

A review of Indigenous knowledge and participation in environmental monitoring

www.nrfirescience.org/resource/21076

There is a growing interest by governments and academics in including Indigenous knowledge alongside scientific knowledge in environmental management, including monitoring. Given this growing interest, a critical review of how Indigenous peoples have been engaged in monitoring is needed. We reviewed and analyzed the academic...

Author(s): Kim-Ly Thompson, Trevor C. Lantz, Natalie C. Ban

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Adaptive prescribed burning in Australia for the early 21st Century – context, status, challenges

www.nrfirescience.org/resource/21072

Despite evident advances in knowledge and understanding concerning the application of prescribed burning for delivering benefits in wildfire control and a variety of sociocultural, economic and environmental outcomes, the practical application of prescribed burning in Australia is increasingly administratively and logistically...

Author(s): Jeremy Russell-Smith, Lachlan McCaw, Adam J. Leavesley

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

Climate, environment, and disturbance history govern resilience of western North American forests

www.nrfirescience.org/resource/20622

Before the advent of intensive forest management and fire suppression, western North American forests exhibited a naturally occurring resistance and resilience to wildfires and other disturbances. Resilience, which encompasses resistance, reflects the amount of disruption an ecosystem can withstand before its structure or...

Author(s): Paul F. Hessburg, Carol Miller, Sean A. Parks, Nicholas A. Povak, Alan H. Taylor, Philip E. Higuera, Susan J. Prichard, Malcolm P. North, Brandon M. Collins, Matthew D. Hurteau, Andrew J. Larson, Craig D. Allen, Scott L. Stephens, Hiram Rivera-Huerta, Camille Stevens-Rumann, Lori D. Daniels, Ze'ev Gedalof, Robert W. Gray, Van R. Kane, Derek J. Churchill, R. Keala Hagmann, Thomas A. Spies, C. Alina Cansler, R. Travis Belote, Thomas T. Veblen, Michael A. Battaglia, Chad M. Hoffman, Carl N. Skinner, Hugh Safford, R. Brion Salter

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Contrasting human influences and macro-environmental factors on fire activity inside and outside protected areas of North America

www.nrfirescience.org/resource/19770

Human activities threaten the effectiveness of protected areas (PAs) in achieving their conservation goals across the globe. In this study, we contrast the influence of human and macro-environmental factors driving fire activity inside and outside PAs. Using area burned between 1984 and 2014 for 11 ecoregions in Canada and the...

Author(s): Nicolas Mansuy, Carol Miller, Marc-Andre Parisien, Sean A. Parks, Enric Batllori, Max A. Moritz

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Adaptive Management and Monitoring

www.nrfirescience.org/resource/21248

This is a chapter in a technical report that is the second of two works describing longer-term actions to implement policies and strategies for preventing and suppressing rangeland fire and restoring rangeland landscapes affected by fire in the Western United States. The first part, Chambers et al 2017, "Science Framework for...

Author(s): Lief A. Wiechman, David A. Pyke, Michele R. Crist, Seth Munson, Matthew L. Brooks, Jeanne C. Chambers, Mary M. Rowland, Emily J. Kachergis, Zoe Davidson

Year Published: 2019

Type: Document

Technical Report or White Paper

Resilience and fire management in the Anthropocene

www.nrfirescience.org/resource/20183

Fire management around the world is now undergoing extensive review, with a move toward fire management plans that maintain biodiversity and other ecosystems services, while at the same time mitigating the negative impacts to people and property. There is also increasing recognition of the historical and anthropogenic dimensions...

Author(s): Lindsey Gillson, Cathy L. Whitlock, Glynis Humphrey

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

Decision Support Approaches in Adaptive Forest Management

www.nrfirescience.org/resource/17655

Climate and social changes place strong demands on forest managers. Forest managers need powerful approaches and tools, which could help them to be able to react to the rapidly changing conditions. However, the complexity of quantifying forest ecosystems services as well as the complexity of current decision theories, technologies...

Author(s): Jan Kaspar, Pete Bettinger, Harald Vacik, Robert Marusak, Jordi Garcia-Gonzalo

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Appropriate Sample Sizes for Monitoring Burned Pastures in Sagebrush Steppe: How Many Plots are Enough, and Can One Size Fit All?

www.nrfirescience.org/resource/18950

Statistically defensible information on vegetation conditions is needed to guide rangeland management decisions following disturbances such as wildfire, often for heterogeneous pastures. Here we evaluate sampling effort needed to achieve a robust statistical threshold using > 2 000 plots sampled on the 2015 Soda Fire that burned...

Author(s): Cara Applestein, Matthew J. Germino, David S. Pilliod, Matthew R. Fisk, Robert S. Arkle

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Collaborative restoration effects on forest structure in ponderosa pine-dominated forests of Colorado

www.nrfirescience.org/resource/17786

In response to large, severe wildfires in historically fire-adapted forests in the western US, policy

initiatives, such as the USDA Forest Service's Collaborative Forest Landscape Restoration Program (CFLRP), seek to increase the pace and scale of ecological restoration. One required component of this program is collaborative...

Author(s): Jeffery B. Cannon, Kevin J. Barrett, Benjamin Gannon, Rob Addington, Michael A. Battaglia, Paula J. Fornwalt, Gregory H. Aplet, Anthony S. Cheng, Jeffrey L. Underhill, Jennifer S. Briggs, Peter M. Brown

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

Where you stand depends on where you sit: Qualitative inquiry into notions of fire adaptation

www.nrfirescience.org/resource/16190

Wildfire and the threat it poses to society represents an example of the complex, dynamic relationship between social and ecological systems. Increasingly, wildfire adaptation is posited as a pathway to shift the approach to fire from a suppression paradigm that seeks to control fire to a paradigm that focuses on "living with"...

Author(s): Hannah Brenkert-Smith, James R. Meldrum, Patricia A. Champ, Christopher M. Barth

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Adapt to more wildfire in western North American forests as climate changes

www.nrfirescience.org/resource/15327

Wildfires across western North America have increased in number and size over the past three decades, and this trend will continue in response to further warming. As a consequence, the wildland-urban interface is projected to experience substantially higher risk of climate-driven fires in the coming decades. Although many plants,...

Author(s): Tania L. Schoennagel, Jennifer Balch, Hannah Brenkert-Smith, Philip E. Dennison, Brian J. Harvey, Meg A. Krawchuk, Nathan Mietkiewicz, Penelope Morgan, Max A. Moritz, Ray Rasker, Monica G. Turner, Cathy L. Whitlock

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Adaptive silviculture for climate change: a national experiment in manager-scientist partnerships to apply an adaptation framework

www.nrfirescience.org/resource/15232

Forest managers in the United States must respond to the need for climate-adaptive strategies in the face of observed and projected climatic changes. However, there is a lack of on-the-ground forest adaptation research to indicate what adaptation measures or tactics might be effective in preparing forest ecosystems to deal with...

Author(s): Linda Nagel, Brian J. Palik, Michael A. Battaglia, Anthony W. D'Amato, James M. Guldin, Christopher W. Swanston, Maria K. Janowiak, Matthew P. Powers, Linda A. Joyce, Constance I. Millar, David L. Peterson, Lisa Ganio, Chad Kirschbaum, Molly R. Roske

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

Opportunities to utilize traditional phenological knowledge to support adaptive management of social-ecological systems vulnerable to changes in climate and fire regimes

www.nrfirescience.org/resource/13956

The field of adaptive management has been embraced by researchers and managers in the United States as an approach to improve natural resource stewardship in the face of uncertainty and complex environmental problems. Integrating multiple knowledge sources and feedback mechanisms is an important step in this approach. Our objective...

Author(s): Christopher A. Armatas, Tyron J. Venn, Brooke Baldauf McBride, Alan E. Watson, Stephen J. Carver

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/13788

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

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

Year Published: 2016

Type: Document

Book or Chapter or Journal Article, Synthesis

Managing ungulate browsing for sustainable aspen

www.nrfirescience.org/resource/16376

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

Quaking aspen forests have high...

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

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

The role of fire in aspen ecology and restoration

www.nrfirescience.org/resource/16377

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

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

Year Published: 2015

Type: Document

Research Brief or Fact Sheet

Learning to coexist with wildfire

www.nrfirescience.org/resource/15326

The impacts of escalating wildfire in many regions — the lives and homes lost, the expense of suppression and the damage to ecosystem services — necessitate a more sustainable coexistence with wildfire. Climate change and continued development on fire-prone landscapes will only compound current problems. Emerging strategies for...

Author(s): Max A. Moritz, E. Batllori, Ross A. Bradstock, A. Malcolm Gill, J. Handmer, Paul F.

Hessburg, J. Leonard, Sarah M. McCaffrey, Dennis C. Odion, Tania L. Schoennagel, Alexandra D. Syphard
Year Published: 2014
Type: Document
Book or Chapter or Journal Article

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

www.nrfirescience.org/resource/12994

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

Author(s): Gary M. Tabor, Anne Carlson, R. Travis Belote
Year Published: 2014
Type: Document
Technical Report or White Paper

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

Making monitoring count: project design for active adaptive management

www.nrfirescience.org/resource/12768

Ongoing environmental change requires that managers develop strategies capable of achieving multiple objectives in an uncertain future. Active adaptive management (AAM) offers a robust approach to reducing uncertainty while also considering diverse stakeholder perspectives. Important features of AAM include recognition of learning...

Author(s): Andrew J. Larson, R. Travis Belote, Matthew A. Williamson, Gregory H. Aplet
Year Published: 2013
Type: Document
Book or Chapter or Journal Article

Adaptation: planning for climate change and its effects on federal lands

www.nrfirescience.org/resource/12449

National forest managers are charged with tackling the effects of climate change on the natural resources under their care. The Forest Service National Roadmap for Responding to Climate Change and the Climate Change Performance Scorecard require managers to make significant progress in addressing climate change by 2015. To help land...

Author(s): Marie Oliver
Year Published: 2012
Type: Document

Can we manage for resilience? The integration of resilience thinking into natural resource management in the United States

www.nrfirescience.org/resource/12693

The concept of resilience is now frequently invoked by natural resource agencies in the US. This reflects growing trends within ecology, conservation biology, and other disciplines acknowledging that social–ecological systems require management approaches recognizing their complexity. In this paper, we examine the concept of...

Author(s): Melinda Harm Benson, Ahjond S. Garmestani

Year Published: 2011

Type: Document

Book or Chapter or Journal Article

Dry forests and wildland fires of the inland Northwest USA: contrasting the landscape ecology of the pre-settlement and modern eras

www.nrfirescience.org/resource/7941

Prior to Euro-American settlement, dry ponderosa pine and mixed conifer forests (hereafter, the 'dry forests') of the Inland Northwest were burned by frequent low- or mixed-severity fires. These mostly surface fires maintained low and variable tree densities, light and patchy ground fuels, simplified forest structure, and favored...

Author(s): Paul F. Hessburg, James K. Agee, Jerry F. Franklin

Year Published: 2005

Type: Document

Book or Chapter or Journal Article, Synthesis

An environmental narrative of Inland Northwest United States forests, 1800-2000

www.nrfirescience.org/resource/18561

Fire was arguably the most important forest and rangeland disturbance process in the Inland Northwest United States for millennia. Prior to the Lewis and Clark expedition, fire regimes ranged from high severity with return intervals of one to five centuries, to low severity with fire-free periods lasting three decades or less....

Author(s): Paul F. Hessburg, James K. Agee

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

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

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

Ecological implications of sagebrush manipulation: A literature review

www.nrfirescience.org/resource/15427

The Montana Department of Fish, Wildlife & Parks (FWP) has long recognized the importance of sagebrush/grassland vegetative communities as wildlife habitat. Efforts to manipulate these communities concern FWP because of the potential implications to wildlife. Some groups believe sagebrush control generally will have beneficial...

Author(s): Joel G. Peterson

Year Published: 1995

Type: Document

Management or Planning Document

Germination and establishment ecology of big sagebrush: Implications for community restoration

www.nrfirescience.org/resource/15421

Big sagebrush (*Artemisia tridentata*) seedling recruitment is limited by seed production and dispersal in space and time, by genetic constraints of specific ecotypes, and by environmental factors that include weather, microsite attributes, soil microbiota, herbivory, and inter- and intraspecific competition. Establishing this species...

Author(s): Susan E. Meyer

Year Published: 1994

Type: Document

Conference Proceedings

Adaptive fire policy

www.nrfirescience.org/resource/12424

Adaptive resource management is a continuous learning process in which current knowledge always leads to further experimentation and discovery. Adaptive management evolves by learning from mistakes. Designing adaptive management strategies involves four tasks. First, the problem must be defined and bounded. There is growing...

Author(s): James M. Saveland

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper