Northeastern California Woody Feedstock Aggregation
Pilot Project

Entity Action and Long-Term Objectives Plan

Prepared for:
Fall River Resource Conservation District
44327 CA-299,
McArthur, CA 96056

Prepared by:
Forest Creek Restoration, Inc.
and
CLERE Inc.

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The following Cal FRAME Project Team members contributed to the preparation of this document:

Fall River Resource Conservation District
- Sharmie Stevenson
- Julie Allen

Consultant Team
- Todd Sloat, Forest Creek Restoration, Inc.
- Regine Miller, CLERE Inc. (Headwaters Environmental, Inc.)
- Camille Swezy, CLERE Inc. (Mule Ears Consulting)
- Christiana Darlington, Esq. Attorney at Law, CLERE Inc.
- Clarke Stevenson, The Watershed Research & Training Center
- Amy Lapin, Economic & Planning Systems, Inc.
- Kevin Zeman, Stewardship West
- Sarah Oldson, Cascade Resource Consultants, LLC
- Vance Russell, 3point.xyz
- Jason Moghaddas, Spatial Informatics Group
- Zane Peterson, Peterson Timber, Inc.
- John Romena, Romena Consulting
- Liz Esposito, Brownstein Hyatt Farber Schreck
- Lindsay Cunningham, Willis Towers Watson
- Joyce Coffee, Climate Resilience Consulting
- Sarah Heard, The Nature Conservancy
- Ben Franklin, The Nature Conservancy
- Dave Jones, Dave Jones Consulting

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ACRONYMS AND ABBREVIATIONS

(BDT)	Bone Dry Tons
(BWD)	CAL FIRE’s Business and Workforce Development Grant Program
Cal FRAME	California Forest Residual Aggregation for Market Enhancement
(CAL FIRE)	California Department of Forestry and Fire Protection
(CFIP)	California Forest Improvement Program
(EPS)	Economic & Planning Systems
(EQIP)	Environmental Quality Incentives Program
(FRREDSS)	Forest Resource and Renewable Energy Decision Support System
(GSNR)	Golden State Natural Resource
(IBP)	Index-Based Pricing
(IPA)	Intergovernmental Personnel Act Mobility Program
(JPA)	Joint Powers Authority
(LCI)	Governor’s Office of Land Use and Climate Innovation
(LTO)	Licensed Timber Operator
(MSA)	Master Stewardship Agreement
(NE CA Region)	Northeastern California Pilot Project Area
(NEPA)	National Environmental Policy Act
(NF)	National Forest
(OPM)	U.S. Office of Personnel Management
(P3)	Public-Private Partnership
(RCD)	Resource Conservation District
(SPA)	Supplemental Project Agreements
(TNC)	The Nature Conservancy
(USFS)	U.S. Forest Service
(WUI)	Wildland Urban Interface designations
(WTW)	Willis Towers Watson

EXECUTIVE SUMMARY

In recognition of the need to support existing and add new wood infrastructure, and to help overcome current market barriers to biomass utilization, the Fall River Resource Conservation District (RCD) and the Governor's Office of Land Use and Climate Innovation established the Northeastern California (NE CA) Cal FRAME Pilot Project in April 2022. The goal of this Pilot Project is to explore regional mechanisms, such as the creation of a biomass aggregation entity, that can support biomass markets, incentivize new wood processing infrastructure, and help overcome current market barriers. The NE CA Pilot Project boundary (NE CA Region) includes parts of Shasta, Lassen, Modoc and Siskiyou Counties (Figure 1).

As part of the NE CA Pilot Project, the Fall River RCD lead the Project Team in a series of tasks, including outreach and engagement with regional stakeholders, assessment of the current biomass market capacity, and evaluation of the potential biomass aggregation entity model options. The Project Team released a number of reports to accompany this process, including: 1) a Market Capacity Assessment to assess long-term average biomass market capacity under current market conditions; 2) Joint Powers Authorities Overview Report, to review options for institutionalizing a biomass feedstock sourcing model for improved biomass removal and contracting mechanisms; 3) JPA Funding Mechanisms Report, to identify funding mechanisms for a potential Joint Powers Authority; 4) California Woody Biomass Insurance Playbook, to identify market enablers and state policy options that target key insurance risks in the biomass supply chain; and 5) Analysis of FRREDSS Price Mechanism Report for if the UC Davis tool could be effective in determining long-term biomass feedstock contract prices.

Outreach activities included four stakeholder meetings and numerous interviews and small group meetings over a one-year period. While arguably the most well-developed in the State, stakeholders in the NE CA Region identified that the wood products market is unstable at times, adversely affecting the ability of forest landowners and contractors to remove material and the ability of existing facilities to meet their biomass feedstock demands. Stakeholders generally agreed that there is a need to improve the current market conditions, and also expressed enthusiasm for enhancing biomass removal activities in the NE CA Region. Many recognized that one possible way to do so would be if long-term biomass feedstock contracts were available for both emerging and existing facilities; long-term feedstock contracts could de-risk the supply chain and help facilities' secure financing.

Building from this input, the Project Team has explored formation of a Joint Powers Authority (JPA) biomass aggregation entity to support development of biomass markets, incentivize new wood processing infrastructure, and help overcome current market barriers in the NE CA Region. A close network of RCDs in the NE CA Region provide highly effective local conservation leadership within their respective districts. In view of this, RCDs were found to be the most viable model option for a future biomass aggregation JPA in the NE CA Region. This report, the Entity Action and Long-Term Objectives Plan (Plan) aims to outline a pathway to implementing a biomass aggregation entity and to provide the foundation for the future activities of the entity. This Plan is organized to:

- Affirm interest in establishing an aggregation entity
- Identify the region's assets and barriers
- Identify the regional priorities
- Recommend actions that a future biomass aggregation entity can take to make progress toward the regional priorities
- Specify the entity's long-term goals and objectives

As part of the outreach processed described above, the Project Team identified assets, barriers, and priorities related to advancing forest management and biomass utilization activities in the NE CA Region, which then serve as the basis for recommended actions for the proposed JPA to take. These are outlined as follows:

Regional Assets

1. Strong Biomass Market

California's northeast region is unique relative to other forested regions of the State in that it has a robust wood and biomass market, including seven operating sawmills and four existing biomass to energy facilities within the districts of the five participating RCDs. Continued operation of this existing infrastructure is critical to the region's ability to maintain and advance community wildfire and ecological resilience. Yet even with the existing operational infrastructure, there remains a significant volume of biomass generated under current forest management activities for which there is no outlet.

2. Well-Developed Regional Leadership [for Forest Management Activities]

The region possesses an active network of natural resource entities that coordinate the management of forest lands. These entities include collaborative groups, non-profit organizations, tribes, the private sector (including timberland owners, land managers, and licensed timber operators), and special districts (including RCDs). RCDs, in particular, provide effective local conservation leadership within their respective districts, functioning as a principal Implementing Entity to landowners and providing services to facilitate forest health and wildfire risk reduction project planning and implementation.

Regional Barriers

1. Limited Local Government Capacity [to support biomass utilization efforts]

The NE CA Region is sparsely populated with small county and city governments. Despite initial outreach to local county and city governments as part of this project, there was a limited level of engagement. The poor response is believed to be due to a lack of available staff capacity to engage, changes in leadership, and/or to concern about the ability to contribute financially to a future biomass aggregation entity. Such limited capacity can effectively prevent local governments from participating in regional forest health programming.

2. Limited Biomass Utilization Infrastructure

The number and processing capacity of the current available biomass outlets in the NE CA Region exceed that of any other part of the State yet they are still insufficient to meet current biomass disposal (CLERE Inc. 2023a; Figures 4 and 5). Often, progress on in-woods projects slows or idles for long periods of time due to lack of offtake demand. This issue is likely to exacerbate as the State and federal governments increase the pace and scale of forest treatments to meet long-term forest health and carbon goals.

3. USFS Staffing and Adaptability Challenges

Despite USFS regional priorities for meeting widespread forest restoration targets, local USFS units continued to face challenges that impede forest management and wildfire prevention activities, including inadequate funding, bureaucratic hurdles, lack of staffing and hiring challenges, and litigation. Additionally, current contracting processes hinder Implementing Entities ability to have full control over the fate of biomass generated from their projects, including purchase, storage, sale, and pricing. Without the ability to control pricing, Implementing Entities cannot respond swiftly to market fluctuations, which can affect the financial viability of biomass projects.

4. Poor Public Perception of Biomass Utilization

A subset of well-funded and highly visible environmental groups oppose biomass to energy, questioning its carbon neutrality and expressing concern about putting communities at risk. A poor understanding of biomass utilization can constrain the continuation of existing support and prevent the adoption of the new policies and programs that support market improvements, such as insurance innovations, public-private partnerships (P3) to advance biomass infrastructure, and the monetary valuation of biomass utilization co-benefits.

5. Insufficient Availability of Forest Sector Workforce

Contractors, agencies and non-profit organizations struggle to attract and retain labor and skilled personnel for forest health and fuels reduction-related work, primarily due to the small number of potential candidates within the expansive geography, the limited availability of affordable housing, and paltry amenities and services provided in rural communities. Other contributing factors include worker transiency and the high cost to enter the market.

Regional Priorities

1. Improve the Business Environment for Existing and New Biomass Utilization

Some stakeholders in the NE CA Region have prioritized strategic planning for project implementation to ensure steady supply of biomass, and to identify opportunities to lessen impacts of market changes. Other activities to pursue include leveraging public-private partnerships and gap funding to finance projects.

2. Improve USFS Relations and Capacity

Specific priorities to improve USFS relations and capacity include providing clarity for and leveraging federal contracting mechanisms, tasking partners to the USFS as Implementing Entities, using the Intergovernmental Personnel Act to staff USFS positions, and conducting third-party capacity environmental planning.

3. Support nonindustrial timberland owners and expanded programming

Non-industrial private forest landowners face challenges in forest restoration due to small, fragmented parcels and high costs, with existing incentive programs limiting commercialization of forest products which reduces landowners' ability to cover expenses. Advocacy for policy changes that allow commercialization of forest products or creation of new funding incentives can improve forest health outcomes.

4. Improve outreach and develop unified voice

The need for forest restoration and biomass utilization is often misunderstood by the public and policymakers, partly due to a lack of coordinated messaging in the forest sector, allowing misconceptions to persist. Advocating with a unified voice across all stakeholders can generate support for biomass initiatives and funding at local, state, and federal levels, while also influencing policy decisions.

Recommended Actions

In consideration of the regional assets, barriers, and priorities, a JPA consisting of regional RCDs was found to be the most viable model option for a future biomass aggregation entity in the NE CA Region. The anticipated JPA's members consist of the Fall River, Pit, Shasta Valley, Western Shasta, and Modoc RCDs (and could expand to others if desired); these special districts have expressed a desire to both maintain their current roles as independent entities and to form a JPA that will fill gaps in existing programs and support the regional priorities. This approach will allow the JPA members (the RCDs) to maintain continuity in their respective programs while also adding value to a new entity that can improve biomass supply chain logistics and advance community and ecological resilience.

The primary focus of the JPA will be to administer and manage guaranteed long-term biomass feedstock contracts between forest landowners/operators and existing and emerging end-use facilities, potentially through the use of a biomass feedstock insurance product and a biomass pricing mechanism. Other activities could include piloting a sort yard that aggregates biomass to improve material flow for both suppliers and off-takers of biomass, leveraging conservation finance, conducting outreach and advocacy, and offering legal, forestry, or environmental services to each RCD member.

Steps to Establish a Biomass Management JPA

The process to form a JPA includes establishing foundational documents and filing those documents with the relevant Local Agency Formation Commission and the Secretary of State. These documents will reflect the JPA's mission, board composition, standing committees, procurement policies, insurance requirements, and a statement that the liabilities of the JPA are not attributable to the members of the JPA.

The JPA's initial funding strategy is expected to include passive income, grants, fees for services through key function activities, and annual member contributions.

Long-Term Goals and Objectives

Through regular meetings, the prospective RCD JPA members have proposed to create a biomass management JPA that is tentatively referred to as the Shasta Pit River Biomass Alliance (the Alliance), with a preliminary mission to facilitate the removal and utilization of woody biomass from forest health projects that promote wildfire resilience. Biomass removal will be facilitated through sales of biomass owned by its members and negotiation of third-party biomass feedstock supply agreements between local buyers and sellers, while leveraging State, federal, and private investments for regional good, and improving the public understanding of biomass utilization co-benefits where appropriate.

Conclusion and Next Steps

The possibility of a public biomass aggregation entity has moved from concept phase through predevelopment since Pilot Project initiation in April 2022. The potential future JPA now sits at the doorstep of late-stage development and implementation. This report establishes the foundation for the future activities and long-term goals and objectives of the JPA, and makes specific recommendations for the formation of an entity.

Upon completion of this Plan, the Project Team will present their findings and Recommended Actions to the governing boards of each anticipated RCD member. The Project Team will then incorporate the feedback received and complete additional work to refine the JPA structure, core functions, funding mechanisms, budget, and governance. The JPA is envisioned to be ready to accept the anticipated final round of State funding as soon as June 2026 which will facilitate filing of the foundation documents and start of operations.

1.0 INTRODUCTION

1.1 Pilot Project Background and Need

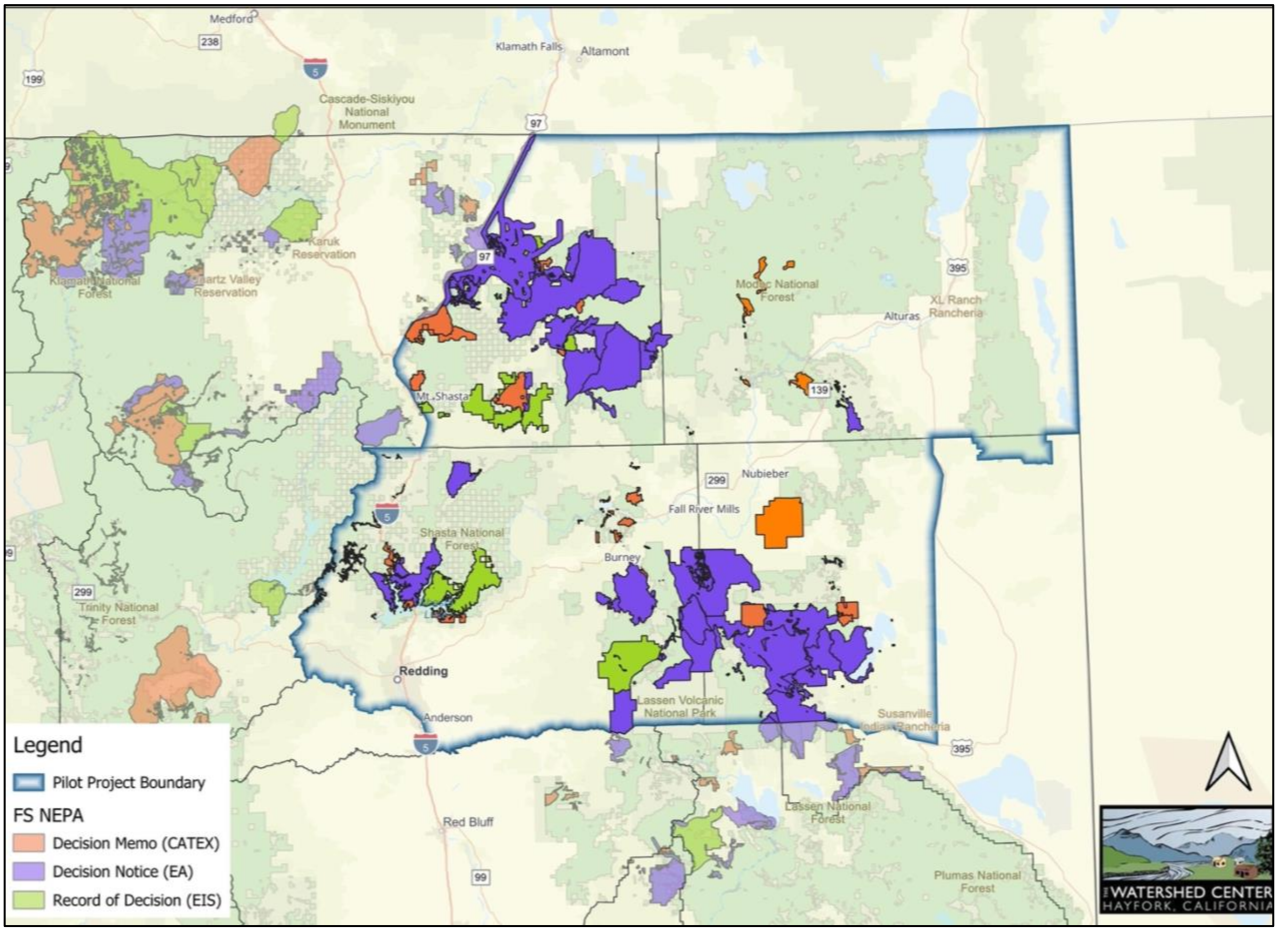
Northeastern California, including Shasta, Lassen, Modoc, and Siskiyou Counties, has numerous small and industrial businesses working to sustainably manage California's forestland, including forest restoration and fuels reduction activities across public and private lands. Despite Northeastern California's robust wood products economy, which is supported by several industrial-scale sawmills and biomass facilities, the biomass markets are still limited and volatile and biomass piles are often left in the woods to burn or decay which undermine forest management efforts to reduce wildfire risk and damage and greenhouse gas emissions.

While there is a recognized need for a strengthened biomass market to help achieve the State's forest management goals and to support forest and vegetation management activities to achieve wildfire resilience, the addition of new infrastructure to process biomass generated by forest management activities will require large investments which are typically beyond the capacity of public funding. Expansion of and innovation in the wood products market provides a pathway to integrate private capital with public investment to mobilize powerful economic drivers that create economic opportunity, reinforce sustainable forest practices, and support community-based vegetation management and fire resilience.

In recognition of the need to support existing and add new infrastructure, and to help overcome current market barriers, the Fall River Resource Conservation District (RCD) and the Governor's Office of Land Use and Climate Innovation (LCI; formerly known as the Governor's Office of Planning and Research) executed Agreement OPR21126 in April 2022 which established the Northeastern California (NE CA) Pilot Project. The goal of the NE CA Pilot Project is to explore regional mechanisms, such as creation of a biomass aggregation entity, that can support biomass markets, incentivize new wood processing infrastructure, and help overcome current market barriers. The NE CA Pilot Project boundary (NE CA Region) includes parts of Shasta, Lassen, Modoc and Siskiyou Counties (Figure 1). The NE CA Region includes significant areas of National Forest System lands for which the environmental review and approvals pursuant to the National Environmental Protection Act (NEPA) are completed (Figure 2) paving the way for forest management projects. Note that the spatial data for the Modoc National Forest is incomplete and requires further input from the USFS. The Region also includes expansive areas within the Wildland Urban Interface (WUI) which underscores the need for forest thinning and hazardous fuel reduction to protect communities and increase their fire resilience (Figure 3).

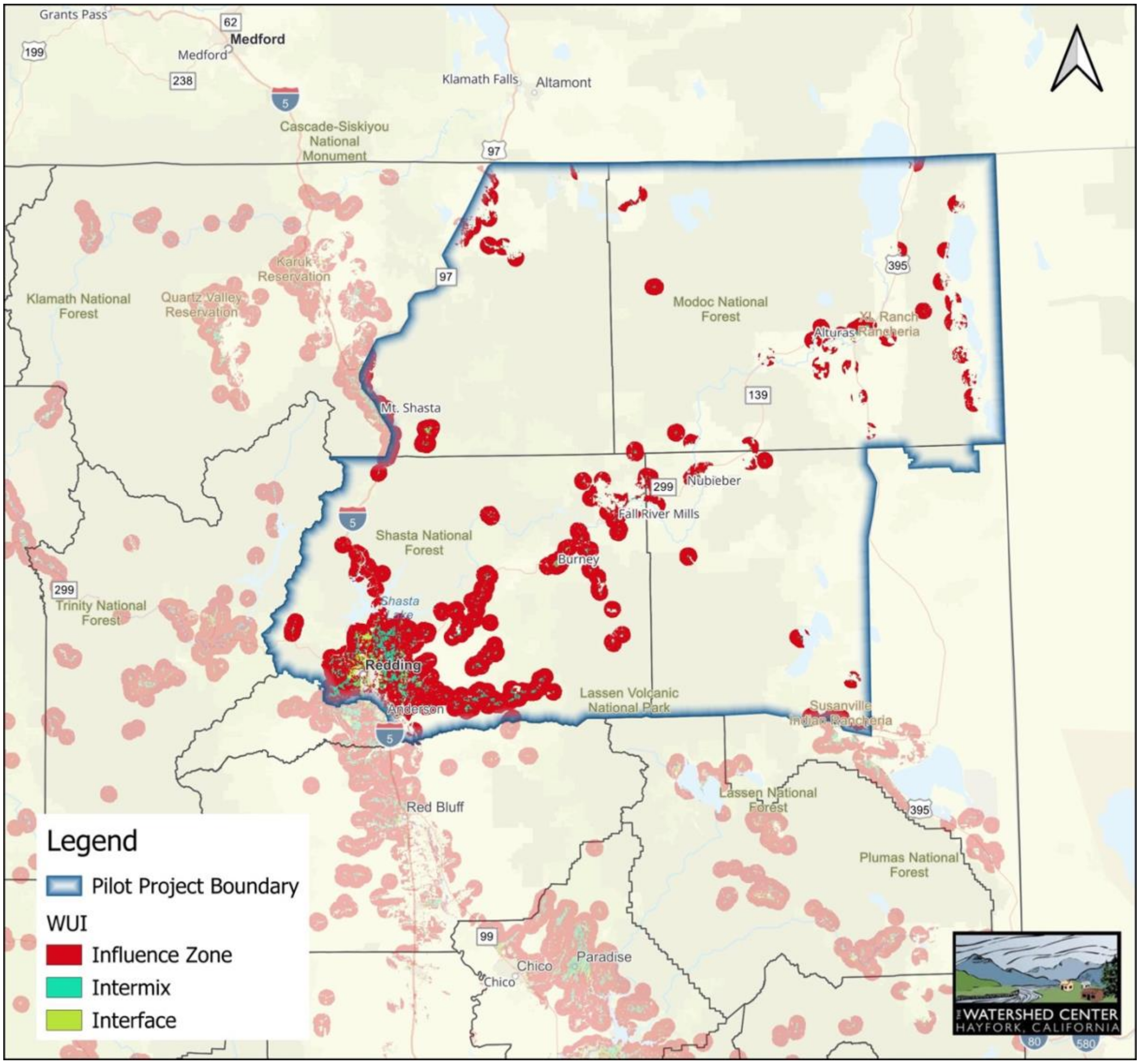
Figure 1. NE CA Region Boundary

Figure 2. U.S. Forest Service National Environmental Policy Act Planning Efforts Within the NE CA Region[1]



[1] Note that the spatial data for the Modoc National Forest is incomplete and requires further input from the USFS as the data becomes available.

Figure 3. Wildland Urban Interface Within the NE CA Region



As part of the NE CA Pilot Project, the Fall River RCD lead the Project Team in a series of tasks, including outreach and engagement with regional stakeholders, assessment of the current biomass market capacity, and evaluation of the potential biomass aggregation entity model options.

The agreement was thereafter amended in May 2023 (OPR21126), to facilitate additional State support and an expanded scope of work. Under the amended agreement, the Fall River RCD committed to: evaluating the possible funding mechanisms for a biomass aggregation entity; analyzing a pricing mechanism for long-term biomass feedstock contracts in collaboration with University of California, Davis, based on the use of the Forest Resource and Renewable Energy Decision Support System (FRREDSS) model; assessing insurance gaps within the biomass supply chain and developing recommendations for how they may be addressed; and supplying technical support for the development of Cal Poly San Luis Obispo's Feedstock Aggregation and Mapping Tool. Taken together, these activities support the State's efforts to increase wildfire and climate resilience, protect communities and enhance the forest economy.

1.2 Plan Purpose

This Entity Action and Long-Term Objectives Plan (Plan) draws from the results of the prior work conducted by the Project Team to outline a pathway to implementing a biomass aggregation entity and development of the entity's long-term goals and objectives in alignment with other regional, State and federal objectives.

The express purpose of this Plan is to provide the foundation for the immediate future activities of the entity, and to establish its long-term vision with consideration given to regional, State and federal efforts and innovative concepts developed as part of the Pilot Project. This Plan is organized to:

- Affirm interest in establishing an aggregation entity
- Identify the region's assets and barriers
- Identify the regional priorities
- Recommend actions that a future biomass aggregation entity can take to make progress toward the regional priorities
- Specify the entity's long-term goals and objectives

1.3 Pilot Project Scope of Work

Work conducted as part of the NE CA Pilot Project is described below. These tasks and studies were conducted in succession or concurrently in support of well-informed and consequential subsequent efforts. This Plan is described under "Next Steps," below.

Outreach and Engagement

As its first task, the Project Team performed extensive stakeholder outreach to engage the Fall River RCD's existing partners and to recruit new ones.

> A stakeholder is defined as any individual or entity who has an interest or involvement in any aspect of forest or community resilience or biomass utilization.

The outreach involved a diverse and large number of entities who were engaged over the course of the project, including operating and emerging wood utilization facilities, forestry and timber operators and associated businesses, non-profit organizations, local, State, and federal agencies, tribes, and others. The purpose of the outreach was to inform these stakeholders about the Pilot Project, vet project concepts and work products, and to solicit input. The results of the stakeholder engagement were critical in informing the structure and function of the biomass aggregation entity being considered under this Pilot Project. The list of participating stakeholders is included in Appendix A.

Market Capacity Assessment

The second task of the NE CA Pilot Project is the "Market Capacity Assessment", or MCA, which aims to understand and quantify long-term average market capacity for forest harvests under current market conditions (CLERE Inc. 2023a). The MCA's results indicate that there is a net availability of 409,646 bone dry tons (BDT) of un-utilized forest biomass available for which there is currently little competition from existing facilities in the region. This excess biomass could support an expansion of the market in the region. The MCA demonstrates that while the region has one of the most developed biomass markets in the Western United States, it still is unable to utilize all forest biomass generated.

Joint Powers Authorities Overview Report

The "JPA Overview: A Tool to Manage Forest Biomass Residuals in California Report" is the third task of this project (CLERE Inc. 2023b). The report provides a review of various options to institutionalize a feedstock sourcing model to support forest resilience through improved biomass removal and contracting mechanisms. Within the report, CLERE Inc. describes how Joint Powers Authorities (JPAs) are structured and function as a voluntary collaboration between multiple public agencies to handle a common or complex issue, such as forest biomass removal and utilization. The report examines various aspects of a theoretical JPA and evaluates possible model options including:

- A JPA formed to be directly involved in funding public infrastructure
- A JPA formed to provide a menu of community services
- A Wildfire Prevention Authority formed that includes forest biomass waste disposal as a circular economy measure

RCDs play a crucial role in the NE CA Region and, as the Pilot Project progressed, it became clear that they generally have a high capacity for forest management work especially when compared to the other forms of local government. Thus, the report describes how RCDs, as defined under State law, could serve as members of a JPA. After the completion and distribution of the JPA Overview Report, the Project Team engaged a core group of RCDs within the Study Area that provide regional natural resource leadership including the Fall River, Pit, Western Shasta, Shasta Valley, and Modoc RCDs, to explore the concept of a JPA biomass aggregation hub where RCDs play a management role. Direct outreach was also conducted to the Honey Lake and Lava Beds-Butte Valley RCDs but there was limited or no response.

The RCD group expressed interest in the possible pursuit of an RCD-led JPA to aggregate biomass. These special districts can maintain their current roles as independent entities and, additionally, come together to form a JPA that will support the regional priorities and fill gaps in the RCD's existing programs. Thus, a JPA consisting of RCDs was determined to be the most viable model option for a future biomass aggregation entity. The potential RCD-led JPA thereafter became primary focus of the Pilot Project including in this Plan, and the RCD group began to meet on an ongoing basis.

JPA Funding Mechanisms Report

Parallel with the RCD engagement, Economic & Planning Systems, Inc. (EPS) evaluated the potential funding mechanisms that could support a biomass aggregation JPA composed of RCDs. EPS initiated research in October 2023 and presented its preliminary findings and data synthesis to the RCD group in February 2024. EPS thereafter prepared the "Funding Options and Strategies for New Joint Powers Authority" report which informs the initial financial strategy that could support an operating JPA (EPS 2024; Appendix B). Of the main sources of funding that were identified in this study, the most feasible were determined to be passive income, grants, charges for services and enterprise revenues, and member agency contributions. A discussion of this report is in Part 5, below.

California Woody Biomass Insurance Playbook

As an accompaniment to the review of various options to institutionalize a feedstock sourcing model and their possible funding mechanisms, Willis Towers Watson (WTW) and The Nature Conservancy (TNC) completed an evaluation of insurance within the biomass supply chain in March 2024 (WTW 2024). They conducted a survey aimed to better understand the insurance coverage, gaps and risks, and the insurance needs of entities within the supply chain. WTW and TNC analyzed the survey results and prepared an Insurance Playbook which identifies both market enablers (including basic insurance training, education on credit rating and development of risk/loss control options) and State policy options such as a third party claims fund, similar to the State's FAIR Plan, that can target key insurance risks not otherwise covered by the private market, to help solve for insurance gaps and improve businesses' abilities to enter into long-term biomass feedstock contracts.

Analysis of FRREDSS Price Mechanism Report

TA further task of the project is the "[FRREDSS Price Mechanism: Utilizing bioenergy siting and economic optimization tool to support long-term feedstock procurement price management]" report which was completed in May 2024 (WRTC & UC Davis 2024; Appendix C). The report details an analysis of the FRREDSS model's effectiveness as a tool to determine long-term feedstock contract prices in a spatial environment. Sensitivity analyses were conducted for six example locations in northern California by summarizing the 20-year profit and loss statement across silvicultural and harvest types, expansion factors, and inflation rates across six site locations. When comparing the average delivered feedstock cost over the 20-year period with reported contractor rates to one of the six locations evaluated, the report found that the FRREDSS model was unable to come within 10 percent of the reported biomass pricing rates. Ultimately, it is recommended that a new biomass pricing tool be built that is customized to long-term feedstock contract price management. The report and additional supporting studies are further described below in Part 4.

Entity Action and Long-Term Objectives Plan

The final task of this Pilot Project is the Entity Action and Long-Term Objectives Plan which lays the foundation for the immediate future activities of the biomass aggregation entity and establishes long-term goals that advance concepts under this Pilot Project in alignment with previous assessment and planning efforts. The Plan is presented herein and establishes the pathway for the formation and implementation of an RCD-led biomass aggregation JPA entity. If implemented, this entity will support the removal and utilization of the significant volume of excess woody material generated in the region and advance both community and ecological resilience.

> Excess woody material is defined as wood (branches, logs or slash) residues generated by and left behind after logging or other forest management activities that is considered beyond what is beneficial for the ecosystem. Excess woody material is often accumulated in piles for later burning, potentially creating a fire hazard or hindering regeneration. Exactly what constitutes excess depends on factors like the fire risk, forest type, size class, wildlife habitat needs, and desired regeneration goals among possible other factors.

2.0 METHODS

This Plan is based upon stakeholder outreach and engagement, previous project tasks and studies as described in Part 1.3, and expert review and professional judgment. Using these methods, the Project Team identified regional assets, barriers, and priorities, and recommended actions that can reduce risk to entities in the forest biomass supply chain and help to overcome existing challenges.

When implemented, the Recommended Actions may strengthen the biomass supply chain and improve the current market conditions, supporting existing and anticipated future forest restoration and fire risk reduction activities and the beneficial use of the associated forest byproducts. Reducing business risk is expected to improve the ability of biomass suppliers and buyers (e.g., off-takers) to enter long-term (10 to 15 year) biomass feedstock contracts. In turn, this will support continued operation of existing facilities and make it possible for emerging facilities to meet credit and investment requirements.

2.1 Project Team

The Project Team consists of Sharmie Stevenson and Julie Allen of the Fall River and Pit RCDs, Todd Sloat of Forest Creek Restoration, Inc., Regine Miller of Headwaters Environmental, Inc., Camille Swezy of Mule Ears Consulting, Christiana Darlington of CLERE Inc., Clarke Stevenson of WRTC, Amy Lapin of EPS, Kevin Zeman of Stewardship West, Sarah Oldson of Cascade Resource Consultants, LLC., Lindsay Cunningham of WTW, Joyce Coffee of Climate Resilience Consulting, and Sarah Heard of TNC. Additional insight and support were provided by Vance Russell of 3point.xyz, Jason Moghaddas of Spatial Informatics Group, Zane Peterson of Peterson Timber, Inc., John Romena of Romena Consulting, Liz Esposito of Brownstein Hyatt Farber Schreck, Brad Franklin of TNC, and Dave Jones of Dave Jones Consulting.

2.2 Process and Approach

Stakeholder Engagement

Section 1.3 summarizes the Project Team's stakeholder outreach which is now further described in this section. Outreach began in Spring 2022 and involved an extensive series of one-on-one calls and interviews with biomass stakeholders in the region. This work was followed by a stakeholder group kick-off meeting in June 2022 in Redding, CA. Subsequent stakeholder group meetings took place in October 2022, March 2023, and August 2023. The large group stakeholder meetings were structured to share project progress and work products and to gather feedback. The foci of these meetings were to introduce the Pilot Project concept and need; to present and analyze the MCA approach, methods and findings; to work with stakeholders to the evaluate potential institutional arrangements for forest biomass aggregation; and to vet the development of a regional biomass pricing mechanism. In and among the large group stakeholder meetings, the Project Team conducted several interviews with key individuals and convened ad hoc committee meetings to address specific questions and issues.

Input from the large stakeholder group, key individuals, and committees played a major role in informing and guiding the progression of the Pilot Project, ultimately leading to the selection and further exploration of an RCD-led JPA biomass aggregation entity to support development of biomass markets, incentivize new wood processing infrastructure, and help overcome current market barriers in the NE CA Region.

To further explore feasibility of an RCD-led JPA, the Project Team initiated engagement with RCDs operating in the NE CA Region in July 2023. The participating RCDs include Fall River, Pit, Western Shasta, Shasta Valley and Modoc. Direct outreach was also conducted to the Honey Lake and Lava Beds-Butte Valley RCDs to assess interest in potential participation but there was limited or no response. The participating RCDs are considered the anticipated five RCD JPA members.

The Project Team made initial informal presentations to each of the participating RCD governing boards, conducted monthly small group meetings with RCD staff, and sought project document review input. Through this, the RCDs drafted the future JPA's working mission statement, identified its key functions, considered governance and member contributions, explored key questions, evaluated JPA funding mechanisms, and deliberated a possible first project.

Professional Judgement

The Project Team participated in all aspects of the stakeholder outreach and engagement, and carefully considered the input received over the course of the project. They combined this information with the previous project document findings, then applied their professional judgement to develop a set of regional priorities, Recommended Actions, and goals and objectives for the future JPA.

3.0 FINDINGS

Input received during the stakeholder engagement process from stakeholders representing a wide range of entity types affirmed the primary Pilot Project goal: to develop community wildfire and ecological resilience across the region.

The stakeholders were enthusiastic about enhancing biomass removal to improve resilience and recognized that long-term biomass feedstock contracts are one possible pathway to doing so. While arguably the most well-developed in the State, the region's wood products market is known to be unstable at times, adversely affecting the ability of forest landowners and contractors to remove material and the ability of existing facilities to meet their feedstock demands. The stakeholders generally agreed that there is a need to improve the current market conditions, and they demonstrated a shared understanding of the limitations of biomass aggregation and the concerns for impacts on the existing market.

Guaranteed, long-term biomass contracts could improve the removal of byproducts generated from forest management activities on federal lands and could support small, private landowners in their efforts to secure outlets for residuals that they may otherwise be unable to dispose of. These long-term contracts could also assist existing and emerging biomass-utilizing businesses by helping existing facilities overcome supply procurement challenges related to seasonal weather fluctuations and unexpected events, including wildfire or wildfire precaution restrictions on forest operations, and by supporting emerging facilities to meet investor finance requirements.

3.1 Regional Assets

3.1.1 Strong Biomass Market

California's northeast region is unique relative to other forested regions of the State in that it has retained a robust wood and biomass market despite the widespread contraction of the timber industry. Within the districts of the anticipated five RCD JPA members, there are seven operating sawmills and four existing biomass to energy facilities which, when taken together, support extensive ongoing forest management and a self-reliant forest economy. Continued operation of this existing infrastructure is critical to the region's ability to maintain and advance community wildfire and ecological resilience.

Yet even with the existing operational infrastructure, there remains a significant volume of biomass generated under current forest management activities for which there is no outlet, as documented in the Pilot Project's MCA (CLERE Inc., 2023a). Furthermore, an increase in volumes of biomass generated is anticipated as a result of the treatment levels required to meet the State and U.S. Forest Service (USFS) Shared Stewardship Memorandum of Understanding with Region 5, which identifies a mutual goal to increase the pace and scale of forest stewardship activities to one million acres per year by 2025, and to better protect human life, infrastructure, and ecosystems. While this surplus of material may be viewed as a barrier to community and wildfire resilience, it can also be considered an asset that supports the development of additional demand, through expansion of existing infrastructure and/or development of new biomass conversion facilities.

There are four actively developing or proposed biomass facilities located within the districts of the five RCDs, which, if implemented, could consume a meaningful portion of the available biomass, and support the end use of additional volumes of material generated as a result of future forest management activities aligned with the State's goals.

Refer to Figure 4 for the locations of existing, idle, actively developing and proposed sawmill and biomass facilities within the NE CA Region and Table 1 for a list of businesses that utilize or could utilize biomass.

3.1.2 Well-Developed Regional Leadership

The NE CA Region possesses important human assets, including an active network of mature natural resource entities that provide effective leadership. An extensive and diverse set of collaboratives, non-profit, tribal, private-sector, and special district entities fulfill a critical role in coordinating the management of federal lands as well as private industrial and non-industrial forest lands across the region. Below are some examples of the types of entities providing leadership.

Collaboratives

Frequently, forest sector players come together in collaborative groups, such as the Burney Hat Creek Collaborative, South Lassen Watershed Group, Pine Creek Coordinated Resource Management Planning Group, Modoc Resource Sustainability Group, Upper Pit River Integrated Regional Water Management Program, and the Northern Sacramento Valley Coalition. These groups represent multiple interests and entity types, who strive to achieve mutual environmental, social and/or local economic goals and objectives through cross-jurisdictional natural resource management and restoration. Collaboratives function to "connect the dots" by leveraging participant resources and achieving coordinated and often larger scale planning and implementation projects than otherwise possible. Collaborative processes also provide a forum for multiple voices to be heard and concerns to be worked through on the front end of the project planning which can avoid delays or stoppage associated with objections or litigation related to environmental review.

Figure 4. Existing, Idle, Actively Developing, and Proposed Biomass Facilities Within the NE CA Region

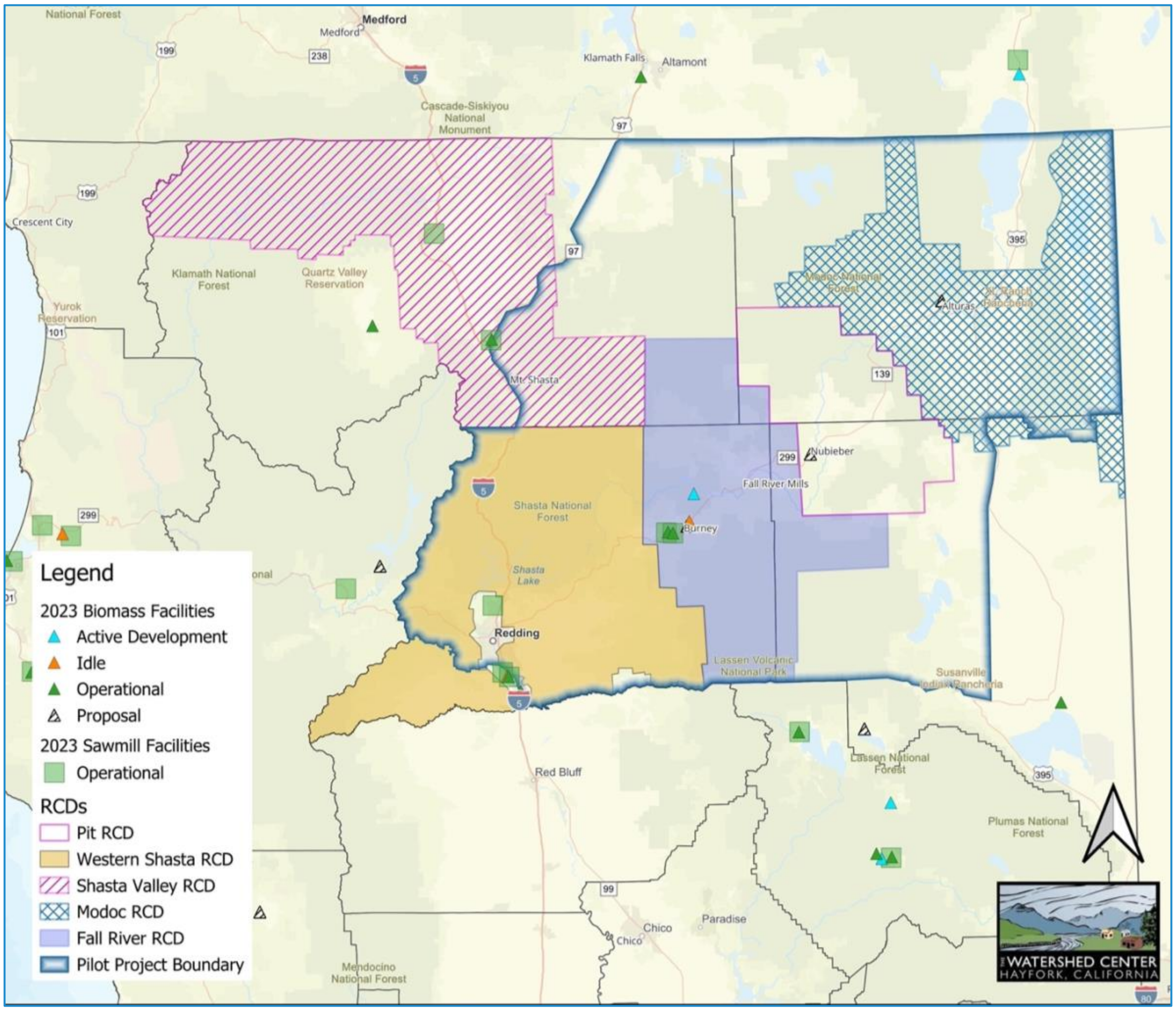


Table 1. Existing and Proposed Businesses that Utilize or Could Utilize Biomass and the Total Estimated Demand.

Name	Status	MW Nameplate	Estimated Demand in the Study Area	County
Operational Bioenergy Facilities				
Burney Forest Power	Operational	31	100%	Shasta
Collins Pine BioMAT Project	Operational	5	25%	Shasta
Honey Lake Power	Operational	31	14%	Lassen
Roseburg Forest Products Biomass Power	Operational	15	43%	Siskiyou
Shasta Sustainable Resource Management	Operational	55	70%	Shasta
Sierra Pacific Anderson Biomass Power II	Operational	30	100%	Shasta
Sierra Pacific Burney Biomass Power	Operational	20	100%	Shasta
Estimated Total Demand			794,505 BDT/yr[1]	
Proposed/Actively Developing Biomass Facilities				
Burney Bright Bioenergy BioMAT	Proposal	5 MW	100%	Shasta
Golden State Natural Resources	Proposal	---	100%	Lassen
Hat Creek Bioenergy BioMAT	Active Development	3 MW	100%	Shasta
Mt. Lassen Power	Active Development	10 MW	32%	Lassen
Estimated Total Demand			596,200 BDT/yr [2]	
Other Developing Biomass Facilities [3]				
Latona Biomass Complex	Proposed	---	108,000 BDT/yr	Shasta
Tubit Wood Yard	Proposed	---	unknown	Shasta

BDT = bone dry tons; MW = megawatt

[1] Of the total 794,505 BDT, 381,497 BDT are estimated to be forest-sourced, 402,529 BDT are sawmill residues, and 11,000 BDT are undetermined.

[2] Of the total 596,200 BDT, 512,450 BDT are estimated to be forest-sourced and 83,750 BDT are sawmill residues.

[3] Facilities does not propose to consume biomass but rather to aggregate and process it, then supply it to biomass utilization facilities.

Non-Profit Organizations

In recent years, the USFS has come to increasingly rely on non-profit organizations to fill the agency's staff and financial capacity gaps. Entities including Stewardship West, the Mule Deer Foundation, the California Deer Association, and the Lomakatsi Restoration Project (LRP), perform forest management activities under their respective agreements with the USFS and in partnership with others.

Stewardship West currently operates in California, Nevada, and Colorado where it fulfills its mission to, "engineer healthy and resilient forests with a boots-on-the-ground, action-focused approach." Within the NE CA Region, the organization holds a stand-alone stewardship agreement with the Modoc National Forest (NF) which covers implementation of the Hollenbeck Project as well as third party landscape-scale environmental planning and implementation for lands in the WUI and transportation and infrastructure corridors. The organization also provides direct assistance to both the Pit and Fall River RCDs and serves as part of their "implementation team" for projects on the Lassen and Modoc NFs under the RCD's agreements with the USFS. Stewardship West is unique in that it has a reciprocal relationship with the Fall River and Pit RCDs, providing mutual aid to overcome gaps in staffing or technical assistance and to achieve the common goal of treating as many acres as quickly as possible, including those on private industrial forest land.

The Mule Deer Foundation operates throughout North America and holds a Master Stewardship Agreement (MSA) with the USFS Pacific Southwest Region 5 (Region 5) and tiered Supplemental Project Agreements (SPAs) with several NFs in California, including the Lassen NF, for implementation of hazard fuel reduction treatments aimed at reducing brush and small diameter conifers and improving deer habitat. The California Deer Association is a statewide organization, with an intermountain chapter established in 2019 to focus on the geographic region extending from Alturas to Big Bend. The organization has MSAs with each of the Lassen, Modoc, Shasta-Trinity and Klamath NFs, among others, and conducts forest health projects to improve deer habitat and plants seed mixes that support breeding success.

Golden State Natural Resource (GSNR), a statewide non-profit organization, was formed by the Rural County Representatives of California and the Golden State Financing Authority. The Golden State Financing Authority holds a MSA with Region 5 through which it supports forest restoration and biomass removal and utilization. GSNR is developing two wood pellet manufacturing plants, one of which is in NE CA Region in Nubieber, Lassen County, CA and is planned to manufacture 700,000 BDT of wood pellets per year. In addition to the pursuit of wood infrastructure, GSNR and the Modoc NF are working together to complete the environmental planning and eventual implementation of fuel reduction treatments on timber plantations located within approximately 32,000 acres of the Big Valley and Double Head Ranger Districts.

Tribes

The Pit River Tribe is made up of 11 autonomous bands including the Ajumawi, Atsugewi, Atwamsini, Ilmawi, Astarawi, Hammawi, Hewisedawi Itsatawi, Aporige, Kosalektawi, and Madesi, and originates from parts of what is currently known as Shasta, Siskiyou, Modoc, and Lassen Counties. The Tribe, together with the LRP a non-profit organization, entered into a MSA with the Lassen, Modoc, and Shasta-Trinity NFs in 2015 for the planning and implementation of restoration activities on a portion of the Pit River Tribe's ancestral homelands. The LRP's focus is to, "advance social equity by layering education, tribal partnerships, and workforce training and development programs, while helping to create more resilient ecosystems and communities across all lands." No SPAs or projects were ever developed under this MSA which was subsequently dissolved in 2017. Despite this, the Pit River Tribes successfully expanded its workforce in preparation for future fuels reduction projects.

Private Sector

Trade associations, such as the American Forest Resource Council and the California Forestry Association represent forest management companies and wood products businesses and advocate for the management of public and private forest lands, access to material supply, and forest products manufacturing. They routinely interface with land managers in the NE CA Region, including the USFS, to support implementation of the agency's Program of Work on behalf of their members. The associations also advocate for supportive legislation and policy.

In addition to the leadership provided by trade associations, individual timberland owners and land managers and licensed timber operators (LTOs) play important roles in forest management. Prominent timberland owners and managers in the region include Sierra Pacific Industries, Shasta Cascade Timberlands, W.M. Beaty and Associates, Hearst, and Campbell Global. Mid- to large-sized LTOs, such as Tubit Enterprises, Peterson Timber, Warner Enterprises, Del Logging, and Franklin Logging, have developed strong industry partnerships with other loggers and facilities which enable them to respond quickly and flexibly to changing conditions and priorities of landowners and managers. This adaptability helps landowners achieve more forest management than would otherwise be possible.

Special Districts

A close network of RCDs that provide highly effective local conservation leadership within their respective districts exists in the region. Each of the RCDs vary in their focus and scope according to landownership and district needs and in their staffing; however, they each function as a principal Implementing Entity to landowners and provide services that facilitate forest health and wildfire risk reduction project planning and implementation. The RCDs also play a chief role in connecting landowners with other State and federal resources, and fill gaps related to grant pursuit and administration and technical services.

The Fall River and Pit RCDs hold agreements with the Lassen and Modoc NFs. They also work with private industrial landowners and with small, private forest landowners bundling small parcels together to form more sizeable projects. The agencies share one part-time Executive Director employee and contract a team of consultants. The Fall River and Pit RCDs support large scale forest health and fire prevention environmental planning and implementation, including work within the WUI, as well as planning and implementation of streambank, wildlife habitat restoration, and meadow restoration projects. The districts have a reciprocal relationship with Stewardship West, sharing the resources needed to implement as many acres as fast as possible. The Fall River and Pit RCDs conduct outreach and education through their annual McArthur Swamp school field tour, an informational booth at the Intermountain Fair, and the FireWise in the Classroom learning program.

The Western Shasta RCD primarily works with and provides technical assistant to small, private forest landowners, and employs 13.75 full-time equivalent positions. The district has a long-standing relationship with the federal Natural Resource Conservation Service, and offers environmental planning, preparation of Forest Management and Non-Industrial Timber Management Plans, wildfire risk reduction (i.e., fuel break construction, defensible space creation, and establishment of FireWise Communities), site mitigation, habitat restoration and enhancement, conservation easement report management, and outreach and education. When relevant, the RCD holds tables at local events to share information with the public on its services. Other outreach activities the RCD participates in include cleanup days with the City of Redding, hosting College Corps volunteers from Shasta College for community service hours, and hosting Shasta College interns who get college credit for helping the RCD with various tasks such as GIS services.

The Modoc RCD collaborates with private, non-industrial forest landowners directly and indirectly through the Modoc Fire Safe Council, and sustains a part-time Executive Director, Business Manager and Grant Coordinator. The district provides natural and agricultural resource services including environmental planning and conducts outreach and education often in partnership with The River Center, a non-profit organization with which it shares a Board of Directors. Outreach and education activities include environmental education at the Modoc National Fish and Wildlife Refuge and the Children's Forest Event every spring, hosting a booth at the county fair and Modoc County Agricultural Expo, performing outreach to local garden clubs and young farmers/ranchers, and general outreach to nonindustrial timberland owners for possible participation in fuels reduction projects.

The Shasta Valley RCD works with both private and public forest landowners and maintains a staff of 10 full-time equivalent positions. The district provides a range of services including environmental planning services, biological surveys, planning and implementation of forest restoration and fuels reduction projects, water quality monitoring, and prescribed fire through the Siskiyou Prescribed Burn Association. Shasta Valley RCD's outreach and education activities include hosting workshops in partnership with University of California Cooperative Extension related to post-fire forest management and forest stewardship, hosting tables at local fairs and markets to sign up private nonindustrial landowners for technical assistance, supporting Siskiyou County Department of Education with curriculum development, supporting Firewise Communities, and sponsoring the Siskiyou Prescribed Burn Association which offers workshops on prescribed fire and burn plan writing.

3.2 Regional Barriers

3.2.1 Limited Local Government Capacity

The NE CA Region is sparsely populated with small county and city governments. The Counties of Lassen, Shasta and Modoc and the Cities of Redding and Susanville were contacted as part of the initial Pilot Project outreach and Implementing Entity recruitment; however, the responses received, and the level of engagement were limited. The poor response is believed to be due to a lack of available staff capacity to engage, to changes in leadership, and/or to concern about the ability to contribute financially to a future biomass aggregation entity. Such limited capacity can effectively prevent local governments from participating in regional forest health programming, let alone playing a lead role in it.

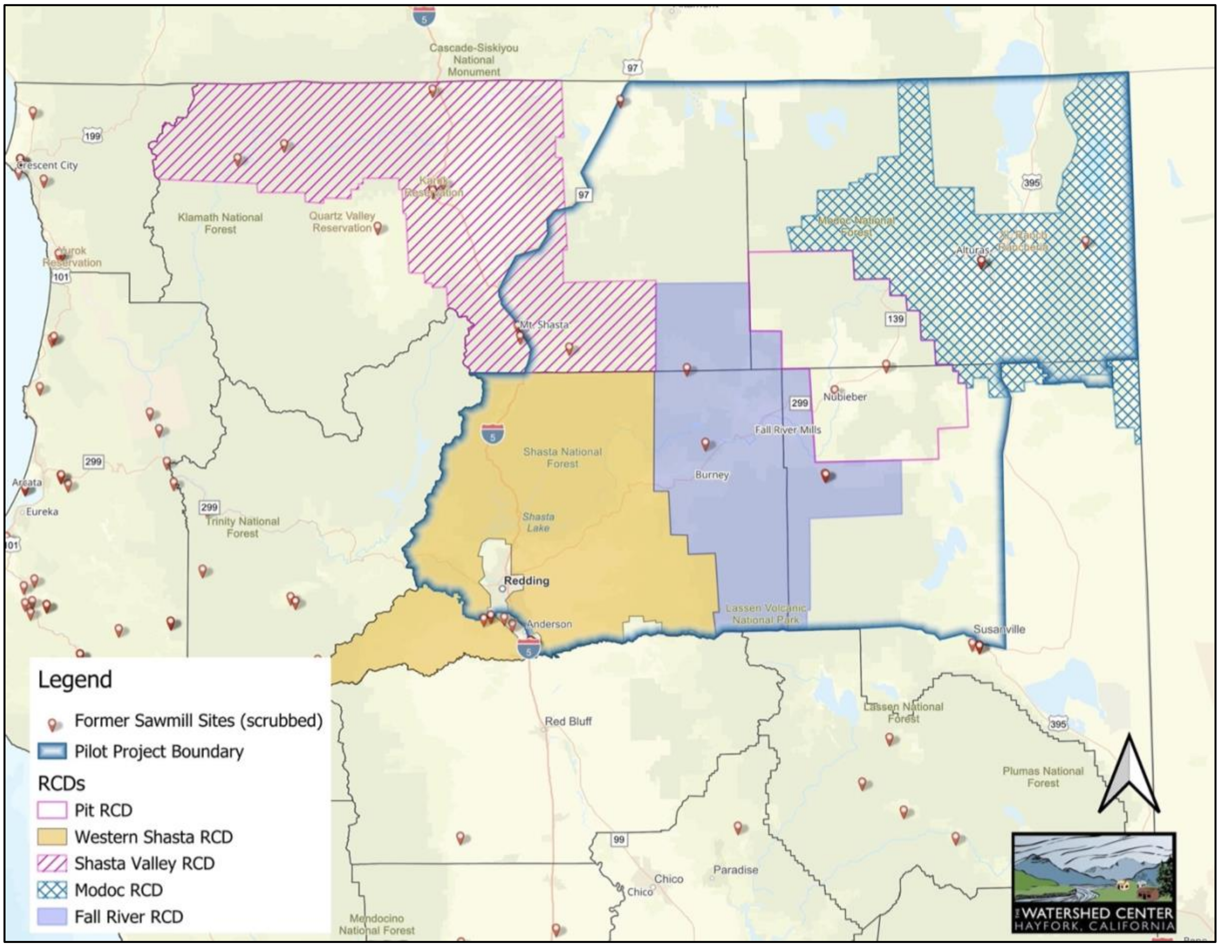
While the Counties within the NE CA Region are largely forested, they are unlike other similar parts of the State where local governments play a prominent role in regional forest health programming. None of the Counties in the NE CA Region have entered into a MSA with the USFS for environmental planning or implementation. They do not maintain staff position(s) focused on forest health and wildfire resilience and prevention, and they are not pursuing the development of biomass infrastructure, either as a lead or as an Implementing Entity.

3.2.2 Limited Biomass Utilization Infrastructure

The number and processing capacity of the current available biomass outlets in the NE CA Region exceed that of any other part of the State yet they are still insufficient to meet current biomass disposal (CLERE Inc. 2023a; Figures 4 and 5). Often, progress on in-woods projects slows or idles for long periods of time due to lack of offtake demand. This issue is likely to exacerbate as the State and federal governments increase the pace and scale of forest treatments to meet long-term forest health and carbon goals.

While efforts are underway to establish new facilities across the region, it is a lengthy path fraught with hurdles. Both the permitting process as well as the electrical grid interconnection process are complex, time consuming and require significant working capital. Even if facility pre-development is achieved, there remains the challenge of securing project finance which is often not possible due to an inability to provide investors with long-term guaranteed biomass procurement contracts for generally 75 – 80 percent of the material needs.

Figure 5. Former Sawmill Facilities Within the NE CA Region



Both State and federal governments have attempted to provide support for the continued operation of existing facilities and the establishment of new infrastructure through programs such as the California Public Utility Commission's BioRAM [SB 859 (instigated by State staff and handled by Committee of Budget and Fiscal Review, 2016)] and BioMAT [SB 1122 (Rubio, 2012)] programs. The BioRAM program was initially made into law in 2016, and subsequently modified in 2018 and 2022, requiring the use of High Hazard Zone biomass as defined by the California Department of Forestry and Fire Protection (CAL FIRE). BioRAM sets electricity pricing for large-scale facilities, all of which were established in the 1970's and 1980's, using a renewable auction mechanism. BioRAM is set to expire in 2032, unless the State legislature approves further extensions. The program has largely been a success, but the electricity pricing does not fully capture forest management and material transportation costs.

The BioMAT program was made into law in 2014 and sets electricity pricing for forest biomass to energy facilities whose net export is 3 megawatts or less. The program is well intended, but has so far proven largely unsuccessful, with only one forest biomass to energy facility (Collins Pine) achieving commercial operations within the program's first 10 years. Barriers to establishing BioMAT facilities include severe delays in the implementation of the program at the California Public Utility Commission, the 2019 PG&E bankruptcy, as well as high grid interconnection costs, thin financial margins at the 3-megawatt scale, and difficulty meeting investor requirements.

State and federal governments also offer grant programs to help strengthen and expand wood and biomass markets. Examples include CAL FIRE's Business and Workforce Development (BWD), the USFS' Wood Innovations, Community Wood Energy, and Wood Products Infrastructure Assistance Program grant programs, and the California Energy Commission's Electric Program Investment Charge which allow for private businesses to apply for and receive public funds that can be used to offset the capital and operating expenses for biomass and wood infrastructure. While any grant funds are useful and of value to the private sector, these programs are typically oversubscribed and highly competitive and can have inconsistent funding levels thereby reducing their ability to meaningfully and sustainably offset business risks.

A funding analysis of the CAL FIRE BWD program by 3point.yxz (2024) as part of the Forest Business Alliance shows that as of December 2023, over $263 million in funding requests were made but only approximately $70 million (27 percent) in grant funds were awarded. When individual BWD awards were analyzed by geographic location, the results reveal that there were a high number of applicants from Shasta, Siskiyou, Lassen, and Modoc Counties and a high number of grants awarded to these same counties, with Shasta County ranking as the second highest grant-receiving County in the State. These results are likely due to the Counties having a well-developed wood market compared to other Counties across the State.

3.2.3 USFS Staffing and Adaptability Challenges

The State and the 18 different NFs within California are challenged to effectively manage forests at the level required to meet the State and Region 5's one-million-acre strategy as outlined in the Shared Stewardship MOU, which identifies a mutual goal to increase the pace and scale of forest stewardship activities to one million acres per year by 2025, and to better protect human life, infrastructure, and ecosystems.

The USFS faces significant challenges that impede forest management and wildfire prevention efforts. Projects like the Trestle Project, intended to reduce fire hazards through controlled burns and thinning, have experienced substantial delays due to inadequate funding and bureaucratic hurdles. Over the past 15 years, the funding for hazardous fuels reduction has not matched the rising costs of wildfire management, making it difficult for the USFS to prioritize and complete essential fire mitigation work. This funding shortfall, coupled with unpredictable federal budget approvals, has led to delayed project initiation and completion, hampering proactive fire prevention measures.

Staffing issues compound these problems. The USFS struggles with hiring and retaining qualified personnel due to low pay rates and the seasonal nature of many firefighting jobs. This high attrition rate among experienced staff weakens the agency's capacity to respond effectively to wildfires and carry out forest management tasks These systemic issues within the USFS leave many communities vulnerable to increasingly severe wildfires. Addressing these problems requires consistent and adequate funding, streamlined bureaucratic processes, and improved hiring practices.

Aside from workforce capacity hurdles, there are additional complex contracting processes that presently limit the ability of partners ("Implementing Entities") to assist the USFS.

> For the purpose of this report, the terms "partner" and "Implementing Entity" are defined as a public or private entity who has entered into an agreement or contract with the USFS. In general, Partners provide a range of services such as surveys and implementing on the ground projects. Use of the term "Implementing Entity" refers to a partner who is implementing one or mor projects (i.e., fuels reduction, sawlog and biomass removal) under an agreement or contract. All the services provided by Implementing Entities are intended to support the USFS' land management goals.

The USFS is unable to enter into long-term offtake agreements due to the inability of federal agencies to act beyond the current-year budgets approved by Congress. Additionally, current contract processes hinder Implementing Entities' abilities to meet their biomass feedstock contract obligations, let alone increase the amount of biomass they can remove from federal land. For example, Implementing Entities do not have full control over the fate of the biomass generated from their projects, which includes aspects such as purchase, storage, sale, and pricing. This lack of control stems from the stringent regulations and contractual terms dictated by the USFS and other regulatory bodies, which are designed to ensure environmental protection and compliance with laws like the California Environmental Quality Act and NEPA. These regulations often require that biomass be handled in specific ways to minimize environmental impact, limiting the flexibility of Implementing Entities to make independent decisions that might otherwise optimize their operations while still protecting the environment.

The restrictions on biomass feedstock contract management also hinder Implementing Entities' abilities to meet their contract obligations effectively. Without the ability to control pricing, Implementing Entities cannot respond swiftly to market fluctuations, which can affect the financial viability of biomass projects. For instance, if market prices for biomass products drop, Implementing Entities are still bound by contractual obligations that may not reflect the current economic conditions, making it difficult to manage costs and revenues. Similarly, logistical challenges such as storage and transportation are compounded when Implementing Entities cannot autonomously decide on the most cost-effective or efficient storage or hauling methods. This lack of operational flexibility often leads to increased costs and delays, further complicating the Implementing Entity's ability to fulfill contract terms. In addition, the broader lack of recognition of the challenges related to the costs and logistics of material transportation to distant facilities adds expense and operational hurdles, making it less feasible to remove larger quantities of biomass.

Yet another challenge pertaining to USFS contracting is determining product value in partnerships like MSAs and Good Neighbor Authority, as this involves a formal process to set rates for sawtimber and biomass that does not reflect the nature of the activities that are not-for-profit. The USFS defines fair market value as the price at which timber would sell between informed and willing parties, considering factors such as timber type, quality, quantity, sale timing, best use, location, and market conditions.

3.2.4 Poor Public Perception of Biomass Utilization

Biomass utilization today contends with a negative public perception that stems from the legacy of large, biomass combustion facilities operating in the 1970's - 1990's that were sited in disadvantaged and low-income communities in the Central Valley that were vulnerable to air emissions from these facilities. A subset of well-funded and highly visible environmental groups oppose biomass to energy, questioning its carbon neutrality and expressing concern about putting communities at risk. Advocates of biomass utilization frequently encounter public resistance regarding facility size, with some individuals or groups supporting "small-scale" or "community-scale" biomass projects but opposing larger facilities or the eventual use of the commodities produced.

The forest sector is diverse and has struggled to coordinate across entity types to develop key messages and a compelling public narrative that responds to these criticisms and demonstrates the importance and sustainability of biomass utilization. Work performed to improve wildfire resilience, to protect communities, to recover from severe wildfires, and to expand and develop biomass infrastructure is often supported by public grant funds which do not allow advocacy, thus restricting funding for a public campaign.

The need for biomass utilization and the associated fire risk reduction and co-benefits, including net emission reductions, protected air and water quality, job creation and economic “spinoff”, and avoided wildfire costs, are complex and often not easily understood by policy makers and the public. This is compounded by the fact that it is not practical to describe biomass utilization in the short sound-bites society has become accustomed to. Urban populations often do not see the direct link between healthy forests and their day-to-day lives. An example of this was the initiative to support California's State parks through Assembly Bill 1589, also known as the California State Park Stewardship Act of 2012, which proposed a voluntary contribution system, and faced several significant hurdles that limited its effectiveness. A major challenge was its dependence on voluntary contributions instead of a mandatory tax or fee. The bill aimed to foster public support by allowing taxpayers to make voluntary contributions through their tax returns, avoiding a compulsory financial burden on residents. However, this approach resulted in uncertain funding, as it relied heavily on taxpayers' willingness to contribute additional amounts. Voter dissociation regarding natural resources in the context of Assembly Bill 1589 arose from skepticism towards government policies and a perceived disconnect between voter influence and policymaking. Many voters did not see direct benefits from conservation efforts, especially when these efforts were focused on resources geographically distant from their communities.

Public perceptions of biomass utilization for energy or products vary widely among different stakeholders. While some see it as a sustainable and useful energy source, others view it as detrimental to the environment and even equate it to fossil fuels like coal. This conflict is often rooted in a lack of comprehensive understanding of science, and mixed communications about the benefits and drawbacks of biomass energy that come from different sources.

Concerns also exist about the carbon neutrality of biomass and the long timeframe that is needed to see benefits from fuel reduction work (assuming a low fire return interval). Some are also concerned that such activities will be an excuse to practice more aggressive forest practices that are needed for fire protection, and lead to the commercialization of large diameter trees or other unsustainable timber practices. The fact is that there are substantial regulations protecting forests in California, and appropriately scaled technologies that have advanced emissions controls are available and can protect against these concerns.

A poor understanding of biomass utilization by legislators and the public can constrain the continuation of existing support (e.g., BioRAM, BioMAT or CAL FIRE BWD grant program) and prevent the adoption of the new policies and programs that support market improvements, such as insurance innovations, public-private partnerships (P3) to advance biomass infrastructure, and the monetary valuation of biomass utilization co-benefits.

3.2.5 Insufficient Availability of Forest Sector Workforce

A lack of available contractors and workforce limit project planning, in-woods activities, and biomass removal within the NE CA Region. Forest contractors can be in short supply and, even if secured, a contractor's availability to complete a project may be disrupted by externalities, such as the need to pivot to unexpected wildfire suppression and recovery efforts, by end-use facilities temporarily closing and/or curbing feedstock, or by contractor's inability to meet client insurance requirements (refer to WTW 2024 for more detail).

Contractors, agencies and non-profit organizations struggle to attract and retain labor and skilled personnel primarily due to the small number of potential candidates within the expansive geography, to the limited availability of affordable housing, and to paltry amenities and services provided in rural communities. Other contributing factors include worker transiency and the high cost to enter the market (e.g., equipment and insurance costs). The reader is referred to the Forest Sector Workforce Study Report prepared for the California Forest Resilience and Wildfire Task Force which fully explores these issues (Center for Economic Development 2021).

3.3 Regional Priorities

To address the above list of barriers, a set of Regional Priorities has been identified. While not exhaustive, these priorities are of the greatest interest by stakeholders and viewed as most feasible by the Project Team. The priorities largely include revising current processes and tasking stakeholders, including collaboratives, non-profits, private industry, RCDs, and tribes, in the region with more responsibility. While any one of these priorities may be considered alone, approaching them in combination through one or more stakeholders will more comprehensively overcome the barriers and accelerate the region's ability to achieve its forest management goals and improve biomass outcomes.

The Regional Priorities that have been identified include:

- Improve the business environment for existing and new biomass utilization
- Improve USFS relations and capacity
- Support nonindustrial timberland owners and expanded programming
- Improve outreach and develop unified voice

3.3.1 Improve Business Environment for Existing and New Biomass Utilization

Promote Strategic Project Planning

Stakeholders in the NE CA Region are working hard to reduce excess fuel loading in forests across land ownerships, particularly given the impacts of recent large-scale catastrophic wildfires on forests and communities. However, the creation of "shovel ready" forest projects (e.g., ready for implementation) does not necessarily guarantee their implementation. This is demonstrated by multiple implementation projects that have sat idle for long periods of time due to a lack of demand by the outlets in the region.

The volume and duration of a feedstock contract depends upon the demands of the off-taker (the buyer). Simply put, a smaller facility requires less volume, and a larger one requires more. Given there are multiple operating biomass facilities and sawmills in the NE CA Region, ensuring that all existing facilities have an adequate feedstock cover ratio could support sustainable expansion of biomass utilization infrastructure. An adequate feedstock cover ratio is considered to be 2:1, or the volume of biomass potentially available within a facility's fuel shed should be twice the demand of the facility.

To achieve an adequate feedstock cover ratio, many stakeholders in the region have used the following strategies in planning their projects:

1. Develop smaller forest management projects on a regular basis to generate a steady supply of material that supports the continued viability of existing facilities.
2. Develop landscape-scale projects that will provide much larger volumes of feedstock to demonstrate that adequate cover ratios exist for new facilities.

The first strategy typically consists of projects under 3,000 acres that require less complex and time-consuming environmental compliance and permitting. The second strategy typically consists of projects covering tens of thousands of acres (e.g., 50,000 - 100,000 acres), are located on NF System lands, and can easily take three to five years to complete the planning process. While the landscape-scale approach may take considerable time to implement, it results in feedstock volumes generated which can be used to demonstrate how cover ratios exceed the capacity of existing facilities, thereby demonstrating the need for new facilities while limiting the potential adverse impacts to existing operating facilities' cover ratios.

Identify Opportunities to Lessen Impacts of Market Changes

Flexibility and quick decision-making are vital to managing biomass seller's and buyer's workflow when market conditions rapidly change, or when federal bureaucratic decision-making processes and procurement policies or State regulatory processes create significant delays or barriers, affecting the supply chain. Recent examples of market changes include spikes in diesel fuel prices, policy changes related to biomass utilization [e.g., the State requiring facilities to procure biomass from areas classified as High Hazard Zones through Assembly Bill 2750 (Gallagher 2024)], and unexpected temporary closing or curbing of feedstock by existing facilities. Such unexpected changes in the marketplace cause extreme shuffling of resources, particularly for LTOs and existing biomass facilities.

Short-term assistance to businesses can help to ameliorate the negative impacts of unexpected changes and government bureaucracy and provide a buffer until conditions settle. One opportunity for such assistance is a material sort-yard which could be developed to physically aggregate, store, and/or process material during extreme events which is discussed in Part 4, below, and in Appendix F. Other examples include developing more work opportunities in areas that allow winter operations; this would provide greater flexibility for LTOs and facilities needing to "catch up" from summer/fall delays associated with seasonal work or wildfire operating restrictions.

Leverage Public-Private Partnerships and Gap Funding

P3 models are commonly used throughout the U.S. for a variety of project types. They generally consist of a long-term arrangement between a government and private business, whereby the arrangement offers a solution to a problem the government has difficulty solving through their standard processes. The traditional P3 model involves financing government projects and services up-front through private capital, and then drawing revenue from taxpayers and/or users for profit over the course of the agreement. Solving the challenges of implementing low value forest health projects may be improved through a unique P3 model.

A potential P3 model could be established between a private business end-use facility and the USFS or other federal entities (e.g., Bureau of Land Management). For example, an emerging end-use facility could sign a long-term feedstock purchase agreement with one or more USFS Implementing Entities, like an RCD or non-profit organization, whose agreement with the USFS provides for project implementation and the removal of biomass and/or sawlogs.

Current statutes, regulations, and USFS guidance applicable to stewardship agreements do not preclude an Implementing Entity from entering into a long-term feedstock agreement with a private entity, such as a biomass facility or sawmill. USFS guidance provides that an Implementing Entity may not profit from the stewardship agreement nor may the USFS enter into agreements that "...contemplate development and sale of a product for profit, either directly or indirectly by the cooperator." Therefore, to the extent that the Implementing Entity prices the biomass and/or sawlogs sold to the private end-use facility at cost, this requirement would be met. Further, USFS guidance provides that if the Implementing Entity does realize profit, that profit may be used to fund additional service work or may be paid back to USFS as excess receipts.

Implementing Entities tasked with the responsibility to treat thousands of acres can help an emerging facility to establish and to supply their new facility. In return, the emerging facility can offer additional services and/or payments to the Implementing Entities project mission for the feedstock security they are receiving.

> Hat Creek Lumber, a developing a community-scale sawmill that will be co-located with Hat Creek Bioenergy, LLC, is pursuing a P3 model with the Fall River and Pit RCDs. The P3 structure is intended to maximize a public resource, namely small diameter sawlogs, and provide profits from the lumber sales to the RCDs to support their ongoing forest health programs. This structure is intended to help overcome the barrier of securing long-term feedstock contracts and financing.

Blending new funding sources with a P3 model is an added opportunity to further improve access to funding and scale up forest management activities. Some RCDs in the NE CA Region have signed agreements with Anew Climate, a carbon developer, to initiate gap (also referred to as stack) funding for projects that seek to reduce wildfire risk. In this agreement, voluntary purchasers of carbon credits, or companies with desires to reduce their carbon footprint, contribute money and receive avoided carbon loss benefits through reduced future wildfire risk. The process of determining carbon benefits, completing the carbon registry and issuing credits can take up to 18 months plus the additional time it may take for the credits to sell. This funding can potentially augment existing grant funds on a similar time scale as a grant and function to implement more work on the ground than otherwise possible.

3.3.2 Improve USFS Relations and Capacity

Provide Clarity for and Leverage Federal Contracting Mechanisms

It is widely recognized that the USFS is challenged to attain its forest management goals and could benefit from additional capacity and support through Implementing Entities. Clearly understanding the diverse and complex contracting methods used by the USFS to engage Implementing Entities is crucial to achieving this and promoting increased pace and scale of forest restoration work on federally managed lands. Appendix E outlines some of these contracting mechanisms (including Stewardship Contracts like G to Z and Good Neighbor Authority), each of which provides the flexibility and collaboration needed to address complex ecological challenges, enhance forest health, and reduce wildfire risks.

Understanding the nuances of each contracting mechanism is important to empower the USFS' Implementing Entities to choose the most appropriate mechanism, enabling them to navigate the process to advance forest management and restoration efforts more efficiently. This knowledge helps Implementing Entities align their strategies with USFS goals, ensuring successful outcomes and sustainable land management practices.

Clarity and agreement upon required legal constraints of the range of agreement and contract types could enable greater efficiency to permit and implement projects. The USFS can more quickly permit and implement projects on federally managed lands through its Implementing Entities using the Stewardship Authority. Region 5 leadership understands that existing directives (such as the USFS Manual and Handbook) do not provide enough clarity for local staff in implementing stewardship authority. This has caused considerable delays in various planning and implementation processes across the NE CA Region.

Similarly, many Implementing Entities in the NE CA Region struggle to find consistency among USFS staff in how policies under the Stewardship Authority are interpreted. The lack of consistency can be compounded by high employee turnover within the USFS and insufficient experience among Implementing Entities. Topics that regularly cause delays include specialist report preparation and review, development and execution of agreements, and utilization of "stewardship credits."

Additionally, the USFS contracting complexities related to determining the product value can affect Implementing Entities' control of material, including pricing and the ability to respond to market fluctuations. Partnerships like MSAs and Good Neighbor Authority involve a formal process to set rates for sawtimber and biomass utilizing a not-for-profit model. Implementing Entities in these agreements could use their own procurement policies to ensure fair market value, rather than competing for profit like traditional contractors. Service work costs, like in an Integrated Resource Service Contract or Integrated Resource Timber Contact, are estimated by the local USFS Procurement Contracting Officer and partner models based on the proposed work type. Timber and forest product values are appraised using methods from the Timber Sale Preparation Handbook and Regional guidelines. Appendix E discusses some of the commonly encountered bottlenecks that cause delays for USFS project development and the approaches to determining product value in more detail.

Task Partners as Implementing Entities

Entering into contracts and agreements with partners and using them as Implementing Entities to support the USFS can play an important role in completing forest management actions on federally managed lands. Once tasked, an Implementing Entity can use their own procurement policies for contracting and, in doing so, can organize and structure the workflow that allows for long-term biomass removal agreements. Typically, it is not possible for the USFS to execute long-term biomass removal agreements due to the inability of federal agencies to act beyond the current-year budgets approved by Congress. However, USFS partnership with Implementing Entities can effectively overcome this hurdle and support market stability and expansion.

In the NE CA Region, the Fall River and Pit RCDs, Stewardship West, Mule Deer Foundation, California Deer Association, and GSNR conduct environmental planning, grant pursuit and administration, and/or project implementation in coordination with the Modoc, Lassen, and Shasta-Trinity NFs through their respective Master Stewardship Agreements, stand-alone Stewardship Agreements, and SPAs. Similarly, the Western Shasta RCD has assisted the Bureau of Land Management Redding Field Office with some of their projects through Stewardship Agreements and, more recently, through a Good Neighbor Authority which facilitated help with hazardous tree removal and other recovery efforts following the Carr Fire. These examples, as well as others from across the State and beyond, can inform how to establish more and better USFS partnerships within the study area to step up the pace and scale of environmental planning and forest treatments, improve biomass removal from the forest, and support existing and emerging biomass facilities. USFS partnerships could also be broadened from the current approach to address other key planning limitations including Implementing Entity preparation of SPAs that are tiered to MSAs, wildlife and botany Specialist Reports required for NEPA, and USFS-certified silviculturist reviews. Refer to Appendix D for an expanded discussion of the capabilities of Implementing Entities.

Use Intergovernmental Personnel Act to Build USFS Capacity

Across the State and within the NE CA Region, there are examples of Implementing Entities providing personnel support services to the USFS to overcome the agency's lack of capacity (CLERE Inc. 2023c). In line with these efforts, the Intergovernmental Personnel Act Mobility Program (IPA) is a federal initiative designed to facilitate temporary assignments of personnel between federal agencies and non-federal entities, including State and local governments, colleges and universities, tribal governments, and federally funded research centers. Enacted in 1970 and revised in 1997, the IPA program, managed by the U.S. Office of Personnel Management (OPM), aims to address workforce capacity issues and fill skilled positions in federal agencies. A significant revision to the Act allows federal agencies to certify eligible non-federal organizations for personnel exchanges, a task previously managed by the OPM. This change promotes greater use of the program by ensuring partnerships are mutually beneficial and serve public purposes, such as enhancing management capabilities, transferring new technologies, and involving State and local officials in federal policy development.

Once certified, organizations retain their eligibility permanently for future partnerships across the federal government. The program permits federal employees to work in non-federal organizations without losing their employee rights and benefits, and vice versa. Common exchanges include university researchers working in federal roles and federal nurses serving in academic research settings. The Act specifies eligible employee types, assignment requirements, term limits, cost-sharing arrangements, and guidelines for travel, conduct, and oversight. Federal agencies can enter IPA agreements without OPM approval, requiring only a written agreement between Implementing Entities. To assign non-federal employees to federal roles, the non-federal organization must be certified by a federal agency, which reviews relevant documentation and maintains a list of eligible entities. By leveraging programs like the IPA that support personnel services, the USFS can fill staff positions and address pinch points that otherwise slow forest project planning and implementation.

Conduct Third-Party Environmental Planning

Large landscape-scale projects are currently being developed on the Lassen and Modoc NFs, including some through local collaboratives made up of a wide range of stakeholder types. These efforts are consistent with the regional planning strategy to develop projects that will generate a large volume of feedstock that can support adequate cover ratios for new facilities.

In the NE CA Region, the USFS' Implementing Entities are more frequently assisting with project fundraising, pre-implementation surveys, project coordination, specialist reports, and other tasks necessary complete planning and to reach a "Decision" that complies with the NEPA. Implementing entity-assisted environmental planning could be used as a stand-alone approach or in combination with personnel support services through the IPA to supercharge the USFS' ability to meet their land management goals.

An example of where this is occurring in the NE CA Region is on the Modoc NF where Stewardship West is assisting with environmental planning. This NF and other regional stakeholders have expressed a desire to identify large-scale treatment strategies that quickly result in landscape resiliency and protection of high-value resources and assets. Therefore, Stewardship West, who is an Implementing Entity, is conducting third-party environmental planning for a corridor strategy to protect high-value resources and assets and to improve fire suppression and management ingress and egress. Stewardship West has effectively increased the USFS' capacity to complete NEPA resulting in more "shovel-ready" acres than would otherwise be possible. Additionally, the acres cleared through NEPA are expected to be highly cost effective to treat given their proximity to corridors and ease of access.

3.3.3 Support Non-industrial Timberland Owners and Expand Programming

Non-industrial private forest landowners are a central element of advancing forest restoration work particularly in the WUI. But the feasibility of projects on this land designation can be limited by small parcel size (such as 20 acres or less) and fragmented properties, resulting in lower treatment efficiencies and increased planning and implementation costs. Non-industrial landowners also often lack the technical knowledge to implement forest management activities, and hiring a Registered Professional Forester to develop planning documents or CAL FIRE timber harvesting documents can be costly. This is especially the case when a landowner's goal is to implement fuels reduction treatments where removal of biomass and small-diameter trees is the focus, which limits opportunity to sell timber to cover planning costs.

High planning and implementation costs make it difficult for them to attempt forest improvements without financial incentives for small private landowners. While funding programs are available to non-industrial landowners to offset planning costs, including the California Forest Improvement Program (CFIP) and the USDA Natural Resource Conservation Service's Environmental Quality Incentives Program (EQIP), these programs have rules that can limit effective forest health outcomes. CFIP and EQIP provide financial and technical assistance to non-industrial landowners for implementing forest stewardship activities, but these programs prohibit commercialization of forest products, including biomass and sawlogs. For many forest landowners in the NE CA Region, the sale of biomass and sawlogs is often pursued not just to capture revenue, but because biomass facilities and sawmills offer an important outlet for byproducts of forest health treatments. This limitation of CFIP and EQIP therefore limits the management tools available to adequately achieve forest health goals and target stocking levels and can also limit the number of participating landowners (as landowners often desire some sort of compensation for their forest products) and subsequent acres treated. Refer to Appendix G for a more detailed discussion of this issue.

To address these shortcomings and best support non-industrial landowner use of the CFIP and EQIP programs, stakeholders in the NE CA Region should advocate for these programs to allow commercialization of forest products. Alternatively, stakeholders could prioritize efforts to create a new program or incentive that allows for commercialization of forest products from fuels treatment activities, such as creation of a "forest stewardship fund" that can pay for forestry costs and/or offer a subsidy for biomass removal; a similar model to this was offered by the short-lived My Sierra Woods program, led by American Forest Foundation, which led to strong forest health outcomes for many small landowners in the NE CA Region.

3.3.4 Improve Outreach and Education and Develop a Unified Voice

The need for and benefits of forest restoration and biomass utilization can be complex to describe and not easily understood by the public and policy makers who lack a background in forest management or wildfire. This is compounded by the fact that the forest sector is not well coordinated in delivering consistent and strong messaging, which allows biomass misperceptions to continue to be perpetuated.

Advocating with a consistent and unified voice that all stakeholders (including county and city governments) can get behind can help to create critical support in urban centers and at the State and federal levels, potentially leading to legislation that promotes biomass opportunities and funding. Unified messaging may also facilitate the ability of stakeholders to provide input on consequential federal and State policy initiatives, such as ensuring California's Low Carbon Fuel Standard considers benefits of biomass utilization.

4.0 RECOMMENDED ACTIONS FOR THE JPA

Based on the Project Team's review of various biomass aggregation entity options, extensive stakeholder engagement, and the identified regional barriers and priorities, a JPA consisting of RCDs was determined to be the most viable model option for a future biomass aggregation entity. The anticipated JPA's founding members consist of the Fall River, Pit, Shasta Valley, Western Shasta, and Modoc RCDs. These special districts have expressed a desire to maintain their current roles as independent entities and, additionally, to come together to form a JPA that will fill gaps in the RCD's existing programs and support the regional priorities. This approach will allow the JPA members (the RCDs) to maintain continuity in their respective programs while also adding value to a new entity that can improve biomass feedstock chain logistics and advance community and ecological resilience.

The primary focus of the JPA will be to administer and manage guaranteed long-term biomass feedstock contracts with federal, State, and private forest landowners and existing and emerging end-use facilities, potentially through a P3 and the use of a biomass feedstock insurance product. The Recommended Actions to support community protection and forest health are listed below then further described:

- Establish long-term guaranteed biomass feedstock contracts
- Improve market economics and business environment
- Conduct outreach, education, and advocacy
- Explore additional potential services

4.1 Establish Long-Term Guaranteed Biomass Feedstock Contracts Using Feedstock Supply Insurance

A future biomass aggregation JPA could function as a P3 model, working in partnership with both private business entities (i.e., existing and emerging end-use facilities) and the USFS or other forest land managing entities, landowners, and contractors. The JPA could also work in partnership with public or non-profit organization-led end-use facilities. The JPA, for example, could enter into an agreement with the USFS and serve as an Implementing Entity assisting with project implementation including the removal of biomass by forest contractors using the JPA's procurement process. The JPA could, in turn, enter into a long-term feedstock agreement with one or more private off-takers. This arrangement could even incorporate gap funding, as described above in Regional Priority 1, to further the JPA's mission.

Biomass Contract Feedstock Supply Insurance

Biomass suppliers (e.g., forest contractors) and off-takers could both benefit from long-term biomass feedstock contracts offered by the potential future JPA. Long-term contracts could allow forest contractors to confidently bid on forest management projects knowing there is a guaranteed outlet and price for their material, resulting in an increased number of acres treated. On the other hand, emerging biomass facilities could also benefit from long-term biomass feedstock contracts which would lessen risks for investors, thereby helping developers obtain facility financing.

However, there are risks associated with both the supply and demand for biomass and its long-term availability. Some examples of supply-side risks that could affect buyers of biomass include the capacity of forest managers to plan or implement projects that generate biomass, inconsistent availability of material, and impacts of wildfire, drought, and disease to timber and biomass supply. Additional risk is associated with the administration of multiple feedstock contracts.

Implementing Entities often experience workflow challenges when federal staff are unexpectedly assigned to fire duty in the summer and fall, making them virtually unavailable. This can cause considerable disruption and increase the amount of time needed for Implementing Entities and their contractors to conduct the forest activities that generate biomass. For example, wildlife or botany pre-implementation surveys or sale administration conducted by the land managing agency may pause unexpectedly, preventing on-the-ground work from proceeding. Similar challenges occur on private lands when staff are redirected to protect the ownership timber assets during wildfire. Sudden work stoppage on forest lands can halt the generation of biomass, hindering facilities' abilities to meet their biomass demands for operations. This can be especially precarious for facilities with limited storage capacities, threatening their operations and potentially resulting in stiff utility penalties in the case of bioenergy plants.

Managing multiple feedstock contracts with small and medium sized contractors of various terms can be onerous for facilities. Maintaining fuel quality control often requires buyers to conduct field visits and to complete lab testing for things like BTU ratings, ash, and metals. If a buyer finds themself with too many contracts with different terms to manage, they may implement measures for biomass sellers to self-police chip quality (i.e., sending out their own lab test samples). While this can alleviate the buyer of some responsibility, it can decrease quality assurance and put facility operations at risk.

Demand side risks affecting suppliers of biomass could include, for example, those associated with deploying new and novel biomass technology. When newer technologies are being explored, facilities can fail to launch. Newer technologies that are commercially viable still face risks from extended downtime, which can mean inconsistent demand for biomass if those facilities have not planned their storage needs, which can then lead to facilities rejecting shipments, or even failing to pay for material under contract

One example of a large-scale bioenergy plant that did not materialize was the Red Rock Biofuels facility in Lakeview, OR (Graham Hughes 2021). The project was delayed several times because of cost overruns, technology re-engineering, technology supplier bankruptcy, COVID-related delays, and insufficient financing. In late 2020, project backers approached the Port of Morrow, nearly 400 miles away, to use some of the Port's special activity bonds to help complete the facility, according to the Lake County Examiner (2024). The Port's Commission initially approved the project but reversed the decision a few months later leading to project failure. The failure of the Red Rock Biofuels facility to establish a demand for biomass significantly impacted forest management activities in the southern Oregon area. One of the primary entities affected was the Green Diamond Resource Company, which had planned to supply biomass to the facility. Without this market, the company lost a significant revenue source that could have supported its forest management operations. Additionally, for the Lake County Resources Initiative, a nonprofit organization focused on sustainable forest management and economic development, the absence of a local market for biomass made it difficult to justify and secure funding for activities aimed at reducing wildfire risks and improving forest health. Local forest stewardship projects in Lake County, which often rely on the economic viability of biomass removal, were also indirectly affected. The lack of demand from the Red Rock facility made it less economically feasible to conduct forest thinning and fuel reduction treatments. This situation increased the cost of forest management activities, as there was no income from biomass sales to offset the expenses of removing excess woody material.

Reducing supply and demand risks is a key component of successfully establishing long-term biomass feedstock contracts in the NE CA Region (Figure 6). A primary function of the JPA will be to develop a feedstock supply insurance model that leads to insurance product availability for long term feedstock contracts.

Figure 6. The Need for Feedstock Supply Insurance

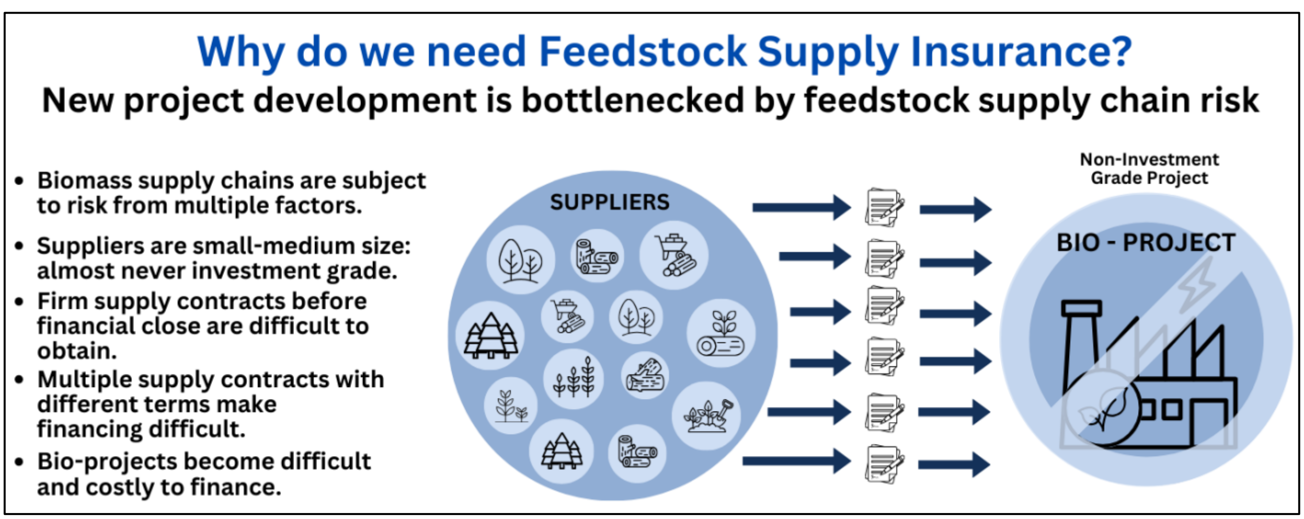


Figure credit: Ecostrat.

The JPA will likely be called upon to manage funds that will be held to reduce the risk of biomass feedstock contracts. These funds will likely be sourced from the State and kept in a “Contract Guarantee Fund” that could also provide passive income to the JPA. This fund would serve as “first in line” to accept a risk of loss up to a certain amount, as determined by the JPA and the State or other funder and could be linked to a particular off take project or could be more generally available.

Participation in a feedstock contract backed by the Contract Guarantee Fund and feedstock supply insurance may require the use of a contract template that contains a biomass pricing mechanism, to further de-risk long-term supply commitments. Use of a Contract Guarantee Fund, feedstock supply insurance, and biomass pricing mechanism are currently being explored by two of the other LCI-funded Pilot Projects pursuant to the California Forest Residual Aggregation for Market Enhancement (Cal FRAME) Program to determine the feasibility of the approach for multiple regions throughout California. The initial results are promising; however, additional evaluation is needed as further described.

The purpose of the JPA’s Contract Guarantee Fund is to soften the blow for the insurance carrier’s risk associated with business interruptions or Acts of God/emergencies (parametric insurance). Figure 7 depicts the public-private partnership feedstock supply insurance framework. This framework is intended to create a publicly backed insurance product that can be used to ensure long term feedstock contract viability.

In this framework, the JPA serves as the public manager of the Contract Guarantee Fund, and a private entity contracted to the JPA would enter into contracts with suppliers and an off taker or multiple off takers (referred to as “Supply Co”). Supply Co would be protected by the feedstock insurance policy, and essentially act as a biomass broker. Note that in some cases the JPA could hire its own staff to do this work, negating the need for a private “Supply Co.” This contract approach, whether the Supply Co is private or in-house at the JPA, will de-risk long-term contracts for both buyers and sellers of biomass and increase their willingness to commit. Shifting contract risk from individual suppliers to a single, credible counterparty (Supply Co or JPA) that issues guaranteed master supply contracts could help to lower the cost of debt for emerging facilities seeking capital and make contract administration less burdensome for facilities.

If a Supply Co is a private entity, oversight by the JPA is ideal because, as a public agency, it allows for a high degree of transparency such as tracking the use of public funds that support the Contract Guarantee Fund and, by extension, the feedstock supply insurance policy. This may be particularly important when considering accountability and verifying that insurance claims are carried out appropriately, compared to a wholly private biomass brokering framework.

Figure 7. Illustrative Example of a Public-Private Partnership with Biomass Feedstock Supply Insurance Using the JPA's Contract Guarantee Fund Combined with Insurance Underwriting

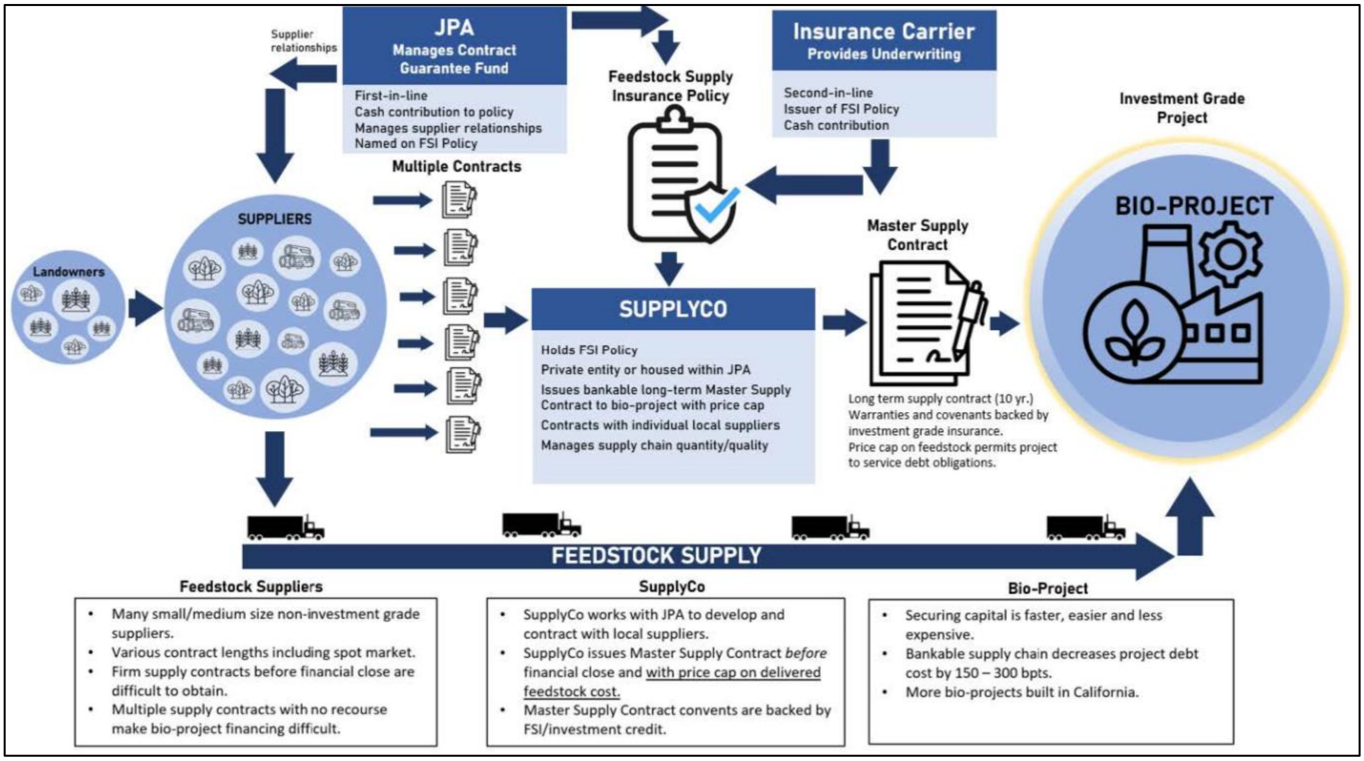


Figure credit: Ecostrat.

The JPA could assist Supply Co by managing individual biomass supplier relationships, leveraging its close working relationships with public and private forest landowners and contractors throughout the region. The JPA could further support the suppliers by offering other services identified as important by stakeholders and JPA members as part of this Pilot Project, such as conducting third-party environmental planning or operating a biomass storage yard.

An additional role the JPA could fill is to provide metrics that set the price that will be offered by the JPA if the JPA decides to manage the contracting in-house, rather than using a private Supply Co. Contracts may or may not provide for an offtake facility's total need, but, in any case, a price that both parties can agree on will be a pivotal part of any deal.

Other Cal FRAME Pilot Projects are studying various aspects of this public-private partnership with biomass feedstock insurance concept, including how to develop the Contract Guarantee Fund, and what specific insurance products will work best for this business scenario. Critical to this work, one of the Pilot Projects will produce a draft term sheet for an insurance product.

Biomass Pricing Mechanism

Due to the volatility of biomass prices, a nimble and transparent inflation-based market design can help improve price stability, reliability, and risk over time for buyers and sellers under contract. The NE CA Pilot Project Team reviewed several existing methods and mechanisms for long-term pricing in commodity markets that attempt to hedge risk for long-term contracts, but further analysis is required prior to choosing a specific mechanism-type for use by an RCD-led JPA. The types of pricing mechanisms reviewed are highlighted below.

Forward contracts, or "buying forward" is a customized contract between two parties that specifies the asset to be purchased at a later date, along with the agreed upon price. Forward contracts replicate the past when people would buy a good when it was plentiful, stockpile it, and then sell it when the supply dwindled. Establishing a forward contract allows for transparency on changes to input costs, defining economic uncertainties through an established methodology, and ensuring price changes are well understood (and agreed to) before they occur. Two forward contract types relevant to the biomass industry include formula-based rates and index-based pricing. A review of literature, conversations, and other sources on a contracting approach for long-term feedstock price management has been prepared by The Watershed Research and Training Center (2024). This research examines both formula-based rates and index-based pricing and also offers a demonstrative index-based pricing approach for forest biomass created to support discussions.

Use of a formula-based rate was also explored by the Project Team through evaluation of the Forest Resource and Renewable Energy Decision Support System (FRREDSS)- a bioenergy siting optimization model developed by the University of California, Davis which calculates a 20-year profit and loss statement based on full cost delivery of biomass to a user-defined location in the Sierra Nevada (The Watershed Research and Training Center and UC Davis 2024). If modified correctly, FRREDSS would be able to provide a multi-variable model to estimate average harvest and transportation costs to deliver biomass to a centralized location. This would support initial negotiations on year 1 prices. After year 1 prices are determined, an index-based pricing model can be applied to account for inflation-based adjustments within the term length of the contract.

Recommendations were developed to further improve the FRREDSS model for the purpose of a biomass price mechanism, however, it was ultimately determined that creation of a new tool that is better customized to the end goals of long-term feedstock contract price management may be more beneficial. Recommendations included updating the vegetation base layer, overlaying an operational feasibility analysis to limit treatments to suitable terrain, adding a basic competition analysis, identifying the proper location to apply subsidies within the decision support system, and improving the user interface.

Index-based pricing (IBP) has been a topic of consideration for long-term biomass procurement pricing across the United States and is frequently used in fuel, chemical, metals, and energy commodity markets. IBP is a transparent method for predicting and tracking price fluctuations based on key cost components that comprise the product under contract, and frequently relies on publicly available data provided by the Bureau of Labor and Statistics' Producer Price Index.

There are several ways IBPs are used based on how sensitive the product price is to a single or multiple components that make up the overall cost of the product. Without proper due diligence on price changes, companies risk margin erosion (a gradual decline in their profitability) or even contract failure. Although, keeping the formula simple and tied to as few indexes as possible will ease administrative burden and make updating indexes less complex.

A voluntary biomass pricing mechanism using an IBP could be developed and managed by the JPA to facilitate transparent and accurate biomass pricing over a 10 - 15-year period to catalyze new markets. However, a contract of this design does not need to sustain 100 percent of the feedstock demand requirement for a given facility. There may be more interest from existing facilities to use a contract of this type to satisfy 10 - 30 percent of feedstock demand for example.

Index-based pricing has been examined in the California biomass industry before. According to one feedstock broker, facilities attempted to use index-based pricing but found it to be too complicated and ultimately too opaque for contractors to be comfortable with participating. Buyers found that a simpler way to incentivize and support contractors is to bulk purchase diesel and offer below-market prices for diesel on-site in exchange for biomass. In these situations, biomass is discounted by contractors if they choose to fill their trucks up at the facility. Returning to an IBP contract design may require additional discussion and evaluation on what has been done before and where opportunities for improvement exist.

Further development of an IBP design should acknowledge that the indices selected either represent seller costs (logger or forest landowner), or buyer costs (facility). One expert review commented on the need to cover the risk of suppliers. Buyers mainly need financial obligations that relate to feedstock risk and therefore a formula would need to focus on supplier cost components. Furthermore, defining the original price baseline, determining price update intervals, and the width of the price collars will be key in determining contract function. Also, developing a strong relationship with facilities and operators in the region will help identify baseline prices.

These factors on developing an accurate and transparent price mechanism can be streamlined or further refined through the Digital Marketplace that is being developed by the WRTC in partnership with LCI and several subcontractors (refer to JPA Action 4: Additional Potential Services, below).

4.2 Improve Market Economics and Business Environment

Elevate Partnerships

While the JPA cannot quickly solve all the USFS' institutional, staffing or contracting challenges, it can begin to work together with it to make strides toward improved federal capacity and adaptability by helping to streamline bureaucratic processes and provide staff support.

The JPA and the NFs (individually or collectively) in the NE CA Region could collaborate and come to agreement on the factors that most impede workflow. Once established, these areas of agreement could be documented in each stewardship agreement, including those with the future JPA, for clarity and consistency.

The JPA should consider utilizing a stand-alone stewardship agreement or an MSA-SPA to secure the authority to assist the USFS to expand the pace and scale of forest restoration work and to facilitate resource sharing. Under any of these agreements, the JPA could complete the environmental analysis and preparation of NEPA documents under the supervision of the USFS as the responsible agency, potentially to include botany, wildlife, and silviculture specialist reports as described in Appendix D. JPA-assisted NEPA could help the USFS to more quickly complete planning and permitting of its smaller, ongoing projects as well as its larger-scale efforts which can generate biomass for use by existing facilities and improve the feedstock cover ratio for emerging ones.

The JPA could also assist the USFS with project implementation, including pursuing and administering grant funding and entering into agreements with forest contractors and resource specialists using the JPA's own procurement processes. The JPA could realize excess stewardship credits from the sale of forest products under a project that could be applied toward the same stewardship project or potentially to another stewardship agreement/project the JPA has entered into. Stewardship credits could be used alone or in combination with conservation finance and/or the carbon market (see below) to maximize the credits' impact and step-up forest management.

As the JPA matures it may hire staff in addition to an Executive Director, which it could temporarily assign to USFS positions under the IPA as described in Regional Priority 2. Lending JPA staff could begin to address key USFS personnel shortages or bottlenecks that delay project development and/or implementation. For example, USFS Grants and Agreements personnel shortages often extend the amount of time needed to review and process stewardship agreements, leaving Implementing Entities unable to assist the USFS. If the USFS had greater staff capacity and agreements with Implementing Entities were processed timelier, then

Implementing Entities could more quickly assist the USFS with project planning and implementation.

Pilot a Sort Yard

The USFS is unable to enter into long-term feedstock supply agreements which hinders the consistent stream of biomass for off-takers. What's more, the short-term flow of biomass generated from projects on NF System lands is regularly disrupted by winter weather and saturated soil conditions and forest operations shutdowns due to wildfire risk or suppression. Establishment of one or more biomass sort yards could be a strategy the JPA could use to improve material flow for both suppliers and off-takers and to increase the amount of biomass removed from federal and potentially also private forest lands.

The most efficient and common method for moving biomass from a given project to a facility is direct transport. However, this often requires some form of subsidy to offset costs when hauling distances are long. Inadequate funding often results in distant forest management projects being left untreated or the biomass from treated areas being left in the forest to decay or piled for later burning. Temporary or permanent sort yards located closer to the source of material could help to overcome this challenge.

Biomass could be transported and delivered to a sort yard in either chip or log and slash form. The former would require either a costly tip truck system at the yard or the use of self-unloading vans, which are also more costly compared to traditional chip vans. The latter is uncommon in the NE CA Region and would require new investments in transportation equipment such as a modified dump truck or log truck with specialized racks built to hold slash material. Stored chips at any sort yard will need to be monitored to ensure the material moisture levels are met to reduce flammability.

Biomass in non-chip form would require additional processing before it can be transported to an end use facility. A diversity of biomass (e.g., small trees) offers the potential to create a variety of products, including low quality and high-quality chips, posts and poles, and mulch. An integrated business model that manufactures multiple products could be developed using one or more sort yard sites and could consist of one or more ownership structures. These could include, but are not limited, to a privately owned sort yard in agreement with the JPA to accept feedstock; the JPA owning property which it then leases to a private entity to operate the sort yard, or; the JPA owning and operating the sort yard. Refer to Appendix F for an expanded discussion of these example ownership structures.

Further investigation is needed to better understand and coordinate with the existing privately owned facilities under development or operating in the region and to determine the feasibility JPA involvement in one or more biomass sort yards. Consideration should be given to potential locations, land use zoning, permit requirements, operating terms, current or anticipated implementation projects and the broader fuel shed, transportation access, operation strategies, range of services, potential revenue, community support, and offtake including biomass utilization facilities. It is also important to evaluate the pros and cons of the JPA owning biomass, if it were to exclusively possess and operate a yard.

Leverage Conservation Finance and Carbon Markets

A future JPA will require consistent and adequate funding to establish and initiate operations. Economic & Planning Systems Inc. evaluated a range of funding options and developed an initial funding strategy based on a preliminary JPA budget and input from the anticipated member RCDs, as detailed in their report (EPS, 2024) and as summarized below in Part 5.3.

In addition to the funding options that may support the JPA establishment and its start-up, the JPA could pursue conservation finance and carbon markets alone or in combination to offset the entity's operational costs and further its mission and services. Conservation finance offers a groundbreaking approach to securing long-term, sustainable finance for landscape-scale conservation and forest health projects at the landscape scale as well as for wood utilization. It fosters collaboration between private and public sectors, like a biomass aggregation JPA public-private partnership, generating sustainable funding streams to achieve multiple goals. Given these mechanisms' new and innovative approaches, trialing them on a small scale may be worthwhile to gain acceptance and proof of concept before scaling them across the Cal FRAME landscape.

1. New Finance Options

Conservation finance options include environmental impact bonds like Blue Forest's Forest Resilience Bond, which leverages private investment from impact investors to support forest health projects, with repayment to investors over time supported by beneficiaries based on the savings and benefits from reduced wildfire risks and improved ecosystem services. The JPA could utilize environmental impact bonds on a trial basis at a small scale to support forest project planning and implementation, for example as a USFS Implementing Entity, then expand as desired by the JPA over an extended period. Identifying potential payor entities interested in paying for the avoided costs of wildfire with pro-active measures, such as thinning and prescribed fire, is worth pursuing immediately or as soon as the JPA hires an executive director.

We do not recommend solely relying on impact bonds since they take a lengthy amount of time to develop and rely on a payor to provide avoided cost funding. However, a bond could be a tremendously valuable complementary funding resource to other secured revenues.

2. Collaborative Finance

Collaborative finance is a conservation finance strategy that involves cooperative interaction between individual project developers, stakeholders, and finance providers. This process may or may not include traditional financial institutions (collaborativefinance.org). The term can be broadened to include finance developed by fair and equitable participation of stakeholders in a region, landscape, or watershed to address natural resource and infrastructure management needs, utilizing multiple forms of funding from public grants to private investment. Finance approaches may include outcomes-based finance models such as environmental impact bonds. For a deeper discussion of collaborative finance approaches to financing water infrastructure in California, see Because It's Worth It. The Cal FRAME project has many aspects of collaboration that can be directed toward developing suitable public-private financing for restoration projects.

3. Carbon Markets

Carbon markets offer an opportunity for the JPA, its members, and Implementing Entities to secure gap or stack funding for on-the-ground forest management activities, such as thinning, pruning, mastication, mechanical treatment, and even prescribed burning. Revenue realized through the carbon market could help the JPA to treat more forest land than otherwise possible and generate additional biomass that could be put under feedstock contracts to support existing and emerging infrastructure. Market prices for carbon credits vary depending on a given project's size and location, treatment type, and the carbon market or registry used. Carbon credits can be realized for projects of any size and located on federal, State, and private lands.

Spatial Informatics Group and Element Markets recently developed a forecast methodology under the Climate Forward program to recognize the climate benefits associated with fuel treatment activities that lower the risk of catastrophic forest fires and their emissions. Known as the Avoided Wildfire Emissions (AWE) Forecast Methodology, this Climate Action Reserve protocol could provide complementary funding for grant-funded thinning and prescribed fire projects. The AWE Protocol differs from carbon offsets in that forecasted mitigation units (FMUs) are issued for forecasted greenhouse gas reductions or removals. FMUs are used to mitigate anticipated future emissions, such as wildfires. AWE does not require as much investment in time and calculations as other carbon market methodologies and could be a complementary source of funding to many forest health projects in the region.

If the JPA were to pursue a project within its boundaries through this methodology, it could utilize a third-party carbon developer, such as Anew Climate or New Leaf Climate Partners, to evaluate the ability of a project to avoid wildfire emissions and then register the project with the registry. Carbon credits would be issued upon the project completion and then sold, generating revenue for the JPA that could be used to support its ongoing costs. The JPA could also perform outreach and education regarding carbon markets by educating landowners on credits and connecting landowners with carbon developers to register their carbon credits.

Note that certain USFS MSAs include provisions specifying that the "Master Stewards Agreement will create and support afforestation/reforestation efforts within the National Forest System without generating carbon credits. The USFS does not make claims of permanence or any guarantees of carbon sequestration on lands reforested or afforested through the [Implementing Entities] assistance." Although this provision does not impose a blanket prohibition on the generation of carbon credits tied to restoration work implemented pursuant to MSAs, it does impose limitations associated with reforestation projects. Further, carbon offset methodologies typically require the landowner (e.g., the USFS) to provide consent and acknowledgements, including that the landowner will not report or claim the emissions reductions or removals claimed by the project; and that the landowner acknowledges that the project is being submitted to the applicable carbon offset registry. The report authors are unaware of any example projects where the USFS has agreed to provide such acknowledgements.

4. Revolving Loan Funds

Pooled funding sources such as impact bonds or revolving loan funds can help make a greater amount of funds available to more projects across a landscape. Typically offered at lower than market interest rates, revolving loan funds are self-replenishing pools of money utilizing principal and interest payments on existing loans to issue new loans. They have been used effectively on small to large scale to develop businesses, assist healthcare, and improve environmental outcomes. Revolving loan funds also provide much needed up front capital for project start-up. They are flexible and can be used with more conventional funds such as grants and loans.

For example, through a coalition of public and private partners, the Southwest Wildfire Impact Fund intends to utilize resources from private investors and revenues from biomass generated from forest thinning to offset the financial burden for wildfire mitigation in the San Juan National Forest WUI. The project fosters regional collaboration through shared project financing and implementation. It also creates the opportunity for scaling up forest treatments and fire reduction by creating a revolving loan fund that reinvests proceeds into additional projects, ensuring that capital is available for long-term re-treatment and expansion of forest health interventions.

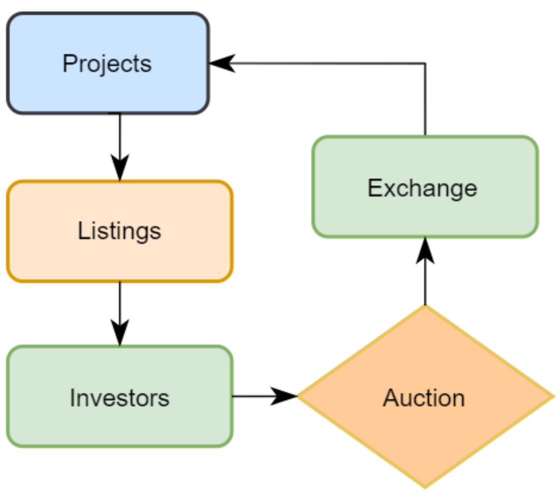
Blue Forest is operating a revolving loan fund called the California Wildfire Innovation Fund that could expand into broader support of other forest health entities. The JPA could pursue funding through this programs to support project planning and implementation or even wood utilization such as for a biomass sort yard that improves material flow.

5. Tech-based Solutions

Technology could help finance the JPA, connect payors to the JPA, and provide digital platforms that connect funders to implementers. Blockchain and digital solutions have mostly been applied to reforestation and carbon sequestration projects. It could be possible to just set up a digital marketplace or expand the one that is being developed by the WRTC in partnership with LCI (refer to JPA Action 4 below), where funders and implementers connect to implement forest health restoration and infrastructure projects.

Here is a hypothetical case to demonstrate how this could fund a JPA as illustrated below. In this case, the following steps are taken for listing a project to connect funders and implementers in a verified program platform online:

- A project implementer designs a project that a neutral third party or agency vets. The project proponent can access the listing engine and generate a project file.
- A rating company accesses the project file. The company then issues an investment recommendation.
- If approved, the project file goes to the investor pool. A limited review period, e.g., 30 days, ensues.
- After the investor review, an auction for the project occurs among pool investors.
- The project is listed on the exchange if the auction clears the reserve price.
- Project reporting ensures quality, transparency, and successful projects.



4.3 Conduct Outreach, Education, and Advocacy

One of the first steps in establishing a JPA-led communications strategy is to identify the local, regional, state, and/or federal issues requiring attention. The JPA could prioritize these issues and determine the desired outcomes for each, identify the relevant target audiences, influencers, and decision makers, establish a consistent, agreed upon, and convincing set of messages, develop an initial suite of supportive materials, and outline an implementation strategy and timeline.

As part of its outreach and education, the JPA could develop and maintain a "score card" to monitor and communicate biomass removal and utilization benefits. Monitoring could focus on fire risk reduction and community protection benefits as well as on direct economic benefits provided to the forest sector and other interconnected sectors (i.e., renewable energy, wood products, transportation, and local vendors). JPA outreach could highlight and track the social benefits of biomass removal and utilization such as creating jobs near where people live, protecting critical infrastructure, maintaining recreation opportunities, and protecting sites of cultural and historic significance. The ecological benefits of biomass removal such as facilitating forest stand heterogeneity and biological diversity and enhancing wildlife habitat, could also be tracked and communicated. Potential monitoring metrics could align with the Framework for Resilience (Manley et al. 2020) which is the basis for the State's Wildfire and Forest Health Task Force's Regional Resource Kits and mapping tool, Planscape. Lastly, Carbon Lifecycle Assessments could be completed to monitor and communicate the benefits of engineered or other durable wood products made from forest biomass.

Additionally, the JPA could develop and regularly maintain a website that informs the public about the entity's key functions and services. The site could potentially serve as a portal for the biomass suppliers and buyers under contract with "Supply Co", provide JPA meeting notice and documentation and transparent reporting including for the Contract Guarantee Fund, identify forthcoming projects, connect website users to other available resources, and make available education materials. In addition to a website, the JPA can conduct ongoing outreach and education through print and online media and presentations to local government, community organizations and groups, local leaders, forest landowner associations, and non-governmental organizations, among possible others.

The JPA's outreach and education could include a placed-based element that complements one or more of the individual member RCD's programs or initiatives. For example, the Fall River RCD has received prior authorization from Ducks Unlimited to establish a wood utilization campus, which could include a material sort yard, on a site in McArthur that is owned by the RCD and under easement by Ducks Unlimited. As part of the campus, the JPA could support or lead the establishment of an education center that serves to inform visitors about forest health, fire prevention, and the necessity of biomass removal and utilization in the NE CA Region.

Individuals, community groups, schools, and others could visit the campus and increase their understanding about the sustainability of forest ecosystems and community health.

Finally, within the NE CA Region, communities have been disproportionately impacted by increased wildfire severity and extent. These large-scale fires and other recent ones have led to broader recognition of the importance of forest health in headwaters areas to downstream communities' air and water resources. The JPA could build upon this heightened awareness and advocate State and federal legislators and policy makers for continued support and change where needed.

Potential advocacy matters of importance include allowing the commercialization of forest products generated from private nonindustrial forest lands under the CFIP and EQIP programs and/or establishing a new incentive that allows for commercialization of product such as "forest stewardship funds" that are managed by the JPA to cover forestry costs and/or offer a subsidy for biomass removal; continued and expanded grant funding for private businesses; continued support for the BioRAM and BioMAT programs; public funds that can be used to support a Contract Guarantee Fund and feedstock supply insurance.

4.4 Additional Potential Services

Feedstock Aggregation and Mapping Tool

LCI awarded grant funds to UC Davis, Cal Poly Humboldt, and Cal Poly San Luis Obispo to integrate existing forest management tools into a comprehensive feedstock aggregation and mapping tool that will serve as a digital marketplace for forest biomass. Leveraging previous State investments made by the California Energy Commission and CAL FIRE, LCI in collaboration with the technology partners, desires to integrate the existing California Biomass Residue Emissions Characterization model by Cal Poly Humboldt, the FRREDSS by UC Davis, and Track and Trace, and Off-taker Tracking services provided by Loamist, with a digital marketplace for forest biomass at Cal Poly San Luis Obispo (also known as the Resilient Sierra for Biomass Landowners website).

The biomass aggregation JPA (and the other Cal FRAME Pilot Projects) could deploy this tool to centralize information on feedstock availability, feedstock demand, other agency's bidding platforms, and average pricing throughout a given region. The tool can also be an interface for the JPA and others working on feedstock aggregation to offer package service options that could include:

- Supply contract management
- Feedstock supply insurance protection
- Track and trace services to access voluntary carbon credit markets

- Long-term price forecasting within contract agreements.

Ultimately, the Digital Marketplace is a tool to improve transparency and efficiency of the biomass supply chain to support new businesses or enhance existing businesses in a time of historic volatility.

Additional benefits of this tool are wide-ranging. Through its various user-interface portals, the Digital Marketplace could support contractors with understanding market level dynamics, workforce needs, and equipment needs, and more easily engage with buyers. The tool could also advance and incentivize fire defensible space compliance, potentially support biomass delivery schedules, track biomass inventory, and/or support the enhancement of FireWise communities. As discussed in JPA Action 2 above, a digital marketplace tool could also connect funder or payors to the JPA to support implementation of forest health restoration and biomass infrastructure projects.

By the end of 2025, the Digital Marketplace will be built, validated through user-tested workshops, and ready for widespread application. Three new features remain to be integrated into the Digital Marketplace to actualize its services and further align all projects occurring within the LCI Cal FRAME Pilot Program in the same environment. These features will be developed over the next year, and include a:

- Chain of custody tool to support the value-chain of biomass through tracking shipment of material that is compliant on voluntary carbon markets.
- Full insurance implementation feature-set that will support price negotiation, risk absorption, and quantifying the ability to guarantee feedstock.
- Spatial environment of all NEPA and California Environmental Quality Act-approved landscapes in order to better forecast biomass quantities and locations.

Environmental, Legal, and Other Technical Support Services

In addition to the JPA's core functions to manage long-term guaranteed biomass feedstock contracts, implement market enhancements, and conduct education and advocacy, the JPA could offer third party services to its members and stakeholders to affect staff or knowledge gaps that impede biomass removal and utilization. Such services could be provided by the JPA employee(s) or its contracted staff and could generate enterprise revenue (refer to Part 5). Services that were identified by the RCDs as helpful include:

- Registered Professional Forester technical assistance for project planning and environmental permitting as well as for implementation of private landowner forest management plans.

- Grant pursuit and administration services, including that for “bundled” small private parcels and/or for large-scale project planning and implementation that may be more attractive to funders and impactful on the landscape.
- Legal counsel to draft, negotiate, and support entering into agreements with federal and private forest landowners, among others.
- Landowner education related to the pursuit of carbon credits, whose sale and revenue can offset costs for fuels reduction projects and potentially achieve more work on the ground than otherwise possible. The JPA could facilitate “bundling” of multiple small private parcels in close proximity to one another, to improve the feasibility of generating credits from fuel reduction work.
- Biomass and wood infrastructure project development support services, including integrated product solutions.

Additional consideration could be given to the JPA potentially managing sawlogs alongside biomass. Projects on federal and private industrial forest lands often generate both products. JPA administration of biomass and sawlogs could potentially optimize supply chain logistics and improve the JPA’s cost and time efficiencies.

5.0 STEPS TO ESTABLISH A BIOMASS MANAGEMENT JPA

The Project Team's evaluation indicates that the majority of stakeholders are in favor of the creation of a public biomass aggregation entity that supports the existing wood market and facilities and the development of new facilities consistent with the pace and scale of forest treatments in the region. This Entity Action and Long-Term Objectives Plan considers the actions an RCD-led biomass aggregation JPA should take to support the key function of long-term biomass feedstock contracting and now applies the Project Team's professional judgment to outline a pathway for JPA entity formation.

5.1 Foundational Documents

In order for the RCDs to form a JPA, they must establish foundational documents including a Joint Powers Agreement, bylaws, and cost sharing agreement (if any). These documents will need to be drafted and then filed with the relevant Local Agency Formation Commissions and with the Secretary of State. There are some fees associated with these filings that will be required.

It is important that the foundational documents reflect the choices of the JPA's mission, board composition, and standing committees, as well as its procurement policies and insurance and a clear statement that the debts and liabilities of the JPA are not attributable to the members of the JPA. Member contributions and other foundational funding decisions are generally found in these documents, as well as how new members would be added or how the entity would be dissolved, if needed.

In the case of a biomass aggregation entity, the associated documents may reflect the existence of the Biomass Feedstock Contract Guarantee Fund, or other special funds that are expected. The documents may also specifically mention the firm position that the JPA is not to compete with its members in pursuit of grant funds, and special procedures could be drawn up to support that important aspect of the JPA.

5.2 Budget

A high-level budget has been estimated to account for the costs needed to establish the JPA and its programs and the anticipated revenue, based on the Project Team's expertise, input from the anticipated RCD members, and budgets of relevant example JPAs (Table 2). The initial JPA start-up period is expected to be three years, beginning as soon as June 1, 2026. For the purpose of this Plan, the Project Team assumes $1 million in start-up grant funding from the State.

Table 2. Proposed New Joint Powers Authority 3-Year Budget

ITEM		Year 1	Year 2	Year 3	TOTAL	% of TOTAL
REVENUE						
Contributions						
Endowment/Passive Income		$50,000	$50,000	$50,000	**$150,000**	10.0%
Contributions/gifts		$5,000	$5,000	$5,000	**$15,000**	1.0%
Member Contributions		$5,000	$5,000	$5,000	**$15,000**	1.0%
	Subtotal	**$60,000**	**$60,000**	**$60,000**	**$180,000**	**11.9%**
Grants						
Regional/JPA development grants		$27,200	$40,000	$52,800	**$120,000**	8.0%
Biz Admin		$0	$26,500	$33,500	**$60,000**	4.0%
Foundations/Corporate		$20,000	$20,000	$20,000	**$60,000**	4.0%
	Subtotal	**$47,200**	**$86,500**	**$106,300**	**$240,000**	**15.9%**
Fees for Services/Enterprise Revenues						
Implement landowner forest plans		$30,000	$40,000	$80,000	**$150,000**	10.0%
RCD grant administration		$15,000	$20,000	$30,000	**$65,000**	4.3%
Sort yard		$100,000	$150,000	$200,000	**$450,000**	29.9%
Carbon credits/AWE		$0	$10,000	$20,000	**$30,000**	2.0%
	Subtotal	**$145,000**	**$220,000**	**$330,000**	**$695,000**	**46.1%**
Operational Reserve						
Reserve to zero budget annually		$281,850	$110,472	$103	**$392,425**	26.0%
	Subtotal	**$281,850**	**$110,472**	**$103**	**$392,425**	**26.0%**
TOTAL REVENUE		**$534,050**	**$476,972**	**$496,403**	**$1,507,425**	**100.0%**
EXPENSES						
Labor						
ED (1 FTE Employee)		$125,000	$130,000	$135,200	**$390,200**	25.9%
ED Benefits (35%)		$43,750	$45,500	$47,320	**$136,570**	9.1%
Feedstock Manager (Contractor)		$60,000	$80,000	$100,000	**$240,000**	15.9%
Admin (0.25 FTE Contractor)		$25,000	$26,000	$27,040	**$78,040**	5.2%
RPF (Contractor)		$62,400	$64,896	$67,492	**$194,788**	12.9%
Legal (Contractor)		$19,800	$20,592	$21,416	**$61,808**	4.1%
Landowner ed for carbon credits (Contractor)		$7,500	$7,800	$8,112	**$23,412**	1.6%
Accountant/taxes (Contractor)		$1,000	$3,000	$5,000	**$9,000**	0.6%
	Subtotal	**$344,450**	**$377,788**	**$411,580**	**$1,133,818**	**75.2%**
Operations						
JPA LAFCO and Sec State Filing fees		$30,000	$0	$0	**$30,000**	2.0%
Audit (Contracted)		$0	$15,000	$0	**$15,000**	1.0%
Legal fees (Contracted)		$10,000	$10,400	$10,816	**$31,216**	2.1%
Insurance		$8,000	$8,200	$10,000	**$26,200**	1.7%
Equipment		$10,000	$1,000	$2,000	**$13,000**	0.9%
Software, phone internet		$3,600	$3,744	$3,894	**$11,238**	0.7%
Office rental/utilities		$9,000	$9,000	$9,000	**$27,000**	1.8%
Travel		$3,000	$5,000	$6,000	**$14,000**	0.9%
Bank fees		$500	$520	$541	**$1,561**	0.1%
	Subtotal	**$74,100**	**$52,864**	**$42,251**	**$169,215**	**11.2%**
Outreach						
Website, education, outreach		$2,500	$2,600	$2,704	**$7,804**	0.5%
	Subtotal	**$2,500**	**$2,600**	**$2,704**	**$7,804**	**0.5%**
Sort Yard						
Equipment		$90,000	$15,000	$10,000	**$115,000**	7.6%
Insurance		$5,000	$10,000	$10,400	**$25,400**	1.7%
Land lease		$18,000	$18,720	$19,469	**$56,189**	3.7%
	Subtotal	**$113,000**	**$43,720**	**$39,869**	**$196,589**	**13.0%**
TOTAL EXPENSES		**$534,050**	**$476,972**	**$496,403**	**$1,507,425**	**100.0%**
NET OPERATING BUDGET		**$0**	**$0**	**$0**	**$0**	-

Based upon feedback from RCD staff, this preliminary budget assumes that the anticipated JPA members will donate modest cash contributions and no in-kind resource contributions during the start-up phase. The budget also assumes there will be one full-time Executive Director employee who will lead program development, management, and administration as well as outreach, education and advocacy. The Executive Director will be supported by one part-time contracted Feedstock Manager who will manage biomass supplier relationships and biomass feedstock contract negotiations and administration. The budget supposes that the JPA support services will be limited to contracted Registered Professional Forester technical assistance, legal counsel, and private non-industrial landowner support for carbon credits, and that the JPA will not lend its workforce to federal agencies or develop reciprocal relationships with its member's partners during the initial operating period.

5.3 Funding Mechanisms

The JPA's initial funding strategy is expected to include: (1) passive income generated through the investment from the State start-up funding; (2) grants from federal and State programs as well as private foundations; (3) charges for services and enterprise revenues generated through key function activities; and (4) annual member agency contributions. Preliminary funding estimates total $534,000 in the first year, $477,000 in the second year, and $496,000 in the third year. In aggregate, initial total revenues are estimated to equal nearly $1.5 million during the first three years.

As the JPA matures, this initial funding strategy will likely evolve to support a larger portion of the expenditures on sustainable sources, including passive income, charges for services, and enterprise revenues, reducing the need for the labor-intensive and competitive pursuit of grants and gifts. Below is an overview of the initial funding sources. Refer to Appendix B for additional detail.

Passive Income

The initial start-up period is three years or roughly the anticipated grant term for the State's seed funding (June 1, 2026 - March 31, 2029). State seed funding is estimated to be $1 to $2 million. For this initial high-level budget, it was assumed $1 million in seed funding will be invested in an investment vehicle to generate passive income (interest income derived from funding invested in an investment account such as the California Cooperative Liquid Assets Securities System [CLASS]). Interest income from seed funding is estimated to represent about 12 percent of aggregated 3-year revenues.

Grants and Gifts

Most, if not all, of the funding in this category is anticipated to be obtained through the successful pursuit of federal, State, and local grants that are not in direct competition with member RCDs. Potential gifts include matching funds provided by The McConnell Foundation or its Implementing Entities or other foundations or investors to be determined during this initial phase of operations. During the initial phase of JPA operations, the Executive Director will work with the Board of Directors to determine a plan to pursue grant programs that align with JPA objectives and that do not compete with grants expected to be pursued by member agencies and provide targeted funding amounts. Grants and gifts are estimated to represent nearly 16 percent of aggregated 3-year revenues, although this percentage may be significantly higher if this category of funding represents the source of funding for the operational reserve, as noted below.

Charges for Services/Enterprise Revenues

The primary revenues supporting JPA operations will be charges for support services provided, including revenues generated from assisting with the implementation of private landowner forest management plans and providing grant and administration services to the member RCDs. In addition, enterprise revenues generated through the establishment and operation, or leasing, of a material sorting and processing yard are estimated to generate a substantial income stream for the JPA. Revenues from charges for services and enterprise revenues are estimated to represent nearly 46 percent of aggregated 3-year revenues.

Member Contributions

RCDs have preliminarily identified annual contributions of $1,000 per member per year in cash contributions. In addition, members may contribute in-kind services, such as office space. In-kind contributions may be in addition to cash contributions or in lieu of cash contributions; this is yet to be determined. Members do not anticipate contributing staff to the JPA in support of the JPA Executive Director or its Feedstock Management contractor. Direct financial contributions from member agencies are estimated to represent about 1 percent of aggregated 3-year revenues.

Operational Reserves

The revenue estimates include a substantial sum, particularly in the first year, identified as "operational reserves," which represents a gap to fund annual Phase 1 operating expenditures in full and achieve a balanced initial phase budget. The budget indicates an operational reserve amount of $282,000 in the first year and $110,000 in the second year (with a negligible amount in the third year), totaling about $392,000, in aggregate, and representing 25 percent of total revenues. The source of this funding will likely need to be obtained through grants and gifts. Highlighting this funding gap during subsequent rounds of State funding may help secure additional seed funding. Alternatively, the proposed new JPA could pursue a strategic partnership with a private foundation that aligns with the proposed new JPA's mission to provide upfront funding and meet this funding gap. Note that a balanced budget will be required for approval by the governing bodies of member agencies and the appropriate Local Agency Formation Commission at the time of JPA formation.

5.4 Plan for Contingencies

Upon its formation and operation, the JPA's unspent funds could be kept in an operational reserve or contingency fund until they reach a certain minimum percent of the operating budget and held for specific purposes. The reserve fund could be replenished and maintained at this level and used to mitigate risks according to financial policies described in the JPA's foundational documents. Contingency funds could be needed for things like shortfalls in gifts, grants or enterprise revenue or delays in grant reimbursement payments. The fund could also be used to support expanding the JPA's programs or services as desired by its governing board and as allowed in the JPA's enabling documents.

6.0 LONG-TERM GOALS AND OBJECTIVES

Through regular meetings, the RCD group has proposed to create a biomass aggregation JPA that is tentatively referred to as the Shasta Pit River Biomass Alliance (the Alliance), with a preliminary mission to facilitate the removal and utilization of woody biomass from forest health projects that promote wildfire resilience. The JPA will facilitate biomass removal and use from all land ownership types through sales of biomass owned by its members and negotiation of third-party biomass feedstock supply agreements between local buyers and sellers, while leveraging State, federal, and private investments for regional good, and improving the public understanding of biomass utilization co-benefits where appropriate.

6.1 Goals and Objectives

The specific long-term goals and objectives of the JPA as identified by the anticipated JPA members are listed below. Note that as the JPA begins its work, this list could change depending on shifts in priorities in the NE CA Region. These goals and objectives serve to guide the development of the JPA and its core functions and can provide a measure of its long-term success.

Goal 1: Facilitate removal and utilization of forest biomass from forest health projects that promote wildfire resilience

- Objective 1.1: Negotiate voluntary, guaranteed long-term biomass feedstock agreements between buyers and sellers (which could include contract insurance and a biomass pricing mechanism to limit price volatility)
- Objective 1.2: Offer additional services to support JPA members and to increase wood utilization in the region, including but not limited to:
    a. Technical assistance for environmental planning, implementation of forest management plans, development of wood infrastructure, pursuit of revenue from the sale of carbon credits, and legal counsel.
    b. Workforce capacity support to federal land managers
    c. Managing biomass price volatility
- Objective 1.3: Sell biomass owned by JPA members

Goal 2: Leverage State, federal, and private investments for regional good

- Objective 2.1: Perform advocacy at regional, State, and federal levels
- Objective 2.2: Leverage funds through grants or other means as specified in the JPA's foundational documents and that do not compete with the individual members pursuit of grants.

Goal 3: Improve public understanding of biomass utilization and co-benefits

- Objective 3.1: perform community outreach on importance of biomass utilization
    a. Establish an education center at the Fall River and Pit RCD's future wood utilization campus.

Once operational, it will be important to monitor and track successes/failures of the JPA to assess whether it is achieving the overall goal of improved ecological health and community resilience.

6.2 Alignment with State and Federal Initiatives

The JPA's goals and objectives will not only guide the future direction of the JPA, but they will also help to progress on other previous assessment and planning efforts and may involve the development of new concepts as described below.

California Wildfire and Forest Resilience Task Force

The JPA aligns with and will advance several goals from the California Wildfire and Forest Resilience Task Force (Task Force)'s Wildfire and Forest Resilience Action Plan (2021), most particularly Goal 3: Manage Forests to Achieve the State's Economic and Environmental Goals. This Pilot Project was created in response to Objective 3.10 in the plan to "Address Feedstock Barriers through Pilot Projects" so at its core, the Pilot Project and future JPA are a direct implementation of an important principle of the Wildfire and Forest Resilience Action Plan.

The Task Force recognizes that achieving the goals of the Action Plan will require mobilization of regional approaches to landscape health and resilience, and has launched Regional Resource Kits to provide a structure for assessing landscape conditions; setting objectives; planning, funding and implementing projects; and measuring progress towards social-ecological resilience. As part of these Resource Kits and Regional Frameworks, the NE CA Region is split between the Sierra Nevada Region and the Northern California Region. Irrespective of spanning these two regions, the JPA is a regional approach to aggregating biomass and could function as a stand-alone entity or potentially be part of a broader regional resource hub that coordinates JPA landscape health and resilience.

Lastly, the California Biomass Plan as part of the Wildfire and Forest Resilience Action Plan has been under development during the drafting of this Entity Action Plan Report and has not yet been released for public review. The Pilot Project Team and the proposed JPA should monitor progress of the California Biomass Plan to identify opportunities from it that may support efforts of the JPA and the NE CA Region broadly.

Joint Institute for Wood Products Innovation

The Joint Institute for Wood Products Innovation (or "Joint Institute", a committee of the Board of Forestry and Fire Protection) through its Recommendations to Expand Wood and Biomass Utilization in California (2020) offers several actions to spur wood and biomass products innovation in California. Under Goal 1.5: Forest Biomass Supply Chain Development the Joint Institute identifies challenges around long-term feedstock contracting and procurement. As the NE CA Pilot Project was launched in response to these State recommendations to create a regional strategy to develop reliable access to woody feedstock in the region, the JPA will directly support State efforts to address biomass feedstock and supply chain barriers.

Another key report released by the Joint Institute is the Advancing Collaborative Action on Forest Biofuels in California (Sanchez and Gilani 2022) that assesses potential liquid fuel types that can be generated from forest biomass and provides recommendations to policy makers to enable low carbon forest biofuels pathways. One key recommendation is to establish and support new flexible, public regional entities to overcome barriers to long-term forest biomass feedstock supply, such as the aggregation entity or JPA being pursued under this project.

CAL FIRE Wood Products and Bioenergy Program Goals and Transportation Subsidies

CAL FIRE's Wood Products and Bioenergy Program seeks to maintain and enhance the forest-sector workforce and businesses of California to promote healthy resilient forests throughout the State by supporting a diverse set of business development projects through its BWD grant program. The grant program has typically been offered biannually, depending on State funding availability and, on two occasions, has solicited applications for transportation subsidies.

In its 2023 white paper that evaluates forest biomass transportation subsidies for California, the CAL FIRE Wood Products team identifies that a well-planned transportation subsidy could facilitate the removal of additional biomass that has a low value in current forest products markets. However, it is important that the program establishes whether the goal is to increase forested acres treated or to change the fate of biomass material already slated for removal. Another key issue for biomass transportation subsidy is that it serves as the minimum cost to bridge the value of the product with the cost of production.

USFS Biomass Transportation Subsidies

In 2023, the USDA initiated the Biomass Transportation Incentive Pilot (BTIP) program which directed Inflation Reduction Act funds to a total of eight facilities, of which three are in the NE CA Region, as part of a short-term test to subsidize the haul of non-merchantable biomass from NF System lands to reduce wildfire risk. BTIP subsidies were based on the distance traveled per load of material and intended to target the hauler. The program is currently being competitively solicited as the Hazardous Fuels Transportation Assistance Grant Program and provides offsets for biomass and low-value sawlogs that otherwise cannot be removed from NF System lands due to transportation cost limitations. A final round of funding is expected to be solicited in the future but the exact timing for that is unknown.

Long term, the JPA could explore if offering a biomass transportation subsidy would be a good fit for the region to help reduce costs of transporting biomass material to facilities and to advance JPA Goal #1 of facilitating biomass removal. Additionally, the JPA may consider pursuing CAL FIRE BWD or BTIP grant funding to fund such a subsidy, thereby advancing JPA Goal #2, Leverage State, federal, and private investments for regional good, as such a project would align well with the CAL FIRE Wood Products and Bioenergy Program goals as well as those of the USDA BTIP.

The Nature Conservancy and Bain & Company Report: "Accelerating Forest Restoration"

Through its Accelerating Forest Restoration Report (2020), TNC and Bain & Company state that a considerable challenge to advancing bioenergy projects is uncertainty around biomass supply prices and low biomass prices. Industry representatives interviewed as part of this report consistently cited the need for predictable, long-term biomass supply as the most critical barrier to investing in California wood-processing infrastructure. The report's recommendations primarily focus on expanding the use of long-term stewardship contracting to increase biomass supply available from NF System lands.

Implementation of California Senate Bill 1383 and Organic Waste Reduction

California Senate Bill 1383 (passed in 2016) requires jurisdictions in California to provide mandatory organic waste curbside collection services to residents and businesses, including green waste and wood waste, in an effort to divert organic waste from landfills and reduce subsequent methane emissions. Initial targets include a reduction of organic waste disposal by 75 percent statewide by 2025. As jurisdictions in the NE CA Region navigate Senate Bill 1383 requirements and launch waste-diversion programs, including for biomass, there may be an increase in available wood waste on the biomass market for which the JPA could support utilization. However, a June 2023 report from the Little Hoover Commission identifies that the Senate Bill 1383 legislation disadvantages rural Californians, and that the State has created temporary waivers for some rural areas, primarily in the form of providing jurisdictions with an extension for the deadline for required compliance. The report also recommends that the State should permanently exempt counties that produce less than 200,000 tons per year of waste. Given proposed exemptions for rural areas, it is unclear at this point how much more wood waste will be made available in the near future in the NE CA Region by this legislation, but the

JPA should continue to monitor regional efforts to advance biomass disposal efforts by local jurisdictions.

California Forest Carbon Plan

The California Forest Carbon Plan was developed in 2018 by the California Forest Climate Action Team, under the leadership of the California Natural Resources Agency, California Environmental Protection Agency, and CAL FIRE. The Plan assembles the best available science to summarize current and projected forest conditions and directs actions to achieve healthy and resilient wildland and urban forests. The JPA's goals and objectives align closely with Goal 3.3 of the California Forest Carbon Plan, to Innovate Solutions for Wood Products and Biomass Utilization to Support Ongoing Forest Management Activities. The California Forest Carbon Plan recognizes the importance of utilizing wood and biomass material from forest health activities to minimize net greenhouse gas and black carbon emissions, and that a regional approach should be used to balance material production and utilization at scales appropriate to given markets and sustainable forest management.

US Forest Service Wildfire Crisis Strategy

As part of its Wildfire Crisis Strategy, the USFS will work with partners to engineer a paradigm shift by focusing fuels and forest health treatments more strategically and at the scale of the wildfire crisis problem. One method of doing so is to focus on key firesheds, or large forest landscapes with a high likelihood that an ignition could expose homes, communities, and infrastructure to wildfire. One Wildfire Crisis Strategy landscape investment in the NE CA Region is the Klamath River Basin, which includes parts of Siskiyou and Modoc Counties that drain into the Klamath River Basin; this could present an opportunity for an increase in available biomass from projects as part of this landscape-scale initiative.

7.0 CONCLUSION

7.1 Summary

The possibility of a public biomass aggregation entity has moved from concept phase through predevelopment since Pilot Project initiation in April 2022. The potential future JPA now sits at the doorstep of late-stage development and implementation. This Entity Action and Long-term Objectives Plan establishes the foundation for the future activities and the long-term goals and objectives of the aggregation JPA and makes specific recommendations for the formation of an entity. While additional work is still needed to further develop and implement the Recommended Actions, several conclusions can be drawn.

- **There is a need to improve the biomass supply chain logistics to facilitate more consistent access to biomass and greater price stability despite the region's strong existing market and number of effective stakeholders who collaborate in various configurations.** Central factors that impede supply chain logistics include: a lack of human and financial capacity at the local government and federal agency levels, a shortage of workers and contractors, and insufficient infrastructure to absorb the volume of biomass generated. While the USFS and its Implementing Entities have existing working relationships, these partnerships could be clarified, improved, and expanded to better utilize product revenue, stakeholder resources and capacities, and the range of contracting types available. Lastly, a legacy negative public perception of biomass utilization persists which stakeholders believe prevents more supportive policy and funding for biomass utilization.

- **While viewed skeptically by some, the formation of a biomass aggregation entity is of interest to most stakeholders in the region.** Such an entity is regarded as a potential means to overcome biomass procurement challenges that existing and emerging facilities each face, but only if development of new facilities does not adversely affect the continued operation of those who are currently operating.

- **The Fall River, Pit, Western Shasta, Shasta Valley, and Modoc RCDs fill key leadership roles in the region,** serving as hubs for federal partners, collaborative groups, natural resource-focused non-profit organizations, tribes, and forest sector businesses. The RCDs are highly knowledgeable at a community level, can work cross-jurisdictionally, are experienced at leveraging resources, and can act quickly and flexibly.

- Stakeholders and RCD staff identified **regional priorities to improve the business environment and the capacity of the USFS, increase forest management activity on private forest lands, and speak with a unified voice** on behalf of the region.

- **Key functions that the JPA could provide** to advance the regional priorities and enhance the removal and beneficial use of biomass include:

    - **Offer the voluntary use and management of long-term biomass feedstock contracts,** potentially through a public-private partnership with a Contract Guarantee Fund and feedstock insurance product, that utilizes a transparent, inflation-based pricing mechanism such as an index-based pricing mechanism with a cap and collar. The JPA can track the use of public funds, assist with managing biomass supplier relationships, and provide metrics to set the biomass price offered.

    - **Work cooperatively with the USFS to maximize the use of partner resources for project planning and implementation** to increase the pace and scale of forest treatments. The JPA can first work with the USFS to reach consensus on the factors that most often slow workflow and address them within future agreements. Using one or more of the many available agreement types, the USFS can then task the JPA as an Implementing Entity authorizing it to conduct partner-assisted project planning and implementation. The JPA can apply excess stewardship credits from the sale of forest products to its stewardship projects and lend JPA staff to the USFS through the Intergovernmental Personnel Act to address personnel shortages that delay project planning and/or implementation.

    - **Facilitate the establishment and/or operation of a biomass sort yard(s)** through any number of ownership structure arrangements, locations, operating terms and strategies, and services. A sort yard could be piloted to help overcome workflow disruptions and to support continued operation of existing facilities and establishment of new ones. If the initial trial is proven beneficial, the model could be replicated in other parts of the region.

    - **Pursue gap or stack funding** using innovative finance mechanisms such as environmental impact bonds or carbon credits to further the JPA's goals and objectives and achieve large-scale forest project planning and fuels reduction implementation, including on private non-industrial lands.

    - **Conduct outreach, education, and advocacy** on behalf of the JPA members and stakeholders to speak with a strong and unified voice about the need and benefits of biomass removal and utilization. Efforts should target those within the RCD's districts as well as those beyond including in urban centers and legislators.

- **Offer technical assistance and support services** by the JPA staff and contractors that can help individual JPA members and stakeholders to overcome key constraints.

7.2 Next Steps

Upon completion of this Entity Action and Long-Term Objectives Plan, the Project Team will present their findings and Recommended Actions to the governing boards of each of the anticipated RCD members. The Project Team will then incorporate the feedback received and complete additional work to refine the JPA structure, core functions, funding mechanisms, budget, and governance. The next steps include:

1. Consider and leverage work completed by other Cal FRAME Pilot Projects and incorporate into the JPA's foundational documents as desired by the anticipated JPA members and as regionally supported:
    - A Contract Guarantee Fund and feedstock insurance product(s).
    - An index-based pricing design that acknowledges if the indices selected represent buyer or seller costs and that is guided by input from facilities and operators in the region to define the price baseline, determine price update intervals, and determine price collars.
    - The Digital Marketplace to centralize information on feedstock availability and demand and to offer package service options to biomass suppliers and buyers, possibly increasing efficiency in the biomass supply chain.

2. Explore in detail the feasibility of establishing biomass sort yard(s) as a long-term strategy to increase the pace and scale.
    - Coordinate with those in the region who are already developing or operating sort yards and consider how the JPA may be able to complement their efforts through ownership structures, operating strategies including potential sharing of resources, services, operating term, revenue, and/or location, among other considerations.

3. Further research revenue-generating funding mechanisms to ensure the JPA's longer-term financial sustainability:
    - Evaluate the revenue potential of various passive income options, considering investment of a portion of anticipated State seed money and grant indirect revenue. Passive income options may include investment into financial markets such as the California Cooperative Liquid Assets Securities System (CLASS) or other investment vehicles (e.g., the purchase and leasing of real estate or equipment).

- Outline a fee-for-services program to provide RCD members and partners (including the USFS) support and to assist with implementation of Forest Management Plans on private non-industrial forestland. The program shall also include Registered Professional Forester technical assistance, grant pursuit and administration, legal counsel, or wood and biomass utilization project development services.
- Evaluate the potential for generating enterprise revenue to ensure the JPA can successfully procure, store, and sell biomass, with the key issues being securing biomass from federal lands and meeting biomass feedstock contract obligations.
- Refine the JPA's budget with information from the Cost Sharing Agreement template.
- Pursue opportunities for conservation finance and the voluntary carbon market. As part of this, collaborate with the USFS to consent and acknowledge that if left undone may limit the use of carbon credits.

4. Continue to work closely with the anticipated RCD members, preparing and making presentations to the governing boards and seeking input on the JPA goals and objectives, organizational structure and governance, services, staffing, budget, and guiding policies regarding fiscal management of the JPA.

5. Draft the JPA's foundational documents, facilitate negotiations among interested JPA members, and prepare the JPA's final draft documents for the member agencies' governing board's approval.

6. Continue to work with USFS to make progress toward the mutual goal of increasing pace and scale of forest restoration.
    - Co-act with each of the NFs to identify the most limiting factors to project planning and implementation and document these in future USFS stewardship agreements.
    - Develop a plan to lend JPA staff to the USFS under the IPA to help address the limiting factors, as considered helpful and desired by the USFS.
    - Consider the USFS tasking the JPA as an Implementing Entity and the agreement types(s) that can make the best use of JPA resources and capacity and stewardship credits, among possible other factors.

Prepare a communications plan to comprehensively guide eventual JPA outreach, education and advocacy on behalf of the RCD members and stakeholders. The plan should identify and prioritize the issues requiring attention and desired outcomes for each, list target audiences, establish unified messaging, include an initial suite of supportive materials, and outline an implementation strategy and timeline including specifying if the work will be led by JPA staff or contractors.

Of these steps, item 2 is expected to be completed by March 31, 2025, using funding under the Fall River RCD's existing agreement with LCI. Items 1, 3, 4, and 5 will be supported by State funding provided through the Fall River RCD's June 2024 agreement with LCI and completed by March 31, 2026. The JPA is envisioned to be ready to accept the anticipated final round of State funding as soon as June 2026 which will facilitate filing of the foundation documents and start of operations. Remaining items 6 and 7 require additional funding to complete and can be addressed as opportunities arise or they can be incorporated into the eventual application to the State for seed funding and JPA kickoff.

8.0 REFERENCES

Bain and Company, The Nature Conservancy. 2020. *Accelerating Forest Restoration: Stimulating a Forest Restoration Economy and Rebuilding Resilience in California's Fire Adapted Forests.* https://www.scienceforconservation.org/products/accelerating-forest-restoration

Board of Forestry and Fire Protection Joint Institute for Wood Product Innovation. 2020. Joint Institute Recommendations to Expand Wood and Biomass Utilization in California. https://bof.fire.ca.gov/media/31nfixsv/final-board-approved-joint-institute-wood-and-biomass-utilization-recommendations-_11-4-20_ada.pdf

California Department of Forestry and Fire Protection (CAL FIRE) Wood Products and Bioenergy Team. 2023. *An Evaluation of Forest Biomass Transportation Subsidies.* https://bof.fire.ca.gov/media/uahpimuz/cal-fire_evaluation-of-forest-biomass-transportation-subsidies_1-25-2023_ada.pdf.

California Governor's Forest Management Task Force. 2021. California's Wildfire and Forest Resilience Action Plan. https://wildfiretaskforce.org/wpcontent/uploads/2022/04/californiawildfireandforestresilienceactionplan.pdf

Center for Economic Development. 2021. North State Planning and Development Collective Forest Sector Workforce Study Report. https://wildfiretaskforce.org/wp-content/uploads/2023/01/WTF_workforce01_25v2.pdf

CLERE Inc. 2023a. *Market Capacity Assessment Southern Cascade and Northeastern Sierra Nevada OPR Pilot Project*.

2023b. *JPA Overview: A Tool to Manage Forest Biomass Residuals in California Report*.

2023c. *Workforce Solutions for Biomass Removal from US Forest Service Lands in North East California*.

Economic & Planning Systems Inc. (EPS) 2024. *Funding Options and Strategies for New Joint Powers Authority*.

Graham Hughes, Gary. 2021. "The Curious Case of Red Rock Biofuels." Accessed on 8/21/2024 at https://www.biofuelwatch.org.uk/2021/the-curious-case-of-red-rock-biofuels/.

Manley, P., K. Wilson, and N. Povak. 2020. *Framework for Promoting Socio-ecological Resilience across Forested Landscapes in the Sierra Nevada*, Final Report. https://www.fs.usda.gov/research/psw/understory/framework-promoting-socio-ecological-resilience-across-forested-landscapes-sierra.

Sanchez, Dr. Daniel and Dr. Haris Gilani. 2022. *Advancing Collaborative Action on Forest Biofuels in California.* Prepared for the Joint Institute for Wood Products Innovation. https://bof.fire.ca.gov/media/mn5gzmxv/joint-institute-forest-biofuels_final_2022_ada.pdf.

State of California and the USDA Forest Service Region 5. 2020. *Agreement for Shared Stewardship of California's Forest and Rangelands Between the State of California and the USDA Forest Service Pacific Southwest Region*. https://www.gov.ca.gov/wp-content/uploads/2020/08/8.12.20-CA-Shared-Stewardship-MOU.pdf.

The Watershed Research and Training Center (WRTC). 2024. *Market designs for long-term biomass feedstock contract pricing. Illustrative examples of price management within long-term biomass agreements in California* (in preparation).

The Watershed Research and Training Center, University of California, Davis (WRTC & UC Davis). 2024. *FRREDDS Price Mechanism Utilizing Bioenergy Siting and Economic Optimization Tool to Support Long-term Feedstock Procurement Price Management*.

United States Forest Service (USFS). Forest Service Handbook, Washington DC. https://www.fs.usda.gov/im/directives/

Forest Service Manual, Washington DC. https://www.fs.usda.gov/im/directives/

VR Collective. 2024. *Forest Business Alliance Guidebook: Chapter 1 Funding Analysis*. https://forestbiz.info/chapters/funding.html

Willis Towers Watson (WTW). 2024. *California Woody Feedstock Insurance Playbook*.

Winter, Kevin, 2024. "Port of Morrow to help finance Red Rock, under judicial review." Lake County Examiner. Accessed om 9/11/2024. https://www.lakecountyexam.com/port-of-morrow-to-help-finance-red-rock-under-judicial-review/article_7941e74d-9231-5218-a37e-d88d4f679230.html

APPENDIX A. List of Participating Stakeholders and Their Affiliations

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List

ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
BOS	Board of Supervisors
CAL FIRE	California Department of Forestry and Fire Protection
CSU	California State University
EDC	Economic Development Corporation
FSC	Fire Safe Council
LTO	Licensed Timber Operator
RCD	Resource Conservation District
USFS	U.S. Forest Service
WUI	Wildland-Urban Interface

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
Aaron Albaugh	Lassen County Board of Supervisors	District 4 Supervisor
Aaron Brazzanovich Jr.	Susanville Rancheria	District 1 Councilman/Environmental Technician
Alan Jacobson	Shasta-Sustainable Resource Management, Inc.	Fuel Procurement Manager
Alden Neel	BLM: Redding Field Office	Assistant Field Manager
Alex Carter	McConnell Foundation	Director of Land Management
Amy Harrison-Smith	USFS: Modoc National Forest	Sale Administrator
Amy Lapin	EPS, Inc.	
Andrea Stuemky	Honey Lake RCD	
Andrew Mueller	BLM: Applegate - Alturas Field Office	Forester
Andy Albaugh	Pit RCD	Board Director
Arian Hart	Susanville Rancheria	Tribal Chairman
Barry Tippin	City of Redding	City Manager
Becky Roe	Shasta College	Director of Forest Health
Ben Rowe	CAL FIRE Shasta-Trinity Unit	Unit Forester
Bill Dillard	Burney Forest Power	Plant Manager

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
Bob Hambrecht	Anderson Biomass Depot	
Boon-Ling Yeo	UC Davis	
Brian Murphy	USFS: Shasta McCloud Management Unit	Fuels Officer
Bruce Goines	Watershed Research and Training Institute	
Bryan Taylor	Trinity River Lumber Company	
Chuck Dethero	Western Shasta RCD	Staff Registered Professional Forester
Cade Mohler	Lassen Fire Safe Council	Registered Professional Forester, Managing Director
Chad Arseneau	Sierra Pacific Industries	Burney District Manager
Chad Peterson	Shasta County Air Quality Management District	
Chester Robertson	Modoc County	County Administrative Officer
Chris Caldwell	Sierra Pacific Industries	Wood Byproducts Manager
Chris Christofferson	USFS: Modoc National Forest	Forest Supervisor
Chris Katopothis	Western Shasta RCD	Project Coordinator
Chris Trott	CT Bioenergy	Managing Partner
Christiana Darlington	CLERE Inc	Attorney at Law
Clarke Stevenson	CLERE Inc	Analyst
Courtney Farrell	CSU North State Planning and Development Collective	Project Manager
Craig Drake	BLM Applegate - Alturas Field Office	Field Manager
Dan Blessing	Shasta Valley RCD	Forester
Dan Newton	City of Susanville	City Administrator
Deb Bumpus	USFS: Lassen National Forest	Forest Supervisor
Debbie Mayer	Fall River Fire Safe Council	Project Coordinator
Diana Craig	USFS: Region 9	Deputy Director, Ecosystems Staff
Doug Lindgren	Tubit Enterprises, Inc.	Owner, LTO
Elizabeth Betancourt	Department of Conservation	Natural and Working Lands Policy Advisor

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
Elliott Vander Kolk	Formerly Sierra Nevada Conservancy (currently California State Parks)	Former NDRC Project Contact (current Wildfire and Forest Resilience Program Manager)
Elyse Blaker	Modoc RCD	Executive Director
Erik Edholm	City of Susanville	Assistant Public Works Director - Engineering
Evan Watson	Fall River RCD/Pit RCD	WUI Coordinator
Galen Smith	Collins Pine	VP Resources
Garrett Costello	Burney Basin Fire Safe Council	
Georgia Reid	Sierra Institute	Wood Utilization Program Coordinator
Geri Byrne	Modoc County Board of Supervisors	Chair of the Board
Greg Norton	Rural County Representatives of California	
Gregory Wolfin	Pit River Tribe	Environmental Specialist
Hayley Stone	CSU North State Planning and Development Collective	
Heidi Rogers	BLM	Fuels Specialist
Helena Murray	USFS: Region 9	Wood & Biomass Utilization Specialist
Ivan Houser	CAL FIRE Lassen-Modoc Unit	Unit Forester
Jacob Martin	USFS: Lassen National Forest - Eagle Lake Ranger District	
James Pitcher	Modoc Fire Safe Council	Project Coordinator
Jason Moghaddas	Spatial Informatics Group	
Jeff Manterach	Red Rock Biofuels	
Jeff Odefey	One Water Econ	
Jeff Oldson	Burney Forest Products	
Jeff Pudlicki	WM Beaty and Associates	
Jennifer Mata	BLM: Redding Field Office	Field Manager
Jerry Bird	USFS: Region 9	Regional Forester Representative
Jess Paoli	BLM: Redding Field Office	
John Christian	Burney Forest Power	

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
John Copsey	Shasta Green	Forester, Log Procurement
John Romena	Romena Consulting	
John Vona	FWS Forestry	Director of Timberlands
Jonathan Kusel	Sierra Institute for Community and Environment	Executive Director
Josiah Jacobs	Pit River Tribe	
Justin Britton	CAL FIRE	Wood Products Division Chief, Operations
Kate Stein	Willis Towers Watson	
Kayla Meyer	Honey Lake RCD	District Manager
Keli McElroy	USFS: Shasta-Trinity National Forest	Ecosystem Staff Officer/Silviculturist
Kevin Cann	Golden State Natural Resources	Vice President
Kevin Zeman	Stewardship West	CEO
Kolton Hawkins	Pit RCD	Board Member
Kyle Keller	PG&E	Fuels Representatives
Lani Estill	Modoc RCD	Executive Director
Laurence Crabtree	Golden State Natural Resources	
Lejon Hamann	USFS: Lassen National Forest	District Ranger
Lorissa "Reese" Soriano	Modoc RCD	Watershed Coordinator
Louise Davis	Redding Rancheria	Cultural Resources Coordinator
Luke Carpenter	Blue Forest Conservation	Investment Strategy Manager
Lyndsey Lascheck	Shasta Valley RCD	Forestry and Fuels Project Manager
Mark DePerro	USFS: Lassen National Forest - Eagle Lake Ranger District	Fuels Planner
Martin Twer	The Watershed Research and Training Center	Biomass Program Director
Mary Rickert	Shasta County BOS	District 3
Maureen Teubert	Western Shasta RCD	District Manager
Meagan Hartman	Wisewood Energy	Director of Business Development

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
Michael Maguire	Governor's Office of Land Use and Climate Innovation (formerly OPR)	Associate Planner for Wood Products
Michael McGill	Shasta Valley RCD	Forestry and Fuels Project Coordinator
Mike Bentley	Sustainable Resource Management	Fuel Procurement
Milton Stubbs	USFS: Modoc National Forest	District Ranger
Molly Redmon	Redding Rancheria	
Natalie McAfee	Western Area Power Authority	
Neil Goule	E&G Logging	Owner, LTO
Nick Zettle	Redding Electric Utility	Assistant Director
Pam Bates	Shasta Fire Safe Council	Executive Officer
Paul Flores	Pit River Tribe	Tribal Chair
Paul Vienneau	Shasta Land Trust	Executive Director
Rachel Birkey	USFS: Shasta-Trinity National Forest	Forest Supervisor
Rebecca Baer	Shasta EDC	
Regine Miller	Headwaters Environmental, Inc.	Project Manager NE CA Pilot Project Collaboration
Richard Eagan	Lassen County	County Administrative Officer
Richard Westmand	Modoc RCD	
Rob Stahl	Shasta County Air Quality District	District Manager
Robin Wall	Lassen National Forest	District Ranger
Rod Dowse	Shasta Valley RCD	District Manager
Ron Rusten	Shasta Fire Safe Council	County Coordinator
Ruben Martinez	Modoc RCD	
Russ Hawkins	Del Logging, Inc.	Owner, LTO
Ryan Hadley	Sierra Pacific Industries	
Ryan Hilburn	WM Beaty & Associates	Chief Forester
Samantha McMullen	Lassen County BOS	Executive Assistant
Sarah Bolnik	Golden State Natural Resources	Community Relations Manager

Northeastern California Woody Feedstock Aggregation Pilot Project Stakeholder List		
Name	**Entity Name**	**Position/Title**
Sarah Oldson	Cascade Resource Consultants, LLC	President, Registered Professional Forester
Sarah Seiler	Western Shasta RCD	
Scott Gable	West Forest LLC	Managing Director
Scott Packwood	CAL FIRE	Unit Chief
Sean Curtis	County of Modoc	Planning Director
Shannon Prather	USFS: Shasta-Trinity National Forest	ADZFMO
Sharmie Stevenson	Fall River RCD Pit RCD	Executive Director
Stacy Hafen	Modoc Fire Safe Council	Executive Director
Stephaney Cox	USFS: Lassen National Forest	Partnership Coordinator
Steve Koslowski	Honey Lake Power	Fuel Buyer
Steve Mueller	Loyalton Biomass	
Ted James	Sierra Pacific Industries	Lassen District Manager
Terrance Rodgers	Golden State Natural Resources	Project Development Manager
Tiffany Martinez	Shasta County Farm Bureau	Manager
Tim Bailey	Watershed Research and Training Center	Shared Stewardship Advisor
Tim English	Black Fox Timber	
Todd Hamilton	USFS: Pacific Southwest Research Station	Forester
Todd Johnson	USFS: Shasta - Trinity National Forest	Wildlife Biologist
Todd Jones	Shasta EDC	President
Todd Sloat	Forest Creek Restoration Pit and Fall River RCDs	Shared Stewardship Advisor; Project Manager
Tom Esgate	Lassen FSC	Managing Director
Tom Shaw	Lassen County	Deputy County Administrator Office
Tracy Edwards	Redding Rancheria	Executive Chief Officer
Tuli Potts	Sierra Nevada Conservancy	North Area Representative
Vance Russell	3point.xyz	Principal
Zach Knight	Blue Forest	CEO, Co-Founder
Zane Peterson	Peterson Timber, Inc.	President, LTO

APPENDIX B. Funding Options and Strategies for New Joint Powers Authority

The Economics of Land Use

Final Report

Northeast California Pilot Project: Funding Options and Strategies for New Joint Powers Authority

Prepared for:
Fall River Resource Conservation District

Prepared by:
Economic & Planning Systems, Inc. (EPS)

Economic & Planning Systems, Inc.
455 Capitol Mall, Suite 701
Sacramento, CA 95814
916 649 8010 tel
916 649 2070 fax

Oakland
Sacramento
Denver
Los Angeles

www.epsys.com

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1. Introduction and Key Findings

As part of a broader effort to establish a governance framework for promoting biomass utilization in the Northeast California region (Region), this report presents an overview of funding sources and financing strategies for the ongoing operations of a potential new Joint Powers Authority (JPA) involving existing Resource Conservation Districts (RCDs) serving the Region.

The potential formation of a JPA comprising the existing RCDs, tentatively proposed to be named the **Shasta Pit River Biomass Alliance**, is the outcome of a State of California (State) Office of Planning and Research (OPR) pilot project to address wildfire prevention and improve forest health and resilience by supporting and strengthening an entire industry cluster to increase biomass utilization that would otherwise remain unused in the forest and contribute to fuels loading. Such an industry cluster would encompass all the private sector business types involved with forest management, wood products manufacturing, energy production, environmental enhancement, and related professional and technical services. Given the scale of existing and continued biomass supply in the Region, such an industry sector has the potential to strengthen the regional economy—creating well-paying basic industry jobs, supporting existing and new population-serving businesses, and expanding the tax base of local governments that support the local economy through infrastructure investment, assuring public safety, and providing education and social services.

The purpose of this report is to provide an overview of existing and potential funding sources at the local, State, and federal levels. In addition, this report provides an assessment of the suitability of each source for funding the initial and ongoing operations of a new JPA involving selected RCDs, with the potential inclusion of other local agencies once the JPA has been well established. It is anticipated that potential sources of funding for annual JPA operations will be an ongoing effort as the JPA's operational demands evolve and new funding sources emerge. At this time, this report outlines a potential plan for initial and short-term JPA operations, associated budget needs, and recommendations regarding a phased funding strategy.

Background

Over time, inadequate forest management practices have resulted in the accumulation of significant woody biomass piles in the State's forests. These woody biomass piles are often burned or left to decay because of complex market dynamics and the prohibitive cost of their removal.[1]

This practice of accumulating woody biomass in forests has contributed to an increase in wildfire damage risk and greenhouse gas emissions. It also represents a missed opportunity to use biomass as a renewable energy source or for alternative products. With the continued expansion of fuels and forestry management to meet local, State, and federal goals, the amount of woody biomass and associated heightened risks and impacts will also continue to increase, necessitating solutions.

Improved utilization of woody biomass could help mitigate these effects. However, the act of removing and utilizing biomass from forests faces many challenges, including a volatile market often negatively affected by fire salvage supply, reduced US Department of Agriculture (USDA) Forest Service budgets and staffing, the low value of biomass relative to high transportation costs, complex contract management, and a shortage of skilled workers and adequate housing for the workers.[2]

There is a critical need for additional market products to utilize the continued accumulation of woody biomass. However, prospective wood product businesses in California face significant barriers to entry due to a combination of regulatory, logistical, economic, and market-related challenges, which has led to difficulties in securing long-term biomass supply contracts that specify pricing and volume. Without these guaranteed contracts, such facilities are challenged to access loans, manage debt, or employ other financial strategies necessary for their operation and growth.

In the last two Fiscal Years (FY), FY 2021-22 and FY 2022-23, OPR received funding from the State’s Wildfire and Forest Resilience Early Action Plan to focus on wildfire prevention and forest resilience. Most of this funding was directed to support the planning and implementation of long-term woody biomass aggregation pilot projects.

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[1] Woody feedstock refers to the raw materials derived from trees and woody plants, including branches, stems, and trunks, which are used in various processes such as bioenergy production, and other wood products manufacturing. These feedstocks are primarily sourced from forest management activities, timber harvesting residues, and non-commercial thinning operations.

[2] “Legal Tools for Government Entities to Incentivize Utilization of Forest Biomass In California.” California Law Empowering Renewable Energy (CLERE) Inc., February 2024.

As directed under the State's January 2021 Wildfire and Forest Resilience Action Plan Objective 3.10 (Address Feedstock Barriers through Pilot Projects), OPR funded five pilot projects to develop regional strategies to establish reliable access to woody biomass through a variety of feedstock aggregation mechanisms and organizational innovations. The initial pilot projects were distributed across single- and multi-county regions in the State including Northeastern/Shasta, Tahoe Central Sierra, Northeastern California, North Coast, and Marin County.

The purpose of these pilot projects was to develop plans to improve biomass supply chain logistics in each target region through an institutional arrangement with the structure, authority, and resources to aggregate and initiate long-term biomass contracts. Each pilot project was tasked with assessing market conditions, evaluating infrastructure needs, and working to enhance economic opportunities for woody biomass businesses in their respective regions.

Northeastern California Pilot Project

The Northeastern California (NE CA) Pilot Project encompasses portions of Shasta, Modoc, Siskiyou, and Lassen counties (see **Figure 1**). The 4-County Region is sparsely populated, with nearly 12 million acres and about 260,000 residents (2023). The Region is characterized by small local governments and working forestlands estimated to comprise over 50 percent of the Region's total land area. The Region has a well-established economy related to sustainably managing forestland in the Wildland Urban Interface (WUI) and largely uninhabited "wildlands" of these counties.

The NE CA Pilot Project, led by the Fall River RCD, includes a core group of other RCDs that manage natural resources in the Region including the Pit, Western Shasta, Shasta Valley, and Modoc RCDs. In addition, a project consultant team (Project Team) has provided technical and advisory services to support ongoing efforts to realize the key objectives of the Pilot Project.

Beginning in FY 2021-22, the Project Team engaged in a comprehensive outreach effort with existing and potential partners, operating and emerging facilities, forestry and timber operators and associated businesses, non-profit organizations, local, state, and federal agencies, tribes, and others to examine challenges and opportunities related to woody biomass aggregation in the region.[3]

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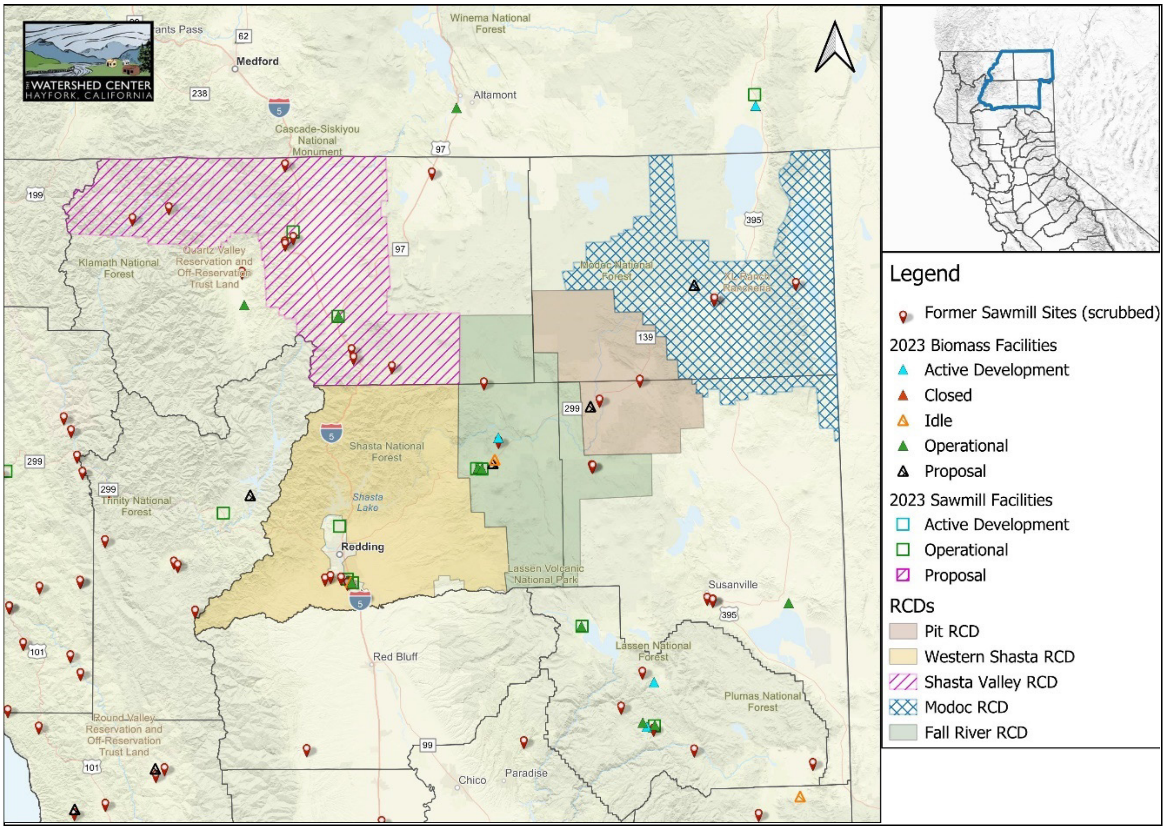
[3] Northeast California Pilot Program Draft Entity Action Plan, prepared by Headwaters Environmental, dated April 14, 2024.

Figure 1. Northeast California Pilot Project Region



Source: The Watershed Research and Training Center.

Key Technical Studies

As part of the Pilot Project, the Project Team has finalized or will finalize the following studies, which provide a foundation for mitigating the woody biomass challenges identified previously. Summaries of these studies follow:

- **Market Capacity Assessment** (CLERE, Inc., 2023). The Market Capacity Assessment summarized the long-term average market capacity for forest harvests under current market conditions. The results indicate a net availability of over 400,000 Bone Dry Tons (BDT) of unutilized forest biomass that is under little competition from existing facilities in the region. This finding supports the expansion of existing wood markets or the development of new wood utilization markets. This report demonstrates that while the region has one of the most developed biomass markets in the Western United States, it is unable to utilize all the forest biomass currently generated.
- **JPA Overview: A Tool to Manage Forest Biomass Residuals in California Report** (CLERE, Inc., 2023). This report offers a detailed examination of various institutional models for managing forest biomass through JPAs. The report discusses different types of JPAs, including those

focused on funding public infrastructure, providing community services, and acting as a Wildfire Prevention Authority with a focus on biomass waste disposal. It explores how RCDs could be integral members of a JPA, contributing to the management and governance of forest biomass utilization. Following the report's release, the project team engaged with several RCDs to further develop the concept of a JPA as a biomass aggregation hub.

- **Woody Feedstock Insurance Playbook** (Willis Towers Watson [WTW] and The Nature Conservancy [TNC], 2024). This report includes a comprehensive evaluation of insurance issues within the biomass supply chain. The report identifies insurance coverage gaps, risks, and needs across supply chain entities. The findings were synthesized into an insurance "playbook" that outlines market enablers such as educational initiatives on insurance and risk management and state policy solutions, including a third-party claims fund like California's FAIR Plan.[4] This playbook aims to address insurance deficiencies and enhance the capacity of businesses to secure long-term contracts for biomass supply.
- **Forest Resource and Renewable Energy Decision Support System (FRREDSS) Analysis** (CLERE, Inc., May 2024). This analysis models the complex market factors and unpredictable nature of supply factors and transportation costs over time for delivering biomass. The model relies on several transportation-related inputs (optimized routing software and a component for estimating transportation cost for a given biomass project supply shed) and the ability to predict costs and pricing over time. The analysis culminated in a report that summarized the methods and findings from the FRREDSS stress test and provided a set of recommendations for enhancing the model. In addition, the report included a review of long-term biomass contracting practices in the forest sector and other industries.

These reports also identify areas where subsequent research will be needed to move the Pilot Project forward. All analyses are intended to assess whether the creation of a public aggregation entity is useful and regionally supported, and how such a public entity may be structured and function to effectively address existing private market challenges and the effects of continued practices related to woody biomass.

[4] The California Fair Access to Insurance Requirements (FAIR) Plan is an insurance pool established to ensure that basic property insurance is available to homeowners who cannot obtain insurance in the traditional market due to the high risk of their property. It is often used as a last resort for properties located in areas prone to wildfires or other severe risks that make them uninsurable through standard insurance policies. The FAIR Plan provides limited coverage for fire damage, but it does not include other types of coverage typically offered in a standard homeowners' policy, such as liability or theft. People whose properties are insured through the FAIR Plan often supplement this coverage with additional policies to cover risks not included under the FAIR Plan.

Through the outreach and technical analyses, participants and stakeholders evaluated potential biomass aggregation entity model options as well as long-term objectives and approaches to implementation. The NE CA Pilot Project has identified a path forward in managing ongoing biomass resulting from forest resilience practices. With several entity options evaluated, the team has supported the formation of a new JPA. The new JPA, the tentatively named **Shasta Pit River Biomass Alliance**, would include all five RCDs currently involved in the NE CA Pilot Project and would likely encompass their collective RCD boundaries (see **Figure 1**).

In support of forming a new JPA, the NE CA Pilot Project retained Economic & Planning Systems, Inc. (EPS) to evaluate potential, sustainable funding mechanisms for the ongoing operations of the proposed JPA. The report also includes a summary of key findings from case study research of select JPAs operating in California that provide similar key functions to that of the proposed **Shasta Pit River Biomass Alliance**. This report will accompany the final reports prepared by the Project Team, including an **Entity Action and Long-Term Objectives Plan** which will establish the immediate implementation actions and long-term goals of the new JPA.

Key Findings

The following sections detail the key findings from the case study research and the potential plan for initial and short-term JPA operations, associated budget needs, and recommendations regarding a phased funding strategy.

Case Study Research

As part of this study, EPS conducted interviews and analyzed the most recent budgets (FY 2023-24) of eight existing JPAs in the State to understand their governance structures and key operational revenues and expenditures. Key findings from this research helped guide discussions with the NE CA Pilot Project and Project Team to determine a preferred funding strategy for a new JPA. EPS selected JPAs that provide similar services or share similar goals to that of the proposed **Shasta Pit River Biomass Alliance**. These JPAs were also highlighted in the 2023 "JPA Overview" report prepared by CLERE, Inc. A detailed summary of the JPAs selected and information gleaned from the case study research is provided in **Appendix A**.

- **Of the JPAs researched, most JPAs are primarily funded through two to three main funding sources.** The primary sources of funding for the JPAs researched are grants and gifts, and contributions from member agencies. For six of the seven JPAs that received grants or gifts from a public agency or nonprofit, almost half of their budget revenues are funded through this source. Additional common sources of funding vary by JPA and include passive income (e.g., investment income, leasing or renting property), program revenues (e.g., charges for services), and special tax revenue through established community facilities districts or assessment revenue through an assessment district.

- **Budgeted expenditures of the researched JPAs generally aligned with five main categories.** JPA budget expenditures were identified within five main categories: Administrative, Operations, Grant Activities, Capital Improvements, and Other Expenditures. Administrative (primarily, staffing) expenditures ranged dramatically among the researched JPAs, from about 10 percent to 70 percent of budgeted expenditures. JPAs had various proportions of their budget devoted to providing services, engaging in grant opportunities, or implementing capital improvements. The level of expenditures among each expenditure category was dependent on the mission and funding structure of each JPA.
- **Most JPAs evaluated employ no direct staff, including the executive directors.** The JPAs are often staffed by contractors or by in-kind staffing provided by the member agencies. Staffing the JPA with full-time employees tends to further the JPA's mission more effectively but can result in significantly higher costs per employee due to retirement, benefits, and insurance, necessitating additional payroll and human resources management staff. Contracting staff on an as-needed basis offers financial efficiencies and access to a broader range of expertise, which is particularly beneficial given the type, scale, and seasonality of services that do not justify full-time positions. However, the downside of using contract staff is the JPA's limited control over their time, a loss of control regarding the contractors' priorities, and other factors.

Operations, Budget, and Funding Strategy of Proposed JPA

After evaluating existing and potential funding sources at the local, State, and federal levels, determining the primary purpose and functions of the new JPA, and preparing a preliminary short-term budget, the following key findings provide the framework for forming and initiating the short-term operations of the new JPA.

- **The primary purpose of the proposed new JPA, the Shasta Pit River Biomass Alliance, is to facilitate the removal and utilization of forest biomass to promote wildfire resilience.** The JPA will achieve its purpose primarily by administering and managing long-term biomass contracts with suppliers and end-users and facilitating the transportation of biomass materials. In addition, it may offer services such as assisting landowners with the preparation of forest management plans and permitting, providing grant administration to member RCDs and other entities, operating a biomass material sort yard for timber processing, and offering education and advocacy services.[5] All these functions and services will help relieve constraints and market failures that private businesses or landowners, on their own, cannot feasibly provide.

- **The new JPA is envisioned to evolve in a series of phases over time, recognizing the strengths and challenges of the Regional biomass industry and the JPA's role in enhancing and sustaining it.** An initial **Phase 1** would involve start-up planning, assessing natural resources capacity and market demand, developing a permitting and environmental review framework, engaging with prospective private sector partners, and feasibility testing. If these efforts prove to be feasible, **Phase 2** would focus on implementing key functions, including negotiating and supporting long-term contracts, conducting third-party environmental planning, providing grant support, and other tasks. This phase should also focus on demonstrating the feasibility of larger-scale operations. As the JPA achieves incremental successes, **Phase 3** would involve sustained operations and a gradual expansion of investment and scaling up, as feasible, to support additional operating activities throughout the Region. Finally, **Phase 4** would include ongoing support to sustain operations and profitability in the industry, adjusting approach and key functions as warranted in response to changing market conditions.
- **Preliminary estimated expenditures for the new JPA encompass staffing, JPA operations, and biomass material sort yard operations.** The Project team prepared an annual preliminary budget for the new JPA's first three years of operations. This budget is estimated to cover the initial phase, as described in the previous finding. High-level cost estimates encompassing staffing and operational expenditures total about $534,000 in the first year to about $496,000 by the third year. Over the 3-year **Phase 1** budget period, expenditures total about $1.5 million.
- **The funding options available to a JPA are derived from the funding authority of its member agencies, with some variation depending on whether the JPA is established as a separate or non-separate entity.** In the case of a new JPA formed by the NE CA Pilot Project RCDs, the JPA is anticipated to be established as a separate entity, and the JPA's funding authority would be defined in the Resource Conservation District 'Principal Act' (California Public Resources Code, §§9001-9972). Several funding sources are available to fund the operations of the new JPA, including member agency

[5] The approach regarding sort yard ownership has not been determined at this time. As part of the initial phase, the proposed new JPA will evaluate the costs and benefits associated with different ownership arrangements, including direct ownership by the proposed JPA, ownership by a member agency or other non-governmental organization (NGO) partner, or private ownership. With any of these options, the preliminary budget estimates included in this study reflect an arrangement by which the proposed JPA will be compensated for operating the sort yard, including securing feedstock and developing agreements with buyers.

contributions, grants and gifts, charges for services, enterprise revenues, taxes and assessments, passive income, and tax increment financing.

- **The proposed Phase 1 funding strategy includes using a combination of four main revenue sources**. These include: (1) passive income generated through the investment of OPR seed money; (2) grants and gifts from Federal and State programs as well as private foundations; (3) charges for services and enterprise revenues generated through key function activities (e.g., assisting with the implementation of landowner forest plans and providing grant administration services to member RCDs); and (4) annual member agency contributions. Preliminary funding estimates total $534,000 in the first year, $477,000 in the second year, and $496,000 in the third year of the **Phase 1** budget period. In aggregate, revenues are estimated to equal about $1.5 million, matching estimated operational expenditures. The revenue estimates include a substantial sum, particularly in the first year, identified as "operational reserves," which represents a gap to fund annual Phase 1 operating expenditures in full. This funding will likely need to come from grants and gifts. Highlighting this funding gap during subsequent rounds of State funding may help secure additional seed funding. Alternatively, the proposed new JPA could pursue a strategic partnership with a private foundation, such as the McConnell Foundation, to provide upfront funding and meet this funding gap.
- **As the new JPA evolves, this initial Phase 1 funding strategy will also likely evolve.** The objective of a longer-term funding strategy will be to fund a larger portion of expenditures on sustainable sources, including passive income, charges for services, and enterprise revenues, reducing the need for the labor-intensive and competitive pursuit of grants and gifts.

Report Organization

Following this introduction and key findings chapter, this Report presents the funding options available to a new JPA (**Chapter 2**) followed by an initial operating plan, budget, and funding strategy (**Chapter 3**). The appendices to this report include relevant reference items including case study research related to the operational budgets of select, existing JPAs in the State as part of an effort to understand how other JPAs operate. **Appendix A** provides an overview of the case study research conducted on similar existing JPAs. **Appendix B** includes the detailed budgets for each case study JPA.

2. JPA Funding Options

With the NE CA Pilot Project's determination to move forward with the formation of a new JPA to oversee improved management of woody biomass in the Region, this chapter provides an overview of JPAs and the potential funding for ongoing operations that would be afforded to a new JPA composed of RCDs.

These funding options are related to the expected functions of the proposed RCD-led JPA, which will be formed to support and strengthen the regional biomass utilization industry. The broader capital and operating expenses of this industry are expected to be funded largely by private capital investment though it is likely that public investment will be involved in supporting private investments, including investments in public infrastructure (roads, powerlines, etc.), participating in public-private partnerships, and addressing 'market failures' that may inhibit private investment or threaten long-term viability of the regional biomass industry cluster.

Joint Powers Authorities Overview

JPAs are legally created entities that allow two or more public agencies to jointly exercise common powers. Forming such entities may not only provide a creative approach to the provision of public services but also permit public agencies with the means to provide services more efficiently and cost-effectively.

The Joint Exercise of Powers Act, as codified in California Government Code §6500, governs JPAs. Under this Principal Act, JPAs are restricted to use by public agencies only. However, the term public agency is defined very broadly. A public agency can include but is not limited to, the federal government, the State or State departments, cities and counties, special districts (e.g., school districts, public utility districts, and other service provider districts), and Native American tribes.

The Act authorizes two types of JPA arrangements: a separate entity or a non-separate entity.

- Under the **separate entity arrangement**, the participating public agencies can create a new, separate legal entity to exercise the powers, functions, or services that are common among them. This type of JPA functions as its own government organization with the ability to make decisions, enter contracts, hold property, hire employees, and manage funds independently of the founding agencies. Forming a separate entity can be beneficial because the debts, liabilities, and obligations of the JPA belong to that entity rather than the contracting parties.

- Under the **non-separate entity arrangement**, the participating agencies agree to cooperate and exercise their common powers through a joint agreement without forming a new legal entity. The powers are managed collaboratively through the existing structures of the participating agencies, and one agency often takes the lead in administrative duties. The second allows two or more public agencies to form a separate legal entity.

Under either arrangement, the public agencies must enter into an agreement. This agreement must state both the powers of the JPA and the way it will be exercised. The governing bodies of all the contracting public agencies must approve the agreement.

Funding Authority for an RCD-Led JPA

The funding options available to a JPA are derived from the funding authority of its member agencies, with some variation depending on whether the JPA is established as a separate or non-separate entity. In the case of a new JPA formed by the NE CA Pilot Project RCDs, the JPA is anticipated to be established as a separate entity and the JPA's funding authority would be defined in the Resource Conservation District 'Principal Act' (California Public Resources Code, §§9001-9972). As a distinct legal entity separate from its member agencies, the JPA may define broader funding authority, such as issuing bonds or charges for services, and access other funding mechanisms that are not directly controlled by the member agencies. However, the specific funding authority of the JPA would not be defined in the Resource Conservation District 'Principal Act' (California Public Resources Code, §§9001-9972), but rather in the Joint Powers Agreement and applicable state laws governing JPAs (Government Code §6500 et seq.).

This evaluation of RCD funding options describes these funding sources in greater detail and reflects research and discussions with the prospective JPA partners conducted as a part of this Report recognizing that the RCDs intend to pursue a JPA under a separate entity arrangement (i.e., creating a new legal entity to administer key functions).

As a backdrop for this effort, it is important to note that the proposed JPA must be part of a broader public-private cooperative effort to establish and sustain the biomass aggregation and utilization industry on a regional scale. Such a regional industry may need to raise substantial funds well beyond that typically derived from the available federal and State grant funding programs. Within the cooperative effort, the key role of the JPA may be to address the variety of market failures (i.e., inabilities of the private sector on its own to develop or sustain the industry) and institutional failures (i.e., regulatory burdens, regulatory conflicts between agencies, underinvestment).

Potential Funding Options

The Principal Act specifies that RCDs can receive funding through grants and contributions from federal, State, and local agencies, as well as from private organizations and individuals (California Public Resources Code, §9403). Such contributions and grants typically comprise the primary source of funding for RCDs. Further, contributions and grants were identified as the primary source of funding for selected JPAs in the State (see **Appendix A** for additional details regarding this case study research).

The Principal Act also authorizes RCDs to levy "regular assessments" as needed to fund general operations (California Public Resources Code, §9501-9513), and to form "improvement districts" within its boundaries and levy assessments as may be needed to fund infrastructure or services that benefit property owners within the designated improvement district (California Public Resources Code, §9801-9821). Levies of benefit assessments require a two-thirds approval of property owners in the improvement district. In addition, RCDs can levy charges for services rendered and obtain revenue from enterprises it may operate or through partnerships with other public agencies or private businesses.

The funding sources evaluated as part of this Report are summarized in **Figure 2**. As shown, this summary table identifies the key funding and financing (debt issuance) options afforded to JPAs composed of RCDs, along with their estimated level of ongoing funding sustainability, eligible costs (all of which are eligible to cover ongoing operational expenditures), financing capabilities through bond issuances, and estimated funding level. The remainder of this chapter evaluates each source in detail.

Figure 2. RCD-Based JPA Funding and Financing Options Summary

No.	Funding Option	Estimated Sustain-Ability [1]	Bond Issuance (Debt)	Eligible Costs: Cap. Facilities	Eligible Costs: Admin./ O&M	Estimated Funding Level
1.	Member agency contributions	High		x	x	Low
2.	Gifts and grants	Low		x	x	Varies
3.	Charges for services	Mod-High			x	TBD
4.	Enterprise revenues	Mod-High			x	TBD
5.	Taxes and assessments	High	x	x	x	Low
6.	Passive income	Moderate			x	Low
7.	Tax Increment Financing (TIF)	High	x	x	x	Low

[1] Estimated sustainability represents EPS's qualitative assessment of advantages and disadvantages, and ease and likelihood of securing ongoing, annual funding.

Source: EPS.

1. Member Agency Contributions

Funding from member agency contributions represents annual financial or in-kind contributions from member or supporting agencies, including the participating RCDs and, potentially, other agencies. Funding may include one-time or recurring, annual funding, staffing, or other in-kind contributions (e.g., office space, equipment). Member agency contributions can fund capital improvements, administration, and ongoing operations and maintenance costs.

- **Advantages:** Member agency contributions are easy to implement following agency board approval (agency budget appropriation). Contributions to the JPA would demonstrate a commitment to the new JPA's mission. This funding source offers a stable and predictable source of funding if the contribution is recurring. Contributions from member agencies usually come with fewer restrictions compared to external grants. This would allow the JPA more flexibility in how it allocates and uses the funds.
- **Disadvantages:** The amount, and whether it is recurring, will be constrained by available funding from member agencies and competition with their other service responsibilities and financial commitments. Without additional recurring funding, the diversion of resources to the JPA could reduce the capacity to sustain existing operations or to pursue new local services.
- **Viability Assessment:** It is likely that member agency contributions could provide a minor source of funding support for the general operations of the JPA. Member agency contributions are not likely to fund major programs of the JPA or related investments to achieve JPA objectives.

2. Grants and Gifts

Grants and gifts provide the bulk of funding for California's RCDs, and grants (alone) represent a primary source of funding for the prospective JPA member agencies currently. Likewise, a new JPA composed of RCDs may accept contributions or donations of property, funds, services, or other forms of assistance from any public or private source to carry out the mission of the JPA. Applicable sources include Federal, state, and

The McConnell Foundation

The McConnell Foundation is a private, non-profit organization based in Redding, California, dedicated to enhancing community vitality, education, and environmental sustainability. It focuses on providing grants and resources to non-profits, public education institutions, and government entities, primarily in Northern California, including Modoc, Siskiyou, Shasta, Trinity, and Tehama counties, as well as abroad.

The foundation leverages its grant funding through strategic approaches such as providing matching funds, collaborating with other organizations, and offering capacity-building support. It collaborates with philanthropic organizations, government agencies, and private entities to co-fund initiatives, amplifying their impact. By offering grant writing and project management training, the foundation helps local organizations attract and manage additional funding. In addition, it provides technical assistance and advisory support to improve grant proposals and project outcomes. The foundation focuses on sustainability, supporting projects that can generate ongoing revenue or attract future investments, ensuring long-term impact.

Example Initiatives

» **Wildfire Mitigation:** In its efforts to support wildfire mitigation, the McConnell Foundation collaborates with local entities and leverages additional funding from state programs like California Climate Investments (CCI).

» **Woody Biomass Utilization:** The foundation works with the Woody Biomass Utilization Group, which includes partnerships with agencies that provide grants for biomass projects.

Source: https://www.mcconnellfoundation.org/. Accessed May 2024.

local government grant programs; private foundation grants (e.g., The McConnell Foundation); corporate sponsorships; and philanthropic donations. Grants and gifts could fund the administration and ongoing operations and maintenance costs, including staffing and indirect expenses, as well as program-specific expenditures and investments, depending on the specific parameters of the funding source.

Gift and Grant Funding Sources

Federal Funding Programs

- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Department of Energy and Infrastructure Resilience
- Environmental Protection Agency
- Federal Emergency Management Agency
- US Department of Agriculture
- US Fire Administration
- US Forest Service

State Funding Programs

- Cal Fire
- Cal Recycle
- California Department of Fish & Wildlife
- California Fire Safe Council
- California Infra. and Economic Development Bank
- Cal Office of Emergency Services
- Cal Office of Planning & Research
- Strategic Growth Council
- Sierra Nevada Conservancy
- State Water Resources Control Board

Private Foundations

- Conservation Fund
- National Fish & Wildlife Foundation
- National Forest Foundation
- Moore Foundation
- The McConnell Foundation

Note: This list illustrates the numerous grant funding opportunities currently available and is not exhaustive of all options. Based on funding availability, grant sources listed may not be available in future years and new sources may become available.

- **Advantages:** Grants will likely provide initial funding tied to JPA formation, capacity building, and JPA objectives. There are numerous grant opportunities currently through State, federal, and private foundations (for reference, some of the most frequently cited programs for funding wildfire resilience activities are shown in the sidebar). Seeking grant funding would allow access to funding while incurring debt, and can enhance an organization's credibility and visibility, making it easier to attract additional funding and support from other sources.
- **Disadvantages:** Grant applications can be highly competitive, with many organizations vying for a limited pool of funds resulting in a low success rate. The process of applying for grants is often time-consuming and requires significant effort in preparing detailed proposals, budgets, and supporting documentation. Administration can also be labor-intensive and include stringent auditing requirements; Grants and gifts may limit the JPA’s functionality if the source has specific restrictions on how the funding can be used. Grants and gifts are subject to political priorities and are ultimately variable in terms of funding amounts and whether funding continues to be available.
- **Viability Assessment:** Gifts and, more likely, grants will certainly be a primary source of funding for the JPA, particularly in the initial (capacity building) phase of organizational development before recurring funding sources can be tapped. However, the new JPA would need to thoroughly vet grant opportunities to avoid competition with members. On a continuing basis, grants will be a source of funding for individual projects pursued by the JPA, such as large-scale projects that could benefit one or more member agencies.

3. Charges for Services

JPAs have the authority to offer services on behalf of their member agencies and the community to carry out specific tasks, deliver services, implement projects, or operate facilities. Service fees are charges levied for services rendered on demand through service contracts. The JPA may provide services, including on behalf of the private sector, provided the services align with the JPA's public purpose and are not precluded by the JPA agreement. Eligible costs include covering the provision of goods and services, including consulting and technical services (e.g., legal counsel, grant writing and administration, Registered Professional Forester), training and workshops, operating facilities, conservation easement transactions, managing carbon credits under the State's broader program, and supporting collaborative projects with private entities.

- **Advantages:** Once services have been determined and there is a plan for implementation, charges for services can be relatively easy to establish and administer. Direct charges for services can provide a significant source of revenue for organizations, helping to cover operational costs and fund service improvements. Charges for services can be a recurring funding source, dependent on market demand for services. Charges for services distribute costs on an 'as benefitted' basis and the scale of operations can be matched to demand, as it changes over time.
- **Disadvantages:** Fluctuations in demand for services can create variations in revenue generation. The management of revenue-generating activities is dependent on finding and sustaining qualified labor. The JPA must comply with legal and regulatory requirements including State constitutional and statutory restrictions that charges must match the cost of the delivered services (State Proposition 26).
- **Viability Assessment:** Insofar as the JPA seeks to become an organization that provides technical support services, charges for these services will fund or offset costs for these services over time.

4. Enterprise Revenues

Enterprise revenues for a JPA typically refer to funds generated through business-like operations, services, or facilities that are operated with the intent of covering their costs. Applicable sources could include joint procurement activities; sale of goods (forest by-products, etc.), or operation of a biomass assembly sorting yard that charges a 'tipping fee'. Most capital costs and operating costs are eligible to be funded through enterprise revenues.

- **Advantages:** Enterprise revenues enable entities to fund their operations independently, reducing reliance on other funding sources like grants and gifts. Enterprise revenues provide a direct source of funding for specific services, ensuring that the money collected is directly reinvested into the provision of services and in the service area. Entities may engage in joint procurement activities, leveraging the collective purchasing power of member agencies to obtain goods and services at favorable terms.

- **Disadvantages:** There may not be opportunities or an adequate scale of potential marketable enterprises that are relevant to this proposed JPA to justify the costs involved, and the costs and complexities of operating enterprises may be difficult to overcome. Further, new enterprise activities offered through a JPA have the potential to offer similar services as local private companies. Thus, the JPA should consider including local labor to the extent it is available and price competitive.
- **Viability Assessment:** Opportunities for enterprises should be evaluated as a part of organizational development and during an initial period of operations. However, the costs and complexities of operating actual enterprises may not be fully determined for some time, rendering this a potential long-term funding source.

5. Taxes and Assessments

Taxes and assessments are distinct revenue mechanisms for government entities in California. Taxes, including general and special taxes, fund broad governmental purposes or specific projects, respectively, and require voter approval (majority approval for general taxes, two-thirds approval for special taxes). Assessments are charges on properties directly benefiting from specific improvements or services. Assessments must correlate with the benefit received and districts can be formed with the approval of a simple majority of affected property owners. General and special taxes and assessments are governed by the requirements of State law.[6]

RCDs do not have the power to levy general taxes but have the authority to levy special taxes and special assessments per the requirements of Proposition 218 and any additional relevant state laws. Specifically, the new JPA composed of RCDs may levy a special tax, provided it is for a specific purpose and is approved by a two-thirds supermajority of voters within the district. Further, a new JPA composed of RCDs may levy a landowner-approved special assessment within a project-specific ‘improvement district’ to support specific projects or services. The assessment must provide a direct and specific benefit to the properties being assessed and be approved by a simple majority of the weighted ballots of property owners (50 percent + 1). Depending on the services and investments

[6] Various propositions have collectively shaped California's tax landscape by setting stringent requirements for the imposition of taxes and assessments. Proposition 13 limits property taxes and requires a two-thirds vote for new state taxes; Proposition 218 mandates voter approval for local taxes and property-related assessments; Proposition 62 requires majority voter approval for local general taxes; and Proposition 26 broadens the definition of taxes to include many fees and charges, necessitating higher thresholds for approval.

envisioned by the JPA, such assessments can provide a stable recurring source of funding to support projects. Eligible costs include capital improvements, administrative, and ongoing operations, and maintenance costs for specific purposes.

In the event the new JPA included a city or county as a member agency, the JPA would be authorized to levy the full range of general and special taxes and assessments based on the funding authority of cities and counties (California Government Code §6503). These include general taxes (e.g., sales tax, utility users' tax, business license tax); special taxes (e.g., parcel tax, Mello-Roos Community Facilities District special tax); and special benefit assessments (e.g., street lighting and landscape maintenance district, property and business improvement district).

- **Advantages:** Special taxes and assessments provide a direct funding source for specific uses and offer a predictable and reliable revenue stream.
- **Disadvantages:** Levying special taxes and assessments requires widespread political and community support. A new special tax or assessment represents an increased financial burden on property owners (though the latter is reflective of benefits received). A new special tax or assessment will require coordination with responsible County departments.
- **Viability Assessment:** Levying a new special tax in the Region is not likely viable for multiple reasons. Alternatively, targeted local area benefit assessments linked to specific projects in particular areas, and where special benefits can be demonstrated, may be a useful tool for the JPA to pursue project-oriented funding in cooperation with benefiting landowners over the long term.

6. Passive Income

JPAs can generate passive income through various means, including investment earnings, leasing or renting property or equipment, and licensing intellectual property. Investments in low-risk securities or bonds provide steady returns while leasing office space or land for commercial use generates rental income. Licensing agreements and royalties from developed intellectual property can also contribute to passive income. Partnerships and revenue-sharing agreements with private companies, such as leasing land for renewable energy projects, further diversify income streams, enhance financial stability, and reduce dependency on other funding sources. Passive income streams offer a flexible funding source, with no restrictions on funding any operating or capital costs unless specified in the Joint Powers Agreement.

When considering passive income strategies, JPAs must ensure alignment with member agency policies and goals, maintain transparency with stakeholders about income activities and their impacts, and adhere to ethical standards consistent with the JPA’s mission and values. In addition, legal compliance and risk management are crucial to safeguard against potential liabilities and ensure sustainable revenue generation. Diversifying passive income sources can further mitigate risks and enhance financial stability over the long term.

- **Advantages:** Passive income provides one or more steady revenue streams with limited active involvement. Passive income streams can enhance financial stability and reduce reliance on member contributions or other sources. The additional income can be reinvested in projects and services that further the JPA's mission, allowing for expansion and improvement of key functions. Moreover, passive income enables better long-term financial planning and sustainability, giving JPAs more flexibility and resilience in managing their operations and responding to changing circumstances.
- **Disadvantages:** Initiating passive income strategies can involve significant initial costs and investments, which may strain existing resources. Oversight of some rental agreements may be more time-consuming and labor-intensive. There are potential legal and regulatory challenges that must be navigated to ensure compliance, adding complexity to the process. Market risks and fluctuations can impact the stability and predictability of passive income streams, posing a financial risk. Lastly, passive income strategies necessitate careful alignment and communication to ensure all stakeholders are in agreement.
- **Viability Assessment:** The viability of passive income for JPAs depends on careful planning, legal compliance, and strategic management by the JPA. By identifying suitable income sources, evaluating risks and benefits, and implementing a robust management plan, JPAs can successfully establish passive income streams to support their operations and goals.

7. Tax Increment Financing

Tax increment financing (TIF) captures the increase in property tax revenue (the "increment") that results from the rise in property values within a designated district. The captured funds are then reinvested in the district. Applicable sources include the formation of an Enhanced Infrastructure Financing District (EIFD) or a Climate Resilience Financing District (CRD).

California Government Code §§53398.50–53398.88 (EIFD Law) enables jurisdictions to consider the formation of EIFDs as a means of using tax increment revenue to fund a variety of eligible improvements with communitywide benefits. With an EIFD, the captured funds are available to fund capital improvements with a useful life of at least 15 years (either directly or through debt repayment of bonds issued against the future TIF revenue stream), affordable housing, and certain maintenance costs.

California Government Code §§62300-62312 permits cities, counties, and special districts to form a CRD to plan and implement climate mitigation or adaptation projects using TIF and other sources of revenue. Eligible costs include projects that address sea level rise, extreme temperatures, and risks related to drought, flooding, and wildfires. CRDs must comply with existing EIFD Law, although CRDs have several key distinctions. Unlike EIFDs, which rely solely on tax increment revenues from participating agencies, CRDs can levy benefit assessments, special taxes, property-related fees, and other service charges consistent with State law, in addition to tax increment revenues. CRDs can also apply for and receive grants from federal and State agencies, and solicit and accept gifts, fees, grants, and allocations from public and private entities. Like EIFDs, CRDs can issue debt against future district revenue streams.

- **Advantages:** TIF provides a mechanism for funding infrastructure projects and ongoing operations and maintenance costs without increasing taxes or reallocating existing public funds. By capturing the increased property tax revenues generated from rising property values within a designated project area, JPAs in California can finance essential infrastructure improvements and public projects that drive economic growth. This funding source offers the JPA bond issuance authority, funding flexibility, and local control, and represents a sustainable annual funding source.
- **Disadvantages:** Public agencies (particularly the respective County governments) must be willing, by agreement, to participate. Incremental property revenues in the Region will likely be limited simply because there may be only little assessed value increment (based on limited new development). The funding capacity will likely ramp up slowly as value increases are realized.
- **Viability Assessment:** While something to consider over time and perhaps discuss with the respective County governments, TIF is not likely a source of funding in the near term for the JPA.

Bond Issuances (Debt Financing)

Issuing municipal bonds is a process to raise capital by selling debt securities to investors. Bonds are essentially loans that investors provide to the issuer in exchange for periodic interest payments and the return of the principal amount at the bond's maturity. The issuer uses the funds raised through bond issuance for various purposes, such as funding infrastructure projects, expanding operations, or refinancing existing debt. Debt repayment must be supported by a sustainable annual revenue source. Typically, future property and sales tax revenue, special tax revenue like a Community Facilities District (CFD) or parcel tax, or tax increment revenue through an EIFD or CRD are pledged as the source of repayment. Other revenue sources that can be pledged include utility and development impact fees and grants.

Evaluating feasibility and risk as part of due diligence before proceeding with a bond issuance is imperative. Different types of municipal bonds will require different thresholds of feasibility and risk and include examining impacts from the standpoint of the municipality, payor, investor, and legal team.

One additional, potential option for generating upfront funding projects that restore and protect our forests, watersheds, ecosystems, and communities is the Forest Resilience Bond offered by the nonprofit, Blue Forest. This financing mechanism reflects a public-private partnership that raises private capital from impact investors, with repayment to investors over time.[7]

- **Advantages:** Bond issuances provide substantial upfront funding for capital improvements; Does not require voter approval but requires member agencies to pass an ordinance (voters have a 30-day period to object). There may be opportunities to partner with private-sector entities (e.g., Blue Forest) to issue bonds as needed to support project-specific investments. Leasing and other sources of revenue can be used to pledge funding support for such private investment.
- **Disadvantages:** Bond issuances do not typically fund ongoing operational expenses. Issuing debt increases overall project costs due to interest payments and creates repayment obligations that can strain a JPA’s budget, potentially diverting funds from other projects. High debt levels can also negatively impact the JPA's credit rating, making future borrowing more expensive. In addition, debt servicing requires regular payments, limiting budget flexibility and long-term financial planning. Economic downturns and market volatility can further complicate debt management, while compliance with regulatory requirements adds administrative burdens.
- **Viability Assessment:** The use of innovative bond funding and developing recurring funding sources (e.g., project-specific benefit assessments) may prove to be a useful source of capital for the JPA to fund any needed facilities to carry out its key functions.

[7] The Forest Resilience Bond (FRB) by Blue Forest is an innovative financing mechanism designed to fund forest restoration and wildfire mitigation projects. It raises private capital from impact investors to fund activities such as forest thinning, fuel reduction, ecosystem restoration, watershed protection, and biochar production. These projects enhance forest health and reduce wildfire risks. The costs are shared among beneficiaries like water utilities and government agencies, who repay the investors over time based on the savings and benefits from reduced wildfire risks and improved ecosystem services. https://www.blueforest.org/finance/forest-resilience-bond/.

3. JPA Operating Plan, Budget Needs, and Funding Strategy

This chapter provides an overview of the initial framework of the proposed new JPA, the phasing of operations, the initial proposed budget, and strategies for funding the initial phase of operations.

Initial JPA Framework

The primary purpose of the proposed new JPA, tentatively proposed to be named the **Shasta Pit River Biomass Alliance**, is to facilitate the removal and utilization of forest biomass from forest health and fire prevention projects that support wildfire and community resilience. It is recognized that such efforts are part of a larger comprehensive effort to promote forest health, reduce wildfire hazards, and enhance the forest management industry cluster that will be needed to carry out biomass harvesting, aggregation and transportation, and processing into marketable commodities.

The JPA will fulfill this purpose chiefly through the administration and management of guaranteed, long-term biomass contracts with suppliers and end-users. The JPA may function to provide additional services for its members that facilitate removal and utilization of forest biomass, including conducting third-party environmental planning for forest landowners, assisting public and private landowners in implementing forest management plans and forest health projects, providing grant administration services to member RCDs (and perhaps other entities), operating a new biomass assembly sort yard to collect, sort, and process biomass, and potentially providing other education and advocacy services.[8] Refer to **Figure 3** for the initial framework of the proposed new JPA, including the JPA's mission statement and key functions.

JPA Operational Development Phasing

The initial operating years of a new JPA will be important for establishing a solid foundation and setting the stage for its evolution over time. The process will begin

[8] The approach regarding sort yard ownership has not been determined at this time. As part of the initial phase, the proposed new JPA will evaluate the costs and benefits associated with different ownership arrangements, including direct ownership by the proposed JPA, ownership by a member agency or other NGO partner, or private ownership. With any of these options, the preliminary budget estimates included in this study reflect an arrangement by which the proposed JPA will be compensated for operating the sort yard, including securing feedstock and developing agreements with buyers.

with identifying common goals among the member agencies, followed by drafting a Joint Powers Agreement that outlines the JPA's structure, governance, and operational guidelines. This agreement must be approved by the governing bodies of each participating agency, typically involving public meetings and stakeholder engagement to ensure transparency and buy-in.

Figure 3. Proposed New Joint Powers Authority Initial Framework

Item	Details
New Entity Name	Shasta Pit River Biomass Alliance (tentative)
Member Agencies	Fall River RCD; Pit RCD; Western Shasta RCD; Shasta Valley RCD; Modoc RCD
Tentative Mission Statement	The mission of the Shasta Pit River Biomass Alliance is to facilitate the removal and utilization of forest biomass from forest health projects that promote wildfire resilience. The Shasta Pit River Biomass Alliance will facilitate biomass removal and use from all land ownership types through sales of biomass owned by its members and negotiate third-party biomass feedstock supply agreements between local buyers and sellers while leveraging state, federal, and private investments for regional good, and improving the public understanding of biomass utilization co-benefits, where appropriate.
Key Functions	• Negotiate and support guaranteed long-term contracts between biomass buyers and suppliers, advancing the ability of both parties to meet lender and investor requirements and facilitate biomass utilization facility financing and development. • Conduct third-party environmental planning for private and, potentially, public forest landowners. • Implement forest management plans and forest health projects for private and public landowners. • Conduct some level of grant support on behalf of its members. • Operate a (new) sort yard. • Conduct educational outreach and advocacy.

Source: Northeastern California Pilot Project members; California Law Empowering Renewable Energy (CLERE) Inc.

Once approved, the JPA will be formally established and will start organizing its administrative functions, including appointing a board of directors, hiring staff, and setting up financial systems, including establishing an annual operating budget. Early activities will focus on building and strengthening collaborative relationships among member agencies, securing initial funding, and developing strategic plans to achieve the JPA's objectives, including implementing initial, identified functions.

As the JPA begins implementing its first projects, it will navigate regulatory requirements and establish operational procedures. Over time, the JPA will evaluate its initial, identified functions, and refine them as necessary. For example, the JPA may need to adapt to changing market demands, expand the scope of identified functions, revise its member agencies, pursue new funding strategies, or other actions to enhance its effectiveness and sustainability.

The phasing of the new JPA has been conceptualized as follows, recognizing that the development of such an industry and the efforts of the regional JPA to incubate and sustain it will evolve.

- An initial phase, **Phase 1**, involves 'start-up' planning, the continued assessment of natural resources capacity and market demand, developing a permitting and environmental review framework for conducting third-party environmental planning, engaging with prospective private sector partners, and overall feasibility testing. Upon the determination that such start-up efforts have the potential to be feasible, additional phases could proceed.
- **Phase 2** would be initiated to the extent these initial efforts prove to be feasible. This phase would focus on the implementation of key functions, including negotiating and supporting long-term contracts, conducting third-party environmental planning, providing grant support, and other key functions identified in the JPA agreement. This phase should also focus on demonstrating the feasibility of larger-scale operations.
- As the JPA achieves incremental successes in Phase 2, **Phase 3** would include sustaining operations and the gradual expansion of investment and scaling up to support additional operating activities throughout the Region.
- **Phase 4** would involve the ongoing support the JPA may provide to the industry to sustain operations and profitability, adjusting approach and key functions as warranted in response to changing market conditions.

Funding Phase 1 of JPA Operations

As outlined above, it is likely that the JPA will generally develop in discrete phases. At this point in the planning stages, it is difficult to forecast how the JPA may evolve given the scale of the Region, the uncertainties around what services and investments may prove worth pursuing, and what external funding may be available for investing in specific functions and projects. The budget included in this study corresponds with the initial “start-up” phase (**Phase 1**) of the JPA, which is estimated to cover the first three years of operation.

The purpose of this pro forma budget in the context of this study is to estimate the funding needed for the JPA at its inception and to identify the realistic sources of funding for its initial operations based on our understanding of available sources, as described in the previous chapter, case study research on how other JPAs are funded, and conversations with the JPA stakeholders to date. **Figure 4** presents a preliminary annual budget over the first 3 years of operations, based upon an assessment of initial costs to administer the JPA, conduct necessary organizational development efforts, and provide initial services determined by its Board of Directors.

Timing of Ongoing Operational Funding

The Fall River RCD’s existing secured funding (referred to as Rounds 1 and 2 funding), which is currently being used to initially evaluate the establishment of a regionally supported aggregation entity, will terminate on March 31, 2025. The grantee (Fall River RCD) has applied to OPR for additional funding (referred to as Round 3 funding) which, if awarded, is expected from June 14, 2024, to March 31, 2026. The Round 3 funding will support further investigation of the most feasible funding mechanisms, leverage and consider work completed by other pilot projects that are focused on the topics of feedstock supply insurance and a value-added wood products campus, support continued engagement with the anticipated member RCDs, and draft the JPA foundational documents. A final tranche of funding (referred to as Round 4 seed funding), while not yet secured, is anticipated from June 1, 2026, to March 31, 2029. Ongoing operational funding for the proposed new JPA will be needed no later than March 31, 2027.

Proposed JPA Budget Details and Funding Strategy

Revenues

The initial phase funding strategy includes: (1) passive income generated through the investment of Round 4 seed funding; (2) grants from federal and State programs as well as private foundations; (3) charges for services and enterprise revenues generated through key function activities; and (4) annual member agency contributions. Preliminary funding estimates total $534,000 in the first year, $477,000 in the second year, and $496,000 in the third year of the Phase 1 budget period. In aggregate, revenues are estimated to equal nearly $1.5 million.

Figure 4. Proposed New Joint Powers Authority 3-Year (Phase 1) Budget

ITEM	Year 1	Year 2	Year 3	TOTAL	% of TOTAL
REVENUE					
Contributions					
Endowment/Passive Income	$50,000	$50,000	$50,000	**$150,000**	10.0%
Contributions/gifts	$5,000	$5,000	$5,000	**$15,000**	1.0%
Member Contributions	$5,000	$5,000	$5,000	**$15,000**	1.0%
Subtotal	**$60,000**	**$60,000**	**$60,000**	**$180,000**	**11.9%**
Grants					
Regional/JPA development grants	$27,200	$40,000	$52,800	**$120,000**	8.0%
Biz Admin	$0	$26,500	$33,500	**$60,000**	4.0%
Foundations/Corporate	$20,000	$20,000	$20,000	**$60,000**	4.0%
Subtotal	**$47,200**	**$86,500**	**$106,300**	**$240,000**	**15.9%**
Fees for Services/Enterprise Revenues					
Implement landowner forest plans	$30,000	$40,000	$80,000	**$150,000**	10.0%
RCD grant administration	$15,000	$20,000	$30,000	**$65,000**	4.3%
Sort yard	$100,000	$150,000	$200,000	**$450,000**	29.9%
Carbon credits/AWE	$0	$10,000	$20,000	**$30,000**	2.0%
Subtotal	**$145,000**	**$220,000**	**$330,000**	**$695,000**	**46.1%**
Operational Reserve					
Reserve to zero budget annually	$281,850	$110,472	$103	**$392,425**	26.0%
Subtotal	**$281,850**	**$110,472**	**$103**	**$392,425**	**26.0%**
TOTAL REVENUE	**$534,050**	**$476,972**	**$496,403**	**$1,507,425**	**100.0%**
EXPENSES					
Labor					
ED (1 FTE Employee)	$125,000	$130,000	$135,200	**$390,200**	25.9%
ED Benefits (35%)	$43,750	$45,500	$47,320	**$136,570**	9.1%
Feedstock Manager (Contractor)	$60,000	$80,000	$100,000	**$240,000**	15.9%
Admin (0.25 FTE Contractor)	$25,000	$26,000	$27,040	**$78,040**	5.2%
RPF (Contractor)	$62,400	$64,896	$67,492	**$194,788**	12.9%
Legal (Contractor)	$19,800	$20,592	$21,416	**$61,808**	4.1%
Landowner ed for carbon credits (Contractor)	$7,500	$7,800	$8,112	**$23,412**	1.6%
Accountant/taxes (Contractor)	$1,000	$3,000	$5,000	**$9,000**	0.6%
Subtotal	**$344,450**	**$377,788**	**$411,580**	**$1,133,818**	**75.2%**
Operations					
JPA LAFCO and Sec State Filing fees	$30,000	$0	$0	**$30,000**	2.0%
Audit (Contracted)	$0	$15,000	$0	**$15,000**	1.0%
Legal fees (Contracted)	$10,000	$10,400	$10,816	**$31,216**	2.1%
Insurance	$8,000	$8,200	$10,000	**$26,200**	1.7%
Equipment	$10,000	$1,000	$2,000	**$13,000**	0.9%
Software, phone internet	$3,600	$3,744	$3,894	**$11,238**	0.7%
Office rental/utilities	$9,000	$9,000	$9,000	**$27,000**	1.8%
Travel	$3,000	$5,000	$6,000	**$14,000**	0.9%
Bank fees	$500	$520	$541	**$1,561**	0.1%
Subtotal	**$74,100**	**$52,864**	**$42,251**	**$169,215**	**11.2%**
Outreach					
Website, education, outreach	$2,500	$2,600	$2,704	**$7,804**	0.5%
Subtotal	**$2,500**	**$2,600**	**$2,704**	**$7,804**	**0.5%**
Sort Yard					
Equipment	$90,000	$15,000	$10,000	**$115,000**	7.6%
Insurance	$5,000	$10,000	$10,400	**$25,400**	1.7%
Land lease	$18,000	$18,720	$19,469	**$56,189**	3.7%
Subtotal	**$113,000**	**$43,720**	**$39,869**	**$196,589**	**13.0%**
TOTAL EXPENSES	**$534,050**	**$476,972**	**$496,403**	**$1,507,425**	**100.0%**
NET OPERATING BUDGET	**$0**	**$0**	**$0**	**$0**	**-**

Source: NE CA Pilot Project Team; NE CA Pilot Project RCDs; EPS.

As the new JPA evolves, this funding strategy will likely evolve to fund a larger portion of expenditures on sustainable sources, including passive income, charges for services, and enterprise revenues, reducing the need for the labor-intensive and competitive pursuit of grants and gifts.

- **Passive income.** The initial start-up period is three years or roughly the anticipated Round 4 term of funding (June 1, 2026 - March 31, 2029). **State seed funding** is estimated to be $1 to $2 million. For this initial budget, we have assumed $1 million in seed funding will be invested in an investment vehicle to generate passive income (interest income derived from funding invested in an investment account such as the California Cooperative Liquid Assets Securities System [CLASS]).[9] Interest income from seed funding is estimated to represent about 12 percent of aggregated 3-year revenues.
- **Charges for services/enterprise revenues.** The primary revenues supporting JPA operations will be charges for services provided, including revenues generated from assisting with the implementation of landowner forest plans and providing grant administration services to member RCDs. In addition, enterprise revenues generated through the establishment and operation, or leasing, of a material sorting and processing yard are estimated to generate a substantial income stream for the JPA. Revenues from charges for services and enterprise revenues are estimated to represent nearly 46 percent of aggregated 3-year revenues.
- **Grants and gifts.** Most, if not all, of the funding in this category is anticipated to be obtained through the successful pursuit of federal, State, and local grants that are not in direct competition with member RCDs. Potential gifts include matching funds provided by The McConnell Foundation or its partners or other foundations or investors to be determined during this initial phase of operations. During the initial phase of JPA operations, the Executive Director will work with the Board of Directors to determine a plan to pursue grant programs that align with JPA objectives and do not compete with grants intended to be pursued by member agencies and provide targeted funding amounts. Grants and gifts are estimated to represent nearly 16 percent of aggregated 3-year revenues, although this percentage may be significantly higher if this category of funding represents the source of funding for the operational reserve, as noted below.
- **Member contributions.** RCDs have preliminarily identified annual contributions of $1,000 per member per year in cash contributions. In addition, members may contribute in-kind services, such as office space. In-kind contributions may be in addition to cash contributions or in lieu of

[9] California CLASS is a Joint Powers Authority investment pool that provides public agencies the opportunity to invest funds on a cooperative basis in rated pools that are managed in accordance with state law with the primary objectives of offering Participants safety, daily and next-day liquidity, and optimized returns. For more information, visit: https://californiaclass.com/.

cash contributions; this is yet to be determined. Members do not anticipate contributing staff to the JPA in support of the JPA Executive Director or its Feedstock Management contractor. Direct financial contributions from member agencies are estimated to represent about 1 percent of aggregated 3-year revenues.

- **Operational reserves.** The revenue estimates include a substantial sum, particularly in the first year, identified as "operational reserves," which represents a gap to fund annual Phase 1 operating expenditures in full. The budget indicates an operational reserve amount of $282,000 in the first year and $110,000 in the second year (with a negligible amount in the third year), totaling about $392,000, in aggregate. The source of this funding will likely need to be obtained through grants and gifts. Highlighting this funding gap during subsequent rounds of State funding may help secure additional seed funding. Alternatively, the proposed new JPA could pursue a strategic partnership with a private foundation, such as the McConnell Foundation, to provide upfront funding and meet this funding gap.

Expenditures

Preliminary estimated expenditures for the new JPA encompass staffing, JPA operations, and sort yard operations ranging from about $534,000 in the first year to about $496,000 by the third year. Over the 3-year budget period, expenditures total about $1.5 million. Higher costs in the first year are primarily attributable to initial expenses related to upfront equipment purchase costs for the sort yard. ***For this study, costs represent high-level estimates that will need to be updated as more refined budget data becomes available.***

Note that a cost contingency factor has not been included to cover additional unanticipated costs but may be a line item the new JPA considers given the uncertainties of providing key functions. This budget estimate assumes that most expenses increase annually by 4 percent to account for inflation.

- **Staffing costs.** Annual staffing costs represent the largest cost center in the proposed JPA budget. Costs include 1.0 FTE employee (Executive Director), and contractors (total FTEs to be determined), including a Feedstock Manager, Administrative Support, a Registered Professional Forester (RPF), and as-needed legal, accounting/tax, and carbon credit technical expert support. Staffing costs represent about 75 percent of the aggregated 3-year budget. Additional information regarding the anticipated roles of the Executive Director, Administrative Support, and Feedstock Manager are provided below and may be refined by the JPA Board of Directors.
    - The **JPA Executive Director role** is anticipated to involve working closely with the Board of Directors to lead organizational, operational, and program development, including facilitating board meetings, establishing policies and procedures, and ensuring compliance with governmental

regulations. Responsibilities include program development, outreach, education, fundraising through grants and private foundations, conducting grant progress reporting, developing and implementing the annual budget, ensuring contract compliance, overseeing website development, and recruiting, hiring, and training staff or contractors as needed.

  - The **Feedstock Manager role** could involve sourcing feedstock from public and private lands, arranging transport from forested sites to the sort yard, coordinating sales to buyers of woody biomass, and working with the Executive Director on outreach and marketing materials. The role also involves maintaining the feedstock yard and equipment, writing grants for funding, ensuring a steady long-term supply of feedstock, preparing stewardship agreements with public agencies, and managing compliance documents. Other essential duties could include maintaining accurate records of feedstock intake and sales, reporting to state and federal agencies, and cooperating with long-term research studies on forest health and wood products business development.
  - The **Administrative Support role** may include developing, maintaining, and managing organizational and program budgets, establishing a JPA Cost Allocation Plan, and maintaining a project-based accounting system in QuickBooks with daily backups. The role involves financial reporting to the Executive Director and Board of Directors, covering financial statements, grant status, payroll liabilities, and budget recaps. It also includes invoicing, managing accounts payable/receivable, bank account management, payroll administration, tracking staff paid time off, coordinating internal audits, preparing for external audits, closing books at the fiscal year-end, preparing annual tax documents, filing quarterly tax documents, developing grant proposal budgets, managing equipment depreciation, following financial policies, and ensuring compliance with financial regulations.

- **JPA Operational Costs**. Annual operational expenditures include an annual audit, legal fees associated with drafting and reviewing feedstock contracts, insurance costs (based on the assumption that the JPA can obtain cost-efficient insurance coverage through the Special District Risk Management Authority [SDRMA]), and maintaining equipment.[10] In addition, operational costs include the leasing of office space, utilities, software, telecommunications, travel, website, education, outreach, and bank fees. Operational costs are estimated to comprise about 12 percent of the aggregated 3-year budget.

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[10] SDRMA provides public agency members comprehensive coverage protection for workers' compensation, general liability, public officials errors and omissions, employment practices liability, auto, property, boiler and machinery, mobile equipment and crime and fidelity coverage. In addition, we provide access to a health benefits program including medical, dental, vision, life, LTD and EAP. For more information, visit: https://www.sdrma.org/.

- **Sort Yard Operational Costs**. In addition to the labor costs itemized under staffing costs (Feedstock Manager), operations of the sort yard will incur upfront equipment purchase costs as well as ongoing equipment maintenance and replacement costs (including fuel and energy costs to operate equipment), separate insurance coverage, including liability, property, and workers' compensation, and the cost to lease land for the facility. Other expenditures may be required to operate the sort yard beyond those identified in this current budget estimate including permit and compliance expenses to meet environmental and safety regulations, technology and software investments for inventory management and administrative tasks, marketing and sales expenditures to attract and retain customers, and miscellaneous supplies such as office supplies, safety gear, and tools. Preliminary expenditure estimates for sort yard operations represent about 13 percent of the aggregated 3-year budget.

Net Budget Forecast

The preliminary budget identifies a balanced net operating budget in all 3 years of Phase 1. However, as noted previously, this balanced budget relies on additional funding identified as operational reserves in the budget and likely funded through grants or gifts. This reserve amount could be used to demonstrate a larger need for additional State funding or be used to secure upfront funding from a private foundation that aligns with the proposed new JPA's mission. Note that a balanced budget will be required for approval by the governing bodies of member agencies and the appropriate Local Agency Formation Commission (LAFCO) at the time of JPA formation.

JPA Financial Policies and Agreements

The JPA should rely on the Joint Powers Agreement to set the mission statement and stipulate important choices for the entity, including which rules will apply to the fiscal management of the new entity. In particular, the Joint Powers Agreement should include provisions about debts, liabilities, auditing, and the treasurer of the entity; insurance provisions; the voting rights and terms of member participation; establish any standing committees; and, describe the terms of JPA termination or member agency withdrawal.

Specific categories of financial policies and agreements may include:

- **Budget policies.** Establish procedures for preparing, approving, and amending the annual budget; define controls for authorizing and monitoring expenditures, and implement regular budget monitoring and reporting.
- **Funding and revenue policies**. Identify and document potential revenue sources, develop policies for applying for and managing grants, and establish clear guidelines for setting and adjusting charges for services.

- **Budget reserve policies**. Establish reserve funds for specific purposes, determine appropriate funding levels for reserves, and set procedures for using and replenishing reserves.
- **Investment policies**. Define objectives for investing JPA funds, specify permitted investments and restrictions, and establish oversight mechanisms and regular reporting on investment performance.
- **Grant policies**. Define objectives for the types of grants to pursue and include a provision that the JPA should not seek grant opportunities that are in direct competition with its member agencies.
- **Debt management policies**. Outline conditions and processes for issuing debt, detail procedures for managing debt service payments, and ensure compliance with legal and regulatory requirements related to debt management.
- **Accounting and financial reporting policies.** Adhere to Generally Accepted Accounting Principles (GAAP), require regular financial reports, and mandate annual independent audits for transparency and accountability.
- **Internal controls policies.** Implement internal controls to segregate financial responsibilities, establish approval processes for financial transactions, and regularly reconcile financial records to ensure accuracy.
- **Procurement policies.** Require competitive bidding for significant purchases and contracts, implement conflict of interest policies, and establish procedures for selecting and managing vendors.
- **Risk management policies**. Obtain appropriate insurance coverage, conduct regular risk assessments, and develop contingency plans for financial emergencies.

In addition, the entity should have a set of bylaws, procedures, and an employee handbook that provides more detail related to the items above and covers procedural actions taken by the JPA Board and various committees. Lastly, there could be a cost-sharing agreement put in place if there are complicated member investments and program costs.

Over time, other policies of the JPA may be developed as needed by the JPA Board. The JPA should develop a strategic plan followed by a detailed work plan guiding work over its first three years. The cost of the preparation of this strategic plan is included in the budget staffing and operational costs.

APPENDICES:

Appendix A: JPA Case-Study Overview

Appendix B: Detailed JPA Case-Study Budgets

APPENDIX A:

JPA Case-Study Overview

Case Study Research Approach

As part of this study, EPS interviewed representatives and evaluated the most recent budgets (FY 2023-24) of eight existing JPAs to understand governance structure and key operational revenues and expenditures. EPS used the information gleaned from these interviews to guide discussions with the NE CA Pilot Project and Project Team to determine a preferred funding strategy to support the operations of a new JPA. EPS's findings are detailed here in **Appendix A**, and the respective budgets EPS analyzed are presented in **Appendix B**.

EPS selected JPAs, solely based in California, that provide related services or share common goals around climate resiliency, ecosystem management, natural resource stewardship, and vegetation. Further, all selected JPAs were included as examples in recent reports evaluating JPAs as an entity option to manage woody biomass, prepared by CLERE, Inc.:[11]

- Eastern Sierra Council of Governments (ESCOG)
- Los Vaqueros Reservoir (LVR)
- Marin Wildfire Prevention Authority (MWPA)
- Mountains Recreation and Conservation Authority (MRCA)
- Rural Counties' Environmental Services Joint Powers Authority (ESJPA)
- Tuolumne River Regional Park (TRRP)[12]
- Upper Mokelumne River Watershed Authority (UMRWA)
- Western Placer Waste Management Authority (WPWMA)

Figure A-1 provides a map of the location of each JPA's operational headquarters. As shown, the majority of JPAs included in this study are located in Northern California, with one exception, MRCA, which is based in Southern California. Refer to **Table A-1** for an overview of each JPA's key characteristics.

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[11] "Joint Powers Authorities. A Tool to Manage Forest Biomass Residuals in California" California Law Empowering Renewable Energy (CLERE), Inc., May 2023, and "Legal Tools for Government Entities to Incentivize Utilization of Forest Biomass In California" CLERE, Inc., February 2024.

[12] All the JPAs interviewed, except for TRRP, are Joint Powers Authorities. TRRP is a Joint Powers Agreement (JPAg). A JPAg is a contract between two or more public agencies, allowing the separate agencies to cooperatively provide services or exercise shared powers. A JPAg can establish an independent agency, but it doesn't have to.

Figure A-1. Location of JPA Case Studies

Source: EPS.

Table A-1 (landscape) page 1 of 2

Table A-1 (landscape) page 2 of 2

Analytical Themes

EPS's interview questions and budget evaluation focused on obtaining information in alignment with the following key themes:

- **Governance Structure/Operations.** Research included questions regarding member agencies and partners, JPA board composition, and the inclusion of any federal or State representation.
- **Staffing Requirements.** Another area of focus for the study included understanding the current landscape of staffing a JPA, including the amount and types of staffing needed to support any future work conducted by the potential JPA.
- **Primary Funding Sources.** Research included interview questions and evaluating each JPA's budget to understand the various sources of revenues funding ongoing operations. In addition, research included understanding sustainability, the level of staffing resources needed to obtain funding, and application to the proposed new JPA.
- **Primary Budget Expenditures.** This theme included understanding the primary categories of operating expenditures for existing JPAs as it relates to services provided, the magnitude of administrative and operational costs, and other expense categories related to the JPA's overall budget.

Case-Study Findings

The following sections detail the case-study findings for each analytical theme. Note that the findings presented are solely representative of the JPAs interviewed rather than representative of all JPAs in California.

Governance Structure/Operations

As detailed in the Joint Powers Authorities Overview section of the report, JPAs are legally created entities that allow two or more public agencies to jointly exercise common powers. The Joint Exercise of Powers Act, as codified in California Government Code §6500, governs JPAs. This act authorizes two types of JPA arrangements: a separate entity (a new legal authority known as a Joint Powers Authority established via an agreement) and a non-separate entity (an agreement to cooperate under a Joint Powers Agreement).

All entities interviewed for this research are Joint Powers Authorities, except TRRP. Seven of the eight JPAs researched had agreements establishing the creation of separate entities, while the remaining JPA, TRRP, was formed as a non-separate entity, sharing responsibilities and powers between the member agencies.

Of the JPAs interviewed, more than half are composed of government agencies (e.g., counties, cities), while the remaining JPAs do not include any jurisdictions and instead have members made up of other public agencies (e.g., utility districts, park and recreation districts, utilities commissions, utility conservation districts, water agencies, flood control districts, irrigation districts). See **Table A-2** for a detailed breakdown of each JPA's participating members.

The JPAs interviewed typically have a governing board that comprises at least one appointed representative from each member agency with each board member receiving one vote.

Table A-2. Summary of JPA Member Agencies

Member Entities	ESCOG	LVR	MWPA	MRCA	ESJPA	TRPP	UMRWA	WPWMA
Towns	x		x					
Cities	x		x			x		x
Counties	x		x		x	x	x	x
Community Services Districts			x			x		
Recreation and Park Districts				x				
Utility Districts		x					x	
Fire Districts			x					
Water Districts		x					x	
Flood Agencies		x						
Irrigation Districts							x	
State Agencies		x		x				
Federal Agency								
Total Member Agencies	**4**	**10**	**17**	**3**	**19**	**3**	**9**	**4**

Source: EPS

State or Federal Board Representation

Most of the JPAs interviewed do not have federal or State representation on their boards, with two exceptions: one existing State representative who is the chair of the Santa Monica Mountains Conservancy and sits on the board of MRCA; and one pending State representative who will sit on the LVR board. The LVR JPA is expected to imminently execute an MOU to have an Ex-Officio non-voting member from the State's Department of Water Resources on its board.

While the JPAs do not have any federal board representation, almost all the JPAs interviewed contract with federal and State Agencies to provide services. In these instances, typically the JPAs have entered into service agreements with, or have received grants from federal or State agencies.

Staffing Requirements

Most of the JPAs interviewed do not employ direct staff, including the JPA's Executive Directors. Instead, the JPAs contract employment for both their Executive Directors and other administrative and programmatic staff. In addition, JPA staffing can be provided in-kind, or in some cases contracted, through the member agencies. Most staffing is determined by the projects identified and successfully funded through grants. See **Table A-3** for a detailed breakdown of estimated full-time equivalents for each JPA.

Listed below are the main findings related to JPA staffing:

- Only two of the eight JPAs have staff that are employed directly by the JPA. These two JPAs also are the only JPAs that employ staff on a full-time basis.[13]
- The remaining JPAs either hire contract staff or have staff time contributed by their respective member agencies.
- Only three JPAs are run by a directly employed, full-time Executive Director. The remaining JPAs have contract Executive Directors who are employed at less than 1.0 full-time equivalent.
- Many JPAs also expressed a preference for hiring contractors as opposed to hiring staff to carry out the JPA's key functions because of the seasonality in the type of work conducted by the JPAs as well as the breadth and depth of experience hiring a contractor specializing in the type of services needed brings to the JPA.
- The JPAs also acknowledged a desire to hire direct staff for the various benefits as described in **Table A-4**.

[13] Only MWPA and MRCA employ staff directly. ESCOG has a full-time Executive Director but instead of being employed directly by the JPA, ESCOG's Executive Director is employed through one of its member agencies.

Table A-3. JPA Staffing Types

Staffing	ESCOG [1]	LVR [2]	MWPA [3]	MRCA	ESJPA [4]	TRRP [5]	UMRWA [6]	WPWMA [7]
Full-time Equivalents (FTEs)								
JPA Staff	-	-	7	80	-	-	-	-
Contractor	1	10	N/A	50	-	5	5.5	N/A
Member Agency Staff								
Employed	1	-	-	-	-	3.25	-	N/A
In-Kind	-	-	7	-	N/A	-	-	-
Total FTEs	**2**	**10**	**14**	**130**	**N/A**	**8.25**	**5.5**	**N/A**

Source: EPS

[1] ESCOG has a full-time Executive Director contracted from Inyo County. Counsel, finance and clerking is contracted from the JPA's member agencies and the JPA compensates the agencies for their staff time and assumes total time to equal 1 additional FTE.
[2] The LVE JPA does not have any full-time employees. The total number of contractors and consultants employed by the JPA is approximately 10.
[3] MWPA has 7 FTEs and estimates that of the 55+ employees at member agencies, about 7 are FTEs. Additionally MWPA hires several contractors for professional services where there is not enough work to employ full time staff but did not provide an estimated FTE equivalent.
[4] RCR provides in-kind staff support for the ESJPA. FTE estimate was unavailable at the time of EPS's interview.
[5] The administrator for TRRP is the Parks and Planning Development Manager for the City of Modesto and estimates that TRRP administrative work is 1/4 FTE. Additional staff for TRRP includes 2 full-time maintenance staff with one additional 1 full-time equivalent from various staff at the City of Modesto for other administrative functions and operations.
[6] UMRWA has a total of 0.5 FTE for administrative work of the JPA. Depending on projects and seasonality, UMRWA's contracted forest health team typically has 5 FTEs.
[7] EPS was unable to interview WPWMA staff directly but assumes all staff are employees of Placer County based on primary research. EPS also assumes that some staff for WPWMA are contractors based on budget line items.

Highlighted in **Table A-4** are two main types of employment that the interviewed JPAs used: direct staff and contractors. There are merits and drawbacks to consider for each type of employment, as summarized below.

Table A-4. Full-time and Contract Staff Comparison

Contract Staff		Direct Staff	
Pros	**Cons**	**Pros**	**Cons**
Personnel and administration costs can be minimized.	Must be cognizant and compliant with any laws relating to employee classification, rules dictating employee hours, and any other tax implications.	Morale and commitment to the organization and its mission could be higher.	Providing benefits to employees increases business costs, retirement, insurance, vacation, etc.
Can scale up (or down) in staffing based on the seasonality of the work and organizational capacity	Don't have complete control over staff time nor have the ability to prioritize their work.	Have control over staff time and project prioritization.	Work can be seasonal and full-time staffing may not be necessary.
Expands the bandwidth of expertise in staff			Finding qualified staff could be challenging.

Source: EPS

Primary Funding Sources

There are a variety of funding sources available to JPAs. These sources are detailed in the JPA funding overview section of this report. In a review of the last FY budgets for each of the JPAs, five sources of funding emerged as the most common:

- Grants and gifts;
- Contributions from member agencies;
- Passive income;
- Program revenues; and
- Special tax and assessment revenue.[14]

In addition to the five main sources of funding, less common funding sources were included under the Other category. Examples of Other funding sources include carryover or reserve funds (typically composed of unspent funds from the previous year), a park safety fund at MRCA, and bond proceeds at WPWMA.
For the JPAs included in this case study, most of the operational expenses of the JPAs are funded through two to three main funding sources. **Table A-5** provides a detailed breakdown for each funding source as it compares to the total revenues for each JPA, while **Figure A-2** graphically highlights the common sources of funding across each JPA.

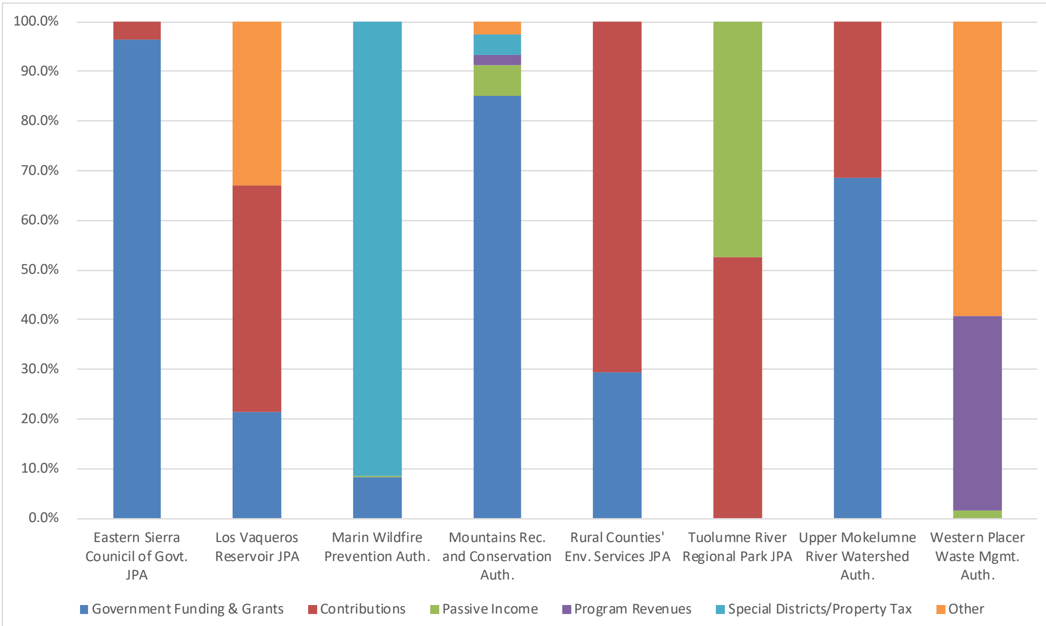
Table A-5. JPA Revenue Summary

	Revenue Sources						
JPAs	Government Funding and Grants	Contributions	Passive Income	Program Revenues	Special Districts/ Property Tax	Other	Total
ESCOG	96%	4%	-	-	-	-	**100%**
LVR	21%	45%	-	-	-	33%	**100%**
MWPA	8%	-	0%	-	92%	-	**100%**
MRCA	85%	0%	6%	2%	4%	3%	**100%**
ESJPA	29%	71%	-	-	-	-	**100%**
TRRP	-	53%	47%	-	-	-	**100%**
UMRWA	69%	31%	-	-	-	-	**100%**
WPWMA	0%	-	1%	39%	-	59%	**100%**

Source: Respective JPA Budgets; EPS.

[14] Levying special taxes and assessments requires political and community support. In the current political environment, it is unlikely that the proposed JPA would be able to leverage this particular type of funding source.

Figure A-2. Primary Funding Sources by JPA (FY 2023)



Source: Respective JPA Budgets; EPS.

Government Funding and Grants

As shown in **Table A-5** and **Table A-6**, with a few exceptions, government funding and grants are the most common sources of revenue across all JPAs. For six of the seven JPAs that received either government funding or a grant, almost half of their budget revenues were funded through this source.

Sources for grants and government funding varied depending on the project and mission of the JPA. Some grantors included nonprofits such as the National Fish and Wildlife Foundation. Other common grant sources included state agencies like the Sierra Nevada Conservancy, CalFire, the California Water Commission, the Water Conservation Board, the Department of Water Resources, and the National Forest Service.

Contributions from Member Agencies

Annual contributions from member agencies are the second most common source of funding for JPAs. For the three of five JPAs that receive member agency contributions, this source of funding makes up almost half of the revenue for the JPAs. For JPAs that have established annual contributions from its member agencies, the amount or share that each member agency is responsible for is typically established by the original Joint Powers Agreement. In other instances, the annual member contribution amount is negotiated on an annual basis. Beyond the total contribution amounts changing from year to year for some JPAs, the amounts contributed by the respective member agencies for one JPA could be the same or varied. For example, each of UMWRA's member agencies makes an annual contribution based on the respective agencies assigned share of the budget, e.g. Amador entities contribute a total of 20 percent, Calaveras entities contribute a total of 20 percent, and East Bay Municipal Utility District contributes 60 percent. See **Table B-10** for a detailed breakdown of UMRWA's budget and annual member contributions.

Passive Income

Examples of passive income included leasing land for cell towers, renting out recreational areas like picnic grounds and athletic fields, or charging fines, fees, or penalties. Only half of the JPAs interviewed utilize passive income as a source of revenue.

Program Revenues

Some JPAs provide services but these services are typically related to grant activities and therefore do not generate revenue. WPWMA is the only JPA that has an active fee-based service by providing solid waste disposal services in Placer County.

Special Tax and Assessment Revenue

Only two JPAs in the case study have special taxes and assessments to fund operations: MWPA and MCRA. MWPA is funded through Measure C, a parcel tax on all real property in Marin County.[15] MRCA has a preservation assessment district and several Mello-Roos Community Facilities Districts (CFD) (special tax) that were established with defined periods (i.e., 10 years) or in perpetuity. Both MRCA and JPA topic experts noted that political willpower and community support are necessary components of forming and maintaining a special tax or assessment district to utilize as a funding source.

Primary Budget Expenditures

In evaluating JPA budgets, expenditures were grouped into four main categories that were identified as common expenditures by each JPA:

- **Administrative.** This category includes expenditures related to staffing and personnel costs. It also includes expenditures for professional contracts and fees related to financial or legal services provided to the JPAs. Administrative costs can be indirect, such as the ones just listed, and general, which exist as a result of the organization's operational needs. Administrative costs can

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[15] Measure C levies up to 10¢ per building square foot ($75 per multifamily unit) for ten years on parcels of real property in Marin County within the defined boundary of the "Member Taxing Entities." It also includes annual inflation adjustments, independent citizen oversight/audits, and low-income senior exemptions.

also be direct costs related to specific programs and activities taken on by the organization.

- **Operations.** Operational expenditures include expenditures such as JPA office rent, utilities, insurance, maintenance, furniture, and equipment.
- **Grant Activities.** Grant activity expenditures varied by JPA. Examples include line items like Grant Expenditures—CalFire Grant, Inyo National Forest Liaison Grant, Sierra Nevada Conservancy Grant, or even more generally, Grants, or Grants and Contracts.
- **Capital Improvements.** Capital improvement expenditures include capital equipment purchases, infrastructure improvements, and construction of facilities.

In addition to the four main categories of expenditures, EPS categorized miscellaneous expenditures like dues, fees, subscriptions, and bond debt issuance costs under an Other Expenditures category. See **Table A-6** for a detailed breakdown of primary budget expenses by JPA.

Table A-6. Detailed Breakdown of Primary Budget Expenses by JPA (FY 2023)

	Expenditures					
JPAs	Admin.	Operations	Grant Activities	Capital Improvements	Other	Total
ESCOG	7%	2%	91%	-	-	**100%**
LVR	33%	27%	-	40%	-	**100%**
MWPA	6%	75%	2%	-	17%	**100%**
MRCA	20%	41%	36%	2%	0%	**100%**
ESJPA	70%	6%	24%	-	0%	**100%**
TRRP	-	95%	-	5%	-	**100%**
UMRWA	15%	8%	77%	-	-	**100%**
WPWMA	32%	1%	-	62%	5%	**100%**

Source: Respective JPA Budgets; EPS.

Administrative Costs

Administrative costs can be either direct or indirect costs depending on the expense. Direct administrative costs can be completely attributable to the production of a good or service. Or, in the case of grant activities, costs that can be 100 percent attributed to the program/project activity, i.e., the cost would not have been incurred if the grant activity did not exist. Indirect costs are general costs where a portion of such costs can be allocated to the grant activity but would still otherwise exist even if the grant activity did not exist, e.g., administrative functions of a director's office or a cost of facilities.

While budgets do not identify direct vs. indirect costs, EPS identified administrative expenditures in all but one of the JPA budgets; TRRP administrative expenses primarily fell within the Operations category. For the remaining JPAs, the range in administrative costs as a percentage of the JPA's total budget is spread between less than 10 percent and as high as 70 percent. Having administrative costs as a high proportion of the budget could suggest that a JPA has fewer programmatic activities as compared to other costs.

When administration costs are higher than 20 percent but within the 20 to 30 percent range, this could be a result of the JPA applying to labor-intensive grant applications, or their grant activities and reporting may include stringent auditing requirements. In addition to stringent auditing, many grants and gifts have limits on how the funding can be used and could restrict the funding from reimbursing a JPA's administrative expenses related to the grant administration and auditing.

Negotiated Indirect Cost Rate Agreement

One tool that could help reduce a JPA's administrative costs, specifically indirect costs, is a Negotiated Indirect Cost Rate Agreement (NICRA).[16] A NICRA is a formal written agreement between an organization and a federal agency describing how the organization will calculate indirect costs. For organizations that have a NICRA, the percentage of indirect costs that can be reimbursed/allocated to the grant funding can vary based on the original agreement and agency with which the organization entered into a NICRA, but once established the rate set into a NICRA can then be used in other federal grant agreements. While the rate can vary based on the agency and organization, it is typically higher than 10 percent.[17] None of the JPAs interviewed indicated they had a Negotiated Indirect Cost Rate Agreement (NICRA) with any Federal agency.

Operations

Operating expenses are costs incurred as a result of the JPA functioning and performing services. Examples of operating expenses across the various JPAs include costs like Rent, Office Expenses, Insurance, Insurance Premiums, Computer Maintenance and Support, Office Supplies, Utilities, Repair and Maintenance Services, etc. Operational expenses range from less than 2 percent to as high as 75 percent of the respective JPAs' budgets. This wide range reflects

[16] At least one RCD in the core group of RCDs that comprise the NE CA Pilot Project has a NICRA with a federal agency and asked EPS to identify if any of the JPAs included in the study has, or had previously used, a NICRA.

[17] Pursuant to 2 CFR 200.414(f), grant recipients may elect to use the de minimis rate of 10 percent of the modified total direct costs if the grant recipient does not have a negotiated rate.

to varying degrees the differing functions, types of activities, and/or services each JPA provides. For example, MWPA is a JPA supported by an assessment spread over a large geography. MWPA directly employs staff and performs a variety of programs and projects to meet its mission. For example, coordinating vegetation management projects, conducting defensive space evaluations, and providing environmental compliance and monitoring, are just a few of the main programs and functions of MWPA. As a result, 75 percent of MWPA’s expenses fall under Operations. On the other hand, ESJPA has little operational expenses because of its minimal functions, currently primarily serves as a grant administrator for its members, and is staffed/administratively supported by the Rural County Representatives of California (RCRC) which helps to reduce operational costs.

Grant Activities

Similar to operational expenses, costs related to grant activities ranged from as little as 2 percent to as much as 90 percent of a JPA's budget. This range reflects the variation in funding sources of the JPA and the resulting activities based on the respective funding sources. For example, in the last fiscal year, 95 percent of ESCOG’s funding was provided by government funding and grants, a source that has stringent auditing requirements and restrictions on what the funding can be used for, thus resulting in the majority of ESCOG’s expenditures relating to activities associated with the grant funding the organization received.

Capital Improvements

Only half of the JPAs identified costs relating to capital improvements. The amount and variation in capital improvement costs are highly dependent on the mission and functions of the JPA. For example, the Los Vaqueros Reservoir JPA has a significant portion of costs allocated to capital improvements because one of the main functions of the LVR JPA is to provide governance and administration of the Los Vaqueros Reservoir Expansion Project, a large capital improvement project that will drastically increase water storage, increase municipal and industrial water supply, and improve the quality of water delivery systems.

APPENDIX B:

Detailed JPA Case-Study Budgets

Table B-1
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
Detailed Budgets by JPA

Item	Eastern Sierra Council of Governments (ESCOG) Budget Amount	% of Total	Los Vaqueros Reservoir JPA (LVR) Budget Amount	% of Total	Marin Wildfire Prevention Authority (MWPA) Budget Amount	% of Total
Source	*Table B-2*		*Table B-3*		*Table B-4*	
Revenue						
Government Funding & Grants	$2,747,300	**96.5%**	$4,100,000	**21.5%**	$1,897,126	**8.3%**
Contributions	$100,000	**3.5%**	$8,673,000	**45.5%**	-	
Passive Income	-		-		$50,000	**0.2%**
Program Revenues	-		-		-	
Special Districts/Property Tax	-		-		$21,026,459	**91.5%**
Other	-		$6,300,000	**33.0%**	-	
Total Revenue	**$2,847,300**	**100%**	**$19,073,000**	**100%**	**$22,973,585**	**100%**
Expenses						
Administrative	$200,000	**7.4%**	$6,277,667	**32.9%**	$1,408,241	**5.6%**
Operations	$48,750	**1.8%**	$5,170,000	**27.1%**	$18,719,493	**75.0%**
Grant Activities	$2,447,300	**90.8%**	-		$611,768	**2.5%**
Capital Improvements	-		$7,625,333	**40.0%**	-	
Other	-		-		$4,207,292	**16.9%**
Total Expenses	**$2,696,050**	**100.0%**	**$19,073,000**	**100.0%**	**$24,946,794**	**100.0%**
Net Budget Surplus/(Deficit)	**$151,250**		**-**		**($1,973,209)**	

Source: Respective JPA Budgets; EPS.

Table B-1
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
Detailed Budgets by JPA

Item	Mountains Recreation and Conservation Authority (MRCA)		Rural Counties Environmental Services Joint Powers Authority (ESJPA)		Tuolumne Regional Park JPA (TRRP)	
	Budget Amount	% of Total	Budget Amount	% of Total	Budget Amount	% of Total
Source	*Table B-5*		*Table B-6*		*Table B-7*	
Revenue						
Government Funding & Grants	$81,051,000	**85.1%**	$130,000	**29.3%**	-	
Contributions	$50,000	**0.1%**	$313,800	**70.7%**	$583,900	**52.7%**
Passive Income	$5,705,000	**6.0%**	-		$524,500	**47.3%**
Program Revenues	$2,027,000	**2.1%**	-		-	
Special Districts/Property Tax	$3,957,000	**4.2%**	-		-	
Other	$2,420,000	**2.5%**	-		-	
Total Revenue	**$95,210,000**	**100%**	**$443,800**	**100%**	**$1,108,400**	**100%**
Expenses						
Administrative	$19,427,000	**20.4%**	$380,000	**70.1%**	-	
Operations	$39,132,000	**41.1%**	$30,125	**5.6%**	$875,996	**94.6%**
Grant Activities	$34,403,000	**36.1%**	$130,000	**24.0%**	-	
Capital Improvements	$2,028,000	**2.1%**	-		$50,000	**5.4%**
Other	$220,000	**0.2%**	$2,000	**0.4%**	-	
Total Expenses	**$95,210,000**	**100.0%**	**$542,125**	**100.0%**	**$925,996**	**100.0%**
Net Budget Surplus/(Deficit)	**-**		**($98,325)**		**$182,404**	

Source: Respective JPA Budgets; EPS.

Table B-1
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
Detailed Budgets by JPA

Item	Upper Mokelumne River Watershed Authority (UMRWA)		Western Placer Waste Management Authority (WPWMA)	
	Budget Amount [1]	% of Total	Budget Amount	% of Total
Source	*Table B-8*		*Table B-9*	
Revenue				
Government Funding & Grants	$556,447	**68.7%**	$56,000	**0.05%**
Contributions	$253,500	**31.3%**	-	
Passive Income	-		$1,762,681	**1.4%**
Program Revenues	-		$48,607,525	**39.4%**
Special Districts/Property Tax	-		-	
Other	-		$73,094,799	**59.2%**
Total Revenue	**$809,947**	**100%**	**$123,521,005**	**100%**
Expenses				
Administrative	$122,000	**15.1%**	$37,658,346	**32.1%**
Operations	$66,500	**8.2%**	$1,379,646	**1.2%**
Grant Activities	$621,447	**76.7%**	-	
Capital Improvements	-		$72,733,993	**62.0%**
Other	-		$5,471,521	**4.7%**
Total Expenses	**$809,947**	**100.0%**	**$117,243,506**	**100.0%**
Net Budget Surplus/(Deficit)	**-**		**$6,277,499**	

Source: Respective JPA Budgets; EPS.

Table B-2
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
ESCOG FY 2023-24 Budget

Item	**Eastern Sierra Council of Governments** (ESCOG)
Budget Year	**Proposed FY 2023-24**
Revenues	
Member contributions	$100,000
Interest revenues	-
Grants	
CDFW Prop 1 Grant	$2,000,000
National Fish and Wildlife Grant ("BIRPI" Implementation)	$247,300
Sierra Nevada Conservancy Grant ("Towns-to-Trails")	$200,000
California Economic Resiliency Fund	$250,000
Inyo National Forest Liaison Grant	$50,000
Total Revenues	**$2,847,300**
Expenses	
Insurance	$3,500
Office expense	-
Clerical	$20,000
Financial	$5,000
Legal	$10,000
Executive Director (Contractor)	-
Executive Director (Inyo County)	$150,000
Part-time Administrative Assistant	$50,000
Carmichael Business Technology	-
Pinon Ranch Consulting (Website Design)	-
Whitebark Institute (CDFW Prop 1)	$1,900,000
USDA Forest Service (CDFW Prop 1)	$50,000
National Fish and Wildlife Grant ("BIRPI" Implementation)	$247,300
Sierra Nevada Conservancy Grant ("Towns-to-Trails")	$200,000
Inyo National Forest Liaison Grant	$50,000
Publications and legal notices	$250
External Audit	$10,000
Total Expenses	**$2,696,050**
Net Budget Surplus/(Deficit)	**$151,250**

Source: Eastern Sierra Council of Governments FY 2023-24 Proposed Budget; EPS.

Table B-3
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
LVR FY 2023-24 Budget

Item	Los Vaqueros Reservoir JPA (LVR)		
Budget Year		**Adopted FY 2023-24**	
Revenues	**Contra Costa Water District (CCWD)**	**JPA**	**Total**
State	$2,000,000	-	**$2,000,000**
Federal	$2,100,000		**$2,100,000**
Local	-	$8,673,000	**$8,673,000**
Carryover	$6,300,000		**$6,300,000**
Total Revenues	**$10,400,000**	**$8,673,000**	**$19,073,000**
Expenses			
JPA Services			
Management	-	$1,706,000	**$1,706,000**
Administration	-	$250,000	**$250,000**
Financial	-	$720,000	**$720,000**
External Affairs/Agency Negotiation Support	-	-	**-**
Government Affairs: State (AWCA, CWC support)	-	$40,000	**$40,000**
Government Affairs: Federal	-	$180,000	**$180,000**
Agency Facilitation & Agreement Development Support	-	$250,000	**$250,000**
Legal	-	$505,000	**$505,000**
Subtotal Expenses		**$3,651,000**	**$3,651,000**
CCWD Services			
Management	$75,000	-	**$75,000**
Environmental Planning	-	-	**-**
Dam Raise	$790,400	-	**$790,400**
Transfer Bethany Pipeline	$364,800	-	**$364,800**
Pumping Plant No.1	$60,800	-	**$60,800**
Program (not facility specific)	$230,333	-	**$230,333**
Design		-	**-**
Dam Raise Design	$534,000	-	**$534,000**
Transfer Bethany Pipeline Design	$2,200,000	-	**$2,200,000**
Pumping Plant No.1 Design	$1,200,000	-	**$1,200,000**
Program (not facility specific) Design	$2,245,000	-	**$2,245,000**
Construction	-	-	**-**
Legal	$860,000	-	**$860,000**
Fees	$584,000	-	**$584,000**
Subtotal Expenses	**$9,144,333**	**-**	**$9,144,333**
CCWD Labor			
Management	$203,000	-	**$203,000**
Environmental Planning	-	-	**-**
Dam Raise	$86,300	-	**$86,300**
Transfer Bethany Pipeline	$86,280	-	**$86,280**
Pumping Plant No.1	$86,280	-	**$86,280**
Program (not facility specific)	$1,467,000	-	**$1,467,000**
Design	-	-	**-**
Dam Raise Design	$340,800	-	**$340,800**
Transfer Bethany Pipeline Design	$535,500	-	**$535,500**
Pumping Plant No.1 Design	$340,800	-	**$340,800**
Program (not facility specific) Design	$956,500	-	**$956,500**
Subtotal Expenses	**$4,102,460**	**-**	**$4,102,460**
Contingency	**-**	**-**	**$2,175,207**
Total Expenses	**-**	**-**	**$19,073,000**
Net Budget Surplus/(Deficit)	**-**	**-**	**-**

Source: Los Vaqueros Reservoir JPA FY 2023-2 Adopted Budget; EPS.

Table B-4
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
MWPA FY 2023-24 Budget

Item	Marin Wildfire Prevention Authority (MWPA)
Budget Year	**Proposed Final FY 2023-24**
Revenues	
Measure C	$21,026,459
County Interest	$50,000
Subtotal Revenues	**$21,076,459**
Other Revenues	
Grant Revenue - CalFire Grant	$1,897,126
Subtotal Other Revenues	**$1,897,126**
Total Revenues	**$22,973,585**
Expenses	
Core Program	
Environmental Compliance/Monitoring	$783,106
Evacuation Study	$405,108
Evacuation Management Platform	$78,750
Subtotal Core Program	**$1,266,964**
Operational Costs	
Rent	$130,000
Tenant Improvements	$25,000
Website Portal	$25,000
Communications	$40,000
GrizzlyCorps	$25,000
Training	$25,000
R&D, Emerging Opportunities	$25,000
Contingencies	$170,750
Subtotal Operational Costs	**$465,750**
Core Projects	
Alert/Notifications	$740,307
Chipper Days	$1,643,877
Defensive Space Evaluations	$524,660
Countywide Grant Program	$1,161,257
Metrics Development Tracking	$337,746
Equipment	$68,393
Evacuation Routes	$738,126
Public Education	$1,377,054
Shaded/Nonshaded Fuel Breaks	$4,763,921
Staffing	$1,508,292
Total Core Projects	**$12,863,633**
Total Core Program	**$14,596,347**

Table B-4
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
MWPA FY 2023-24 Budget

Item	Marin Wildfire Prevention Authority (MWPA)
Defensible Space Program	
Defensible Space Agency Payments	$4,207,292
Defensible Space Abatement Program	($84,146)
Total Defensible Space Program	**$4,123,146**
Local Wildfire Mitigation Program	
Local Agency Payments	$4,207,292
Total Local Wildfire Mitigation Program	**$4,207,292**
Administrative Costs	
Financial & Administrative Services	$159,377
Legal Services	$225,749
Personnel	$690,000
Services and Supplies	$233,115
Professional Services	$100,000
Total Administrative Costs	**$1,408,241**
Other Expenses	
Grant Expenditures - CalFire Grant	$611,768
Subtotal Other Expenses	**$611,768**
Total Expenses	**$24,946,794**
Net Budget Surplus/(Deficit)	**($1,973,209)**

Source: Marin Wildfire Prevention Authority FY 2023-24 Proposed Final Budget; EPS.

Table B-5
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
MRCA FY 2023-24 Budget

Item	**Mountains Recreation and Conservation Authority** (MRCA)
Budget Year	**Proposed Final FY 2023-24**
Revenues	
Investment Earnings	$275,000
Fees - Events	$1,725,000
Fees - Filming	$1,250,000
Fees - Parking	$920,000
Leases and Licensing	$460,000
Administrative Fees GC 53069.4	$1,035,000
Park Safety Fund	$345,000
Grants - SMMC	$41,034,000
Grants - Other	$36,850,000
Mitigation Program Revenue	$2,027,000
Preservation Assessment Districts	$495,000
Community Facilities Districts	$3,462,000
Government Agency Contracts	$3,167,000
Sale of Assets	$40,000
Donations	$50,000
Other Revenues	$600,000
Use of One-Time Funds/Unreserved Fund	-
Salary Savings Offset	$975,000
Use of Reserves	$500,000
Total Revenues	**$95,210,000**
Expenses	
Salaries and Wages	$9,095,000
Payroll Benefits & Taxes	$7,065,000
Contract Services	$3,267,000
Supplies and Maintenance	$1,695,000
General Office/Operations	$1,059,000
Insurance	$3,368,000
Utilities	$1,232,000
Grants	$34,403,000
Land and Improvements	$31,778,000
Capital Equipment Purchases	$2,028,000
Interest Expense	$120,000
General Contingency	$100,000
Total Expenses	**$95,210,000**
Net Budget Surplus/(Deficit)	

Source: Mountains Recreation and Conservation Authority FY 2023-24 Proposed Final Budget; EPS.

Table B-6
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
ESJPA FY 2023-24 Budget

Item	Rural Counties Environmental Services Joint Powers Authority (ESJPA)
Budget Year	**Proposed FY 2023-24**
Revenues	
Member County Dues	$148,800
Contracts-grants/projects	$130,000
Contribution from RCRC	$165,000
Total Revenues	**$443,800**
Expenses	
Accounting and Auditing	$5,775
Community Relations	$1,500
Computer Maintenance and Support	$3,000
Conferences attended by Staff	$1,000
Contact Support Service Fee	$380,000
Delivery Services	$500
Dues, Fees, and Subscription	$1,000
Equipment and Furniture	$250
Grants and Contracts	$130,000
Insurance	$4,500
Legal Fees	$1,000
Meetings	$2,000
Miscellaneous	$1,000
Office Expenses	$500
Rent	$6,600
Training	$1,000
Travel	$1,500
Travel - Board Member Reimbursement	$1,000
Total Expenses	**$542,125**
Net Budget Surplus/(Deficit)	**($98,325)**

Source: Rural Counties Environmental Services Joint Powers Authority FY 2023-24 Proposed Final Budget; EPS.

Table B-7
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
TRPP FY 2023-24 Budget

Item	Tuolumne Regional Park JPA (TRPP)
Budget Year	**Proposed FY 2023-24**
Revenues	
Intergov - County Contribution	$311,650
Intergov - Local - City of Ceres Contribution	-
Intergov - Local - City of Modesto Contribution	$272,250
CS-GG - Misc. Special Service	-
Lease of Land (includes Cell Tower Revenue)	$49,500
Ballfield Rental (Mancini and Bellenita)	$3,000
Picnic Area Rental (TRRP A and B)	$2,000
Building/Room Rental - Other (Mancini & ALH)	-
Miscellaneous Revenue	-
Refund, Damages, and Cost Recovery	-
Interest Revenue on Bank Accounts	-
Change in Fair Market Value	-
Sales of Fixed Assets	$470,000
Total Revenues	**$1,108,400**
Expenses	
ISF - Mail Services - Inside (58010)	-
ISF - Building Services (58020)	$14,029
ISF - Property Insurance (58060)	$4,263
Subtotal - APPR Unit B	**$18,292**
Office Supplies (52010)	-
Printing and Binding (52015)	$100
Custodial and Cleaning Supplies (52150)	$500
Personal Protection Equipment	$500
Gardening Supplies (52180)	-
Tools and Field Supplies <$5,000 (52300)	$4,000
Business Expenses (53030)	$1,500
Electricity Utility Expenses (53040)	$9,000
Gas Utility Expenses (53041)	-
Sewer Utility Expenses (53042)	-
Water Utility Expenses (53043)	$28,700
Rental of Equipment (53072)	$15,000
Repair and Maintenance Services (53100)	-
Repair and Maintenance Services - Vandalism (53110)	$20,000
Repair and Maintenance Services - Real Property (53150)	$40,000
Repair and Maintenance Services - Property Damage (53160)	$5,000
Professional Services (53300)	$381,301
Legal Services (53450)	-
Insurance Premiums (54200)	$8,500
Service City Forces - Interfund (54500)	$305,512
Services City Forces Non-Labor (54502)	-
ISF - Fleet Operating and Maintenance (54550)	$29,594
ISF - Fleet Replacement Expenses (54551)	$8,497
Survey GPS Replacement Fee (54555)	-
Subtotal - APPR Unit C	**$857,704**
Deferred Maintenance/CIP Budget (Transfer to Fund 6710)	$50,000
Transfer to Fund 5230 (Software Upgrade)	-
Subtotal - APPR Unit D	**$50,000**
Total Expenses	**$925,996**
Net Budget Surplus/(Deficit)	**$182,404**

Source: Tuolumne Regional Park JPA FY 2023-24 Proposed Budget; EPS.

Table B-8
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
UMRWA FY 2022-23 Budget

Item	**Upper Mokelumne River Watershed Authority** (UMRWA)
Budget Year	**Approved FY 2022-23**
FY 2023 Member Agency Funding Offsets (Revenues)	
Member Assessments	$253,500
Off Budget In-Kind Contributions [1]	$58,486
Total Member Supported Budget	**$311,986**
Indirect Fees	($15,000)
Reserves	($66,806)
Subtotal Offset	**($81,806)**
Total Required Member Funding (Revenues)	**$230,180**
Grant Pass Through	
West Point Water Reliability Project	$527,287
UMRWA Administration	$29,160
Total Grant Pass Through	**$556,447**
Expenses	
Executive Officer	$50,000
Administrative Officer	$50,000
Web technical support	$12,000
Public school program (STE)	$16,500
Forest Projects Plan – Phase 1	-
Forest Projects Plan – Phase 2	$50,000
Forest-related Grant Applications	$40,000
Inter-agency liaison & Board support	$10,000
Grant applications	$25,000
West Point Water Reliability Project	-
UMRWA administration	-
Total Expenses	**$253,500**

FY 2023 Member Funding Allocations and Assessments	**Member Agency %**	**FY 2023 Allocation**	**In-Kind Credit**	**FY 2023 Assessment**
Amador Entities				
Amador County	9.2%	$21,177	($6,500)	$14,677
Amador Water Agency	9.2%	$21,177	-	$21,177
Jackson Valley ID	1.6%	$3,683	-	$3,683
Subtotal Amador Entities	**20%**	**$46,036**	-	**$39,536**
Calaveras Entities				
Calaveras County	6.0%	$13,811	-	$13,811
Calaveras County WD	9.6%	$22,097	-	$22,097
Calaveras PUD	4.4%	$10,128	-	$10,128
Subtotal Calaveras Entities	**20%**	**$46,036**	-	**$46,036**
EBMUD	**60%**	**$138,108**	**($51,986)**	**$86,122**
Total Member Funding	**100%**	**$230,180**	**($58,486)**	**$171,694**

Source: Upper Mokelumne River Watershed Authority FY 2023 Proposed Final Budget; EPS.

Table B-9
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
WPWMA FY 2022-2023 Budget

Item	**Western Placer Waste Management Authority** (WPWMA)
Budget Year	**Approved FY 2022-23**
Revenues	
Investment Income	
Interest/Investment Income	$198,562
Interest with Fiscal Agent	$1,019,467
Rents and Concessions	$499,652
State Aid	$56,000
Sanitation Services	$29,787
Solid Waste Disposal	$48,577,738
Insurance	-
Miscellaneous	$15,000
Gain/Loss on Fixed Asset Disposal	$45,000
Operating Transfers In	-
Subtotal Revenues	**$50,441,206**
Additional non Income Statement Transactions	
Bond Proceeds	$69,579,799
Planned Use of Reserves	$3,500,000
Total Additional non Income Statement Transactions	**$73,079,799**
Total Revenues	**$123,521,005**
Expenses	
Capital Assets	
Buildings & Improvements	$17,082,893
Equipment	$44,101,506
Infrastructure	$622,000
Land Improvements	$10,927,594
Subtotal Capital Assets	**$72,733,993**

Table B-9
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
WPWMA FY 2022-2023 Budget

Item	**Western Placer Waste Management Authority** (WPWMA)
Operating Expenses	
Wages and Salaries	$2,493,632
Clothing and Personal	$2,500
Communication and Services Expense	$9,000
Food	$1,000
Household Expense	$500
Insurance	$620,000
Parts	$1,000
Maintenance	$76,796
Maintenance - Building	$2,500
Fuels & Lubricants	$2,500
Materials - Buildings & Improvements	$500
Professional / Membership Dues	$12,000
Services and Supplies	$500
Misc. Expense	-
Printing	$10,000
Other Supplies	$25,000
Postage	$3,500
Professional and Special Services - General	$2,740,086
Professional and Special Services - Legal	$150,000
Prof. & Special Services - County	$230,000
Prof. & Special Services - IT	$75,000
Rents and Leases - Equipment	$100
Rents and Leases - Buildings & Improvements	$100
Small Tools & Instruments	$750
Employee Benefit Systems	$21,200
PC Acquisition	$5,300
Commissioner's Fees	$6,000
Signing & Safety Material	$1,000
Small Equipment	$100
Advertising	$317,000
Special Department Expense	$1,500
Training/Education	$2,500
Transportation and Travel	$45,000
Utilities	$250,000

Table B-9
Northeastern California Woody Biomass Pilot Project
Funding Options and Strategies for New Joint Powers Authority
WPWMA FY 2022-2023 Budget

Item	Western Placer Waste Management Authority (WPWMA)
Operating Expenses (Continued)	
Operating Materials	$1,000
Debt Issuance Costs	$3,700
Bond Interest	$4,631,285
Taxes and Assessments	$517,545
Contributions to Other Agencies	$274,022
Transfer A-87 Costs	$26,969
Operating Transfer Out	-
Appropriation for Contingencies	-
Professional and Special Services - Tech., Eng. & Env.	
Building Maintenance Installation and Repair Services	$25,000
MRF Operations	$29,052,360
Landfill Operations	$2,768,568
Environmental and Ecological Services	$100,000
Hazardous Waste	$2,500
Subtotal Professional and Special Services - Tech., Eng. & Env.	**$31,948,428**
Subtotal Operating Expenses	**$44,509,513**
Total Expenses	**$117,243,506**
Net Budget Surplus/(Deficit)	**$6,277,499**

Source: Western Placer Waste Management Authority FY 2023 Budget; EPS.

APPENDIX C. FRREDSS Price Mechanism Utilizing Bioenergy Siting and Economic Optimization Tool to Support Long-term Feedstock Procurement Price Management

FRREDSS Price Mechanism

Utilizing bioenergy siting and economic optimization tool to support long-term feedstock procurement price management

Prepared for:
Fall River Resource Conservation District
44327 CA-299,
McArthur, CA 96056

Prepared by:
The Watershed Research and Training Center
University of California Davis

May 23, 2024

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Authors: Clarke Stevenson, The Watershed Research and Training Center
Boon-Ling Yeo, Ph.D, UC Davis

Stakeholder focus group:

Zane Peterson, Peterson Timber, Inc.
John Romena, Romena Consulting
Kevin Zeman, Stewardship West

Northeastern California OPR core team:

Christiana Darlington, CLERE Inc.
Regine Miller, Headwater Environmental Inc.
Todd Sloat, Forest Creek Restoration
Sharmie Stevenson, Fall River and Pit Resource Conservation Districts
Clarke Stevenson, The Watershed Research and Training Center

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Abstract

The need to establish new infrastructure for biomass processing has been recommended by several state strategies for California to accomplish its carbon neutrality and forest health goals. However, without a long-term guaranteed supply contract, new facilities are not eligible for loans, debt servicing, or other financing strategies. In 2023, the Watershed Research and Training Center (WRTC) partnered with UC Davis on the use of the Forest Resource and Renewable Energy Decision Support System (FRREDSS)—an integrated optimization tool for least-cost feedstock procurement—to test its effectiveness as a tool to determine long-term feedstock contract prices in a spatial environment. Sensitivity analyses were conducted by summarizing the 20-year profit and loss (P&L) statement across silvicultural and harvest types, expansion factors, and inflation rates across six (6) site locations within Nevada, Placer, and El Dorado Counties. Site locations were modeled to test the feedstock costs for a 5 MW combined heat and power conversion system with a general average feedstock demand of 35,753 bone dry tons (BDT) per year. Input variables were updated to 2023 market rates across the modeling environment (i.e. diesel price, hauling rate, CPI, etc.). When comparing the average delivered feedstock cost over the 20-year period with reported contractor rates to the Ophir site location, we found that the model was unable to come within 10% of the reported rates. On a year by year basis, costs where consistently less than reported rates. It wasn't until Year 15 of the 20-year P&L statement that prices began to exceed reported contractor rates. For this reason, recommendations to improve the FRREDSS model focus on better representing logging constraints in a spatial environment, adding variables to estimate workforce capacity, adding variables to represent subsidies, and to develop an inflation-based index to better represent biomass economics. Ultimately, it is recommended that a new tool be built that is more customized to the end goals of long-term feedstock contract price management. Results developed in this report continue to support the basis for long-term feedstock pricing, but more development is required before cost estimates are within an acceptable range of accuracy to be applied in existing markets.

Overview

The need to establish new infrastructure for biomass processing has been recommended by several state strategies for California to accomplish its carbon neutrality and forest health goals (California Air Resources Board, 2022; Forest Climate Action Team, 2018; Forest Management Task Force, 2021). However, prospective wood product businesses face high barriers to market entry in California and often face a nearly insurmountable challenge in securing long-term feedstock supply contracts. Without a guaranteed supply contract, facilities are not eligible for loans, debt servicing, or other financing strategies (CLERE, 2021). Through the Governor's Office of Planning and Research (OPR), five regions throughout California were awarded funding to investigate the potential for new public entity business models to support the coordination of non-merchantable biomass from subsidized forest health projects. A component of this entity proposes that bundling many biomass contracts and establishing transparent, long-term brokering services for new facilities to satisfy lending requirements could drastically enable a new generation of biomass processing businesses to access large sums of capital (CLERE, 2023). To accomplish this, a publicly managed price mechanism could establish a common ground between buyers and sellers to enter a fair process for price negotiation.

In 2023, the Northeastern California (NE CA) OPR Pilot Project team partnered with UC Davis on the use of the Forest Resource and Renewable Energy Decision Support System (FRREDSS) to test its effectiveness as a tool to determine long-term feedstock contract price points. Developed in 2020, the FRREDSS model provides a multi-step framework for user-defined locations to site bioenergy facilities and calculates the 20-yr profit and loss (P&L) statements based on the full delivered price of forest-based feedstock.

Goal

The goal of this study is to validate FRREDSS feedstock price changes over time using a sensitivity analysis on location, different combinations of forest treatment and harvest system, inflation rate, and with various expansion factors. This study relied on a small stakeholder group of industry experts to determine the accuracy of the model and the potential for its incorporation into feedstock procurement plans.

Objectives

1. Understand the FRREDSS model inputs and outputs and identify specific results from the model that would be useful for developing long-term feedstock agreement.
2. Validate current FRREDSS output feedstock prices with existing feedstock contracts.
3. Identify the most sensitive parameters which will be the target parameters to toggle in model scenarios (i.e., under what conditions would warrant a feedstock agreement to be updated, modified, or re-written).
4. Recommend changes to the FRREDSS model to better service the goal of the study.

Introduction

During California's rise of bioenergy development in the aftermath of the 1973-1974 energy crisis, biomass procurement systems may have looked very different from today's supply chain. Between 1985 and 1990, 33 new biomass generating facilities were opened. During this time, some facilities may have been more vertically integrated by owning their own land, logging crews or chipping equipment (Morris, 2002; BioResource Management, 2012). Today, the forest product sector is more fragmented with landowners, operators, and wood product facilities often existing as separate entities. As such, feedstock contracts are either negotiated through long-term relationships with different landowners, negotiated with brokers or contractors, or are based on spot market purchases. Guaranteeing a constant feedstock supply over a long-term period (more than 10 years) thereby becomes a sophisticated exercise and can be a nearly insurmountable task for new facility development without ownership of their own forested land[1]. Without a long-term feedstock agreement, lenders will deem the project too risky for a loan thereby jeopardizing new development feasibility. More research on innovative contract designs for the wood procurement process could help provide a more informed discussion as California considers options for a circular bioeconomy.

The barriers to biomass utilization have been well documented throughout the West over the last two decades (Becker et al., 2011; Dysthe, 2021; Nicholls et al., 2018; Sanchez & Gilani, 2022). Price volatility of markets, increasing costs to operate, and the market capture of subsidies required to accomplish the new land management objectives of fuel reduction and forest resiliency are some of the variables which have exacerbated uncertainty in feedstock agreements in California today. Timing of wood delivery as well as workforce capacity have also been significant barriers. Managing these dynamics has been the responsibility of the receiving end-user's feedstock procurement manager, where large landowners offer the simplest process for multi-year contracts on a regular basis. However, there are timber dealers or feedstock brokers who can be hired to manage feedstock procurement across the scale from small to large landholdings.

Feedstock brokers were a common and relied upon aspect of the biomass market in the past and to a lesser extent today. It is still common for feedstock brokers to be hired by established facilities to fill in gaps of supply during key times of the year, although this type of profession has slowly dwindled as bioenergy facilities regularly employ feedstock procurement managers (Personal Communication with Industry Professional). Recreating a network of wood brokers to manage fiber flow to existing markets and bundle many smaller contracts for new facility developers to obtain a long-term feedstock agreement is a promising option. However, an entity of this sort must be highly receptive to the existing market conditions. Where there is current concern for existing supply chains to scale up to satisfy state goals, the question becomes: how to incentivize facilities and timber operators to feel safe when entering into an agreement that would otherwise be seen as risky?

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[1] The only operational facility under the BioMAT program is owned by Collins Pine who is also an industrial timber landowner. Burney Hat Creek would be the first without land ownership to operate if successful. They are currently under construction and are expected to be operational in 2025.

Prominent risks within a long-term feedstock agreement can be most acutely felt with price volatility or feedstock availability. In some cases, established supply chains may prefer more access to feedstock during the winter in order to maintain consistency. In the Northeastern OPR pilot region, stakeholders preferred to have their existing prices not be significantly altered because “it works”, adding that winter feedstock availability could be improved. Other regions may prefer more predictable prices over a long term to anchor financial cash flow projections. In the Central Sierra OPR pilot region, markets are still developing, and long-term price forecasting remains a prominent concern for business development. Other regions still may require both. However, biomass price prediction can be a complex process.

There are many factors which impact harvesting, processing, and mobilizing biomass to market. Final costs to operate are calculated on a project by project basis and therefore makes generalizations potentially misleading. Yet, the viability of mobilizing biomass to market frequently depends on the transportation distance (Berry, 2017). Consequently, the price of diesel (both for hauling and for timber operations) becomes one of the quickest estimations of biomass price volatility for the timber operator (BioResource Management et al, 2012). Additionally, the stumpage price of sawlogs can significantly impact the viability of feedstock supply by influencing landowner’s decision to operate (BioResource Management et al, 2012). Ultimately, there are a variety of pinch points within the biomass supply chain that can be exposed to risk and potential failure.

Table 1 summarizes the ways that feedstock contracts can manage various types of risk in addition to others. In California, many of these measures are already practiced. However, with the need for some facilities to manage upwards of 20 or 30 contracts at a time, simplicity is important. The simplest process, as stated earlier, is to work with a large landowner or otherwise develop forest projects with high-value sawlog harvesting to offset the costs to remove biomass.

Table 1: Summary of risk and uncertainty types, sources, and potential management measures. (Source: BioResource Management et al. 2012)

Risk / uncertainty type	Main sources	Potential for mitigation or management	Management measures
Production cost uncertainty	● Diesel fuel volatility ● Inflation	Low to moderate	● Build fuel cost 'pass through' provisions in biomass facility offtake agreements ● Petroleum/diesel fuel hedging

Risk / uncertainty type	Main sources	Potential for mitigation or management	Management measures
External demand uncertainty	• Demand (domestic and international) for renewable energy. • Demand for building products, such as oriented strand board, made from small diameter timber	Low to moderate	• Long-term supply agreements to secure needed quantities. • Land leases to generate dedicated biomass exclusively for the facility. • Diversification of biomass material types
Biomass Crop Risk	• Catastrophic events (fire, storm, pathogens) • Yield underperformance	Low (storms) to high (fire, yield)	• Good silvicultural management practices • Timberland insurance • Diversification of suppliers, material types, and geographic sources
Counterparty risk	• Exposure to production cost or other market volatility	Moderate to high	• Selection of stable and reliable suppliers • Sound contract construction (to avoid conditions leading to supplier default)
Regulatory uncertainty	• Dynamic nature of natural resource and renewable energy policy	Low to moderate	• Abide existing regulations. • Involvement in industry groups

Other ways to manage uncertainty can be through the long-term commitment of subsidies. It is hard to overstate the importance of both subsidies to guarantee power generation revenue from the biomass facilities and the subsidies for contractors to operate with preferred silvicultural treatments on priority landscapes. Subsidies close the gap between the timber operator production cost and the purchase price, thereby mobilizing biomass that would have originally been uneconomical.

Nevertheless, even with these management measures, there is still a perceived opportunity to innovate with long-term feedstock contracts and pricing. A key component of long-term contracts is the ability to identify a price and system for ongoing negotiation throughout the lifetime of the contract. Ideally, a mechanism of this sort would provide security to timber operators who can better forecast financial performance over the term of the contract, as well as benefit an end-user to prove a long-term commitment to feedstock (e.g. the last 10% of the total feedstock demand).

It's important to note that this type of supply uncertainty exists as a necessary risk in other sectors as well. For example, the energy market uses many sophisticated tools and mechanisms when developing long-term agreements for power purchases.

This analysis aims to evaluate the ability to generate a self-adjusting price contracting scheme to support the forest-biomass feedstock procurement process. Specifically, this paper reviews the application of the UC Davis Forest Resource and Renewable Energy Decision Support System (FRREDSS) model to validate its feasibility to support long-term feedstock contract prices during contract negotiations. If successful, the FRREDSS model can create a more transparent price negotiation and procurement process for all interested parties in contract negotiation. This includes potential lenders looking to invest in new biomass opportunities.

Decision Support System for long-term feedstock price mechanism

The FRREDSS is a web-based forest biomass-to-energy plant siting application that was developed by UC Davis under a project funded by the California Energy Commission (CEC). FRREDSS allows users to quickly assess preliminary forest feedstock availability as well as evaluate the economic feasibility and environmental impacts of potential wood-based bioenergy facilities in California. While the project aims to include biomass resources associated with extreme tree mortality, vegetation layers represent 2016 vegetation.

FRREDSS is intended to assist in identifying potential sources of feedstock for project development. FRREDSS currently has the capability to identify forest biomass resources in the Sierra Nevada region and their relationship to fire hazard zones and other attributes important to siting power generation and other types of biomass utilization facilities. In addition, the spatial analysis model of FRREDSS also has the capability to assess proximity of feedstock to infrastructure, e.g., access to landings and road networks, along with estimated delivered costs of feedstock at the facility and overall levelized cost of energy (LCOE).

FRREDSS currently uses forest biomass data produced from the F^3 modeling framework that integrates Forest Inventory and Analysis (FIA) data from the U.S. Forest Service (USFS), the Forest Vegetation Simulator (FVS), and the FastEmap (Field and SatelliTe for Ecosystem MAPping) to simulate spatiotemporal forest changes under natural succession and vegetation management (Huang, 2018). With support from the OPR, FRREDSS will structure the updated statewide biomass data

(LEMMA GNN dataset derived from FIA) currently used in the C-BREC model[2] for direct use with the FRREDSS and eventually with the overall online digital marketplace[3].

FRREDSS was developed using primarily open-source software and integrates user-defined inputs with a number of analysis modules representing the elements of a forest-based biopower supply chain including forest biomass harvesting cost evaluation adapted from the Fuel Reduction Cost Simulator (FRCS) (Fight et al., 2006), optimized feedstock transportation employing the Open Source Routing Machine (OSRM)[4] and a transportation cost estimator developed in association with the Advanced Hardwood Biofuels (AHB) project (Bandaru, 2015); comprehensive techno economic assessment (TEA) developed through the California Biomass Collaborative at UC Davis[5] to provide estimated levelized lifecycle cost of energy, and lifecycle inventory, accounting and assessment (LCI/LCA) to estimate criteria pollutant and greenhouse gas emission.

Methods and Parameters

The methods for examining the suitability of FRREDSS as a tool for long-term feedstock prices contains both a sensitivity analysis and consultation with stakeholders through a series of focus group meetings. The sensitivity analysis is explained in depth in the section. Our stakeholder focus group meetings were attended by two timber operators, one feedstock broker in California, and foresters. In addition, individual meetings were conducted with a variety of individuals including foresters, biomass power facility operators, and project managers throughout the process.

The purpose of this research is to investigate variable feedstock costs to inform long-term feedstock contracts and a potential rate structure. While this model does have a techno-economic analysis (TEA) component to determine the profit and loss (P&L) statement of a biopower facility, the model is built in such a way that the economics of the facility do not constrain the availability of feedstock or its price. As such, this effort looked exclusively at sensitivity analyses which only impact the feedstock cost. The scenarios are summarized below. Each scenario is labeled according to the analysis being performed and the scenario number. For example, scenarios dealing with forest treatment and harvest system combinations are labeled “S1” and each variation within this scenario is given a separate number (1-5). Scenarios dealing with the expansion factor are labeled “S2” and each variation within this scenario is given a number (1-3). Six site locations were chosen throughout the Tahoe Central Sierra.

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[2] California Biomass Residue Emissions Characterization (C-BREC) model provides a life-cycle assessment framework for the use of California forest residues for electricity generation.

[3] OPR has offered a joint award through an interagency agreement of $350,000.00 to UC Davis, Cal Poly Humboldt and Cal Poly San Luis Obispo, to finance the integration of existing forest management tools into a comprehensive feedstock aggregation and mapping tool.

[4] Project OSRM

[5] Energy Cost Calculator | California Biomass Collaborative

FRREDSS provides default assumptions for the model. This research updated the assumptions to reflect current market rates, as depicted in Table 2. Model runs were only conducted for updated assumptions. Once the input assumptions were updated, all other input variables were fixed except for the following:

1. **Forest Treatment/Forest Harvesting System Sensitivity Analysis** These combinations are intended to replicate the most common forest treatment and harvest method meant to be delivered to a biomass facility and associated with non-industrial timberland management. Land objectives are associated with stand improvement, fuel reduction, and general vegetation management from public agencies. Scenario labels are depicted in Table 2.

Table 2: FRREDSS forest treatment and harvest system combinations with sensitivity run combination identified

	Ground Mech Whole Tree (WT)	Ground Manual WT	Ground Manual Log	Ground Cut to Length (CTL)	Cable Manual WT/Log	Cable Manual WT	Cable Manual Log	Cable CTL	Heli-Manual Log	Heli-CTL
Clearcut										
Commercial Thin	S1-1									
Commercial Thin Chip Tree (CT)	S1-4									
Timber Salvage										
Timber Salvage CT										
Selection				S1-2						
Selection CT	S1-5									
10% Group Selection	S1-3									
20% Group Selection										
Biomass Salvage CT										

2. **Expansion Factor.** The expansion factor is an approach developed within FRREDSS to expand on the search region in each year of the analysis. As the expansion factors increase, the size of the woodbasket increases as well. However, biomass clusters are optimized within this larger radius to be the cheapest source of material, given the costs of the unique

forest treatment and harvest combination selected. This research examined the following expansion factors under a commercial thin prescription with small tree removal and whole tree harvest systems ("S1-1", see Table 2) as the baseline.

1. Expansion factor 3 (S2-1)
2. Expansion factor 10 (S2-2)

3. **Location**. This analysis selected the following locations in the Tahoe Central Sierra region due to their affiliation with prospective biomass development sites. See Figure 1 for their spatial location. All facilities were modeled under a 5 MW feedstock demand assumption, with the exception of the South Lake Tahoe site.

    1. **Ophir, Auburn, Placer County.** Proposed 5 MW biomass facility being investigated by Placer County Water Agency located just outside the City of Auburn.
    2. **Camptonville, Town of Dobbins, Nevada County.** The Camptonville Community Partnership has been developing a 5 MW BioMAT compliant bioenergy facility.
    3. **Cabin Creek, Truckee, Placer County.** Proposed 5 MW Cabin Creek Biomass facility located along the HWY 89 Corridor to Tahoe City near the Eastern Regional Landfill being investigated by Placer County.
    4. **South Tahoe Refuse, City of South Lake Tahoe, El Dorado County**. Proposed small-scale 125 kW demonstration project at the Material Recovery Facility located within the City of South Lake Tahoe.
    5. **Medium to Large Wood Product Campus, Town of Camino, El Dorado County.** El Dorado County is looking to have a more informed discussion with SPI and other key stakeholders, including PG&E, Mountain Enterprises, SMUD, USFS, EDWA & Pioneer on a new 5 MW facility. SPI agreeable to sell or lease space at Camino site.
    6. **Grass Valley, Nevada County**. The City of Grass Valley is examining potential site locations for a 5 MW facility.

4. **Inflation Rate**. The default assumption for inflation is 2.1%. This number is eliminated in order to isolate the impacts to prices due from general model performance.

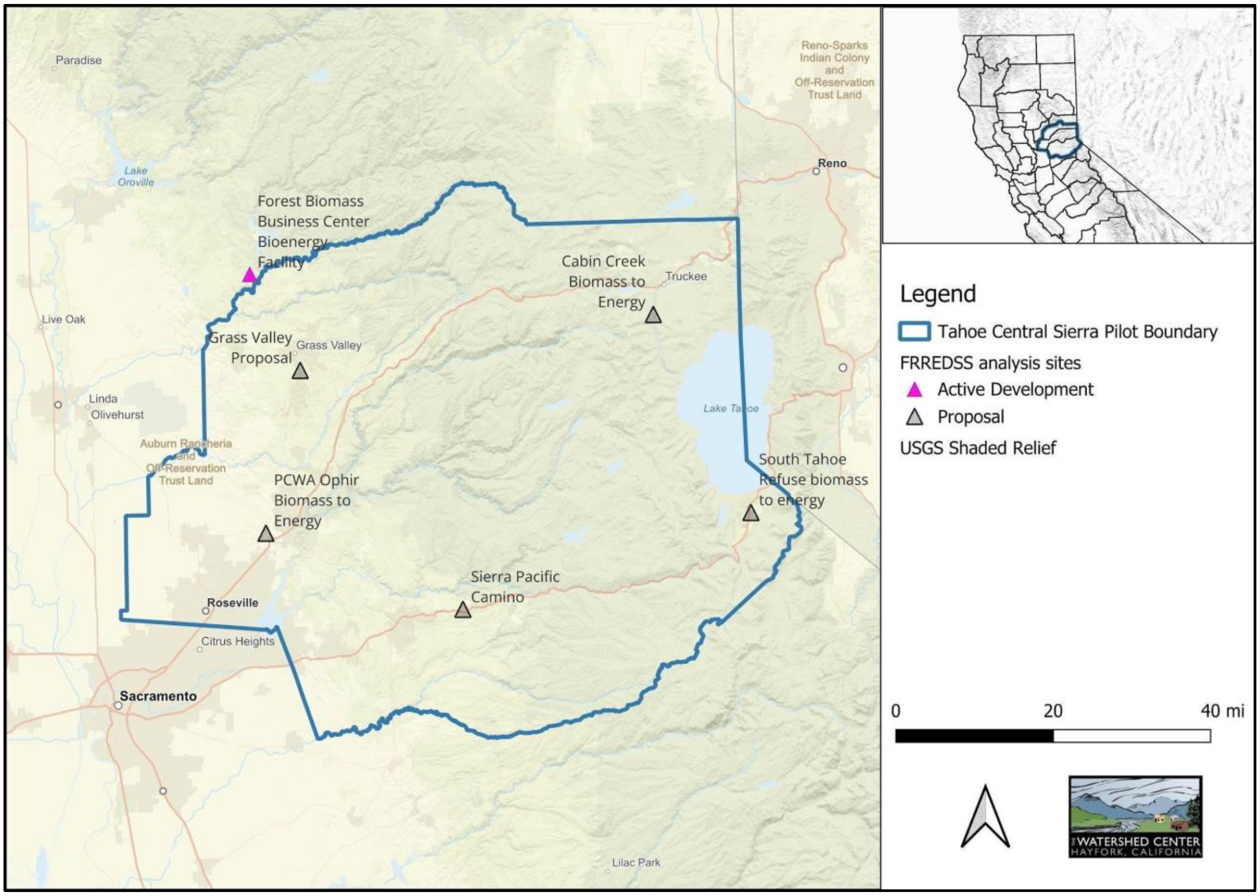


Figure 1: Site locations of FRREDSS analysis

The sensitivity analysis also updated assumptions on the feedstock cost inputs in the model. Inputs and updates to the input assumptions are shown in Table 3. Updates were developed through interviews with industry professionals or additional research. Diesel fuel price is determined by averaging the 2022-2024 CA diesel prices for Northern California using data from the US Environmental Information Agency (US EIA). Percent overhead and hourly hauling contractor rates are based on industry standards as communicated by professionals, in addition to Swezy (2021). Finally, electrical capacity of 5,000 kWe is selected in order to represent facilities which are compliant with the California Bioenergy Market Adjusting Tariff (BioMAT).

Table 3: Updated assumptions to customize in FRREDSS input selection

	Default	Updates
Expansion Factor	1	Sensitivity variable
Fuel Reduction Cost Simulator		
Diesel Fuel Price ($/gal)	$2.24	$5.41
Wage for Fallers ($/hr)	$35.13	Used default values

	Default	Updates
Wage for Other Workers ($/hr)	$22.07	Used default values
% benefits and overhead for operators	35%	20%
Current Producer Price Index	284.7	140.5
Residue Recovery from WT	80%	Used default values
Residue Recovery from CTL	50%	Used default values
Transportation		
Hourly Wage for Truckers ($/hr)	$24.71	$150.00
% benefits and overhead for truckers	67%	0%
Oil Cost ($/mi)	$0.35	Used default values
Techno-Econ Assessment		
Bioenergy generation type		
Generic Power	x	
Combined Heat and Gas		
Gasification Power		x
Net Electrical Capacity (kWe)	25,000	5,000
Capacity Factor	80%	Used default values
Moisture Content	50%	Used default values
Fuel Heating Value	18,608	Used default values
Inflation Rate	2.1	Used default values

Finally, we compare the outputs of the FRREDSS model under all scenarios to reported harvest rates collected in the region from contractors as documented by Swezy (2024). This will help benchmark the effectiveness of the model to calculate a general cost to deliver biomass.

Results

Sensitivity Analysis

Analysis results looked at average feedstock price across sensitivities and site locations. For a specific look at how prices changed across sensitivities, results focus on the Grass Valley site. Feedback from stakeholders and a comparison of prices to contractor rates supported model refinement based on the results of the analysis.

The Grass Valley feedstock price curve for each sensitivity variable is shown in Figure 2. All other facility locations followed a similar trajectory. Sensitivity S1-2 uses a cut to length harvesting system which inflates the overall cost to operate. Most of the harvest systems use whole tree logging and have an average delivered feedstock cost of $44 per BDT in the first year, rising to an average of $113 per BDT in year 20 when given fixed inflation rates and deterministic assumptions about the future of forest treatment availability. Generally, treatment prescription had less of an impact on prices than harvest type when assuming the most common type of harvest type within the region for biomass procurement.

Furthermore, the difference in expansion factors did not play a significant role in price forecasting. As a reminder the expansion factor is a variable to determine the spatial extent for the model to locate the least expensive biomass clusters. As the expansion factor continues to increase, it is assumed that the model will be more "optimized" to find the least expensive biomass. For images of how each expansion factor impacted the location of biomass around a site location please see "Appendix C: FRREDSS spatial outputs for each expansion factor scenario".

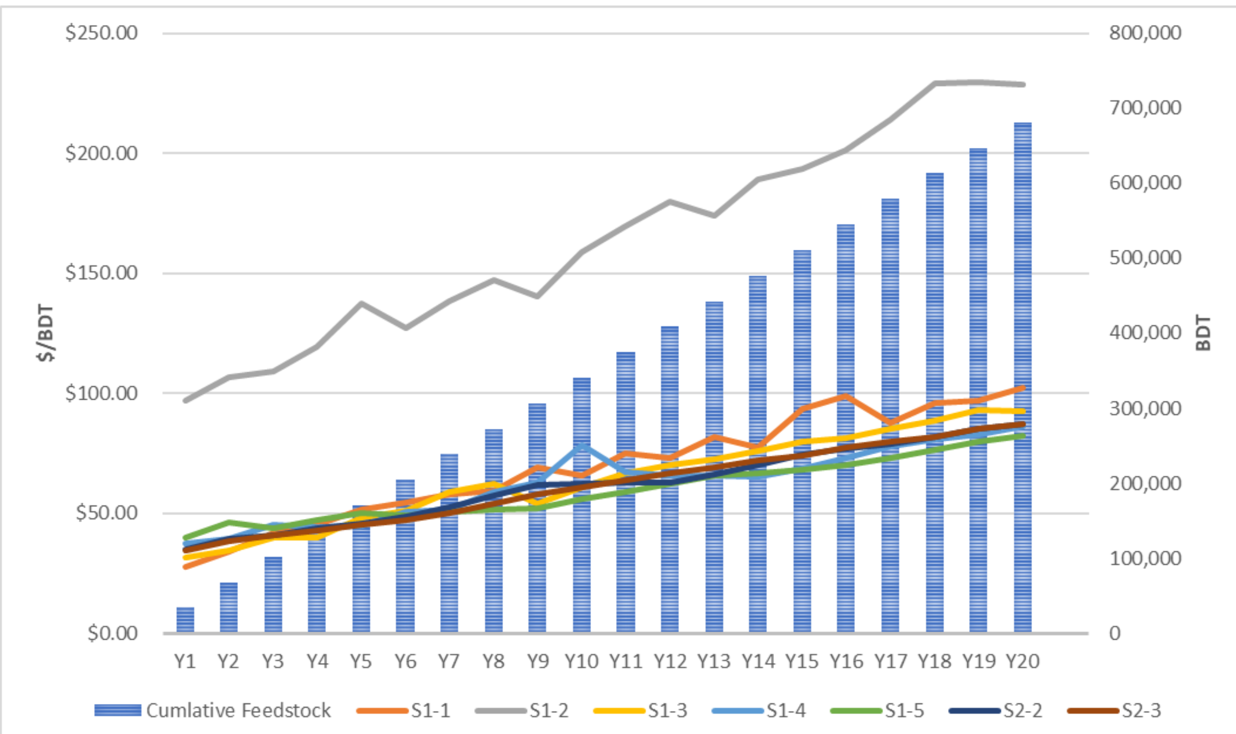


Figure 2: Delivered Price in Grass Valley across sensitivity variables

The FRREDSS model is built to assume that feedstock closest to the facility would be more favorable and is consumed first. As the size of the facility increases so will the feedstock demand. Due to the variability in harvest site locations, transportation costs are often the hardest cost to predict and can frequently be the most expensive aspect to delivering feedstock costs (Berry, 2017). Distances are calculated within the outputs of FRREDSS but can be easily derived using the $150 hourly hauling rate for contractors and transportation costs. As shown in Table 4, all site locations are able to find a potential feedstock availability supply within a 30-minute radius. Note that workforce availability, additional terrain characteristic constraints (e.g. distance from roads, protected activity centers, etc.), or road access is not considered within the model.

Table 4: Summary of time distance to procure feedstock over the lifetime of facility operations

Distance (minutes)	Y1	Y5	Y10	Y15	Y20	Average
Cabin Creek	6.29	11.14	21.65	23.80	26.39	18.36
Camino	4.83	11.67	18.04	23.27	28.89	17.70
Camptonville	4.28	10.55	14.90	19.81	24.21	15.77
Grass Valley	5.33	11.21	16.50	22.48	27.44	17.01
Ophir	11.03	16.21	19.30	23.49	28.85	20.39
South Tahoe	2.09	3.43	5.10	6.19	7.96	5.25

Figures 3 and 4 look at the average harvest and transportation costs across sensitivities per site location. Harvest costs are generally similar and range from $30 per BDT to $40 per BDT over the course of the facility life. Costs are increasing over the 20-year period due to inflation rates of 2.1%. This rate and other factors can be customized in the FRREDSS model if desired. There is a large increase in harvest costs after year 10 at the Cabin Creek site, located just outside of the Town of Truckee, that is not replicated for other site locations. Because Figure 3 represents only harvest costs (not transportation costs like Figure 4), the increase in transportation costs cannot explain this anomaly. The only variable that may be subject to this drastic change within the FRCS harvest calculation is the yarding distance for each pixel. Due to the facility's location within a wildland-urban interface (WUI) environment, yarding distance may have been impacted. Notably, Grass Valley's harvest cost curve remains more stable.

Consequently, a new class of questions is raised regarding the differences in schedule machine hour (SMH) and productive machine hour (PMH) with operations occurring in the built environment and WUI, versus the wildland. SMH and PMH are standard machine rate calculations developed by Miyata (1980). The FRREDSS model does not currently operate with this granularity for user modification, although the FRCS module relies on the formulas developed by Miyata (1980) for individual machines and combines machines into systems by using the approach described in Hartsough and others (2001) to determine harvest cost (Fight, 2006).

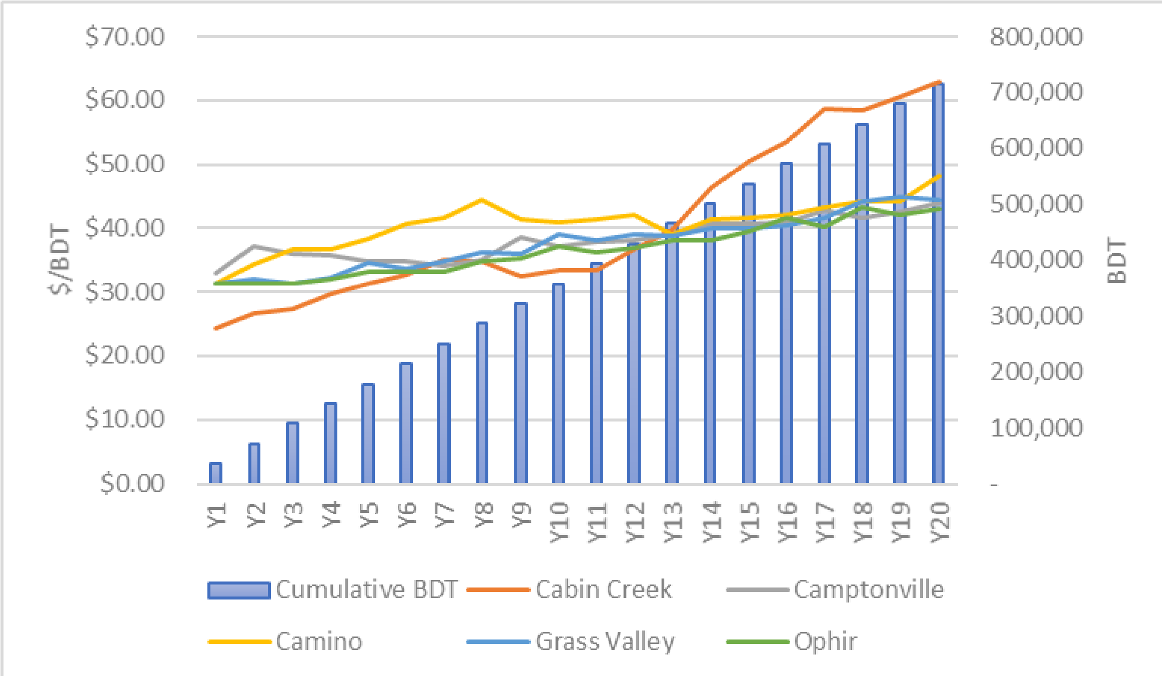


Figure 3: Average harvest cost across sensitivities per site location

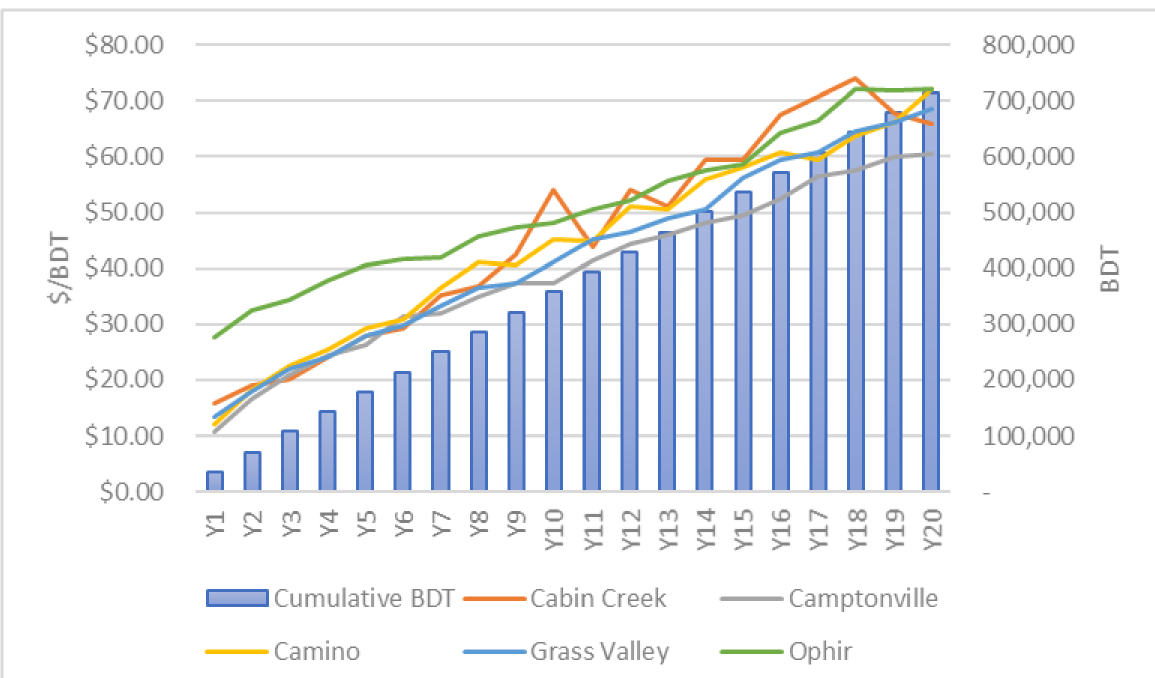


Figure 4: Average transportation cost across sensitivities per site location

The combined 20 year delivered feedstock price curve averaging all sensitivity variables per location is illustrated in Figure 5. Sensitivities include both the changes in treatment and harvest combinations, and the expansion factor. In other words, Figure 5 depicts a general trend for prices across various scenarios and distances using the FRREDSS model. Prices increase throughout the life of the project due to the priority for the model to harvest the closest feedstock first and due to general inflation.

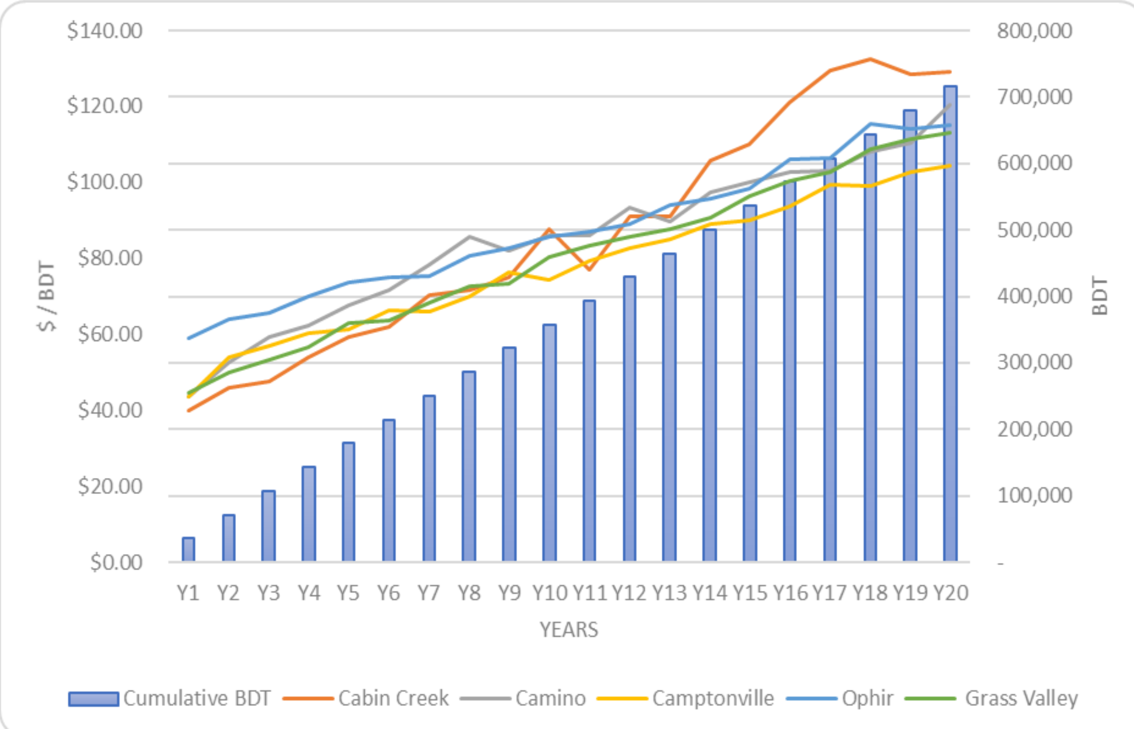


Figure 5: Total delivered feedstock cost per site location in Tahoe Central Sierra OPR region assuming a 5MW feedstock demand

Table 5 shows that costs rise from an average of $43 per BDT within the first year of operation under 2022 price assumptions and increase to $106 per BDT by year 20. This is a 147% increase in prices. On a year-to-year basis, prices increased from 4–7% depending on the site location. Overall, prices increased by 5% per year on average across all site locations.

Table 5: Cost summary table of harvest operations to cut, skid, deck, chip, and deliver biomass to a site location

Feedstock Cost	Y1	Y5	Y10	Y15	Y20	**Average**
Cabin Creek	$40	$59	$88	$110	$129	**$86**
Camino	$44	$68	$86	$100	$120	**$85**
Camptonville	$44	$61	$74	$90	$105	**$78**
Grass Valley	$43	$60	$78	$93	$110	**$78**
Ophir	$59	$74	$86	$98	$115	**$88**
South Tahoe	$30	$37	$43	$50	$58	**$44**
Average	**$43**	**$60**	**$76**	**$90**	**$106**	**$76**

Finally, in order to understand the magnitude default inflation rates of 2.1% had on price forecasting, S1-1 was modeled across each site location without inflation rates. Eliminating the inflation rate focuses attention on the impact transportation distance has on prices year over year. The results are represented in Figure 6. Without a year over year inflation rate of 2.1%, prices over a 20 year period remain more constant with a difference of $15 per BDT from year 1 to year 20. This is a 30% decrease in prices at year 20 when compared with inflation based prices. This graph illustrates that general inflation rates are more important than transportation distance when explaining prices changes under our assumptions. When thinking about price forecasting, general inflation rates or escalation factors will be a consequential component to making the tool identify appropriate prices within changing markets.

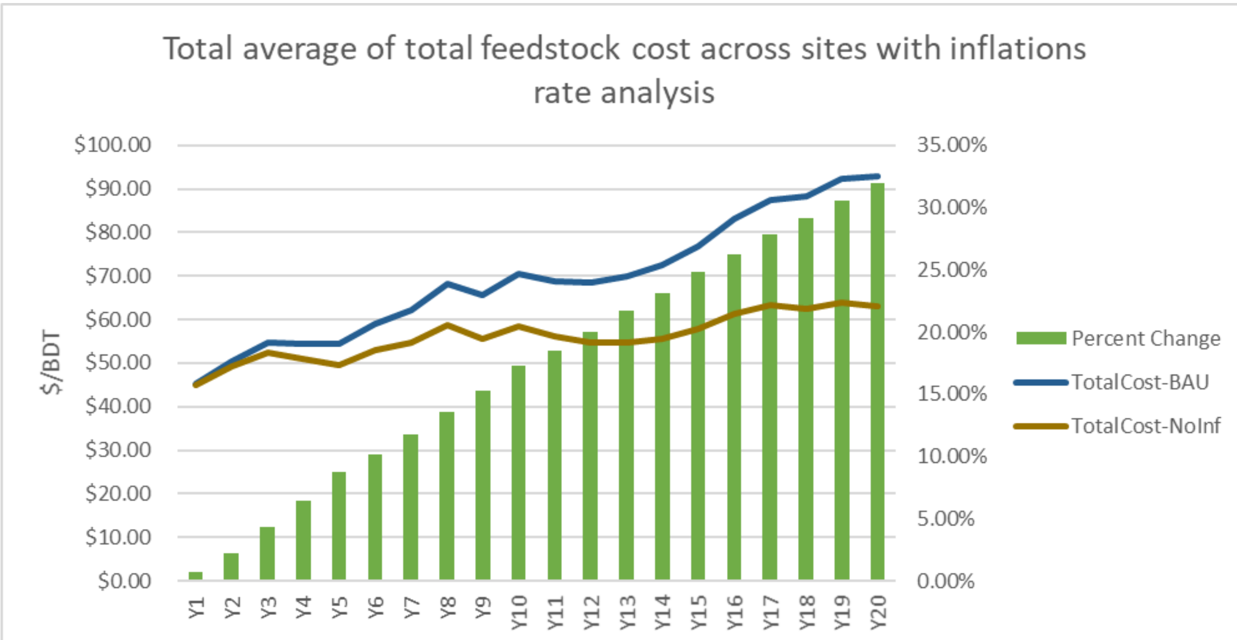


Figure 6: Total average delivered feedstock cost in Tahoe Central Sierra OPR region analysis with and without inflation rates assuming a 5MW feedstock demand.

Stakeholder comments

On September 19th, 2023, the project team held a stakeholder meeting to introduce the FRREDSS model to the participants and help them answer questions for an informed discussion on model effectiveness. During this presentation, we discussed the inputs and outputs of the model, participants impression biomass prices with preliminary model runs and opportunities for improvement. A list of questions was developed for the participants to respond to and are included in Appendix B. The meeting summary is below.

(1) **Model accuracy.** There is a general sense that the model was within an acceptable price range, although could be improved with more fine-tuning. One participant offered to have us tour one of his operations to get a better sense of the cost analysis.

(2) **Fully-load costs.** There is a need to calibrate the model to offer the option for fully loaded costs for operators and haulers. This will allow for practitioners to fill in their fair-market rate rather than having the model compute expected costs. Having the option for the model to calculate expected costs however will allow for transparency on costs, beneficial for both industry and non-industry users.

(3) **Satellite treatment locations.** There is the situation where a facility is not in the same location as where the actual treatments will occur. However, there is a place in the FRREDSS model where you can customize the location of the treatments. See Figure 6. The results would effectively increase hauling costs, providing a more realistic delivery estimate. In this scenario, the blue dots route directly to the conversion facility. They do not route to the tree icon before being delivered to the facility.

(4) **Subsidies.** There is a clear need to better understand how subsidies play out over a 10-year period and its utility in a model such as this. More thought is required on this subject. FRREDSS does have a technical advisory committee which has some great thinkers on biomass utilization in the state, and who may provide some additional thoughts on the matter.

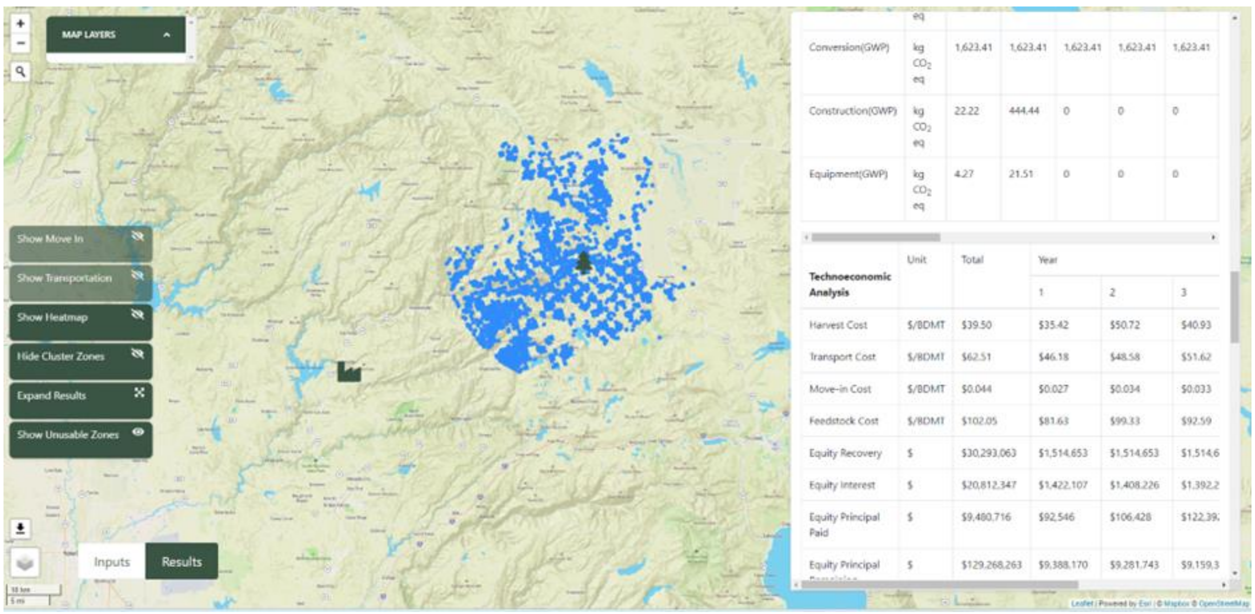


Figure 7: Example of FRREDSS capability to model a satellite fuel yard or concentrated forest treatment location separate from facility location.

Comparison to Contractor Rates

Information collected by CLERE Inc in completion of a Biomass Supply Report for the Placer County Water Agency (PCWA) was developed in consultation with operators and project managers within the OPR Pilot boundary extent (Swezy, 2024). Operators provided a significant range of prices for delivered biomass, from $50/BDT to $112/BDT, up to $200/BDT for material from more distant locations. To pay for a full harvesting system of cutting, skidding, and processing biomass, the price ranges from $56-$64/BDT just to get a loaded truck. Trucking costs add $28 - $48/BDT, resulting in a grand total of $84-$112/BDT. This input is consistent with results from the Tahoe Central Sierra Initiative (TCSI) Restoration Wood Supply Assessment (Baribault, 2020), which suggested that the current market price of $40/ton (the industry standard in the TCSI region) is far too low to make forest restoration activities economically feasible.

Table 6 shows a comparison between reported contractor prices and the FRREDSS model outputs. Averages were taken from (1) the contractor estimates and the FRREDSS model outputs for prices to Ophir site location, (2) averages across all sites under 2.1% general inflation, and (3) averages across all sites without inflation. It shows that FRREDSS model outputs under our assumptions tend to be on the lower end of estimated prices, although, it is worth emphasizing again the short distance which biomass was procured within the FRREDSS model. The distance for the reported contractor rates is unclear. The largest difference in prices occurs within the costs to cut, skid, and load the material. As this calculation from the FRREDSS model is not subject to change across time as much as transportation distance, additional information will be needed to bring the FRREDSS model within range of real-world prices.

Table 6: Average $/BDT comparison between contractor operating price estimates and FRREDSS model outputs

	Average $/BDT				
TCSI contractor estimates to deliver to Ophir (Swezy, 2024)					
Cut, skid, load	$60.00				
Trucking	$38.00				
subtotal	**$98.00**				
FRREDSS price to Ophir	Y1	Y5	Y10	Y20	20yr Average
Cut, skid, load	$31.25	$33.24	$37.16	$43.02	$36.59
Trucking	$27.57	$40.52	$48.26	$72.12	$50.98
subtotal	**$58.82**	**$73.76**	**$85.41**	**$115.14**	**$87.56**
Average across sites with inflation	Y1	Y5	Y10	Y20	20yr Average
Cut, skid, load	$29.78	$34.05	$36.84	$48.47	$38.36
Trucking	$16.00	$29.93	$44.34	$66.32	$43.88
subtotal	**$45.78**	**$63.98**	**$81.17**	**$114.78**	**$82.24**
Average across sites without inflation	Y1	Y5	Y10	Y20	20yr Average
Cut, skid, load	$29.70	$29.51	$30.17	$29.16	$29.70
Trucking	$26.31	$20.12	$28.12	$33.88	$26.31
subtotal	**$56.01**	**$49.63**	**$58.29**	**$63.04**	**$56.01**

The column on the far right (“20yr Average”) averages the price over the full 20-year P&L statement. Because the model is built to move further away from the facility each year of operation, the 20-year average is the same as calculating average costs across distance as well. When thinking about a long-term feedstock price, the 20-year average may be a useful number to base initial contract negotiations. However, the following table shows the difference between model results and contractor estimates. Average prices within a 30-minute radius around a facility never falls within a 10% range of accuracy to reported estimates.

Table 7: Difference between 20-year average delivered feedstock costs and reported contractor estimates by $/BDT and percent.

	Difference to contractors	
	$ / BDT	Percent (%)
FRREDSS price to Ophir		
Cut, skid, load	-$23.41	-64%
Trucking	+$12.98	+25%
subtotal	**-$10.44**	**-12%**
Average across sites with inflation		
Cut, skid, load	-$21.64	-56%
Trucking	+$5.88	+13%
subtotal	**-$15.76**	**-19%**
Average across sites without inflation		
Cut, skid, load	-$30.30	-102%
Trucking	-$11.69	-44%
subtotal	**-$41.99**	**-75%**

To explain this divergence, it is important to note that quoted costs from operators are likely padded to accommodate risk and profit margins. Additionally, the operations frequently performed by contractors in the region may not be entirely representative of the modeling work performed under this report. Contractors may work more on clearcut operations with cut-to-length harvest systems for example, when all model runs in this report are based uneven aged management with whole tree harvest systems. Future modifications of the FRREDSS model should provide the ability for contractors to apply their fully loaded rates.

Finally, reported contractor estimates may have timber operations concentrated in locations outside of the working circle derived from the FRREDSS model. Modeling unique harvest locations can be completed in FRREDSS at the moment as long as there is prior knowledge on where treatment intensity is highest on the landscape. Future research should identify where treatment locations are concentrated and for cost estimates to be based on a more robust analysis using the “separate biomass coordinates" feature.

Discussion

The FRREDSS model proved to be an effective tool to quickly calculate timber operator costs to deliver in-woods feedstock and within a logical distance from a site location. Programming a 20-year profit and loss statement with user-defined inputs has a strong potential to support contract negotiation prices in an open and transparent manner. The increase in prices on a year-to-year basis can represent a useful metric for determining rate structure within a contract, although more attention is needed to refine the tool. Further development of the model can be categorized by additional research that needs to be completed and modifications to the way the model is configured to more accurately simulate the biomass supply chain.

Additional Research

Next steps in development will require additional research on a variety of items. This research does not originally intend to alter the way the model is built, but rather provide more precision to how prices are determined.

First, the inflation rates were found to be the most influential factor impacting prices over time. At a rate of 2.1%, average prices changed by $69 per BDT. When compared to a zero-inflation rate scenario, prices over a 20 year period only changed $7 per BDT showing the importance of a constant escalation factor. Identifying the correct escalation factor will be the most important factor in determining a regular price increase. Due to the heavy influence diesel prices play on the supply chain, one suggestion is to tie escalation rates to the fluctuations in diesel listed on commodity markets (Solomon, 2017; Mason, 2023).

Second, the sensitivity analysis only looked at feedstock procurement within the immediate radius around each site location. However, the FRREDSS tool has the ability to identify different harvest locations than the immediate facility. Further research should incorporate this into another set of sensitivity analyses in order to have a more realistic picture of transportation distances and costs. Distance is discussed further in the following section.

Finally, more information needs to be provided to understand why harvest costs differed so greatly between reported prices by contractors and the FRREDSS model. There is a difference of $40 per BDT between reported prices and those calculated by FRREDSS. The FRREDSS model relies on the Fuel Reduction Cost Simulator (FRCS) which may need further research to know how to best remedy this divergence.

Model Configuration

This section refers to changes in the way the model is configured in order to better simulate the biomass supply chain. There is an itemized recommendations paper that was developed to further support the development of the FRREDSS model that is not included in this section. This summarizes limitations in the model and provides a basis for the recommendations paper.

Biomass prices and subsidies

The most notable aspect of the FRREDSS model is its assumption that a buyer (ie. bioenergy facilities) will accept the full delivery costs to procure biomass. The FRREDSS model projects the full cost to harvest, skid, and deliver biomass. This provides a cost estimate for sellers (ie. timber operators). Biomass prices rarely, if ever, cover the full costs to operate. Integrated harvesting–where operations offset costs with high value logs–provides a more reliable way of conducting biomass removal operations. As such, using the full delivery costs as an estimate for buyer prices only represents those situations where biomass is the main focus (a “biomass only sale”). The results illustrate the concern for operations to continue increasing in costs while market prices are stagnant, causing a larger and larger need for public intervention if acre targets are to be met and preferred silvicultural treatments are to be widely deployed.

Market price

The facility economics which determine the buyer's price (or "market price") for biomass is generally based on power production rates and business performance considerations like internal rates of return (ROR) or profit margins. While the buyer's price can be challenging to predict at times, they are a function of their revenue. Nevertheless, electricity rates have not changed enough to pay for the increasing costs to operate. There are very few times when the biomass spot market changed enough to accommodate larger haul distance for sellers. One of these periods was during the rise of bioenergy in the late 80s and early 90s (Morris, 2002). A 60% increase in price per BDT from 1988 to 1990 occurred, before it returned to 1988 prices by 1996 due to a sharp increase in facility development and feedstock competition. It only returned to 1988 prices because CPUC purchased and subsequently shut down one third of the operating capacity by 1994 (Morris, 2002). Another time was during the start of the Bioenergy Renewable Auction Mechanism (BioRAM) in 2016. Prices went from approximately ~$40 per ton to ~$60 per ton within two years for qualifying fuel sources due to the sharp increase in feedstock competition (MB&G 2019).

Recently, state mandates from SB 100 and SB 350 have required energy procurement within the state to increase renewable generation sources year over year, and have 65% of those renewables be under a 10+ year contract, respectively. Furthermore, resource adequacy requirements have placed more value in baseload power sources. In order to reduce stress on the grid during the transition between periods of high solar and wind generation, renewable baseload power sources like biomass to electricity have become more sought after to meet these stacking state mandates. As such, there is reason to believe that power purchase agreements (PPA) with bioenergy sources may increase, however, it is unclear if they will be able to keep up the pace of rising timber operation costs, or otherwise result in a higher market price without feedstock competition. Because of the importance competition plays on prices, more attention to how the model should account for feedstock competition should be given considering the growing interest in the sector.

In the meantime, subsidies to end-users through PPAs or to land managers for forest health treatments provide a meaningful service to fill this financial gap between electricity rates and in-woods fuel procurement. In context to developing long-term feedstock agreements, one interviewee said, "if you can guarantee me a subsidy, I can guarantee you feedstock". The FRREDSS model has the capability to include producer tax credits (PTC) as well as other additional credits (e.g. carbon credits), but is unable to represent subsidies for land management or power purchase agreements (PPA).

Applying subsidies to the model can be a simple calculation, however structuring the model to allow for users to input subsidy amounts over a 20 year period is challenging. One method to approach this is to apply a constraint on the "total revenue required" of the facility. By constraining the revenue to a known quantity as determined by electricity rates or PPAs, the model could hypothetically be retooled to define a breakeven distance for feedstock rather than the amount of money a facility would require if it purchased the full delivery cost of its feedstock. By adding subsidies to this version of the model (either by listing a PPA price or average CALFIRE grant award over a region), the facility would essentially be able to expand its woodbasket radius. Nevertheless, it is important to note the value of the current configuration of FRREDSS. Currently, the ability for the model to surpass breakeven distances is potentially a better way to *identify* additional subsidies needed to make the facility economics work. While additional ways to apply subsidies need more attention, other methods may best be done after processing.

Some individuals voiced reports of buyers gouging prices if they knew a timber operator was delivering biomass from a subsidized project. While there is inherent tension between buyers and sellers, they require a more dynamic relationship to make the supply chain work. To develop long-lasting relationships built on trust, they must be willing to work with each other. While this situation may have occurred, it may be an exception rather than the norm or otherwise a function of expected supply surplus.[6] For example, when BioRAM was first established, BioRAM compliant facilities were faced with a need to expand the supply chain infrastructure. In response, they provided financial assistance to contractors who were encountering cash flow issues. Contractors then entered an agreement to deliver the biomass from projects occurring on HHZ compliant lands. Facilities also leased equipment timber contractors were hesitant to purchase during this time (MB&G, 2018). This type of cooperation between the two parties shows how dependent they are on each other, and can act in more altruistic ways to support the benefit of land stewardship.

Feedstock quality and added value

As timber prices fluctuate, so do landowners' willingness to operate. Without favorable timber prices or subsidies, silvicultural treatments which target small-diameter, non-merchantable materials are not prioritized. As the FRREDSS model suggests, unless further intervention is implemented to improve the economics of forest biomass, the existing cost gap is expected to widen. It is because of this reason, attention on large-scale biomass utilization solutions often focus on the need to build additional revenue streams for end producers to afford a higher feedstock purchase price (Sanchez 2020). Presumably, this would encourage additional forest operations by increasing the market price for the product. While advanced technology solutions that would be able to take advantage of carbon credits or low-carbon fuel markets are promising, their technologies are still developing (Porter, 2020; Sanchez, 2020). Making additional technologies available within the techno-economic analysis module of FRREDSS may be useful. With the addition of new technologies other than combustion based facilities, feedstock quality will need to be considered due to system sensitivities to feedstock size and type.

[6] Reports about this center on FEMA post-disaster relief for tree removal and hazard reduction.

Distance

The site of the biopower facility is provided by the user and the Open Source Routing Machine (OSRM) module within the FRREDSS model calculates the distance from every cluster to the biopower facility. For example, the first year of feedstock delivery costs in Grass Valley are expected to be around current market prices of $50/BDT. This would bring parity to both buyer and seller of the biomass, but it is not immediately clear the distance at which feedstock is procured from. We can see from Figure 4 that transportation costs are around $15/BDT and know that hauling rates are $150/hr. Therefore, we can calculate that the haul zone within the first year is about 4 minutes away from the facility. In other words, conducting forest thinning projects only makes economic sense if operations are within a 4-minute radius around the site location. Calculating time distance away for each year after processing is doable but can also be a low hanging fruit to program into the model for ease of use. This example also illustrates the hard reality of biomass economics. If one were to equate the model to real world situations, the FRREDSS model computes a relatively small woodbasket. It is uncommon for a 20-year supply of feedstock to be procured within a 30-minute haul distance of the site location as made evident in Table 4. This is due to workforce capacity, permitting restrictions, and road access conditions.

Workforce Capacity

Workforce capacity is hard to estimate within a spatial context. However, there are ways to approximate workforce capacity based on the limits to a county's volume or acre production level. The Board of Equalization releases timber volume estimates by county based on timber tax data. This could suffice for determining a threshold to operating capacity. The limitation to using this dataset is that it tracks sawlog volumes which is not the target feedstock for the facilities modeled under FRREDSS. Within the last several years, more spatial data has emerged to track forest treatment polygons approved under CAL FIRE and the Forest Service. Recently, the Spatial Informatics Group and Ascent Environmental entered into a contract to produce a spatial layer of all NEPA and CEQA approved lands which may be a suitable proxy for workforce availability and future biomass supply. A more exhaustive process of determining area production level thresholds per county could be completed on a semi-regular basis to improve accuracy to feedstock availability (Yeo et al., n.d.). Without the inclusion of workforce capacity, transportation times will be an unreliable approximation for contract price negotiations.

Vegetation Base Layer

Finally, the vegetation data is dated to 2016. There is a need to update this layer to current vegetation conditions including the removal of forest treatment polygons and wildfire scars (Yeo et al., n.d.). With the update to this vegetation layer, several new operational feasibility considerations can also be included as well, including: maximum distance from roads; and removing riparian areas, wildlife protected activity centers, and slopes above 40% from the vegetation layer. Furthermore, if salvage harvest systems are to be maintained within the model annual vegetation base layer updates will be required. The removal of post-fire material safely should be conducted within a maximum time interval of 5 years from ignition date. Due to salvage harvest's high maintenance needs to have the vegetation layer be updated every 3 to 5 years, it may not be a practical treatment option to include moving forward.

Conclusion

The biopower facility development faces several obstacles including a lack of security in long-term feedstock supply, permitting requirements, economic estimations, and uncertain technology performance for many new types of technologies, among other reasons. Without a supply chain, new prospective facilities are deemed risky to investors and are ultimately restricted from access to capital. The wicked problem of building new biomass infrastructure is therefore defined by a lack of consistent supply for a new facility to develop if the new facility doesn't already exist to offer a price for the biomass-generating projects. Investigating new ways to structure feedstock agreements may provide additional risk assurance and product security to encourage more markets to develop. Innovative ways to look at long-term feedstock supply contracts requires a look at long-term feedstock prices. The FRREDSS model is a useful tool but may not be able to serve as a contracting software. With further research on aspects like escalation rates, a more streamlined model may be easier to include changes to the vegetation base layer to better represent logging constraints, inclusion of workforce capacity considerations, incorporating variables for subsidies, clearer metrics like time-distance, and restructuring the model to better represent market dynamics through an index-based pricing formula. Recommendations are included in Appendix A of this document, as well as elaborated in Chapter 5 of Yeo et al.(n.d.).

Next Steps

The next steps for the price mechanism are to use these sensitivity analysis results and recommendations to update the FRREDSS model. Once updated, FRREDSS 2.0 can then be tested as a contracting software in a real market environment with iterative updates based on user feedback. Various stakeholders involved in this transaction will be contacted for their feedback. This includes industrial forest landowners, contractors, facility operators, and a range of project managers working in the biomass and workforce development space.

Additionally, a bioeconomy risk rating company, Ecostrat, will be contracted to review the model and provide comments on its use-ability for their own Bioeconomy Development Opportunity (BDO) Zone modeling. Finally, once comments from all parties have been received and applied to FRREDSS model updates, the new versions will be eligible for review with financial professionals and banks.

References

Becker, D. R., McCaffrey, S. M., Abbas, D., Halvorsen, K. E., Jakes, P., & Moseley, C. (2011). Conventional Wisdoms of Woody Biomass Utilization on Federal Public Lands. *Journal of Forestry*, *109*(4), 208–218.

Bandaru V, Parker N, Hart Q, Jenner M, Yeo B, Crawford J, Li Y, Tittmann P, Rogers L, Kaffka S, Jenkins B. 2015. Economic sustainability modeling provides decision support for assessing hybrid poplar-based biofuel development in California. Calif Agr 69(3):171-176. https://doi.org/10.3733/ca.v069n03p171.

Baribault, T., Porter, D., Burrow, A., Desrocher, J., Larmour, D., Rasmussen, M., Anderson, R. (2020). Tahoe-Central Sierra Initiative: Phase 1 Restoration Wood Supply Assessment. Unpublished report of The Nature Conservancy. San Francisco, California. 38 pp.

Berry, M., and J. Sessions. 2018. The economics of biomass logistics and conversion facility mobility: An Oregon case study. Applied Engineering in Agriculture. Applied Engineering in Agriculture. ASABE special collection publication. 34(1): 57-72. http://box2343.temp.domains/~wastetow//////wp-content/uploads/2018/08/Economics-of-biomass-conversion_Berry-and-Sessions-2018.pdf

California Air Resources Board. (2022). *2022 Scoping Plan for Achieving Carbon Neutrality*. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

California Air Resources Board (2022). 2022 Scoping Plan for Achieving Carbon Neutrality. Accessed February 6th, 2024. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

California Natural Resources Agency (CNRA) (2021). California's Wildfire and Forest Resilience Action Plan. State of California. https://wildfiretaskforce.org/wp-content/uploads/2023/04/californiawildfireandforestresilienceactionplan.pdf

CLERE Inc. (2021). "The Lack of Long-term Feedstock Supply Impedes Capital Investment in California's Wood Utilization Opportunities". https://www.clereinc.com/_files/ugd/21f5c9_a8402d7ae16e472e85d0b6295804fa02.pdf

CLERE Inc. (2023). "Joint Powers Authorities: A Tool To Manage Forest Biomass Residuals In California". Fall River Resource Conservation District.

Dysthe, D. L. (2021). *The politics of biomass energy in California: How external benefits are used to support an economically marginal sector* [Cal Poly Humboldt theses and projects, Humboldt State University]. https://digitalcommons.humboldt.edu/etd/489

Fight, R. D., Hartsough, B. R., & Noordijk, P. (2006). *Users Guide for FRCS: Fuel Reduction Cost Simulator Software*.

Forest Climate Action Team. (2018). *California Forest Carbon Plan: Managing Our Forest Landscapes in a Changing Climate.* https://cdrlaw.org/wp-content/uploads/2020/08/California-Forest-Carbon-Plan-Final-Draft-for-Public-Release-May-2018.pdf

Forest Management Task Force. (2021). *California's Wildfire and Forest Resilience Action Plan*. California Department of Water Resources, Public Affairs Office, Creative Services Branch. https://wildfiretaskforce.org/wp-content/uploads/2022/12/californiawildfireandforestresilienceactionplan.pdf

Huang S, Ramirez C, McElhaney M, Evans K. 2018. F3: Simulating spatiotemporal forest change from field inventory, remote sensing, growth modeling, and management actions.

Forest Ecology and Management 415-416:26-37. https://www.sciencedirect.com/science/article/abs/pii/S0378112717320716

Mason, Bruce & Girard, and the Beck Group (2019) "High Hazard Fuel Availability Study". PG&E Natural Resource Management: The High Hazard Fuel Study Committee. Contract #C9333

Mason, T. (2023). "Biomass Feedstock Supply Assessment and Procurement Key Factors to Consider". Presentation to the Department of Conservation: Feedstock Supply Plan Workshop.

Miyata, Edwin S. 1980. Determining fixed and operating costs of logging equipment. General Technical Report NC-55. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central Forest Experiment Station

Morris, G. (2002). *Biomass Energy Production in California 2002: Update of the California Biomass Database*. National Renewable Energy Laboratory (U.S.). https://doi.org/10.2172/15002488

Nicholls, D., Halbrook, J., Benedum, M., Han, H.-S., Lowell, E., Becker, D., & Barbour, R. (2018). Socioeconomic Constraints to Biomass Removal from Forest Lands for Fire Risk Reduction in the Western U.S. *Forests*, *9*(5), 264. https://doi.org/10.3390/f9050264

Porter, Dan, et al. (2020) *Accelerating Forest Restoration: Stimulating a Forest-Restoration Economy and Rebuilding Resilience in California's Fire Adapted Forests.* The Nature Conservancy.

Sanchez, D. L., & Gilani, H. (2022). *Advancing Collaborative Action on Forest Biofuels in California*. University of California, Berkeley.

https://bof.fire.ca.gov/media/mn5gzmxv/joint-institute-forest-biofuels_final_2022_ada.pdf

Sanchez, D. L., Zimring, T., Mater, C., & Harrell, K. (2020). *Literature Review and Evaluation of Research Gaps to Support Wood Products Innovation* (A Report Submitted to the California Board of Forestry and Forest Protection Agreement #9CA04450). Joint Institute for Wood Products Innovation. https://bof.fire.ca.gov/media/9688/full-12-a-jiwpi_formattedv12_3_05_2020.pdf

Solomon, J., Lewandowski, M., Kenney, K., Emerson, R., Nair, S., Elless, M. 2017. Framework For Biomass Supply Chain Risk Standards Woody Biomass. Ecostrat, Idaho National Laboratory, US Department of Energy: Energy Efficiency & Renewable Energy Bioenergy Technologies Office.

Sundstrom, S., Nielsen-Pincus, M., Moseley, C., & McCaffery, S. (2012). Woody Biomass Use Trends, Barriers, and Strategies: Perspectives of US Forest Service Managers. *Journal of Forestry*, *110*(1), 16–24. https://doi.org/10.5849/jof.10-114

Swezy, Camille, John Bailey, and Woodam Chung. 2021. "Linking Federal Forest Restoration with Wood Utilization: Modeling Biomass Prices and Analyzing Forest Restoration Costs in the Northern Sierra Nevada" Energies 14, no. 9: 2696. https://doi.org/10.3390/en14092696

Swezy, Camille. 2024. Tahoe Central Sierra Cal FRAME Project: Case Study: Biomass Supply Report. Placer County Water Agency.

Yeo, B.-L., Li, K., Kirkland, S., Carmen, T., Varaprasad, B., Lan, S., Laura, H., & Jenkins, B. (n.d.). *Forest Resource and Renewable Energy Decision Support System 1.0: An Online*

Application for Decision Support in Siting Woody Biomass to Electricity in California (CEC-500-202X-XXX). California Energy Commission.

Appendix A: Recommendations to support forest biomass pricing for long-term feedstock agreements through a decision support system

Please contact the Fall River RCD for access to this document.

Appendix B: Stakeholder Questionnaire

Overarching questions

- Identify key characteristics of successful feedstock contracts
- How should we be thinking of the impact of subsidies on price dynamics?
- How do we address the importance of timing? Are feedstock rates staggered depending on the season?
  - Summer season with high volumes = lower feedstock prices
  - Winter season with low volumes = higher prices
  - Peaker plant ramping during high grid stress = higher prices
- How to incorporate mixed feedstock procurement (eg. sawmill residue)?

Questionnaire

1. What is the average length of a harvest contract in your region? _________________________
2. Please rate the most important aspect of a feedstock contract for your company

a.	Contract length	1	2	3	4	5
b.	Time of year	1	2	3	4	5
c.	Feedstock quantity	1	2	3	4	5
d.	Feedstock quality	1	2	3	4	5
e.	Feedstock price	1	2	3	4	5

3. Please put an X for the top 3-5 forest treatment and harvest system combinations used in your region. Please add anything not listed here.

Forest Treatment	Clearcut	Commercial Thin	Commercial Thin Chip Tree (CT)	Timber Salvage	Timber Salvage CT	Selection	Selection CT	10% Group Selection	20% Group Selection	Biomass Salvage CT	Other:
Harvest System											
Ground Mech Whole Tree (WT)											
Ground Manual WT											
Ground Manual Log											
Ground Cut to											

Forest Treatment	Clearcut	Commercial Thin	Commercial Thin Chip Tree (CT)	Timber Salvage	Timber Salvage CT	Selection	Selection CT	10% Group Selection	20% Group Selection	Biomass Salvage CT	Other:
Length (CTL)											
Cable Manual WT/Log											
Cable Manual WT											
Cable Manual Log											
Cable CTL											
Helicopter Manual Log											
Helicopter CTL											
Other:											

4. What basal area is commonly removed from thinning contracts in your region?
   a. 20%
   b. 40%
   c. 60%
   d. 80%
   e. Other (please specify):

5. Operators – Please fill out the following (are any of these items negotiable?)
   a. Diesel Fuel Price ($/gal)____
   b. Wage for Fallers ($/hr)____
   c. Wage for Other Workers ($/hr)____
   d. % benefits and overhead for operators__________________________________
   e. Hourly Wage for Truckers ($/hr)____
   f. % benefits and overhead for truckers __________________________________

6. Facilities – Please fill out the following (are any of these items negotiable?)
   a. Moisture content ____

b. Fuel ash concentration ____

c. Feedstock type ____

d. Source of feedstock ____

e. Feedstock composition ____

f. How is ash disposed of or managed? ___________________________________

g. Ash disposal cost? ____

h. Labor costs ____

i. Maintenance cost ____

j. Insurance ____

k. Utilities ____

l. Management ____

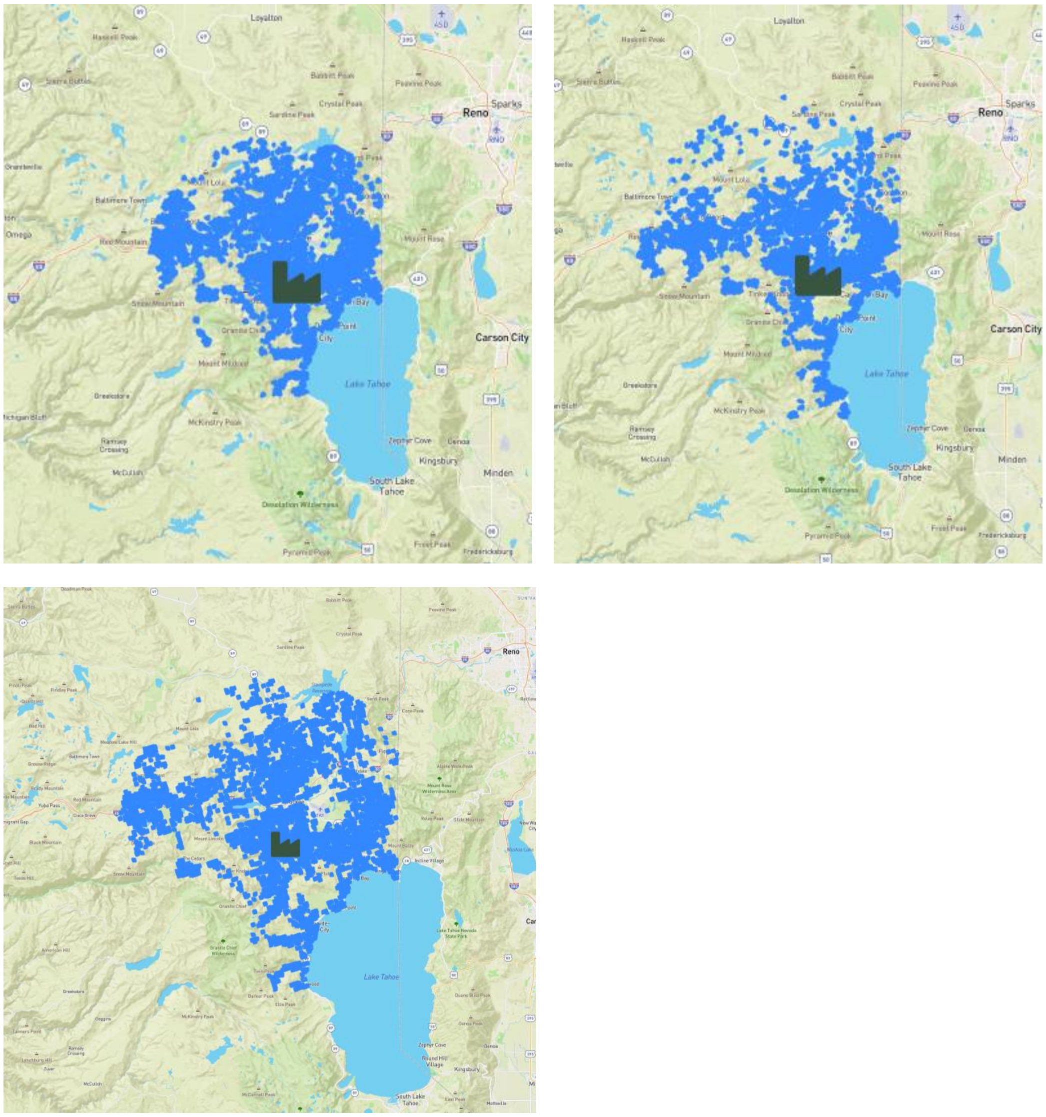
m. Other operating expenses ____

n. Escalation rate ____

o. % benefits and overhead for facilities ___________________________________

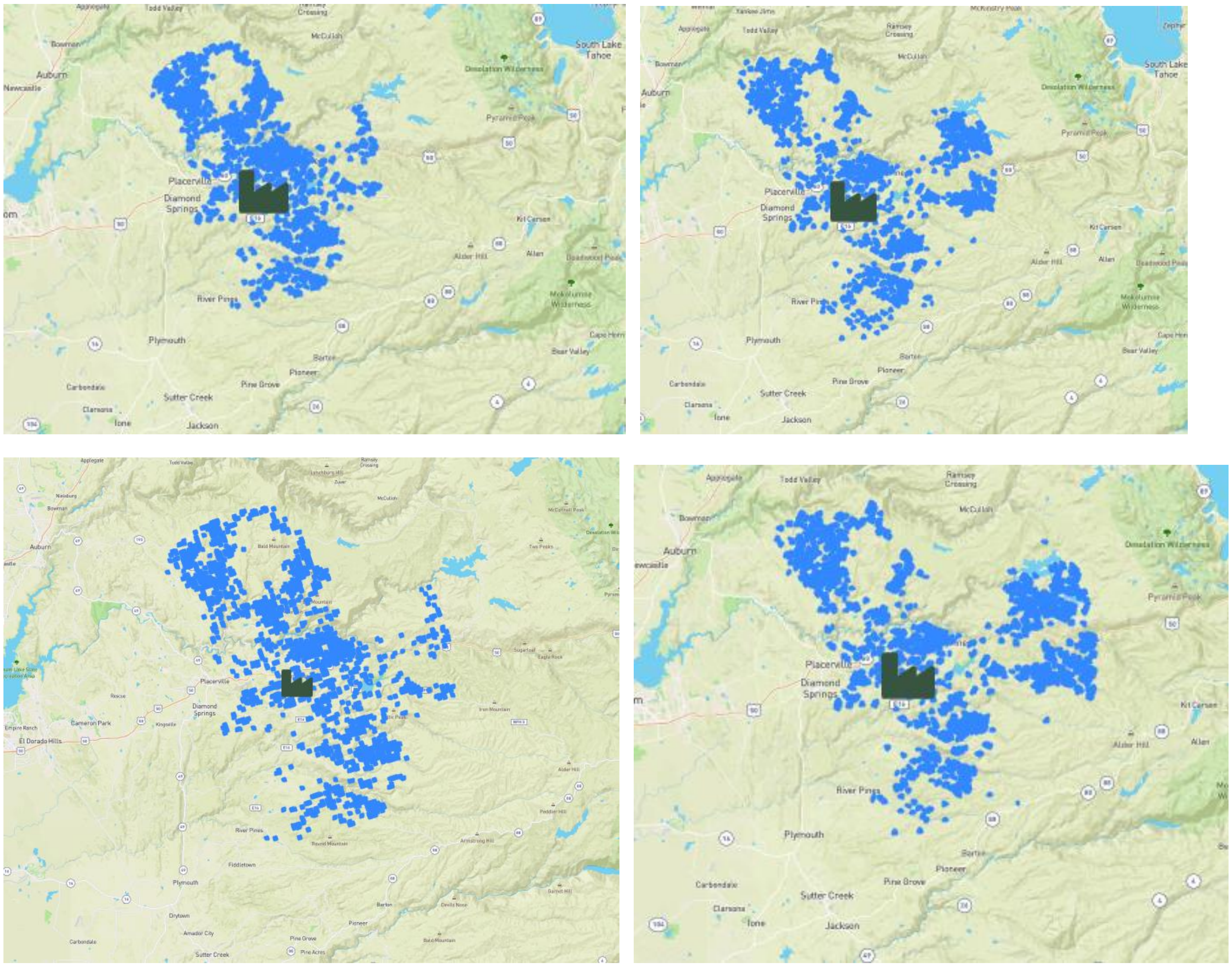
Appendix C: FRREDSS spatial outputs for each expansion factor scenario

Cabin Creek



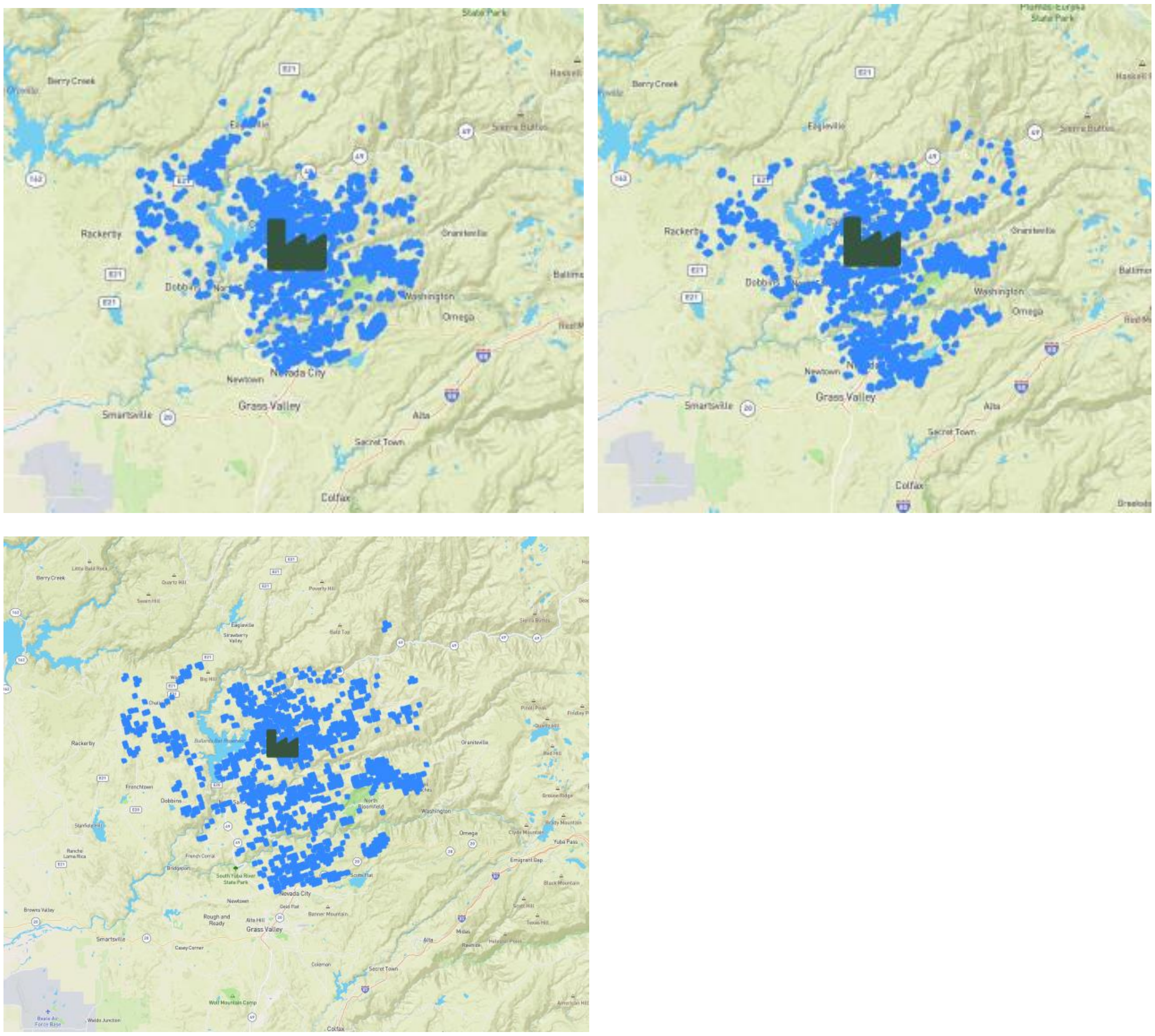
Cabin Creek at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left).

Camino



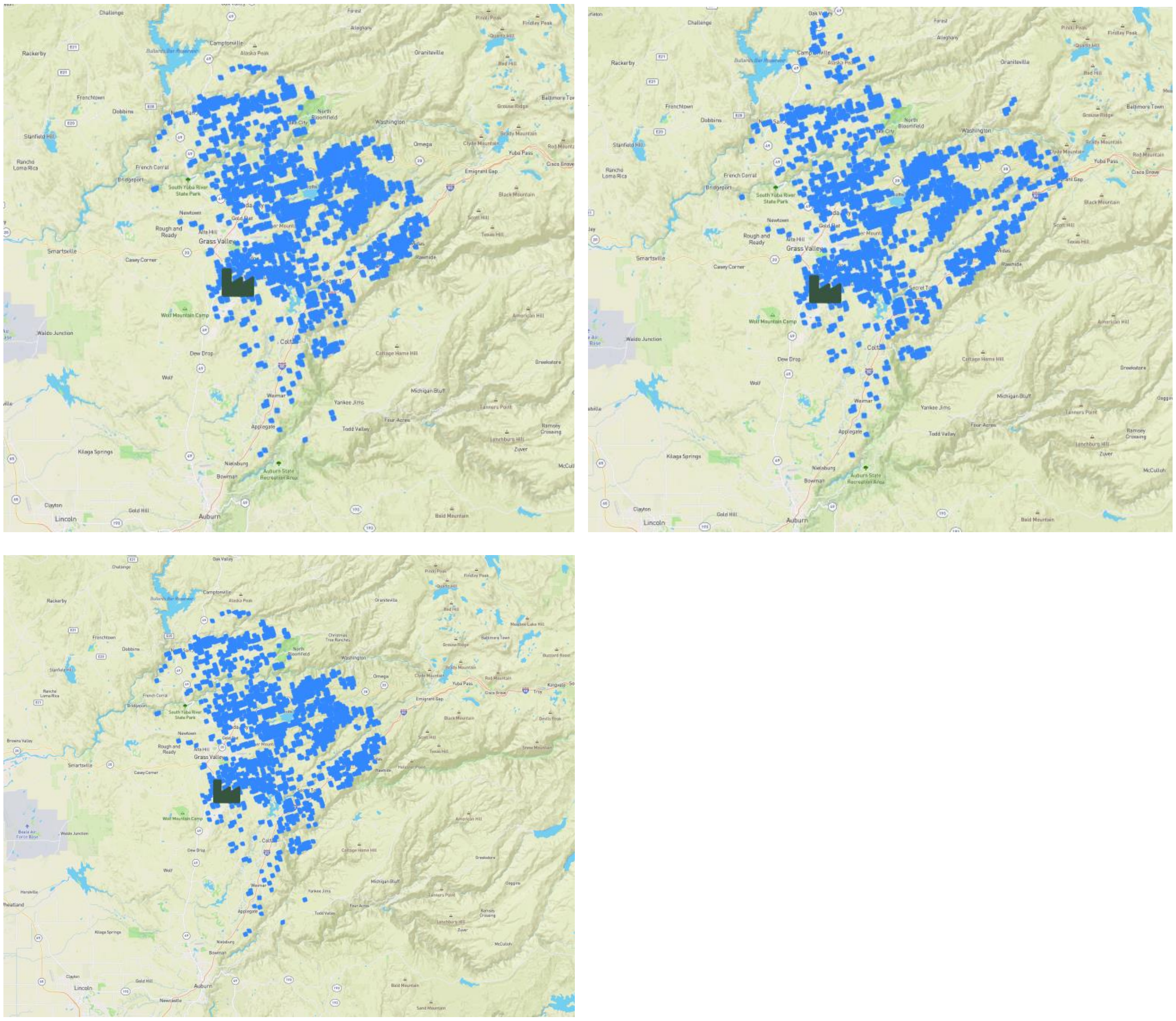
Camino at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left). Camino at expansion factor 20 (bottom right).

Camptonville



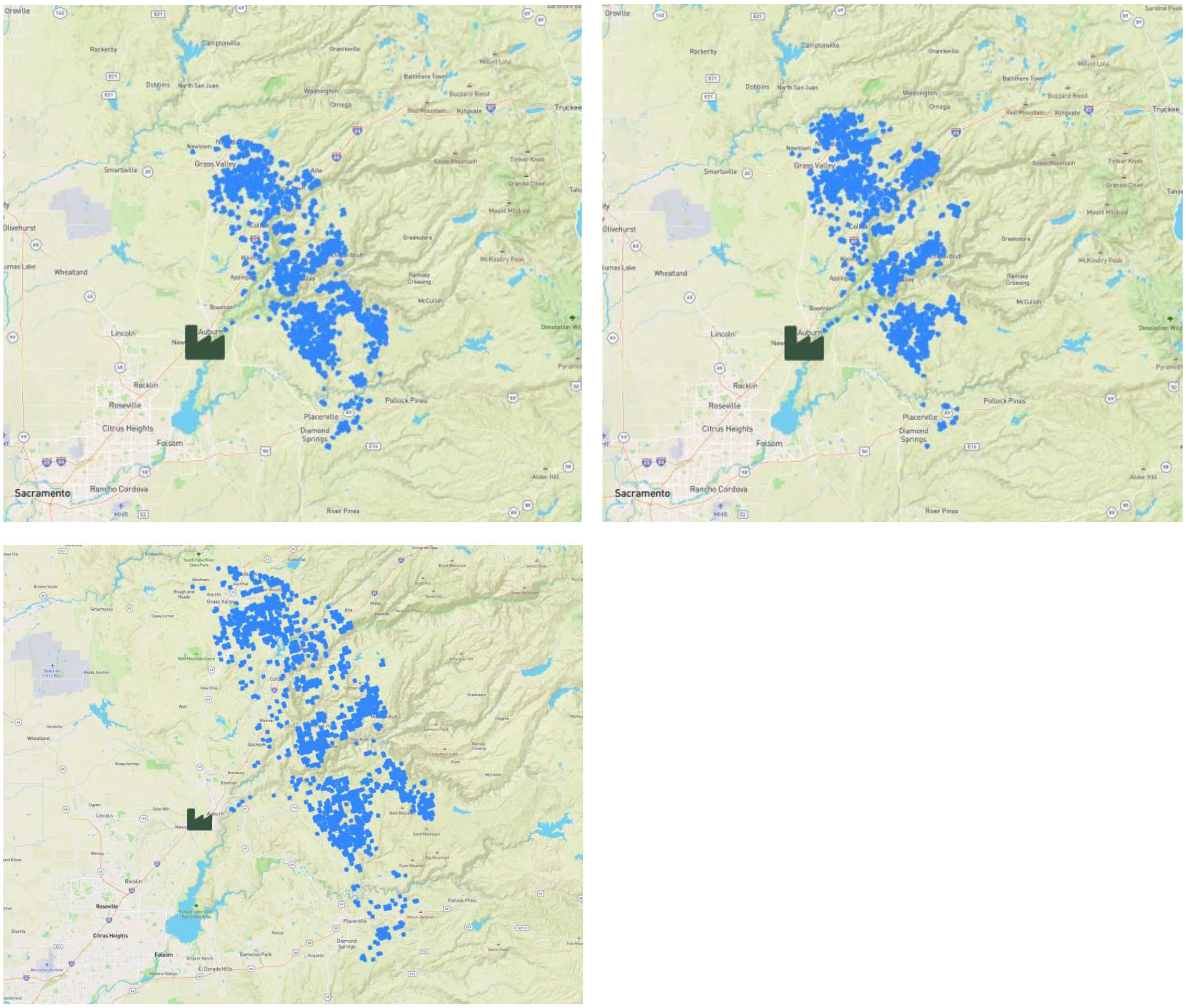
Camptonville at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left).

Grass Valley



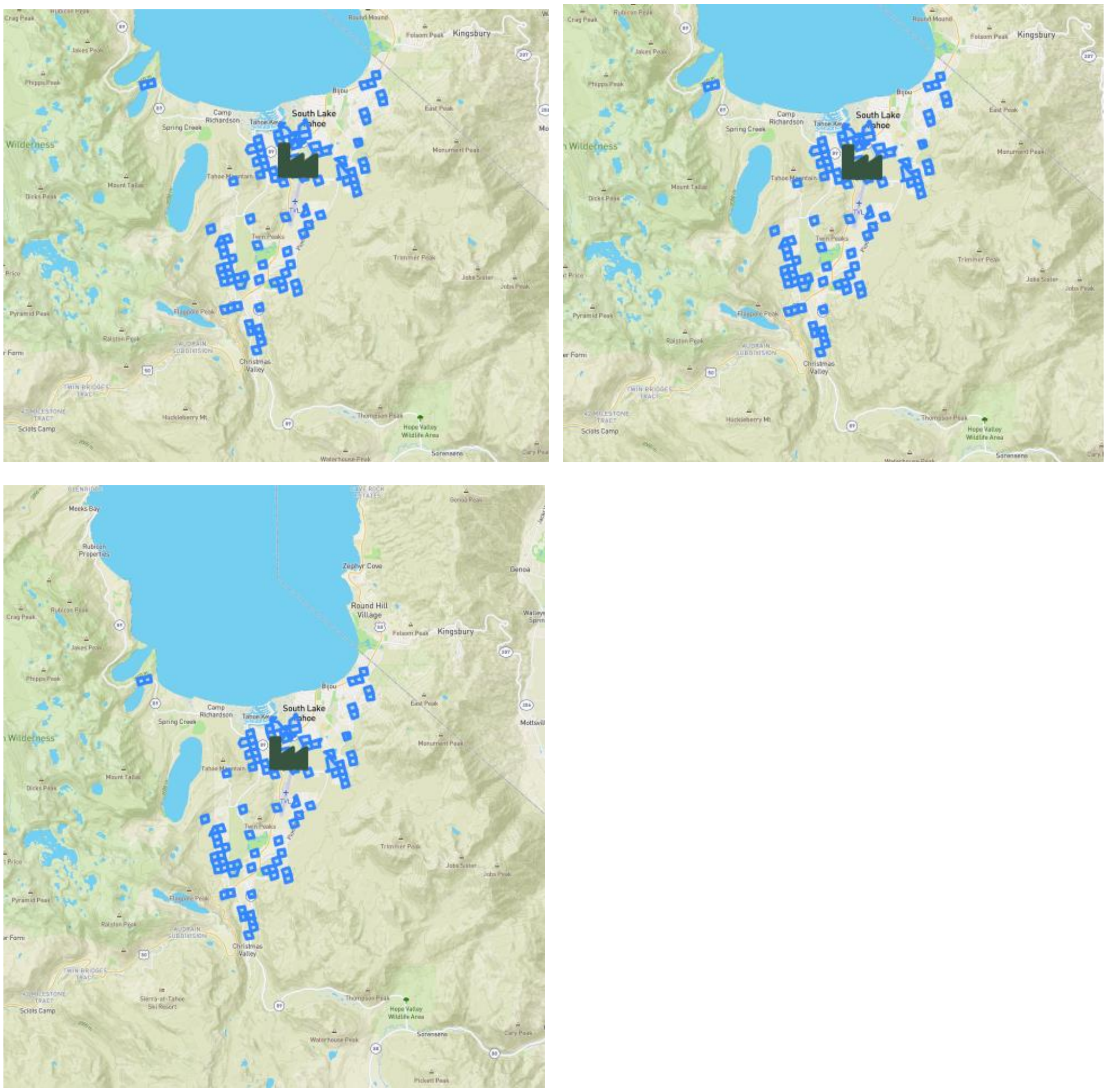
Grass Valley at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left).

Ophir



Ophir Site at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left).

South Lake Tahoe



South Tahoe Refuse at expansion factor 1 (left) and expansion factor of 10 (right). Zero inflation rate (Bottom left).

APPENDIX D. Issues Related to United States Forest Service Stewardship Agreements

October 11, 2024

Accelerating the Pace and Scale of Forest Restoration on National Forest System Lands Via Innovative Partnerships Involving Stewardship Agreements—Issues and Analysis

Authors: Elisabeth Esposito, Rachel Rockwell, and Todd Sloat[1]

I. EXECUTIVE SUMMARY

In light of the growing threats to forest health and communities posed by wildfires and climate change, the United States Department of Agriculture, Forest Service ("Forest Service" or the "agency") has focused on increasing forest restoration activities across at-risk landscapes. In recent years, the Forest Service has leveraged partnerships to achieve its mission, including through agreements to implement priority projects. Stewardship agreements, in particular, are an important tool used by the Forest Service to accomplish its restoration objectives, and the agency has entered into stewardship agreements with partners at forest-wide, region-wide, and nationwide scales.

This report evaluates various mechanisms for accelerating the pace and scale of forest restoration work on National Forest System ("NFS") lands pursuant to stewardship agreements between the Forest Service and its partners.

Section II provides an overview of the legal and regulatory background relevant to stewardship agreements and the promising role of partnerships and community-scale sawmills in advancing much-needed forest restoration work.

Section III focuses on unlocking barriers to the promising role to be played by community-scale sawmills and other wood products facilities[2] in providing infrastructure essential to processing materials removed from NFS lands pursuant to Forest Service stewardship agreements (or other contractual mechanisms) to meet forest health, forest restoration, and wildfire mitigation objectives.

Specifically, as described in Section III, one of the greatest barriers to the establishment of community-scale sawmills is their ability to secure long-term feedstock agreements, which are crucial to those facilities obtaining equity and debt financing. This report identifies and evaluates one promising mechanism for overcoming this barrier—by securing long-term feedstock for community-scale sawmills

[1] Elisabeth (Liz) Esposito and Rachel Rockwell are natural resources attorneys with Brownstein Hyatt Farber Schreck, LLP where they focus on assisting clients engaged in the stewardship of natural resources on public and private lands. Todd Sloat owns Forest Creek Restoration, Inc., through which he consults and engages on a variety of natural resources management projects.

[2] This report refers to such facilities collectively as "community-scale sawmills." This term encompasses community-scale facilities that take generally smaller diameter trees and other wood underutilized by traditional sawmills and turn it into wood products (e.g., lumber, firewood, poles, and other specialty products) and/or energy.

via partnerships with entities that have entered into stewardship agreements with the Forest Service to implement forest restoration projects ("Partners" or "cooperators"). Under the partnership model described in this report, the Partner would provide the community-scale sawmill with a consistent and reliable feedstock supply, with payments for raw materials flowing back to the Partner for further use in implementing stewardship work on NFS lands.

Section III also evaluates potential constraints on this partnership model, including: (1) whether there is a limitation in law, regulation, policy, or Forest Service stewardship agreement terms that would preclude a Partner from entering into a long-term feedstock agreement, including a sole-source contract[3] with a community-scale sawmill and; (2) constraints on the Partner in pricing forest products under such an arrangement.

In summary, Section III concludes that:

- Long-term feedstock agreements between Partners and community-scale sawmills offer myriad potential benefits including:
  - Supporting community forest health, forest restoration, and wildfire mitigation objectives;
  - Providing a consistent and reliable feedstock supply to enable the development of new and existing community-scale sawmills, which also facilitates their ability to secure financing;
  - Providing local jobs;
  - Creating infrastructure capable of turning lower value trees harvested pursuant to restoration projects on predominantly Federal land into wood products, including lumber, firewood, poles, other specialty products, and energy, transforming trees that might otherwise be cut and burned or left on site into valuable products; and
  - Potentially reducing haul times from project sites to wood processing infrastructure by allowing community-scale sawmills to be developed and sited near long-term landscape-scale restoration projects.
- Applicable limitations on the Partner entering into a long-term feedstock agreement with a community-scale sawmill, including a sole-source contract, turn on whether (i) the Partner holds title to the forest products at issue and is contracting with the community-scale sawmill to dispose of the products; or (ii) the Forest Service holds title to the materials and/or the Partner uses Forest

[3] As used in this report, a "sole-source contract" refers to a feedstock contract entered into between a Partner holding a stewardship agreement and a community-scale sawmill, without the Partner engaging in a competitive bidding process.

Service funding under the stewardship agreement to award a contract to a community-scale sawmill (i.e., a “subcontract”).

- Where the Partner holds title to the forest products at issue:

    - The Partner has significant flexibility to enter into a long-term feedstock agreement with a community-scale sawmill, including a sole-source contract, subject to any constraints applicable to the Partner (e.g., under state law or procedures adopted by the Partner). For example, where the Partner is a California local agency, the agency may have adopted an applicable policy imposing procedures to ensure that personal property (including forest products) is disposed of in a fair and transparent manner.

    - Forest Service guidance provides that a Partner may not profit off of the stewardship agreement, nor may the Forest Service enter into agreements that “contemplate development and sale of a product for profit, either directly or indirectly by the cooperator.” Forest Service Handbook (“FSH”) 1509.11 § 70.3(4)(d). This directive may function to constrain the pricing of forest products under a contract between the Partner and the purchaser (i.e., to ensure that the Partner is not directly or indirectly profiting from the sales). However, Forest Service guidance provides flexibility, allowing that if the Partner does realize profits, the profits may be used to fund additional service work or may be paid back to Forest Service as excess receipts. *Id*. at § 70.3(4).

    - Provisions of applicable stewardship agreements may also impose limitations on agreements between a Partner and a community-scale sawmill purchasing forest products (e.g., limitations on contracting to export forest products removed from NFS lands).

- Where the Forest Service holds title to the forest products at issue and/or the Partner uses Forest Service funding under the stewardship agreement to award a contract to a community-scale sawmill:

    - Standard Forest Service stewardship agreement terms require that contracts awarded using Forest Service funding be awarded pursuant to the Partner’s “established procedures, to ensure free and open competition, and avoid any conflict of interest (or appearance of a conflict).” FS-1500-21c – Stewardship Agreement, § V, ¶ LL; FS-1500-21 – Master Stewardship Agreement, § V, ¶ DD.

    - Other stewardship agreement provisions may impose further limitations, for example, a requirement to seek and obtain fair market value for forest products.

Section IV more generally explores mechanisms by which the Forest Service and its partners can most efficiently and effectively carry out work pursuant to their stewardship agreements, including: facilitating efficient Forest Service review of partner work, expanding Forest Service capacity through specialist reports incorporated in National Environmental Policy Act ("NEPA") analyses for forest health projects, and using stewardship credits to accomplish priority work on NFS lands.

In summary, Section IV concludes that opportunities exist to:

- Structure stewardship agreements in a manner that facilitates efficiency, including timely reviews by Forest Service staff;

- Use stewardship credits accrued in the footprint of one project to accomplish further work on other projects, again subject to certain constraints described herein; and

- Accelerate and scale forest restoration work via partner-assisted NEPA, subject to certain constraints described in Section IV.

These opportunities are more specifically discussed in Section IV.

II. BACKGROUND

A. Legal and Regulatory Background

The Forest Service is authorized to enter into stewardship agreements and contracts with public or private entities to "perform services to achieve land management goals for the national forests and the public lands that meet local and rural community needs." 16 U.S.C. § 6591c(b). The land management goals of a stewardship project may include any of the following:

> (1) Road and trail maintenance or obliteration to restore or maintain water quality;
>
> (2) Soil productivity, habitat for wildlife and fisheries, or other resource values;
>
> (3) Setting of prescribed fires to improve the composition, structure, condition, and health of stands or to improve wildlife habitat;
>
> (4) Removing vegetation or other activities to promote healthy forest stands, reduce fire hazards, or achieve other land management objectives;
>
> (5) Watershed restoration and maintenance;
>
> (6) Restoration and maintenance of wildlife and fish; or

(7) Control of noxious and exotic weeds and reestablishing native plant species.

16 U.S.C. § 6591c(c); see also Forest Service Handbook ("FSH") 2409.19 § 61.2, Exhibit 02 (Examples of Appropriate Stewardship Project Work Items). One of the key innovations in the stewardship authority is that it allows the Forest Service to apply the value of timber or other forest products removed as an "offset" against the cost of services rendered under the contract or agreement. 16 U.S.C. § 6591c(d)(4)(A); *see generally Conservation Cong. v. U.S. Forest Serv.*, 409 F.Supp.3d 861, 875-76 (E.D. Cal. 2019) (providing a brief overview of Forest Service stewardship authority and protocols as compared with timber sales). In other words, the statute permits a trade of goods (forest products) for services (stewardship project work commonly referred to as "service work").

The Forest Service has discretion to enter into either contracts or agreements to carry out stewardship projects. 16 U.S.C. § 6591c(b); 36 C.F.R. § 223.301(a). The Forest Service has developed five contract types approved for use in stewardship projects: two types of integrated resource timber contracts ("IRTCs"), two types of integrated resource service contracts ("IRSCs"), and a service-only contract. FSH 2409.19 § 62.1. The Forest Service has also developed various stewardship agreement templates.[4]

FSH 2409.19 section 62, Exhibit 01, includes a detailed table comparing the use of stewardship contracts and agreements. The key differences between the various types of stewardship contracts and stewardship agreements are that:

- IRTCs are used where the value of the goods exceeds the costs of services to be performed. FSH 2409.19 § 62.11.

- IRSCs are used where the cost of services or construction exceeds the value of the goods. *Id*. at § 62.12. The IRSC may trade goods for services, use appropriated funds, and use retained receipts from another stewardship contracting project to pay for service work. *Id.*

- Service-only stewardship contracts are used where product removal is not included in a stewardship project, so there is no exchange of goods for services. *Id.* at § 62.13.

- Stewardship agreements can be used for product removal, but only where the Forest Service and Partner share mutual interests and benefit in the same qualitative way from the objective of the agreement, the Partner makes a matching contribution to the partnership (e.g., cash, property, services, or in-kind contributions, like volunteer labor), and the agreement does not directly or indirectly contemplate development and sale of a product for a profit by the Partner. FSH 1509.11

[4] See Forest Service, "Stewardship Contracting Reporting, Guidance, and Directives," https://www.fs.usda.gov/restoration/Stewardship_Contracting/guidance.shtml.

§§ 70.3, 72.61.[5] The Partner must document the sale of any products and if a profit is realized, the funds are either used for additional service work or paid back to the Forest Service as excess receipts. *Id*. at § 70.3(4). Stewardship agreements must be awarded "after a best approach determination is made that considers both a technical and cost evaluation." FSH 2409.19 § 62.14. Further, the Partner is generally expected to contribute at least 20 percent of total project costs (including indirect costs). FSH 1509.11 § 72.61(5). Absent a 20 percent matching contribution, "the more likely the activity will have to be accomplished through procurement." *Id*.[6]

As described further in Section IV.A, stewardship agreements can be structured either as stand-alone, individual project agreements that cover the scope of one project, or using an umbrella Master

[5] Applicable Forest Service guidance suggests that stewardship agreements are most appropriate for non-profit entities due to the requirement that a partner cannot profit from a stewardship agreement. However, the directives also indicate that the Forest Service may partner with public benefit entities (including public benefit corporations, social purpose corporations, benefit limited liability companies, low-profit limited liability companies, and B corps) so long as they meet the requirement for partnerships to achieve mutual interest and mutual benefit in "the same qualitative way." FSH 1509.11 §§ 70.3, 70.5.

[6] Forest Service guidance issued in 2022 provides that there is leniency in certain circumstances to lower the 20 percent match requirement, or to count certain non-monetary benefits a Partner provides towards this matching requirement. U.S. FOREST SERV., MATCH AND SUBSTANTIAL CASH CONTRIBUTIONS POLICY CHANGES (Jul. 22, 2022) https://www.fs.usda.gov/sites/default/files/LC-GrantsAgreementsPolicyChangeLetter.pdf. For example, this guidance directs staff to "consider and include all of the values a partner brings to the relationship when determining when and how match requirements are met." *Id.* at p. 2. The guidance also provides several examples of the types of in-kind contributions that Partners may bring to Forest Service work including: "access to networks and communities that are underrepresented or underserved; access to indigenous traditional ecological knowledge; networks and relationships that increase social license for wildfire risk reduction and treatments; creativity and innovation that can support effective public outreach and education and facilitate safe and inclusive recreation experiences; experience managing work projects to improve forest health and climate resilience; capabilities to support project design and management and provide subject matter expertise that complements the skills of agency employees or fills a gap in agency capacity; and more." *Id.* at pp. 1-2. Finally, in addition to the above, this guidance instituted waivers of policy match requirements (i.e. matching contributions not required by statute) for agreements entered with Tribes and for agreements "that will serve underserved communities that have been systemically denied a full opportunity to participate in aspects of economic, social, and civic life, as set forth in *Executive Order 13985, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*." *Id.* at p. 3.

Stewardship Agreement (sometimes referred to as "MSAs") to which individual Supplemental Project Agreements (sometimes referred to as "SPAs") are tiered.[7]

The term of a stewardship contract or agreement may run for 10 years, or up to 20 years in areas where the majority of Federal lands are in Fire Regime Groups I, II, or III. 16 U.S.C. § 6591c(d)(3)(B); Consolidated Appropriations Act, 2018, P.L. 115-141, 132 Stat. 1065, Division O, Title II, § 207 (2018); FSH 2409.19 § 62.3. Many stewardship agreements implement projects that treat thousands of acres of NFS lands and include a sawlog or biomass removal component. The projects implemented under a stewardship agreement must be analyzed under NEPA and approved by the applicable Forest Service decision-maker after the opportunity for public involvement.[8]

B. <u>The Promise of Partnerships and the Role of Partners and Community-Scale Sawmills</u>

In light of the growing threats to forest health and communities posed by wildfires and climate change, the Forest Service has focused on increasing forest restoration activities across at-risk landscapes. In recent years, the Forest Service has focused on leveraging partnerships to achieve its mission, including through large, national-level agreements, sometimes called "keystone agreements," to implement priority projects funded by the Bipartisan Infrastructure Law and the Inflation Reduction Act.[9] Stewardship

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[7] These templates were historically available online at: Forest Service, "Stewardship Contracting Reporting, Guidance, and Directives," https://www.fs.usda.gov/restoration/Stewardship_Contracting/guidance.shtml, but have been recently taken offline. Form FS-1500-21 – Master Stewardship Agreement, Form FS-1500-21A Stewardship Agreement Supplemental Project Agreement, and Form FS-1500-21c – Stewardship Agreement, are still available, respectively, at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497654.pdf; https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497655.pdf; and https://www.fs.usda.gov/restoration/documents/stewardship/agreements/FS-1500-21c-StewardshipAgreement.docx. Sometimes, a Memorandum of Understanding is also utilized to set the framework for the Master Stewardship Agreement-Supplemental Project Agreement structure.

[8] As described in greater detail in Section IV, the Forest Service can rely on partners to assist in the development of NEPA analyses, subject to Forest Service oversight, thereby increasing Forest Service capacity for project planning and analysis and increasing the pace and scale of federal forest restoration work. For example, the Pit and Fall River Resource Conservation Districts and their partners have initiated such projects with the Modoc and Lassen National Forests, respectively. Third-party NEPA teams have been assisting these and other national forests over the last five years and are now equipped with planning funds through the Sierra Nevada Conservancy to lead project work in Wildland Urban Interface areas, resilient corridors (e.g., transmission and distribution lines, major roads), and plantations.

[9] See, e.g., Forest Service, "Achieving our mission through keystone agreements," (Mar. 27, 2023), https://www.fs.usda.gov/inside-fs/leadership/achieving-our-mission-through-keystone-agreements.

agreements, in particular, are an important tool used by the Forest Service to accomplish its restoration objectives, and the Forest Service has entered into stewardship agreements with Partners at forest-wide, region-wide, and nationwide scales.[10]

Adequate wood products processing infrastructure is necessary to meet forest restoration objectives. Without access to such facilities, cut trees and vegetation must be burned in place or treated (e.g., masticated or lopped and scattered) and left on site. Community-scale sawmills hold promise because they can be sited near landscape-scale restoration projects and designed to manufacture lumber from small diameter, lower value logs, which are commonly harvested from federal land and made available through federal timber sales, stewardship contracts, or stewardship agreements. These materials are also available from forest management activities on private industrial timberland and through fuel reduction activities on smaller, privately owned land by organizations like fire safe councils. Existing sawmill infrastructure is primarily scaled for activities on private lands, not federal lands. Therefore, opportunities exists to develop infrastructure closer to larger-scale projects and design it to process log and biomass supplies from federal lands, which will assist in federal forest restoration efforts.

However, a significant obstacle to actually developing a community-scale sawmill is the ability to secure financing. Financing, in turn, may be conditioned on the existence of a reliable long-term feedstock supply. Obtaining future supply guarantees is particularly challenging where a facility primarily processes feedstock harvested from Federal lands because the Federal government cannot provide a long-term feedstock guarantee.

This report explores the role of stewardship agreements in providing a potential solution. As described in Section II.A, above, the Forest Service has the ability to enter into long-term contracts and agreements to implement forest management and restoration work under the stewardship authority (16 U.S.C. § 6591c). Given the long-term nature of stewardship agreements, engagements between Partners and community-scale sawmills hold promise as a mutually beneficial mechanism to ensure a consistent and predictable

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[10] Examples of nationwide stewardship agreements include the following "keystone agreements:"

- National Forest Foundation: Master stewardship agreement to aid in executing the wildfire crisis strategy;
- Mule Deer Foundation: Master stewardship agreement for habitat improvement and restoration while supporting the wildfire crisis strategy; and
- National Wild Turkey Federation: Master stewardship agreement for habitat improvement and restoration while supporting the wildfire crisis strategy.

Forest Service, "Achieving our mission through keystone agreements," (Mar. 27, 2023), https://www.fs.usda.gov/inside-fs/leadership/achieving-our-mission-through-keystone-agreements.
Examples of regional and forest-level stewardship agreements in Forest Service Region 5 (California) are available at Forest Service, "Good Neighbor and Stewardship Agreements," https://www.fs.usda.gov/detailfull/r5/workingtogether/partnerships/?cid=fseprd646022.

supply of feedstock. Specifically, long-term feedstock agreements between Partners and community-scale sawmills would provide a consistent and reliable source of feedstock to the community-scale sawmill, facilitating their ability to secure financing; provide a consistent and reliable outlet for the Partner; and allow revenue from feedstock sales to flow back to the Partner to conduct further work on NFS land under the stewardship agreement. At the discretion of the Partner and the community-scale sawmill, the long-term feedstock agreement could also be structured in different ways to further promote its mutually beneficial nature (e.g., to include a supply guarantee, a right of first refusal, or other terms negotiated by the parties).

Section III, below, addresses the benefits and potential limitations of such a model in greater detail.

III. UNLOCKING THE PROMISE OF COMMUNITY-SCALE SAWMILLS

A. The Role of Stewardship Agreements in Providing Long-Term Feedstock Supplies to Community-Scale Sawmills: Opportunities and Potential Limitations on Supply Contracts between Partners and Community-Scale Sawmills

As described in Section II.B, above, a primary obstacle to developing a community-scale sawmill is securing equity and debt financing. A potential solution to the financing and supply issues is the stewardship agreement. Given their long term (10 or 20 years) and potentially large scope, stewardship agreements that include a sawlog or biomass removal component have the potential to provide the opportunity for collaboration between Partners and community-scale sawmills that provide the former with a reliable outlet and the latter with a reliable feedstock supply.

Federal law, regulation, and Forest Service policy do not preclude a Partner from contracting with a community-scale sawmill to provide a long-term feedstock agreement, including a sole-source contract. However, these sources do provide guidance which informs the relationship between the Partner and community-scale sawmill. Specifically, applicable limitations on the disposition of forest products from a Partner to a community-scale sawmill turn on whether: (i) the Partner holds title to the forest products at issue[11] and is contracting with a community-scale sawmill to dispose of the products; or (ii) the Forest Service holds title to the materials and/or the Partner uses Forest Service funding under a stewardship agreement to award a contract to a community-scale sawmill (i.e., a "subcontract").

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[11] The Supplemental Project Agreement template explains that where forest products are to be scaled, title passes from the Forest Service to the Partner after timber "has been cut, scaled, and removed from the Stewardship Project Area or other authorized cutting area, and paid for." Supplemental Project Agreement Template, FS-1500-21A, Appendix F, ¶ F.14 (emphasis in original). Where forest products are sold on a "tree measurement" basis, title passes to the Partner after the timber "has been measured, paid for, and removed from the Stewardship Project Area or other authorized cutting area." *Id.* (emphasis in original).

Where the Partner holds title to the forest products at issue, the Forest Service guidance and stewardship agreement terms provide limited constraints on disposition. Specifically, Forest Service guidance provides that a Partner to a stewardship agreement may not profit off of the stewardship agreement, nor may Forest Service enter into agreements that "contemplate development and sale of a product for profit, either directly or indirectly by the cooperator." FSH 1509.11 § 70.3(4)(d). This directive may function to constrain the pricing of forest products under a contract between the Partner and the community-scale sawmill (i.e., to ensure that the Partner is not directly or indirectly profiting from the sales). However, to the extent that the Partner prices the feedstock sold at cost (including any margin to cover its expenses), this requirement would be met. Further, Forest Service guidance provides some flexibility, allowing that if the Partner does realize profits, the profits may be used to fund additional service work or may be paid back to Forest Service as excess receipts. *Id*. at § 70.3(4); see also FSH 2409.19 § 60.3(7) (allowing excess retained receipts to fund stewardship projects).

Other stewardship agreement provisions may also govern contracts between the Partner and a community-scale sawmill. For example, provisions within Appendix F (Timber Removal Specifications) of certain Supplemental Project Agreements,[12] prohibit the Partner from exporting timber harvested from NFS lands and requires the Partner to require any buyer or recipient of timber to "execute an acceptable agreement that will:

> (i) Identify the Federal origin of the timber;
> (ii) Specify domestic processing for the timber involved;
> (iii) Require the execution of such agreements between the parties to any subsequent transactions involving the timber;
> (iv) Require that all hammer brands and/or yellow paint must remain on the logs until they are either legally exported or domestically processed, whichever is applicable; and
> (v) Otherwise comply with the requirements of the Act (16 USC 620d)."[13]

Each such agreement shall be furnished to the Forest Service within 10 days following its execution.[14]

Additional constraints apply where the Forest Service holds title to the forest products at issue and/or the Partner uses Forest Service funding under the stewardship agreement to award a contract to a community-scale sawmill. Specifically, the Forest Service stewardship agreement templates include a provision obligating the Partner to award any third-party using Forest Service funding pursuant to the Partner's "established procedures, to ensure free and open competition, and avoid any conflict of interest (or

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[12] See, e.g., Supplemental Project Agreement to Pit Resource Conservation District Master Stewardship Agreement (Agreement No. 24-SA-11050900-013), Appendix F.
[13] *Id*., ¶ F.16(f).
[14] *Id*., ¶ F.16(g).

appearance of a conflict)." FS-1500-21c – Stewardship Agreement, § V, ¶ LL; FS-1500-21 – Master Stewardship Agreement, § V, ¶ DD (note to template agreements).

Supplemental Project Agreement provisions may further impose limitations on contracts between the Partner and the purchaser of forest products. Appendix F (Timber Removal Specifications) to one example Supplemental Project Agreement[15] provides:

> The [Partner] will be seeking fair market value for the products listed below. Amendments may be utilized when contractor or contractors are selected by the [Partner]. These amendments will be utilized to update actual rates, minor modifications, and map updates. Actual rates will be reviewed by USFS and [Partner] staff to ensure fair market value was achieved.[16]

These provisions would not, however, apply to the disposition of forest products by Partners after they have taken title to the materials (i.e., because the Forest Service would have already been paid fair market value for the materials).

Finally, subcontracts for disposal of forest product must include any stewardship agreement terms applicable to subcontracts. See, e.g., FS-1500-21 – Master Stewardship Agreement, § V, ¶¶ Y, NN.

B. The Community-Scale Sawmill as a Partner: Opportunities and Potential Limitations on Community-Scale Sawmills Partnering Directly with the Forest Service

Section III.A, above, describes opportunities and limitations on potential relationships between community-scale sawmills and Partners. However, the potential also exists for the community-scale sawmill to directly hold a stewardship agreement itself, subject to the limitations discussed below.

The first potential limitation relates to the corporate structure of the community-scale sawmill entity and the related ability of the sawmill and the Forest Service to meet the mutual interest / benefit test applicable

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[15] Supplemental Project Agreement to Pit Resource Conservation District Master Stewardship Agreement (Agreement No. 24-SA-11050900-013).

[16] *Id.*, Appendix F. The Forest Service provides specific guidance for appraisal of forest products in Chapter 40 of FSH 2409.18, Forest Service Manual 2431.3 and in Regional Guidelines. See FSH 2409.19 § 61.3.

to partnership agreements.[17] Forest Service guidance permits the agency to enter into a stewardship agreement with for-profit entities, private individuals, and non-profit entities. See FSH 2409.19 § 62.14 Ex. 01 ("Note: Agreements with for-profit entities and private individuals are allowed. Agreements with for-profit entities are allowable provided that minimum matching contributions are met, mutual interest(s)/benefit(s) are present (beyond a profit motive), and the entity is not allowed to profit. Any 'overages' must be returned to the Forest Service in the form of retained receipts or additional service items completed.").

However, in any partnership, including with a for-profit entity, Forest Service guidance requires the agency and the Partner "share mutual interests and benefit in the same qualitative way from the objective of the agreement." FSH 1509.11 § 70.3(3).[18] The guidance specifically recognizes that this mutual interest / benefit test can be met for both non-profit and for-profit entities, including public benefit legal entities (e.g., Public Benefit Corporation, Social Purpose Corporation, Benefit Limited Liability Company, low-profit limited liability company, or certified B Corp). FSH 1509.11 §§ 70.3, 70.5. While Forest Service guidance does not explicitly preclude for-profit entities that are not public benefit legal entities from entering into stewardship agreements, it may be more difficult for such entities to meet the mutual interest / benefit test.

The second potential limitation, described in Section III.A, above, is found in the Forest Service guidance providing that a Partner may not profit off of the stewardship agreement, nor may Forest Service enter into agreements that "contemplate development and sale of a product for profit, either directly or

[17] The mutual interest / mutual benefit test does not apply outside of cost-sharing arrangements (i.e., partnership agreements) including stewardship agreements and would therefore not apply to stewardship contracts or other procurement relationships. See FSH 1509.11 § 70.3(3).

[18] The FSH provides the following example of the mutual interest / benefit test being met: "For example, a cost-sharing agreement exists when the Forest Service and the cooperator(s) share a mandate for wildlife habitat improvement, and both parties contribute significant resources to accomplish a wildlife habitat enhancement project on land under Forest Service jurisdiction. Both the Forest Service and the cooperator leverage their resources to complete a project to accomplish their missions." FSH 1509.11 § 70.3(3). In contrast, the mutual interest / benefit test is not met where the partner's contribution is "meaningless," or where the partner's "primary motive is to obtain paid employment." *Id*. An example of the former is "when . . . the cost of reimbursing the cooperator may be the same as the rate for completion of the total project that could be obtained through competitive procurement procedures (making the cooperator's contribution meaningless). This type of project should be accomplished using Government procurement procedures." *Id*. An example of the latter "would be where a local contractor proposes to provide reimbursable backhoe services to dredge a pond at a discounted price, offering what appears to be a contribution. In this situation, while the Forest Service and the cooperator share mutual interests, they do not mutually benefit since dredging the pond is of no additional benefit to the cooperator than providing a source of paid employment." *Id*.

indirectly by the cooperator." FSH 1509.11 § 70.3(4)(d). Note, however, that the guidance does not impose an absolute bar on a Partner realizing profits. Rather, if the Partner does realize profits, they may be used to fund additional service work or may be paid back to the Forest Service as excess receipts. FSH 1509.11 § 70.3(4).

IV. MAXIMIZING EFFICIENCY AND EFFECTIVENESS IN PARTNERSHIPS IMPLEMENTED VIA STEWARDSHIP AGREEMENTS

Regardless of the type of Partner, various mechanisms exist for the Forest Service and its Partners to efficiently and effectively carry out work pursuant to their stewardship agreements. This section explores several such mechanisms, including: facilitating efficient Forest Service review of Partner work, using stewardship credits to accomplish priority work on NFS lands, and expanding Forest Service capacity through specialist reports incorporated in NEPA analyses for forest health projects.

A. Opportunities for Structuring Stewardship Agreements to Facilitate Efficiency and Timely Reviews by Forest Service Staff

As indicated in Section II.A, above, stewardship agreements can be structured in one of two ways: (1) as a stand-alone, individual project agreement that covers the scope of one project, see, e.g., FSH 2409.19 § 62.14c, or (2) using an umbrella Master Stewardship Agreement from which individual Supplemental Project Agreements are tiered. *Id*. The latter approach is useful because it creates a potential opportunity for efficiency where the Forest Service and its Partner intend to enter into multiple stewardship agreements.

A Master Stewardship Agreement is typically used to designate a large area for restoration, such as a landscape, region, or national forest, where a series of projects is contemplated to occur. FSH 2409.19 § 62.14c. The Master Stewardship Agreement sets out the overarching terms of the agreement between the Partner and the Forest Service, saving both parties time and resources associated with negotiating multiple agreements. In turn, a Supplemental Project Agreement is tiered from the Master Stewardship Agreement and used to implement specific projects (including the obligation of federal funding and matching funds) under the overarching Master Stewardship Agreement, providing the Partner with increased certainty of terms for future Supplemental Project Agreements. *Id.*

The Master Stewardship Agreement-Supplemental Project Agreement structure also presents an opportunity for the Forest Service and the Partner to identify and document agreed-upon procedures for timely review and approval of project milestones by Forest Service staff. One concern commonly expressed by Partners and Forest Service leadership alike is that Forest Service staffing shortages, particularly among Forest Service Grants and Agreements ("G&A") personnel tasked with administering stewardship agreements, can hamper the Forest Service's ability to timely process the stewardship agreement documents and approvals[19] essential to the implementation of partnerships and the performance of the agency's mission.

To address this concern, the Partner and the Forest Service could use the Master Stewardship Agreement to clearly identify terms intended to streamline the development, execution, and implementation of future Supplemental Project Agreements. For example, such terms delineating the negotiation process and cooperation between the parties may include:

- Clear statements outlining the character and extent of anticipated involvement of both parties;

- Project performance measurements to evaluate achievement of specific milestones or mutual objectives;

- A resource list naming the responsible partner for all services, facilities, equipment, materials, supplies, and personnel, and if applicable, a schedule indicating when they will be provided;

- Agreed-upon deadlines for any required Forest Service reviews and approvals; and

- Provisions whereby Partners or volunteers may perform work that would otherwise be handled by Forest Service staff, subject to final review, approval, and oversight by the applicable Forest Service decision-makers.[20]

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[19] For example, the Master Stewardship Agreement template specifies that Supplemental Project Agreements must be reviewed and approved both by a delegated timber contracting officer when forest products will be disposed and by a Forest Service G&A specialist. Master Stewardship Agreement template, FS 1500-21 ¶ V.E(12)-(13) ("At a minimum, an SPA must: . . . 12. Be reviewed and approved by a delegated timber contracting officer when forest products will be disposed. 13. Be reviewed and approved by a Forest Service Grants & Agreements Specialist."), available at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497654.pdf.

[20] Forest Service policy directs that the agency may not transfer "official, inherently governmental, functions related to G&A specialists responsibilities, to contractors[,]" or "recipients/cooperators." Forest Service Manual ("FSM") § 1580.32 ("[s]imilarly, the Forest Service shall not transfer these responsibilities to recipients/cooperators under FSM 1580 instruments."). However, the Forest Service directives recognize that persons not affiliated with the agency may undertake work subject to review and approval by certified G&A specialists. FSH 1509.11, Ch. 10, § 11.11 ("Contractors, volunteers, or other agency staff are ineligible for Forest Service [Grants Management Specialist] certification and therefore have a limited role in any grants and agreements review. Any action taken by contractors, volunteers, or other agency staff must be reviewed and final signature applied by a certified specialist. Grants Management Specialist system roles will only be granted to certified individuals.").

Other possibilities for addressing Forest Service staffing shortages may also include mechanisms for funding Forest Service positions involved in administering stewardship agreements (e.g., G&A specialists) or mechanisms that permit employee sharing between the Forest Service and public agency partners, such as through the Intergovernmental Personnel Act ("IPA"),[21] which allows employees of state and local governments, Indian tribal governments, institutions of higher education, and other organizations to serve in federal agencies for a limited period of time.

B. Opportunities for Use of Stewardship Credits Outside the Footprint of the Supplemental Project Agreement Where they were Accrued

As described in Section II.A, one of the key innovations in the stewardship authority is that the statute permits the trade of goods (forest products) for services (stewardship project work). To account for this trade of goods for services, stewardship credits are earned and established when work items have been performed and accepted by the Forest Service at a rate identified in the applicable agreement or contract. Earned credits may then be used to pay for timber value.

Given the nature of the restoration work implemented via many stewardship agreements, excess credits can accrue under a particular Supplemental Project Agreement (i.e., where the value of stewardship work items exceed timber value). Therefore, the question arises whether stewardship credits may be used only in the footprint of the Supplemental Project Agreement where they were accrued.

While not directly applicable to stewardship credits, 16 U.S.C. section 6591c(g)(2)(B) provides that "[i]f the offset value of the forest products [removed pursuant to a stewardship project] exceeds the value of the resource improvement treatments," the Forest Service may, assuming there are no outstanding liabilities, "apply the excess to other authorized stewardship projects." 16 U.S.C. § 6591c(g)(2)(B). By analogy, a stewardship credit should be able to be applied to other authorized stewardship projects. There does not appear to be a basis for distinguishing between the Forest Service's ability to apply offset value between stewardship projects, and a Partner's ability to do the same with excess stewardship credit.

The Supplemental Project Agreement template, FS-1500-21A, does not expressly limit the use of credits to the Supplemental Project Agreement within which they were accrued; however, the Supplemental Project Agreement template anticipates that "funds will be exchanged in the performance of this Supplemental Project Agreement when the value of the timber will not cover the value of the services performed." FS-1500-21A, ¶ III.F.[22] In other words, the template anticipates that stewardship credits will not be accrued in excess of the timber value in the Supplemental Project Agreement, but the template does not go on to cap credit accrual to the timber value in the Supplemental Project Agreement.

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[21] 5 U.S.C. §§ 3371-3375; 5 C.F.R. Part 334.

[22] The Supplemental Project Agreement template, FS-1500-21A, is available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd497655.pdf.

Rather, with respect to stewardship credits, the template provides that stewardship credits are accrued only for work that has been completed and accepted by the Forest Service and that "[e]arned stewardship credits are exchanged for forest products received by [partner] at the value designated in the Supplemental Project Agreement Financial Plan, Appendix D. Earned stewardship credits may also be funded with federal funds which will be obligated and reimbursed through NRM." FS-1500-21A ¶ IV.I-J. Although the latter provision defines the value of earned credits by the Supplemental Project Agreement Financial Plan, it does not specifically require those credits be spent under the Supplemental Project Agreement. The template further defines "Stewardship Credits" to mean "[c]redits that are earned and established when work listed in the schedule of items has been performed and accepted." FS-1500-21A, Appx. A. This definition clarifies that credits are earned and established through completing work under a particular Supplemental Project Agreement, but it similarly does not limit the expenditure of credits to that Supplemental Project Agreement.

There also does not appear to be a clear limitation in Forest Service guidance on spending stewardship credits accrued under one Supplemental Project Agreement on timber removed pursuant to a second Supplemental Project Agreement. FSH 2409.19, section 65.1 explains that "[e]xcess stewardship credits occur when the cost of the stewardship work exceeds the value of the timber and must be paid for by adding timber to the contract or through cash payments to the Contractor." This section, however, does not explicitly address stewardship agreements, including any limitation on use of stewardship credits accrued under one Supplemental Project Agreement on timber removed pursuant to another Supplemental Project Agreement.

C. <u>Opportunities to Accelerate and Scale Forest Restoration Work Via Partner-Assisted NEPA</u>

All stewardship projects must comply with NEPA, which generally requires an approved NEPA decision before ground-disturbing activities can proceed. FSH 2409.19 § 61.1. Partners can play a pivotal role in enhancing the Forest Service's capacity by developing all or a portion of the NEPA analyses for particular stewardship projects. Moreover, Forest Service guidance recognizes that the tasks necessary to develop the NEPA analysis for a stewardship project are an allowable stewardship project work item. FSH 2409.19 § 61.2, Ex. 02 (listing examples of appropriate stewardship project work items, including: resource surveys such as biological or heritage surveys, environmental analysis, timber sale preparation activities, and boundary survey/maintenance). In particular, Partner prepared specialist reports present a valuable opportunity for adding capacity and enhancing the Forest Service's ability to accelerate and scale-up of forest restoration work.

Forest Service guidance recognizing the potential role of partners in preparing NEPA analyses for stewardship projects is consistent with recent updates to NEPA via the Fiscal Responsibility Act. These updates explicitly approve of the preparation of NEPA documents by project proponents under the supervision of federal agencies. H.R. 3746 Fiscal Responsibility Act of 2023, P.L. 118-5, 137 Stat. 42 §

321. Specifically, the legislation states that the lead agency is responsible for reviewing the third party prepared NEPA document and "taking responsibility for the contents." *Id.*

The Council on Environmental Quality ("CEQ") NEPA regulations applicable to all federal agencies are consistent with these statutory updates, allowing agencies to rely on documents prepared by partners and consultants, while ultimately placing responsibility for review and approval on agency decision-makers. *See* 40 C.F.R. § 1506.5(a) ("The agency is responsible for the accuracy, scope . . . , and content of environmental documents and shall ensure they are prepared with professional and scientific integrity . . . regardless of whether they are prepared by the agency or a contractor under the supervision and direction of the agency or by the applicant under procedures the agency adopts pursuant to section 107(f) of NEPA and § 1507.3(c)(12) of this subchapter."); *see also* 36 C.F.R. § 220.4(c) ("For each Forest Service proposal . . . the responsible official shall coordinate and integrate NEPA review and relevant environmental documents with agency decisionmaking"). Likewise, the CEQ NEPA regulations explicitly permit an agency to "authorize a contractor to prepare an environmental document under the supervision of the agency." 40 C.F.R. § 1506.5(c).

The following provides specific examples and limitations related to wildlife, botany, and silviculture reports.

1. Wildlife and Botany Specialist Reports

Partners have the opportunity to streamline the preparation of wildlife and botany specialist reports, subject to compliance with Forest Service directives. Forest Service policy defines the substantive requirements for biological evaluations, FSM 2672.42, and further provides that Regional Foresters are responsible for establishing "procedures for conducting wildlife and fish habitat examination and for preparing management prescriptions." FSM 2634.04a. As to the responsibility for conducting biological evaluations, Forest Service policy requires that both biological evaluations and habitat examinations must be conducted or reviewed by journey level professionals. FSM 2672.42 ("In order to meet professional standards, biological evaluations must be conducted or reviewed by journey or higher level biologists or botanists (FSM 2634)."); FSM 2634.03(3) ("Use journey level wildlife and fisheries biologists to conduct or approve habitat examinations."). However, Forest Service policy does not specify that the biologists conducting biological evaluations, surveys, or otherwise preparing specialist reports must be employed by the agency or directly supervised by biologists employed by the agency, thereby leaving the decision of how to ensure the accuracy, scope, and content of Partner-prepared specialist reports up to the relevant Forest Service decision-maker.

In addition, botany guidance specific to Forest Service Region 5 provides that Forest Botanists or Forest Sensitive Plant Coordinators have the responsibility to prepare biological evaluations for sensitive plant collection permits, develop conservation strategies for individual species based on the results of a conservation assessment, and provide professional botanical advice to line officers. FSH 2609.26 § 10.42a. Further, Forest Botanists or Forest Sensitive Plant Coordinators are responsible for designating sensitive plant surveyors, the qualifications for which are general and listed in the guidance. FSH 2609.26 § 10.42a; *see* FSH 2609.26 § 11 ("The Forest Botanist, or the Forest Sensitive Plant Coordinator shall select sensitive plant surveyors based on: a. Familiarity with the plants and plant communities in general and of the area. b. Knowledge of the sensitive plant species and their habitat requirements. c. Experience analyzing impacts on native plants and their plant communities."). These qualifications are not limited to agency employees and the Region 5 guidance does not preclude non-agency employees from preparing botany specialist reports.

2. Silviculture Reports

The FSH includes extensive guidance on qualifications for Forest Service silviculturists, but does not limit a contractor's ability to prepare silviculture reports or other relevant documents. However, Forest Service guidance does state that silvicultural prescriptions, which are required to implement any silvicultural treatment on NFS lands, must be "prepared or reviewed by a certified silviculturist." FSH 2409.17 § 80.3; FSM 2478.03 ("On [NFS] lands, all silvicultural activities that cut, burn, establish, or otherwise modify forest vegetation, must have a silvicultural diagnosis and prescription prepared or reviewed by a certified silviculturist prior to implementing the project or treatment.").

Additionally, the California State Board of Forestry entered a memorandum of understanding ("MOU") with the Forest Service that addresses the provision of professional forestry services by California Registered Professional Foresters ("RPFs") in managing federally owned forest lands in California. There, the MOU stipulates that "[a]ny person who is not a [Forest Service] employee, but is practicing forestry on [NFS] lands shall be either a RPF, or working under the direct supervision of a RPF, or working under the direct supervision of a federal employee who is 'qualified but exempt' pursuant to [the formal certification program outlined in the MOU]." MOU Between the California State Board of Forestry and USDA, Forest Service Region V, ¶ 7 (Sept. 27, 1992). The MOU also includes a list of specific projects or tasks subject to contracting on federal land that require the involvement of an RPF. *See id.* at ¶ 8.

V. <u>CONCLUSION</u>

Partnerships implemented via stewardship agreements with the Forest Service hold the potential to accelerate and scale forest restoration work on NFS lands. Applicable law and Forest Service guidance provide various mechanisms to improve and facilitate these partnerships in an effort to more effectively and efficiently meet forest health, forest restoration, and wildfire mitigation objectives.

For example, applicable law, regulation, and Forest Service guidance provide a path to long-term feedstock agreements between Partners and community-scale sawmills, consistent with certain limitations identified herein. Such relationships hold the potential to unlock community forest health, restoration, and wildlife mitigation objectives, providing both Partners and community-scale sawmills with long-term consistency and reliability, and providing the community with a host of benefits. .

Moreover, stewardship agreements can be tailored to best facilitate the relationship between the Forest Service and the Partner—through either a stand-alone agreement or a Master Stewardship Agreement with tiered Supplemental Project Agreements. Under the latter structure, the Partner can then also benefit by using stewardship credits outside the footprint of the Supplemental Project Agreement where they were accrued—maximizing the cost-benefit nature of the partnership.

Finally, the Forest Service can benefit from stewardship agreements by outsourcing certain NEPA analyses to the Partner—again allowing the Forest Service to accelerate and scale-up its restoration work.

APPENDIX E. Contracting Mechanisms for Forest Management Used by the USDA Forest Service

CONTRACT MECHANISMS FOR FOREST MANAEGMENT BY THE USDA FOREST SERVICE

Prepared by Clere Inc.

Contracting Mechanisms for Forest Management by the U.S. Forest Service Related to Forest Health

The U.S. Forest Service (USFS) utilizes a variety of contracting mechanisms to achieve comprehensive forest management and restoration goals. These include Integrated Resource Timber Contracts (IRTCs) and Integrated Resource Service Contracts (IRSCs) which blend timber harvesting with essential land management activities such as thinning, reforestation, and habitat restoration. Additionally, Stewardship Authority and Master Stewardship Agreements enable the USFS to collaborate with public and private partners, leveraging diverse resources and expertise for holistic ecosystem management. Other tools like the Good Neighbor Authority (GNA) and Blanket Purchase Agreements (BPA) streamline the procurement of services and supplies, ensuring efficient and effective stewardship of forestlands. Understanding the diverse contracting methods used by the USFS is crucial for effectively managing and restoring forest ecosystems.

Main Ecosystem-Focused Contracting Methods

Stewardship Authority

Stewardship authority allows the USFS and the Bureau of Land Management (BLM) to collaborate with partners on comprehensive land management. Authorized in 1999 and made permanent by the 2014 Agricultural Act (commonly referred to as the Farm Bill), it integrates activities like timber harvesting, habitat improvement, watershed restoration, and invasive species control. Stewardship authority allows for long-term contracts of up to 10 years using a goods-for-services model, where the value of timber helps fund management duties and assists in budget administration. In areas where the majority of federal lands fall within specific fire regime groups, the duration of these contracts and agreements can be extended up to 20 years, as per the 2018 omnibus budget bill. This approach ensures that essential activities receive the necessary funding for the project. It also promotes collaboration with various stakeholders, encouraging local community involvement and enabling flexible project design to foster innovative solutions.

The Stewardship authority provides essential tools used by the USFS and BLM for forest and land management which can be broadly categorized into two main types: stewardship contracts and stewardship agreements. Stewardship contracts include three primary forms. Integrated Resource Timber Contracts (IRTCs) are employed when the value of goods exceeds the value of services. Conversely, Integrated Resource Service Contracts (IRSCs) are utilized when the value of services surpasses the value of goods. The third type, Stewardship Service Contracts, does not involve a goods-for-services trade and is specifically used to spend retained receipts. Stewardship agreements, the second category of contracting, include three types. Master Stewardship Agreements (MSAs) are comprehensive, covering large areas with multiple potential projects. Supplemental Project Agreements (SPAs) are individual projects tiered to MSAs, allowing for specific implementation within the broader framework. Stand-Alone Stewardship Agreements are designed for small areas with single projects, used when a comprehensive MSA isn't necessary. This structure enables flexible forest management at various scales, from large landscapes to specific project sites.

Stewardship Contracts

Integrated Resource Timber Contract

IRTCs are a specific type of contract used by the USFS as part of stewardship contracting. These contracts are employed when the value of the timber to be harvested exceeds the cost of the services provided. IRTCs are similar to traditional timber contracts in that they focus on the commercial value of timber, but they also integrate land management activities. The primary purpose of IRTCs is to facilitate forest management activities that align with broader ecosystem goals. These contracts allow the USFS to use the revenue generated from timber sales to fund necessary stewardship tasks, such as reforestation, thinning, prescribed burns, and road maintenance. This goods-for-services model helps alleviate budget constraints and ensures that critical land management activities are completed. Appraisal methods are used by the USFS to determine the product value In IRSCs and also IRTCS. The appraisal system takes into consideration multiple different variables to calculate the value of both the sawtimber and the biomass component of the contract. These variables include haul distance, road maintenance, the types of machinery needed to perform the task, and other variables that lead to the removal of products inside a contract. IRTCs are typically used in situations where there is significant commercial timber value, making them an effective tool for achieving both economic and ecological objectives. They are part of the USFS's broader strategy to manage forests sustainably while addressing local and rural community needs. The contracts are awarded through a competitive bidding process, ensuring that the best value is achieved for both the forest service and the contractors involved.

Integrated Resource Service Contract

IRSCs are a specialized type of stewardship contract employed by the USFS when the estimated value of services to be performed exceeds the estimated value of timber to be sold. These contracts are designed to combine service work with timber removal in a single agreement, allowing the agency to achieve multiple land management objectives simultaneously. IRSCs operate under a dual governance structure, implemented under the broader Stewardship authority granted, while primarily regulated by the Federal Acquisition Regulation (FAR). This unique framework allows IRSCs to benefit from the flexibility provided by stewardship contracting authorities while also functioning as procurement contracts subject to FAR regulations, including requirements for small business set-asides.

The structure of IRSCs is designed to meet specific land management objectives through performance-based service contracts. They typically involve a competitive bidding process and can be awarded to a variety of entities, including private contractors, non-profit organizations, tribal governments, and state or local agencies. The scope of work in IRSCs primarily focuses on services such as thinning, tree planting, road decommissioning, and habitat restoration, with timber removal playing a secondary role. Financially, IRSCs are characterized by the cost of services exceeding the value of timber removed. Any difference in value is balanced with an appropriate cash payment. This structure requires contracting officers who are familiar with both procurement requirements and certified to obligate government funds for service acquisition, which can present challenges in staff training and administration.

The USFS has been increasingly favoring IRSCs, especially for complex, long-term projects focused on forest restoration and wildfire mitigation. This trend aligns with current forest management priorities, where the cost of services often exceeds the value of timber. IRSCs offer more flexibility for service-oriented projects compared to timber-focused contracts, making them a valuable tool in the USFS's forest management strategy.

G to Z Stewardship IRSCs

G to Z stewardship IRSCs exhibit several unique characteristics that set them apart from other IRSCs. These contracts are known for their comprehensive scope, covering a wide range of activities "from A to Z" (or in this case, G to Z), including planning, layout, implementation, and completion of forest restoration work. This end-to-end responsibility gives contractors more comprehensive control over the project, from NEPA handoff through final completion.

G to Z projects typically operate on a larger scale compared to standard IRSCs, often covering extensive areas across multiple ranger districts or sections of national forests. For example, the Spirit G-Z Stewardship IRSC incorporates all three Ranger Districts across the Plumas National Forest. These projects also tend to have longer performance periods, often extending to 8-10 years, allowing for more substantial and sustained forest management efforts. Flexibility in implementation is another key feature of G to Z stewardship IRSCs. Contractors are often required to identify work activities needed across all project acres and present a detailed Implementation Plan before commencing layout. This approach allows for adaptability in addressing specific forest management needs over the course of the project. While the combination of timber removal and service work is typical of stewardship contracts, G to Z projects emphasize a balance between commercial timber removal and service work for forest restoration. This balance helps achieve both economic and ecological objectives. Additionally, these contracts are often solicited under full and open competition, rather than being set aside for small businesses, potentially attracting a wider range of qualified contractors.

Indefinite Delivery/Indefinite Quantity (IDIQ)

IDIQ contracts are a flexible contracting mechanism used by the USFS to procure an indefinite quantity of supplies or services over a specified period. These contracts are particularly useful when the exact quantity of goods or services needed is not known at the time the contract is awarded. IDIQ contracts specify a minimum and maximum quantity of goods or services that can be ordered, allowing the USFS to issue task or delivery orders as needs arise during the contract period. IDIQ contracts are commonly used by the USFS for service contracts, including architect-engineering services, mechanical thinning, fuels reduction, and other forest management activities. These contracts expedite the contracting process by allowing the USFS to place orders against a basic contract for individual requirements, thereby speeding up service delivery. The flexibility of IDIQ contracts enables the USFS to issue task orders as needs arise, which can include biomass removal as part of broader forest management and restoration efforts. This adaptability allows the USFS to efficiently manage projects and respond to changing environmental and operational needs.

IDIQ contracts can be used in conjunction with IRSCs to provide greater flexibility in forest management projects. When implementing an IRSC, agencies can choose between a firm, fixed-price contract or an IDIQ contract structure. The IDIQ option allows for more adaptability in ordering services and adjusting to changing conditions. With IDIQ-structured IRSCs, contractors can provide new price offers with each task order, enabling them to respond to fluctuations in commodity market prices for wood products and energy. This flexibility is particularly useful when agencies need to quickly award new work due to sudden funding availability, such as unspent funds at fiscal year-end or new appropriations. IDIQ contracts used with IRSCs don't require cancellation-ceiling obligations, reducing costs for government agencies. However, this also means less security for contractors in terms of guaranteed work and biomass supply. Multiple-award IDIQ contracts can be used with IRSCs, allowing agencies to distribute work among several contractors based on a single solicitation.

Stewardship Credits

Stewardship credits are a type of credit earned through stewardship contracts (IRTCs and IRSCs). Agencies like the BLM facilitate the earning of these credits by contractors as they perform service work. These credits can then be applied to offset the value of forest products removed from the land, effectively acting as payment for the services provided. Specifically tied to stewardship contracts, these credits are not applicable to regular forest product sales that are not a part of a stewardship contract. They are intended to enable the exchange of goods for services, allowing for the extraction of timber or other vegetative products without cash transactions, thereby supporting conservation and land management objectives. Stewardship credits offer flexibility in forest management, as there is no legal mandate restricting their use to the SPA where they were accrued. This flexibility allows for strategic application of credits across multiple projects, potentially enhancing the scope and impact of forest management initiatives. To maximize benefits, comprehensive planning is important for efficient allocation of stewardship credits across priority areas and projects.

Master Stewardship Agreements and Supplemental Project Agreements

Master Stewardship Agreements (MSAs) are collaborative frameworks between federal agencies like the USFS and partners such as state agencies, non-profits, and private entities to manage and restore forestlands sustainably. These agreements aim to enhance forest health through various stewardship activities. The MSA Agreement does not commit any of the signatories to a specific project or action. Instead, associated with MSAs are Supplemental Project Agreements (SPAs), detail the terms, conditions, and responsibilities for specific projects, ensuring that the broader goals of the MSA are effectively implemented.

MSAs promote collaboration by leveraging the resources, expertise, and local knowledge of federal agencies and their partners. This joint approach improves the effectiveness of forest management and restoration efforts. The agreements offer flexibility, allowing for a wide range of activities such as thinning, controlled burns, invasive species removal, and habitat restoration. SPAs provide project-specific details, including objectives, timelines, funding, and responsibilities, ensuring clear alignment and accountability among all parties involved. Having an MSA in place streamlines the process of initiating individual projects through SPAs compared to using Stand-alone Stewardship Agreements (SAs) for each project. An MSA sets the overall framework, terms, and conditions for a series of projects across a large area, typically at the regional level. This allows for multiple projects to be planned and executed under the same agreement reducing administrative burdens and expediting the implementation of forest management activities. These agreements also facilitate resource sharing, including funding, personnel, and equipment, which maximizes efficiency and impact.

Additionally, MSA SPAs include provisions for monitoring and evaluating project progress and outcomes, ensuring that objectives are met and informing future forest management planning. They outline the objectives, scope, methods, and expected outcomes of individual projects, ensuring alignment with the broader goals of the MSA. MSA SPAs specify financial contributions and resource allocations from each party, detailing funding sources, personnel, equipment, and materials. They also include specific timelines with start and end dates, milestones, and deadlines to keep projects on track. Roles and responsibilities are clearly defined in MSA SPAs, detailing what each partner is accountable for, which promotes clear communication and accountability. Legal compliance is a key component, with SPAs ensuring adherence to relevant laws and regulations while including provisions for liability and risk management. The ability to modify a SPA to add funding or additional tasks though mutual consent of the involved parties helps it adapt to changing project needs and priorities without the need to establish new agreement. They allow for well-planned, adequately funded, and effectively managed projects that contribute to the successful stewardship of forest resources.

For instance, if a National Forest and a local conservation organization have an MSA to enhance forest resilience, an SPA might detail a specific forest thinning project, including the area to be thinned, methods used, timeline, funding, and roles of each party. This structured approach ensures effective project execution and contributes to overall forest health.

Stand-Alone Stewardship Agreement

SAs are a specific type of stewardship agreement utilized by the USFS for forest management and restoration activities. These agreements are designed to cover individual projects in small areas, making them ideal for small-scale or highly specialized initiatives. Unlike larger-scale agreements, Stand-Alone Stewardship Agreements focus on the scope of a single project, providing a targeted approach to land management. The primary purpose of Stand-Alone Stewardship Agreements is to facilitate the exchange of goods for services, funds for services, or a combination of both to complete restoration activities on National Forest System lands. This flexibility allows the USFS to address a wide range of land management goals, including road and trail maintenance, soil productivity improvement, wildlife habitat enhancement, prescribed burns, vegetation removal, watershed restoration, and control of noxious weeds. To enter into a Stand-Alone Stewardship Agreement, there must be mutual interest and mutual benefit between the USFS and the partner organization. While the stewardship authority itself does not mandate partner cost sharing, USFS policy requires a minimum 20% contribution of the total project value from partners. This requirement ensures a collaborative approach to forest management and encourages active participation from partner organizations.

Good Neighbor Authority

The Good Neighbor Authority (GNA) enables the USFS and BLM to collaborate with state agencies, tribes, and local governments on forest, rangeland, and watershed restoration. Expanded by the 2014 Farm Bill and the 2018 Agriculture Improvement Act, GNA includes timber management, invasive species control, road maintenance, and soil stabilization. GNA stands out due to its flexible contracting, allowing state agencies to use their own procedures and personnel, which speeds up projects and reduces costs. However, while states can retain timber sale revenue for restoration, tribes and local governments cannot, limiting their project participation. Efforts to address these disparities include proposed legislation to extend revenue retention to tribes and local governments. GNA projects, while flexible, must comply with federal environmental standards like National Environmental Policy Act (NEPA) and Endangered Species Act (ESA). They rely on cooperative agreements emphasizing collaboration and cost-sharing, contrasting with the more rigid, federally controlled MSAs and traditional contracts. GNA also simplifies environmental review processes to expedite project implementation. Overall, GNA supports broad landscape restoration, enhancing cooperation and efficiency in managing public lands.

Blanket Purchase Agreements (BPAs) and Timber Transit Blanket Ordering Agreements (BOAs)

BPAs in forest stewardship are prearranged agreements between federal agencies, like the USFS, and vendors for the procurement of recurring services and supplies needed for forest management. These agreements set terms and conditions in advance, reducing administrative costs and saving time for both parties. BPAs cover activities such as tree thinning, brush removal, invasive species control, habitat restoration, controlled burns, and firebreak creation. They also facilitate reforestation efforts by managing the acquisition of seeds and seedlings, and support ongoing forest health monitoring through wildlife surveys, water quality testing, and vegetation monitoring. This approach ensures that high-priority forest management tasks are addressed promptly and effectively, promoting consistent quality and responsiveness.

Similarly, BOAs refine the procurement process for timber and wood products. These pre-negotiated contracts set terms, conditions, and pricing in advance, allowing for repeated purchases over a specified period without renegotiation. This simplifies and expedites the acquisition process, making it useful for governmental or large commercial entities. These agreements outline the types of timber products covered, pricing structures, delivery terms, and quality standards, often without specifying exact quantities initially, allowing buyers to place orders as needed.

BPAs and Timber Transit BOAs reduce administrative costs and procurement time, ensuring a steady and reliable supply chain. They provide cost savings through bulk purchasing and long-term commitments, resulting in better pricing and terms for the buyer. For governmental entities, these agreements ensure compliance with procurement regulations and enhance audit and reporting processes. Additionally, BPAs and BOAs foster stronger relationships between buyers and suppliers, promoting better communication and collaboration, making them a strategic tool for managing procurement efficiently and cost-effectively.

Additional Contracting Pathways

The contracting pathways listed below are ancillary options for timber sales or community engagement in forestry issues provided by the USFS. They are included to give a broader understanding of the contracting landscape.

Participating Agreements

Participating agreements are distinct partnership instruments used by the USFS, separate from stewardship contracts and agreements. They are designed for collaborative work with partners that yields non-monetary mutual benefits, governed by specific authorities like the Cooperative Funds and Deposits Act of 1975 and the Wyden Amendment. The primary purpose of Participating Agreements is to facilitate cooperation between the USFS and its partners in achieving shared goals. Both parties contribute resources, which can include funding, personnel, or equipment, to accomplish the agreed-upon tasks. These agreements are governed by federal laws and regulations, and they are designed to align with the partners' shared vision and goals, helping to bridge organizational differences and ensure successful collaboration.

Participating Agreements are particularly useful for projects that require a joint effort and where both parties stand to gain from the outcomes. For example, they might be used in environmental education initiatives or in projects aimed at enhancing forest history materials. The flexibility of these agreements allows for modifications, making them adaptable to changing project needs and ensuring that both the USFS and its partners can effectively manage and execute their collaborative efforts.

Timber Sale Contracts

Timber sale contracts are agreements between the USFS and purchasers for timber from National Forest System lands. The process starts with the USFS designating timber for harvest and advertising it with an appraised starting price; bids are submitted, and the highest qualified bidder is awarded the contract. These contracts detail the timber to be harvested, price, payment terms, harvest timeline (3 to 10 years), harvesting methods, road construction, maintenance, and environmental protections. Revenue from sales may be allocated to various USFS funds, supporting forest management. Governed by regulations like the National Forest Management Act, these contracts are vital for effective resource management and require careful negotiation and execution. The primary difference between an IRTC and a Timber Sale Contract lies in their objectives and financial structure. An IRTC offsets service costs with timber value, hiring contractors for management tasks. In contrast, a Timber Sale Contract focuses on selling timber from National Forest lands through a bidding process, where the highest bidder purchases timber rights, with revenue supporting USFS funds. While both involve timber removal, IRTCs integrate service work, whereas Timber Sale Contracts focus on commercial timber sales.

Administrative Use of Timber (AUT)

The USFS may opt to dispose of timber through administrative use permits instead of traditional sales, often to support restoration activities. Policy allows for the disposal of trees or forest products on NFS lands for administrative purposes, either by sale or without charge, as deemed most beneficial to the US. This timber can be used for constructing or maintaining USFS infrastructure, such as roads and buildings, as fuel in federal facilities, for research projects, disaster relief, and to enhance multiple-use values. A single administrative use contract can cover up to one million board feet, and if the timber's appraised value is below the "minimum rates" for sales, it can be sold at its appraised value, with a minimum price of $50 per thousand board feet. Agency personnel are responsible for defining cutting areas and marking trees for removal. If the timber has no market value or offers a "compensating benefit" to the government, it may be provided without charge under "administrative free use." District rangers can grant free use permits for timber valued up to $200 per fiscal year, while forest supervisors can approve permits for materials not exceeding $5,000 annually.

Forest biomass residuals from contracts like MSAs, SPAs, or IRTCs are typically classified as renewable resources under federal law, rather than waste[1]. The Renewable Fuel Standard (RFS) recognizes certain forestry residues and wood waste as renewable biomass, provided they meet specific criteria such as being byproducts of preventive treatments or unsuitable for higher-value products. This classification applies particularly when these materials are used for bioenergy production. Federal policies have

[1] https://forestsandrangelands.gov/documents/woody-biomass/biomass_deskguide.pdf

shifted to acknowledge the potential of these residuals in energy and biofuel production, moving away from the traditional view of them as waste and towards recognizing their value as renewable resources.

Contract modifications

The USFS utilizes several contracting mechanisms that can be modified to add funding or additional tasks, similar to SPAs. One such mechanism is service contracts, which cover activities like tree planting, thinning, and trail maintenance. These contracts, governed by FARs, can be adjusted in terms of scope, funding, or tasks through processes such as requests for proposals (RFPs) or requests for quotations (RFQs). Another flexible option is IDIQ contracts. These contracts allow for the adjustment of quantities of supplies or services as needed, making them suitable for projects with variable requirements. IRSCs and IRTCs are also modifiable. These contracts combine timber sales with service work, enabling adjustments to address evolving project needs and facilitating comprehensive land management. Participating Agreements are another mechanism that can be modified to include additional tasks or funding. These agreements involve collabo..ration between the USFS and external partners, and modifications require mutual consent. Such agreements are often used for projects that provide mutual benefits to both the USFS and its partners. These flexible contracting mechanisms help the USFS adapt to changing project needs efficiently, without the need to establish new contracts or agreements.

Appraisal Methods and Fair Market Value Determination

The USFS contracting barriers related to determining the product value can be addressed using partnerships like MSAs and Good Neighbor Authority, as these involve a formal process to set rates for sawtimber and biomass that does not reflect the nature of the activities that are not-for-profit. Implementing entities in these agreements could use their own procurement policies to ensure fair market value, rather than competing for profit like traditional contractors. The USFS uses the Transaction Evidence Appraisal (TEA) method, which adjusts base market prices for timber and biomass based on site conditions, road maintenance, haul costs, and contractor expenses. Implementing entities can use different appraisal methods approved by the Washington Office Director of Forest Management. They establish fair market value through open competitive bidding, considering local market factors and disclosing the process to the USFS for review. This ensures prices that support long-term profitability. The value of stewardship projects combines product value and service work. For example, a project with $500,000 in product value and $400,000 in service work expenses totals a net revenue of $100,000. Early appraisals at fair market value help determine contract types, restoration activities, project economics for NEPA compliance, and funding needs, which may come from retained receipts, appropriated funds, or cooperator contributions. A final appraisal occurs during contract preparation to finalize work items. For IRTCs, forest products are appraised like regular timber sales, but stumpage value is not reduced for service items. Specified road costs and deposits are part of the TEA. For IRSCs, products are appraised similarly, but without specified road costs, and deposits are limited. Road-related work is treated as service items. In stewardship agreements, forest products are appraised like regular timber sales without specified road costs, and deposit collections are limited. Stumpage value is not reduced for service items, and road work is considered a service item. Roll-back factors are not used, and alternative appraisal methods may be approved by the Washington Office Director of Forest Management. Service work costs are determined by the local Procurement Contracting Officer based on the proposed work type.

Service work costs are estimated by the local Procurement Contracting Officer based on the proposed work type. Timber and forest product values are appraised using methods from the Timber Sale Preparation Handbook and Regional guidelines. For salvage sales, the volume of trees removed is estimated at the contract midpoint. Minimum rates for forest products are waived for stewardship projects, and rollback factors are not applied. Contracts over five years include provisions for rate redetermination. Base rates cover essential reforestation if it cannot be completed by the contractor within the contract term. These costs are included in appraisals to ensure adequate rate redetermination and fund collection. The value of products under stewardship authorities must be determined using approved appraisal methods and offered at fair market value. The TEA method adjusts base prices for sale conditions, values, and costs. Adjustments account for reduced business costs when service items are included.

USFS Contracting Comparison

TYPE	OVERSIGHT	SELECTION PROCESS	SCOPE OF WORK	TIMELINE	FUNDING	LAND AREA	LIKELY AWARDEE
INTERGRATED RESOURCE TIMBER CONTRACT (IRTC)	STEWARDSHIP AUTHORITY	VALUE OF TIMBER SOLD EXCEEDS THE VALUE OF SERVICE	TIMBER HAVESTING WITH LAND IMPROVEMENT	UP TO 10 YEARS WITH POSSIBILITY FOR EXTENSION	TIMBER VALUE OFFSETS SERVICE COSTS	PROJECT SPECIFIC	TIMBER COMPANIES, HIGHEST QUALIFED BIDDDER
INTERGRATED RESOURCE SERVICE CONTRACT (IRSC)	STEWARDSHIP AUTHORITY WITH THE FEDERAL ACQUISITION REGULATION	VALUE OF SERVICE EXCEEDS THE VALUE OF TIMBER	LAND RESTORATION WITH TIMBER REMOVAL	UP TO 10 YEARS	APPROPRIATED FUNDS AND TIMBER REVENUE		FOREST MANAGEMENT ENTITIES AND SMALL BUISNESSES
G TO Z IRSC		INCREASE PACE AND SCALE OF RESTORATIO N				LARGE LAND AREAS WITH MULTIPLE ACTIVITES	EXPERIENCED FOREST MANAGEMENT CONTRACTOR OR LARGE ORGANIZATIONS
STEWARDSHIP SERVICE CONTRACT	STEWARDSHIP AUTHORITY	BEST VALUE BIDDING			APPROPRIATED FUNDS FROM FEDERAL GOVERNMENT	PROJECT SPECIFIC	LARGE ORGANIZATIONS ENVIRONMENTAL NON-PROFITS
MASTER STEWARDSHIP AGREEMENT WITH SPA	STEWARDSHIP AUTHORITY	BEST-APPROACH EVALUATION	HOLISTIC MANAGEMENT BOTH FOREST PRODUCT REMOVAL AND SERVICE WORK	UP TO 20 YEARS	PARTNER CONTRIBUTIONS AND TIMBER VALUE	LARGE LAND AREAS WITH MULTIPLE ACTIVITES	ENVIRONMENTAL NON-PROFIT
BLANKET PURCHASE AGREEMENTS	FEDERAL ACQUISITION REGULARION	PRE-APPROVED SUPPLIERS BASED ON NEEDS	REPETITIVE LOW DOLLAR VALUE PURCHASES	1-5 YEARS WITH OPTION TO EXTEND	ACCORDING TO SPECIFIC NEEDS	APPLICABLE TO PURCHASES RATHER THEN SPECIFIC ACTIVITIES	SPECIFIC TASK FORCE
GOOD NEIGHBOR AUTHORITY	USFS AND BLM (AGRICULTURAL ACT OF 2014)	INVOVLES SPECIFIC LOCAL ENTITTIES OR TRIBES	RESTORATION FUNDED THROUGH COMMERCIAL REVENUES	UP TO 10 YEARS	APPROPRIATED FUNDS AND PARTNER RESOURCES	COLLABORATIVE MANAGEMENT ON USFS LAND	PUBLIC ENTITY OR TRIBES

APPENDIX F. Sort Yard Snapshot

Sort Yard Snapshot

By,

Todd Sloat, Forest Creek Restoration
Kevin Zeman, Stewardship West, and
Sarah Oldson, Cascade Resource Consultants, LLC

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Development of biomass sort yard(s) are a long-term recommended strategy to increase pace and scale of forest health and fuels reduction projects. This Memorandum discusses a range of options for their ownership structure, operation strategy, range of services and revenue, and location of them.

The most efficient model for moving biomass from the project to an end use facility is direct transport. This is the most common method used for nearly all of the biomass in the NE CA pilot region. However, because utilization of biomass has such low value and often requires some form of subsidy, project sites that have a long distance transport either do not get implemented, is left in the woods, or is piled and burned. Therefore, location of new facilities is a central factor to consider. New sites could be temporary or long-term depending upon anticipated need for the geographic area. Multiple sites in NE California are currently permitted to compile feedstock, and some of these sites have end use facilities either operating on them or planned for future operations. Permitting new sites can be a difficult hurdle, particularly if the timing of the compliance process is long (e.g., greater than one year).

Sort yards, whether temporary or long term can provide a range of services. First, and most importantly, they provide a “home” for material that must be or needs to be transferred from the forest or fuels reduction site. The relocation of this biomass reclassifies it as a liability (i.e., its source site) to an asset (i.e., it’s end-use location). The relocation of the biomass form is primarily transported using “chip vans,” loaded from in-woods chipping/grinding. However, if sort yards become established at sites that are not adjacent to end use facilities, a more likely process would be to transport the biomass in log or slash form. Transportation of biomass in log form is commonly done in the region, but transportation of slash is not because of the greater cost in doing so. Transporting biomass in slash form would require new investments in transportation equipment. Many other regions transport material in this form utilizing a modified dump truck or log truck with specialized racks built to hold slash material. Finally, sort yards not attached to end use facilities could certainly store biomass in chip form, but this would require either a tip truck system at the site, which is costly, or to use self unloading vans, which are also more costly compared to traditional vans. Sort yards will also have to monitor any chips stored at the yard to ensure the material moisture levels are met to reduce flammability.

Biomass in non-chip form in sort yards will likely require additional processing before it is sent to an end use facility. A diversity of biomass (e.g., small trees) offers the potential to create a variety of products, including low quality and high quality "chips,", posts and poles, and mulch. Heartwood Biomass runs a sort yard business in Oregon that produces these products, and is currently constructing a similar business in central California. A similar business model could be developed with one or multiple sort-yard sites, and that model could consist of multiple ownership and operation structures. These could include but are not limited to privately owned property leased to a JPA/Partner/Tribe entity or JPA/Partner/Tribe owned property leased to a private entity, privately owned and operated venture with a contract with JPA or Partner for feedstock procurement. Examples of such arrangements, with additional pro's and cons for them are provided below as discussion points.

Example 1: Privately Owned Sort Yard Enters Agreement with JPA/Partner/Tribe ("Partner")
Existing facilities and emerging privately owned sort yard facilities enter into an agreement with a Partner to secure more or consistent feedstock. In this example, the existing sort yard facility has already gone through the environmental permit process that allows the storage and processing of biomass. These processes are costly and take considerable time (more than one year depending on multiple factors) and money (>$250,000). The existing facility also has staff (typically three or more) and equipment (i.e., weight scales, log loader, wheel loader, and tip-dump) to receive and rearrange biomass. The existing facility has, therefore, already invested considerable funds. For example, capital costs for this equipment varies but would likely be between $1,200,000-$2,000,000, assuming the equipment complies with the latest air quality emission standards. The Partner in this example is an Implementing Entity, or has an agreement with one, and therefore has ready access to biomass and negotiates a purchase agreement for the biomass with the existing facility. This relieves the existing facility from the burden of procuring biomass from multiple forest contractors and/or landowners and the transaction is a fee for service. The Partner is responsible for providing an agreed upon amount of biomass to the facility. There are a small number of private facilities in the region that could fit this example (i.e., Tubit Wood Yard, Latona Biomass Complex).

Example 2: JPA/Partner/Tribe ("Partner") Owns Sort Yard and Leases to Private Entity

The Partner owns a site which it leases to a private entity and the Partner serves as an Implementing Entity. This example assumes the Partner has either purchased a site that is already permitted for storing and processing material, or has purchased a site and gone through the permit process. The permit process likely has resulted in securing a Use Permit from an Initial Study, Mitigated Negative Declaration. The private entity provides all equipment and staff to process biomass material, and pays the Partner a lease payment for site usage. In this example, the Partner and private entity have both invested considerable resources to enter into the agreement.

Various options are available for biomass volume to be secured by the Partner or private entity. This is also the case for Example 1 above. However, the partnership between the Partner and private entity allows for security of biomass via the Partners unique ability to manage biomass workflow through their various relationships with the U.S. Forest Service and their work in Wildland-Urban-Interface (WUI's) areas. Therefore, having the Partner tasked with supplying at least some volume would be beneficial to the agreement. This example is currently being utilized in Colorado between Stewardship West and a private entity. Stewardship West is a non-profit organization and an Implementing Entity and structures biomass contracts they award for work on federal land as cut, skid, deck and deliver to their sort yard. The private entity is then responsible for processing it and securing a purchase agreement with an end use facility.

Example 3: JPA/Partner/Tribe ("Partner") Owns and Operates Sort Yard

The Partner wholly owns and operates the sort yard and is responsible for conducting the biomass processing operations as well as developing agreements with end use facilities. In this example, the Partner "owns" the biomass and can utilize their procurement policy to offer a variety of benefits that are not typically done. For example, the Partner could enter into a long-term feedstock agreement with an end use facility or could offer a long-term biomass contract to an existing or emerging LTO. The overall goal of this model assumes that a greater amount of forest health work has been developed by the Partner through multiple pathways (e.g., Stewardship Agreements with the U.S. Forest Service, high volume of WUI fuels reduction projects). Another element of this model is the Partner is a non-profit or not-for-profit entity and therefore is focused on treating acres quickly and ensuring enough funding remains to maintain operations of the sort yard and biomass brokering. Private businesses working with the Partner can "gift" income or services to them to help secure long-term viability.

APPENDIX G. Improving Forestry Assistance Programs for Non-Industrial Landowners in California

Improving Forestry Assistance Programs for Non-industrial Landowners in California

By Evan Watson, California Registered Professional Forester #3150
Sierra Cascade Land Stewards, Inc.

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Increasing the pace and scale of forest restoration is a critical step in addressing California's forest health and wildfire crisis. Assisting small, non-industrial landowners with improving forest health on their own land is a crucial, yet challenging and expensive component of achieving pace and scale. This reality is recognized by both state and federal agencies through their respective California Forest Improvement Program (CFIP) and the Environmental Quality Incentives Program (EQIP). Both programs provide technical and financial assistance to non-industrial timberland owners.

These cost share programs are less effective and efficient than they could be, primarily because they prohibit commercialization of forest products —even low or negative value products such as wood chips and biomass — from funded projects. This limits the management tools available to adequately achieve forest health goals, and decreases operational efficiencies by creating the need for multiple entries and permits to reach target stocking levels and forest health goals. There is not enough time, foresters, equipment or operators to nip around the edges of the forest health and wildfire crisis with legacy programs structured for operational inefficiency.

The current limitations of CFIP and EQIP create scenarios in which less effective forest health outcomes are achieved at a higher cost. This is a bureaucratic shortcoming that landowners and taxpayers cannot afford. The existing programs either need to change to allow the commercialization of products, specifically chips from biomass size trees, or a new program needs to be created. Either option must recognize several fundamental aspects of small-landowner forestry assistance:

- Removal of low value biomass (trees less than 10" diameter) to reduce fire risk has a public benefit but will require funding.
- Achieving the appropriate stocking levels for improved forest health and fire resilience goals will often require removing some sawlog size trees in addition to biomass trees.
- Technical and financial assistance to non-industrial forest landowners is important, yet must be streamlined and efficient as possible. Non-industrial timber landowners typically do not have the knowledge or resources, and they lack the economies of scale enjoyed by larger landowners who are able to spread fixed costs over more acres; this results in higher per-acre costs for small properties. These factors make it challenging for small landowners to clear the regulatory hurdles required to effectively manage their forests; technical and financial assistance is therefore important.
- Outcomes to forest health are more important the processes: programs that allow removal and commercialization of biomass and sawlogs may increase the incentive for landowners to enroll, resulting in better outcomes across the landscape.

One potential solution would be to create a program that provides a per acre subsidy in the range of $500-$1000/acre, for example, to small landowners for the removal of biomass in conjunction with a standard CAL FIRE permit for timber harvesting to allow the commercialization of forest products. This is approximately half the cost of current CFIP and EQIP rates. An additional benefit of a program structured in this manner is that it would streamline planning and permitting by using existing CAL FIRE documents.

A hypothetical example is provided below:

A landowner owns 40 acres of uneven-aged mixed conifer forest. Current stocking is 220 trees per acre and 180 square feet of basal area with an average tree diameter of 14”. The landowners target stocking for high quality timber production and fire resilience is 80 trees per acre, 120 square feet of basal area with an average tree diameter of 18”. Currently, both EQIP and CFIP will pay landowners over $2000/acre to reduce stocking. Due to the prohibition of commercialization, the most feasible treatment for this landowner is mastication, which will leave significant residual fuel on site and is unlikely to achieve target stocking as mastication is unable to deal with sawlog size material. This is a suboptimal outcome from both an economic and ecological standpoint. Target stocking levels are often unachievable without removal of some sawlog size trees

If commercialization is allowed, the same landowner could achieve targeted stocking and forest health goals at a lower cost. Operational efficiencies (and subsequently economic efficiencies) would be gained by removing biomass at the same time as sawlogs, resulting in fewer pieces of equipment to touch each acre. The revenue generated by the biomass would help subsidize its own removal, lowering per acre costs. Ecological outcomes would also be improved by removing fuel from the property rather than rearranging it, such as through mastication. Additionally, this scenario allows for and encourages the profitable removal of trees too large to be masticated, which helps offset treatment costs. By combing operations, landowners are more incentivized to sign up for this type of program as they would stand to benefit financially through sawlog sales.

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For reference, the following are general program rates for timber stand improvement activities through EQIP and CFIP:

<u>EQIP:</u>
666 (thinning): $1,300 - $1,700/ac
660 (pruning): $200/ac
384 (slash treatment): $200 - $375/ac
314 (herbicide): $50 - $200/ac

<u>CFIP:</u>
Pre-commercial Thinning:
- Light: $645
- Moderate: $970
- Heavy: $1,290

Release:
- Mechanical – Light: $645
- Mechanical – Moderate: $970
- Mechanical – Heavy: $1,290

- Herbicide or Other – Light: $405
- Herbicide or Other – Moderate: $620
- Herbicide or Other – Heavy: $835

Pruning:

- Light: $270
- Moderate: $405
- Heavy: $540

Follow-up:

- Follow-Up Herbicide – Light: $405
- Follow-Up Herbicide – Moderate: $620
- Follow-Up Herbicide – Heavy: $835
- Follow-Up Mechanical or Handwork – Light: $645
- Follow-Up Mechanical or Handwork – Moderate: $970
- Follow-Up Mechanical or Handwork – Heavy: $1,290