



Financing Future Forests in the Tahoe Central Sierras



Proposers:

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Objective:

Blue Forest Conservation uses innovative finance mechanisms to create sustainable solutions to large scale environmental challenges. Their flagship tool, the Forest Resilience Bond (FRB), uses collaborative financing to accelerate the pace and scale of forest restoration projects and lower the risk of severe wildfire.¹ The first FRB pilot project was launched in 2018.² As Blue Forest prepares to move past the pilot project phase, they need to thoroughly understand the stakeholders and benefits, or ecosystem services, of healthier forests in a larger region. This project proposal will focus on California's Tahoe-Central Sierra Initiative (TCSI, Figure 1), which aims to accelerate large-landscape forest restoration by developing and demonstrating innovative planning, investment, and management tools with federal, state, non-profit, and tribal partners. While this region includes Blue Forest's pilot project area, it is geographically much larger and provides water security and carbon storage benefits to the state.³ There are two related objectives for this larger region:

- Objective 1: Ecosystem Service Demand via Stakeholder Analysis
 - Identify, research, and interview stakeholders and tribal governments to learn which forest restoration benefits they are interested in, how those benefits are valued, and assess where synergies and conflicts of interest arise.
 - Map the location of stakeholder demand for forest restoration.
- Objective 2: Ecosystem Service Supply via Natural Capital's InVEST model
 - Identify key forest restoration ecosystem services from literature review and interviews.
 - Model three scenarios of restored forestry benefits: 1) business as usual, 2) partial forest restoration, and 3) fully funded and financed restoration.

Significance:

California's Sierra Nevada region is an essential area for conservation, supplying over 60% of California's water, as well as critical carbon storage and many other benefits.³ However, the Sierra Nevada region is increasingly threatened by intense wildfire. In 2018, the Camp Fire burned 70,000 acres within the region in just one day, becoming the deadliest and most destructive wildfire in state history.^{4,5} These devastating megafires have significant consequences for communities, organizations, and ecosystems and have been exacerbated by a history of fire suppression policies, loss of indigenous land management strategies, and climate change.⁴

The goal of forest restoration is to reinvigorate natural processes that will result in landscape resilience to disturbances and the ability to adapt to climate change. Comprehensive restoration can take various forms—including fuels reduction, aspen regeneration, streambank stabilization, road decommissioning, invasive plant removal, meadow restoration, mine reclamation—but reducing wildfire risk is a primary activity to foster ecologically healthy forests. Healthy forests are more resilient to natural and anthropogenic disturbances, including pests, disease, and wildfire, and provide important benefits to communities in California and elsewhere. These benefits, called ecosystem services, include carbon sequestration and stable storage, increased water supply, increased water quality, decreased sedimentation, cultural benefits, recreation benefits, as well as many others.¹

In response to increasing environmental and economic threats to the Sierra Nevada, the state of California signed the Sierra Nevada Watershed Improvement Program (WIP) into law in 2018. This partnership program unites federal, state, local, and private partners to restore the Sierra Nevada watershed and advance economic opportunities for the local community.⁴ The first WIP pilot project is the TCSI, which aims to increase the pace and scale of restoration through the development and use of innovative planning, investment, and management tools in the 2.4-million-acre region. The TCSI contains priority forests for California and is the site for several state and federal restoration high priority areas.⁶

Forest restoration projects are costly. Blue Forest has the expertise to leverage financing for forest restoration projects like those in the TCSI. By combining the multiple benefits of forest restoration projects (reduced fire risk, increased carbon storage, improved water supply, etc.) with stakeholders' (Federal/State Govt, Utilities, Private Companies) willing to pay for those outcomes, Blue Forest is able to stack the value of those benefits from traditional and new stakeholders to create a Forest Resilience

Bond. The Forest Resilience Bond (FRB) is an investment vehicle that transfers the risk of large-scale forest restoration projects from risk-averse stakeholders like utilities and companies to impact investors that are willing to take on that investment risk. If the project is verified to be successful using predetermined metrics (acres treated, reduced wildfire risk, carbon sequestered, water supply protected), as evaluated by a third-party, the stakeholder will then pay back, with interest, the upfront investment of the private investor. Explicitly connecting stakeholders to ecosystem services of interest can help reduce the aggregate costs to each stakeholder and leverage scarce public dollars.¹ Blue Forest can then use this approach to help the TCSI advance large scale forest health projects.

Background:

The Tahoe-Central Sierra region includes the Lake Tahoe basin along with the American, Bear, Truckee, and Yuba watersheds. These areas provide ecosystem services to communities in the Sacramento-San Joaquin Delta and Northern Nevada while providing habitat for many unique ecosystems. The TCSI combines several public and private partnerships, along with cutting edge science, to accelerate forest and watershed restoration.⁴ Blue Forest's success with their pilot project in the Yuba watershed indicates there is potential for larger-scale projects in the TCSI to benefit more stakeholders.⁶

In November 2018, Blue Forest launched its first FRB pilot project in the Tahoe National Forest's Yuba River Ranger District, which is slated for completion in 2022. Although projects traditionally take ten years or more to be completed, this pilot project has cut completion time down by 65%. The Yuba FRB captured \$4 million in investments to finance over 7,000 acres of forest restoration, including prescribed fire implementation, meadow restoration, and invasive species removal. In sum, the treatment projects will improve the health of 15,000 forested acres by reducing wildfire risk and amplifying ecosystem services. The Yuba FRB will also spur economic growth by supporting 79 new direct and indirect jobs. The 18 formal Blue Forest FRB partners include organizations such as the Tahoe National Forest, Yuba Water Agency, and National Forest Foundation. Partners are enthusiastic about the initial success of the pilot project and are interested in Blue Forest expanding project work to larger areas.² While the pilot project identified some key ecosystem services and stakeholders that would likely be the same for the TSCI, Blue Forest hopes to use this proposed project to identify additional stakeholders, such as fire districts, that may have initially been overlooked.

Equity:

Identifying and understanding stakeholder interests is a core component of this project's objective. It will be critical to include a complete range of stakeholders in the analysis and avoid only engaging with the same set of stakeholders that have traditionally been consulted in similar studies.⁷ To mitigate potential biases, Blue Forest will work closely with local groups to include a variety of communities and stakeholders, building on ten years of stakeholder engagement as part of the University of California's Sierra Nevada Adaptive Management Project (SNAMP). Importantly, this project will include groups typically underrepresented in research, such as indigenous tribes. Blue Forest wants to include the input of native peoples, such as the Nisenan tribe, and will treat indigenous tribes as co-equal to the Federal Government. Blue Forest contacts that have worked with local tribes will be utilized to effectively communicate with indigenous peoples, while respecting their boundaries.

Available data:

Because TSCI is a conglomerate of partnerships and organizations, there is a plethora of data in the area. Here are some recommended datasets for this project:

- Center for Ecosystem Climate Solutions
 - Carbon dynamics; biomass stocks, vegetation, wildfire
 - Water balance: runoff/groundwater
- Sierra Nevada Conservancy Watersheds Map
 - 25 million acre of Sierra Nevada region broken into 7 areas
 - Based on watershed boundaries; grouped by biogeography and water flows

- State Water Resources Control Board: Drinking Water Supply Service Area
 - Map showing where water suppliers are for an area
 - Useful for stakeholder mapping
- EPA: Hydrography Dataset Plus
 - Complete National Elevation Dataset (WBD)
 - Flow direction, flow accumulation, and elevation grids
- Blue Forest's List of Stakeholders in TSCI
 - Stakeholder input from previous Blue Forest projects
 - Stakeholder resources from UC SNAMP project
 - Additional stakeholders will be identified through interviews
 - Federal and state agencies, universities, NGOs, community members

Approaches/Tasks:

Stakeholder Analysis - This task would involve group members and staff interviewing 20 - 40 stakeholders and will be started through a summer internship with Blue Forest. An initial list of interviewees will be provided by Blue Forest but the majority will be found through the “snowball” method, where interviewed stakeholders will be asked to identify other parties to be contacted for an interview. Stakeholders contacted will be selected based mainly on their geography (e.g., where they live or work) and involvement in TSCI. This will be used to determine which stakeholders are interested in ecosystem services, what they value, and where in TSCI they value these services the most. It will also be used to determine where synergies and conflicts of interests are between stakeholders to promote conversation and collaboration.

Resource Assessment - This task will involve inputting data into Natural Capital's InVEST model to estimate the benefits from restoration in TSCI. InVEST is a suite of software models that natural resource professionals use to map and value ecosystem services. Because InVEST is a suite of models, it can model different ecosystem services such as carbon storage and sequestration, annual water yield, and sediment delivery ratio. It takes GIS data (.shp files) and returns maps that show results in either biophysical terms (e.g., sequestration rate) or economic terms (e.g., net present value of carbon sequestered).⁸ The group will also use the InVEST model to estimate ecosystem services under three scenarios: business as usual, partially funded restoration, and fully funded restoration.

Overall approach - Group members will conduct stakeholder interviews and geospatial resource assessment concurrently. Members will start the resource assessment analysis by focusing on the ecosystem services that have been prevalent in previous studies (e.g., carbon sequestration, water quality, water availability). However, as more interviews are conducted, members will begin to incorporate different, more niche ecosystem services based on stakeholder interest.

Deliverables - In addition to the interviewee list and interview notes, the main deliverables will be various maps. One of the main types of map will be a “map of demand” for ecosystem services. This map will identify where stakeholders are, what ecosystem services are in demand, and where these demands are. This type of map will help determine demand overlap, as well as synergies and conflicts between stakeholder groups. The second type map is a “map of supply” of ecosystem services. This will identify where high-priority ecosystem services (determined through Blue Forest data and interviews) are in TSCI. Supply maps will be created under three different scenarios: 1) business-as-usual conditions, 2) partially funded restoration, and 3) fully funded and financed restoration.

Internship:

There is funding for a paid, ten week internship with Blue Forest beginning in late June 2021. The intern is expected to perform stakeholder research, determine specific interview questions, conduct the initial set of interviews, and provide general support to the Blue Forest team.

January 21, 2021

Group Project Committee
Bren School of Environmental Science and Management
University of California, Santa Barbara

Blue Forest is pleased to support Laurel Abowd and Teague Tran's proposal "Financing Future Forests in the Tahoe Central Sierras". Blue Forest is a non-profit mission driven organization committed to finding innovative finance solutions for forest management and wildfire risk. Our Forest Resilience Bond blends the multiple benefits of forest restoration projects to leverage project financing and realize financial and implementation efficiencies to better address the critical wildfire risk California and the Western US are facing.

Our approach to innovative conservation finance is underpinned by substantive scientific research, data, and evaluation on the benefits of forest restoration including ecosystem health, reduced wildfire risk, water supply security, carbon sequestration and stability, public health, and recreation. While we have a background working with state agencies and large utilities interested in the wildfire and water related outcomes of forest management, we know we are missing many local stakeholders and capturing the other important benefits they may care about. Local communities, small water districts, tribal governments, and private companies interested in carbon neutrality are just a few of the potential groups and resources that can contribute to increasing the pace and scale of restoration activities to achieve both wildfire and climate resilience.

We are enthusiastic about the opportunity to work with a Bren group to expand our work in the Tahoe – Central Sierra and have the resources to support the group during the project period. We commit to supporting a paid summer associate for an internship with Blue Forest that will focus on both this proposed project, as well as work with the larger team developing a broad range of conservation projects. We are fully remote capable during the pandemic, with the potential for use of our co-working space in Oakland to resume if conditions allow and the intern desires (not required). Blue Forest supports transparent and open science using publicly available data, and will provide access to internal curated data sets and partner organizations who also curate relevant data for this project. Blue Forest agrees to the use of its logo in accordance with the proposal guidelines.

I am familiar with Bren teams and have interacted with a variety of group projects as an alumnus of the UC system. I am always impressed by the excellence these groups bring to different projects and am excited about the opportunity for Blue Forest to have a team that will help further our mission, while providing a learning experience we can support and build on over time.

Regards,

Phil Saksa

Phil Saksa, Ph.D.
Chief Scientist
Blue Forest

