a "burn specialist" because of its preference for nesting within burned pine forests. No prior study, however, has demonstrated the relative importance of crown-burned forests to this woodpecker species by examining its reproductive success in different forest types. We...

Author(s): Victoria A. Saab, Kerri T. Vierling

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Ghost forests, global warming, and the mountain pine beetle (Coleoptera: Scolytidae)

www.nrfirescience.org/resource/19322

The mountain pine beetle, *Dendroctonus ponderosae* Hopkins, is a significant ecological force at the landscape level. The majority of the life cycle is spent as larvae feeding in the phloem tissue (inner bark) of host pine trees. This feeding activity eventually girdles and kills successfully attacked trees

(Amman and Cole 1983,...

Author(s): Jesse A. Logan, James A. Powell

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

The management of insects, diseases, fire, and grazing and implications for terrestrial vertebrates using riparian habitats in eastern Oregon and Washinton

www.nrfirescience.org/resource/18683

Riparian habitats in eastern Oregon and Washington compose a small percentage of the landscape, and yet these habitats are essential for many species of vertebrates. Riparian areas are sensitive to disturbance agents, which can pose a formidable challenge to effective management of these habitats. Moreover, few studies have...

Author(s): Barbara C. Wales

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/8185

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

Author(s): Diana F. Tomback, Angela J. Anderies, Katherine S. Carsey, Mary L. Powell, Sabine Mellmann-Brown

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Catastrophic wildfire and number of populations as factors influencing risk of extinction for Gila trout (*Onchorhynchus gilae*)

www.nrfirescience.org/resource/18501

We used the computer program RAMAS to explore the sensitivity of an extinction-risk model for the Gila trout (*Oncorhynchus gibe*) to management of wildfires and number of populations of the species. The Gila trout is an endangered salmonid presently restricted to very few headwaters of the Gila and San Francisco river tributaries in...

Author(s): D. K. Brown, A. A. Echelle, D. L. Propst, J. E. Brooks, W. L. Fisher

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Aspen response to prescribed fire and wild ungulate herbivory

www.nrfirescience.org/resource/12104

Land management agencies in northwest Wyoming have implemented an active prescribed fire program to address historically altered fire regimes, regenerate aspen, and improve overall watershed functions. Treated clones are susceptible to extensive browsing from elk concentrated on supplemental feedgrounds and from wintering moose....

Author(s): Steve Kilpatrick, Diane Abendroth

Year Published: 2001

Type: Document
Conference Proceedings

Effects of stand-replacement fire and salvage logging on a cavity-nesting bird community in eastern Cascades, Washington

www.nrfirescience.org/resource/17449

We monitored the response of cavity-nesting species to three snag density treatments (high = 37-80 snags/ha, medium = 15-35 snags/ha, and low = 0-12 snags/ha) during two breeding seasons 4-5 yr post-fire and logging in Douglas-fir- ponderosa pine forests in the eastern Cascades, Washington. Snag surveys were used to describe habitat...

Author(s): Maryellen Haggard, William L. Gaines

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Water quality substratum and biotic responses of five central Idaho (USA) streams during the first year following the Mortar Creek fire

www.nrfirescience.org/resource/18606

The Mortar Creek Fire burned 26 000 ha of mixed-conifer Rocky Mountain forest in July-August 1979. Changes in burn stream conditions were examined relative to reference streams for various ecological factors on two to six occasions, from October 1979 to August 1980. Factors included major ions and nutrients, suspended and benthic...

Author(s): G. Wayne Minshall, James T. Brock, Douglas A. Andrews, Christopher T. Robinson

Year Published: 2001

Type: Document

Book or Chapter or Journal Article

Toward an integrated classification of ecosystems: defining opportunities for managing fish and forest health

www.nrfirescience.org/resource/18639

Many of the aquatic and terrestrial ecosystems of the Pacific Northwest United States have been simplified and degraded in part through past land-management activities. Recent listings of fishes under the Endangered Species Act and major new initiatives for the restoration of forest health have precipitated contentious debate among...

Author(s): Bruce E. Rieman, Paul F. Hessburg, Danny C. Lee, Russell F. Thurow, James R. Sedell

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Chapter 1: Introduction to wildland fire in ecosystems: effects of fire on fauna

www.nrfirescience.org/resource/12603

Fires affect animals mainly through effects on their habitat. Fires often cause short-term increases in wildlife foods that contribute to increases in populations of some animals. These increases are moderated by the animals' ability to thrive in the altered, often simplified, structure of the postfire environment. The extent of...

Author(s): Jack L. Lyon, James K. Brown, Mark H. Huff, Jane Kapler Smith

Year Published: 2000

Type: Document

Technical Report or White Paper

Acute toxicity of fire-control chemicals, nitrogenous chemicals, and surfactants to rainbow trout

www.nrfirescience.org/resource/18506

Laboratory studies were conducted to determine the acute toxicity of three ammonia-based fire retardants (Fire-Trol LCA-F, Fire-Trol LCM-R, and Phos-Chek 259F), five surfactant-based fire-suppressant foams (FireFoam 103B, FireFoam 104, Fire Quench, ForExpan S, and Pyrocap B-136), three nitrogenous chemicals (ammonia, nitrate, and...

Author(s): Kevin J. Buhl, Steven J. Hamilton

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Wildlife habitat considerations

www.nrfirescience.org/resource/11034

Fire, insects, disease, harvesting, and precommercial thinning all create mosaics on Northern Rocky Mountain landscapes. These mosaics are important for faunal habitat. Consequently, changes such as created openings or an increase in heavily stocked areas affect the water, cover, and food of forest habitats. The 'no action'...

Author(s): Helen Y. Smith

Year Published: 2000

Type: Document

Conference Proceedings

Associated riparian communities

www.nrfirescience.org/resource/10962

Some 100 years of fire exclusion in the Interior Northwest has resulted in riparian areas dominated by dense thickets of shade-tolerant trees. If former, more open conditions could be restored, these habitats could once more support a more diverse bird community. Efforts toward this at two study sites are described.

Author(s): Colin C. Hardy, Robert E. Keane, Michael G. Harrington

Year Published: 2000

Type: Document

Conference Proceedings

Guidelines to manage sage grouse populations and their habitats

www.nrfirescience.org/resource/15385

The status of sage grouse populations and habitats has been a concern to sportsmen and biologists for >80 years. Despite management and research efforts that date to the 1930s, breeding populations of this species have declined throughout much of its range. In May 1999, the western sage grouse (*C. urophasianus phaios*) in...

Author(s): John W. Connelly, Michael A. Schroeder, Alan R. Sands, Clait E. Braun

Year Published: 2000

Type: Document

Management or Planning Document

Wildland fire in ecosystems: effects of fire on fauna

www.nrfirescience.org/resource/12584

Fires affect animals mainly through effects on their habitat. Fires often cause short-term increases in wildlife foods that contribute to increases in populations of some animals. These increases are moderated by the animals' ability to thrive in the altered, often simplified, structure of the postfire environment. The extent of...

Year Published: 2000

Type: Document
Technical Report or White Paper

Long-term effects of fire on sage grouse habitat

www.nrfirescience.org/resource/11456

This study documented the long-term (>10 years) impact of fire on sage grouse (*Centrocercus urophasianus* Bonaparte) nesting and brood-rearing habitats on the Upper Snake River Plain in southeastern Idaho.

Author(s): Pamela J. Nelle, Kerry P. Reese, John W. Connelly

Year Published: 2000

Type: Document

Book or Chapter or Journal Article

Prescribed fire effects on herpetofauna: review and management implications

www.nrfirescience.org/resource/18650

Prescribed burning is used to achieve a variety of silvicultural objectives, including controlling heavy fuel accumulation, exposing mineral soil, releasing available nutrients for seedbed preparation, and controlling certain insects, diseases, and competing vegetation (Hunter 1990, Pyne et al. 1996).

Prescribed burning also is an...

Author(s): Kevin R. Russell, David H. Van Lear, David C. Guynn, Jr.

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Prescribed fire effects on biological control of leafy spurge

www.nrfirescience.org/resource/8282

The flea beetle, *Aphthona nigricutis* Foudras, is a potentially useful agent for biological control of leafy spurge (*Euphorbia esula* L.) in grasslands devoted to wildlife conservation. However, effects of other grassland management practices on the persistence and dynamics of flea beetle populations are not well understood. We...

Author(s): David P. Fellows, Wesley E. Newton

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Birds in a sagebrush sea: Managing sagebrush habitat for bird communities

www.nrfirescience.org/resource/15329

This booklet presents land management recommendations to help bird communities in sagebrush habitats. It was prepared for the Western Working Group of Partners in Flight, a partnership of private citizens, industry groups, government agencies, universities, nongovernment organizations, and others interested in bird conservation. Why...

Author(s): Christine Paige, Sharon Ritter

Year Published: 1999

Type: Document

Management or Planning Document

Forest fire's influence on yellow hedysarum habitat and its use by grizzly bears in Banff National Park, Alberta

www.nrfirescience.org/resource/18221

Hedysarum (*Hedysarum* spp.) roots are a primary food of grizzly bears (*Ursus arctos*) in the Front

Ranges of the Canadian Rocky Mountains. I studied the effects of recent forest fire on yellow hedsarum (*H. sulphurescens*) habitat by comparing root density, mass, fibre content, ease of digging, and use by grizzly bears in and adjacent...

Author(s): David Hamer

Year Published: 1999

Type: Document

Book or Chapter or Journal Article

Responses of cavity-nesting birds to stand-replacement fire and salvage logging in ponderosa pine/douglas-fir forests of southwestern Idaho

www.nrfirescience.org/resource/11413

From 1994 to 1996, researchers monitored 695 nests of nine cavity-nesting bird species and measured vegetation at nest sites and at 90 randomly located sites in burned ponderosa pine forests of southwestern Idaho. Site treatments included two types of salvage logging, and unlogged controls. All bird species selected nest sites with...

Author(s): Victoria A. Saab, Jonathan G. Dudley

Year Published: 1998

Type: Document

Technical Report or White Paper

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

www.nrfirescience.org/resource/11505

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

Author(s): Donald Godtel

Year Published: 1998

Type: Document

Management or Planning Document

Acute toxicity of fire-retardant and foam-suppressant chemicals to early life stages of chinook salmon (*Oncorhynchus tshawytscha*)

www.nrfirescience.org/resource/18505

Laboratory studies were conducted to determine the acute toxicity of three fire retardants (Fire-Trol GTS-R, Fire-Trol LCG-R, and Phos-Chek D75-F), and two fire-suppressant foams (Phos-Chek WD-881 and Ansul Silv-Ex) to early life stages of chinook salmon, *Oncorhynchus tshawytscha*, in hard and soft water....

Author(s): Kevin J. Buhl, Steven J. Hamilton

Year Published: 1998

Type: Document

Book or Chapter or Journal Article

***Ambystoma macrodactylum* (long-toed salamander)**

www.nrfirescience.org/resource/10732

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

Author(s): Janet L. Howard

Year Published: 1997

Type: Document
Synthesis

Fire and fish: fish habitat attributes of watersheds with pulse and press disturbance patterns

www.nrfirescience.org/resource/18528

The native salmonids of the Idaho Panhandle National Forests, bull chaff (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarki lewisii*) evolved with natural pulse disturbances of which the most common were fire and flood. These fish are indicator species in the Forest Plan, listed as sensitive species by Region...

Author(s): D. Cross

Year Published: 1997

Type: Document

Conference Proceedings

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

www.nrfirescience.org/resource/8129

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

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

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Postfire responses of lotic ecosystems in Yellowstone National Park, U.S.A.

www.nrfirescience.org/resource/18607

Wildfire is a major large-scale disturbance affecting terrestrial landscapes and lotic ecosystems in many regions of the world. We examined environmental and biological responses of 20 streams in Yellowstone National Park, U.S.A., over 5 years following extensive wildfires in 1988. Streams of burned catchments displayed increases in...

Author(s): G. Wayne Minshall, Christopher T. Robinson, Deron E. Lawrence

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Acute toxicity of fire-retardant and foam-suppressant chemicals to *Hyalella azteca* (Saussure)

www.nrfirescience.org/resource/18595

Acute toxicity tests were conducted with *Hyalella azteca* Saussure (an amphipod) exposed in soft and hard waters to three fire retardants (Fire?Trol GTS?R, Fire?Trol LCG?R, and Phos?Chek D75?F) and two foam suppressants (Phos?Chek WD?881 and Silv?Ex). The chemicals were slightly to moderately toxic to amphipods. The...

Author(s): S. F. McDonald, Steven J. Hamilton, Kevin J. Buhl, James F. Heisinger

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Timber-management and natural-disturbance effects on moose habitat: Landscape

www.nrfirescience.org/resource/18228

We used 16 years of survey data for a moose population, and 3 Landsat satellite scenes, 19 years, to

evaluate the hypotheses that Ontario's Moose Habitat Guidelines for timber harvest: (1) the effects of unmodified clearcuts on moose populations, and (2) create enhanced habitat with greater interspersion of forage with cover and...

Author(s): Robert S. Rempel, Philip C. Elkie, Arthur R. Rodgers, Michael J. Gluck

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Does wildfire threaten extinction for salmonids? responses of redband trout and bull trout following recent large fires on the Boise National Forest

www.nrfirescience.org/resource/18641

From the introduction... "The magnitude and intensity of recent fires heighten concerns regarding forest/ecosystem health, the potential loss of valuable wood fiber and private property, and the apparent threat to sensitive species. Such concerns have galvanized new efforts to reduce fuel loads and stand densities through mechanical...

Author(s): Bruce E. Rieman, Danny C. Lee, Gwynne L. Chandler, Deborah Myers

Year Published: 1997

Type: Document

Conference Proceedings

Fire and fish: issues of forest health and conservation of sensitive species

www.nrfirescience.org/resource/18636

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

Author(s): Bruce E. Rieman, James L. Clayton

Year Published: 1997

Type: Document

Book or Chapter or Journal Article

Acute toxicity of fire control chemicals to *Daphnia magna* (Straus) and *Selenastrum capricornutum* (Printz)

www.nrfirescience.org/resource/18594

Acute toxicity tests were conducted exposing *Daphnia magna* Straus (daphnid) in soft and hard reconstituted waters (hardness 42 and 162 mg/liter as CaCO₃, respectively), and *Selenastrum capricornutum* Printz (algae) in ASTM algal assay medium (hardness 15 mg/liter as CaCO₃) to fire retardants Fire-Trol GTS-R, Fire-Trol LCG-R, and Phos...

Author(s): S. F. McDonald, Steven J. Hamilton, Kevin J. Buhl, James F. Heisinger

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

***Microtus pennsylvanicus* (meadow vole)**

www.nrfirescience.org/resource/10514

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

Author(s): Janet Sullivan

Year Published: 1996

Type: Document
Synthesis

Scophiopus intermontanus (Great Basin spadefoot)

www.nrfirescience.org/resource/10713

This FEIS species review synthesizes information on the relationship of *Scophiopus intermontanus* (Great Basin spadefoot) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Whitebark pine ecosystem restoration in western Montana

www.nrfirescience.org/resource/11251

From the Background... 'A rapid decline in whitebark pine has occurred during the last 60 years as a result of three interrelated factors: epidemics of mountain pine beetle (*Dendroctonus ponderosae*); the introduced disease white pine blister rust (*Cronartium ribicola*); and successional replacement by shade-tolerant conifers,...

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

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Spermophilus townsendii (Townsend's ground squirrel)

www.nrfirescience.org/resource/10711

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

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Acute toxicity of three fire-retardant and two fire-suppressant foam formulations to the early life stages of rainbow trout (*Oncorhynchus mykiss*)

www.nrfirescience.org/resource/18545

Laboratory studies were conducted with five early life stages of rainbow trout, *Oncorhynchus mykiss*, to determine the acute toxicities of five fire-fighting chemical formulations in standardized soft and hard water. Eyed egg, embryo-larvae, swim-up fry, and 60- and 90-day posthatch juveniles were exposed to three fire...

Author(s): M. P. Gaikowski, Steven J. Hamilton, Kevin J. Buhl, S. F. McDonald, C. H. Summers

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

An investigation on fire effects within xeric sage grouse brood habitat

www.nrfirescience.org/resource/11457

We investigated the short-term influence of fire on xeric sage grouse (*Centrocercus urophasianus* Bonaparte) brood habitat in southeastern Idaho from 1990-92.

Author(s): Richard A. Fischer, Kerry P. Reese, John W. Connelly

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Taxidea taxus (American badger)

www.nrfirescience.org/resource/10507

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

Author(s): Janet Sullivan

Year Published: 1996

Type: Document

Synthesis

Mustela vison (American mink)

www.nrfirescience.org/resource/10513

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

Author(s): Janet Sullivan

Year Published: 1996

Type: Document

Synthesis

Perognathus parvus (Great Basin pocket mouse)

www.nrfirescience.org/resource/10719

This FEIS species review synthesizes information on the relationship of *Perognathus parvus* (Great Basin pocket mouse) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Athene cunicularia (burrowing owl)

www.nrfirescience.org/resource/10726

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

Author(s): Janet L. Howard

Year Published: 1996

Type: Document

Synthesis

Acute toxicity of firefighting chemical formulations to four life stages of fathead minnow

www.nrfirescience.org/resource/18544

Laboratory studies were conducted with four early life stages of fathead minnow, *Pimephales promelas*, to determine the acute toxicity of five firefighting chemical formulations in standardized soft and hard water. Egg, fry, 30-day posthatch, and 60-day posthatch life stages were tested with three fire retardants (Fire-Trol GTS-R,...

Author(s): M. P. Gaikowski, Steven J. Hamilton, Kevin J. Buhl, S. F. McDonald, C. H. Summers

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Comparative effects of elk herbivory and 1988 fires on northern Yellowstone National Park grasslands

www.nrfirescience.org/resource/8265

The drought, frequent lightning strikes, and resultant large fires of 1988 in Yellowstone National Park were considered a several-century event for the area. They presented an unparalleled opportunity to document the effects of large fires on forage production, forage quality, and herbivory for the largest elk (*Cervus elaphus*)...

Author(s): Francis J. Singer, M. K. Harter

Year Published: 1996

Type: Document

Book or Chapter or Journal Article

Urocyon cinereoargenteus (common gray fox)

www.nrfirescience.org/resource/10506

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

Author(s): Janet Sullivan

Year Published: 1996

Type: Document

Synthesis

Buteo lagopus (rough-legged hawk)

www.nrfirescience.org/resource/10517

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

The composition of bird communities following stand-replacement fires in northern Rocky Mountain (U.S.A.) conifer forests

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

Procyon lotor (northern raccoon)

www.nrfirescience.org/resource/10533

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

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Peromyscus maniculatus (deer mouse)

www.nrfirescience.org/resource/10512

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Molothrus ater (brown-headed cowbird)

www.nrfirescience.org/resource/10444

This FEIS species review synthesizes information on the relationship of *Molothrus ater* (brown-headed cowbird) to fire--how fire affects the species and its habitat, invasiveness of the species, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general...

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Bos bison (American bison)

www.nrfirescience.org/resource/10549

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

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Winter habitat use by large ungulates following fire in northern Yellowstone National Park

www.nrfirescience.org/resource/8266

The effect of fire and habitat heterogeneity on winter foraging by ungulates was studied in northern Yellowstone National Park (YNP). Grazing was monitored at 15 study sites for 14 wk during the winters of 1991 and 1992. The location and intensity of grazing activity within each site were recorded on topographic maps and digitized...

Author(s): Scott M. Pearson, Monica G. Turner, Linda L. Wallace, William H. Romme

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Sialia mexicana (western bluebird)

www.nrfirescience.org/resource/10505

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Aspen, elk, and fire in northern Yellowstone Park

www.nrfirescience.org/resource/8261

Most stands of trembling aspen (*Populus tremuloides*) in northern Yellowstone National Park appear to have become established between 1870 and 1890, with little regeneration since 1900. There has been controversy throughout this century regarding the relative roles of browsing by elk (*Cervus elaphus*) and fire suppression in...

Author(s): William H. Romme, Monica G. Turner, Linda L. Wallace, Jennifer S. Walker

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Poecile atricapillus (black-capped chickadee)

www.nrfirescience.org/resource/10511

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Trophic generalists vs. trophic specialists: implications for food web dynamics in post-fire streams

www.nrfirescience.org/resource/8260

The trophic ecology of 11 benthic macroinvertebrate taxa found in Cache Creek, Yellowstone National Park (YNP) was studied to determine if burned organic matter is an important resource and how resource utilization patterns may be altered in post-fire streams. Laboratory food quality experiments

were conducted to determine the...

Author(s): Timothy B. Mihuc, G. Wayne Minshall

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Tamiasciurus hudsonicus (red squirrel)

www.nrfirescience.org/resource/10509

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Bubo virginianus (great horned owl)

www.nrfirescience.org/resource/10518

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Sylvilagus floridanus (eastern cottontail)

www.nrfirescience.org/resource/10508

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Lepus californicus (black-tailed jackrabbit)

www.nrfirescience.org/resource/10721

This FEIS species review synthesizes information on the relationship of *Lepus californicus* (black-tailed jackrabbit) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Janet L. Howard

Year Published: 1995

Type: Document

Synthesis

Phasianus colchicus (ring-necked pheasant)

www.nrfirescience.org/resource/10535

This FEIS species review synthesizes information on the relationship of *Phasianus colchicus* (ring-necked pheasant) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Antilocapra americana (pronghorn)

www.nrfirescience.org/resource/10731

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

Author(s): Janet L. Howard

Year Published: 1995

Type: Document

Synthesis

Lepus americanus (snowshoe hare)

www.nrfirescience.org/resource/10515

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Sialia currucoides (mountain bluebird)

www.nrfirescience.org/resource/10510

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

Author(s): Janet Sullivan

Year Published: 1995

Type: Document

Synthesis

Lynx rufus (bobcat)

www.nrfirescience.org/resource/10526

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

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Canis latrans (coyote)

www.nrfirescience.org/resource/10548

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

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Benthic community structure in two adjacent streams in Yellowstone National Park five years after the 1988 wildfires

www.nrfirescience.org/resource/18609

Physical characteristics, benthic macroinvertebrates, and periphyton assemblages in two adjacent headwater streams in Yellowstone National Park were evaluated five years after the 1988 wildfires. The catchment of one stream was burned by wildfire (burned stream) while the other catchment was unburned (unburned stream). Physical...

Author(s): G. Wayne Minshall, Christopher T. Robinson, Todd V. Royer, Samuel R. Rushforth

Year Published: 1995

Type: Document

Book or Chapter or Journal Article

Puma concolor (mountain lion)

www.nrfirescience.org/resource/10534

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

Author(s): Julie L. Tesky

Year Published: 1995

Type: Document

Synthesis

Buteo jamaicensis (red-tailed hawk)

www.nrfirescience.org/resource/10551

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Aquila chrysaetos (golden eagle)

www.nrfirescience.org/resource/10554

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Asio flammeus (short-eared owl)

www.nrfirescience.org/resource/10725

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

Author(s): Janet L. Howard

Year Published: 1994

Type: Document

Synthesis

Falco sparverius (American kestrel)

www.nrfirescience.org/resource/10542

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Buteo regalis (ferruginous hawk)

www.nrfirescience.org/resource/10545

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Bufo boreas (western toad)

www.nrfirescience.org/resource/10859

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

Author(s): Janet Sullivan

Year Published: 1994

Type: Document
Synthesis

Buteo swainsoni (Swainson's hawk)

www.nrfirescience.org/resource/10546

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Falco mexicanus (prairie falcon)

www.nrfirescience.org/resource/10541

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Diatom assemblages of streams influenced by wildfire

www.nrfirescience.org/resource/18646

The Greater Yellowstone Area ecosystem experienced major wildfires in 1988, resulting in a substantial number of catchments being burned. We studied diatom assemblage structure at 14 sites over 5 years in catchments ranging from 0 to over 90% burned. Coefficients of variation for selected physical measures provided a good assessment...

Author(s): Christopher T. Robinson, Samuel R. Rushforth, G. Wayne Minshall

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

Accipiter striatus (sharp-shinned hawk)

www.nrfirescience.org/resource/10519

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

Author(s): Janet Sullivan

Year Published: 1994

Type: Document

Synthesis

Tympanuchus phasianellus (sharp-tailed grouse)

www.nrfirescience.org/resource/10532

This FEIS species review synthesizes information on the relationship of *Tympanuchus phasianellus*

(sharp-tailed grouse) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Simulating winter interactions among ungulates, vegetation, and fire in northern Yellowstone Park

www.nrfirescience.org/resource/8267

The interaction of large-scale fire, vegetation, and ungulates is an important management issue in Yellowstone National Park. A spatially explicit individual-based simulation model was developed to explore the effects of fire scale and pattern on the winter foraging dynamics and survival of free-ranging elk (*Cervus elaphus*) and...

Author(s): Monica G. Turner, Yegang Wu, Linda L. Wallace, William H. Romme, Antoinette Brenkert

Year Published: 1994

Type: Document

Book or Chapter or Journal Article

Dumetella carolinensis (gray catbird)

www.nrfirescience.org/resource/10516

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

Author(s): Janet Sullivan

Year Published: 1994

Type: Document

Synthesis

Brachylagus idahoensis (pygmy rabbit)

www.nrfirescience.org/resource/10550

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

Author(s): Julie L. Tesky

Year Published: 1994

Type: Document

Synthesis

Alectoris chukar (chukar)

www.nrfirescience.org/resource/10860

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

Author(s): Janet Sullivan

Year Published: 1994

Type: Document

Synthesis

Branta canadensis (Canada goose)

www.nrfirescience.org/resource/10847

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

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Pandion haliaetus (osprey)

www.nrfirescience.org/resource/10537

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Chen caerulescens (snow goose)

www.nrfirescience.org/resource/10844

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

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Anas strepera (gadwall)

www.nrfirescience.org/resource/10553

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Grus americana (whooping crane)

www.nrfirescience.org/resource/10540

This FEIS species review synthesizes information on the relationship of *Grus americana* (whooping crane) to fire--how fire affects the species and its habitat, and fire management considerations.

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Rapid decline of whitebark pine in western Montana: evidence from 20-year re-measurements

www.nrfirescience.org/resource/12916

Whitebark pine (*Pinus albicaulis*), an important producer of food for wildlife, is decreasing in abundance in western Montana due to attacks by the white pine blister rust fungus (*Cronartium ribicola*), epidemics of mountain pine beetle (*Dendroctonus ponderosae*) and successional replacement mainly by subalpine fir (*Abies lasiocarpa*)....

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

Year Published: 1993

Type: Document

Book or Chapter or Journal Article

Aythya valisineria (canvasback)

www.nrfirescience.org/resource/10552

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Haliaeetus leucocephalus (bald eagle)

www.nrfirescience.org/resource/10843

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

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Ovis canadensis (bighorn sheep)

www.nrfirescience.org/resource/10536

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Castor canadensis (American beaver)

www.nrfirescience.org/resource/10547

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Zenaida macroura (mourning dove)

www.nrfirescience.org/resource/10531

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Circus cyaneus (northern harrier)

www.nrfirescience.org/resource/10845

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

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Anas discors (blue-winged teal)

www.nrfirescience.org/resource/10557

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Aix sponsa (wood duck)

www.nrfirescience.org/resource/10849

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

Author(s): S. A. Snyder
Year Published: 1993
Type: Document
Synthesis

Cygnus buccinator (trumpeter swan)

www.nrfirescience.org/resource/10543

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

Author(s): Julie L. Tesky
Year Published: 1993
Type: Document
Synthesis

Anas crecca (green-winged teal)

www.nrfirescience.org/resource/10556

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

Author(s): Julie L. Tesky
Year Published: 1993
Type: Document
Synthesis

Cygnus columbianus (tundra swan)

www.nrfirescience.org/resource/10544

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

Author(s): Julie L. Tesky
Year Published: 1993
Type: Document
Synthesis

Anser albifrons (greater white-fronted goose)

www.nrfirescience.org/resource/10555

This FEIS species review synthesizes information on the relationship of *Anser albifrons* (greater white-fronted goose) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species...

Author(s): Julie L. Tesky
Year Published: 1993
Type: Document
Synthesis

Anas acuta (northern pintail)

www.nrfirescience.org/resource/10527

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Anas platyrhynchos (mallard)

www.nrfirescience.org/resource/10848

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

Author(s): S. A. Snyder

Year Published: 1993

Type: Document

Synthesis

Lutra canadensis (northern river otter)

www.nrfirescience.org/resource/10538

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

Author(s): Julie L. Tesky

Year Published: 1993

Type: Document

Synthesis

Grizzly bear use of habitats modified by timber management

www.nrfirescience.org/resource/18230

This study employed a sample of 22 radio-collared grizzly bears to document the extent to which grizzly bears used harvested habitats on a seasonal and annual basis and how this use compared to the availability of harvested habitats. Use sites within treated stands were sampled and compared to random sites within the same stand to...

Author(s): John Steven Waller

Year Published: 1992

Type: Document

Dissertation or Thesis

Spatial and temporal trends in stream macroinvertebrate communities: the influence of catchment disturbance

www.nrfirescience.org/resource/18632

Macroinvertebrate communities of five headwater streams in catchments disturbed by wildfire were compared with five similar streams with no catchment disturbance. Over the five years of observation, communities in disturbed streams were more similar to one another than they were to reference streams. Communities in disturbed streams...

Author(s): Carl Richards, G. Wayne Minshall

Year Published: 1992
Type: Document
Book or Chapter or Journal Article

Recovery of temperate-stream fish communities from disturbance: a review of case studies and synthesis of theory

www.nrfirescience.org/resource/18536

To evaluate the relative effect of autecologic factors, site-specific factors, disturbance characteristics, and community structure on the recovery of temperate-stream fish communities, we reviewed case histories for 49 sites and recorded data on 411 recovery end points. Most data were derived from studies of low-gradient third- or...

Author(s): Naomi E. Detenbeck, Philip W. DeVore, Gerald J. Niemi, Ann Lima

Year Published: 1992

Type: Document

Book or Chapter or Journal Article

Meleagris gallopavo (wild turkey)

www.nrfirescience.org/resource/10841

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

Author(s): S. A. Snyder

Year Published: 1992

Type: Document

Synthesis

Deterioration of fire-killed and fire-damaged timber in the Western United States

www.nrfirescience.org/resource/11159

Fire-killed and fire-damaged timber are an important source of fiber and are becoming more important because of a decrease in the land base available for timber harvest. Forest managers need to know the causes of deterioration and degrade, the expected losses in product volume and value, and the impact of time on deterioration. This...

Author(s): Eini C. Lowell, Susan A. Willits, Robert L. Krahmer

Year Published: 1992

Type: Document

Technical Report or White Paper

Odocoileus virginianus (white-tailed deer)

www.nrfirescience.org/resource/10840

This FEIS species review synthesizes information on the relationship of Odocoileus virginianus (white-tailed deer) to fire--how fire affects the species and its habitat, and fire management considerations. Information is also provided on the species' taxonomy, distribution, basic biology, and general management. This species review...

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Canis lupus (gray wolf)

www.nrfirescience.org/resource/10846

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

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Ursus arctos horribilis (grizzly bear)

www.nrfirescience.org/resource/10837

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

Author(s): S. A. Snyder

Year Published: 1991

Type: Document

Synthesis

Lodgepole pine arthropod litter community structure one year after the 1988 Yellowstone fires

www.nrfirescience.org/resource/12034

Litter arthropod data was collected every 10 days from nine intensively burned forest stands, five lightly burned stands, and nine unburned forest stands. For burned forest stands (n=540 samples, there were decreases in insect density (87 percent), noninsect density (67 Percent), noninsect taxa (63 percent), and noninsect diversity...

Author(s): Tim A. Christiansen, Robert J. Lavigne, Jeffrey A. Lockwood

Year Published: 1991

Type: Document

Technical Report or White Paper

Changes in wild trout habitat following forest fire

www.nrfirescience.org/resource/18605

The responses of streams to the 1979 Mortar Creek fire in central Idaho provide valuable insights into the extended impact of wildfire on trout habitat. The fire dramatically increased runoff and fine sediment levels and reduced shading and cover from undercut banks and woody vegetation. Although habitat conditions for all life...

Author(s): G. Wayne Minshall, Douglas A. Andrews, James T. Brock, Christopher T. Robinson, Deron E. Lawrence

Year Published: 1990

Type: Document

Conference Proceedings

Recovery of lotic macroinvertebrate communities from disturbance

www.nrfirescience.org/resource/18684

Ecosystem disturbances produce changes in macrobenthic community structure (abundances, biomass, and production) that persist for a few weeks to many decades. Examples of disturbances with extremely long-term effects on benthic communities include contamination by persistent toxic agents, physical changes in habitats, and altered...

Author(s): J. Bruce Wallace

Year Published: 1990
Type: Document
Book or Chapter or Journal Article

Impact of fire and flood on the trout population of Beaver Creek, upper Missouri Basin, Montana
www.nrfirescience.org/resource/18618

A forest fire followed by an intense convectional rainstorm caused a 100-year flood in the Beaver Creek drainage. This study documented changes in resident trout populations and use of the stream by adfluvial spawning fish. Two months after the event trout populations in the impacted portion of the stream were nearly eliminated....

Author(s): Mark A. Novak, Robert G. White
Year Published: 1990
Type: Document
Conference Proceedings

Effects of fire in the northern Great Plains

www.nrfirescience.org/resource/11184

Fire has been used inconsistently to manage native and tame grasslands in the Northern Great Plains (NGP) of the north-central U.S. and south-central Canada, particularly the grasslands found in prairies, plains, agricultural land retirement programs, and moist soil sites. This has happened for three primary reasons: (1) the...

Author(s): Kenneth F. Higgins, Arnold D. Kruse, James L. Piehl
Year Published: 1989
Type: Document
Synthesis, Technical Report or White Paper

Wildfires and Yellowstone's stream ecosystems

www.nrfirescience.org/resource/18211

Few studies have examined the effect of fire on the aquatic biota, and none has adequately addressed major aspects of aquatic ecosystem function. Most of the research has examined the effects of fire on water chemistry (Schindler et al. 1980, Tiedemann et al. 1979). Nevertheless, it is possible to develop a set of predictions...

Author(s): G. Wayne Minshall, James T. Brock, John D. Varley
Year Published: 1989
Type: Document
Book or Chapter or Journal Article

Whitebark pine cone crops - a diminishing source of wildlife food

www.nrfirescience.org/resource/19234

Whitebark pine (*Pinus albicaulis*)s found at timberline and in subalpine forests from central California and western Wyoming north to British Columbia and Alberta. This species has been of little interest for commercial timber, but in recent years its large seeds (average 2,600/1bh) have been recognized as an important food source...

Author(s): Stephen F. Arno
Year Published: 1986
Type: Document
Book or Chapter or Journal Article

Effects of disturbance frequency on stream benthic community structure in relation to canopy cover and season

www.nrfirescience.org/resource/18645

Field experiments were conducted to examine the effects of disturbance frequency on invertebrates and periphyton colonizing bricks in a third order Rocky Mountain (USA) stream. After an initial colonization period (30 days), sets of bricks were turned over at intervals of 0, 3, 9, 27, or 54 days. Invertebrate species richness and...

Author(s): Christopher T. Robinson, G. Wayne Minshall

Year Published: 1986

Type: Document

Book or Chapter or Journal Article

Fire, logging, and white-tailed deer interrelationships in the Swan Valley, northwestern Montana

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

Bighorn sheep and fire: seven case histories

www.nrfirescience.org/resource/11057

Responses of seven bighorn sheep populations and habitats to prescribed fire and wildfire in southern British Columbia, Idaho, and Glacier National Park ranged from no influence to increase; interacting factors such as lungworm infection, livestock grazing, and reduction in forage overrode potential benefits of subsequent increases...

Author(s): James M. Peek, Raymond A. Demarchi, Dennis A. Demarchi

Year Published: 1985

Type: Document

Conference Proceedings, Technical Report or White Paper

Fire's effects on a small bird population

www.nrfirescience.org/resource/11188

Changes in bird populations as a result of a 122 ha forest fire are evaluated. There is little evidence of any drastic effect on numbers of birds, species, or species diversity in the year of the fire or 2 years later.

Author(s): L. Jack Lyon, John M. Marzluff

Year Published: 1985

Type: Document

Technical Report or White Paper

Managing wildlife habitat with fire in the Aspen ecosystem

www.nrfirescience.org/resource/11482

Much of the nearly 7 million acres (2.86 million ha) of aspen in the western United States is seral to conifers. Also, most aspen stands are old, in excess of 60 years. Proper treatment of these aspen forests will retain the aspen and can produce optimum wildlife habitat. Optimally, all age and size classes of aspen should be...

Author(s): Norbert V. DeByle

Year Published: 1985

Type: Document

Influencing globe huckleberry fruit production in northwestern Montana

www.nrfirescience.org/resource/18223

Globe huckleberry (*Vaccinium globulare*) fruit is a major food source for the grizzly bear (*Ursus arctos horribilis*) in northwestern Montana. A ranked-set sampling pattern was used to determine the effects of wildfires, timber harvest practices, and physical and vegetative site characteristics on globe huckleberry fruit production....

Author(s): P. Martin

Year Published: 1983

Type: Document

Conference Proceedings

Logging and wildfire influence on grizzly bear habitat in northwestern Montana

www.nrfirescience.org/resource/18233

Vegetation was sampled on 330 sites known to be used by grizzly bears (*Ursus arctos*). The response to disturbance of 6 shrub species important as grizzly bear foods was determined by comparing their percent canopy cover on disturbed sites with that on undisturbed, old-growth sites. Overall, the canopy cover of these species was...

Author(s): Peter Zager, Charles Jonkel, James R. Habeck

Year Published: 1983

Type: Document

Conference Proceedings

The central role of Clark's nutcracker in the dispersal and establishment of whitebark pine

www.nrfirescience.org/resource/20063

Whitebark pine (*Pinus albicaulis*) is known to have its seeds harvested and cached in the soil by Clark's Nutcracker (*Nucifraga columbiana*), and unretrieved seeds are known to be capable of germinating and establishing new pines. Many other vertebrates also harvest and feed on these seeds, however, and the roles of these animals as...

Author(s): H.E. Hutchins, R. M. Lanner

Year Published: 1982

Type: Document

Book or Chapter or Journal Article

Trichopteran communities of streams associated with aspen and conifer forests: long-term structural change

www.nrfirescience.org/resource/18611

A comparison of the trichopteran communities of streams associated with aspen, spruce—fir, and mixed—conifer forests demonstrated significant differences in structure. Though trichopteran species composition in aspen—associated and spruce—fir associated streams was virtually identical, relative abundances of shredder and...

Author(s): Manuel C. Molles Jr.

Year Published: 1982

Type: Document

Book or Chapter or Journal Article

Dispersal of whitebark pine seeds by Clark's nutcracker: A mutualism hypothesis

www.nrfirescience.org/resource/20060

Abstract (1) Clark's nutcrackers (*Nucifraga columbiana*) store a mean of only 3.7 whitebark pine (*Pinus*

albicaulis) seeds per cache, which reduces competition for moisture and space. The mean depth at which seeds are stored, 2.0 cm, is compatible with germination requirements, and many sites selected appear suitable for seed...

Author(s): Diana F. Tomback

Year Published: 1982

Type: Document

Book or Chapter or Journal Article

Clearcutting and fire in the larch/Douglas-fir forests of western Montana: a multifaceted research summary

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

Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming - Volume II: changes and causes, management implications

www.nrfirescience.org/resource/12126

Provides information on wildlife habitat condition and trend on the Bridger-Teton National Forest in the Jackson Hole Region of Wyoming by analysis of broad plant communities. Visual evidence of condition and trend are provided in Volume I, The Photo Record. Management implications are included.

Author(s): George E. Gruell

Year Published: 1980

Type: Document

Technical Report or White Paper

Fire's influence on wildlife habitat on the Bridger-Teton National Forest, Wyoming - Volume I: photographic record and analysis

www.nrfirescience.org/resource/12151

The Bridger-Teton National Forest in the Jackson Hole Region of Wyoming has long been recognized for its wildlife resource. Management efforts have emphasized the measurement of forage utilization by elk (*Cervus canadensis nelsoni*) and their effect on summer and winter ranges. Less consideration has been given to other biotic and...

Author(s): George E. Gruell

Year Published: 1980

Type: Document

Technical Report or White Paper

Elk-aspen relationships on a prescribed burn

www.nrfirescience.org/resource/11924

Elk use of aspen alones was deterred only one winter following prescribed fire. Numbers of aspen suckers on the nine burned clones increased 178 percent in 3 years, but the response varied greatly among clones. Elk browsing the third winter after burning averaged 44 percent of current annual growth, and eliminated incremental height...

Author(s): Joseph V. Basile

Year Published: 1979

Type: Document
Research Brief or Fact Sheet

Effects of fire on fauna: a state-of-knowledge review

www.nrfirescience.org/resource/18585

In preparing a state-of-knowledge review for fire and fauna, our basic reference source was the chapter "Effects of Fire on Birds and Mammals," by J. F. Bendell (1974) in the book "Fire and Ecosystems". In addition to summarizing this 52-page paper, we added material covering invertebrates and stream fauna and attempted to recognize...

Author(s): L. Jack Lyon, Hewlette S. Crawford, Eugene Czuhai, Richard L. Fredriksen, R. F. Harlow, Louis J. Metz, Henry A. Pearson

Year Published: 1978

Type: Document

Conference Proceedings

Fire effects on marten habitat in the Selway-Bitterroot Wilderness

www.nrfirescience.org/resource/7955

In an area of 21 km² where fires have produced a mosaic of forest communities, including subalpine fir (*Abies lasiocarpa*), Engelman spruce (*Picea engelmannii*) and lodgepole pine, results from 255 track observations, 80 captures of 13 live-trapped martens, and scat analysis, over a 13 month period in 1973-1974, suggest that the...

Author(s): Gary M. Koehler, Maurice G. Hornocker

Year Published: 1977

Type: Document

Book or Chapter or Journal Article

Chemical forest fire retardants: acute toxicity to five freshwater fishes and a scud

www.nrfirescience.org/resource/18569

Toxicities of four chemical forest fire retardants, Fire-Trol 100 and 931 (ammonium sulfate or polyphosphate with an attapulgite clay thickener) and Phos-Chek 202 A and 259 (diammonium phosphate with a guar gum derivative thickener) were determined by static and flow-through toxicity tests for fry and fingerling coho salmon (...)

Author(s): W. W. Johnson, H. O. Sanders

Year Published: 1977

Type: Document

Technical Report or White Paper

Effects of a forest fire upon the benthic community of a mountain stream in northeast Idaho

www.nrfirescience.org/resource/18664

The purpose of this study which was conducted in 1974 and 1975 was to investigate the effects of the Fitz Creek fire of August, 1973 upon the benthic community of White Cap Creek which was partially surrounded by the burn. Study sections of White Cap Creek within the burn, below the burn, and above the burn were examined. Taxonomic...

Author(s): Deborah Cynthia Stefan

Year Published: 1977

Type: Document

Dissertation or Thesis

Spring burning in an aspen-conifer stand for maintenance of moose habitat, West Boulder River, Montana

www.nrfirescience.org/resource/8441

Description not entered

Author(s): Floyd A. Gordon

Year Published: 1976

Type: Document

Conference Proceedings

Toxicity of ferro- and ferricyanide solutions to fish and determination of the cause of mortality

www.nrfirescience.org/resource/18509

The investigation of the causes of a fish kill in waters containing ferro- and ferricyanide at concentrations far under those generally accepted as non-lethal have shown these low concentrations to be lethal due to photo-decomposition and release of the cyanide ion. Experimental data place the toxic level of these compounds,...

Author(s): George Edgar Burdick, Morris Lipschuetz

Year Published: 1950

Type: Document

Book or Chapter or Journal Article

Positive effects of fire on birds may appear only under narrow combinations of fire severity and time-since-fire

www.nrfirescience.org/resource/14589

We conducted bird surveys in 10 of the first 11 years following a mixed-severity fire in a dry, low-elevation mixed-conifer forest in western Montana, United States. By defining fire in terms of fire severity and time-since-fire, and then comparing detection rates for species inside 15 combinations of fire severity and time-since-...

Author(s): Richard L. Hutto, David A. Patterson

Type: Document

Book or Chapter or Journal Article