Making a Difference; Building Capacity, Improving Preparedness, and Learning From Experience
Presented by International Association of Wildland Fire

in partnership with the

Wildland Fire Leadership Council (WFLC) and the Western, Southeast and Northeast Regional Strategy Committees

This workshop would not have been possible without the support and partnership of the following:

• Great Basin Fire Science Exchange
• JFSP Southern Fire Science Exchange
• JFSP California Fire Science Consortium
• National Fallen Firefighters Foundation
• Northern Rockies Fire Science Network
• PHOS-CHeK
• Sim-Table
• Strategies Wildland Leadership
• U.S. Geological Survey

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Ed Brunson  
Deputy Program Director  
Joint Fire Science Program

Chuck Bushey  
President, Montana Prescribed Fire Services  
Past President, IAWF

Craig Goodell  
Fire Ecologist  
Bureau of Land Management

Katie Lighthall  
Coordinator  
Western Region National Cohesive Wildland Fire Strategy

Larry Mastic  
Coordinator  
Northeast Regional Strategy Committee

Jack McGowan-Stinski  
Program Manager  
Lake States Fire Science Consortium

Michelle Medley-Daniel  
Program Director  
Watershed Center

Tom Montoya  
Forest Supervisor  
Forest Service  
Wallowa-Whitman National Forest

John O’Connor  
Cohesive Wildfire Strategy Coordinator  
ODF Southwest Oregon District

Tami Parkinson  
Lead Fire Application Specialist  
USFS Wildland Fire Management RD&A

Mikel Robinson  
Executive Director  
International Association of Wildland Fire

Toddi Steelman  
School of Environment and Sustainability  
University of Saskatchewan, Canada

Joe Stutler  
Senior Advisor, Deschutes County  
Wildland Fire Cohesive Strategy,  
Western Region Co-Chair  
IAFC, Wildland Fire Policy Committee

Gary Wood  
Coordinator  
Southeastern Region National Cohesive Wildland Fire Strategy

Tom Zimmerman  
Past President  
International Association of Wildland Fire

Mike Zupko  
Executive Manager  
Wildland Fire Leadership Council (WFLC)
Desert Research Institute (DRI)
http://www.dri.edu/
@DRIScience

Desert Research Institute (DRI) is the environmental research arm of the Nevada System of Higher Education. DRI conducts cutting-edge applied research in air, land and life, and water quality across Nevada, the United States and on every continent. With more than 500 employees and two main campuses in Reno and Las Vegas, Nevada, DRI generates $30 million in total annual revenue.

DRI’s faculty members are nontenured, entrepreneurial and responsible for their own salaries from external grants and contracts. This blend of academic rigor and private-sector pragmatism has earned DRI a reputation for delivering rapid, high quality environmental science in a businesslike fashion.

Our Mission: We excel in basic and applied research and the application of technologies to improve people’s lives throughout Nevada and the world. We implement this mission by fostering scientific and engineering talent. We apply scientific understanding to the effective management of natural resources while meeting Nevada’s needs for economic diversification and science-based educational opportunities.

Our Vision: We seek to be the world’s scientific leader investigating the effects of natural and human-induced environmental change and advancing environmental technologies aimed at assessing a changing planet. We will achieve this vision by increasing scientific knowledge and understanding of the earth’s environment, promoting preservation of diverse ecosystems, advancing responsible resource management, and improving human health and welfare.

Research for a Balanced Future: Since 2000, DRI has attracted $391 million in external research. Watch the video below to learn more about DRI’s research, scientists, and mission.
The Great Basin Fire Science Exchange (greatbasinfirescience.org) is a regional program for land managers and researchers to share science and knowledge about fire, fuels, and vegetation management in the Great Basin (parts of NV, UT, ID, OR, and CA). This project is one of 15 regional Fire Science Exchanges funded by the national Joint Fire Science Program (firescience.gov/JFSP_exchanges.cfm). The goals of our project are to: 1) provide a place for land managers to voice their management questions, 2) compile the science information to address the questions, 3) package the information in a way that is quick to access and easy to understand, and 4) host events that bring researchers and managers together to talk directly with each other. For example, many managers have questions about what, if any, treatments they should apply to the ground after a wildfire to stabilize the soil and prevent invasion by weeds. Our project brought together fire ecologists and land managers to create a post-fire land treatment field guide outlining the different treatment options and where you might use one option versus another. We published the field guide, conducted a webinar on the topic, and then hosted six field workshops in different states where we distributed the guides, showed people how to use them, and had open discussions about the questions and content. We expect public and private land managers to benefit from this project by having a place and a person to turn to for answers to management questions and leads to research contacts, and we expect scientists to benefit by gaining new ideas and partnerships for research and by providing new methods of outreach for research results.

Our programs that support the National Cohesive Strategy both pre- and post-disaster include:
- Hazard Mitigation Planning
- Assistance to Firefighter Grants
- Community Planning and Capacity Building/Recovery Planning
- Hazard Mitigation Assistance
- Individual and Community Preparedness
- Fire Management Assistance Grants
- Risk Mapping, Assessment, and Planning (MAP)

The International Association of Wildland Fire (IAWF) was formed in 1990 as an international professional membership association focusing on all aspects of wildland fire. For 25 years IAWF has grown from its fledgling early years to being the foremost global member focused association spanning 30+ countries. IAWF is uniquely positioned as an independent organization whose membership includes experts in all aspects of wildland fire. IAWF independence and breadth of global membership expertise allows it to offer a neutral forum for the consideration of important, at times contentious, wildland fire issues.

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JFSP Southern Fire Science Exchange

A regional wildland fire science communication program and a member of the national Fire Science Exchange Network, funded by the Joint Fire Science Program (JFSP). Representing 11 southern states, we work with numerous partners throughout the region to increase the use of available fire science, facilitate discussions about the relevance of research results and future research needs, and connect fire managers and researchers.
JFSP California Fire Science Consortium

A network of scientists and managers that strives to accelerate the awareness, understanding, and adoption of wildland fire science information by federal, tribal, state, local, and private stakeholders within ecologically similar regions of the state. Our mission is to be an inclusive, neutral, customer-driven collaborative group that facilitates the flow of fire science information and dialogue. JFSP funded.

National Fallen Firefighters Foundation (NFFF)
www.firehero.org
@nfff_news

Congress created the National Fallen Firefighters Foundation to lead a nationwide effort to honor America’s fallen firefighters. Since 1992, the non-profit Foundation has developed and expanded programs that fulfill that mandate. Our mission is to honor and remember America’s fallen fire heroes and to provide resources to assist their survivors in rebuilding their lives and work within the fire service community to reduce firefighter deaths and injuries.

Each October, the Foundation sponsors the official national tribute to all firefighters who died in the line of duty during the previous year. Thousands attend the weekend activities held at the National Fire Academy in Emmitsburg, Maryland. The Weekend features special programs for survivors and coworkers along with moving public ceremonies.

The Foundation is a 501(c)3 nonprofit organization, located in Emmitsburg, Maryland. It is registered as a corporation in the State of Maryland. The Foundation receives funding through private donations from caring individuals, organizations, corporations, and foundations.

The Northern Rockies Fire Science Network—Bringing People Together, Sharing Science
http://nrfirescience.org/

Effective science communication is critical to science-informed management. With a rich history of fire research in the Northern Rockies, fire and fuels managers must sort through available science; find relevant and appropriate knowledge, tools, and applications to inform management decisions; and access expertise to address fire and fuels management questions. A partnership among the Joint Fire Science Program (JFSP), Rocky Mountain Research Station, USFS Northern Region, University of Montana, University of Idaho, Montana State University, and the Salish Kootenai College, the Northern Rockies Fire Science Network (NRFSN) is part of a national network that enhances awareness, understanding and use of science. The NRFSN aims to be a go-to resource for relevant, timely and accessible information to meet the needs of federal, tribal, state and local managers and scientists involved in fire and fuels management in Rocky Mountain forests of Idaho, Montana, Washington and Wyoming. Based on needs and priorities identified by stakeholders, we develop a variety of products to foster communication, strengthen collaborations, synthesize science, and increase science application to critical fire and fuels management challenges. Activities include fieldtrips, workshops, webinars, syntheses, e-newsletters, and searchable online publication and webinar databases. NRFSN activities are designed to increase scientist-manager interactions and knowledge exchange to develop greater mutual understanding and application of fire and fuels science to management.

PHOS-Chek
www.phos-chek.com

For over 50 years PHOS-CHeK has provided the world’s leading chemical solutions for management of wildland and structural fires. PHOS-CHeK Long-Term Fire Retardants, Class A & B Foams, Gels, and Fuel Gelling Agents are the safest, most effective and environmentally friendly fire chemicals available and are fully qualified by the USDA Forest Service. PHOS-CHeK Fire Retardants are available in powder and liquid form.
U.S. Geological Survey Wildland Fire Science (USGS)
https://www2.usgs.gov/ecosystems/environments/fireecology.html

The U.S. Geological Survey produces wildland fire science, data, and tools that are essential to decision making before, during, and after wildfires, and are used by fire and land management agencies, states and tribes, landowners, and communities across the U.S. Areas of emphasis for fire science work at USGS include:

- Effects of wildfire and prescribed fire on plants, wildlife and ecosystems
- Wildland fire history and management, including post-fire restoration and recovery, especially on lands managed by the Department of the Interior (DOI)
- Characterize risk of post-fire flooding, sedimentation, debris flow, smoke, and toxic fire ash
- Remote sensing and geospatial data, tools and products to support decision making by fire and land managers

For further information, contact:
Paul F. Steblein, Wildland Fire Science Coordinator • US Geological Survey, Ecosystems
12201 Sunrise Valley Dr., Rm 4A426A Reston, VA 20192
W: 703-648-6895  E: PSteblein@USGS.gov

Sim-Table
www.simtable.com
@SimTable
Simtable provides digital sandtables to the wildfire and emergency management communities. Combining existing GIS data with next generation agent-based modeling and ambient computing SimTable provides a straightforward easy to use approach in incident response and training. Interactive simulations and realtime maps can be distributed across the web and mobile devices. Simtable is based in Santa Fe, New Mexico. Current research and development includes LiveTexture which coordinates mobile, aerial and social media videos and photos into one 3D texture of an ongoing incident.

Western, Southeast and Northeast Regional Strategy Committees of the National Cohesive Wildland Fire Management Strategy

The Western Regional Strategy Committee was established in 2011 to support and facilitate implementation of the National Cohesive Wildland Fire Management Strategy across the West. From the great plains of Kansas and Nebraska to Alaska, Hawaii and the Pacific Islands.

The Northeast Regional Strategy Committee (NE RSC) provides executive leadership, coordination and guidance for implementation of the Northeast Regional Action Plan while providing a forum for members to recommend and guide joint strategic direction on fire and land management activities. The NE RSC continues to collaboratively support, recognize and assist the National Cohesive Wildland Fire Management Strategy goals and implementation efforts.

Approximately 45,000 wildfires and 1 million acres burn every year in the Southeastern U.S. A recent study by NOAA suggests that the risk of very large fire weeks will increase by 300% in this region by mid-century (2041-2070). Prescribed fire is used more frequently in southeastern states than other US regions, where approximately 6.5 million acres for forest management and 3.8 million acres for agriculture are burned annually. Though wildland fire has a long history in the Southeast, continuing to minimize the risks associated with it are essential to increasing the region’s fire-resiliency. The Cohesive Fire Strategy provides a framework to achieve this.
# NATIONAL COHESIVE WILDLAND FIRE MANAGEMENT STRATEGY WORKSHOP

**Second Annual**

**MARCH 26-29, 2018  THE PEPPERMILL  RENO, NV**

## Making a Difference; Building Capacity, Improving Preparedness, and Learning From Experience

**Presented by**

*International Association of Wildland Fire in Partnership with Wildland Fire Leadership Council (WFLC) and the Western, Southeastern and Northeastern Regional Strategic Committees*

### Monday, March 26

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>4:00-5:30 pm</td>
<td>Pre-Dinner Social Gathering, Welcome, Leaders Intent</td>
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<td>Tom Zimmerman/Joe Stutler/Toddi Steelman</td>
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### Tuesday, March 27

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>8:00-8:15</td>
<td>Welcome, Leaders Intent, Purpose</td>
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<td></td>
<td>Tom Zimmerman/Joe Stutler/Toddi Steelman</td>
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<tr>
<td>8:15-9:00</td>
<td><strong>How the Forest Service is implementing the Cohesive Strategy and how they can learn from this workshop</strong></td>
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<td></td>
<td>Jane Darnell, Deputy Regional Forester, Northern Region, Forest Service Rocky Mountain Region</td>
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</tbody>
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### MICRO-TALKS

**Session Moderator: Katie Lighthall**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>9:00-9:10</td>
<td>1. Facilitating Fuel Reduction across Landscapes: Cultivate Partner Resources, Increase Capacity for Private Landowner Engagement—Kara Baylog</td>
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<tr>
<td>9:20-9:30</td>
<td>3. Social science to increase capacity for co-managing wildfire risk across boundaries—Daniel Williams</td>
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<tr>
<td>9:30-9:40</td>
<td>4. Infusing Social Science into Wildfire Education Programs: An Innovative Approach to Becoming Fire Adapted—Chris Barth</td>
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<td>9:40-9:50</td>
<td>5. Advising Fire Adapted Communities Based on Recent Fire Science—Mark Dietenberger</td>
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<tr>
<td>9:50-10:00</td>
<td>6. Wildfire Characteristics in California: Status and Trends—Tadashi Moody</td>
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<tr>
<td>10:00-10:10</td>
<td>7. Risk Co-Management on the 2017 Wildfires—Toddii Steelman</td>
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<tr>
<td>10:10-10:20</td>
<td>8. Human presence diminishes the importance of climate in driving fire activity across the United States—Jon Keeley</td>
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<tr>
<td>10:40-11:00</td>
<td>Networking Break - N. Grand Naples Ballroom 6A&amp;B</td>
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<tr>
<td>Time</td>
<td>Grand Naples Ballrooms 1/2</td>
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| 11:00-12:45| Session Moderator: Michelle Medley-Daniel  
10. Fantastic Failures, Learning from our Mistakes - Allison Jolley, Dave Lasky, Ryan Anderson, and Eytan Krasilovsky | Session Moderator: Craig Goodell  
11. Moving from Fire Adapted Communities to Fire Dependent Cultures: Traditional Fire Knowledge and Wildland Fire Management—Frank Lake, Jim Durglo, Bill Tripp, Jonathan Long, Vita Wright | Session Moderator: Ed Brunson  
12. Stories to Scenarios: Creating Momentum for Large-Scale, Cross-Boundary Collaborative Restoration and Fire Management—Laura McCarthy, Porfirio Chavarria, Steve Guerin and Collin Haffey |
| 12:45-1:45 | Lunch - on your own                                                                           |                                                                                          |                                                                                             |
| 1:45-2:45  |                                                                                              | Session Moderator: Mike Zupko  
13. Nevada Prescribed Fire Alliance—Julie Hunter                                                  |                                                                                             |
| 2:45-3:45  |                                                                                              | Session Moderator: Mike Zupko  
14. Manufacturing the Components of the Cohesive Strategy to Achieve it's Vision and Goals: How Communities in the Western Klamath Mountains are Working Together to Create a Better Fire Future —Will Harling |                                                                                             |
| 3:45-4:00  |                                                                                              | Session Moderator: Michelle Medley-Daniel  
15. Flagstaff Watershed Protection Project—Matthew Millar                                  |                                                                                             |
| 4:00-4:45  |                                                                                              | Session Moderator: Joe Stutler  
16. Sell or Enforce Compliance?—Bob Roper                                                      |                                                                                             |
| 4:45-5:30  |                                                                                              |                                                                                          |                                                                                             |
| 5:30       | Summation - Tom Zimmerman/Joe Stutler/Toddi Steelman                                           |                                                                                          |                                                                                             |
| 5:30-7:00  | Socal Gathering with Exhibitors - Naples Ballroom 6A&B                                         |                                                                                          |                                                                                             |

**Wednesday, March 28**

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<thead>
<tr>
<th>Time</th>
<th>Grand Naples Ballrooms 1-5</th>
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| 8:00-8:30  | Welcome, Leaders Intent for the Day, open mic for Q/A/s from the floor  
Tom Zimmerman/Joe Stutler/Toddi Steelman |
| 8:30-9:00  | Wildland Fire Leadership Council (WFCLC) Perspective  
George Geissler, Director / Oklahoma State Forester, President, NASF |
<p>| 9:00-10:00 | Risk Management Assistance Teams; lessons learned from 2017 fire season and where is the program going, how do other stakeholders become involved and how is this connected to the CS2 - Becki Heath, Acting Associate Deputy Chief, US Forest Service, State and Private Forestry, WO |
| 10:00-10:15| Networking Break - N. Grand Naples Ballroom 6A&amp;B                                             |
| 10:15-10:25| MICRO-TALKS - Session Moderator: John O’Connor                                              |
| 10:25-10:35| 17. Operationalizing Responder Exposure Metrics to Support Response Decisions, Learning, and Accountability—Matthew Thompson |
|           | 18. Successful Wildfire Ozone Exceptional Events Demonstrations in Washoe County under the new Exceptional Events Rule—Julie Hunter |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>10:35-10:45</td>
<td>19. Case Study of Landscape Prescribed Burning and Monitoring in the Great Lakes Region—Brian Stearns</td>
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<td>10:45-10:55</td>
<td>20. Lessons learned from large wildfires: landscape fuel treatments and wildland fire management strategies—Susan Prichard</td>
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<tr>
<td>11:35-11:45</td>
<td>25. Learning from experience to prepare for the future - aerial firefighting use and effectiveness —Keith Stockmann</td>
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<td>11:45-11:55</td>
<td>26. Bridging the gap: the role of boundary organizations at the fire science/policy interface —Meg Nakahara</td>
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| 12:00-12:45  | **Session Moderator: Tom Zimmerman**  
**PANEL SESSION: Three Levels of Cohesive Strategy Implementation**  
Chuck Mark, Forest Supervisor, Salmon-Challis National Forest, US Forest Service;  
Michael T. DeGrosky, Chief, Fire and Aviation Management Bureau Forestry Division, Montana Department of Natural Resources and Conservation and  
Mike Robison, District Manager, Coos Forest Protective Association |
| 12:45-1:30   | Lunch - on your own |
| 1:30-2:30    | **Session Moderator: Larry Mastic**  
27. Increasing prescribed fire on private lands—Kristen Newman and Mylea Lovell |
| 2:30-3:30    | **Session Moderator: Larry Mastic**  
28. Reducing Fuels, Restoring Landscapes and Protecting Communities in the Northeast and Midwest U.S.—Thomas Fielden |
| 3:30-3:45    | **Networking Break - N. Grand Naples Ballroom 6A&B**  
**Session Moderator: Katie Lighthall**  
29. Restoring Resilience of the Socio-Ecological Landscape: Focus on the Lake Tahoe West Restoration Partnership—Forest Schafer, Sarah DiVittorio, Brian Garrett, Jonathan Long, Jason Vasques, Mason Bindl |
| 3:45-4:45    | **Session Moderator: Joe Stutler**  
30. How Do We Accomplish All-Lands Management Projects? Ingredients, Recipes, and Chefs’ Stories—Karen Hardigg and Emily Jane Davis |
| 4:45-5:30    | Summation  
Tom Zimmerman/Joe Stutler/Toddi Steelman |
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<tr>
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<tr>
<td>8:00-8:30</td>
<td>Leaders Intent and open mic for Q’s/A’s</td>
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<td>Tom Zimmerman/Joe Stutler/Toddi Steelman</td>
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<td>8:30-9:30</td>
<td><strong>PANEL SESSION: State’s perspective on CS implementation, barriers and</strong></td>
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<td><strong>opportunities with Q/A</strong> Jeff Whitney, Arizona State Forester; Jim Karels,</td>
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<td>Florida State Forester; Peter Daugherty, Oregon State Forester and Dave Celino,</td>
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<td>Chief Fire Warden (Massachusetts State Forest Fire Supervisor)</td>
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<td>9:30-10:00</td>
<td><strong>Session Moderator: Mike Zupko</strong></td>
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<td>31. BLM South Pass Aspen Enhancement Project in Wyoming</td>
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<td>Rance Neighbors and Tim Kramer</td>
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<td>10:00-10:15</td>
<td><strong>Networking Break - N. Grand Naples Ballroom 6A&amp;B</strong></td>
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<td>10:15-11:15</td>
<td><strong>Grand Naples Ballroom 1</strong></td>
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<td><strong>Session Moderator: Tim Brown and Tamara Wall</strong></td>
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<td>32. Are Red Flag warnings a resource tool or safety product? - Tim Brown</td>
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<tr>
<td>11:15-11:30</td>
<td><strong>Networking Break - N. Grand Naples Ballroom 6A&amp;B</strong></td>
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<tr>
<td>11:30-12:15</td>
<td><strong>Session Moderator: Joe Stutler</strong></td>
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<td><strong>John F. Ruhs, State Director, Nevada, Bureau of Land Management</strong></td>
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<tr>
<td>12:15-12:45</td>
<td><strong>Session Moderator: Joe Stutler</strong></td>
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<td><strong>Keynote closeout of conference, Jeff Whitney</strong></td>
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<tr>
<td>12:45-1:00</td>
<td><strong>Closeout/Summation/Next Workshop</strong> - Tom Zimmerman/Joe Stutler/Toddi Steelman</td>
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<tr>
<td>1:00-2:00</td>
<td><strong>Lunch</strong> - on your own</td>
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<tr>
<td>2:00-5:00</td>
<td><strong>Optional Field Trip to Desert Research Institute</strong></td>
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Jane Darnell
Deputy Regional Forester, Northern Region, Forest Service Rocky Mountain Region

Jane Darnell has been Deputy Regional Forester for the Northern Region since February 8, 2015. Jane came to the Northern Region from the Forest Service’s Rocky Mountain Region where she served as the Forests and Grasslands Supervisor on the Nebraska National Forests and Grasslands, headquartered in Chadron, Nebraska.

Jane has extensive experience working for both the Forest Service and the Bureau of Land Management in the West. She is a graduate of Colorado State University with a degree in Farm and Ranch Management. Jane began her Forest Service career in 1989 in Douglas, Wyoming, where she worked in range and as a realty specialist. Jane has served as the District Ranger in Lemmon, SD on the Dakota Prairie National Grasslands, as a realty specialist in the Northern Region Regional Office, the Wyoming Capital City Coordinator, and as the BLM Wyoming Deputy State Director of Resource Policy and Management.

During the winter of 2016, Jane served as Acting Associate Deputy Chief in State and Private Forestry with responsibility for fire. Jane currently serves as co-chair of the Forest Service National Fire Leadership Council and the National Line Officer Team for Fire.

Jane is married and has two grown children.

George Geissler
Director / Oklahoma State Forester, President, NASF

George L. Geissler is Oklahoma’s State Forester and Director of the state’s Forestry Services division. A position he has held since February of 2011.

Mr. Geissler is a native of New Orleans. He received his Bachelor of Science degree in Forest Management from Louisiana State University and a Master of Business Administration degree from Harvard University. He has almost 30 years of experience in natural resource and wildland fire management, and six years of experience in structural firefighting as a volunteer in Idaho and New Mexico. He is a member of the Society of American Foresters since 1987 and a Certified Forester.

Mr. Geissler began his career with the United States Forest Service on the Boise National Forest as both a wildland firefighter with the Boise Hotshots and a silviculturist on the Idaho City Ranger District.

He left the USFS in 1988 to become Corporate Forester for Central and Southwest Services (an electric utility holding company based in Dallas, TX) where he directed forest management activities on 475,000 acres of company owned timberlands and vegetation management on company electrical system infrastructure located in the US, Brazil and England.

In 1997 Mr. Geissler left Central and Southwest to establish Forestry West LLC, in New Mexico. Forestry West quickly established itself in natural resource management including forest management, community wildfire protection planning, and wildland fire planning and prevention. When the firm was sold in 2005 Forestry West had a staff of 80 supporting clients in 18 western states.

He joined Oklahoma Forestry Services in 2006. Before being named as State Forester he served in a staff function to coordinate all forest management activities provided by OFS including the Forest Stewardship program, forest management planning, prescribed fire planning, financial analysis, and technical assistance.
Mr. Geissler is the current President of the National Association of State Foresters and represents Governor Mary Fallin and National Governors Association to the Wildland Fire Leadership Council.

Mr. Geissler is married to his wife Bea. They have two children and 4 grandchildren and reside in Norman, OK.

Becki Heath
Acting Associate Deputy Chief,
US Forest Service, State and Private Forestry, WO

Becki is currently working on a long-term detail in the Washington Office as Acting Associate Deputy Chief for State and Private Forestry. Her work is focused on Fire and Aviation Management.

Prior to this she severed for 4 years as the Deputy Regional Forester for the Pacific Northwest Region. She had responsibility for Natural Resources, Fire, Planning, State and Private Forestry, Public Affairs, Safety and Tribal Affairs.

Previously she served as the Forest Supervisor on the Okanogan-Wenatchee National Forest, in Wenatchee Washington, from August 2007 until September 2013. And prior to that, she served 6 years as the Forest Supervisor on the Gallatin National Forest, in Bozeman Montana.

She was District Ranger for the Leavenworth Ranger District on the Wenatchee National Forest from 1990-1999, then the Deputy Forest Supervisor for the Deschutes in Bend Oregon, until late 2001. Her early positions ranged from silviculturist to presale forester, on the Mt. Hood, Ochoco, Umatilla and Wenatchee National Forests. She has spent all of her 35+ year career with the Forest Service in the West.

In all of her leadership positions she has focused on restoration of dry forests and fire adapted ecosystems; she has helped move the agency to a restoration focus for our forested and aquatic systems. One of her passions is connecting people and natural resources. She has also spent nearly 25 years as a Line Officer and has always had significant fire workload in her portfolio. She is committed to further connecting Line and Fire Leadership.

She has a BS in Resource and Recreation Management from the OSU School of Forestry and a MS in Forest Management from the University of Washington.

PANEL

Chuck Mark
Forest Supervisor, Salmon-Challis National Forest US Forest Service

Chuck grew up in the Midwest in the suburbs on the south side of Chicago. After high school graduation he came west to Missoula, Montana to the University of Montana. Chuck earned a B.S. degree from the School of Forestry at the University of Montana in 1981. He attended and graduated from the CEFES (Continuing Education in Forest Ecology and Silviculture) program in 1991 and became a Certified Silviculturist in 1992. Chuck worked in silviculture, timber and fire management throughout his Forest Service career until he became a line officer in 2004. He served as the St. Joe District Ranger on the Idaho Panhandle National Forests in northern Idaho from 2004 through 2010. Chuck returned to Montana in 2010 as the Deputy Forest Supervisor for the Beaverhead-Deerlodge National Forest in Dillon, Montana. He has served as the Forest Supervisor for the Salmon-Challis National Forest in east-central Idaho since 2013.

Chuck’s love for wild places is what drew him out west and skiing, hiking, backpacking, fishing, hunting and rafting still occupies his adventures. He is devoted to his wife of 34 years, Pam and his two daughters, Sienna a junior at Eastern Illinois University and Peyton a high school Junior in Salmon, Idaho. Chuck’s professional interests revolve around collaborative forest management and fire management. He is actively leading a collaborative planning effort to revise the Salmon-Challis National Forest land management plan. Chuck also advocates for the use of fire across landscapes to promote resiliency and sustainability of ecological, social and economic conditions.
Michael DeGrosky  
**Chief, Fire and Aviation Management Bureau, Forestry Division, Montana Department of Natural Resources and Conservation**

Michael DeGrosky is Chief of the Montana Department of Natural Resources and Conservation’s Fire and Aviation Management Bureau. Prior to returning to the Montana DNRC in 2016, Mike was Chief Executive of Guidance Group, Inc. a consulting firm specializing in the human and organizational aspects of the fire and emergency services and an adjunct instructor in the Leadership Studies Department for Fort Hays State University.

He is an experienced wildland and municipal fire professional with an emergency service background spanning 40 years. Mike earned PhD in Business Administration, with a specialization in organizational leadership from Northcentral University. He is also an alumnus of the University of Montana, School of Forestry and Fort Hays State University, College of Business and Leadership, where he earned a master’s degree in organizational leadership.

Mike Robison  
**District Manager, Coos Forest Protective Association**

Mike Robison started working for the Douglas Forest Protective Association (DFPA) in 1975. In 1989, Mike transferred to Coos Forest Protective Association (CFPA), becoming its District Manager in 2002. 2018 marks the start of Mike’s 43rd year of serving Oregon’s Fire Protection Program as a forest protection association employee.

Jeffery C. Whitney  
**Arizona State Forester Director, Department of Forestry and Fire Management**

Jeff Whitney was appointed to his current role as Arizona State Forester in January 2015 by Arizona Governor Doug Ducey. Prior to becoming the Arizona State Forester, Mr. Whitney enjoyed a 36-year career with the federal government in both natural resources and emergency response. His last position served was as Executive Director for Fire Program Analysis (FPA) in Washington, D.C. with the U.S. Department of the Interior and the USDA Forest Service.

In terms of natural resources, Mr. Whitney served in a number of capacities with both the U.S. Forest Service and the U.S. Fish and Wildlife Service as a range conservationist, wildlife biologist, fisheries biologist, hydrologist, forester, agency administrator and senior program manager.

Related to wildland fire and emergency response, he began his career in 1972 as a seasonal firefighter, serving five seasons with hotshot crews and three seasons as a heavy engine captain. Following that, he continues to serve in incident response, primarily in operations and as an Incident Commander. Currently, he is a qualified National Area Commander. Mr. Whitney earned a Bachelor of Science in botany from Northern Arizona University in 1977, and a Master of Science in environmental resources from Arizona State University in 1996. Mr. Whitney serves on a number of boards, commissions and advisory councils.

Jim Karels  
**Florida State Forester**

Jim Karels has been the Director and State Forester of the Florida Forest Service since 2008. He oversees all wildland fire and land management activities and also has held the positions of Fire Chief and Assistant Director. He began his career with the division as a firefighter suppressing wildfires in 1985. He has more 35 years of experience in wildfire and emergency response and land management with the U.S. Forest Service and the Florida Forest Service.

Jim has coordinated the department’s Emergency Response Program since 1995 through numerous hurricanes, floods, tornadoes, wildfire outbreaks and other emergencies. He is the past president of the National Association of State Foresters (NASF), representing all 50 states on wildland fire issues and is the past Fire Committee Chair for NASF. He also represents all states on the Wildland Fire Executive Council with the U.S. Forest Service and Department of Interior. He received his Bachelor of Science in Forest Management from the University of Minnesota.
Peter Daugherty
Oregon State Forester

Peter Daugherty, selected by the Board of Forestry as Oregon’s 13th State Forester, leads the Department of Forestry in its mission to serve Oregonians by protecting, managing, and promoting stewardship of Oregon’s forests. He also helps the Board carry out its mission to lead Oregon in implementing policies and programs that promote sustainable management of Oregon’s public and private forests.

State Forester Daugherty joined the Department in 2007. He served most recently as the Private Forests Division Chief, where he worked on best forest management practices for water quality, and on forest health, family forestlands, and urban forestry. Over the course of his career, he has worked as a private forest economist and a professor of forest management and ecological economics. He also enjoyed time as a U.S. Forest Service research forester.

He has a doctorate in forest management and economics, and two bachelor’s degrees—a B.S. in forestry and a B.A. in political science and dramatic art—all from the University of California at Berkeley. He is a member of the Society of American Foresters and the International Society of Ecological Economics.

Dave Celino
Chief Fire Warden, State of Massachusetts

Dave Celino has a degree in Forestry and Surveying from Paul Smith’s College in the Adirondack Region of New York. He started his career out of college as a professional timber faller in southwest Colorado in the early 1980s before moving back to his home state of Connecticut, where he worked as a procurement forester for a large hardwood lumber operation. In the 1990s Dave moved to Massachusetts, where he ran his own forestry consulting firm for the next 20 years and worked with numerous private, municipal, and state landowners to develop long-range forest management planning. During this period, he became a member of the Massachusetts Wildfire Crew and was a municipal fire chief for the town of Colrain, MA. In 2007 Mr. Celino brought his land management and firefighting experience to the Massachusetts Department of Conservation and Recreation as the Chief Fire Warden, where he remains today.

John F. Ruhs
State Director, Nevada, Bureau of Land Management

John F. Ruhs began his duties as State Director for the Bureau of Land Management in Nevada in November 2015. He oversees the management of 48 million surface acres of public land in Nevada, 59 million subsurface acres, six district offices and 14 field offices. Headquartered in Reno, NV.

BLM Nevada has the largest mining program in the BLM as well the largest Wild Horse and Burro program. Other program areas include Grazing, Recreation, Cultural Resources, National Landscape Conservation, Renewable Energy, Geothermal Leases, Oil and Gas, Wildland Fire and Fuels Management, Abandoned Mines and Sage-Grouse Conservation. Ruhs recently served as Acting Deputy Director of Operations for BLM in Washington D.C. from April to December 2017. He previously served as the Director of BLM’s Eastern States and had been the acting State Director for Nevada from April through September of 2015. He has extensive experience in land management in the west, including previous assignments as the Ely District Manager and Winnemucca Fire Management Officer in Nevada, District Manager of the High Desert District in Wyoming and other work for the BLM in Colorado, Idaho and Oregon.

Ruhs is a native of Iowa and served in the U.S. Marine Corps. He received his Bachelor of Science degree in Animal Science from the University of Idaho. He and his wife, Amy, have seven daughters. He enjoys outdoor activities including riding horses, camping and playing golf.
1. **Facilitating Fuel Reduction across Landscapes: Cultivate Partner Resources, Increase Capacity for Private Landowner Engagement**  
**Presenter:** Kara Baylog, Educational Programming Assistant, Oregon State University Extension

A complicating factor of fuels reduction across contiguous landscapes is the diversity of landownerships. If neighboring lands do not make fuel reductions a priority, it can hamper the effectiveness of fuels treatments. This problem is pronounced across “checkerboard” ownership, where public and private lands are highly intermingled, and where there are limited levels of private landowner treatments. According to an assessment completed by the American Forest Foundation (AFF), upwards of 40% of the land in high fire risk areas that are important to water are private and family-owned, and most have never met with a professional forester. With forest health across mixed ownerships a critical issue in the west, providing professional forestry guidance to private landowners with limited resource knowledge is essential to reducing fire risk and protecting water and forest resources.

This talk focuses on methods of outreaching to landowners with limited knowledge of forest management or fuels reduction, and the coordination of financial and technical resources to encourage work on the ground. We look the results of of the targeted outreach and collaborative effort, My Southern Oregon Woodlands. This campaign uses a targeted marketing approach to focus on motivating private woodland owners to action in conjunction with 1) the wildfire preparedness needs of the area 2) the availability of funding resources and 3) fuels treatments being done concurrently on public lands.

Partners include a variety of organizations including, Oregon State University Extension, the Oregon Department of Forestry, Oregon Forest Resources Institute, AFF, the Natural Resource Conservation Service, the Bureau of Land Management, the US Forest Service and private woodland owners of southern Oregon. Thanks to these collaborations, campaigns serve as a warehouse of information on management resources and the needs of private landowners, and a conduit to connect the two.

**Bio:** Kara Baylog is the coordinator of the Citizen Fire Academy and My Southern Oregon Woodlands with Oregon State University Extension. In 2010, she completed her master’s degree in Environmental Science and Policy at Clark University in Worcester, MA. She has worked in southern Oregon and northern California for over 5 years, increasing the capacity of small woodland owners to make informed decisions regarding forest health and fire risk reduction on their properties.

**Additional Authors:**
John O’Connor, Cohesive Wildfire Strategy Coordinator, Oregon Department of Forestry and Elizabeth Weber, Regional Manager Western Forest Conservation, American Forest Foundation

2. **Nudging toward Mitigation: Using Behavioral Economics to Encourage WUI Resident Engagement with Wildfire Council Programs**  
**Presenter:** James Meldrum, Research Economist, US Geological Survey, Fort Collins Science Center

Behavioral economics and “nudges” are everywhere these days, including underlying Richard Thaler’s 2017 Nobel prize in economics. Nudges are low-cost interventions for influencing behavior without introducing new programs, policies, or incentives. They’re popular in part because they’re low cost and have shown promise in improving social welfare - without constraining individuals’ choices - in numerous domains, including retirement savings, energy and water conservation, and public health. One potential context for nudging that has not been explored much, though, is wildfire or other natural hazards.

This Ignite-style presentation will introduce the audience to a simple experiment for nudging WUI residents toward mitigating the wildfire risk on their properties. The experiment, implemented by West Region Wildfire Council with help from members of the WiR Wildfire Research team, explores the use of information from parcel-level rapid wildfire risk assessments as the content of a simple nudge for increasing residents’ engagement with the Council’s mitigation-focused programs, which include site visits, fuels treatment grants, and chipper days. The experiment looks at different information treatments, including not only telling people their own risk rating but also that of their closest neighbors or for their overall community.

Our brief presentation will walk audience members through the general concept of the nudge and key aspects of the experiment. Rather than focus on technical details of the analysis, we’ll highlight some of the exciting results we’re seeing and what they imply about this approach to using rapid risk assessment information to help wildfire councils and similar organizations do their jobs better. We hope to generate excitement and ideas for
other practitioners to implement similar-style efforts, as well as to more generally encourage folks to take an experimental and data-driven approach to developing their own risk mitigation and related programs.

Bio: James Meldrum is a Research Economist at the US Geological Survey’s Fort Collins Science Center. James belongs to the WiR (WildfireResearch) Team, a research-and-practice collaboration focused on homeowner wildfire risk mitigation and community wildfire adaptedness. He also investigates the effects of natural resource decisions, including those about fuels and fire management, on ecosystem services. James has authored numerous publications on wildfire risk, plus other topics including water resources, energy, flood risk, and invasive species. James has a PhD in environmental economics from the University of Colorado and a BS in physics and philosophy from Washington University in St. Louis.

3. Social science to increase capacity for co-managing wildfire risk across boundaries
Presenter: Daniel Williams, Research Social Scientist, USFS - Rocky Mountain Research Station

Developing effective long-term strategies for managing wildfire across a mosaic of landowners and managers increasingly depends on co-managing the wildfire risk that is shared across fire-prone landscapes. In January of 2017 a research team was organized to improve the social science understanding of cross-boundary risk management. An initial roll-out of this project was presented at last year’s Cohesive Strategy Workshop. The goal for this year’s presentation is to share progress made in the design of the project and present some initial results. More specifically, this talk will provide an overview of the project, discuss project approaches, and present initial results that begin to paint the current picture of the wildfire governance network.

Bio: Daniel R. Williams is a Research Social Scientist with the USDA Forest Service, Rocky Mountain Research Station in Fort Collins, Colorado. He has worked for RMRS for 19 years and previously served on the faculty at University of Illinois, Virginia Tech and the University of Utah. He received his Ph.D. in Forestry from the University of Minnesota. Dan’s research on wildland fire focuses on the adaptive capacity of communities in the WUI, the human dimensions of landscape change, and the adaptive governance of complex social-ecological systems.

Additional authors: Maureen Essen, Social Science Analyst, USDA Forest Service, Rocky Mountain Research Station; Derric Jacobs, Research Faculty, Portland State University; Cody Evers, PhD student, Portland State University.

4. Infusing Social Science into Wildfire Education Programs: An Innovative Approach to Becoming Fire Adapted
Presenter: Chris Barth, Fire Mitigation Specialist, BLM - Montana/Dakotas

The Cohesive Strategy effort was designed to understand the complexities of managing wildfire risks, so that we can learn to live with wildland fire. The integration of social science with wildfire management both informs and facilitates the social and biophysical landscape to becoming fire adapted.

Wildfires have increased dramatically in both number and associated losses in recent years. As a nation, we spend a lot of time and money suppressing wildfires to protect homes and communities. Every time we think we’re making progress, another wildfire makes us scramble and spend more time and money reacting to a threatening wildfire rather than proactively addressing the problem. Can we break this cycle?

The Wildfire Research (WiR) Team believes that we can change the paradigm through strong researcher-practitioner partnerships, applied social science, and wise investments. We challenge common beliefs about wildfire by learning about individuals and their communities to understand their perceptions about risk, attitudes about mitigation, and the relationship between the individual and the community. We collect and use community-specific information to improve programs that are tailored to local needs and support fire adaptation. With this approach, our partnerships help communities create their own paths to fire adaptation based on the unique characteristics and strengths of the area. We learn about the community to find solutions that work in the community. Because the community is front and center and the work is in-depth, the positive changes are long-term solutions.

This presentation will demonstrate the researcher-practitioner model used by the WiRe Team using some of the same innovative tools that we have created with our partners. The audience will learn what drives our desire to learn about the whole of the community rather than a vocal few; the process we follow to understand individuals and communities they live in; and the positive outcomes of engaging this approach. The presentation will highlight new, live illustration videos that we are using, and some of the infographics that highlight programmatic and policy changes that have increased participation in the fire adapted conversation – all told within a story map.

Bio: Chris Barth is a Fire Mitigation Specialist with the Bureau of Land Management; working in fire
management since 1992. Chris is a member of the WiR (WildfireResearch) Team, a research-and-practice collaboration focused on homeowner wildfire risk mitigation and community wildfire adaptedness. He has co-authored multiple publications on homeowners’ attitudes towards wildfire mitigation and perception of risk. Chris has extensive experience in crisis communication – working with the public, elected officials and the media to communicate fire management strategies, disaster response, and mitigation activities. Chris holds Bachelor’s Degrees in Biology and Environmental Conservation, as well as a Master’s Degree in Environmental Education.

5. Advising Fire Adapted Communities Based on Recent Fire Science

Presenter: Mark Dietenberger, Research General Engineer, USDA Forest Service - Forest Products Laboratory

Much of adaptation strategies to mitigate wildland fire on communities have been based on experiential knowledge. Some of mitigation strategies commonly used can be shown to be overly conservative based on fire research. In some situations the experiential knowledge is even lacking. For example, once the home is fully hardened against direct embers, the requirements for vegetation and building clearances can potentially be relaxed considerably to address the threats of contacts and radiances from vegetative crown fires ignited with embers. Furthermore, fire modeling has been used to show that for such hardened home, the zones of vegetation clearance can be adjustable depending on the building cladding, ground cover, fencing, and vegetation density. No attention need be made towards a suitable firewise vegetation. On the other hand, if wildland fire embers are unlikely at the home, and the home is hardened only with its roof against embers, then a conservative vegetation and fuel clearance would intuitively be needed, as typically within a city with existing building regulations on their spacing. Because of the unlikelihood of landscape fire spread, the city can rely on the fire department as an accessible resource for fire suppression. However, if a prescribed burn is being done nearby, the smoke development becomes an emergent issue for fire research. Increasingly, in some places, the wildland fire can be especially threatening and extreme, discharging both heavy embers and fire whirls as from an adjoining pristine forest land as happened with the Peshtigo Firestorm in 1871 and others since. It would be very difficult to evaluate from this threat the current experiential knowledge or fire modeling as to the appropriate mix of home hardenings and fuel clearances, especially in the likelihood that evacuations and fire suppressions will be overwhelmed.

A detailed and advanced fire modeling could be proposed for development of this advanced fire adapted community, but until then the building of such communities at those threat sites ought to either be avoided, or consider installing shelters-in-place, allowing the possibility of some losses, and then rebuilding.

Bio: Dr. Mark Dietenberger has been a General Research Engineer with the USDA Forest Products Laboratory for 25 years researching in Fire and Building Science. For the last 15 years he has done fire modeling related to WUI. He developed the ecoSmart Fire model that calculates vegetation landscaping around the home that mitigate the radiant and flame contact threats of the vegetation burning using the Google Earth mapping, and also internal landscaping mapping.

6. Wildfire Characteristics in California: Status and Trends

Presenter: Tadashi Moody, Environmental Scientist, California Department of Forestry and Fire Protection (CAL FIRE)

The California Department of Forestry and Fire Protection (CAL FIRE) performs a periodic assessment of status and trends in forests and rangelands throughout the state. In this ignite talk, we will present information from the current Forest and Rangeland Assessment (in review), which includes five resource indicators for wildfire: 1) fire return interval departure, 2) fire threat, 3) wildfire activity, 4) fire severity and 5) fuel treatments. These indicators are synthesized into a cohesive story of altered landscape conditions, increasing area burned, changing patterns of fire severity, and fire management efforts in the face of a changing climate. We explore briefly how this story aligns with and can inform the Cohesive Strategy.

Bio: Tadashi J. Moody is an Environmental Scientist for the California Department of Forestry and Fire Protection - Fire and Resource Assessment Program. His current work focuses on the use of forest and wildfire models to inform state programs and planning efforts, including the periodic Forest and Rangeland Assessment, and the Greenhouse Gas Reduction Fund - Forest Health Program. He received an M.S. in Environmental Science, Policy and Management from the UC Berkeley, a B.S. in Forestry and Natural Resources from Cal Poly, San Luis Obispo, and is a certified Wildland Fire Ecologist with the Association for Fire Ecology.

Additional Authors: Chris Keithley, Chief, Fire and Resource Assessment Program, CAL FIRE
7. **Risk Co-Management on the 2017 Wildfires**  
**Presenter:** Toddi Steelman, Professor, School of Environment and Sustainability, University of Saskatchewan

Ineffective risk co-management manifests in conflict and problematic communication and coordination among the variety of stakeholders during an incident, hindering the effectiveness in incident response. The adoption of collaborative risk management has been offered as a path forward to deal with the ongoing challenges associated with wildfire management, however, realizing its promise is difficult. Our presentation focuses on the models and practices that facilitate or impede risk management dialogue. Drawing from a national sample of 10 of the most complex wildfires from the 2017 fire season and interviews with key informants across different jurisdictional levels (local, state, federal), we document substantive differences in risk narratives among key stakeholders.

**Bio:** Dr. Steelman has a more than 15 year history of wildfire research and has conducted research on community aspects of wildfire management throughout the United States and Canada. Her research agenda has focused on understanding community responses to wildfire and how communities and agencies interact for more effective wildfire management. She is co-director of the FireChasers project at NCState University with Dr. Branda Nowell.

8. **Human presence diminishes the importance of climate in driving fire activity across the United States**  
**Presenter:** Jon Keeley, Climate and fires across the United States, U.S. Geological Survey

Growing human and ecological costs due to increasing wildfire is an urgent concern in policy and management, particularly given projections of worsening fire conditions under climate change. Different factors limit fire behavior in different places and times, but most fire-climate analyses are conducted across broad spatial extents that mask geographical variation. This could result in overly broad or inappropriate management and policy decisions that neglect to account for regionally specific or other important factors driving fire activity. We developed statistical models relating seasonal temperature and precipitation variables to historical annual fire activity for 37 different regions across the continental United States and asked whether and how fire-climate relationships vary geographically, and why climate is more important in some regions than others. Seasonal climate variation played a significant role in explaining annual fire activity in some regions, but the relative importance of different variables, in addition to the overall importance of climate, varied substantially depending on geographical context. Human presence was the primary reason that climate explained less fire activity in some regions than others. That is, where human presence was more prominent, climate was less important. This means that humans may not only influence fire regimes, but their presence can actually override, or swamp out, the effect of climate. Thus, geographical context as well as human influence should be considered alongside climate in national wildfire policy and management.

**Bio:** Jon E. Keeley, is a Senior ST research scientist with USGS, adjunct professor at UCLA, former program director at NSF, recipient of a Guggenheim Fellowship and ESA Fellow. He has spent sabbatical leaves in all of the mediterranean climate regions of the world. Dr. Keeley has over 350 publications in national and international scientific journals and books and have garnered more than 15,000 citations. He is senior author of a 2012 Cambridge University Press book Fire in Mediterranean Climate Ecosystems: Ecology, Evolution and Management.

**Additional Authors:** Alexandra D. Syphard, Conservation Biology Institute

9. **Discussion on future data needs across multiple perspectives**  
**Presenter:** Kurtis Nelson, Physical Scientist, USGS

The USGS is exploring the future needs of different users and providers of data and information products relevant to wildfire management. Our goal is to engage with a broad spectrum of data consumers and gather input on current and future data products. The USGS exhibitor booth is set up to provide examples of current data products and to capture feedback from workshop participants. Our goal will be to share the results gathered at this workshop with interested participants, continue to solicit ideas from other users at future events, and use this information to guide future development of USGS fire science data.

**Bio:** Kurtis Nelson is a physical scientist affiliated with the USGS Earth Resources Observation and Science Center in Sioux Falls, SD. He has been engaged in various aspects of producing data for wildfire management for over 10 years.

**Additional Authors:** Birgit Peterson, Geographer, USGS
10. Fantastic Failures: Learning From Our Mistakes

**Presenters:** Allison Jolley, Communications Manager, Fire Adapted Communities Learning Network
Dave Lasky, Module Lead, Gravitas Peak Wildland Fire Module
Ryan Anderson, Executive Director, Washington Resource Conservation and Development Council
Eytan Krasilovsky, Southwest Director, Forest Stewards Guild

In this session, workshop attendees will hear 2-4 honest reflections from fire adapted communities practitioners about times that they failed, how they recovered, and what they learned from it. This type of storytelling is a critical, yet often underutilized, stepping stone toward improvement. This session will provide a framework of how to productively and honestly reflect on failures so that attendees can capitalize on all that failures have to offer. In the longer of the two options, participants will also receive a short training on the art and science of failure storytelling, develop a story of their own, and reflect on the process via group discussion, in efforts to build their own storytelling and reflecting capacity.

11. Moving from Fire Adapted Communities to Fire Dependent Cultures: Traditional Fire Knowledge and Wildland Fire Management

**Presenters:**
Frank Lake, Research Ecologist, USDA Forest Service-PSW
Bill Tripp, Deputy Director of Eco-Cultural Revitalization, Karuk Department of Natural Resources.
Jonathan Long, Research Ecologists, USDA Forest Service
Vita Wright, Research Ecologist, USDA Forest Service
Jim Durglo, Intertribal Timber Council-Fuels/Retired Confederated Salish & Kootenai Tribes Forestry

This workshop will bring together tribal, agency, non-governmental organizations, and academic representatives working to restore landscapes and reintroduce fire as a critical ecological and socio-cultural process. Significant policy and societal emphasis is being placed on wildfire preparedness for developing Fire Adapted Communities, one of the three main tenants of the Cohesive Strategy. Many American Indian tribes were and still are dependent upon wildland fires as an important source of cultural renewal, sustaining traditions, provider of water and food security, and for the generation of ecosystem services. Traditional fire knowledge and teachings instruct that cultural burning is a form of “human services to ecosystems”. This workshop will provide lessons learned, share advancements in using traditional fire in a modern context to achieve multiple resource objectives, and examples of tribal Fire Dependent Cultures. This session addresses the workshop topic “Learning from Experience” [or Building Capacity-engaging vulnerable tribal populations] as a type of Learning Lab approach using a Story Circle format for active sharing and learning among workshop session participants.

The main themes to be addressed are: Where and How is Tribal traditional fire knowledge being used to inform project research/monitoring, planning and implementation? How and What values [economic, ecological and socio-cultural] are being addressed with wildland fire management strategies associated with post-fire resources and other forest products of tribal significance? These targeted question topics will be addressed by several invited speakers who will provide short presentations of their case study examples. Next the session organizers will facilitate discussion among the session participants on the topics. Emphasis of the conversation, Story Circle style, will include lessons learned, what worked and how, key findings or messages to carry forward, what science support or research remains or is desired, and what policies or authorities are applicable or needed.

**Bio:** Frank Lake works on tribal and community forestry and related natural resource issues. His research focuses on restoration ecology and the incorporation of traditional knowledge into wildland fire and forest management in the Pacific Northwest and northern California, with an emphasis on the Klamath-Siskiyou bioregion. He has a research interest in wildland fire and management effects on tribally valued resources and habitats. Frank serves as a science advisor to The Nature Conservancy’s Indigenous Peoples Burning Network and for the Western Klamath Restoration Partnership.
12. Stories to Scenarios: Creating Momentum for Large-Scale, Cross-Boundary Collaborative Restoration and Fire Management

Presenters:
- Laura McCarthy, New Mexico Associate State Director, The Nature Conservancy
- Porfirio Chavarria, Wildland Urban Interface Specialist, City of Santa Fe Fire Department
- Stephen Guerin, CEO, Simtable
- Collin Haffey, Conservation Coordinator, The Nature Conservancy in New Mexico

This will be a hands-on workshop session that uses stories about the Rio Grande Water Fund (RGWF), whose goal is to restore 600,000 acres of fire-adapted forests, as the template for learning about designing and implementing large-scale, cross-boundary collaborative restoration. The workshop will include role-playing scenarios supported by Simtables, videos, photographs/slides, mobile phones, and paper maps and pens. The workshop opening will build off the traditional presentation (see below) or will use the Simtable, slides (photos only) and video, to share an interactive story about the 7 million acre Rio Grande Water Fund. The story will recount the impacts of Cerro Grande and Las Conchas Fires on land, water and communities, and share how these fires influenced partnership development, fire response, landscape planning and fire-adapted communities.

Most of the workshop, however, will be spent on role-playing scenarios set in the Greater Santa Fe Fireshed, a focal area of about 200,000 acres that includes the City of Santa Fe and its municipal watershed, as well as Tribal lands, Santa Fe National Forest, and private lands in a WUI setting. The workshop leaders will set up the scenario and distribute “character sketches” to the participants for role-playing, with profiles for County fire chief, private landowners, State Forester, Forest Supervisor, City Fire Chief, City Water Manager, fire ecologist, recreationists, elected officials, environmentalists, and more. The participants will work through two scenarios: 1) developing a landscape-scale restoration plan and outline of the actions needed for implementation; and 2) responding to a fire incident with fire protection and resource benefit options. In small groups, the participants will play out the scenarios with Simtables and map stations.

The workshop will conclude with a discussion of lessons learned from the RGWF story, the scenarios, and participants own experiences. Participants will be asked to share their thoughts about how to: 1) break through barriers of complexity and scale to catalyze restoration across boundaries; and 2) braid the 3 Cohesive Strategy pillars together to accelerate change.

Bio: Laura McCarthy is Associate State Director for the Nature Conservancy in New Mexico. Laura got her start with the USDA Forest Service as a firefighter, planner and ranger in Idaho, California, and New England. She joined the Conservancy’s in 2005 as a policy advisor and worked on legislation to create the Collaborative Forest Landscape Restoration Program. Currently, she serves as the managing director for the Rio Grande Water Fund and oversees statewide conservation programs. Laura has earned several awards including the Society of American Foresters Young Leader, New Mexico Environmental Leader of the Year, and Yale School of Forestry and Environmental Studies Distinguished Alumna Award.

Stephen Guerin is the Founder and President of Simtable which produces interactive simulations of wildland fire, hazmat plumes, and floods coupled to traffic evacuation models. Simtable is a spinout of RedfishGroup, an R&D consultancy based in Santa Fe, New Mexico applying the emerging science of Complex Adaptive Systems. Stephen founded Redfish in 1991 to provide special effects animation, video editing and commercial printing. In the mid ’90s Redfish was centered in Beijing to provide Internet programming and consulting to multinational and Chinese firms with presences in Beijing and Shanghai. After returning from China in 1997, Stephen focused his research in Cognitive Science looking for applications to distributed software systems. In the early 2000s, Stephen worked as a Senior Software Developer at BiosGroup and participated as a member of Stuart Kauffman’s research group. Stephen is also a faculty member of Santa Fe Institute’s Complex System Summer School where he lectures on agent-based modeling, artificial life, spatial augmented reality and self-organizing systems. Stephen lives in Santa Fe with his wife Alison and two sons.

Porfirio Chavarria serves the City of Santa Fe Fire Department in Santa Fe, New Mexico as the Wildland Urban Interface Specialist. He began his career in wildland firefighting in 1998 on a Bureau of Indian Affairs handcrew. In 2001, Porfirio began working for the Santa Clara Pueblo tribal forestry as a forestry technician. The tribe was recovering from the devastating Cerro Grande fire which burned over 200 homes in Los Alamos and 8,000 acres on tribal land. He learned forestry techniques doing forest inventory, Brown’s transects, and built erosion mitigation structures such as one-rock dams and contour felling. In 2005, Porfirio joined the Santa Fe Fire Department and began implementing fuels reduction projects, wildfire assessment rankings, and in 2010 hired a ten person fire/fuels crew. Porfirio is currently involved with the Fire Adapted Communities Learning Network, Fire Department Exchange Steering group, and the Greater Santa Fe Fireshed Coalition to create fire adapted communities in Santa Fe through networking and building personal relationships.
Collin Haffey is the conservation coordinator with The Nature Conservancy in New Mexico, where, among other things, he works to support the Rio Grande Water Fund. Before joining TNC Collin worked on climate-related forest disturbance processes, ranging from drought- and fire-induced ecosystem type conversion from forests to shrublands or grasslands at local and regional scales. He is currently co-organizing a large collaborative climate change adaption project in the Jemez Mountains.

**Additional Authors:**
- Anne Bradley, Forest Program Manager, The Nature Conservancy in New Mexico
- Lynn Decker, Fire Initiative Director, The Nature Conservancy
- Steven Bassett, Spatial Analyst, The Nature Conservancy in New Mexico

### 13. Nevada Prescribed Fire Alliance

**Presenter:** Julie Hunter, Senior Air Quality Specialist, Washoe County Health District, Air Quality Management Division

In 2015, a group met to discuss the development of a prescribed fire cooperative to meet current prescribed burning challenges. With the assistance of the Great Basin Fire Science Exchange, the Desert Research Institute, and members of the Coalition of Prescribed Fire Councils, Nevada agencies and organizations held a series of meetings and out of those meetings formed the Nevada Prescribed Fire Alliance (NV-PFA). This cooperative group has grown to include representatives from the prescribed fire implementation and regulation sectors of Nevada land management agencies, natural resource agencies, regulatory agencies and research institutions. The group finalized their strategic plan in 2017 and are currently working to be an established member of the Coalition of Prescribed Fire Councils, Inc.

This workshop would give the Nevada Prescribed Fire Alliance an opportunity to reunite with the previous 80 plus members from the initial startup in 2015 and build the NV-PFA community as well as communicate with other states interested in forming a Prescribed Fire Council. The intent of this workshop would be a discussion about the goals, outcomes and next steps of the NV-PFA. Upcoming training opportunities, bi-annual events, such as field visits, local professional speakers, and lessons learned and future prescribed fire opportunities and projects.

**Bio:** Julie Hunter is a Senior Air Quality Specialist with the Washoe County Health District. As a member of the Air Quality Management Division Planning Section, Julie is the Smoke Management Program coordinator, lead for Exceptional Events, and is the project manager for the outreach program. Julie received her Master’s degrees in Environmental Science and Health at the University of Nevada, Reno and has worked in the environmental field since 1996. She is the chair of the Nevada Prescribed Fire Alliance, is on the Safe Routes to School committee, and is the Planning Official Development Officer for the Nevada American Planning Association.

**Additional Authors:**
- Eugénie MontBlanc, Great Basin Fire Science Exchange Coordinator, University of Nevada, Reno
- Anna Higgins, Resource Management Officer, Nevada Division of Forestry

### 14. Manufacturing the Components of the Cohesive Strategy to Achieve it’s Vision and Goals: How Communities in the Western Klamath Mountains are Working Together to Create a Better Fire Future

**Presenter:** Will Haibling, Director, Mid Klamath Watershed Council

In the Klamath Mountains of far northern California, we have been working for decades to create the enabling conditions for a new fire management paradigm based on traditional ecological knowledge and western science. As the Cohesive Strategy and recent fire studies show, fire is fundamentally a social problem and not a land management problem. Through this lens, we have brought together diverse interest groups to create scalable fire management strategies that are supported at local, regional and national levels. Wholistic fire management requires that we engage in collaborative wildfire prevention, management and planning, before, during, and after wildfire events, learning from our successes and failures, and applying these lessons to future actions. Through local Fire Safe Council efforts over the past two decades, and more recently through the Western Klamath Restoration Partnership, Community Liaison Program, Klamath River Prescribed Fire Training Exchange, and the bridging work of Prescribed Fire Councils, Fire Adapted Communities and Fire Learning Networks programs, we are shifting public perceptions of managed wildfire, prescribed burning, and necessary manual and mechanical treatments needed to safely apply good fire at the landscape scale. This presentation shares lessons learned from the massive 2017 fire season in the Klamath Mountains, addressing how communities can better engage in wildfire management, prescribed burning, and landscape scale fire planning, creating the social conditions for success.
**Bio:** Will is the director of the Mid Klamath Watershed Council, serves on the steering committee of the Northern California Prescribed Fire Council, and leads the Western Klamath Mountains Fire Learning Network. He has been a lifelong advocate for increasing the use of prescribed fire to create fire resilient forests and communities in the Western Klamath Mtns in Northern CA and beyond. Will is part fire ecologist, fire fighter, fire lighter, storyteller, community organizer, desk jockey, fisherman, grant slave, and father of two beautiful wild mountain kids.

## 15. Flagstaff Watershed Protection Project

**Presenter:** Matthew Millar, FWPP Operations Specialist

In November 2012, the citizens of Flagstaff approved a $10M dollar bond to support the Flagstaff Watershed Protection Project (FWPP). The goal of the project is to reduce the risk of catastrophic and high severity fire, and the associated post-fire flooding events, within two key watersheds important to the City of Flagstaff. Although the City of Flagstaff greatly depends on the ecosystem services provided by these watersheds, the majority of the FWPP project is in the “upstream” watershed areas outside of the city limits, and under the management jurisdiction of the US National Forest Service. The “downstream” portions of the project area include state, county, and city lands, including many areas within the wildland urban interface, and valuable city and private infrastructure.

The City of Flagstaff and its citizens have provided a unique funding mechanism to prioritize forest-thinning treatments in areas mostly outside of the city limits. To coordinate this hazardous fuels reduction project across jurisdictional boundaries, a collaborative partnership effort among the City of Flagstaff, the Arizona Department of Forestry and Fire Management, the Coconino National Forest, and numerous other partner groups have come together. Several years of careful planning among the collaborative partners have resulted in successful forest treatments of over 4,000 acres using a combination of mechanical thinning, hand thinning, and prescribed burn operations. In addition, Phase 1 operations on USFS land has begun, and consists of hand and mechanical treatments on USFS administered land.

As the project operations continue to roll out, beneficial partnerships continue to form with local and national conservation organizations. These partnerships produce “ripple effects” that have made available novel funding opportunities that otherwise would be unattainable. These new partnerships have also allowed for the testing of new forest treatment technologies, helped support local industry, provided conservation training for emerging forest professionals, and offered opportunities for forestry related research and academic projects. Additional contributions from local businesses and a brewery emerged to assist with community engagement and outreach for and during our 5-year project anniversary event.

FWPP has gained recognition as a unique forest management collaborative and is identified as a model that can inform other communities that share similar risks of high severity forest fire. The proposed presentation for this conference can cover the social and ecological context and background of FWPP, the early ‘lessons learned’, the interagency working groups and collaborations that move the project forward, and the structure of the $10M municipal bond and how money moves from the city to on the ground projects outside of the city. The presentation can also explain how we have leveraged an additional $3.5M dollars through grants and partner collaborations. Lastly, the presentation can describe our current operations and next steps moving forward.

## 16. Sell or Enforce Compliance?

**Presenter:** Bob Roper, Fire Chief - Retired, IAFC

This presentation will showcase the “Weed Abatement” program conducted in Ventura County, CA. This is an enforced defensible space program that has proven successes and can be replicate anywhere if there is leadership and policy support. While the program relies on enforcement, the cornerstone of the program’s success lies within the political support and the public marketing of the program’s tenets. This program builds upon the three Cohesive Strategy tenets while focusing on building Fire-adapted Communities.

**Bio:** Bob Roper is a 33-year veteran of the Ventura County Fire Department, retiring in 2012, and then becoming the Nevada State Forster until 2016. He is an Executive Fire Officer from the National Fire Academy, has a Bachelor’s degree in Business from the University of Redlands and is a Harvard Fellow from the Kennedy School of Government.

Bob Roper has served on State and local incident management teams in several capacities working on many complex incidents including, wildfires, earthquakes, airline disaster, hazardous materials, landslides and flooding. Bob Roper stays active in local, State and Federal fire service matters.
17. Operationalizing Responder Exposure Metrics to Support Response Decisions, Learning, and Accountability  
**Presenter:** Matthew P. Thompson, PhD, Research Forester, US Forest Service, Human Dimensions Program, Rocky Mountain Research Station

The U.S. Forest Service defines success in the wildland fire response environment as “safely achieving reasonable objectives with the least firefighter exposure necessary while enhancing stakeholder support for our management efforts.” The focus on reducing unnecessary exposure is consistent with policy stating that “firefighter and public safety is the first priority in every fire management activity.” And yet the agency does not systematically monitor or quantify exposure, such that it has a limited ability to measure performance with respect to its own definition of success. In this micro-talk I will briefly review best practices as they relate to organizational performance measurement, and put in a plug for new analysis techniques intended to improve responder exposure assessment and enhance the safety of ground and aerial suppression resources.

**Bio:** Matthew P Thompson is a Research Forester in the Rocky Mountain Research Station’s Human Dimensions Program in Fort Collins, CO. His research interests center around risk, decision, and systems analysis, particularly as applied to wildland fire management. He has a BS in systems engineering from the University of Virginia, a MS in industrial engineering and operations research from the University of California, Berkeley, a MS in forest management from Oregon State University, and a PhD in forest engineering from Oregon State University. In 2016 he received the Presidential Early Career Award for Scientists and Engineers, where he tried and failed to convince President Obama to face him in the basketball game Horse.

18. Successful Wildfire Ozone Exceptional Events Demonstrations in Washoe County under the new Exceptional Events Rule  
**Presenter:** Julie Hunter, Senior Air Quality Specialist, Washoe County Health District, Air Quality Management Division

Washoe County, Nevada has experienced severe impacts from wildfires in California, Oregon and Washington in the last two years, leading to six exceedances of the 2015 Ozone National Ambient Air Quality Standard. Under the new Exceptional Events Rule (EER), if an agency adequately demonstrates that an exceptional event has caused an exceedance, the data can be excluded from regulatory decisions. These exceedances would have affected Washoe County’s initial designation for ozone. The Washoe County Air Quality Management Division (AQMD) worked closely with EPA Region IX to develop Exceptional Events demonstrations for 2015 and 2016 wildfire events. EPA Region IX concurred with these demonstrations on May 30, 2017. These demonstrations were the first wildfire O3 demonstrations to be concurred upon by EPA under the new Exceptional Events Rule and Wildfire O3 Guidance that were finalized in late 2016. This presentation will go over the details of the Exceptional Events demonstrations and the importance of the partnership and communication with EPA.

**Bio:** Julie Hunter is a Senior Air Quality Specialist with the Washoe County Health District. As a member of the Air Quality Management Division Planning Section, Julie is the Smoke Management Program coordinator, lead for Exceptional Events, and is the project manager for the outreach program. Julie received her Master’s degrees in Environmental Science and Health at the University of Nevada, Reno and has worked in the environmental field since 1996. She is the chair of the NV Prescribed Fire Alliance, is on the Safe Routes to School committee, is the Planning Official Development Officer for the Nevada American Planning Association.

19. Case Study of Landscape Prescribed Burning and Monitoring in the Great Lakes Region  
**Presenter:** Brian Stearns, Fire Equipment Operator, USFS

Our case study will cover effective management treatments for landscape level prescribed burning in conifer dominated forests of the Great Lakes region. An extensive fuels monitoring program has captured some of the ecological and practical information useful in quantifying the effectiveness of such a large scale restoration treatment. We have gained insight related to historic fire return interval, lessons learned from decades of prescribed burning, and conventional wisdom about ecosystem function, and silvicultural opportunities in these communities. We will discuss the development of a prescribed burn program within a fragmented landscape and heavy component of Wildland Urban Interface. Finally, sharing challenges of being faced with opposition from coworkers within the same agency and how that internal discourse was overcome so that all disciplines of resource management could agree on objectives and treatments.
**Bio:** Brian began his wildland fire career with the USDA Forest Service in 1997 and began a focus on prescribed burning and fuels monitoring in 2003. During his career, Brian has been involved in numerous research projects, and collaborative studies on fire and fuels with a focus on conifer species in the Great Lakes region. In 2016 Brian worked with the Lakes States Fire Science Consortium to offer a “Fire and Fuels Workshop” to teach and exchange monitoring techniques and ideas. The success of the project allowed Brian to help develop a second workshop with the North Atlantic Fire Science Exchange in 2017. Paul has spent the last 3 seasons working as a crew member on the Great Lakes Wildland Fire Module for the USFS where he started his career in fire. In May of 2017 Paul graduated from the University of Wisconsin-Stevens Point earning his B.S. with a double major in Wildland Fire Science and Forest Ecosystem Restoration while gaining great classroom and hands on field experience. Having a strong passion for fire ecology, he intends to go on to complete a masters degree in this field to be a better land manager and fire researcher.

**Additional Authors:** Paul Priestley, Wildland Fire Module Member

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**20. Lessons learned from large wildfires: landscape fuel treatments and wildland fire management strategies**

**Presenter:** Susan Prichard, Research Scientist, University of Washington School of Environmental and Forest Sciences

Recent large fire events in north-central Washington underscored the need for management strategies across ownerships, vegetation types and landscapes. As agencies work to implement the National Cohesive Wildland Fire Management Strategy, guidance on where and when landscape fuel reduction treatments may mitigate subsequent wildfire behavior and directly assist in active fire management is needed. As part of a project recently funded by the Joint Fire Science Program, we are evaluating the effects of prior fuel reduction treatments and past wildfires on burn severity and firefighting operations within the 2014 and 2015 large fires of north-central Washington State. Prior wildfires and past treatments (i.e., mechanical thinning and/or prescribed burning) span multiple agencies and land ownerships, including the Colville Indian Reservation (CIR), Colville (CNF) and Okanogan-Wenatchee National Forests (OWNFs), Washington Department of Fish and Wildlife (WDFW) and Washington Department of Natural Resources (WDNR) lands. We are compiling geospatial layers of past wildfires and fuel reduction treatments and evaluating how treatments contributed to two central goals of the Cohesive Strategy--restoring fire resilient landscapes and promoting safe and effective firefighting response. Because fire heeds no administrative boundaries, our emphasis on multiple land ownerships is intended to help understand how future fuel reduction treatments can be coordinated across ownerships and land allocations. Through a retrospective study of past fuel reduction treatments and burn severity, we will assess how prior treatments and their biophysical context mitigated subsequent fire effects. We will identify thresholds under which treatments were ineffective – including treatment type, size and configuration, time since treatment, topographic position, and exposure to prevailing wind. To evaluate how treatments assisted firefighting operations, we are conducting post-incident interviews with fire management teams to compile lessons learned about specific ways treatment type, configuration and landscape position assisted in safe and effective wildfire response, and where such treatments failed. Using operational fire models within the Wildland Fire Decisions Support System, simulations of fire behavior and suppression difficulty will be used to assess how treatments could be configured to restore landscape resilience to wildfire, accounting for constraints including management boundaries, neighboring communities, and highly valued resources.

**Bio:** Susan Prichard is a research scientist at the School of Environmental and Forest Sciences and studies fire ecology and dry forest management issues. Her main interests are in the effects of fire and other disturbances on forest dynamics, climatic change on forest ecosystems, and fuel treatment options to mitigate wildfire effects. Her current research projects include an evaluation of past fire burn mosaics on fire management strategies, smoke and fuels management tradeoffs analyses, post-fire burn severity assessments following large fires in north-central Washington, and developing fuel consumption models for use in fire management.

**Additional Authors:** Paul Hessburg, Research Landscape Ecologist, Pacific Northwest Research Station Nicholas Povak, Research Ecologist, Pacific Southwest Research Station Robert Gray, Fire Ecologist, R.W. Gray Consulting Brion Salter, Geographer, Pacific Northwest Research Station
21. Understanding Wildland Fire Fighters’ Perception of Unpredictable and Extreme Fire Behavior
Presenter: Tamara Wall, Desert Research Institute

As more large and extreme fires occur, it is of interest to assess firefighter’s perspectives of these events from safety and training perspectives. Recent preliminary research suggests that how male and female firefighters perceive the outcomes of extreme or unpredictable wildfire events can be very different. This micro talk focuses on looking at those differences and if examining these different perspectives in more depth could positively influence training and safety.

Bio: Dr. Tamara Wall is a researcher in the Western Regional Climate Center (WRCC); the program for Climate, Ecosystem, and Fire Applications (CEFA); and the California-Nevada Applications Program (CNAP). She is involved in several on-going projects related to integrating social science research with the production of climate and fire knowledge and services.

Additional Authors: Tim Brown, Research Professor, Desert Research Institute

22. The Future of Fire Tracking, Emissions, and Modeling in the Western United States
Presenter: Matthew Mavko, Western Regional Air Partnership

The Western Regional Air Partnership (WRAP), since its inception, has shaped policy and technical approaches for addressing fire emissions in the context of air quality planning. With the next round of Regional Haze planning approaching, it has vested interest and a critical role to play in supporting the development of fire emissions inventories appropriate for meeting planning goals. The WRAP’s Fire and Smoke Workgroup (FSWG) has begun the process of defining the needs and goals of WRAP over the next several years to support its members. This presentation will review these goals and a proposed roadmap for achieving them. In the process, we will examine the current universe of data products, operational environments, and research efforts related to fire emissions, the methods used, their appropriate applications and perceived gaps that remain. In addition, the methods used to estimate fire emissions for both operational and retrospective uses will be described in an effort to shed light on how fire management decisions and tracking elements affect these estimates.

Bio: Mr. Mavko is a Principal Air Quality Scientist at Air Sciences Inc. in Portland Oregon. He has a Masters Degree in Environmental Sciences from Portland State University. Mr. Mavko specializes in GIS and data management/analysis for environmental projects. He has expertise in developing post-processing applications and web applications for environmental data sampling and management databases and design and development of permitting, tracking, and management systems for Tribal and State fire programs. He worked closely with the Western Regional Air Partnership for over ten years to develop fire emissions inventories and regional air quality analysis tools.

23. Interagency Fuels Treatment Decision Support System: Enabling Fuels Planning For All
Presenter: Kim Ernstrom, Fire Application Specialist, Wildland Fire Management RD&A (DOI)

The Interagency Fuels Treatment Decision Support System (IFTDSS) is a web-based application designed to make fuels treatment planning and analysis more efficient and effective. IFTDSS combines models, data and new and previously existing fuels planning tools and software into one user-friendly interface.

IFTDSS supports the planning and analysis needs of users with a variety of skill, background, and experience and is available to all interested users regardless of agency or organizational affiliation. The simple and intuitive interface allows the user to model fire behavior across an area of interest under a variety of weather conditions and easily generates downloadable maps, graphs, and tables of model results. Additionally the application provides a step-by-step process for testing a variety of fuels treatment (eg. thin, clear cut, prescribed burn) impacts on fire behavior. Users may compare results to determine which modeled treatment scenario best achieves desired results in terms of altering fire behavior. IFTDSS can be used at a variety of scales from local to landscape level.

The first release of IFTDSS occurred in April 2017 with subsequent releases in the Fall 2017 and February 2018. Additional functionality with these releases includes various shapefile features, Landscape (LCP) download, fire behavior output download, enhanced summary reports and landscape fire behavior including Wind Ninja.

Additional development will continue through 2018. The Fuels Treatment Effectiveness Monitoring (FTEM) database is being incorporated to include a spatial mapping function and viewing capability and could be available as early as June. Preliminary development of Quantitative Risk Assessment will be being summer of 2018 and continue through fall/winter. Future development will be dependent on leadership direction, funding and input from the field.

The presentation will include a brief snapshot of IFTDSS functionality and examples of its applicability in fuels planning across ownerships as well as a short description of scheduled development. Handout information will be available for attendees seeking additional information.
**Bio:** KIM ERNSTROM – Lead Fire Application Specialist – Wildland Fire Management RD&A – Boise, ID. Kim began her fire career on the Bridger-Teton NF as a seasonal in 1993 after completing a bachelor’s degree in Geography and Geology. She has worked in fire management in eight different states throughout her career. Positions with the US Forest Service, the National Park Service, the US Fish and Wildlife Service and the Nature Conservancy have provided a broad perspective on fire management. Titles such as Helicopter Crewmember, Hotshot Foreman, Prescribed Fire Specialist, Prescribed Fire Training Center Coordinator, Fire Management Officer and Fire Application Specialist round out Kim’s resume. While enjoying summers as a fire fighter Kim received her Masters Degree in Earth Science at Montana State University in 1999 completing a thesis on the “Fire effects of the 1988 fires on headwater stream systems in Yellowstone National Park”. Kim’s fire management interests with the Wildland Fire Management RD&A include advanced fire behavior applications, long term fire planning, decision support and fuels management.

**Additional Authors:** Caroline Noble, Fire Application Specialist, WFMRDA; Forest Service
Bre Schueller, Fire Management Specialist, WFMRDA; Forest Service
Josh Hyde, Technical Specialist, University of Idaho

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**24. Effects of Irradiance, Topology, and Magnetism on Extreme Weather and Wildfires**

**Presenter:** Chris Giesige, Researcher, WESTCATS

Solar irradiance and magnetism play an important role in the development of extreme weather and wildfires. How they interact with the topography are key components in being able to establish prediction systems for lightning and wildfire behavior. The Great Basin acts as a collector of irradiance and magnetism generating a flow of an electrical component that drives lightning and weather events, along with wildfire behavior. Understanding the role of the Great Basin in weather circuits can lead us to a better understanding of how see behavior development.

**Bio:** From high school I became interested in becoming a firefighter both residential and wildland. In college I studied Fire Science and graduated with a degree in Business Administration. Since then I have completed courses in wildfire behavior and academy in the National Wildfire Coordinating Group, and am in the process of going back to school for geophysics. In 2010 I helped re-initiate the Westcats group where we research and monitor for advanced detection of lightning caused wildfires, prediction of fire behavior, climate and climate adaptation. I believe we have the ability to develop advanced systems for monitoring lightning caused wildfires and wildfire behavior as well as other extreme weather events, and in the importance of science communications.

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**25. Learning from experience to prepare for the future - aerial firefighting use and effectiveness**

Keith Stockmann, PhD, Lead Analyst / Economist, Aerial Firefighting Use and Effectiveness Project, USDA, Forest Service, National Technology and Development Program.

The Aerial Firefighting Use and Effectiveness (AFUE) study’s mission is to systematically document the utilization and effectiveness of aerial water and wildland fire chemical delivery in support of wildland fire management objectives. The AFUE approach shows significant progress from previous studies by using firefighters to develop terminology to document the full set of aerial firefighting objectives and by expanding from single liquid drop event analysis to focus on the contribution that aerial tasks (connected drops) make to meeting campaign/incident management objectives. By comparing observed outcomes to planned outcomes, effectiveness and probability of success will be assessed for the various suppressant/retardant aircraft roles and configurations. The AFUE approach leverages the evolving computerized interagency decision support systems and anchors to the firefighting policy hierarchy. It also contains techniques capable of assessing cost-effectiveness and break-even values required to justify aerial resource use in achieving strategic objectives. Although this evolving approach will take several years to execute, a planned schedule of deliverables has been designed to span from the simplest firefighter’s needs to those of oversight agencies. Eventually, AFUE will help Federal agencies, domestic and international partners develop performance metrics that move towards goals of increasing firefighting effectiveness and public safety, while becoming more cost-effective.

**Bio:** Dr. Keith Stockmann is the lead analyst for the Aerial Firefighting Use and Effectiveness Project with the Forest Service National Technology and Development Program. He supports various fire and aviation related efforts, ranging from fuel treatment investment analysis to aerial firefighter delivery evaluations and aircraft acquisition optimization.

**Additional Authors:** Ryan Becker, Zachary Holder
26. Bridging the gap: the role of boundary organizations at the fire science/policy interface

Meg Nakahara, Policy Engagement Specialist, COMPASS

Boundary organizations like COMPASS play a crucial role in filling the gaps that can form between scientists and policy makers, as well as academic and federal communities. This micro-talk will explore how boundary organizations break down silos that can form due to cultures and norms, perceived roles, fields or topics, or geographical distance. It will also highlight how boundary organizations fit within and support the National Cohesive Strategy, in addition to sharing stories of successful connections that boundary organizations have brokered.

Bio: As a Policy Engagement Specialist at COMPASS, I help scientists join policy conversations and share their work with policy makers, especially around wildfire and western lands adaptation. I am enthusiastic about bringing science and policy together and before joining COMPASS, worked on federal geoscience policy at Earth science organizations in Washington, D.C. I earned a B.A. from the University of Pennsylvania in Environmental Science and Political Science and a Master of Public Administration from the University of Washington.

27. Increasing prescribed fire on private lands

Presenter: Kristen Newman, Wildland Urban Interface Specialist, Texas A&M Forest Service
Mylea Lovell, Wildland Urban Specialist, Texas A&M Forest Service

In the state of Texas, a small fund from the National Fire Plan has been set aside to assist landowners with the costs associated with prescribed fire near communities with Community Wildfire Protection Plans. It has become apparent that there is a real need for more fuels mitigation, especially prescribed fire, on private lands. Requests for funding always exceeds available funds. We are looking for alternative solutions for increasing prescribed fire on private lands in our state.

Bio: Kristen Newman is a Wildland Urban Interface Specialist who works with county and city officials as well as homeowners to educate them on wildland fire risks, fuel mitigation, and other fire prevention programs. Kristen joined Texas A&M Forest Service in February 18, 2014 and started her career as a Wildland Urban Interface Specialist I, where she gain her basic training in wildland fire fighting, public information, and fire prevention. In 2016, she became a Wildland Urban Interface Specialist II- Team Leader.Kristen holds a Master of Science in Animal Science and Bachelor of Science in Natural Resource Management from Angelo State University. Kristen is a qualified Public Information Officer, Prevention Team Member, and holds several other NWCG qualifications.
Mylea C. Lovell is the Team Lead Wildland Urban Interface Specialist for West Texas with Texas A&M Forest Service. She is originally from Corsicana, Texas and relocated to Lubbock in 2008 to attend Texas Tech. She has a BS from Texas Tech University in Environmental Conservation of Natural Resources and a MS in Range and Wildlife Management from Texas A&M Kingsville.

28. Reducing Fuels, Restoring Landscapes and Protecting Communities in the Northeast and Midwest U.S.

Presenter: Thomas Fielden, Land Stewardship and Prescribed Fire Manager, The Nature Conservancy

With the growing concerns of wildfire every year facing rural communities throughout the nation fire practitioners, fire managers and community organizations have been pulling together to use fire and mechanical fuels treatments to help mitigate the impacts of large fires that threaten communities on an annual basis.

The Northeast Regional Strategy Committee (NERSC) of the Cohesive Strategy is comprised of agencies and organizations that are leading the way in the Northeast in promoting community protection programs and assisting member organizations to bring more tools to the table to prepare for wildfires and recover from their devastating effects.

The NE RSC membership is composed of professional fire managers, scientists and researchers from Northeast and Midwest states and include Federal, State, County, Local and Non-Profit agencies dedicated to reducing fuels, restoring landscapes and protecting communities.

The NE RSC will bring together experts and representatives from the Northeast to discuss what is working in their areas, what challenges they have overcome, what are some of the challenges they face in building local and regional capacity, improving wildland fire preparedness, and learning from our experiences.
**Bio:** Thomas works for The Nature Conservancy’s Missouri Chapter and serves as the Fire and Stewardship Manager. He is involved with cooperative burns with state and federal partners. He is involved with The Fire Learning Networks, Prescribed Fire Training Exchange (TREX) program. Thomas Chairs the Board of the Missouri Prescribed Fire Council, working with Federal, State, Local, Private, Non-Profit Organization, Contractors and Prescribed Burn Associations around the state to bring together fire practitioners of all levels to safely apply good fire use fire for ecosystem restoration, fuels reduction and community protection. He also represents TNC’s Midwest and eastern chapters on the NERSC.

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**29. Restoring Resilience of the Socio-Ecological Landscape: Focus on the Lake Tahoe West Restoration Partnership**

**Presenter:** Forest Schafer, Forest Science and Management Coordinator, California Tahoe Conservancy  
Sarah DiVittorio, Northern California Program Manager, National Forest Foundation  
Brian Garrett, Assistant Staff Officer, US Forest Service Lake Tahoe Basin Management Unit  
Jonathan Long, Ecologist, USDA FS Pacific Northwest Research Station  
Jason Vasques, Recreation, Access, and Forest Ecosystem Planning Supervisor, California Tahoe Conservancy  
Mason Bindl, GIS Analyst, Tahoe Regional Planning Agency

The Lake Tahoe West Restoration Partnership (Lake Tahoe West) is an interagency initiative of the California Tahoe Conservancy, the USDA Forest Service, California State Parks, Tahoe Regional Planning Agency, National Forest Foundation, and the Tahoe Fire and Fuels Team. Its goal is to restore the resilience of Tahoe’s west-shore forests, watersheds, recreational opportunities, and communities to threats such as wildfire, persistent drought, climate change, overstocked forests, and a potential bark beetle epidemic.

Lake Tahoe West is taking a landscape scale approach to integrating scientists, managers, and community stakeholders into project design. This 60 minute session of concurrent panel discussions will provide examples of innovations that are connecting people across disciplines to create fire adapted communities and restore resilient landscapes, and provide opportunities to share learning through discussion of the unique local contexts that shape managers’ work. The session addresses themes of building capacity for landscape scale restoration work, and learning from experiences.

Following an overview of Lake Tahoe West, participants will be invited to attend one of three panel discussions as detailed below. Additional panel members with expertise in the topic areas will be drawn from conference participants, in order to provide more diverse perspectives and experiences.

**The panels are focused on:**

- Connecting Fire Adapted Communities to Landscape Resilience through Stakeholder Engagement Processes
- Assessing Landscape Resilience, and Using Scientific Modeling to Inform Strategies
- Increasing Capacity by Leveraging Resources and Working at Scale

**Bio:** Forest is the Forest Science Management Coordinator for the California Tahoe Conservancy. He also serves as the Incident Commander of the Tahoe Fire and Fuels Team, a partnership of 20 organizations working to create fire adapted communities and fire resilient landscapes. Forest was the project manager and lead editor for the Lake Tahoe Basin Community Wildfire Protection Plan, and is actively engaged in numerous interagency forest management and community engagement initiatives.

**Additional Authors:**

Sarah DiVittorio, Northern California Program Manager, National Forest Foundation  
Brian Garrett, Assistant Staff Officer, US Forest Service Lake Tahoe Basin Management Unit  
Mason Bindl, GIS Analyst, Tahoe Regional Planning Agency  
Jonathan Long, Ecologist, US Forest Service Pacific Northwest Research Station  
Jason Vasques, Recreation, Access, and Forest Ecosystem Planning Supervisor, California Tahoe Conservancy

**Keywords:** Collaborative Planning, Resilience, Stakeholder Engagement, Communities, Science

**Purpose:** This 60 minute session of concurrent panel discussions will provide examples of innovations that are connecting people across disciplines to create fire adapted communities and restore resilient landscapes through collaborative planning, and provide opportunities to share learning through discussion of the unique local contexts that shape managers’ work.

**Specific learning topics and discussion questions for the panels are:**

**Connecting Fire Adapted Communities to Landscape Resilience through Stakeholder Engagement Processes (Brian Garrett, Assistant Staff Officer, US Forest Service Lake Tahoe Basin Management Unit. Sarah DiVittorio, Northern California Program Manager, National Forest Foundation)**
Existing partnerships among communities, local fire districts, land management agencies, and others, have enabled a strong community focus in the Lake Tahoe West project. The concept of resilience utilized in the project explicitly incorporates communities, and the landscape restoration benefits of fire adapted community practices. How perspectives have evolved in the Lake Tahoe Basin will be shared, and the panel will share lessons learned from their own communities and projects.

Lake Tahoe West includes an intricate process design and structure for stakeholder engagement. Multiple focused teams and stakeholder groups have been formed to cover every aspect of the Lake Tahoe West project. Examples will be provided, and the panel will share their experiences, successes, and challenges in engaging stakeholders in projects.

**Example discussion questions:**
- How has local community action benefited efforts to improve landscape fire resilience in your area?
- How has your community’s perception of its role in restoring landscapes shifted over time?
- What non-traditional organizations have you engaged with to increase community action and support, and was it successful?
- How have you designed processes to provide for meaningful stakeholder engagement and commitment?
- Have you ever used a process redesign to solve a big problem?

Assessing Landscape Resilience and Using Scientific Modeling to Inform Strategies (Mason Bindl, GIS Analyst, Tahoe Regional Planning Agency; Jonathan Long, Ecologist, US Forest Service Pacific Northwest Research Station)

Lake Tahoe West has developed an extensible, adaptable Landscape Resilience Assessment for representing and understanding landscape resilience in a deeply interconnected and complex system. The framework was jointly developed by stakeholders and staff experts, and will be built upon to develop assessment-based, accurate restoration goals and priorities, and ultimately a holistic landscape restoration strategy. The benefits of the assessment, and challenges in completing it will be shared. The panel will discuss the multiple interpretations of resilience, and how it can be assessed.

Lake Tahoe West also includes deliberate processes for integrating the results of scientific modeling into management decision making. Scientists, land managers, and stakeholders are collaboratively developing science-based restoration strategies, and providing answers to key questions that will help increase the resilience of the landscape. Examples of the models being utilized and how they are being interpreted will be provided, and the panel will discuss unique approaches they have taken to improve the connectivity of scientists and land managers.

**Example discussion questions:**
- What methods have you used to gain understanding of your landscape?
- How do you quantify resilience?
- What technical tools have you used to interpret relevant data sources?
- What lessons have you learned from challenges in integrating science into management decision making processes?
- How have you engaged stakeholders in developing, reviewing, or interpreting scientific outcomes?

Increasing Capacity by Leveraging Resources and Working at Scale (Jason Vasques, Recreation, Access, and Forest Ecosystem Planning Supervisor, California Tahoe Conservancy; Forest Schafer, Forest Science and Management Coordinator, California Tahoe Conservancy)

Lake Tahoe West along with multiple landscape resilience initiatives throughout the Central Sierra are developing unique ways to address their local challenges. However, some challenges are common across all of the initiatives, and opportunities to address barriers like biomass utilization, contractor availability, and resource sharing, can best be solved at a larger scale. Examples of these challenges and how the Tahoe-Central Sierra initiative is working across 2.4 million acres to address them will be provided. The panel will share their approaches to supporting solutions for similar big problems.

**Example discussion questions:**
- What lessons have you learned from challenges in increasing local planning and implementation capacity?
- What challenges have you encountered that you haven’t been able to solve at the local scale, and how did you address them?
- What is your experience working across a broad geographic area, given that team members may not be able to frequently interact in person?
30. How Do We Accomplish All-Lands Management Projects? Ingredients, Recipes, and Chefs’ Stories
Presenter: Karen Hardigg, RVCC Director, Rural Voices for Conservation Coalition
Emily Jane Davis, Assistant Professor and Extension Specialist, Oregon State University

Overview: Working across public and private boundaries is essential for creating fire-adapted forests and communities. Since the late 2000s, the term “all lands” has gained popularity among natural resource managers, practitioners, and policy makers. An all lands approach refers to planning and implementation of activities across landownership boundaries and through engagement of multiple partners and landowners. Despite the significant interest in this approach, there is a lack of research and information about how these projects are actually working on the ground. There are also limited opportunities for peers to share best practices and innovations. Our session provides 1) findings from new applied research about keys to all-lands projects, 2) best practices for navigating programs/tools/authorities, and 3) direct practitioner/manager experiences and examples. This combination of ingredients, recipes, and chefs’ stories will allow us to explore a specific issue, share information and practices, and create new knowledge about how to really partner across boundaries.

Bio: Karen has served as Director of the Rural Voices for Conservation Coalition since 2015. Before joining RVCC, she spent nearly eight years working in Southeast Alaska on community forestry, forest stewardship, restoration and policy both at The Wilderness Society and The Nature Conservancy. She holds a Master’s degree from the Yale School of Forestry and Environmental Studies.

31. BLM South Pass Aspen Enhancement Project in Wyoming
Presenters: Rance Neighbors, Assistant Fire Management Officer/Fuels, BLM Wyoming, Wind River/Bighorn Basin District
Tim Kramer

The purpose of this presentation is to utilize experiences and lessons learned to not only highlight the associated positive aspects but also to daylight some of the local struggles when merging different policies and objectives with multiple agencies and private landowners, and the challenges to implementing a truly cohesive project. The content of the presentation is learning from experiences and acknowledging unintended consequences in project planning and the importance of communication.

32. Are red flag warnings a resource management tool or a safety product?
Presenter: Tim Brown, Desert Research Institute

A Red Flag Warning (RFW) is a term that has been used since the 1960s by National Weather Service (NWS) fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern. The original intent was to alert land management agencies about the onset of critical weather and fuel moisture conditions that could lead to rapid or dramatic increases in wildfire activity, impacting firefighter safety. Over time, however, several issues with this system have evolved. First, there is no single quantitative definition of a RFW—different regions use different factors to determine the warning, raising the question of what the definition should be. Second, the public has become more aware of the RFW product, but it was not originally designed for their use. Third, RFWs are issued so frequently that agencies and the public are becoming numb to the product largely because of an increased perception that the warnings are now less meaningful. There is now a strong sense amongst NWS and fire agency personnel that the RFW is not an effective messaging medium. As a result of these issues and questions, the National Wildfire Coordinating Group Fire Environment Committee (FENC) has expressed interest in conducting an assessment of this forecast product to determine how it should be informed and the intent of its use. There is currently a pilot project underway at the Desert Research Institute (DRI) joint with the NWS and the California and Nevada Applications Program (CNAP) to begin assessing RFW within the fire management community. We propose a workshop session to have group discussion focused on two primary RFW questions: 1) Does the fire management community view a RFW as a safety or a resource management product? If safety, then what is a fire management safety product? 2) What kind of product could be disseminated that would change actions?

Bio: Dr. Brown conducts applied research and applications development at the Desert Research Institute (DRI) in Reno, Nevada. His primary academic interests include wildland fire-climate and fire-weather connections; the wildfire environment; applications development for wildland fire management planning, decision-making and policy, the interface between science and decision-making. He is Director of the Western Regional Climate Center and the Program for Climate, Ecosystem and Fire Applications (CEFA) at DRI. He is graduate faculty in the Atmospheric Sciences Program at the University of Nevada, Reno, and quandom Monash University Adjunct in School of Earth, Atmosphere and Environment, Science Faculty in Clayton, Victoria, Australia.

Additional Authors: Tamara Wall, Associate Research Professor, Desert Research Institute
33. Overcoming barriers to increasing restorative burning through science and practice

Presenters:
Jonathan Long, Ecologist, USDA FS Pacific Northwest Research Station
Craig Thomas, Conservation Director, Sierra Forest Legacy
Malcolm North, Ecologist, USDA Forest Service, Pacific Southwest Research Station
Leland Tarnay, Physical Ecologist, USDA Forest Service, Region 5 Remote Sensing Lab
Julie Hunter, Senior Air Quality Specialist, Washoe County Health District
Becky Estes, Region 5 Central Sierra Province Ecologist

We return to a panel discussion that we held at last year’s workshop regarding opportunities to expand restorative burning while protecting public health from smoke. Presenters will discuss strategies to increase pace and scale of restorative fire in light of recent policy advances and scientific understandings regarding fire management, smoke monitoring, modeling, and messaging, including a case study of a large prescribed burning restoration project on the Eldorado National Forest. The session will feature short talks (with questions) culminating in a discussion with audience members regarding challenges, opportunities, knowledge gaps, and policy solutions for increasing the pace and scale of using wildland fire.

- Recent progress on policy, tools, and research [Craig, Lee, Jonathan]
- Wildland smoke in the Sierra Nevada—theory and practice [Jonathan, Malcolm, Lee]
- Strategies for restorative burning (or managed wildfire) and case study of the Caples Lake Burn, El Dorado NF including public communication [Lee, Becky, Julie]
- Panel discussion with audience

Bio: Jonathan W. Long is a research ecologist with the Pacific Northwest Research Station in Davis. He leads a variety of interdisciplinary research projects to help managers restore forests and wetlands to support important social and ecological values. He worked previously for the Rocky Mountain Research Station, University of Arizona Cooperative Extension, and the White Mountain Apache Tribe in Arizona.

34. Improving postfire actions to build landscape and community resilience

Presenter: Anne Bradley, Forest Conservation Program Manager, The Nature Conservancy

Western forests have experienced more frequent large, severe fires in the last two decades. The increased area of lands affected by these fires are a concern because 1) the size of severely burned patches is increasing, and in some areas like the Southwest, are believed to be greater than the historic norm; 2) warming and drying trends that accompany climate change are creating more difficult conditions for tree regeneration; 3) these large burned landscapes continue to be flood and debris flow hazards for years after fire; 4) available federal and state resources to address burned area impacts are primarily allocated to the time period immediately after the fire through emergency rehabilitation programs. Few existing policies address longer term impacts. Through local and cross-regional scientist, manager and community partnerships developed through the emerging Burned Areas Learning Network and the existing Fire Adapted Communities Network we are striving to promote implementation of the 3 elements of the Cohesive Strategy in the postfire environment. We are working to create opportunities for fire suppression planners to incorporate postfire event risks to values in tools such as WFDSS; we are promoting
practices that accelerate the ecological recovery of severely burned landscapes; and we are using landscape analyses and public engagement to help improve community preparedness for fire and postfire impacts such as flooding and debris flows. This session will facilitate sharing lessons learned by collaborators with firsthand experience to improve preparedness for postfire response by all participants.

Bio: Anne has worked for The Nature Conservancy in New Mexico for over a decade. She coordinates the current Burned Areas Learning Network and is based in Santa Fe. Her priorities are to promote and scale up forest resilience building, including fire use, and developing opportunities for fire, forest and water scientists and managers to work together to address severe fire risks to forested watersheds.

Additional Authors:
Porfirio Chavarria, Santa Fe City Fire Dept. Wildland Urban Interface Specialist
Collin Haffey, Conservation Coordinator, The Nature Conservancy
invited- Zander Evans, The Forest Stewards Guild
Jonathan Bruno, Coalition for the Upper South Platte, Colorado
Will Harling, Western Klamath Restoration Partnership, California

35. Network perspectives on risk assessment: Applications of wildfire transmission networks and collaborative networks for implementing the Cohesive Strategy

Presenters:
Matthew Hamilton, Research Fellow, School for Environment and Sustainability, University of Michigan
Melanie Colavito, Senior Program Coordinator, Ecological Restoration Institute, Northern Arizona University
Alan Ager, Research Forester, Rocky Mountain Research Station, US Forest Service
Tom Quigley, Senior Wildland Fire Consultant, St George, Utah
Tzeidle Wasserman

A defining feature of wildfire is its potential to burn across large areas and spread across property lines and administrative jurisdictions. The likelihood that a particular land parcel will experience wildfire not only depends upon conditions within that parcel, but also its connectivity to other parcels and the likelihood that those parcels will experience fire. Knowledge of the pathways through which wildfire can be transmitted is crucial for risk assessment. Leveraging fire transmission networks with information about collaborative interactions among organizations managing fire-prone lands can also improve risk mitigation planning and strategies. For example, when there is high potential for fire to spread between lands managed by different organizations, efforts to incentivize their collaboration on wildfire risk mitigation activities may be especially beneficial.

Collaborative efforts to reduce wildfire risk across jurisdictional boundaries are an important theme in the National Cohesive Strategy and are referred to as All Lands, All Hands fire management. Although there are often common goals across jurisdictional boundaries to reduce fire risk and create resilient landscapes, achieving multi-jurisdictional management is challenging. This facilitated discussion will focus on efforts in Oregon, Arizona, and Utah to utilize a wildfire transmission model developed by Ager and colleagues to encourage and inform collaboration across jurisdictional boundaries to reduce fire risk. The transmission model outputs provide information about wildfire transmission (i.e. where fires start and where they go), wildfire risk (i.e. lands that disproportionately receive wildfires due to their connections to other fire-prone lands), and wildfire exposure (i.e. annual acres burned and housing units exposed to fire) across complex landscapes and multi-jurisdictional boundaries. The results can be used to:

- Inform how and where land managers and landowners can work together to reach a cohesive fire management strategy to mitigate the possible effects of major wildfire events;
- Help decision makers determine how to restore and maintain landscapes and fire adapted communities; and
- Explore management opportunities across the landscape and work collaboratively among landowners and stakeholders to identify opportunities to reduce wildfire risk.

Bio: Matthew Hamilton does research on how people and organizations work together to solve environmental problems, including wildfire risk. A particular goal of this work is to improve strategies for risk mitigation by taking into account how land managers share fire risk and how they collaborate to address it.