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TINDERBOX TO TREATMENT

Leveraging forest restoration funds

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FIRE

In April 2015, I drove up highway 50 in American River Canyon to the Horsetail Falls trailhead to climb Pyramid Peak. There were still patches of snow on the ground, and the water coming down the falls was gushing, making for scenic views up the narrow canyon. While still hiking up through the mixed conifer stands on the trail, I noticed how dense the forest was with small-diameter trees. I left the trailhead briefly, walked through the pines and firs, and was struck by the excessive accumulation of downed wood in the understory. It was scary and surprisingly dry for this point in the spring. These conditions were due to a century of fire suppression, which created a high chance of burning soon, severely altering the picturesque canyon. A similar pattern exists in nearly every forested system of the Sierra Nevada mountains.

Reducing these harmful conditions will require forest health and restoration solutions that integrate communities, infrastructure, ecological thinning, and responsible biomass utilization are critical to reducing the negative impacts that unhealthy forested systems pose. Addressing unnatural conditions due to past forest and fire management regimes is a massive undertaking, already garnering billions of dollars from state and federal resources and countless organizational resources. However, it is challenging to get to the scale needed due to localized environmental conditions, organizational capacity, environmental compliance, and funding.¹

Theory of change

Together with partners and a literature review, we created a simplified situation model connecting uncharacteristic fire results from fire suppression on public and private lands exacerbated by climate change (Figure 1).² To enable solutions that effectively address these challenges, we then linked interventions, interim results, and outcomes (Figure 2). The treatments identified in the results chain focus on local-level interventions such as thinning, biomass utilization, and prescribed fire.³ Although based on a widely agreed upon forest restoration interventions, the models explicitly show the links between wildfire, forest health and beneficial outcomes.



SOLUTIONS

Walking the talk and progressing from models to solutions is a significant hurdle, especially at the landscape scale. Proposed solutions to reduce the negative impacts of wildfires generally fall into three buckets: funding, scaling, and capacity, although each local situation is nuanced and contains different approaches.

Funding

Substantial state and federal funds are available for forest health projects. California is investing in forest health, betting that increased funding for thinning, prescribed fire, wood processing infrastructure, and businesses development projects will reduce wildfires. This increase in funding, capacity, and resources is part of an all-hands-on-deck approach to address forest health throughout California. However, public funds cannot cover all project needs. Furthermore, engaging the private sector is critical to meeting the challenge. How can public dollars be maximized to reduce wildfire risk while restoring forested stands after a fire?

A potential funding solution is to leverage and complement public funds with private capital, increasing the number of projects that return an investment to investors once meeting predetermined outcomes. Two innovative finance approaches examples include

- The recently launched \$25 million [Yuba II Forest Resilience Bond](#) on the Tahoe National Forest to restore 48,000 acres. Eli Ilano, Tahoe Forest Supervisor, said that the bond “...will help us finance prevention strategies to stave off the ever-present risk of catastrophic wildfire that can damage national forests and our neighboring lands.”
- The [Southwest Wildfire Impact Fund](#) takes a similar revolving loan fund approach to foster regional restoration across public and private land in the San Juan National Forest. The fund is capitalized by a combination of bond proceeds, grants, and appropriations, disbursing loans to landowners annually to pay for forest health treatments.

Blended, non-traditional funding strategies such as these have three distinct advantages to traditional grants and loans: 1) shift risk from project implementers/agencies to investors; 2) provide funding faster by providing capital to implementers at project start rather than reimbursement-driven grants; and 3) creating new funding sources where funding may be scarce or not enough to address the problem at hand fully.

One critical barrier to developing non-traditional finance is the lack of payors, or the entities that repay initial restoration investments, ideally with a modest return. For example, the Yuba Water Agency pays investors in the Yuba II Forest Resilience Bond when predetermined outcomes related to watershed forest health and sedimentation reduction projects are reached following project implementation and validation. Please see the collaborative finance white paper [Because It's Worth It](#) for a full description of payors and impact bonds.

Scale

Following the Caldor Fire that burned large proportions of the American River Canyon, CAL FIRE awarded the El Dorado Resource Conservation District (RCD) funding as part of a coordinated and centralized Emergency Forest Restoration Team to prioritize post-fire restoration projects. A similar effort is underway following the Dixie Fire on the Plumas and Lassen National Forests and is helping to create cost and time efficiencies over large landscapes.

Other strategies for scaling efforts may include outreach to support stakeholder understanding of the broader forest system, go beyond localized thinking, and consider how to replicate pilots through local solutions and policy-based regional solutions ([Salafsky et al., 2021](#)). At a vast scale, the Forest Service’s newly released Confronting the Wildfire Crisis Plan aims to treat up to 20 million acres of National Forest Lands and 30 million acres on other federal, Tribal, State, and private lands with partners ([USFS, 2022](#)). By increasing the scale of this work, other factors such as ecological function, biodiversity, ecosystem services, climate adaptation, socio-cultural equity, and human well-being factors are more relevant ([Meyer et al., 2021](#); Schuster et al., 2022⁴).

Capacity

Building a workforce that can ably plan integrated projects, develop creative financing solutions, implement the needed array of forest treatments, utilize the removed biomass, safely apply prescribed fire, and measure the outcomes is part of a fire and finance effort. Increasing local capacity is critical for scaling efforts to restore forests following fire and build more resilient rural communities. Capacity building is not possible without community-based qualified personnel and a sustainable, ecologically sound forest health economy.

Huge strides are being made through coordination at the state and local levels. CAL FIRE’s Wood Products and Bioenergy Program has an open request for proposals that is both funding wood products businesses and building capacity. We can solve multi-disciplinary challenges to implementing forest restoration, energy, safety, and equity by bringing together best practices and methods from various disciplines. Healthier and more resilient forest ecosystems will result from identifying the relationships between the issues and barriers to increased pace and scale and offering integrated approaches. Testing and refining pilot efforts will be an essential part of the learning process and ensuring we meet social and ecological goals.

Training a workforce to work in the woods is a critical current and future need. Many community colleges are creating programs to address this for work as varies as forestry to truck driving. For example, Lake Tahoe Community College started a forestry program teaming with the California Conservation Corps and local agencies, and Shasta College has an associate in science degree in forest science and technology. “The CCC’s partnership with education institutions is extraordinarily beneficial and one we aim to replicate across the state,” said CCC Director Bruce Saito. “It’s a huge benefit to our Corpsmembers, who get exposure to college and degree programs that can help them launch great paying and meaningful careers in forestry and other fields. Together we’re helping develop a highly-trained workforce.”

CONCLUDING THOUGHTS

Capacity, scale, and funding will not be the only items needed to change California and the West’s wildfire situation. Policy change, community health, increased private sector engagement, and more diversified equity and cultural approaches are needed to surmount this life-threatening situation. Volatile forest conditions will not change overnight, but perhaps future disasters can be avoided by considering how existing and new approaches to mitigate adverse conditions can be exponentially ramped up and coordinated throughout the Western United States.

We welcome constructive feedback on this issue paper. Please send us your thoughts and ideas.

COLLABORATIVE FINANCE SERIES

This paper is part four of a series of issue briefs on collaborative finance. Part one, [Finding the Pathway](#), outlines the steps to collaborative finance. In [part two of the series](#), we provide a primer on alternative approaches to project finance. A third paper explores [barriers facing collaborative finance](#) and strategies to leverage public grants and loans to secure private investment. A final paper examines [strategies for leveraging public and private sources of project funding](#).

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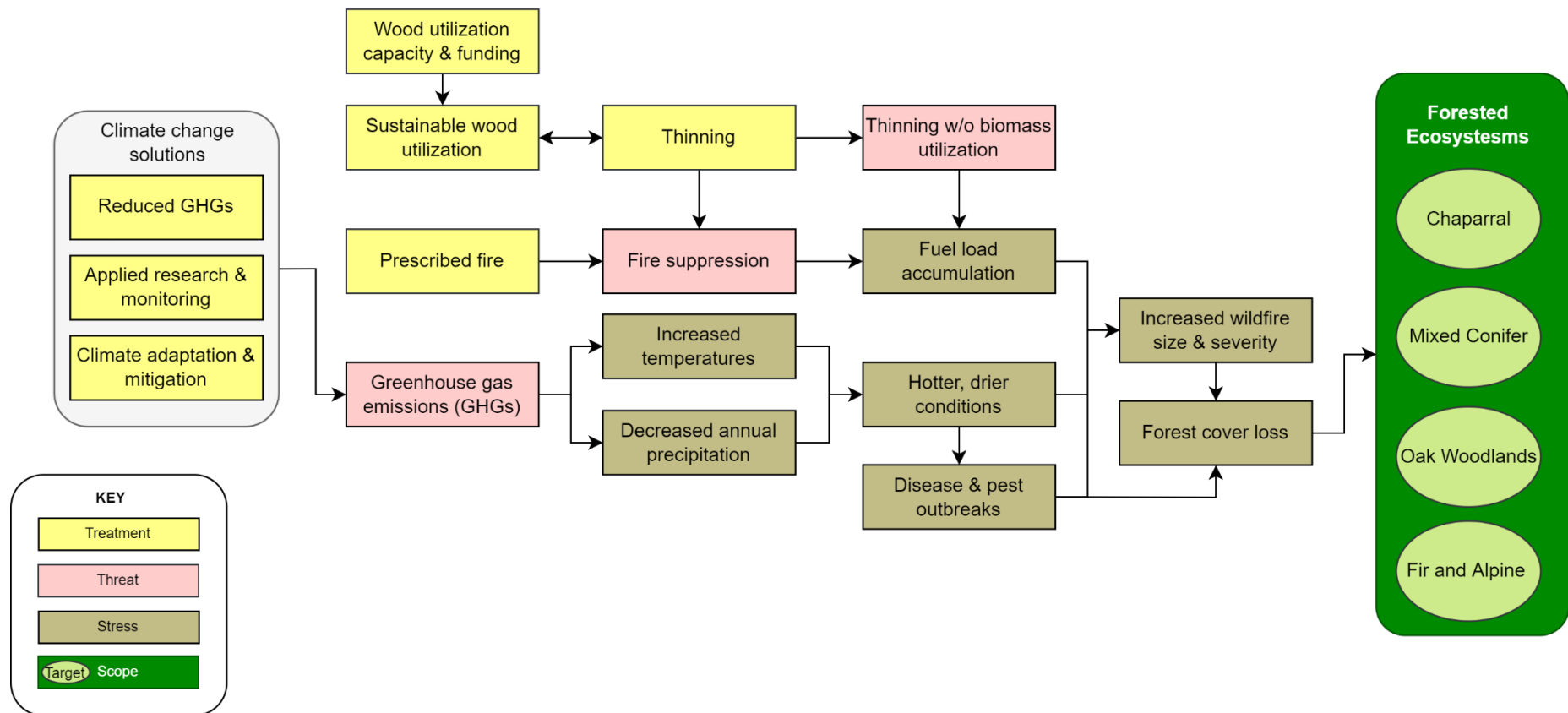


Figure 1. Situation model of fire's impact on forested ecosystems and potential interventions to reduce impacts.

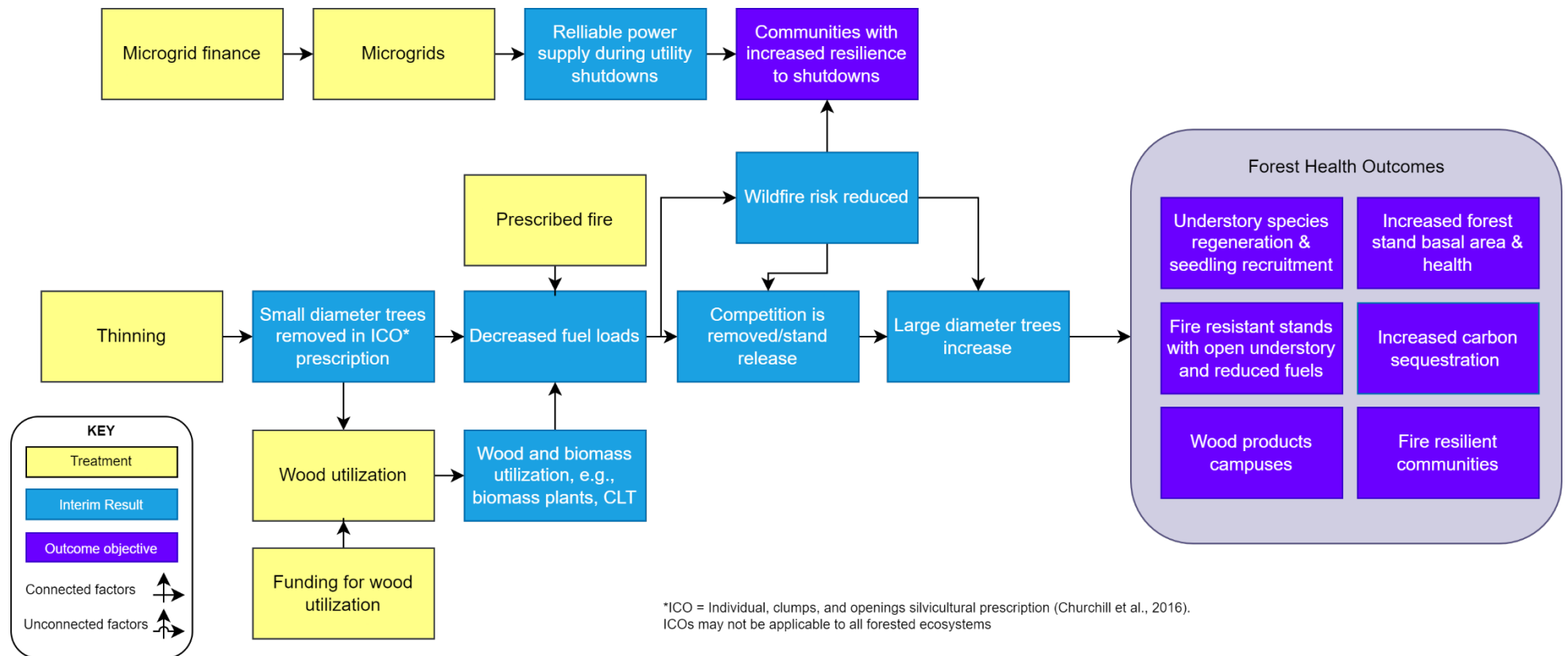


Figure 2. Results chain linking interventions with interim results and outcome objectives.

¹ Progress in permit streamlining and coordination for CEQA/NEPA compliance is taking place through vehicles such as the [California Vegetation Treatment Plan](#) and the [Cutting the Green Tape Initiative](#). Multi-agency and stakeholder coordination at the state level for forest health is being led by California's [Wildfire and Forest Resilience Task Force](#).

² The situation model and results chains shown in Figures 1 and 2 follow the [Open Standards for the Practice of Conservation](#).

³ It is important to distinguish between good fires that burn at low intensities in the understory vs bad fire that reach the forest crown, burn at high intensity, destroy soil biota, and create their own weather systems. See [Good Fire vs. Bad Fire](#) or view this [this](#) explainer video on low intensity fire for more information.

⁴ Schuster, E, Russell, V, Lacy, L. In Press. Top barriers for nonprofits aiming to increase their impact on nature and human well-being. Cool Green Science. <https://blog.nature.org/science/>