RCPP Narrative Elements for Pre-proposal (4000 character limit per item)

Project Name:

Crisis to Opportunity: Sierra Nevada Tree Mortality Biomass to Biochar

Funding Pool: NATIONAL State: CA

Please review the Pillar and Criteria descriptions in the 2017 APF, and make sure your pre-proposal has adequately addressed each pillar in sufficient detail.

1. Briefly describe your RCPP team. Include a description of each partner's expertise and experience implementing similar projects. If partners are providing cash and/or in-kind services, "Letters of Financial Contribution" will be required in the Full-proposal application phase.

The focus of the proposed RCPP grant is to help restore forest health (including water quantity, quality and soil health) on non-industrial private forestlands by removing the trees killed by the unprecedented bark-beetle infestation in California. These activities are part of a larger partnership to comprehensively address conservation issues surrounding climate change and forest health. This will be done by utilizing the biomass from these dead trees to produce biochar, a valuable agricultural commodity that can sequesters carbon, increase soil water retention, and enhance soil fertility. The tree mortality crisis is linked to climate change and if the dead trees are simply burned they will release millions of tons of carbon, exacerbating the greenhouse effect. By sequestering the carbon from dead trees in biochar for agriculture and other uses the partnership will further the state's GHG reduction goals and help prevent future climate-related crises.

The major partners in the proposed RCPP activities include the following:
- The California Department of Forestry and Fire Protection (CAL FIRE) provides funding for healthy forest projects on private lands within the State Responsibility Area and is coordinating a response to the tree mortality crisis. CAL FIRE has extensive experience with providing funding and technical assistance to private landowners.
-Pacific Gas and Electric coordinates with landowners to maintain forest health and fire safety in the areas surrounding utility company infrastructure, including power lines and poles on private land. PG&E also provides funding for forest health efforts on private lands within their region.
-The California Office of Emergency Services provides funding from the California Disaster Assistance Act to help restore private lands devastated by bark beetle infestations.
-The Sierra Nevada Conservancy has provided funding and technical assistance for forest health projects over the past ten years.
-Local government and Resource Conservation Districts in the high impact counties stretching from Kern to Placer on the western slope of the Sierra Nevada range are providing technical information and outreach to private landowners regarding healthy forest resources and practices in response to this crisis.

In addition, other partners will be involved with the 'big picture' conservation activities related to sequestering carbon from the tree mortality biomass, including biochar production, utilization, and market development. These include UC Davis and UC Riverside (biochar research and standards development), the Sonoma Ecology Center, (biochar field trials), the Placer County Air Pollution Control District (development of carbon credit protocols), and Cutting Edge Capital (commodification and market development). The Governor's Office of Planning and Research will facilitate and coordinate this work.

The California Association of RCDs (CARCD) will be the lead partner for this effort. CARCD's member RCDs are actively engaged both with forestry and agriculture, and work very closely with NRCS offices to provide a liaison with private land-owners. CARCD has previous experience with various NRCS grants and programs. Locally, this includes (but is not limited to) outreach and technical assistance for growers on multiple topics including forest health, irrigation systems, hedgerows, erosion control, water management and conservation, production, nutrient management, creating habitat, soil health, productivity. At the Statewide level this includes capacity building for local field offices; building the ability of RCDs and field offices to assist landowners; coordinating the implementation of new NRCS national initiatives and policies; recognizing partnerships, initiatives and employees; providing support and technical assistance in the wake of temporary decreases in NRCS staffing levels; and outreach and education to RCDs and NRCS local offices on critical issues.

2. Specify the geographic focus of the project area. Provide background for why and how the project area was selected. (Note that the project area does not need to be contiguous, but all areas should have a common primary resource concern that the project addresses.) In the description, discuss any areas that will be specifically targeted within the project area and explain why those areas are to be prioritized.

The tree mortality crisis in California was declared a state emergency in October 2015 and is being addressed through the Governor's Tree Mortality Task Force (www.fire.ca.gov/treetaskforce/). The Task Force has identified 'high hazard areas', defined as areas in greatest need of healthy forest restoration due to severe tree mortality levels. Tree mortality from bark beetle infestation in these areas range from 40% to 90%, it is truly an unprecedented situation. According to Asner et al. 2015, "approximately 10.6 million ha of forest containing up to 888 million large trees experienced measurable loss in canopy water content during this drought period (2011-2015). Severe canopy water losses of greater than 30% occurred over 1 million ha, affecting up to 58 million large trees." The mortality creates a major threat to water quantity, quality and soil health both from the overall degradation of the habitat and through the threat of wildfire. Given that coniferous areas of the State supply 2/3 of Ca's water supply, the effect can be devastating to Ca.

Currently the high hazard areas are in the central and southern Sierra Nevada range, specifically the forested areas of Placer, El Dorado, Amador, Calaveras, Tuolumne, Mariposa, Madera, Fresno, Tulare, and Kern counties. These are the areas selected as the geographic focus of the proposed RCPP activities. These areas are also part of the California Bay Delta Critical Conservation Area. The agricultural lands targeted for agricultural testing and utilization of biochar are in the adjacent Central Valley, which is also part of that CCA.

In addition to all of the other benefits, one outcome of the comprehensive conservation crisis response will be to strengthen the partnerships between the upper watershed forest owners/managers and the lower watershed beneficiaries. Creating these connections and emphasizing common interests can continue to serve both the forest and the agricultural communities in addressing conservation issues into the future.

3. Describe the natural resource concern(s) of the project area. Include how the resource concerns were identified through watershed plans, scientific literature, etc. See the listing of priority resource concerns in Section II.B. A complete list of NRCS approved natural resource concerns may be found on the RCPP Web site at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/

There is an unprecedented bark beetle infestation in California's forests. Weakened by severe drought, millions of trees in the Sierra Nevada range have died from bark beetle infestations in the past 24 months, which is exacerbated by drought conditions. "Four years of drought have made trees in many regions in Ca susceptible to infestation by native bark beetles, which are normally constrained by the defense mechanisms of healthy trees" (Governor's Press Office, 2015). The rate of tree mortality is increasing and the infestation area is spreading. The tree mortality crisis was declared a state emergency on October 30, 2015.

Forest tree mortality is an important natural resource concern, which significantly impacts forest health, water quantity and quality, soil health, wildfire severity and watershed conditions. Wildfire severity in Ca has been increasing for decades, destroying seed banks and adversely impacting soil health, making forest restoration extremely challenging. Despite the important ecosystem role played by fire, human activities have altered natural fire regimes relative to their historic range of variability. Consequently, fuel loads are much higher today because of land management and fire suppression strategies, leading to much more intense fires that spread faster and burn hotter. If managed properly, these excess fuel loads can be utilized to return the balance of carbon back to its historic state.

In order to preserve forest health in the face of the tree mortality crisis, it is critical to remove a large proportion of the dead trees, particularly those nearest sources of ignition, such as roads and power lines. The EQIP funding sought in this RCPP application will be used to help remove dead trees and reforest non-industrial private forest-lands which make up a large percentage of the impacted area.

In addition to these RCPP activities, the partnership seeks to address the larger conservation challenges associated with tree mortality. Trees removed through EQIP funding will be transported to log decks which are being set up by local government and community organizations. In order to continue to provide space on the log decks for dead tree removal, the biomass must be turned into a product with economic value. If there is no opportunity to process this biomass, the only option is to burn the biomass. While removal minimizes ecological damage, burning would still release pollutants and greenhouse gases into the atmosphere at an unacceptable scale.

The 'big picture' partnership will promote the utilization of forest tree mortality biomass to produce biochar, specifically for agricultural use in the nearby central valley, which is currently suffering from the state's prolonged drought. If designed properly, biochar has significant potential to improve soil health, increase soil water retention, improve groundwater quality (by reducing nutrient run-off), and sequester carbon in agricultural soils. The 'big picture' partners will help establish biochar manufacturing facilities at the log decks. Although there is a great deal of interest among public and private stakeholders, there are few formal standards and practices that have been adopted for utilization of biochar on irrigated lands. The biochar produced through this program will be used in field trials to establish standards, practices and protocols, including EQIP standards, carbon market protocols, and research findings needed for conservation financing mechanisms.

The proposed activities will primarily address the CA State Resource Priority of Forest Health and also insufficient water (by increasing irrigated water use efficiency and protecting watersheds that supply 2/3 of ca's water), water quality degradation (by preventing sedimentation of streams after wildfires), soil quality degradation (in post-fire forest soils), air quality impacts (contaminants released during wildfires), and climate change (by sequestering carbon).

4. Project Scope: Describe the role of each partner during the project preparation, implementation, monitoring and evaluation phases. Identify the NRCS conservation programs to be used (EQIP, CStP, ACEP, etc) and conservation systems selected to address the resource concern(s) in the geographical focal area (conservation practices, activities, enhancements, restoration work, easement acquisition, and other partner approaches). Provide a brief description of the sequence of practice implementation or timeline.

Roles of Partners:
Project Preparation Phase (identify private non-industrial forest landowners, compile resources from grant and partner): CARCD will coordinate with partners including local NRCS offices, RCDs, County staff and CAL FIRE representatives to develop mechanisms and materials for outreach to EQIP eligible forest landowners. NRCS offices will work with RCDs to determine shared responsibilities for TA, processing, and prioritization.

Implementation Phase (tree removal and forest restoration):
NRCS office, CAL FIRE, PG&E, County staff and other partners with funding for forest restoration on non-industrial private forest lands will implement TA and FA protocols to provide the funding and TA needed for implementation activities. The NRCS program will be EQIP. It is estimated that roughly 1000 landowners will receive financial or technical assistance with this grant and the match dollars for forest health both in tree removal and reforestation.

Monitoring and Evaluation Phase:
CARCD will work with NRCS offices and other RCDs to compile information on the acres of forest restored, the amount of dead tree biomass removed and the amount of this biomass which was processed into biochar and utilized in agriculture.

'Big Picture' Partnership Implementation Activities (Biochar processing, utilization, and conservation finance):
The Office of Planning and Research will coordinate with partners implementing biochar utilization research to maximize market potential and conservation finance opportunities. The University of California will participate in research and field trials, coordinated by the Sonoma Ecology Center. The Placer County Air Pollution Control District will follow up with finalizing carbon market protocols.

Timeline:
The planning phase of the project will commence upon grant award. After 3-6 months NRCS office will work with RCDs to start the implementation phase. Partner efforts for implementation will be ongoing. Monitoring and Evaluation will start upon commencement of the implementation phase and documentation will be maintained throughout the period of the grant project.

5. Describe any activities that have already taken place that support the proposed project. Characterize the existing infrastructure and capacity of partner(s) that provide a solid foundation from management of the proposed project. Consider future partnership resource needs and describe any other steps that are needed to ensure project success, such as hiring, coordination, outreach, training, etc.

The coordination and planning of forest restoration activities was commenced in December of 2015 through the establishment of the Governor's Tree Mortality Task Force (TMTF). The TMTF is coordinated by CAL FIRE and consists of several working groups on critical areas including Forest Health and Resilience; Mapping and Monitoring; Public Outreach; Resource Allocation; and Utilization/Market development. These working groups have started to compile resources and overcome obstacles to forest health restoration.

Several counties in the high-hazard areas have already held 'Resource Fairs' where private landowners can come to find out about resources for forest restoration on their properties. These resource fairs are partially responsible for this grant application, since it was clear that the demand and need for NRCS EQIP forest restoration funds greatly exceeds the supply. This is true even though special allocations of funding have been made to NRCS for this purpose and the demand is likely to increase as the bark beetle infestation moves northward.

It is important to note that this bark beetle infestation and the corresponding tree mortality disaster is just an outgrowth of a serious forest health crisis in the region. This crisis is based on climate change, lack of funding for forest restoration, and California's recent severe drought. The Sierra Nevada Conservancy and other partners have been working for the past 10 years to address this issue by trying to re-establish forest biomass processing industries in the region. This includes the establishment of biomass processing businesses, such as bioenergy and biochar. Because of this work many communities are already poised to provide sites for log decks and equipment for tree mortality biomass processing.

At this point, the step most needed for project success is the development of markets for the biomass processing products. That is why we are including the biochar market-related activities of the 'big picture' partnership in this application. These partners are currently applying for several grants to develop a draft interim standard for application of biochar to irrigated agriculture. That work will also address meeting the requirements of the California Air Resources Board to complete a carbon exchange protocol which will allow funding from the state's Greenhouse Gas Reduction funds to be used for biochar processing and agricultural application. There is an exciting opportunity to take a conservation crisis and use it to develop new conservation practices that will foster healthy forests, water conservation, water quality improvements, soil health improvements, and carbon sequestration.

6. Describe how project outcomes will be evaluated. This may include monitoring, modeling, measurements, and/or photo points, etc. Specify how the partners will collect data and report progress that demonstrates project objectives have been met or exceeded.

The ultimate goal of this project is to protect soil health, the ability of the land to retain water, and a reduction of soil run off by avoiding catastrophic fire and habitat degradation. Avoided cost is not easily measured because fire is not predictable. Therefore, we will take other measurements to show the results of the project.

The project outcomes will be evaluated by measuring the following:
total number of trees removed (by species), number of trees planted (by species), and documenting weight of trees (in Bone Dry Tons); total acres treated; monitor impact of tree removal on forest health (for up to 3 years after project implementation); document the return on investment of utilizing forest tree mortality biomass in this alternative waste stream management practice; determine through a comprehensive research program administered by the University of California (Davis and Riverside campuses), if the biochar produced from this alternative waste management practice can be designed to significantly enhance soil health; and develop a formal standard for biochar utilization on irrigated agricultural lands. Additionally, a GHG reduction budget will be calculated to record achieved carbon offsets as Net CO2 Equivalent Sequestered (in Million Metric Tons), based upon the total amount of biochar produced at each location. The Sierra Nevada Conservancy Avoided Cost Study will be used to estimate avoided costs at the completion of the project.

Impacts on soil water use efficiency, nutrient leaching, soil microbial population diversity and crop yields should provide an appropriate avenue to assess achieved agronomic benefits of biochar on soil health. This will be monitored by scientists from UC Davis. Likewise, the impacts of removal activities on forest health can be measured by evaluating ecosystem responses to removal efforts (i.e. forest ecology, biodiversity, resilience to disturbance, watershed conditions, etc.).

7. If applicable, indicate how the project will "assist producers in meeting or avoiding the need for natural resource regulatory requirements." Section 1271B (d) (4)(A) of the 1985 Act.

This issue is not applicable to the immediate project, however it is possible that the use of biochar in irrigated agriculture might reduce the concentration of nutrients and contaminants flowing into the groundwater, which could in turn impact requirements for water quality on irrigated lands. This is a potential focus of research which may be implemented by the academic project partners in the future.

Reminder: The Pillar and Criteria descriptions offer insight into how proposal scoring takes place during the review phase.

8. Use this space to provide additional information about the project that has not been requested. Only include information and/or examples that will provide a greater understanding of your proposal.

Participation:
The project includes a broad range of collaborating partners, including those involved with the Governor's Tree Mortality Task Force, those which will be involved in specific RCPP activities, and those who are working to develop markets for biomass products. Many of these partners, such as the RCDs, the California Association of RCDs, and the Sierra Nevada Conservancy have been involved with NRCS-administered conservation programs for many years. These partners also have a history of collaboration with agricultural producers and forest landowners. Most importantly, participation in the project helps resolve pressing natural resource issues (the current tree mortality disaster) and its root causes (climate change and unhealthy forests), by implementing healthy forest activities and maximizing greenhouse gas reduction.

Innovation:
The proposed RCPP activities are a part of a comprehensive, innovative project which integrates multiple conservation approaches to deliver effective solutions. The impact of this project will be measurable through documentation of the number of acres restored, the amount of woody biomass removed and the amount of carbon sequestered instead of being released into the atmosphere (by conventional burning practices). The program will also directly engage emerging environmental markets, specifically carbon credits, green bonds achieved through water conservation efforts, greenhouse gas reduction funding, etc., as well as other conservation finance options. In addition, the project helps pave the way for market expansion of a value-added product from waste forest biomass. This will not only address the current disaster, but it can also help maintain healthy forests by providing value to excess biomass removed in restoration projects.

Contributions:
Faced with unprecedented disaster, the state and other agencies are dedicating unprecedented resources to a response. These funds are being used for the specific RCPP forest restoration activities (biomass removal) as well as activities related to the comprehensive approach to the crisis (funds to establish log decks, transportation of biomass to the log decks, and equipment to process the biomass for beneficial use.) The requested RCPP funds represent an important part of this effort - biomass removal on non-industrial forestland. The amount of EQIP funds currently available for non-industrial private forestland restoration is far exceeded by the need and demand for these funds.

Solutions:
This project will engage organizations ranging from local communities to state agencies to design and implement comprehensive solutions to a complex and difficult issue. It will provide a model for the region, the state, and other areas faced with forest health challenges.

Additional information

9. Partners are strongly encouraged to work with NRCS to fully understand program purpose and limitations. If **Adjustment of Terms** are needed in order to achieve project objectives, please describe here. Refer to Appendix A in the APF for Definitions.

No requests for adjustment of terms are anticipated.

10. Does the project require **Alternative Funding Arrangements (AFA)**? If the project requires AFA, please describe how it will meet the goals and objectives of RCPP.

    Refer to Section III, Part C. for AFA eligibility and requirements and Appendix A in the APF for Definitions.

None is requested.