



# State of California

National  
Disaster  
Resilience  
Competition

Phase II  
October 27, 2015

Exhibit E -  
Factor 3 - Soundness  
of Approach  
[ExhibitESoundnessofApproach.pdf](#)



## **EXHIBIT E: SOUNDNESS OF APPROACH**

### **PROJECT APPROACH**

As outlined in Exhibits B, C, and D, the Rim Fire is one event in a long history of wildfires in the Sierra Nevada, made more intense by the current drought and overstocked forests. Since the 2013 Rim Fire, large wildfires throughout the state have burned nearly 400,000 acres and destroyed hundreds of homes/structures. Successful deployment of the Community and Watershed Resilience Program (CWRP) in Tuolumne County will enable the State to replicate the program in other watersheds, which is even more urgent under changing climate conditions. Research shows that climate change will result in more frequent and severe wildfires under a range of plausible future scenarios (Westerling et al. 2014).

The CWRP integrates three pillars or activity areas that reflect the interdependence of community and watershed resilience. Together, these elements create an economically- and environmentally sustainable program for long-term community and watershed resilience that is replicable throughout the State's upper watershed communities. The NDRC provides a unique opportunity to integrate these elements into a single funding proposal. The three pillars are:

1. **Forest and Watershed Health:** Support healthy, resilient forests through restoration, reforestation, strategic forest thinning, biomass removal and other science-based investments to ensure ecosystem health and services. This pillar provides economic development opportunities to diversify and strengthen local economies.
2. **Bioenergy and Wood Products Facility:** Develop an appropriately scaled and sited facility to use biomass removed through forest restoration and thinning. Thinned material will be feedstock for wood products (e.g., lumber, fence posts, wood shavings); residue from wood



products will be utilized to produce electricity, heating, and cooling for facilities and the local community. This pillar also provides local educational, job training, and economic development opportunities.

3. **Community Resilience Centers:** Develop centers that will serve the needs of rural communities during emergencies. The centers will further support the first two pillars by providing education and job-training opportunities in natural resources and forest and watershed health in cooperation with the California Conservation Corps and local community colleges. The facilities will also offer services, including Head Start Program and training space to support workforce and business development.

Projects within each pillar were selected after public solicitation of project ideas and needs from the County, community members, landowners, and State agencies. Projects included in the NDRC were carefully selected to address the unmet recovery needs within the disaster impacted area, with the specific goal of creating a replicable framework for Forest and Watershed Health. The following describes the [project activities within each pillar](#) that were selected for Phase II of the State of California's NDRC application.

### **Activity Pillar 1: Forest and Watershed Health**

The forest and watershed health projects encompass five activities:

- Removal of trees for fuel reduction and to provide feedstock for a biomass energy and wood products facility (\$13.5 million),
- Forest restoration and reforestation (planting resilient and diverse forests) (\$17 million),
- Treatment of noxious weeds (\$2.4 million),



- Developing and reconstructing strategically placed fuel breaks to provide forest and community protection (\$5.2 million), and
- Reconstruction of rangeland infrastructure destroyed during by the Rim Fire (\$1.9 million).

These activities will occur throughout the entire 257,314-acre Rim Fire burn area, alongside a suite of activities funded by other sources, both inside and adjacent to the burn area.

Prior to reforestation and restoration, burned trees are salvaged if possible, to utilize the material and avoid having the burned trees provide fuel for a future fire. Timely conifer reforestation is critical. Because of the extremely high amount of conifer mortality within the Rim Fire boundary, natural regeneration is sporadic and limited, leaving thousands of acres of brush fields. The lack of conifer seed source across this landscape means it could take centuries for conifers and forested conditions to return naturally.

Biomass removal will be accomplished using best management practices, following standard operating procedures on federal land, to mitigate sedimentation and soil erosion. These projects can also improve road conditions and help keep stream crossings functional. The goal of a biodiverse, healthy forested landscape includes stable soil, resilient vegetation and a structurally diverse mixed conifer forest including hardwoods. Large buffers on meadows will promote those unique habitat types and critical hydrologic features. Noxious weed treatments will help to ensure the health of reforested and restored areas.

Once plantations are established, fuel management and associated fuel breaks become an even more critical component in protecting these areas from future large fires. CAL FIRE and USFS have identified seven important fuel breaks that will enhance the ecosystem, provide protection to communities, and ensure the long-term sustainability of restoration work. Fuel



breaks can help reduce wildfire intensity and size. Fuel breaks also protect housing tracts and neighborhoods in areas where fires occur often and they provide strategic locations for fire fighters to contain wildfires or conduct prescribed burns.

Reconstruction of rangeland infrastructure will allow the continuation of grazing within the national forest. Cattle grazing has long been allowed under agreements between the forest and local ranchers. Reconstruction of destroyed fencing and troughs will ensure that grazing occurs in the most environmentally sensitive manner possible and will protect water sources, restoration areas, and sensitive habitat.

The work proposed for funding under NDRC will be part of a larger effort to restore forest and watershed health. In order to maintain forest ecosystem health and resilience, it is critically important to keep soil on the hill slopes and out of streams. Soil can take thousands of years to form, and the loss of several inches of top soil in a single wildfire can have devastating impacts on vegetation and the beneficial uses of water, including fisheries and reservoirs that supply drinking water. Watercourses throughout the fire area will be restored to match their natural drainage patterns and provide accommodation for future extreme events predicted in the plan area. Riparian areas impacted by intense wildfire will be rehabilitated and hydrologic function will be restored.

This work builds on emergency steps taken immediately following the fire. Right after the Rim Fire, work was completed under the Burn Area Emergency Rehabilitation (BAER) program. The BAER work focused on erosion control and road stabilization, and was intended to address short-term fire impacts. The Community and Watershed Resilience Program builds on this work to focus on long-term goals for recovery and resilience. As discussed earlier, limited forest budgets make such long-term work difficult. An important part of the Community and



Watershed Resilience Program is to provide supplemental funds to enable full reforestation and watershed restoration across the entire fire impacted area. Linking this work to economic development and job training helps to overcome financial barriers in the long-term.

### **Benefits to Vulnerable Populations and Section 3 Persons**

Local workers will be recruited and trained to complete the forest and watershed work. This will be completed through partnership with the California Conservation Corps (CCC). The CCC will develop job training programs in order to develop a deep pool of skilled workers to support forest management activities, including regulatory approval, 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 and to manage forests to proactively prevent destructive wildfire.

The USFS and CCC will advertise postings for employment generated by activities outlined in this application, creating a plan to advertise employment opportunities to Section 3 residents within Tuolumne County. The Forest Service recruits prospective full-time, part-time, and seasonal employees through several methods including direct contact with local and regional employment agencies and posting opportunities on their websites, outreach at high school and college career fairs and other local events, youth employment programs, involvement in local workforce development and Veterans groups, and postings on the USAJobs.gov website.

### ***Alternatives to Forest and Watershed Health Activities***

With no restoration work, the forests will remain in a degraded condition for the foreseeable future. Carbon storage and sequestration will be a mere fraction of the potential that can be realized in a healthy, growing mixed conifer forest in this area. In addition to the concerns noted



above, this will also pose risks to biodiversity and broader ecosystem health. This will also threaten water supply for the local community and millions of downstream users.

## **Activity Pillar 2: Biomass and Wood Products Facility**

Development of a biomass and wood products facility will create a market for biomass removed from the forest through initial and ongoing forest health work and provide local economic development opportunities. Development of a wood products and biomass energy campus will be accomplished in two phases:

1. Phase 1 (\$6 million): Feasibility analyses, feedstock assessment, siting, environmental review, and permitting
2. Phase 2 (\$16 million): Facility construction and operation

**Phase One:** The Sierra Nevada Conservancy, in partnership with the California Environmental Protection (CalEPA), will work with the USDA Forest Service (USFS), CAL FIRE, tribes, and private landowners to identify land parcels of 10 acres or more for evaluation for a multi-purpose wood products and energy facility. Parcels will first be reviewed using geospatial tools for proximity to feedstock, electricity transmission infrastructure, acreage for future expansion and proximity to Community Resilience Centers or other load centers with need for generated electricity, heating, and cooling. Parcels will be further assessed by wood products and biomass energy developers for overall site potential. TSS, an experienced bioenergy consultant, has provided pro bono technical support in developing this scope of work.

[Senate Bill 1122 \(Rubio\)](#), a law passed in California in 2012, provides a competitive price, or feed in tariff, to be paid by utilities for biomass-electricity facilities sized up to 3 megawatts. A detailed feasibility analysis will be performed using public input to determine feedstock availability while ensuring sustainable forest health and preventing over-harvest of woody



biomass. Results of the analysis will aid in determining the County's capacity for one or more stationary small-scale facilities or a combination of stationary facilities and mobile air burners to manage biomass supply in the forest. To complement this process, phase one will include consultation with the California Independent System Operator and Pacific Gas and Electric to determine the interconnection requirements and potential costs for integrating one or more stationary and mobile facilities with electric transmission infrastructure. If necessary, a formal interconnection study will be prepared in phase one.

Phase One will also include a feasibility analysis of marketable wood products in Tuolumne County based on sustainable feedstock supply. The range of potential products includes biochar (soil amendment), fence posts, animal bedding, landscape mulch, wood pellets, lumber, pellets, composite/particle board, and liquid fuels. Because the costs and resource needs to produce each wood product varies considerably, a feasibility analysis will include the market and non-market costs and benefits to select one or more of these products for development. The financial analysis will include capital cost needs, break-even points, and cost-saving measures and efficiencies. Red Rock Biofuels, a collaborator that produces jet fuel from woody biomass, will provide guidance on necessary feedstock supply and condition for production of liquid fuels.

Upon completion of the feasibility analyses for sites, energy potential and wood products, a range of suitable sites will be selected for formal state and federal environmental and cultural review and development of 30 percent engineering and design plans. Full review of multiple sites will be necessary to allow for final site selection(s) that meet public needs and ensure forest resilience by sizing facilities to prevent over-harvest. The design will include the wood products facility options and the adjacent heating, cooling, and electric facility to serve both the wood products facility and nearby centers, public facilities, or homes. Throughout phase one, the state,





the county and partners will work with the local community to receive input on design and site selection and build capacity around economic development in the area. The formal environmental and cultural review will initiate a federal and state schedule to permit available sites along with associated formal comment periods.

The conclusion of phase one will include: completion of the state and federal environmental and cultural review on multiple sites, final site selection based on the review, project design for wood product and energy facilities, financial analysis, a possible completed interconnection study, and site control to allow development. Site control may range from completed plan amendments on county or state-owned lands, executed contracts with tribes or private landowners, or land use permits/special use permits and associated plan amendments on federally managed lands.

**Phase Two** will begin with a request for proposals to develop the facility according to the proposed project design. The proposal request will require applicants to devise and demonstrate a business model that incorporates the use of feedstock from the NDRC forest health activities in the early years of operations and the proposed sources of feedstocks for the ensuing years of operation to ensure continued investment in defensible space, forest management, and landscape resilience. Successful applicants will demonstrate financial and technical capacity to build and operate the proposed facility. In support of local self-reliance, the community may choose to be a substantial project partner as owners and operators of the facilities.

The wood products and energy campus is a critical component of the Community and Watershed Resilience Program. Inclusion of this component spurs job creation, diversifies economic development, community engagement, and forest health. Potentially the most critical benefit of such a facility is the support of energy security and independence in a rural



community. By cultivating development of local energy generation, the state can support local communities' ability to thrive in the face of natural disasters and climate disruption. With a localized energy economy, rural communities can better control costs and manage infrastructure to mitigate vulnerabilities to climate change and extreme events.

### ***Benefits to Vulnerable Populations and Section 3 Persons***

The proposed approach for a biomass and wood products facility introduces innovation and economic diversity to Tuolumne County. While biomass electricity plants and sawmills exist in California, no facilities scale forest health activities. Nor do any current facilities employ combined cooling, heating, and electricity technologies. The development, building and ongoing operation of the facility will supply jobs to the local area. The innovative nature of the proposed approach will ensure that the training and jobs created allow replication of the CWRP approach in other forested communities.

Public health will benefit from the development of a facility. Currently, trucks carrying biomass feedstocks through small mountain towns and on steep roads pose risks to local residents and tourists traveling in the area. By siting smaller facilities closer to the forest, fewer truck trips will be necessary to transport materials to facilities at lower elevations, thereby supporting public safety and protecting health through reduced truck trip emissions. Further, a local facility can provide an economic driver for private landowners to clear defensible space and protect their homes and businesses. A successful biomass and wood products facility will further protect public health with the air quality benefits of using best available emissions control technology in a closed environment to manage biomass feedstocks.

### ***Alternatives to a Biomass and Wood Products Campus***



Without a local biomass wood products facility, biomass will be piled and burned in the open or trucked long distances. This will result in increased local and regional air pollution. Open burning also poses a risk of fire in the forest. The facility also provides a delivery point for residue cleared through the forest health activities, spurring ongoing investment in forest health after the completion of NDRC funding.

### **Activity Pillar 3: Community Resilience Centers**

Tuolumne County is a rural county with a population spread over 2,274 square miles. Given limited infrastructure, providing emergency response and evacuating residents during a fire is extremely challenging. These challenges also make provision of services difficult during non-emergencies as well. To address these challenges, the State worked with Tuolumne County to identify needs to help build resilience for residents, local business, and local government. The resulting concept was to invest in Community Resilience Centers (CRC) that provide resources during an emergency event including fire, but also extreme heat or flooding, and also serve the community year-round. These facilities will be used as evacuation centers during fires or other emergencies and also provide space for job training, educational programs from Head Start up to the Community College level, community education on forest health and fire science, commercial kitchens for economic development, business development training, and other social services. The facilities will be constructed to demonstrate state of the art energy and water efficiency measures.

Serving a dispersed rural community with a single facility is challenging given limited public transportation and small capacity roads, therefore, two locations were identified that would best meet the needs of the MID-URN area. One facility (Groveland, discussed in more detail below) would also provide housing for the California Conservation Corps (CCC) to develop a locally-



based crew to support the forest and watershed work and to assist in the operation of facilities during and emergency. The CCC is a State program that employs low-income individuals and at-risk youth to undertake conservation work, including ecosystem restoration

Recognizing that designing a public facility to serve multiple purposes in a rural community is challenging and the limited time frame of the NDRC development process, each Community Resilience Center is being proposed as a two-phase activity:

1. **Phase 1:** Further community engagement to site, delineate service needs and opportunities, and finalize design to meet those needs. This phase would build on the principles of Rebuild by Design to engage residents, community groups, business, and elected officials to hone in on the best design to enhance community resilience.
2. **Phase 2:** Construction and operation of the facility.

***Groveland Community Resilience Center*** (\$33 million construction cost) Groveland is located along the Highway 120 Corridor, a narrow winding road that provides the only access in or out of the area, and that also serves as an entryway to Yosemite National Park. Given its location, the Groveland CRC would provide a nearby center that would enable residents of the south county area to evacuate and avoid clogging roads needed for emergency vehicles. Similarly, the facility can provide educational opportunities and public services for residents who otherwise have limited access to services located in other parts of the County.

The Groveland CRC will provide housing for the CCC. The CCC has provided staff for the Rim Fire Recovery, including crews from Auburn, Fresno, Redding and Stockton. The CCC will utilize the Groveland CRC as a staging area for forest and watershed health work proposed under Activity 1, as well as run its Backcountry Trail Program, Veterans Fire Corps, Fire Suppression, and Fire Camp Support out of the facility. The Backcountry Trail Program has been the hallmark



of the CCC, building and maintaining trails throughout the Sierra Nevada; Veterans Fire Corps trains veterans on fire hazard reduction and provides job placement with the USFS and the Bureau of Land Management; Fire Suppression and Fire Camp Support train crews to respond to wildfires, and provide support for other agencies in fire suppression. The facility will contain 16 dorm rooms, 4 beds to a room, housing 40 service members and up to 5 CCC staff, operating 8 months out of the year.

The facility's commercial kitchen will serve as a base of operations for the South Side Seniors, a community group that provides the Meals-on-Wheels program to the Groveland community. Training rooms will also be available for business development assistance provided by the Tuolumne County Economic Development Administration, educational programs from Columbia College, Head Start, and other service providers.

***Tuolumne City Community Resilience Center*** (\$16 million construction cost) Tuolumne City is an unincorporated LMI area within the County. This center will serve as a social hub for the community of Tuolumne City and surrounding areas. A variety of services and programs will be provided at this facility on a year round basis. Just as in the Groveland CRC facility, the following could be provided: senior programs, job training, cooking classes, commercial kitchen, immunization clinics, town hall meetings, business incubator services and rabies clinics.

Both CRCs will also serve as a regional transportation hubs for both [Tuolumne County Transit](#) and the [Yosemite Area Rapid Transit System \(YARTS\)](#). Currently, it is difficult for LMI and vulnerable populations in Groveland and Tuolumne City to access services such as health care. There is no hospital or health care clinic in Groveland or in Tuolumne City. The aim of the CRCs is to provide a known and comfortable location for the residents of the region to come to during emergencies, for community events, and for assistance with logistics such as



transportation. The implementation of these activities will naturally create a social network and cohesion around a central location. Neither Groveland nor Tuolumne City has facilities that can provide this important resiliency benefit.

### ***Benefits to Vulnerable Populations and Section 3 Persons***

As noted above, the CRCs provide an excellent and critical opportunity for local residents to connect, learn, prepare and support each other. At the current time, services and activities are offered in dispersed locations, which make accessing them challenging, especially for elderly or low-income residents who face transportation limitations. Job training and educational programs will provide new economic opportunities in this County, which faces high unemployment.

Tuolumne County has long required local and low-income preferences in procurement of design and construction contracts. Their most recent use of this process is in the \$49 million jail facility the County is currently constructing. As with the jail project, given the high dollar bonding requirements, a developer with the capacity to obtain a bond at that level may need to be procured from outside the area, however the County will require local subcontractors to be included and preferred in the construction procurement process.

### ***Alternatives to the CRCs***

Without the CRCs, the community and broader region will lack facilities to provide centralized support to community members from Tuolumne County and its neighbors during an emergency. The community will also lack supportive services, better transportation options, and education and training for new economic opportunities. Without the CRC in Groveland, the CCC will not have a location to develop a locally based work crew to support the forest and watershed health work.

### **Metrics for the Community and Watershed Resilience Program**



The table below identifies the suite of metrics that will be employed to evaluate the Community and Watershed Resilience Program.

	<b>Resiliency Value</b>	<b>Environmental Value</b>	<b>Social Value</b>	<b>Economic Revitalization</b>
<b>Forest and Watershed Health</b>	Acres treated  Acres of fuel breaks	Acres treated  Miles of fencing installed	CCC crews work-hours  Inmate crew work-hours	Forest visit stats  Grazing use  Revenue from timber sales
<b>Biomass and Wood Products</b>	Biomass processed	Biomass processed	Electricity generation	Jobs created  Revenue from wood products
<b>Community Resilience Centers</b>	Services offered  Service uptake	Energy consumption  Water consumption	Services offered  Service uptake	Students enrolled in courses

**Alternative to the Community and Watershed Resilience Program**

The CWRP proposes an integrated set of activities to meet unmet recovery needs and build resilience in the forest, watershed and community. Each piece functions on its own, but together they reinforce and support one another. If no funds are made available to complete the work, the forest will remain in its degraded state, which will result in declines in tourism and recreation,



reduced water quality due to erosion and sedimentation, and severely curtailed carbon storage and sequestration. The State and region will also lose the opportunity to pilot a promising model for community and watershed resilience that could have far-reaching benefits.

### **Describe How Proposal is a Model (Replicable, Scalable, Integrated)**

As previously stated, the goals of this program are applicable throughout the Western United States. This proposal includes the development of innovative partnerships that link forest stewardship with productive uses for forest raw materials, including lumber, other wood products, and bioenergy, alongside investments in community protection, economic development, and education. Once demonstrated in Tuolumne, the CWRP will represent a viable model for replication. There is a tight connection and interdependence between the local community and the forest; community and forest ecosystem resilience go hand in hand.

We are integrating two critical elements to enhance the potential for replicating the Community and Watershed Resilience Program: innovative financing and regional collaboration.

***Innovative Financing*** A major challenge to replicating this work will be financing to support investment in forest and watershed health. The biomass and wood products campus is one element of developing an economically sustainable model. We have explored the potential to attract outside investors for forest and watershed restoration work. To that end, we have engaged a team of subject matter experts to explore how to use the CWRP work in the Rim Fire area as a pilot for innovative investment tools. This team includes pay-for-success environmental investors at Blue Forest Conservation, researchers from UC Merced and UC Davis, and the U.S. Forest Service. We will be using available resources to quantify the environmental benefits of this work and contracting mechanisms, which can be used as a basis of a pay-for-success





investment model. Using project as a proof of concept could prove invaluable to replication throughout watersheds in California and the Western United States.

***Regional Collaboration*** The Rim Fire is an entry point through which we can examine dimensions of resilience that are of concern statewide: wildfire, drought, forest health, water quality, water supply, and rural economic development. Therefore, in developing this Phase II proposal, we have consulted with a broad group of stakeholders in Tuolumne County, the surrounding region, and the rest of the state. In an effort to use the model developed in this proposal as a case study for western states, we have also reached out to multi-state organizations including the Pacific Coast Collaborative (PCC) and the Alliance of Regional Collaborative for Climate Adaptation (ARCCA).

As we move ahead, both groups will provide venues to share knowledge and identify opportunities for replication. We will also integrate the work of Civic Spark members to work across the regions. Civic Spark is an AmeriCorps Governor's Initiative that started in California in 2014. Members are deployed throughout the State to support local climate change planning. The Local Government Commission is already committed to allocating a portion of a CivicSpark Resilience Fellow's time to urban rural adaptation issues, specifically in support of NDRC. Beginning in November 2015 a CivicSpark Fellow based in Sacramento will be working with local and state partners - including OPR on coordination activities. Additional funds provided through NDRC will be used to engage Civic Spark members in Tuolumne County and with other partners to monitor the NDRC work and develop partnerships and materials to support program's ability to be replicated.

### **Feasibility and Long-Term Resilience**



The Program is designed to demonstrate a sustainable model for maintaining forest and watershed health and community resilience. The goal is to move from a reactive model to one that is proactive, forward-looking 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 many decades of fuel build-up. After that initial investment, the goal is to implement a free-standing community and watershed resilience program for forest health that is economically viable and durable. Natural systems are dynamic; therefore, our Program will require long-term monitoring and adaptive management. The funds provided through the National Disaster Resilience Competition will help develop the capacity, partnerships, and a trained local workforce to undertake this maintenance.

***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, local and downstream water utilities, and concerned citizens. We have also engaged with consultants, private business, and researchers.

***Engagement and Collaboration Moving Ahead*** California and Tuolumne County will continue an interactive and collaborative dialog with the community moving ahead. Core team members include the State agencies listed in Exhibit C, Tuolumne County, US Forest Service, Tuolumne County Economic Development Authority, and other local groups. The phased approaches for the CRCs and biomass facility will provide immediate opportunities for engagement.

### **Maps, Drawings, Renderings**



A full review of Tuolumne County, the identified target areas, proposed project locations, and graphics depicting the Program can be found in [Attachment E](#).

## BENEFIT-COST ANALYSIS

The complete detail of the methodology and narrative associated with the working benefit cost analysis (BCA) for each of the three pillars (Forest and Watershed Health; Integrated Biomass and Wood Products Facility and Community Resilience Centers) and including the aggregated total can be found in [Attachment F](#). While benefits of many of the proposed activities are well-documented, there are many benefits to the Community Resilience Centers that are difficult to quantify. These include: the value of evacuation services; improved social cohesion due to year-round services; improved access to services and technology; and the value of educational programs. These challenges are further discussed in [Attachment F](#).

The total benefits of each of the three pillars and their associated life cycle costs are presented in the table below, alongside the benefit cost ratio (BCR) for each activity. The combined total benefits, life cycle costs, and aggregated BCR is presented in the final row of the table. The overall project benefit cost ratio of the Community and Watershed Resilience Program is 1.53.

<b>Discount Rate = 7% Project Life = 30 Years</b>	<b>Forest &amp; Watershed Health</b>	<b>Biomass &amp; Wood Products</b>	<b>Community Resilience Center</b>	<b>TOTAL</b>
<b>Lifecycle Costs (2015 \$)</b>	\$54,348,010	\$73,330,800	\$103,890,000	<b>\$231,568,810</b>



<b>Lifecycle Costs (Present Value)</b>	<b>\$41,416,603</b>	<b>\$38,182,459</b>	<b>\$69,281,397</b>	<b>\$148,880,459</b>
<b>Project Benefits (Present Value)</b>	\$134,984,276	\$53,969,024	\$39,247,170	<b>\$228,200,470</b>
<b>Net Present Value</b>	\$93,567,673	\$15,786,565	\$30,034,227	<b>\$79,320,011</b>
<b>Benefit Cost Ratio</b>	<b>3.26</b>	<b>1.41</b>	<b>0.57</b>	<b>1.53</b>

The table above presents results using a seven percent discount rate. Given the long-term benefits of this investment and that these benefits will affect generations to come, a lower discount rate is likely more appropriate. Repeating the analysis with a 3 percent discount rate results in a BCR of 2.04 for the overall program, and a BCR of 4.62 for forest and watershed health; 1.69 for biomass and wood products, and 0.82 for the community resilience centers.

**SCALING/SCOPING**

Performed separately, each of the activities within the pillars presented in this proposal will increase resilience. However, the integration of the three is the key to its broader success. The Community and Watershed Resilience Program is an interrelated set of activities, which ultimately relies upon each component for successful implementation and institution of community and environmental resilience. Implementing work in each of the three areas will provide the opportunity to demonstrate how each of the elements can work with the other (e.g., job training feeding into forest and watershed health work; contracting needs for getting material from the forest and watershed work to a biomass facility). Understanding and demonstrating the



mechanics of these interconnections will be invaluable for replication of this program to neighboring counties and the broader region.

Understanding that HUD reserves the right to scale down funding in given areas, we think that it is important that some level of investment is made in each area. The NDRC provides a unique opportunity to develop this program in an integrated manner and take advantage of the synergies that are present if all three pillars are developed together. At a minimum, the following elements are needed to demonstrate the power and replicability of this integrated approach:

- Biomass thinning, reforestation, and restoration: These activities are shovel ready and time-sensitive.
- Biomass/wood products facility: Such a facility will demonstrate the economic benefits to the community and support ongoing forest and watershed health initiatives.
- Workforce training location and program: These programs will be necessary to ensure there is an adequately-trained and –sized workforce to complete forest and watershed health work and will provide direct benefit to local residents and the economy.

Working together, these three elements demonstrate the environmental benefits and economic potential for replicating and scaling this program to the broader region.

## **PROGRAM SCHEDULE**

### **Detailed Schedule for Completion of Proposed Activities**

Upon award, the three pillars of the Program will all be ready to begin. The Forest and Watershed Health portfolio of activities is immediately ready to begin, as the longer this work waits the more perilous will be the consequences. Following award, the Biomass and Wood Products Campus will initiate phase one, which involves site selection, permitting, engineering and design, which would require approximately 12-16 months. Phase two of build-out would



require an estimated 12-14 months. An initial scope and design exists for the Community Resilience Centers. However, the County will undertake an initial 6-month period to continue outreach and engagement efforts and seek stakeholder input from residents of Tuolumne County with respect to programming needs and final design criteria. The California Team is considering a micro ‘*Rural Rebuild by Design*’ process wherein the community presents additional ideas on resilience features to be incorporated in the final design. The Program will initiate in early 2016 and complete construction by late 2019.

**BUDGET**

**Budget in DRGR Format**

**Community and Watershed Resilience Program  
DRGR Budget Template**

Project Number	Activity Number	Project Title	Activity Title	Responsible Organization	Project Budget	Activity Budget
		Overall Budget			\$117,000,000	
1-Jan		Administration			\$5,850,000	
	1-01-AD		Administration	HCD		\$5,850,000
2-Jan		Public Facilities & Improvements			\$111,150,000	
	1-02-UN		Restoration and reforestation	SNC		\$12,825,000
	1-02-UN		Biomass removal and thinning	SNC		\$16,150,000
	1-02-UN		Strategic fuel breaks	SNC		\$4,940,000



	1-02-UN		Rangeland improvements	SNC		\$1,805,000
	1-02-UN		Noxious weed treatment	SNC		\$2,280,000
	1-02-LMA		Groveland CRC & CCC (Phase I & II)	Tuolumne County		\$35,245,535
	1-02-LMA		Tuolumne City CRC (Phase I & II)	Tuolumne County		\$17,004,465
	1-02-LMA		Biomass Facility & Wood Products Campus (Phase I & II)	SNC		\$20,900,000

**Narrative Description of How Budget Was Developed**

For each of the activities included in CWRP, members of the California Team worked with subject matter experts to develop budget estimates. The estimated total of \$40 million for Forest and Watershed Health portfolio of activities includes the assessments of the USFS and CAL FIRE, with input of the CCC, given their collective experience implementing similar measures in the recent past. The Biomass Facility and Wood Products Campus, with an approximate cost of \$22 million, was established with the input of CalEPA and OPR, in concert with TSS Consultants, a California-based firm with experience in design and implementation of similar facilities, including one in a neighboring county. The estimated total of \$55 million for the Community Resilience Centers in Groveland (with CCC outpost) and Tuolumne City were



developed with the professional construction design input of Vanir Construction Management, who have a long track record of large-scale capital projects in Tuolumne County. Given the scale and scope of the Program, the Core Team is allowing for a contingency of ten percent for project delivery and administration needs.

The ongoing operations and maintenance costs are not included in NDRC request in the proposed budget (though are included in the BCA). Once built, both of the CRCs and the Biomass Facility will generate revenue that will largely offset or cover all of these costs. In addition to committing to budget for these costs for the CRCs, Tuolumne County will utilize the various meeting rooms and meeting hall spaces within the CRCs for rental by community groups, special events, and conferences – which will generate approximately \$1.3 million in rental usage (see CRC Fac Rental tab in BCA spreadsheet – [Attachment F - BCA Worksheet](#)). Once operational, the Biomass Facility and Wood Products Campus will realize revenue generation from sales of wood products, electricity generation, and heating and cooling. The design of the Biomass Facility and Wood Products Campus will contribute to the economic model being developed through this Program.

**Sources and Uses Statement (inclusive of all funding)**

**Community and Watershed Resilience Program - Sources and Uses**

Sources of Funding	
<b>Forest and Watershed Health</b>	
CDBG-NDR	\$ 40,000,000
<b>Subtotal =</b>	<b>\$ 40,000,000</b>





<b>Community Resilience Centers</b>	
CDBG-NDR	\$ 55,000,000
<b>Subtotal =</b>	<b>\$ 55,000,000</b>
<b>Biomass Facility and Wood Products Campus</b>	
CDBG-NDR	\$ 22,000,000
<b>Subtotal =</b>	<b>\$ 22,000,000</b>

<b>Total Sources =</b>	<b>\$ 117,000,000</b>
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<b>Uses of Funding</b>	
<b>Forest and Watershed Health</b>	
Restoration and Reforestation	\$ 13,500,000
Biomass Removal and Thinning	\$ 17,000,000
Strategic Fuel Breaks	\$5,200,000
Rangeland Improvements	\$ 1,900,000
Noxious Weed Treatments	\$ 2,400,000
<b>Subtotal =</b>	<b>\$ 40,000,000</b>
<b>Community Resilience Centers</b>	
Groveland (CRC & CCC)	\$37,100,563
Tuolumne City (CRC)	\$17,899,437
<b>Subtotal =</b>	<b>\$ 55,000,000</b>
<b>Biomass Facility and Wood Products Campus</b>	



Biomass Facility and Wood Products Campus	\$ 22,000,000
<b>Subtotal =</b>	<b>\$ 22,000,000</b>

<b>Total Uses =</b>	<b>\$ 117,000,000</b>
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## CONSISTENCY WITH OTHER PLANNING DOCUMENTS

### Consolidated Plan and/or Regional Sustainability Plan (HUD-2991)

Tuolumne County, the most impacted and distressed target area outlined in this application, is a non-entitlement jurisdiction, is considered an eligible jurisdiction to receive State-administered funds through the [State of California’s 2015-2020 Consolidated Plan](#). All proposed NDRC activities are directly tied to the most impacted and distressed target area within Tuolumne County.

### Mitigation Plan

As of June, 2015 the State of California has a FEMA-approved [Enhanced State Mitigation Plan](#). The Tuolumne County Board of Supervisors adopted the [Tuolumne County Multi-Jurisdictional Hazard Mitigation Plan](#) on December 4, 2012. The activities proposed for the Community and Watershed Health Resilience Program are in alignment with both the State and County’s Hazard Mitigation Plans, by minimizing the level of damage and losses to people, critical facilities and infrastructure due to wildfires.

