



CalEPA
California Environmental
Protection Agency



Sierra Institute
for Community and Environment

PUBLIC REVIEW DRAFT

State of California's Phase I Application to the National
Disaster Resilience Competition

Funding Opportunity Number: FR-5800-N-29

Released: February 17, 2015

Exhibit A: Executive Summary

California will be home to 50 million people by the middle of this century. Californians depend on the state's abundant natural resources to sustain its citizens, economy, and way of life. A critical part of this relationship is the state's watersheds that collect and store precipitation in the mountains and foothills. These watersheds feed networks of rivers, reservoirs, and aquifers that support rural communities, agriculture, and the state's urban areas. Under the current drought conditions, the health and resilience of the state's upper watersheds is even more critical.

The Rim Fire, California's third largest wildfire, starkly underscored the vulnerability of the state's watersheds and rural resource-based economies to extreme fires, and highlighted the fragile relationship between the state's people, economy, and its natural resources. The Rim Fire began in August 2013 and burned over 250,000 acres, cost more than \$127 million to control, and burned for over two months, despite well-coordinated multi-agency efforts to control it. The fire impacted the Hetch Hetchy Reservoir, which supplies water to over 2.5 million customers in the City and County of San Francisco.

The State of California, in partnership with federal and local governments, community organizations, and private business proposes to develop the Community Resilience and Forest Stewardship Program. The Program recognizes that a more balanced, integrated, and sustainable approach to forest restoration and management requires supporting the interdependent relationship of community and forest ecosystems. Declines in the timber industry and years of fire exclusion that generated dense, overgrown forests, and increased development in the wildland-urban interface increased the risk of severe wildfire not only to forests and associated natural benefits and services, but also to surrounding communities. This challenge pervades both Tuolumne County and forested areas throughout the state's upper watersheds in the Sierra Nevada, Cascade Mountains, and other areas throughout California and other Western States.

Exhibit A: Executive Summary

The Community Resilience and Forest Stewardship Program (Program) will facilitate the transition to a sustainable forest economy in our rural communities. The Program aims to support economic development in rural communities through restoration and stewardship of our natural forest systems and watershed. The Program design integrates strategic planning for activities to support forest and watershed health with job-training opportunities in sustainable forest management (e.g., marking trees, forest thinning, planting, transportation of material, etc), and the development of appropriately-scaled biomass and wood products markets, along with watershed restoration skills, including hydrology, engineering, and ecology.

The state of California has developed a strong partnership with Tuolumne County and the U.S. Forest Service (USFS) to lead this effort. We have engaged with local businesses, non-profits, community groups, and education leaders to identify community recovery needs and develop a program for community and ecological resilience in the area. Activities will also include job training through the California Conservation Corps and educational programs to transition the community to more resilient management practices.

California has many opportunities to leverage funds to magnify the benefits of this program. These include the USFS's recovery funds for the Rim Fire, a portion of the state's Greenhouse Gas Reduction Fund, and the California Public Utility Commission's Senate Bill (SB) 1122 program, which is designed to make small-scale bioenergy facilities more competitive. Our stewardship and resilience effort will result in an enduring program to improve forest and community resilience that will be replicable throughout the forested Sierra Nevada region and other Western States.

Exhibit B: Threshold Requirements

Target Area

The Target Area for California's application is a Tuolumne sub-county area including the Rim Fire burn area and evacuation area. Map: [Rim Fire Burn, Evacuation Areas and Census Tracts- MID-URN Area](#). Census Tracts: 06109002200, 06109004100, 06109003100, 06109003200, 06109004200

Most Impacted Characteristics

Public Infrastructure:

The Rim Fire damaged and destroyed permanent public infrastructure systems critical to roadway access into and out of Stanislaus National Forest. Landscape changes due to the fire rendered the infrastructure systems non-functional or inadequate and unsafe, due to erosion and landslides. The Fire also burned rangelands, fencing and water troughs used by cattle ranchers who graze their cattle in a partnership with the USFS. Further, within the Target Area the fire damaged several historical sites, one of which was the complete burning of the Niagara Railway Trestle, which was originally built between 1923 -1924 and is listed on the National Historic Site Register.^{1,2} While the lists are not exhaustive, the eight projects included in the three source documents below represent \$3,641,176 in Most Impacted damage to permanent public infrastructure components, as well as Unmet Recovery Need.

- Source: USFS - \$1,130,000: [US Forest Service - Burned Landscape - Roadway/Culvert/Retaining Wall Infrastructure](#)
- Source: USFS - \$1,068,000: [US Forest Service - Rim Range Infrastructure Damage and Repair Report](#)

¹ [US Forest Service - Camp Niagara National Register Original Historic Photos](#)

² [US Forest Service - Camp Niagara National Register Nomination](#)

Exhibit B: Threshold Requirements

- Source: USFS - \$1,443,176: [US Forest Service - Burned Niagara Trestle - Historic Site](#)
 - Source: [US Forest Service - Cost Estimate for Bourland Trestle](#)

Environmental Degradation

The immediate environmental damage caused by the Rim Fire is estimated at between \$100 million and \$736 million for the first year after the fire. Environmental benefit losses for Private Lands within the Rim Fire perimeter was estimated at \$10 million to \$62 million, or about 10 percent of the total year 1 post-fire damages.³

The Rim Fire released millions of tons of smoke into the atmosphere^{4,5}, and left behind a barren forest that stores a mere fraction of its pre-fire carbon, hydrophobic soils, charred stands of timber, slash piles, and scarred slopes. The watersheds are threatened as soils no longer absorb rain run off, leading to sedimentation in creeks and rivers. Where water can be absorbed into the soil, there is less vegetation to hold the soil in place, which could result in dangerous and damaging mudslides.

The damage from the Rim Fire threatens every aspect of life in this forest-dependent community. Without resilient recovery, the Target Area and surrounding communities will remain vulnerable to the danger of severe wildfire because of heavy fuel loads in the forest and low moisture on the forest floor. Severe wildfire poses a continued threat to the Target Area's tourism- and forest-based economy, including Yosemite National Park, Stanislaus National Forest, and other tourist attractions; valuable private timber stands; and the wood products the forest provides. Mudslides from destabilized mountainsides threaten the function, health and water quality of the entire watershed system that runs directly through the Target Area, including

³ [Earth Economics Report](#) – page 25, 6. Conclusions

⁴ [Rim Fire Air Quality Update - August 26, 2013](#)

⁵ [NOAA Smoke Map](#)

Exhibit B: Threshold Requirements

the Don Pedro and Hetch Hetchy reservoirs which are the primary sources of potable water for California's Central Valley area and the city and county of San Francisco, respectively. Forests also play a significant role in mitigating climate change by storing carbon from the atmosphere in trees and soil. When forests burn during wildfires, they rapidly release stored carbon as greenhouse gas (GHG) emissions into the atmosphere jeopardizing California's efforts to mitigate climate change. The Rim Fire alone released 11,352,608 metric tons of GHG emissions, which is roughly the equivalent of the annual GHG emissions from 2.3 million motor vehicles.⁶ Without resilient recovery to improve forests, carbon storage will continue to plummet, degrading both air quality and embedded carbon stores.⁷

Most Distressed Characteristics

Economically Fragile Area

The census tract area has an unemployment rate of 15.4 percent, 158.4 percent of the national average of 9.7 percent.⁸

Prior Environmental Distress

The Target Area has suffered prolonged environmental distress due to drought, overgrown forests from a century of fire exclusion, and previous wildfire damage. In August 2012, according to the U.S. Department of Agriculture and the National Oceanographic and Atmospheric Administration's (NOAA) Drought Monitor Mitigation Map, Tuolumne County was under Moderate Drought conditions⁹ and on August 13, 2013, four days before the start of the Rim Fire, Tuolumne County was under Extreme Drought.¹⁰ Currently, nearly 40 percent of

⁶ [Sierra Nevada Conservancy Rim Fire Fact Sheet](#)

⁷ [Quantitative Evidence for Increased Forest Fire Severity](#) - Page 29 (13 in the PDF), highlighted area.

⁸ [CA NDRC Target Area Unemployment-Census Tracts](#)

⁹ [August 14, 2012 Drought Map](#)

¹⁰ [August 13, 2013 Drought Map](#)

Exhibit B: Threshold Requirements

California, including Tuolumne County, is under Exceptional Drought, the most severe drought ranking.¹¹

In 1987, much of the Rim Fire boundary burned in the Complex Fire; that fire burned 157,000 acres of Tuolumne County. When a wildfire burns as hot as the Complex and the Rim fires, natural regeneration of conifer tree seedlings is sporadic due to competing vegetation such as sage and Manzanita. These shallow-root vegetation types do not resist erosion the way trees do and hold moisture poorly, making them ideal wildfire fuels.

The majority of the remaining unburned forest is overgrown due to decades of fire suppression management and an unnatural fire regime. Annual forest growth, measured in board feet, surpasses the amount of timber harvested annually by an orders of magnitude. This imbalance leads to overgrown forests ripe for catastrophic wildfire.¹² With the exception of the highest peaks in Tuolumne County, the Target Area in Tuolumne County is and has consistently been under extreme fire threat, as shown by the 2011 Fire Threat Map.¹³ This high level of threat ensues due to a combination of fuel type, topographic features of the area, and the type and structure of the trees present. The results of this risk are reflected in the USFS's budget, where funding for Wildland Fire Management swelled from 17 to 51 percent from 1995 to 2014. Further exacerbating the problem, funding for active fire suppression displaces all other USFS programs including state and private forestry, capital improvement and maintenance, and staffing.¹⁴

¹¹ [Current Drought Monitoring Map](#)

¹² [Quantitative Evidence for Increased Forest Fire Severity](#) – Pages 28-30

¹³ [California Fire Threat Map - 2011](#)

¹⁴ [US Forest Service-Rising Cost of Fire Operations 1995-2014](#)– Page 3

Exhibit B: Threshold Requirements

Current forest health and climate change is leading to more frequent and more severe wildfires¹⁵, affecting water supply. The denser the forest canopy, the higher the likelihood that rain and snow is intercepted by the canopy rather than landing on soil and flowing into streams, rivers, reservoirs, and recharging groundwater.¹⁶

Unmet Recovery Need

Infrastructure

As noted in the Most Impacted section above, roadways that provide access into and out of the forest have either been damaged by fire, or as a result of landscape changes resulting from the fire. These changes have rendered roadway systems non-functional or inadequate and unsafe. The fire also damaged cattle grazing facilities and historic sites. While this list is not exhaustive, the eight projects included represent \$3,641,176 in Unmet Recovery Need for repair and/or replacement of permanent public infrastructure components.

- Source: USFS - \$1,130,000: [US Forest Service - Burned Landscape - Roadway/Culvert/Retaining Wall Infrastructure](#)
- Source: USFS - \$1,068,000: [US Forest Service - Rim Range Infrastructure Damage and Repair Report](#)
- Source: USFS - \$1,443,176: [US Forest Service - Burned Niagara Trestle - Historic Site](#)

Eligible Activity

California will demonstrate that each CDBG-NDR activity proposed is an eligible activity or will request an eligibility waiver for the activity with the Phase 2 application. The State is

¹⁵ [Quantitative Evidence for Increased Forest Fire Severity](#) – Page 28

¹⁶ [Community Stewardship White Paper - 2011](#) –Pages 8-11

Exhibit B: Threshold Requirements

aware that HUD does not guarantee that such waivers will be granted, but any request will be evaluated prior to determination regarding disposition of your application.

Incorporate Resilience

As further described in Exhibit E: Soundness of Approach, completion of the plans and activities proposed in the State's Application will achieve multiple goals: 1) reduce the risk of future severe wildfire, 2) protect vital natural resources including forests and watersheds, 3) improve infrastructure needed to fight fires and protect the community, 4) improve the capture and recharge of groundwater, which is critical to the water supply of the communities served by the mountain watershed systems, and 5) stabilize the local economy by developing a broader economic base for the target area and surrounding areas.

California has a strong framework of laws and policies that promote resilience. In 2006, the legislature passed Assembly Bill (AB) 32, the California Global Warming Solutions Act, which requires the state to reduce greenhouse gas emissions to 1990 levels by 2020.¹⁷ In 2009, California was the first state to develop a comprehensive climate adaptation strategy.¹⁸ The 2014 update to this strategy, *Safeguarding California*, lays out risks and resilience needs across sectors.¹⁹ California voters showed further support for our critical resources by approving Proposition 1, an expansive water bond to address current drought and develop resiliency measures as climate change continues.²⁰ In recognition of the role forests play in delivering clean water to the state's growing population, a portion of the funds in the bond supports upper watershed health which takes California another step in its effort to fully protect vulnerable and critical watersheds and downstream resources.

¹⁷ California Health and Safety Code, Division 25.5, Sections 38500-38599.

¹⁸ [2009 Climate Adaptation Strategy](#)

¹⁹ [Safeguarding California: Reducing Climate Risk – An Update to the 2009 California Climate Adaptation Strategy](#)

²⁰ [2014 California Passes Prop 1 - Water Bond Measure](#)

Exhibit B: Threshold Requirements

Meet a national objective

California intends to demonstrate that each proposed activity other than general administration and planning, both not subject to such demonstration, can and will meet a CDBG-NDR national objective or request and receive a waiver from HUD.

Overall benefit

At least 50 percent of the funds requested in the state's application must assist activities that will provide sufficient benefit to low- and moderate-income persons in the form of services, area benefit, housing, or jobs, to meet the national objective of benefit to low-and moderate-income persons or request and receive a waiver from HUD.

Establish tie-back

All eligible activities will tie-back to the Rim Fire as damage caused directly by the fire or as a consequence of the fire.

Exhibit C: Capacity

The Community Resilience and Forest Stewardship Program (Program) establishes an innovative model for building resilience in fire-prone areas. Declines in the timber industry, years of fire exclusion leading to dense, overgrown forests, and increased development in the wildland-urban interface increased the risk of severe wildfire not only to forests and associated natural benefits and services, but also to surrounding communities. This challenge pervades Tuolumne County and the state's forested watersheds in the Sierra Nevada and Cascade Mountains other areas throughout California, and other Western States.²¹

The Community Resilience and Forest Stewardship Program is designed to facilitate the transition to a sustainable forest-based economy in our rural communities. A partnership between public and private institutions at the federal state, and local level, the Program will support economic development in rural communities through restoration and stewardship of our natural forest systems. The Program partnership will integrate strategic planning for activities to support forest and watershed health with job-training opportunities in sustainable forest management (e.g., forest thinning, marking, transportation of material) and the development of appropriately-scaled biomass and wood products industries.

The State of California's application to the National Disaster Resilience Competition builds on its extensive capacity to work across sectors, engage at the federal, state, and local level, develop and use technical and data resources, and leverage capacity and funding to achieve multiple outcomes. Together, this capacity enables the state to accomplish sound project design and selection, active monitoring of investments, and use of adaptive management tools.

Grant Oversight and Management Structure

The Grantee is the State of California. Within the state, five departments will assume

²¹ [The State of the Sierra Nevada's Forests](#); [The Klamath-Cascade: California's Watershed in the Balance](#)

Exhibit C: Capacity

primary grant oversight and management responsibilities.

- **The California Department of Housing and Community Development (HCD)** will provide administrative responsibility for ensuring that the grant efforts are carried out in compliance with all HUD requirements, and will serve as fiscal agent for the Grant overseeing the financial, procurement, quality assurance, and internal controls. HCD has extensive experience in managing the state's federal consolidated plan funds and in the last 15 years has allocated over \$4 billion in state and federal capital resources to municipalities, community-based organizations and private sector business and developers. HCD's CDBG division, as well HCD's newly created internal audit division, will directly oversee the grant activities and ensure the appropriate internal controls, training are in place for grant and sub-recipient activities.
- **The Governor's Office of Planning and Research (OPR)** will assume the primary leadership role for project management and implementation, including coordinating and aligning state department resources, policies, and efforts. OPR currently facilitates several statewide and regional efforts that multi-sector resources and funding together, including the Drought Mitigation task force, California Environmental Quality Act (CEQA) guidance, and local General Plan Guidance.
- **The California Environmental Protection Agency (CalEPA)** will provide oversight on outreach efforts, cross-sector climate change work, and resource development, including leverage of innovative funding such as the Greenhouse Gas Reduction Fund.
- **The California Department of Forestry and Fire Protection (CALFIRE)** will provide oversight of forest stewardship practices, technical expertise, and tie back to ecological and climate goals.

Exhibit C: Capacity

- **California Conservation Corps (CCC)** will provide job training programs for sustainable forestry management.

Oversight Steering Committee

A 10-member steering committee will advise the State on results-based outcomes, outreach, engagement, systems strategies, resilience planning, and implementation of the Grant activities. Leadership partners include the County of Tuolumne, USFS, Sierra Business Council, Local Government Commission, Yosemite-Stanislaus Solutions Partnership, the Amador Tuolumne County Action Agency, Local Fire Councils, and PolicyLink.

Four Work Groups of the Oversight Steering Committee Structure will ensure inclusive engagement and decision-making processes for the proposed grant activities. Each of the workgroups will be co-chaired by public and private/nonprofit partners, and include state, regional and local partners. The four work groups are as follows:

- **Outreach and Engagement Work Group:** Responsible for the development and implementation of an engagement and partnership formation strategy. The work group will convene monthly to discuss grant progress and development. The group will ensure that community representatives, including those from under-represented communities, make decisions in the work group, and regularly participate.
- **Social Equity, Workforce Development, and Economic Opportunity Work Group:** Responsible for the commitment to equity through inclusion of tribal, underserved, and under-represented communities and the development of equitable approaches in grant activities. The work group will focus on building or maintaining resilient social infrastructure and systems integration to ensure that resilience improvements address

Exhibit C: Capacity

economic and social disparities. PolicyLink, a national equity advisory and advocate organization, will be providing technical assistance and support to the state and work group.

- **Natural Systems and Resources Work Group:** Responsible for advising on the investment approach for resilient forest and watershed stewardship that contributes to climate goals, sustainable economic models, and new energy and climate benefits-focused employment opportunities. The work group will determine best approaches and priorities, and determine cost benefit of approaches using principles from *Safeguarding California*.
- **Built Environment and Infrastructure:** Responsible for advising on innovative, sustainable, green infrastructure design approaches combined with appropriate investment structures to address unmet needs in most sustainable and cost-effective manner, maximizing co-benefits. Possible approaches include biofuel processing, timber and wood products, and watershed and water management approaches that address drought.

The state led the preparation of this application in coordination with the USFS and Tuolumne County. Several partners provided review and comment.

Cross-Disciplinary Technical Capacity

Key partners in this effort include Tuolumne County, the USFS, and a range of regional and local organizations. The state will be working with partners across the Sierra Nevada region to leverage efforts and investments in other sectors and regions and to expand and transfer this approach to resilience to other forest-dependent communities. Each of our partners has significant capacity to work across disciplines and organizations. The state's capacity and expertise is outlined below. Our partners provide expertise in the following areas:

Exhibit C: Capacity

- **The U.S. Forest Service:** The USFS regularly engages with citizens, business, and state and county agency on forest management issues. They have held multiple stakeholder workshops and public meetings, hosted dozens of field visits, and worked consistently with the local collaborative group, Yosemite Stanislaus Solutions. USFS efforts are focused on meeting the interests of local government, local and regional industry, local and regional utilities, environmental groups, permittees, and adjacent landowners.
- **Tuolumne County:** The County regularly engages businesses and citizens in planning efforts, including Hazard Mitigation Plan and General Plan development. The County has also led extensive engagement following the Rim Fire, discussed below.
- **Community and Regional Organizations:** Several local and regional organizations regularly engage businesses, public sector, and citizens. We are working with a range of these organizations to engage as many communities as possible.

Cross-Disciplinary Experience, Comprehensive Planning, and Major Program Development

California has significant experience working across disciplines and scales to complete projects and brings this experience to its leadership role. The groups described below demonstrate the state's success with cross-disciplinary teams at the federal, state and local level.

[Climate Action Team](#) (CAT): State-level group established through the state's precedential Global Warming Solutions Act of 2006 (AB 32) to coordinate state-wide climate change mitigation, adaptation and research efforts. The structure includes subgroups focused on specific areas, including the [Forest Climate Action Team](#) (FCAT), which focuses on forest health and carbon sequestration to generate other natural resource and climate benefits

Exhibit C: Capacity

and the [Water-Energy Action Team](#), which focuses on the water-energy nexus and working to protect and enhance upper watershed management.

- Safeguarding California Implementation Partners: Cross-agency workgroup focused on developing and implementing the state's climate adaptation strategy.
- Renewable Energy Policy Group and Action Team: a federal and state agency working group to develop large-scale plans coupling natural resource conservation with renewable energy and infrastructure development in California.

These cross-agency and jurisdiction groups have produced several major action plans that guide state programs and long-term planning and implementation. These plans have been quickly translated into major investment and programs. These include:

- [Cap and Trade Investment Plan](#): Outlines investment areas for proceeds from California's emission allowance auctions, in accordance with guiding state laws and policies. This document frames eight targeted programs under the Greenhouse Gas Reduction Fund.
- [Water Action Plan](#): Roadmap for developing a sustainable water system in California, designed to guide investment and policy. The state's recently passed Water Bond draws from the Plan.
- [The Desert Renewable Energy Conservation Plan](#) (DRECP) <http://www.drecp.org/>: Twenty-two million acre plan for renewable energy development and land conservation in California's southern, deserted areas. Development of the DRECP engaged local, regional, state and federal agencies and thousands of members of industry, academia, non-profit groups, and the interested public.

Understanding Climate Risk

Exhibit C: Capacity

Climate change poses significant risks to California communities. California funded the development of three [comprehensive assessments of climate change risks](#) to the state and developed [indicators to track climate changes](#) underway. The state also committed significant resources to translating this information into tools and guidance to inform state, regional, and local planning. These tools include the state's comprehensive climate adaptation strategy, [Safeguarding California](#), [Cal-Adapt](#), and the companion [Adaptation Planning Guide](#), which provide step by step guidance to assist local governments in developing climate adaptation strategies. Each of the state agencies engaged in this proposal have worked closely in the development of the state's climate change research activities and climate change assessments.

The state has also worked closely in the development of two programs focused on local and regional response to climate change:

- [CivicSpark](#) : AmeriCorps program developing as a Governor's Initiative that provides assistance to local governments to develop climate mitigation and adaptation plans.
- [Alliance for Regional Collaboratives for Climate Adaptation](#): Collaborative of five regional organizations focused on climate adaptation in the four large metropolitan areas and the Sierra Nevada region. The state is an ex-officio member of the Alliance.

Civil Rights, Fair Housing, and Vulnerable Populations

California has developed tools to better understand what climate change and natural hazard risks mean to communities. These include [MyPlan](#) (maps local hazards) and [Cal-Adapt](#) (downscaled information on climate risks). These tools, and accompanying guidance, are an example of the state's capacity to implement and evaluate the work under this proposal.

[CalEnviroScreen](#) is a complementary tool that identifies disadvantaged communities through an

Exhibit C: Capacity

analysis of socioeconomic and environmental risk factors. CalEnviroscreen has been used across state agencies to direct the investment of revenues from the Greenhouse Gas Reduction Fund, the fund housing fees collected through the state's cap and trade program. State law requires that at least 10 percent of these funds be spent in disadvantaged communities and that at least 25 percent of the funds be spent in a manner that benefit disadvantaged communities.

California has placed a priority in ensuring that state policies and investments benefit the state's most disadvantaged and/or vulnerable residents. HCD is developing its Statewide Housing Plan, which will be informed by the California Regional Opportunity Index tool created by University of Davis Center for Regional Change, CalEnviroscreen, and HUD's continued guidance on fair housing equity assessments. HCD's policy, regulatory, and program administrative functions focus on furthering fair housing in accordance with federal and state fair housing law and Title VI. The [*Analysis of Impediments to Fair Housing*](#), updated by HCD in 2012, sets forth actions addressing 10 impediments to fair housing choice within these functions. Provisions in the State housing element law (Government Code Section 65580-65589.8), which involves certification of regional and local plans, including the Regional Housing Need Allocation (RHNA), address fair housing, housing need distribution by income, overconcentration of lower income households, and jobs and housing relationships. HCD has, for example, assessed access and need of minority and lower income households to the federal CDBG and HOME programs it administers predominantly in rural areas in its periodic updating of the Consolidated Plan and respective program guidelines. HCD has also developed a universal design ordinance available for adoption by local governments to accommodate the needs of its aging population, especially prevalent in rural counties of California.

Exhibit C: Capacity

Design Guidance and Ensuring Good Design

California's approach to resilience is based on the guiding principles outlined in the [Safeguarding California](#) plan. These principles were identified to ensure that the state's activities align with the state's long-term goals address climate risk in the context of the state's long-term goals. These principles will also serve as the underlying design guidance for the approach and framework for this proposal. These principles are to:

- Use the best-available science;
- Design programs that can incorporate and adjust to new information on current conditions and future projections (i.e., adaptive management);
- Involve all relevant stakeholders and establish and maintain strong partnerships across all levels of government, tribes, businesses, landowners, and non-governmental organizations;
- Prioritize solutions with multiple benefits and ensure that strategies to reduce climate risk are coordinated, to the extent possible, with the state's efforts to reduce GHG emissions and other local, national and international efforts.

Partnership Durability and Redundancy

The intent of the Program is durability and the provision of multiple benefits value by all of the partners. Therefore, we do not anticipate a partner withdrawing from this effort; because we assembled a diverse set of partners who possess expertise and experience, we are confident that we would be able to fill in any vacancies that may arise should a partner leave the group.

Cost Effectiveness and Reasonableness

California state agencies have a deep pool of experience conducting cost assessments in different programs and contexts. Our partners bring broad expertise on the economics of natural and built systems. CALFIRE routinely considers costs and benefits of competing forestry and

Exhibit C: Capacity

fire protection projects. Factors evaluated include: strategic spatial placement in a landscape context, values at risk, ecological benefit, job creation and economic benefits to our local communities. Methods range from formal cost/benefit analyses to less-structured empirical analyses. The Forest Service has many years of research, practical experience and trained personnel who are experienced in prioritizing forest management actions and implementing these kinds of resource projects. USFS has industry partners, the capacity to establish and execute contracts, and partner agreements in place that enable implementation of projects and achievement of multiple objectives. HCD brings expertise to review and underwrite capital investments including best investment approaches and appropriate funding levels to mitigate risk or attract capital.

Research throughout the Sierra Nevada indicates that investment in fuel treatments and thinning can reduce the size and intensity of wildfires. The economic benefits of investments in fuel treatments can outweigh costs by up to three times.²² These benefits include reduced structure loss, lower costs for fire suppression and post-fire restoration, and revenue from merchantable timber and potential revenue from carbon sequestration offsets. Fuel treatments have the potential to enhance carbon sequestration by increasing forest health to reduce the risk of large destructive fires and by redistributing carbon on larger trees that are more resilient to wildfire. The benefits of these forest health actions accrue to landowners, industry, and taxpayers.²³

Community Engagement Capacity

²² [The Mokelumne Watershed Avoided Cost Analysis: Why Sierra Fuel Treatments Make Economic Sense](#)

²³ *ibid*

Exhibit C: Capacity

In California, stakeholder engagement is critical to decision-making at the local, regional and state level. All members of the Leadership Team have staffed, led, attended and/or managed formal and informal public engagement meetings and workshops.

Community Engagement in Rim Fire Recovery and NDRC Application Development

California and our partners have great capacity to work with stakeholders to identify specific recovery and resilience needs and include feedback in our application. Tuolumne County leaders regularly engage with their constituents. During the fire, members of community, businesses, and community organizations reached out to county, state and federal personnel. Since the fire, county staff has worked to respond to unmet needs identified by community members. The county has regularly considered post-fire recovery needs, including a focused study session on the impact of the fire on access to insurance in the county. Throughout the Program, the Leadership Team has and will continue to engage regional groups to hear their ideas and concerns and incorporate changes to the approach based on their feedback (See Attachment D for a full list of groups engaged).

Because of the extensive engagement work of the County following the Rim Fire, community engagement in the NDRC competition began easily and continues unimpeded. NDRC-focused meetings held (see Appendix I Consultation Summary) include:

- NDRC public meeting in Sonora on January 15
- NDRC public hearing in Sonora on March 2 to review the proposed application
- Statewide NDRC webinar on March 3

Meetings where the NDRC opportunity was included as a discussion item:

Exhibit C: Capacity

- Sierra Nevada Forests and Communities Initiative Coordinating Council meeting on January 28. The Council, sponsored by the Sierra Nevada Conservancy, includes representatives of all perspectives in the Sierra Nevada region.
- Water and Energy Climate Action Team (WETCAT) meeting in Sacramento on February 9. WETCAT members, including members of the public and representatives of two water districts heard a presentation on the NDRC competition and supplied feedback on approach and references or ideas for other relevant partners and watershed and forestry projects.
 - [California Biodiversity Council \(http://ucanr.edu/sites/CBC/\)](http://ucanr.edu/sites/CBC/) Interagency Alignment Group meeting on February 19. Group includes 40 California-based natural resources agencies at every level of government.
- FCAT public meetings in Sacramento (February 20), Anderson (March 2) and Arcadia (March 11), with webcasts to Bishop, Eureka, Fresno, Richmond and Sonora.

The NDRC leadership team published drafts of each phase of the NDRC application on the project [webpage](#) and noticed the publication in at least three newspapers. Notice was also sent attendees of each of our meetings, and to all of the relevant forest, watershed and industry groups affected by the Rim Fire. The state, in partnership with Tuolumne County, held a public hearing on March 2nd in Sonora, California. Both publication dates and public meeting dates accommodated at least two weeks of public comment before final submission of applications, building in time for inclusion of public comments. The State also hosted a webinar on March 3, to allow more statewide participation in the development of the application.

The approach for future phases of the application will be similar to Phase 1. The team intends to not only engage existing stakeholders, but continually reach out to additional groups to ensure that all affected parties, whether in Tuolumne County or outside its borders, learn of

Exhibit C: Capacity

the competition, engage in the process, and communicate with the leadership team to allow their voices to be heard. We will hold regular monthly meetings in Tuolumne County, dedicated to the State and County's NDRC application. We will also seek opportunities to be on the agenda of other standing meetings, including the Board of Supervisors, Fire Safe Councils, and other community organizations.

Harmonizing Diverse Views

All of our Partners and our Leadership Team have experience both working with and harmonizing the contributions of diverse stakeholders in the consultation process. Rarely does a policy-decision meet all the needs of every stakeholder, yet our Partners reach so many communities and interested constituents that we believe our approach holds benefits for all.

Regional Capacity

Wildfires are ubiquitous in California, not just in Tuolumne County. The Sierra Nevada and other mountain regions in the West have a long history of wildfire, though in recent years the fires have become more severe. Because the Program is durable, we are working closely to engage the broader Sierra Nevada region, with an eye to replicating the Program in more communities. In addition to working with areas that have suffered from fire, we will be working with communities to take a proactive approach to building community resilience and forest health. One of our partners, the Sierra Business Council, a regional organization whose mission is to support the economy and sustainability of the region, has long served as a convener in the region. The Sierra Business Council is also home to the Sierra Nevada region's

Exhibit C: Capacity

new collaborative for climate adaptation and mitigation, Sierra Climate and Mitigation Partnership (Sierra CAMP), another partner in our efforts.

Fires in the Sierra Nevada affect not just the immediate region, but the entire state. The Sierra Nevada is the origin of over 60 percent of the state's water supply.²⁴ And, the region serves as a favorite getaway for many of the state's residents. As we look to develop broader engagement throughout the state, we will work with the Alliance of Regional Collaboratives for Climate Adaptation (ARCCA), of which Sierra CAMP is a member and the state is an ex-officio member, to broaden our outreach. We will also work with the [Pacific Coast Collaborative](#) (PCC) to extend our reach to other states and to Canada. The PCC is a collaboration between California, Oregon, Washington, and British Columbia, with a focus on climate change mitigation and resilience.

²⁴ [The State of the Sierra Nevada's Forests](#)

Exhibit D: Need/Extent of the Problem

The target area for California's NDRC application includes the area of the 2013 Rim Fire along with evacuation areas (see [Rim Fire Burn, Evacuation Areas and Census Tracts- MID-URN Area](#) and [Tuolumne County Burn History - Rim Fire Overlay](#)). The proposed Community Resilience and Forest Stewardship Program will also be applicable to other resource dependent communities in California and the western states.

Unmet Need

As described in Exhibit B, the Rim Fire led to significant damage to public infrastructure – both in destruction of built structure, but also in environmental damage. This included direct burn damage to landscapes, slope retaining walls and drainage infrastructure which have resulted in erosion and landslides that have further damaged infrastructure, including roads, and culverts due to sedimentation that threaten structural integrity of roads, road access, and water quality; cattle grazing infrastructure including fences and troughs; and some historic landmarks. The effects of the fire can be felt far downstream, impacting water facilities that supply the San Francisco Bay Area and the Great Central Valley.

The environmental damages from the Rim Fire are estimated range between \$100 million and \$736 million in the first year after the fire. These damages are estimated based on an assessment of the over 250,000 acres that burned, across eight land cover types, and based on ten environmental benefits: air quality; carbon sequestration; moderation of extreme events; soil retention; biological control; water regulation; pollination; habitat and biodiversity; property and aesthetic values; recreational values.²⁵

²⁵ [Earth Economics Report](#)

Exhibit D: Need/Extent of the Problem

Addressing these unmet needs requires not only investment in the infrastructure itself, but also in the surrounding environment to provide protection. These activities include reforestation of the burned areas and establishment of firebreaks to protect reforested areas, and critical infrastructure. Investments are needed to support sustainable forest practices that ensure the establishment of healthy forests and support timber and wood products industries. Erosion control measures are needed to prevent infrastructure damage and environmental degradation and sedimentation in downstream water bodies. Additional monitoring is needed to gauge future risk and evaluate the effectiveness of forest management practices.

The fire highlighted the need for improved infrastructure. Communications infrastructure in Tuolumne County and other rural areas of the state is inadequate. During the fire, firefighters and residents regularly had to drive several miles or form cell phone brigades to access cellular or broadband services and communicate with other fire crews, command centers and personnel delivering supplies. This travel increased personal safety risks and delayed fire response time. An extensive, modern and secure communications network would increase resident response times, allow firefighters and other personnel to rapidly address critical concerns, and increase data flow regarding extent and location of the fire. At least 50 percent of the county's population resides in un-met or underserved communications infrastructure areas²⁶. The Central Sierra Regional Broadband Consortium further detailed the need by identifying Pine Mountain Lake, Cold Springs, Pinecrest and Strawberry as areas of immediate need ([Resolution T-17443](#)).

Water infrastructure also proved to be vulnerable and, in some cases, inadequate. A 15.7 mile long wooden flume, the Main Tuolumne Canal, which not unique in rural areas, brings

²⁶ [Tuolumne County Priority Areas - Communication Service](#)

Exhibit D: Need/Extent of the Problem

water from the Lyons Reservoir to the local communities.²⁷ Above ground and constructed of wood, the flume carries water through a steep canyon, which is at high risk of fire.²⁸ In some developments, fire hydrants and fire suppression infrastructure was also unable to support fire-fighting activities.

Impacted and Distressed Characteristics

Economic and environmental factors already affecting the region accentuated the damage from the Rim Fire. Tuolumne County is an economically fragile area. Unemployment in the Target Area is currently 15.4 percent, which is 158.4 percent of the national average. The fragility is further enhanced by the nature of the region's workforce. The region's economy is highly tied to the forest – through tourism, recreation, timber, and wood products. In 2009, over 20 percent of the workforce was employed in recreation, retail, or accommodation and food services.²⁹ Furthermore, the workforce is highly seasonal. The trend in the size of the workforce, averaged for the 2000 to 2011 time period, shows that the size of the labor force peaks between July and October.³⁰ The Rim fire began right before Labor Day weekend, forcing the closure of hotels, portions of Yosemite National Park, Stanislaus National Forest, and other attractions at a peak time for tourism and recreation. Local residents suffered not only from these economic impacts, but also from extensive evacuations, exposure to smoke, and disruptions to work, school, and other activities. These impacts were especially challenging for the elderly, the young, and residents reliant on employment in resource-dependent sectors.

²⁷ Link to TUD map here

²⁸ Link to TUD photo here

²⁹ [Tuolumne County Profile 2012: Community Indicators Project](#)

³⁰ *ibid*

Exhibit D: Need/Extent of the Problem

In addition to the region's fragile economy, the impact of the fire was amplified by current drought conditions³¹ and the past history of severe wildfire throughout the region.³² Wildfire is a natural phenomenon, and it is an integral part of the natural succession of forested ecosystems like the Sierra Nevada.³³ In the past, most fires were low- to moderate-severity over at least the last several centuries. These frequent, low-intensity fires maintained relatively open, patchy stands composed primarily of large, fire-resistant trees across much of the landscape. Past timber-harvesting practices and livestock grazing, coupled with over a century of fire suppression, have shifted forest structure and composition within the ponderosa pine, Jeffrey pine, and mixed-conifer types of the Sierra Nevada.³⁴ This shift is generally characterized by increased tree densities, smaller average tree diameters, increased proportions of shade-tolerant tree species, and elevated surface fuel loads relative to historic conditions, and reduction in heterogeneity across landscapes.³⁵ Alongside these changes, the proportion of high-severity fire has increased in mixed-conifer forests in the Sierra Nevada from 1984-2010.³⁶ Fire sizes and annual area burned have also risen during the same period. These trends are linked to stand- and landscape-scale changes in forest structure and a warming climate.

³¹ [August 13, 2013 Drought Map](#)

³² [Tuolumne County Fire History Map](#)

³³ Collins, B. and C. Skinner. 2013. Chapter 4.1 Fire and Fuels. In: Science synthesis to promote resilience of social-ecological systems in the Sierra Nevada and southern Cascades. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 504 p.

McKelvey, K.S., et al. 1996. An overview of fire in the Sierra Nevada. Chapter 37. Vol. III. Pages 1033-1041. Sierra Nevada Ecosystem Project. Center for Wildland and Water Resources, University of California, Davis.

³⁴ *ibid*

³⁵ Collins, B.M.; Everett, R.G.; Stephens, S.L. 2011b. Impacts of fire exclusion and managed fire on forest structure in an old growth Sierra Nevada mixed-conifer forest. *Ecosphere*. 2(4): 51.

van Wageningen, J.W.; Fites-Kaufman, J.A. 2006. Sierra Nevada bioregion. In Sugihara, N.G. et al. (eds.), In: Fire in California's ecosystems. Berkeley, California, USA: University of California Press: 264-294.

Perry, D.A et al. 2011. The ecology of mixed severity fire regimes in Washington, Oregon, and Northern California. *Forest Ecology and Management*. 262(5): 703-717.

³⁶ Miller, J.D.; Safford, H.D.; Crimmins, M.; Thode, A.E. 2009. Quantitative evidence for increasing forest fire severity in the Sierra Nevada and southern Cascade Mountains, California and Nevada, USA. *Ecosystems*. 12(1): 16-32.

Miller, J.D.; Safford, H.D. 2012. Trends in wildfire severity 1984-2010 in the Sierra Nevada, Modoc Plateau and southern Cascades, California, USA. *Fire Ecology*. 8(3): 41-57.

Exhibit D: Need/Extent of the Problem

Threats, Hazards, and Vulnerabilities

This application focuses on a number of threats, hazard, or vulnerabilities, ecological factors include wildfire, air quality, drought, water quality and quantity, soil, wildlife, and carbon storage and climate change. These factors are all linked, and changes in one of the factors can dramatically affect the others. It also focuses on a range of socioeconomic vulnerabilities, including unemployment, public health, access, and disadvantaged populations. These threats, hazards and vulnerabilities were identified through communication with community leaders, stakeholders, the general public, public agencies and researchers. Other information sources include peer reviewed research and other publications.

Affected Entities, Individuals, and Vulnerable Populations

Wildfires already pose a significant management challenge to local, state and federal authorities in California, which together spend over \$2 billion per year on fire suppression.³⁷ For the federal agencies in particular, in severe fire years, funds earmarked for stewardship and resilience are often used to backfill fire-fighting budgets when these run low. As demonstrated in Exhibit B, the U.S. Forest Service budget has been increasingly used for fire suppression in the place of other activities.

For local residents, the fire affects the local economy, personal finances, public health, and their well-being. Smoke from wildfires is an acute problem for children, the elderly and people with disabilities. The public health impacts can be severe, over a period of several months. Our approach includes strategies for streamlining prescribed burning regulations and air quality

³⁷ California Department of Forestry and Fire Protection. [Fire and Resource Assessment Program](#). 2015.

Exhibit D: Need/Extent of the Problem

standards, recognizing that a modest controlled release of smoke from a controlled burn is preferable to a massive uncontrolled release in a wildfire. Air quality and smoke management is currently subject to conflicting regulations by several agencies. Streamlining regulations can benefit these vulnerable groups throughout the state.

It became more difficult to obtain and maintain homeowner fire insurance following the Rim Fire, notably those who live at the wildland-urban interface. Access to insurance will continue to be a problem for some homeowners, and it will affect recovery from the Rim Fire and resilience against similar incidents in the future. Development policies could make a substantial difference in the economic impact of wildfire by reducing the capital losses associated with catastrophic wildfires. By reducing the need to actively protect structures during a wildfire, these measures could also free up suppression resources that could be better employed protecting resources with cultural and natural conservation values, or restoring forests to a natural fire cycle through the use of prescribed fire, tree removal, and mechanical fuel reduction. The proposed project can help mitigate this risk by assisting low- and moderate-income homeowners and small businesses create and maintain fire clearance through vegetation removal with 100-foot buffers around structures.

Rural and downstream/downwind urban communities are faced with risks from drought and wildfire. The impacts of large wildfires on the hydrology and water quality of a basin are significant and important to water managers. More than 60 percent of California's water originates in the Sierra Nevada. When forested areas are exposed to wildfires, the negative impacts on water quality can reach all the way to low elevation reservoirs in the Sierra Nevada foothills and they can be long-lasting. For example, the impacts from the Rim Fire are expected to include extensive soil erosion and sedimentation to Don Pedro Reservoir. The negative

Exhibit D: Need/Extent of the Problem

impacts on water quality will likely continue for at least a decade, and they could persist longer depending on soil type and other factors. Loss of reservoir capacity is generally permanent.

Data and Information

Data and information used for this proposal, and throughout this project, will be collected from peer-reviewed research and professional studies as often as possible. The Rim Fire Environmental Impact Statement provides a wealth of data including ongoing monitoring projects associated with the 2013 Rim Fire.³⁸ Ongoing studies by Yosemite National Park are investigating water quality effects of the fire through long term monitoring stations.³⁹

³⁸ USDA Forest Service. 2014. Rim Fire Recovery (43033) Draft Environmental Impact Statement. Stanislaus National Forest, 19777 Greenley Road Sonora, CA 95370.546 p.

³⁹ Gillies, J. 2014. Yosemite watersheds burned by Rim Fire studied for water quality impacts. Environmental Monitor. <http://www.fondriest.com/news/yosemite-watersheds-burned-rim-fire-studied-water-quality-impacts.htm>. Accessed on February 3, 2015.

Exhibit E: Soundness of Approach

The Community Resilience and Forest Stewardship Program aims to transition rural areas to sustainable forest economies. Our model program is built around several broad objectives, including: reducing the risk of large, severe wildfires; safeguarding water storage and yields which is an increasingly urgent priority in drought-stricken Western states; diversifying and supporting local economies; and increasing the storage of carbon to mitigating climate change. Our objective is to apply this model in the Rim Fire recovery program, through the development of innovative partnerships that link together forest stewardship (e.g., reforestation, thinning, strategic firebreaks) with productive uses for forest products, including timber, wood products, and bioenergy, alongside investments in community protection, economic development, and education. The partnerships will include job training, creation of permanent, stable employment for the area, and coordination across public and private entities. Due to the tight connections and interdependence between the local community and the forest, community and forest ecosystem resilience go hand in hand and can reinforce each other. Through our regional engagement, the goal is to develop a replicable and durable model program that can be applied throughout the state's rural, forest communities and shared with other Western states.

As outlined in Exhibits B, C, and D, the Rim Fire is one event in a long history of wildfire in the Sierra Nevada. Wildfire risk has increased as a result of years of management decisions, development patterns, drought, and other factors. The evidence suggests that climate change will result in more frequent and severe wildfires under a range of plausible future climate situations (Westerling and other 2014). Boosting economic and ecological resilience in the fire area and surrounding communities requires reversing this management trend and developing opportunities to increase the strength and resilience of the local communities and economies

Exhibit E: Soundness of Approach

Consultation

California experienced three natural disasters that made it eligible for the National Disaster Resilience Competition. We consulted with stakeholder groups in the context of all three disasters and chose to focus in on the 2013 Rim Fire in Tuolumne County.

The Rim Fire is an entry point through which we can examine dimensions of resilience that are of concern statewide. Addressing recovery in the context of the Rim Fire directly addresses wildfire risk to forests and communities, but also integrates issues of drought, water quality, landslides and flooding. Therefore, in developing this Phase 1 proposal, we have consulted with a broad group of stakeholders in Tuolumne County, the surrounding region, and the rest of the state. We will continue to engage a broad group of stakeholders in executing the work.

Outreach, Stakeholders, and Collaboration

As described in Exhibit C and outlined in Appendix I, we have had broad-ranging consultation in developing our approach. These conversations have included stakeholders from many parts of the community and broader region, including local government, education, environmental organizations, fire prevention and safety groups, economic development organizations, community organizations, the agriculture, forestry, and wood products industries, and concerned citizens. We have also engaged with consultants, private business, and the academic community.

Cumulative Risk and Vulnerable Populations

We have identified and reached out to a number of vulnerable populations within our target area. As a rural community with an economy that is closely connected to the forest and

Exhibit E: Soundness of Approach

surrounding landscape, the communities and local economies in Tuolumne County are highly vulnerable to wildfire and other natural disasters. Community members who are employed in tourism and recreation-related jobs and the timber and wood products industry are highly vulnerable. We have engaged with representatives of the timber, wood products, and recreation and tourism industries, ranchers and non-industrial private forest landowners to identify ways to build more resilience in these businesses. We plan to continue with this engagement as this project moves forward.

Specific segments of the population are also particularly vulnerable to the occurrence of wildfire. These include the elderly, the young, and the infirm, who are especially vulnerable to poor air quality and wood smoke exposure. In the case of school-age children, the fire also resulted in school cancellations, which, for some children, limited access to meals and other services. We have engaged with the County Office of Schools to work with this population. We have and will continue to consult with PolicyLink, a national equity advisory and advocacy organization, to help build more extensive networks and collaboration with underserved populations and to develop equity opportunities in Phase 2 of this work.

Results of Collaboration and Engagement

The residents and businesses in Tuolumne County and in other forest communities we have engaged with have an intimate understanding of the interdependence between the forest, the watershed, the local economy, and the broader state. Our conversations with stakeholders and partners have been a tremendous asset to the development of this proposal. In particular, these engagements have provided the following:

- A better understanding of the range of economic and infrastructure damage of the Rim Fire,

Exhibit E: Soundness of Approach

- Infrastructure deficits, including inadequate water and transportation systems that place communities at risk,
- Ideas for new projects, partnerships, and collaborations that will sustainably support the local economy, forest and watershed health, and ecosystem resilience, and
- An understanding of collaborative efforts and work already underway in Tuolumne County and the surrounding region, which creates a strong foundation for the work being developed through this proposal.

Concept for Resilience

The Rim Fire demonstrates the vulnerability of the state's watersheds, resource-based rural economies, and the fragile relationship between the state's people, economy, and its natural resources. To boost the resilience of the region, we are looking to achieve multiple objectives through this effort, including: reducing the risk of catastrophic wildfire; diversifying and strengthening the rural economy; reducing risks to personal and commercial property; reducing public health risks; and increasing water yields and storage in watersheds. This region is also representative of large portions of the western States, so this program will have wide applicability throughout the West.

Project Ideas for Addressing Unmet Needs

This proposal focuses on a multi-pronged program for ecological and economic revitalization, in which the concept of socioecological resilience is central. We defined two elements that are essential for socioecological resilience: promoting social and economic well-being and adaptation, and promoting more natural ecological disturbance regimes. Our program

Exhibit E: Soundness of Approach

also addresses two key ideas in the 2012 Forest Planning Rule (USDA Forest Service 2012), namely pursuing "opportunities for landscape scale restoration," and emphasizing "wildland fire and opportunities to restore fire-adapted ecosystems." Working forests are increasingly recognized as a beneficial approach to achieving economic prosperity in rural, resource-dependent communities, increasing resilience in the face of future fires and providing forest carbon storage to help mitigate climate change. Timber harvesting, thinning and fuel reduction projects can increase the wood products that store carbon, directly reduce the impacts of future wildfires, and also distribute forest carbon stocks on fewer, larger trees that are more resistant to fire, thereby increasing forest carbon storage and mitigate climate change. We exploring the following elements as part of our approach:

- Reforestation in the burn area: The US Forest Service is clearing burned timber and reforesting parts of the burn area. Due to budget and staff limitations, the US Forest Service was unable to access and remove a significant portion of the timber that could have been used for wood products. We aim to leverage private businesses and facilitate more prompt and complete reforestation and salvage of burned trees.
- Thinning for health and fuel reduction, and strategic firebreaks: Additional investments are needed to transition restoration of the burn area alone into activities that will boost resilience in the broader forested area and reduce the risk of future wildfire to the recovery area.
- Strategic firebreaks: will provide protection to communities, businesses, and increase future fire resistance of forests that are vital for the local timber and wood products industry.
- Development of partnerships to manage and utilize biomass for timber: Manage forest biomass removed to reduce fire risk, develop strategic firebreaks, and enhance watershed

Exhibit E: Soundness of Approach

health. Develop economic models for using this biomass bioenergy development and support of the wood products industry.

- Job training: Work with the forest industry and the California Conservation Corps to develop job training programs in order to develop a deep pool of skilled workers to support forest management activities, including marking trees, thinning, timber harvest, permitting, and biomass utilization. Such a work force will be needed to achieve successful reforestation, tree salvage and erosion control efforts after future wildfires.
- Investment in infrastructure to protect communities from wildfire: Ensure that water systems and transportation networks are resilient in the face of wildfire and are adequate to support evacuation, access, and fire-fighting activities during a fire.
- Regional coordination and partnerships: Coordinate with other Sierra Nevada communities (and beyond) to share practices and models for managing forest biomass.
- Education: Work with schools and other agencies to inform the public about steps needed to reduce wildfire risk (e.g., defensible space), the natural role of wildfire, and the role of the watershed in protecting the state's water supply and quality.

Resilience Work Underway

Tuolumne County has a number of organizations in place that are working to boost the resilience of the region to wildfires and the resulting infrastructure and economic damage. This includes two FireSafe Councils, which work with homeowners and businesses to develop resilience strategies. The [Southwest Interface Team](#) (SWIFT) is a bi-county collaboration that has worked to develop and maintain a set of strategic firebreaks to protect communities, timber stands, and other vital assets in the region. These efforts provide strong starting points for this

Exhibit E: Soundness of Approach

work and need to be complimented by investments in additional forest management activities and infrastructure investment to build the region's resilience.

The US Forest Service also has several programs underway to reforest the Rim Fire burn area. Burned material has been removed, to the extent feasible – though more is needed. In these cleared areas, work is underway to prepare and replant.

The actions undertaken with this grant will augment existing activities.

Feasibility and Long-Term Resilience

The Program is designed to build a sustainable, long-term model for maintaining forest and watershed health and community resilience. The goal is to move from a reactive model to one that is proactive and takes an integrated approach to resilience. The program requires both an initial up-front investment to jump start forest health efforts and to address the decade of fuel build-up in the forests. After that initial investment, the goal is to have in place a model for forest health that is economic and self-sustaining. Natural systems are dynamic, therefore our program will require long-term monitoring and adaptive management.

Co-Benefits and Integrated Thinking

The Community Resilience and Forest Stewardship Program is designed around the relationship between forests and communities. The Program is intended to achieve multiple benefits.

Exhibit F: Leverage and Outcomes

Fires do not respect administrative boundaries of counties or land ownership regimes. Therefore, activities in the affected area will provide significant benefits to neighboring areas. Replicating and spreading these activities in neighboring counties, forests, and communities will increase the overall resilience of the region. In particular, by proactively applying this approach in areas that have not burned, we can reduce the severe ecological and economic impacts of a severe wildfire. This is a critical element of the Community Resilience and Forest Stewardship Program, which will increase resilience on a local and regional scale and also support attainment of broader statewide goals.

Outcomes

Timing and Approach

As described in Exhibit E, The Community Resilience and Forest Stewardship Program is designed to be a long-term strategy for developing a sustainable forest economy. A significant up-front investment is needed to launch it, but then the goal is to develop a program that can be economically and institutionally sustainable over the long term.

Green Infrastructure Solutions

Healthy and sustainable forests and watershed are, in and of themselves, critical nature-based infrastructure for the State of California. These forests are home to the headwaters of the state's water system, providing water storage as snowpack, natural filtration of water, and recharge of groundwater resources. The forests also store carbon and are a critical to the state's long-term goals to reduce greenhouse gas emissions and stem the tide of climate change. On a

Exhibit F: Leverage and Outcomes

local scale, a well-maintained and healthy forest can provide fire protection for communities, landowners, and local businesses.

Financial Sustainability and Vulnerable Populations

One of the driving forces for this work is that under current conditions, there are insufficient funding and investment mechanisms for forest maintenance, but also that current structural issues (e.g., transportation costs, facility locations) hinder economical solutions to forest and biomass management. The Community Resilience and Forest Stewardship Program is designed to engage stakeholders, including public and private landowners, the timber and wood products industry, the bioenergy industry, workforce and educational organizations, and the community to design an economically viable, sustainable model for forest resilience. This will include stewardship partnerships, job training, and development of appropriately scaled and sited facilities to manage forest biomass. The Program is designed to couple forest and community resilience and create employment opportunities for local residents. This will include unemployed, underemployed, and Section 3 residents to the fullest extent possible.

Defining Success and Program Evaluation

Broadly speaking, success in the context of this effort will be development of a sustainable model for forest stewardship that also supports a more resilient and robust local economy. We will track progress in specific areas using a suite of metrics and indicators that the state has been developing in several sectors. This will include selections from the indicators for forest and rangeland health, being developed through the State's Forest and Rangeland Assessment

Exhibit F: Leverage and Outcomes

Program. The indicators cover many aspects of forest and rangeland health, economy, equity, and public health.

Leverage

Partners and Resources

As mentioned in the Exhibit C, California and Tuolumne County have developed a broad set of partners for this effort. These partnerships will be very important as we look to develop an ongoing program to support local residents, forest health, and related industries.

Co-Benefits and Financing

During and after the Rim Fire, local homeowners and businesses struggled to obtain insurance. The Tuolumne County Board of Supervisors led a study session devoted to understanding the impacts of insurance issues on local residents and businesses. The Supervisors also engaged with local real estate and insurance agents. The Leadership Team has initiated conversations with the California Insurance Commissioners office. Throughout this effort, we will continue to work with these organizations to better understand and resolve insurance issues in the area.

Building resilience in the forest ecosystem through stewardship and management activities will benefit numerous stakeholders in the area. This is especially true for the local timber and wood products industry, whose livelihood depends on a healthy forest ecosystem. These companies are highly engaged in this effort and are eager to join our partnerships. This could result in direct funding, but also in providing expertise and manpower.

Exhibit F: Leverage and Outcomes

The state and USFS have been exploring a number of ideas for developing financing mechanisms for natural resource protection, including Environmental Impact Bonds, where an initial investment in forest stewardship will result in cost-savings in reduced fire-fighting costs. These savings can then be passed on to investors. We also anticipate that this investment in the Rim Fire recovery area will enable other available funds to be invested in other regions to replicate our approach and program. These funds include the USFS's Rim Fire recovery funds and CALFIRE's grant program funds made available through the Greenhouse Gas Reduction Fund (GGRF) and other sources. Ideally, we will be able to invest proactively in forested communities to prevent future wildfire, which will mean that these investments go further.

The USFS also indicated its intention to partner on this effort and committed leverage funds to the work. The partnership with the Forest Service indicates that this effort could have a very broad reach as it becomes a model for other National Forests.

Exhibit G: Regional Coordination and Long-Term Commitment

Federal, state, and local agencies are already making significant investments to boost the resilience of our target area. The following is a list of significant or major steps that have already been taken or are in the planning stages to increase the resilience in our target area:

1. The USFS are continuing a program of reforestation, erosion control, rehabilitation, and timber salvage in the area of the Rim Fire.
2. The California Department of Forestry and Fire Protection (CAL FIRE) is implementing a fire prevention and fuel reduction project in the target area. The project consists of fuel breaks intended to slow the advance of an approaching wildfire, and allow firefighters to control the fire before it impacts nearby residential communities. The Rim Fire Contingency Line stretches from the community of Tuolumne, northeast to the community of Long Barn. The project consists of cutting, piling, and burning or chipping vegetation that is encroaching and re-growing in the Rim Fire Contingency Line. Hand piles that were created during fire suppression operations will be burned. The planned start date is July 1, 2015 and initial work will take 24 months, with 5 years for maintenance.
3. Two FireSafe Councils work in Tuolumne County, along with a multi-county collaborative (SWIFT). All are taking steps to reduce the vulnerability of key commercial areas, housing, and infrastructure to future wildfire. This includes investment in the creation and maintenance of strategic firebreaks, creation of defensible space, and community education and outreach.
4. The Climate Action Team Forest Carbon Plan will outline a concrete strategy for reducing greenhouse gas emissions and increasing carbon storage in California forests. It will be completed in May, 2016.

Exhibit G: Regional Coordination and Long-Term Commitment

CALFIRE has established a baseline and goal for the work that they are doing in the region.

The baseline is the current conditions of the fuel breaks, consisting of piled vegetation from suppression of the Rim Fire, and significant encroachment and re-vegetation of the fuel break.

This baseline condition will diminish significantly the breaks effectiveness in helping control future wildfires in this area. The goal for CALFIRE's ongoing work is to develop a fuel break that: is substantially free of piled vegetation, understory vegetation up to six feet removed, and achieves widely spaced trees at least 24 feet apart.

DRAFT