Presentation by Tony Cheng, Colorado State University
Colorado Wildfire Matters Review Committee
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My name is Tony Cheng. I am a professor in the Dept. of Forest & Rangeland
Stewardship at Colorado State University and director of three applied research and
outreach centers at CSU: the Colorado Forest Restoration Institute, the Southern
Rockies Fire Science Network, and the Center for Managing Wildland-Urban
Interface Fire Risk.

Thank you for the opportunity to present on the work my colleagues and I are
engaged in in Colorado to address wildfire issues, especially in forested
environments.

The Colorado Forest Restoration Institute, or CFRI, was established at CSU in 2005
and has sister institutes at Northern Arizona University and New Mexico Highlands
University.

There are four full-time staff at CFRI. Our base operating funding comes through
annual agreements with the US Forest Service. We also receive funds through
agreements with other entities, such as the DNR, water providers, and through
research grants.

Our mission is to develop, compile, and apply <u>locally-relevant science-based
information</u> to assist managers in defining and achieving forest restoration and
wildfire mitigation goals.

A key operating principle of CFRI – and the other centers I direct – is that fire is a
natural and necessary part of forest health, but that wildfire risks to communities
can be managed strategically. Based on our current scientific understanding of
wildland fire, we seek to promote strategic actions that can affect the behavior,
intensity, and severity of fire in ways that benefit long-term forest health and
minimize negative societal consequences.

We "promote strategic actions" by working with collaborative groups and managers
around the state to assess locally-relevant science-based evidence, define clear goals
and objectives, identify treatments, and assess the effectiveness of treatments to
inform future goals, objectives, and actions.

Our aim is to continuously learn and improve the effectiveness of wildfire mitigation
treatments through locally-relevant science-based information.

I want to highlight two major efforts we're involved in.

The first is the Collaborative Forest Landscape Restoration (CFLR) Projects on national forest lands in Colorado – one on Colorado's Front Range and the other on the Uncompahgre Plateau in western Colorado.

These projects were initiated in 2010 and are part of a national program administered by the US Forest Service that directs funding to large-scale forest restoration projects.

The Front Range CFLR project encompasses the Arapaho-Roosevelt and Pike-San Isabel National Forests.

> The Front Range CFLR is an outgrowth of the Front Range Roundtable, a collaborative partnership of over 40 governmental and non-governmental organizations focusing on reducing catastrophic wildfire and improving forest health on about 400,000 acres of forest land along the Front Range.

> The goal is to treat 31,600 acres on national forest lands; as of 2014, about 46% of the acreage goal has been treated.

The Uncompahgre Plateau CFLR project encompasses the national forest lands on the Uncompahgre Plateau.

> The UP CFLR is an outgrowth of long-standing collaboration among managers, communities, organized interests, and scientists.

> The goal is to treat 27,000 acres through mechanical harvest and 55,000 acres through prescribed burning. As of 2014, about 37% of the acreage goal has been achieved.

The goal of both projects is to reduce the intensity of wildfires in Ponderosa pine forests compared to historic conditions of these forests which are presumed to have burned every 10-40 years with low to moderate intensity. Many of Colorado's recent large high-intensity wildfires have occurred in the Ponderosa pine zone.

This zone also has large extents of housing developments. Hence, doing fuel reduction-based forestry work can reduce the exposure of homes to extreme fire behavior where those treatments occur.

Actions include tree harvesting and prescribed burning.

A central part of both CFLR projects is a monitoring plan collaboratively developed by partners. The monitoring encompasses both ecological and socio-economic topics.

CFRI plays a central role in these monitoring efforts. Our job is to quantify the effects of treatments occurring in these projects and provide additional information about treatments than "acres treated".

On the ecological side, we are assessing the impacts and effectiveness of these treatments on fire behavior and several ecological attributes through field measurements and quantitative analysis of fire potential.

So far treatments are creating a forest structure that is reminiscent of historical forest conditions. In some cases, we're finding that not enough trees are being removed, reducing the longevity of the treatment effectiveness. Research is ongoing to figure out how long a treatment will last before forest density and fuels build up to the same level as before treatment. Results of this work can yield a better understanding of return on investment into treatments. It looks like subsequent projects are doing a better job at reducing forest density and creating forest conditions that more likely can receive low to moderate intensity fire, even under extreme weather conditions.

Also, we find in many projects that the woody material left on the surface may contribute to increased fire hazards and impacts to soils, plants, and watersheds. Woody material on the ground can take up to 15 years to decompose to the point where they won't produce a big fire hazard.

The plan for many of these treated areas is for prescribed fire to reduce this surface fuel loading, but burn windows are tight due to the lack of favorable weather conditions and air quality regulations, and so prescribed burning can't keep up with the harvesting treatments. And there are obvious community safety and health concerns that prevent prescribed fire from being used in many places.

CFRI is also collecting data on economic factors, such as employment, regional economic activity, and wood utilization.

Monitoring reports for the CFLR projects are available on our website or I can send hardcopies.

The second effort CFRI is involved in is to monitor treatment effects and effectiveness of projects funded by the Wildfire Risk Reduction Grant administered by the Colorado Department of Natural Resources

We do this by conducting measures of fuel loading pre- and post- treatment. Treatments include both mechanical removal of trees, hand cutting of small trees and brush, and mechanical reduction of trees and brush through chipping, mulching, or mastication – basically taking a whole tree and reducing it into small wood chunks on the ground.

We have monitoring plots on 40% of Round 1 and 2 grantees – 52 total grantees. These are distributed across the state and across different vegetation types.

Similar to the CFLR projects, our results show that crown fire hazard across all projects are being reduced immediately after treatment. However, in many projects surface fire hazards are unchanged or have increased.

Because all of these treatments are in the wildland-ubran interface, prescribed fire will be a challenge.

The proposal requirements and instructions have been adapted to require that grantees demonstrate how woody biomass will be removed from the project site. Our monitoring will continue to inform what the appropriate balance of the quantity of biomass on site for ecological productivity vs. being a fire hazard. Our forests rely on cycles of live and dead woody biomass to be healthy.

That is certainly a lesson learned – we use the term "fuel" in wildland fire to describe anything that can burn, but fuel is also otherwise known as trees, shrubs, and plants – the very things that make a forest a forest. We'll continue working to generate science-based information to meet fire hazard concerns while avoiding unintended long-term ecological consequences. We are finding out that it's an ongoing balancing act that defies easy answers.

Additionally, we're initiating a project analyzing the difference in effect between untreated and treated forest stands on potential runoff and erosion. We're doing this work in drainages affecting Denver Water supplies in the Upper South Platte watershed. Our goal is to derive quantitative measures of effectiveness and return on investment. You will be hearing from Paige Lewis with The Nature Conservancy about this.

Lastly, I want to mention current work of the <u>WUI Center</u>

We are finishing up a high-resolution map of home locations across high fire hazard wildland-urban interface areas in Colorado.

For each structure, we can identify physical attributes important to wildfire risk, like topography, vegetation type and condition, proximity to fuel treatments, and proximity to firefighting resources.

The map and accompanying database can be a powerful strategic and tactical planning tool to improve wildfire response. The plan is to work with forestry and fire managers to use this map to help prioritize and coordinate fuel reduction actions and firefighting strategies – we're planning to test-drive the map with a few local fire mgmt. organizations along the Front Range.

The WUI Center also collaborates with researchers with the US Forest Service and the National Institute for Standards and Technology to better understand the mechanics by which homes ignite during a wildfire.

By combining this understanding with specific home locations, we hope to provide managers a better understanding of what and where actions can reduce vulnerabilities to wildfire.

Thank you for the opportunity to speak to this committee and describe science-based resources available at Colorado State University to help address wildfire matters in Colorado. It is an issue that engenders strong emotions and a desire to act to "do something". Fortunately, there is a robust body of scientific knowledge and understanding about wildland fire that can be brought to bear on solutions.

I am happy to answer any questions that committee members might have.