

COLORADO FOREST RESTORATION INSTITUTE 2017 ANNUAL REPORT



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About the Colorado Forest Restoration Institute

The Colorado Forest Restoration Institute (CFRI) was established in 2005 as an application-oriented program of the Department of Forest & Rangeland Stewardship in the Warner College of Natural Resources at Colorado State University. CFRI's purpose is to develop, synthesize, and apply locally-relevant science-based knowledge to achieve forest restoration and wildfire hazard reduction goals in Colorado and the Interior West. We do this through collaborative partnerships involving researchers, forest land managers, interested and affected stakeholders, and communities. Authorized by Congress through the Southwest Forest Health and Wildfire Prevention Act of 2004, CFRI is one of three Institutes comprising the Southwest Ecological Restoration Institutes, along with centers at Northern Arizona University and New Mexico Highlands University.

The Colorado Forest Restoration Institute at Colorado State University receives financial support through the Cooperative and International Programs of the U.S. Forest Service, Department of Agriculture, under the Southwest Forest Health and Wildfire Prevention Act. In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights Room 326-A, Whitten Building 1400 Independence Avenue, SW Washington, DC 20250-9410 or call (202) 720-5964 (voice & TDD).



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BACKGROUND

Fire is an essential part of how forests renew and sustain. However, historic land uses and decades of fire suppression has excluded fire from millions of forested acres of in Colorado and across the western United States. Since the early 1990s, the size and severity of wildfires has increased; human land use and development in fire-prone forests has also increased. This combination of factors has resulted in the loss of life, property, and highly-valued natural, social, and economic assets from wildfires. This is forecasted to continue due to increases in average annual temperatures and the frequency, duration, and severity of drought. The US Forest Service estimates that approximately 80 million acres of western forests are vulnerable to large severe wildfires.

Forest restoration aims to reduce this vulnerability by applying mechanical, manual, and managed fire (both natural and planned ignitions) methods to alter or remove forest vegetation. By doing this, fires – when they do occur – can result in lower social and economic losses and costs, and serve their natural role in renewing forests. However, the cost, complexity, and controversy associated with forest restoration requires that forest managers and interested and affected stakeholders access and apply locally-relevant science-based knowledge to strategically identify the location, size, and types of restoration actions to produce the most benefits. While researchers in federal agencies and universities produce scientific findings relating to forest and fire ecology, it is not in their missions to engage with managers and stakeholders to localize these findings into project planning, analyses, design, and monitoring, and adapting future plans. Similarly, managers and stakeholders rarely have sufficient time and expertise to access, interpret, and localize scientific findings to inform effective forest restoration. What is needed are entities that can act as bridges and translators between research and management.

To address this gap, the Southwest Forest Health and Wildfire Prevention Act was enacted by Congress in 2004 (Public Law 108-317). The act authorized the establishment and federal funding support for university-based institutes in Arizona, Colorado, and New Mexico. As specified by the Act, the duties of each Institute are to:

- (1) Develop, conduct research on, transfer, promote, and monitor restoration-based hazardous fuel reduction treatments to reduce the risk of severe wildfires and improve the health of dry forest and woodland ecosystems in the interior West;
- (2) Synthesize and adapt scientific findings from conventional research to implement restoration-based hazardous fuel reduction treatments on a landscape scale using an adaptive ecosystem management framework;
- (3) Translate for and transfer to affected entities any scientific and interdisciplinary knowledge about restoration-based hazardous fuel reduction treatments;
- (4) Assist affected entities with the design of adaptive management approaches (including monitoring) for the implementation of restoration-based hazardous fuel reduction treatments; and
- (5) Provide peer-reviewed annual reports.

Per the fifth duty of the act, this annual report provides information about accomplishments of the Colorado Forest Restoration Institute (CFRI) at Colorado State University for calendar year 2017 for deliverables under the FY17 work plan approved on April 7, 2017 by the Southwest Ecological Restoration Institutes (SWERI) Executive Team.

ORGANIZATION

CFRI is hosted in the Department of Forest and Rangeland Stewardship, one of five academic departments in the Warner College of Natural Resources at Colorado State University. Tony Cheng is Professor in the Forest and Rangeland Stewardship department and the director of CFRI. Dr. Cheng has been director since April 2008. In calendar year 2017, CFRI had nine full-time employees and sixteen part-time employees. All employees report to Dr. Cheng. In turn, Dr. Cheng reports to the head of the Forest and Rangeland Stewardship. Heads of all departments in the Warner College report to the college's Dean.

ACCOMPLISHMENTS

Funding

CFRI utilizes funding appropriated under the SWERI-approved work plan as leverage for additional funding from federal and state government and nongovernmental sources. The table below displays all CFRI's funding sources, amounts, and agreement numbers for calendar year 2017.

Source	Project title	Agreement No.	Amount
US Forest Service, Grand Mesa-Uncompahgre-Gunnison NF	Monitoring Ecological, Social, and Economic Effects of the Uncompahgre Plateau Collaborative Forest Landscape Restoration Project	17-CS-11020400-023	\$19,000
USDA Forest Service - Rocky Mountain Research Station	Strategic Science Application and Delivery Efforts in the Interior West, MOD 1	16-JV-11221631-139, MOD 1	\$22,000
Colorado Department of Natural Resources	Development and Implementation of an Effectiveness Monitoring Strategy for the Colorado Wildfire Risk Reduction Grant Program	CMS 59848	\$35,540
US Forest Service, Arapaho-Roosevelt NF/Pawnee NG	Science-Based Support to Sustain the Resilience of Colorado's Front Range Forests, Watersheds, and Communities to Wildfire	17-CS-11021000-032	\$400,000
USDA Forest Service - Southwest Region	Colorado Forest Restoration Institute, FY17 (SWERI-approved plan)	17-DG-11031600-062	\$150,000
USDA Forest Service - Southwest Region	Colorado Forest Restoration Institute, FY17 (Supplemental) (SWERI-approved plan)	17-DG-11031600-070	\$200,000
US Geological Survey	Comparing Changes in Spatial Patterns between Collaborative Restoration Treatments and Wildfires in the Colorado Front Range (Co-PI; Lead PI = Jeff Cannon)	G17AC00392	\$25,000

The Nature Conservancy	Developing and Implementing an Ecological Effectiveness Monitoring Strategy, and Developing and Evaluating a Process to Improve Wildfire Response in the Watershed	Subaward G052017-CFRI (parent agreement 15-DG-11020000-069)	\$147,400
USDA Forest Service - Rocky Mountain Region	Forest-to-Faucets Assessment and Monitoring , MOD 1	16-CS-11020000-062, MOD 1	\$140,000
		TOTAL	\$1,138,940

State support

The State of Colorado, through its support to Colorado State University, provides financial support for CFRI facilities and administration. In 2017, this support totaled \$440,608.

Project deliverables

For agreement number 17-DG-11031600-062, CFRI reports the following accomplishments toward each project deliverables in the work plan:

Deliverable	Status of Deliverables
Project 1: Supporting Collaborative Forest Landscape Restoration Projects	
1.1 Produce and disseminate 1-3 technical documents regarding multi-party monitoring strategies and results for the Front Range Collaborative Forest Landscape Restoration Project	In progress. Submitted manuscript on monitoring and adaptive management results to journal <i>Forest Ecology and Management</i> for peer-review.
1.2 Produce and disseminate 1-3 technical documents regarding multi-party monitoring strategies and results for the Uncompahgre Collaborative Forest Landscape Restoration Project.	In progress. Compiling and synthesizing data from 2017 projects.

<p>1.3 Conduct and report on at least two (2) field-based workshops per CFLR project to review and deliberate treatment effects and desired conditions.</p>	<p>None yet to report.</p>
<p>1.4 Document and distribute CFLR treatment design and monitoring approaches to other place-based collaborative forest efforts</p>	<p>None yet to report.</p>
<p>Project 2: Addressing Knowledge Gaps for Post-Disturbance Forest Recovery and Future Forest Resilience</p>	
<p>2.1 In collaboration with Paula Fornwalt at the Rocky Mountain Research Station and Jeff Underhill, Regional Silviculturalist, produce and disseminate 1-3 status of knowledge summaries of vegetation response following large-scale forest mortality events</p>	<p>In progress.</p>
<p>2.2 In collaboration with Mike Battaglia at Rocky Mountain Research Station, produce and disseminate 1-3 technical reports or management briefs concerning the status of scientific knowledge about spruce management effects about spruce management effects</p>	<p>None yet to report.</p>
<p>2.3 Conduct and report on at least one (1) workshop to facilitate knowledge exchange regarding post-disturbance forest</p>	<p>Delivered presentation, <i>“Patterns of conifer regeneration following high severity wildfires in Southern Rockies ponderosa pine-dominated forests”</i> at the Natural Areas Conference, October 10-12, 2017.</p> <p>Delivered presentation, <i>“Patterns of conifer regeneration following high severity wildfires in Southern Rockies ponderosa pine-dominated forests”</i></p>

management options and effects	at the 7 th International Fire Ecology and Management Congress, November 28-December 2, 2017.
Project 3: Assessing Treatment Effectiveness	
3.1 Produce and disseminate between 1-3 written reports on fuel treatment effects on landscape-scale fire behavior, forest vegetation dynamics, and/or watershed values	
3.2 Conduct and report on between 1-3 field-based workshops to review and deliberate treatment effects and desired conditions	August 16, 2017, three CFRI staff conducted a field workshop at a CSFS project near Golden, Colorado, to deliberate treatment effects and desired conditions with CSFS staff and private land owners, and discussed application of monitoring from the Forest to Faucets program to private lands forestry management.
Project 4: Supporting Collaborative Capacity-Building	
4.1 Conduct, convene, organize, and report on between 1-3 site visits or workshops that bring together research scientists from RMRS, other federal agencies, and universities with participants of place-based forest collaboratives to transfer knowledge about, and assist in the development of, science-based methods for multi-party monitoring	Organized and led a field workshop for the Natural Areas Conference, October 12th, 2017, in Fort Collins, Colorado. The workshop toured CFLRP restoration sites and discussed monitoring data and strategies. Approximately 38 people from across the USA attended, representing two other CFRLP programs outside of Colorado, the San Juan Headwaters Forest Health Partnership, Pennypack Ecological Restoration Trust, California State University - Davis, and several other organizations. Speakers included CFRI staff Brett Wolk, Jeff Cannon, and Ben Gannon; RMRS Research Scientist Matt Thompson; USGS Research Scientist Jenny Briggs; and CSU Faculty in watershed sciences Stephanie Kampf.

For agreement number 17-DG-11031600-070, CFRI reports the following accomplishments toward each project deliverables in the work plan:

Deliverable	Status of Deliverables
Project 1: Provide training and analysis assistance for treatment effectiveness monitoring	
1.1 Produce and disseminate between 1-3 technical documents regarding forest fuel treatment monitoring strategies and techniques, and data management strategies and techniques.	None yet to report.
1.2 Develop and implement between 4-6 field-based workshops to train CSFS field staff and partners on monitoring strategies and techniques, and data management strategies and techniques.	- October 24th and November 3rd, 2017, worked with staff from Coalition for the Poudre River Watershed and The Nature Conservancy to train on fire effects monitoring protocols at the non-federal lands Ben Delatour Boy Scout Ranch prescribed fire.
1.3 Produce one written report assessing the effectiveness of the training program, including recommendations for improvement.	None yet to report.
1.4 Develop and report on a master data management system for aggregating monitoring data	None yet to report.
Project 2: Provide training on science-based forest fuel management strategies and techniques	

<p>2.1 Produce and disseminate between 1-2 synthesis documents of currently available scientific information on management effectiveness on wildland fire and forest health objectives for common forest types in Colorado</p>	<p>None yet to report.</p>
<p>2.2 Develop, implement, and document between 1-3 “train the trainers” workshops to develop a cadre of CSFS and NRCS staff to deliver training curriculum to CSFS and NRCS field staff, and other partners in implementation.</p>	<p>None yet to report.</p>
<p>2.3 Develop and implement between 3-4 field-based workshops with CSFS and NRCS field staff and partners</p>	<p>In progress: scheduled February 7th, 2018, CFRI staff for Brett Wolk and Kat Morici to conduct field based workshop to review fuel treatment science with CSFS Montrose District office field staff and West Region Wildfire Council mitigation specialists.</p>
<p>2.4 Produce one written report assessing the effectiveness of the training program, including recommendations for improvement</p>	<p>None yet to report.</p>
<p>Project 3: Assessing Cross-Boundary Treatment Effectiveness</p>	
<p>3.1 Compile, maintain, and report on forest management treatments on federal and non-federal lands for between 2-4 large landscape-scale project areas</p>	<p>None yet to report.</p>

<p>3.2 Develop and disseminate between 2-4 written reports assessing the landscape-scale effects of these treatments across landownership boundaries on fire behavior and effects, watershed values, and forest structure and composition</p>	<p>None yet to report.</p>
<p>Project 4: Assess the effectiveness of cross-boundary, National Cohesive Wildland Fire Management Strategy-related projects on reducing wildland fire impacts to people, property, and communities</p>	
<p>4.1 Develop and coordinate a working group to identify assessment questions and sampling strategy</p>	<p>In progress: meeting scheduled for July 18th, 2018 with USFS R2 fire and fuels specialists (Keating and Synowiec) and CSFS fire and fuels specialist (Garrison) to establish a working group.</p>
<p>4.2 Develop and disseminate one report on case studies assessment.</p>	<p>None yet to report.</p>