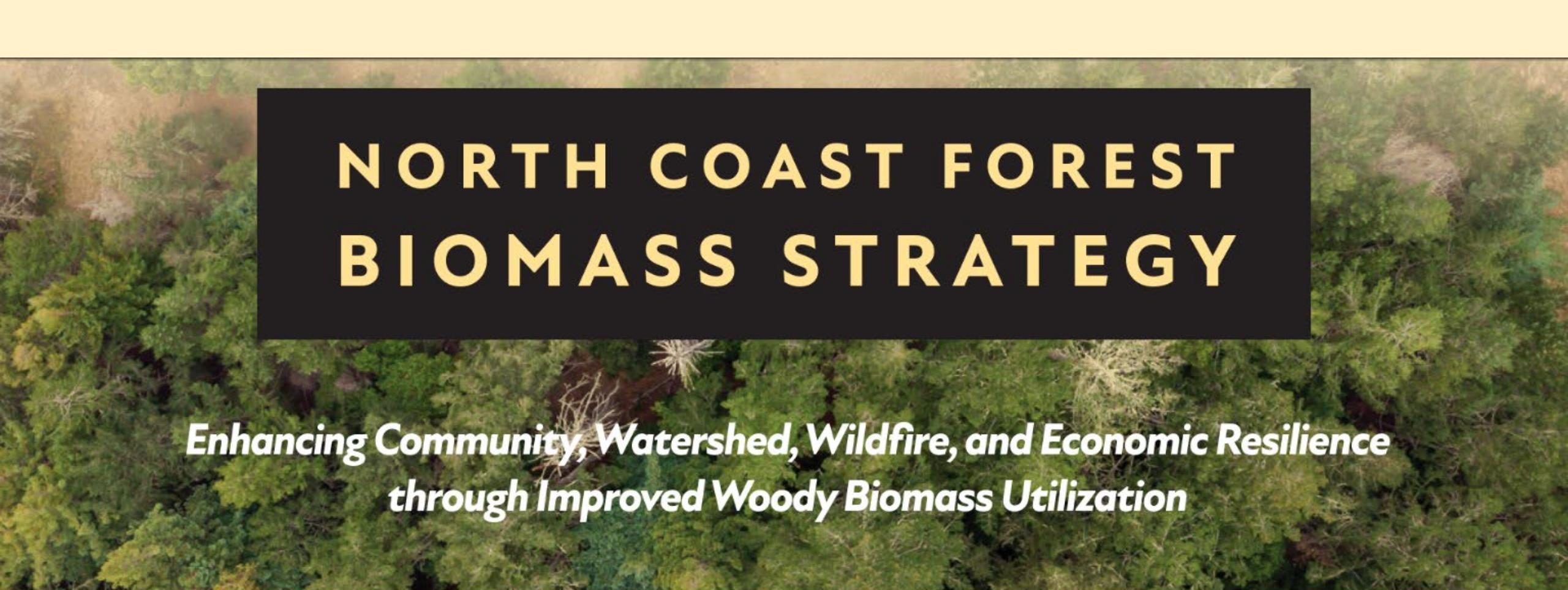


Agenda

- North Coast OPR pilots review and results (50m)
 - Overview
 - Dinsmore Woody Feedstock Aggregation Pilot
 - Forest Reciprocity Group Pole Aggregation Depot
 - Sonoma County Wood Recovery and Utilization Project
- Digital Marketplace (50m)
- NEPA/CEQA permitted landscapes (20m)
- The Future of the Pilot Programs and Funding (30m)



NORTH COAST FOREST BIOMASS STRATEGY

*Enhancing Community, Watershed, Wildfire, and Economic Resilience
through Improved Woody Biomass Utilization*

Cohort Call

Wednesday, February 5th, 2025

Background

- Non-commercial wood product history (1990s-present)
 - Juniper processing demonstration (1995-1998+)
 - Tanoak processing demonstration (1997-2001)
 - WRTC research (1990-2005; 2012-2017)
 - Sustainable Northwest Wood model
 - Small diameter and bioenergy
 - Finger jointing
 - Firewood campus
 - Waste to Wisdom (2013-2017)
 - C-BREC (2017-present)
 - Biochar (2009-present)
 - Sonoma Biochar Initiative: Pile burn v lowtech emissions; small scale pyrolysis emissions
 - Carbonator demonstration in Siskiyou
 - CBREC LCA for biochar
 - Sonoma Biomass Business Competition (2021)
 - NCRP Wood Feedstock Aggregation Pilot



The North Coast Feedstock Aggregation Pilot Project

- North Coast Resource Partnership (NCRP)'s Regional Vision for Resilience to increase the pace, scope and scale of forest health projects
- A diverse region warranted 3 subregion P3 pilots
- Coupled with region-wide structural and functional supports (NCRP), leveraging additional regionally-tailored funding streams (RFFC, TA)
- Advocating for a mixed product pathway for highest, best use of material and explicitly focusing on *non-industrial wood sources*



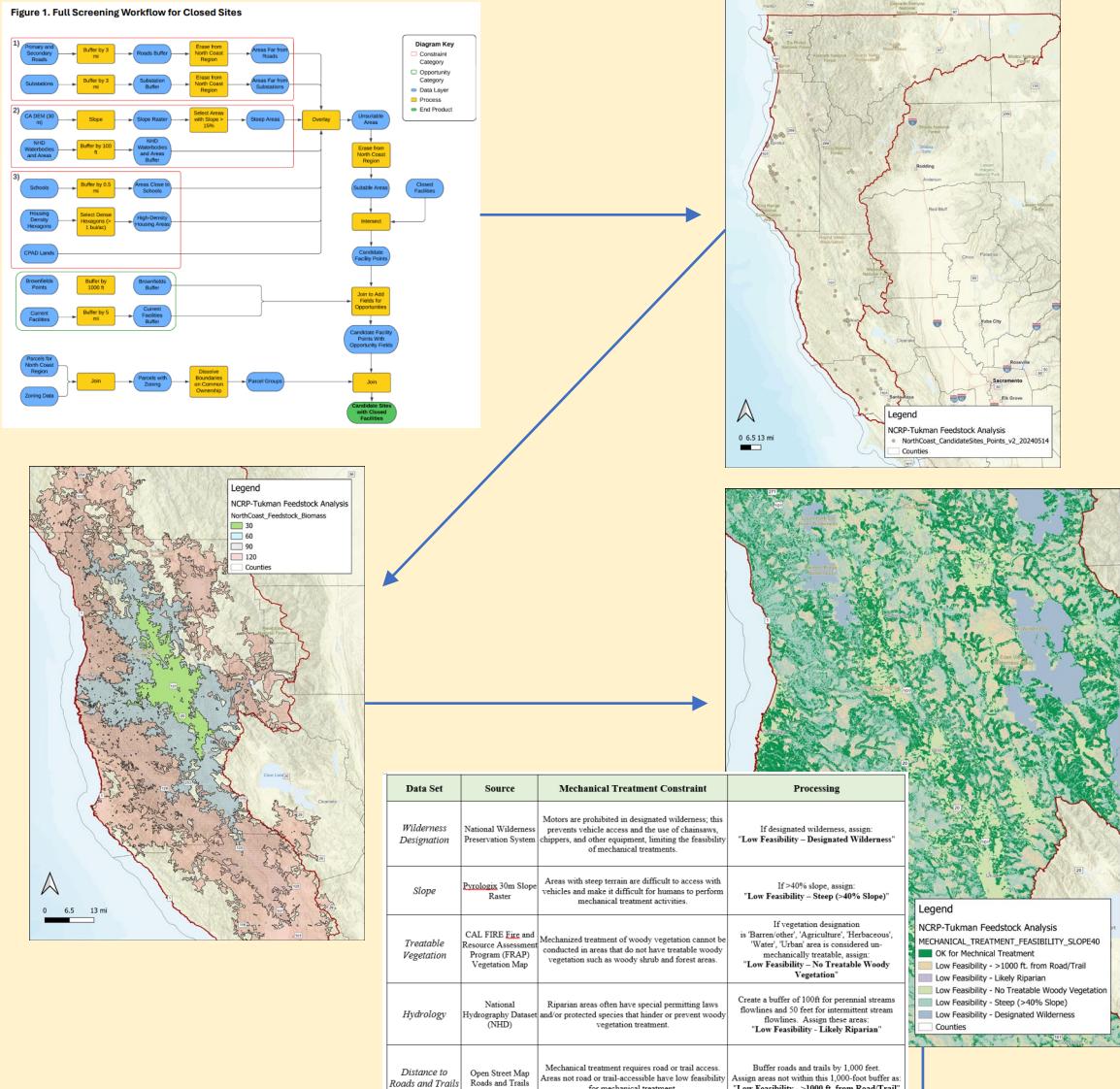
The North Coast Feedstock Aggregation Pilot Project

- **Task 1:** Build a durable, diverse network of experts, advisors, and stakeholders to develop shared vision for the region
 - [Interviews, vision planning, expert input](#)
- **Task 2:** Conduct Regionwide Baseline Assessment - Biophysical & Socio-economic Landscape
 - [Analyze Feedstock, facilities, potential sites](#)
- **Task 3:** Model Potential Scenarios for Facility Placement/Enhancement, Aggregation and Business Development to achieve multiple integrated benefits
 - [Subregion pilot project business plans](#)
- **Task 4:** Develop Implementation & Policy Strategies at Various Scales
 - [Legal review of entity types, economic review of market conditions](#)
- **Task 5:** Share learning within the region and statewide (describe how this was done for each Objective)



Task 2: Tukman Geospatial

- Mechanical treatment feasibility
- Candidate Site Selection and Feedstock Analysis
 - 93 former sawmill sites, 56 new sites identified
 - CBREC ThinBelow 40%

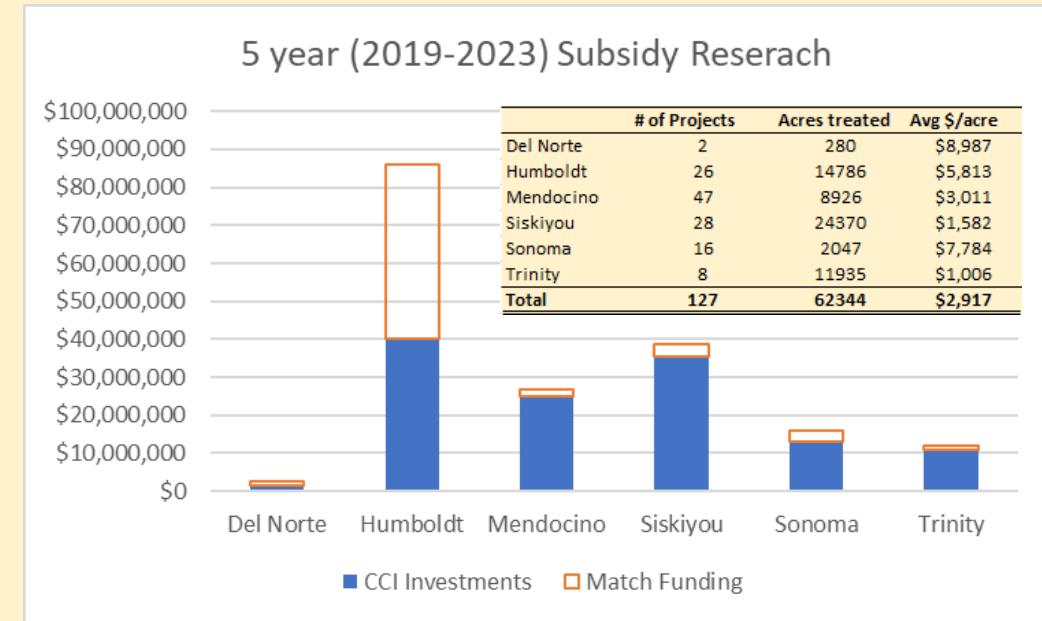


Time shells	BDT	Acres	BDT/ac
30	791,694	67,694	12
60	3,350,569	258,656	13
90	7,812,971	558,153	14
120	12,179,821	855,047	14

Example output

Task 4: Economic Report - The Beck Group

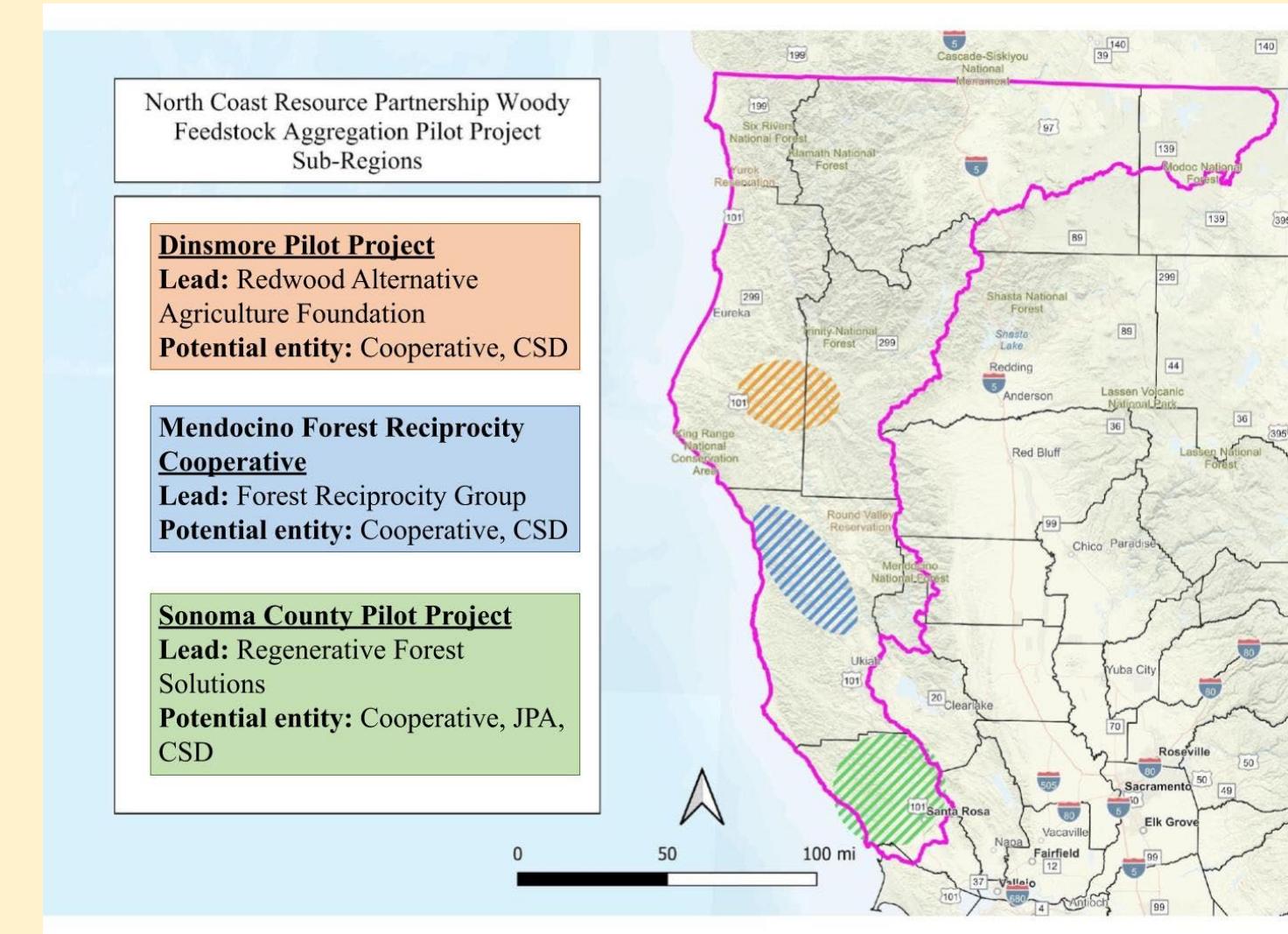
- Market condition with subsidy research
- The Beck Group
 - Without consideration of feedstock availability, what is the minimum production level (MPL) of a certain technology to breakeven?
 - Return To Log (RTL) = Value of products – cost of manufacturing
 - Return to Stumpage = RTL – harvest costs



Technology	Outputs		EBIT (\$/BDT)	Stumpage (\$/BDT)
	Units	Volume		
Wood Wool Cement	Cubic feet	4,414,378	\$300.50	\$202.42
Wood Wool for Packaging	BDT	1,033	\$65.38	(\$32.70)
BioMAT Cogen	MWH	35,935	\$60.61	*n/a
Wood Fiber Growing Media	Cubic Yards	182,651	\$30.84	*n/a
Sawmill - Base Case	MBF	11,520	\$37.99	(\$60.09)
Sawmill + Treating	MBF	11,520	\$50.97	(\$47.11)
Sawmill + TMT Decking	MBF	11,520	\$53.80	(\$44.28)
Sawmill + Pallets	MBF	11,520	\$43.63	(\$54.45)
Post & Pole	Green Tons	4,940	\$212.29	\$114.21
Fuel Briquettes	"Green Tons"	7,903	\$53.84	*n/a

Pilot Regions

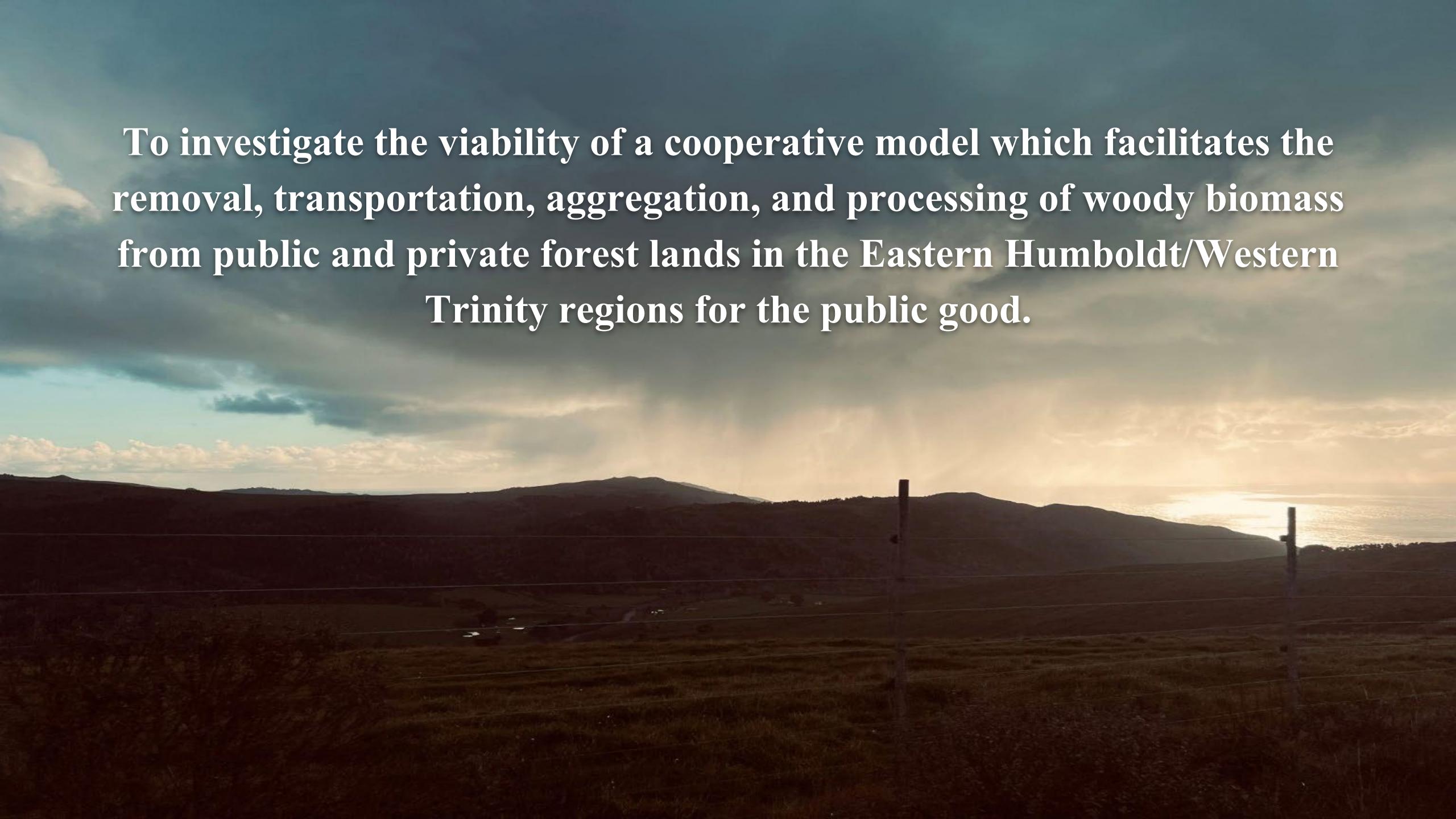
- Cooperative models
 - Similar to JPAs but at a community scale
 - None in CA, but widely practiced on the East Coast and Canada



Wood Feedstock Aggregation Feasibility Study in the Mad River - Van Duzen - Dinsmore Region

Assessing feasibility of a cooperative entity approach

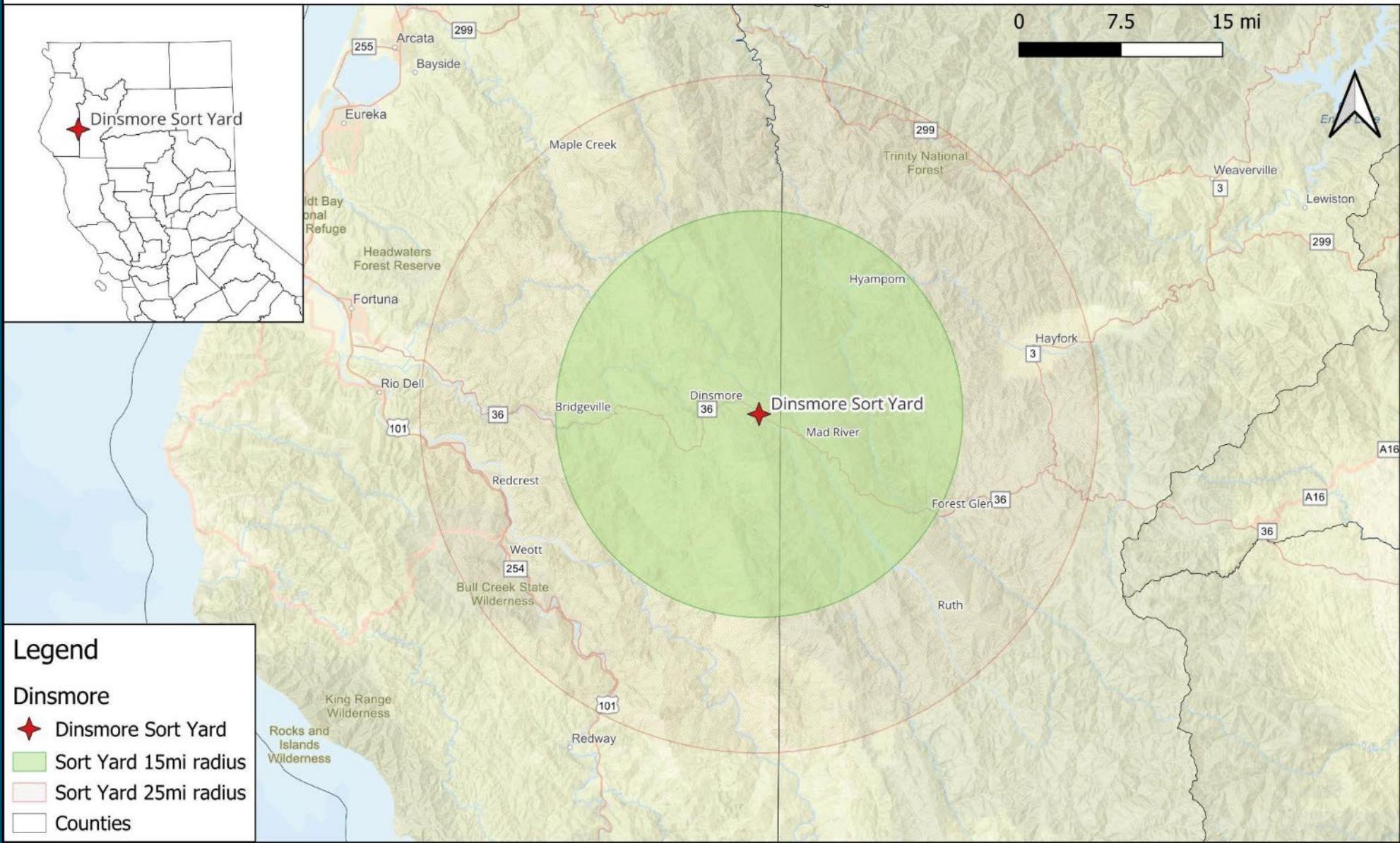




To investigate the viability of a cooperative model which facilitates the removal, transportation, aggregation, and processing of woody biomass from public and private forest lands in the Eastern Humboldt/Western Trinity regions for the public good.

Dinsmore Pilot Project

Sort Yard Area of Interest (AOI)

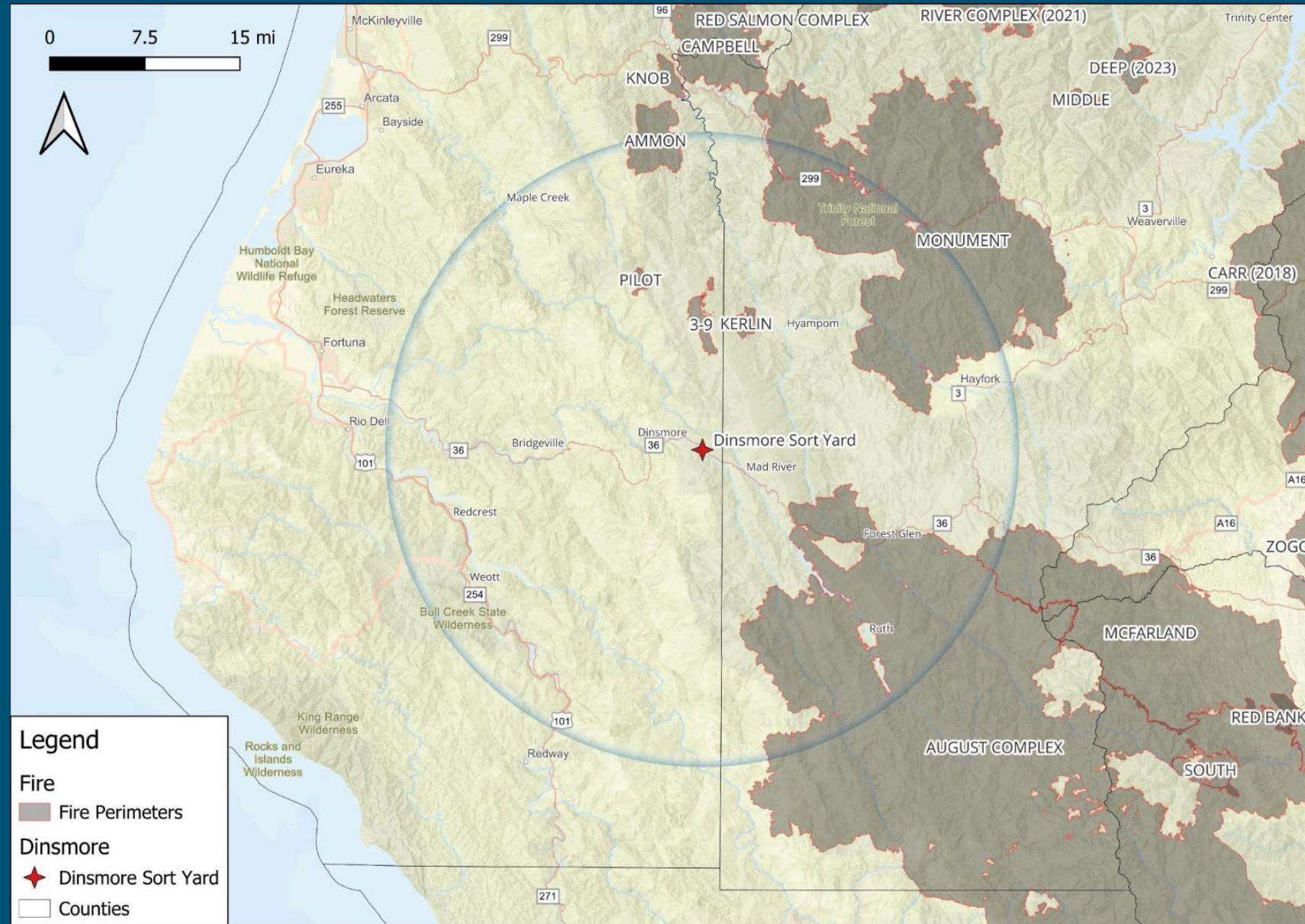


Why is the Dinsmore facility important?

- Historical Use
- Economics
- Geographic Location



Area wildfires larger than 500 acres in the last 5 years



Why is it important to look into a **Cooperative Approach?**

The forested communities of our AOI, like most other forested communities, suffer from years of value extraction of their forested areas. Despite offering employment opportunities over the course of history, large scale forest product companies have extracted value from the lands and left the community generally disenfranchised. Today wildfire risk has grown exponentially further stressing forest economies and ecological function in these communities. Cooperative principles and the cooperative entity model has some of the most robust checks and balances to ensure that local ownership, decision making, and local value return to the community.

Our team set out to explore this possibility...





**Step 1 - Reinvigorate the
Van Duzen Watershed Fire Safe Council**

- Host kick-off meeting
- Host and support follow up meetings to provide community feedback on HCFSC CWPP

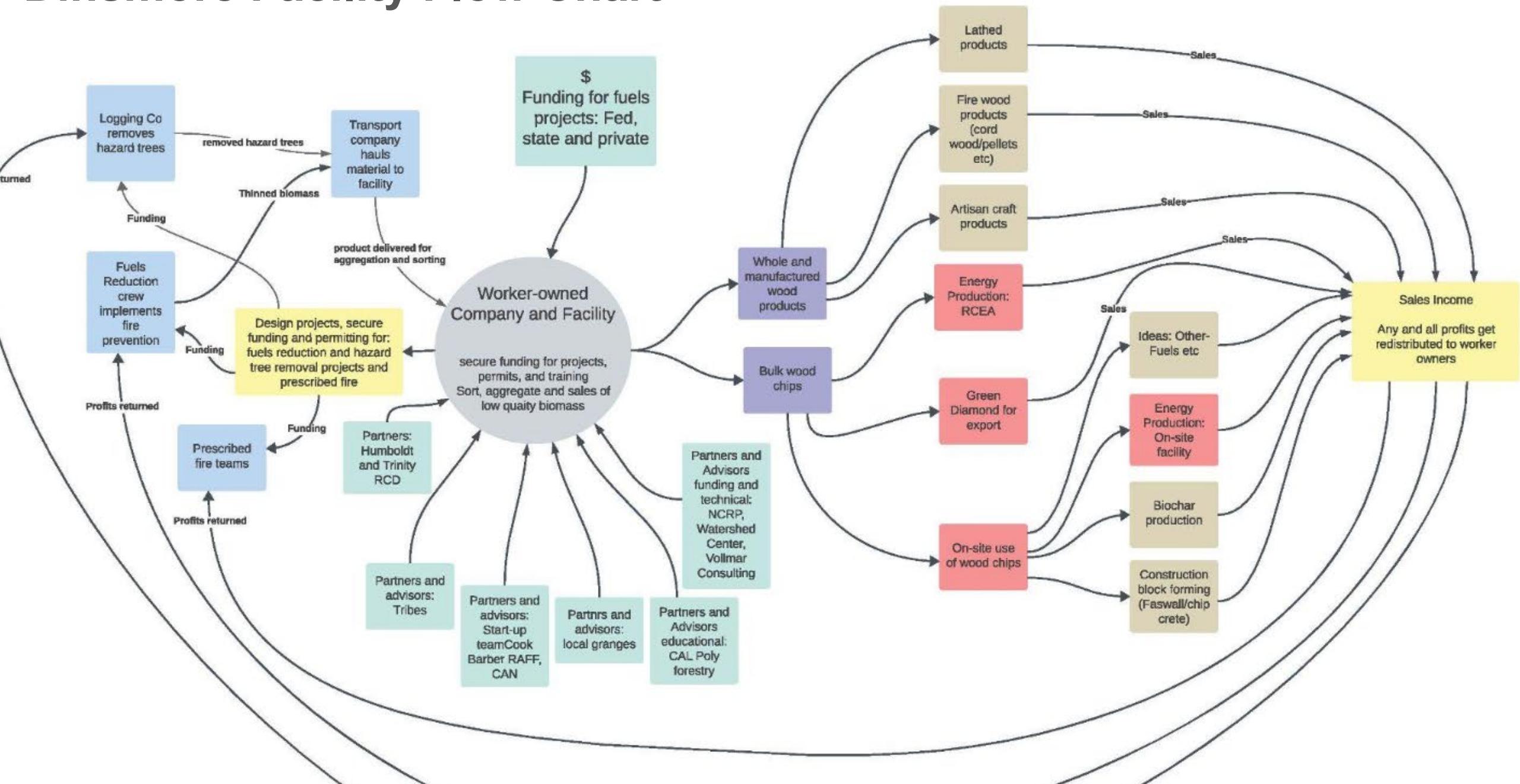
Step 2 - Design, fund and implement fuels reduction and forest health projects.

- Build unit specific projects
- Apply for and secure funding for specific projects
- Build local fuels reduction teams to

Step 3 - Start up Dinsmore facility for aggregating and sorting biomass.

- Secure start up loan or grant
- Secure facility through lease or purchase
- Proceed start up process as described in feasibility report

Dinsmore Facility Flow Chart



A modified approach

The availability of biomass for this project depends on subsidies which encourage fuels reduction projects. The community capacity for fuels reduction projects was in need of a jump-start which we saw as the first step to getting the Dinsmore facility up and running

The cooperative entity is an excellent secure entity for equity and community empowerment. However it's a big lift and take a lot of capacity and leadership. Our AOI currently does not seem to have that capacity, so we concluded that a modified entity would be better.

VDWFSC -
program of the
non-profit



Fuels Reduction
contracting
company (LLC w/
single member
owner)



Dinsmore
aggregation and
sorting yard
company (LLC w/
single member
owner)

Bridgeville Community Center

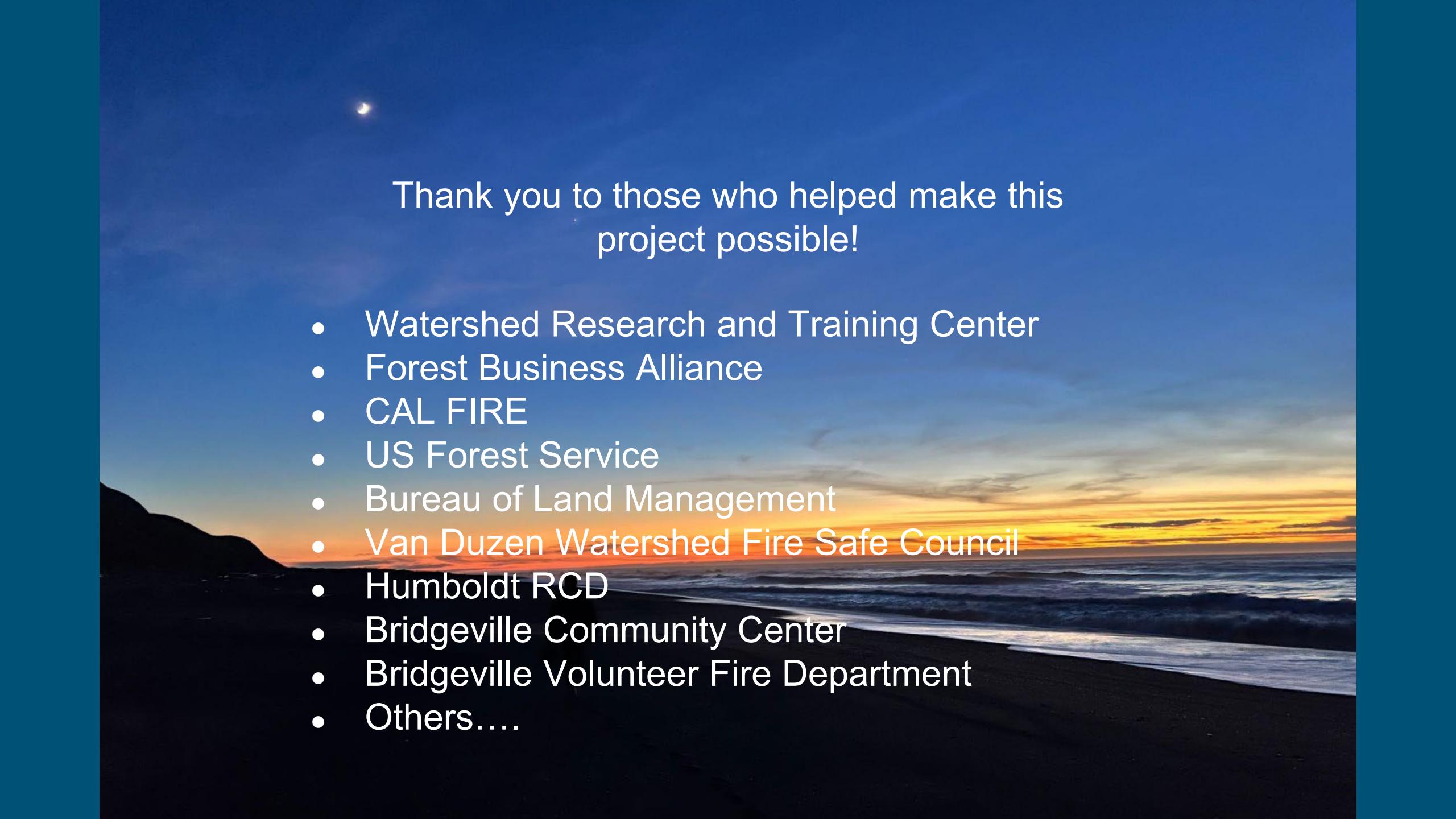
Our recommendation is for the Bridgeville Community Center 501(c)3 to continue to operate the VDWFSC and also become the single member owner of two companies

Dinsmore Pilot Community Collaboration

- Interacted with over 40 different organizations
- Our team attended over 50 different meetings
 - Community groups
 - Statewide organizations
 - Participated in multiple collaborative solution stakeholder meetings
- Met with over 80 individuals as well as the attendees at the Bridgeville Community Center community meeting

The first step - reinvigorating the VDWFSC



A photograph of a sunset over a beach. The sky is a gradient of blue, orange, and yellow. A crescent moon is visible in the upper left. The ocean waves are crashing onto the dark sand. The horizon line is low, and the overall atmosphere is peaceful.

Thank you to those who helped make this
project possible!

- Watershed Research and Training Center
- Forest Business Alliance
- CAL FIRE
- US Forest Service
- Bureau of Land Management
- Van Duzen Watershed Fire Safe Council
- Humboldt RCD
- Bridgeville Community Center
- Bridgeville Volunteer Fire Department
- Others....



Forest Reciprocity Group

Pole Aggregation Depot

The FRG PAD Primary Processing Facility will:

- Process small-diameter Douglas fir
 - 6"-14" into Structural Round Timber (SRT)
 - 1"-6" into utility grade posts/stakes, and furniture-grade round wood
- Create economic opportunity and support ecologically balanced forest thinning
- Serve Mendocino and Southern Humboldt communities

Our Regional Characteristics

- Rural, economically disadvantaged communities with a surplus of small trees
- Growing market potential in San Francisco Bay and Eureka Areas

Our Business Structure:

- Operate as 501(c)3 to leverage grants and donations
- Net revenue reinvested to further public benefit mission
- Focus on graded SRT, utility grade posts/stakes, and furniture-grade round wood

• FRG PAD Pathway to Impact

5-Year Vision

- Full-service Pole Aggregation Depot in southern Leggett, providing graded poles ready for construction projects
- Training center and community hub at Tan Oak Park
- Educational partnerships with local schools and colleges
- Growing network of builders and manufacturers

Current Progress

- Strong partnerships with Redwood Forest Foundation, Inc., Usal Redwood Forest Company, Institute for Sustainable Forestry, and established research institutions
- Market commitments from Almquist Lumber and Polecraft Solutions
- Relationship initiated with Whole Trees
- Applied for \$126,835 R&D funding for Water Pressure Debarker blueprint
- Started development of internal decay detection equipment

Next Steps

- Seeking \$30,000 for harvesting protocol development
- Will continue offering Workshops on building with round wood in close collaboration with Northern Mendocino Ecosystem Recovery Alliance (NM-ERA) at Tan Oak Park (TOP).
- Plan and build pilot Mobile Restoration, Harvesting and Processing Unit at Tan Oak Park
- Developing controlled drying shed design with Cal Poly Humboldt
- Initiating strength testing research for ring density analysis
- Pole production is scheduled at Whitethorn Construction in Spring 2025, utilizing their kiln and yard



Sonoma County Wood Recovery & Utilization Project

Wednesday, February 5, 2025



SONOMA COUNTY WOOD RECOVERY PARTNERS

STAFF / CONSULTANTS



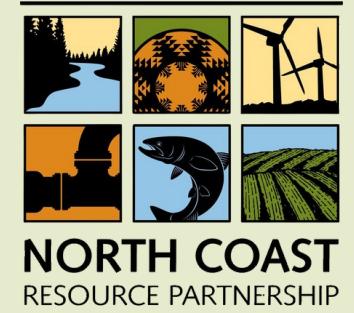
WORKING GROUP

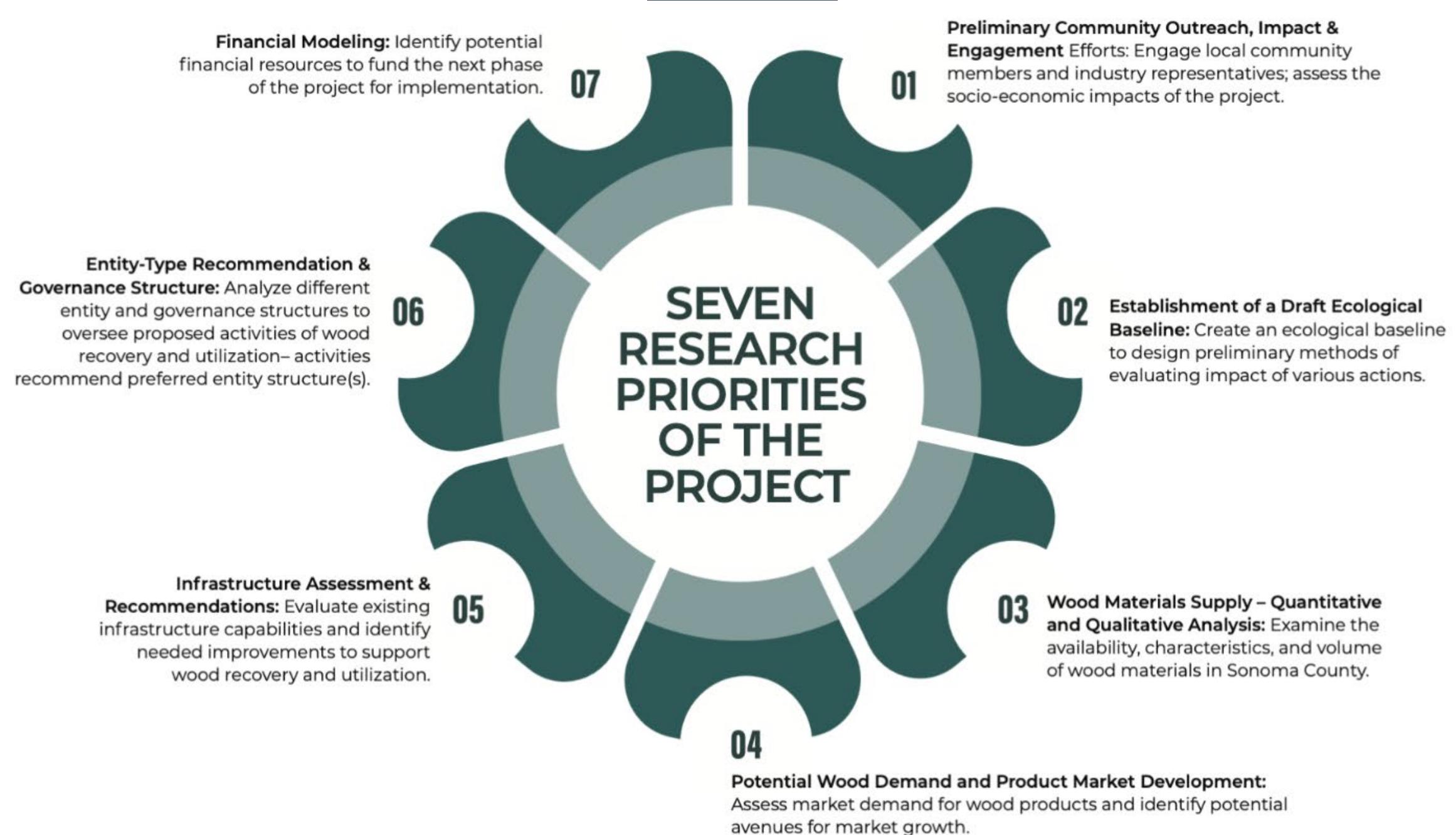


TECHNICAL ADVISORS

Aldo Lopez, **Permit Sonoma**
Brock Dolman, **OAEC**
Bud Bigelow, **RPF**
Caitlin Cornwall, **Sonoma Ecology Center**
Clarke Stevenson, **WRTC**
Fred Euphrat, **RPF**
Jeanne Wetzel Chinn, **Sierra Club Redwood Chapter**
Josh Metz, **SMEDD**
Kim Batchelder, **Sonoma Ag + Open Space**
Lindsay Dailey, **TERA**
Matt Greene, **RPF**
Misha Bailey, **Permit Sonoma**
Vance Russell, **3point.xyz**

FUNDERS



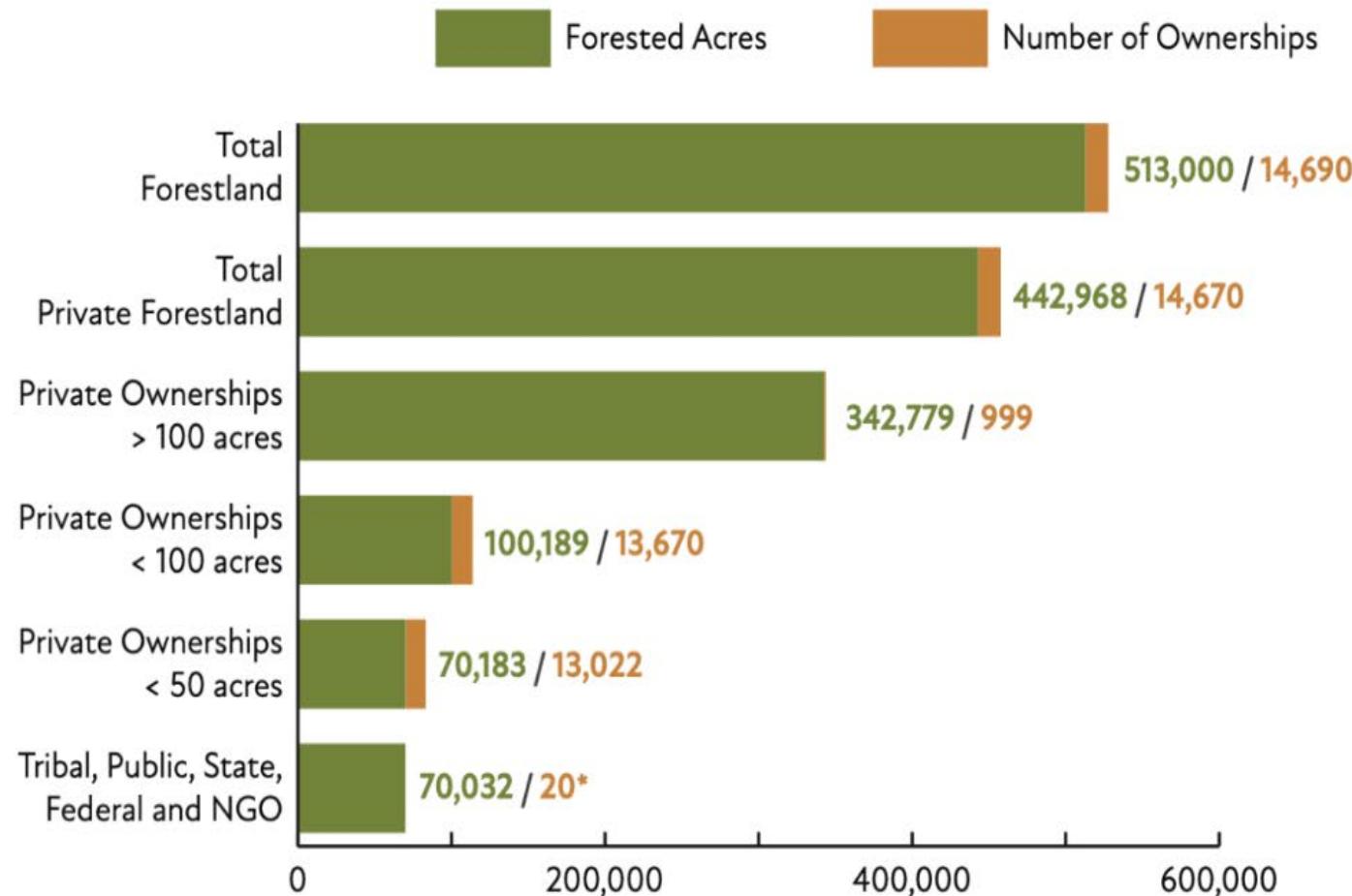


KEY FINDINGS

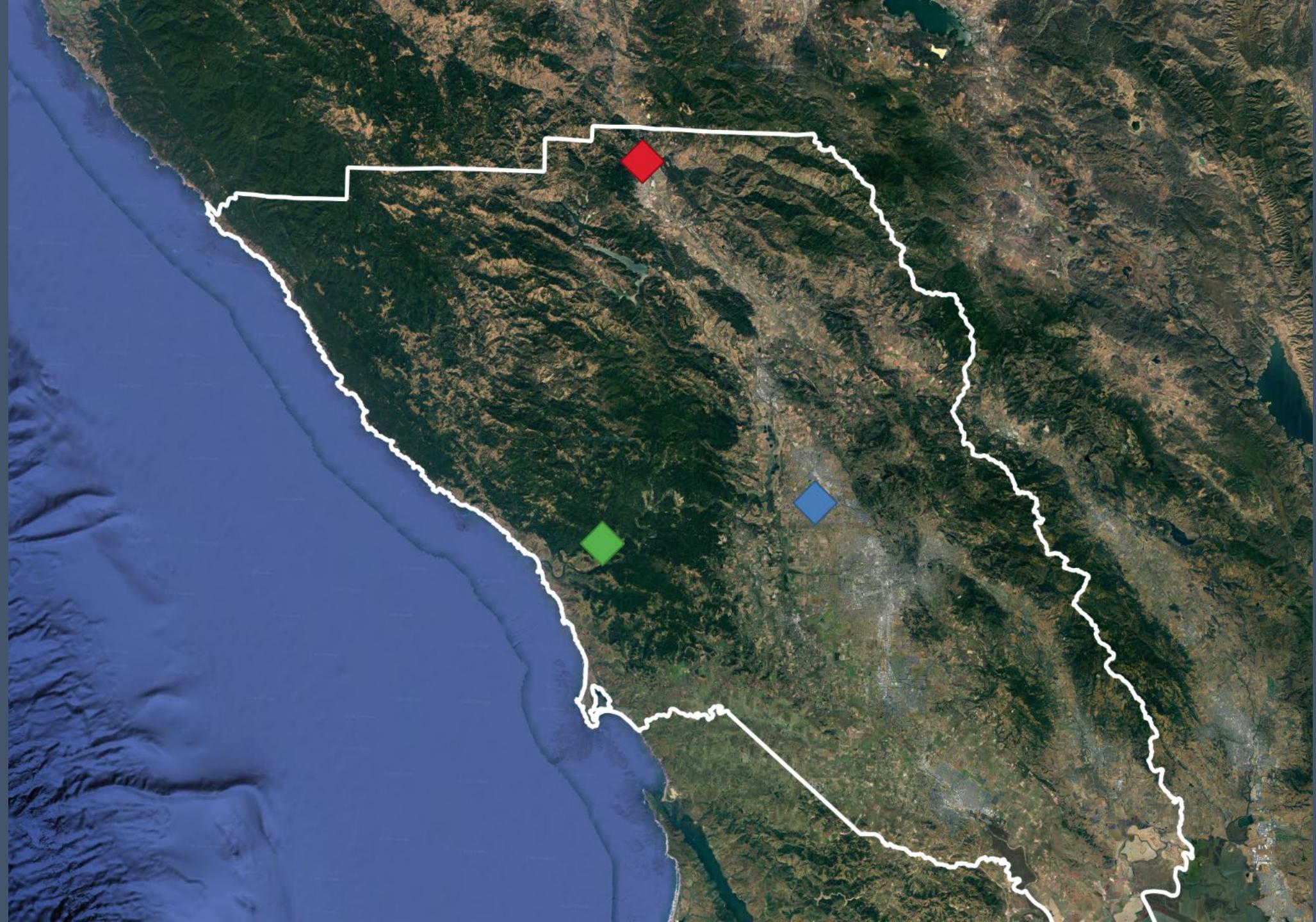
“Just as other infrastructure is necessary for the production and distribution of food, energy and water, a wood products campus is critical infrastructure to effectively manage our forests.”

1. Sonoma County's **private forestland owners** manage 86% of the county's 513,000 acres of forest; **13,670, 93%**, of the 14,670 private ownerships manage parcels less than 100 acres.
2. Enhanced wood recovery and utilization can help material “**pay its way**” out of the forest for increased wildfire resilience and forest health.
3. **246,365 acres of forested acres were identified as “feasible” to treat**, representing an estimated 48.4MMGT of forest biomass.
4. **2,800 acres** are presently treated annually on private forestlands in Sonoma County. To meet the stated goals of AB 1757 (C. Garcia, 2022), the county would need to treat **10,400 acres annually**.
5. With engaged leadership in the county, but no existing organization interested in managing wood resources and requisite infrastructure, the project determined that the appropriate legal entity to implement recommendations at this time would be a **501(c)(3) nonprofit corporation**, likely in partnership with private entities.
6. Sonoma County is well-positioned to establish the recommended entity and wood products campus.

PRIVATE FORESTLAND OWNERSHIPS / ACRES



Data source: Sonoma County Fine Scale Vegetation Map, Sonoma County Agricultural Preservation + Open Space District
*Estimated



Wuuii

GROWING THE FOREST STEWARDSHIP ECONOMY



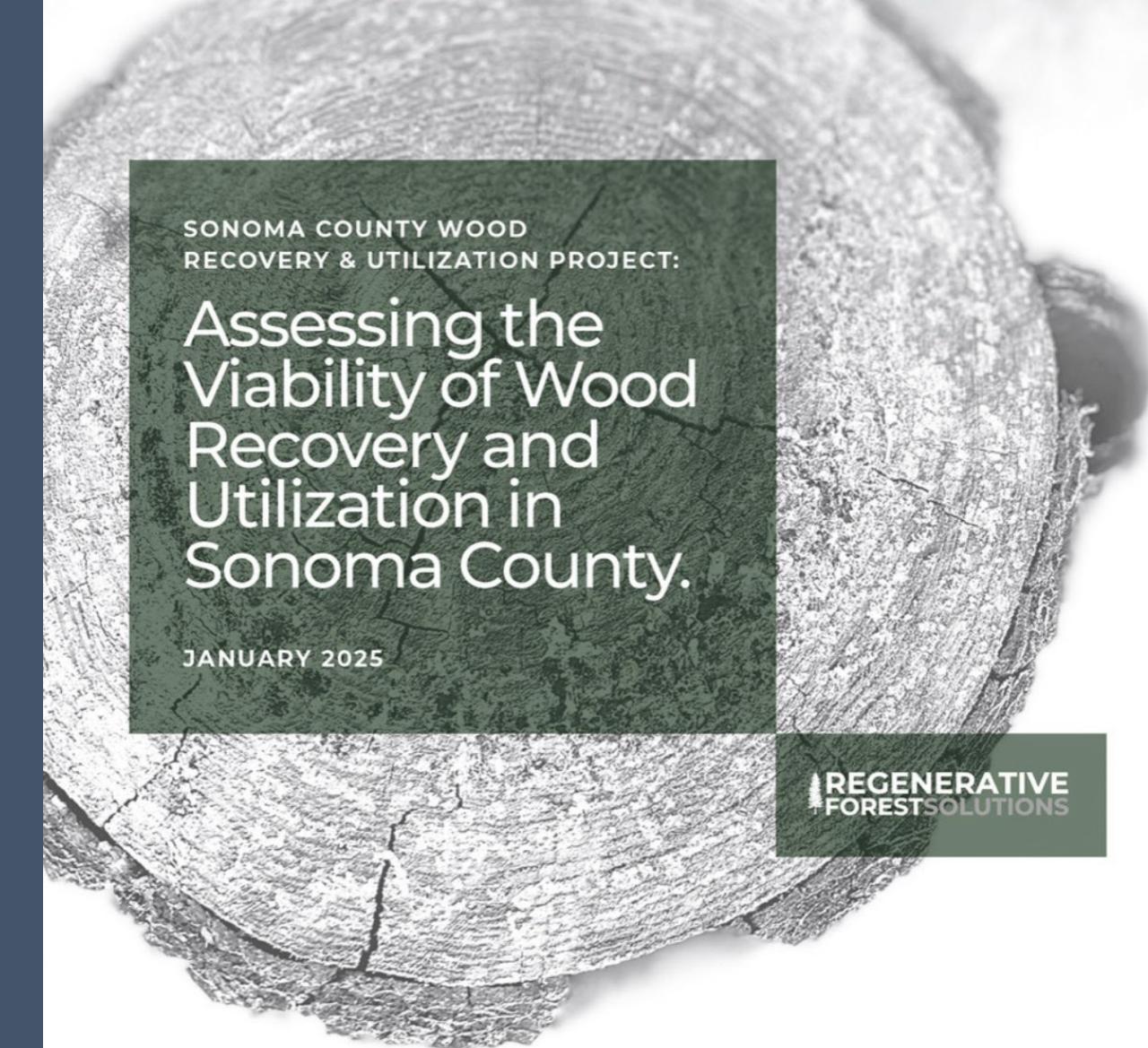


Temra Costa

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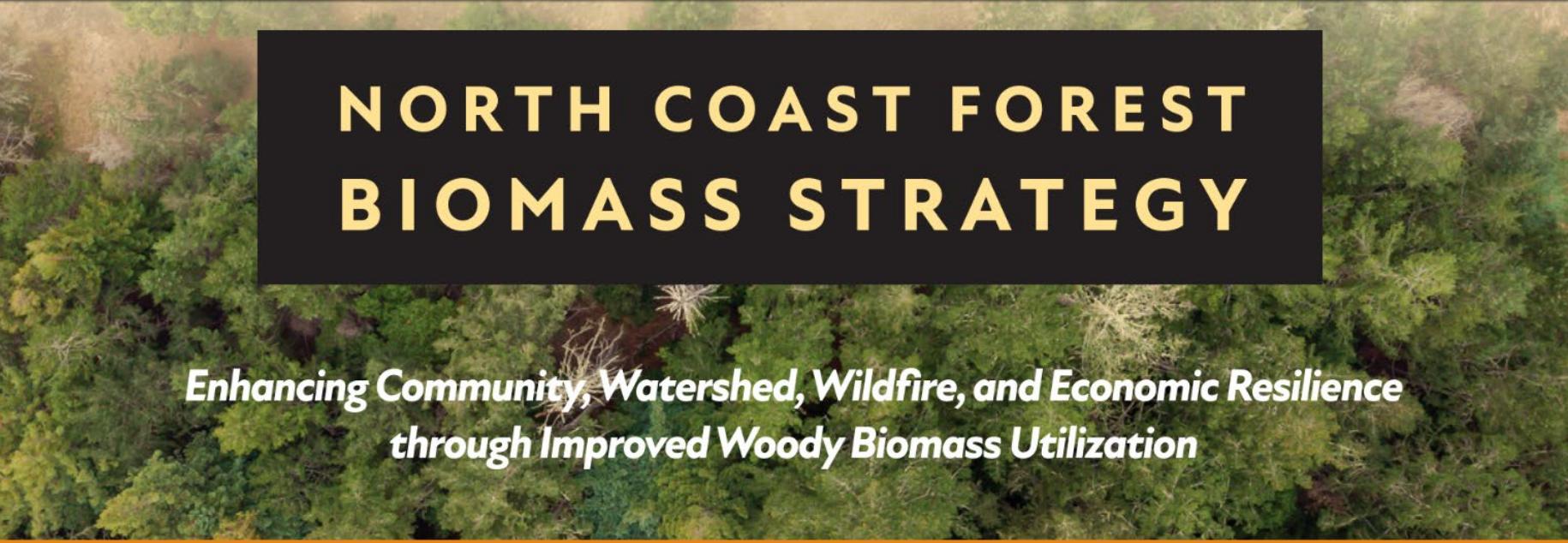


Prepared by Regenerative Forest Solutions (RFS), Working Group Members of the Sonoma County Wood Recovery & Utilization Working Group, Consultants and Technical Advisors.

This report was made possible with support from North Coast Resource Partnership (NCRP), the Governor's Office of Land Use and Climate Innovation (LCI) and the Bay Area Council Foundation's California Resilience Challenge.

Next Steps

- Wood procurement review
- Round 3 funding
- Website design – send us recommendations!



NORTH COAST FOREST BIOMASS STRATEGY

*Enhancing Community, Watershed, Wildfire, and Economic Resilience
through Improved Woody Biomass Utilization*

Thank you

Clarke Stevenson

Forest Stewardship Specialist

The Watershed Research and Training Center

Clarke@thewatershedcenter.com

The Digital Marketplace

Overview

Agenda

- The Problem
- Software
- Investments to Date
- The Solution: the Digital Marketplace
 - Working Forest Planner
 - Forest Industry Directory
 - Offtaker Portal
- Next Steps

The Problem

Multiple tools have been developed to aid in business development, policy, and landscape strategy for wood utilization in California;

Additionally, key information on the forest industry, contractor pool, and steps in developing a forest management plan are missing for professional and non-professional audiences;

Integrating existing tools and filling in key information gaps across the forest industry will help improve communication, data exchange, and ideally enable more active participation in forest management across the state.

Software

- Schatz Energy Research Center's California Biomass Residue Emissions Characterization (C-BREC), a statewide post-treatment vegetation analysis and corresponding counter-factual analysis to account for GHG and air pollutant emissions from biomass conversion systems.
- UC Davis Forest Resources and Renewable Energy Decision Support System (FRREDSS) is a multi-criteria feedstock supply optimization model to calculate preliminary site assessments for bioprocessing facilities over a 20-year period.
- CalPoly San Luis Obispo [Working Forest Planner] (formerly "Resilient Sierra") integration platform to harmonize tools, and support small landowner forest management process.
- Loamist proprietary software to support real-time track of biomass markets through an "offtaker" portal.

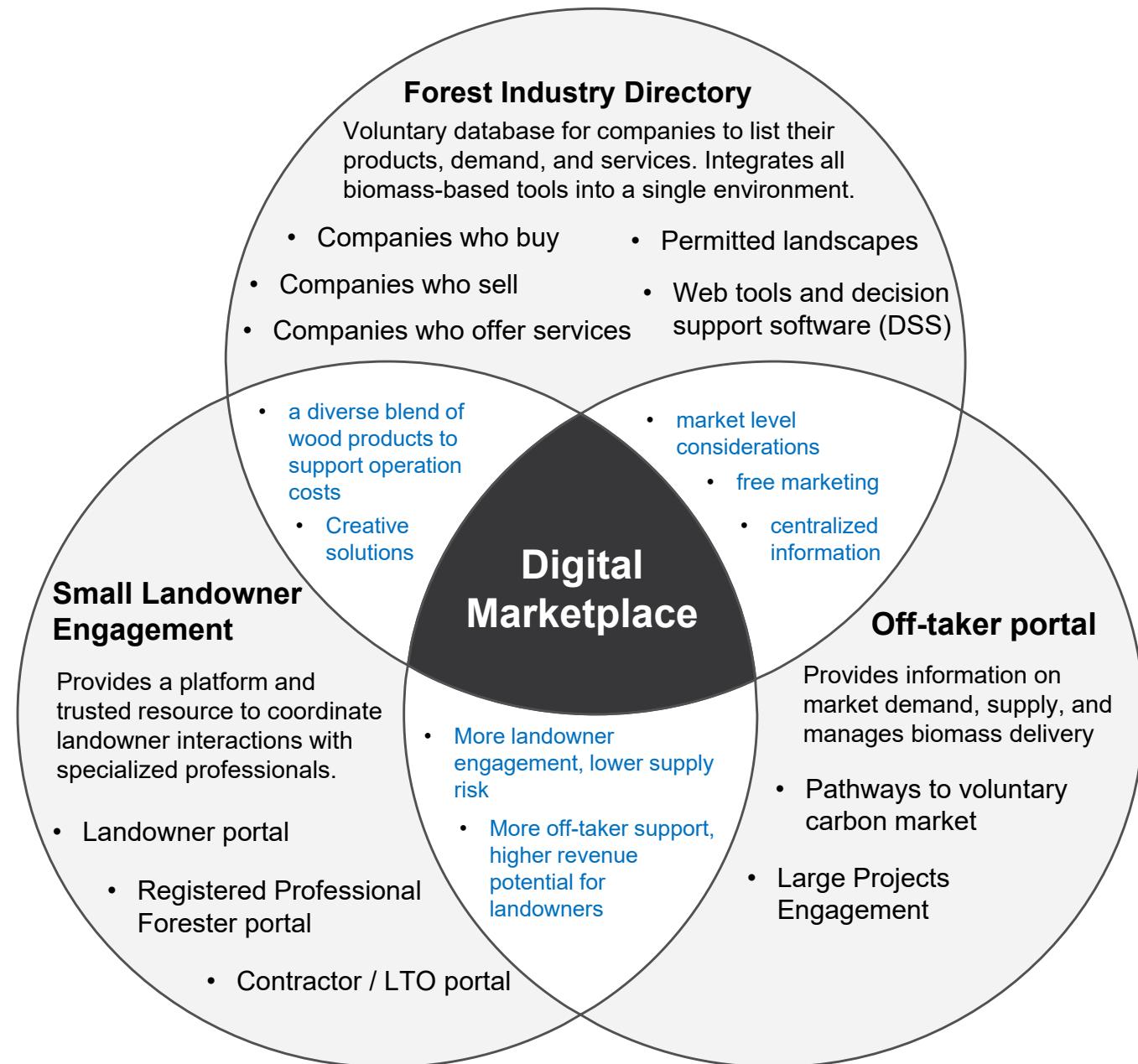
The screenshot shows a dark-themed software interface for Loamist. At the top, there are logos for Loamist, WovenEarth Ventures, Sphere, VoLo Earth, and AIRMINERS. A navigation bar on the right includes a 'D NOW' button and a menu icon. The main area features a map of California with a yellow dot indicating the 'PROJECT SITE' in Fresno, Fresno County, California, at 37.7749° N, 122.4194° W. A callout box for 'Fresno Lumber Project' shows it was created on Aug 12, 2024, and last updated on Jul 2, 2024. Another callout box for 'Green Energy Solutions' is marked as 'VERIFIED' and was added on Aug 12, 2024, with a note that it was last updated on Jul 2, 2024. A third callout box shows biomass data: 'Wood Chips 19,040 Tons 78 miles BIOMASS TYPE YEARLY BIOMASS DISTANCE \$25 TON PRICE'. Below the map, a section titled 'Unparalleled Access To Suppliers' states: 'We give you the tools to build and manage your local supply chain. Track your feedstock contacts and attestations in our integrated system.'

Investments

- **Project Funding:** \$1,523,686
- **Project Managers:** Governor's Office for Land Use and Climate Innovation (LCI) and the Watershed Research and Training Center (WRTC) – \$78,280
- **Project Partners:**
 - UC Davis (FRREDSS) – \$238,500
 - Cal Poly Humboldt (C-BREC) – \$314,000
 - Cal Poly San Luis Obispo, Amazon Web Services, ScaleCapacity Inc. (The Digital Marketplace: Working Forest Planner & Forest Industry Directory) – \$457,796
 - Spatial Informatics Group
 - Biomass pile quantification – \$40,500
 - NEPA/CEQA permitted landscapes (with Ascent Environmental) – \$51,510
 - Loamist (Offtaker Portal, Chain of Custody) – \$204,600

The Solution

- Helping landowners find contact information on forestry consultants & contractors; improve data transmission between parties; and develop an online presence for contractors;
- Increasing awareness of potential buyers for primary and secondary products at all scales and localities;
- Helping secondary/value-added firms (molding, millwork, furniture and cabinetmakers) find sources of lumber, panel products, and other raw materials;
- Enabling entrepreneurs and architects to find the suppliers and partners they need to commercialize a product/project;
- Providing the general public with information on local producers of lumber, custom cabinets, boughs for wreaths, and much more.



Working Forest Planner

Small Landowner Engagement

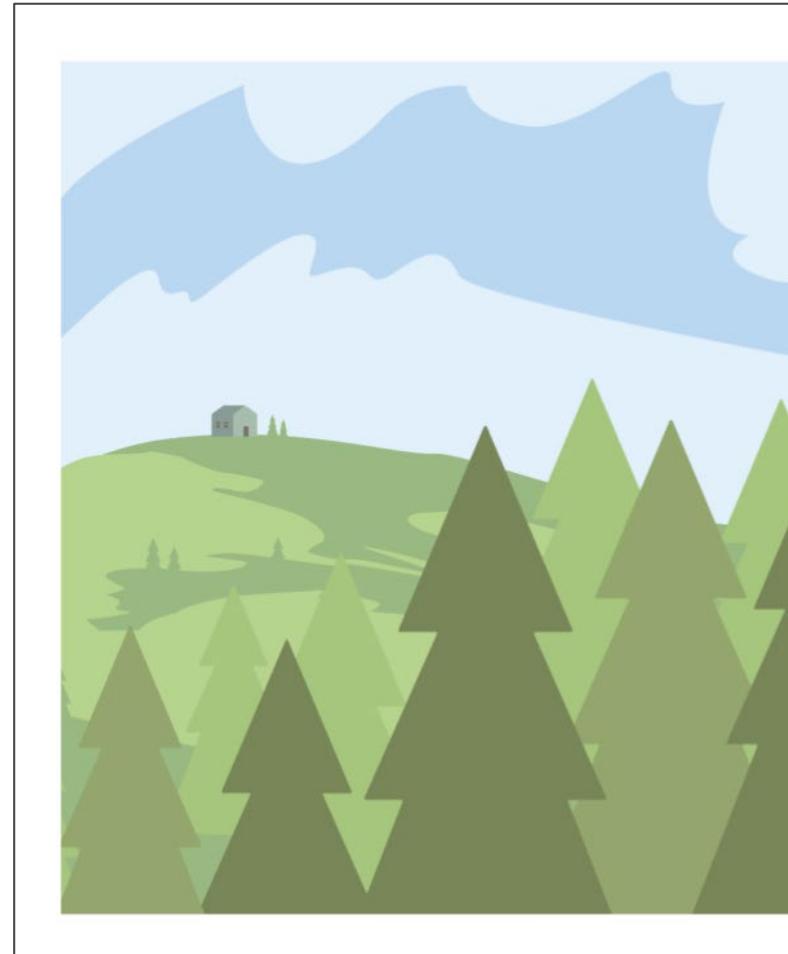
Goal

Motivation:

New tools can improve small landowner education and data exchange with RPFs; RPFs could benefit from comprehensive list of contractors;

The Solution:

Support the small, non-industrial forest planning and implementation process by facilitating data, resources, and communication sharing between the landowner, RPF, and LTO



Let's Get You Started

What title best describes you?



Wooded Property Owner

Land owners looking to get land fortified



Licensed Timber Operator

LTOs looking to bid on work contracts



Registered Professional Forester

RPFs looking to facilitate Landowners



Landowner Portal

- **Objective:** to enable forest management projects on small, non-industrial private forestlands through a data and resource sharing digital interface.
- **Intended Audience:** small, non-industrial private landowners, especially those participating in the UC Cooperative Extension Forest Stewardship Workshops.
- **Features**
 - Step-by-step process for landowners to engage RPF,
 - Custom analysis of property based on address/APN (based on CFIP and EQIP requirements),
 - Identification and solicitation of RPF by proximity to landowner,
 - Share GPS points, lines, polygons, and images important for management planning,
 - Initiate, or cultivate, a management history digital archive.

Registered Professional Forester Portal

- **Objective:** to facilitate forest management projects on small, non-industrial private forestlands through a data and resource sharing digital interface
- **Intended Audience:** consulting foresters engaged in non-industrial forest management
- **Features**
 - Step-by-step process for landowners to engage RPF,
 - Custom analysis of property (based on CFIP and EQIP requirements),
 - Identification and solicitation of RPF by proximity to landowner,
 - Share GPS points, lines, polygons, and images important for management planning,
 - Initiate, or cultivate, a management history digital archive,
 - Access to post-treatment metrics such as stand density index based on 10 different harvest intensity scenarios (source: C-BREC)

Licensed Timber Operator Portal

- **Objective:** to enable forest management projects on small, non-industrial lands through a data and resource sharing digital interface.
- **Intended Audience:** vegetation management contractors (LTOs or Tree Service) to list their availability within a specific region, and RPFs to have a more complete list of available contractors to send bids to.
- **Features**
 - Separate, but complementary to Forest Industry Directory,
 - Database manager for contractors to volunteer their information, including:
 - Licensed
 - Insured
 - Types of treatment (timber harvest, fuels rearrangement, road work, prescribed fire)
 - Types of equipment (tree climbing, light equip, heavy equip)

Landowner Step-by-Step Process

1. Sign up

2. Custom Analysis – Pre-populated information on your “Property Fact Sheet”

- a. Based on the CA Cooperative Forest Management Plan (mgmt. history, APN, slope, vehicle access, etc.)
- b. Estimate volume of biomass within property (based on C-BREC);

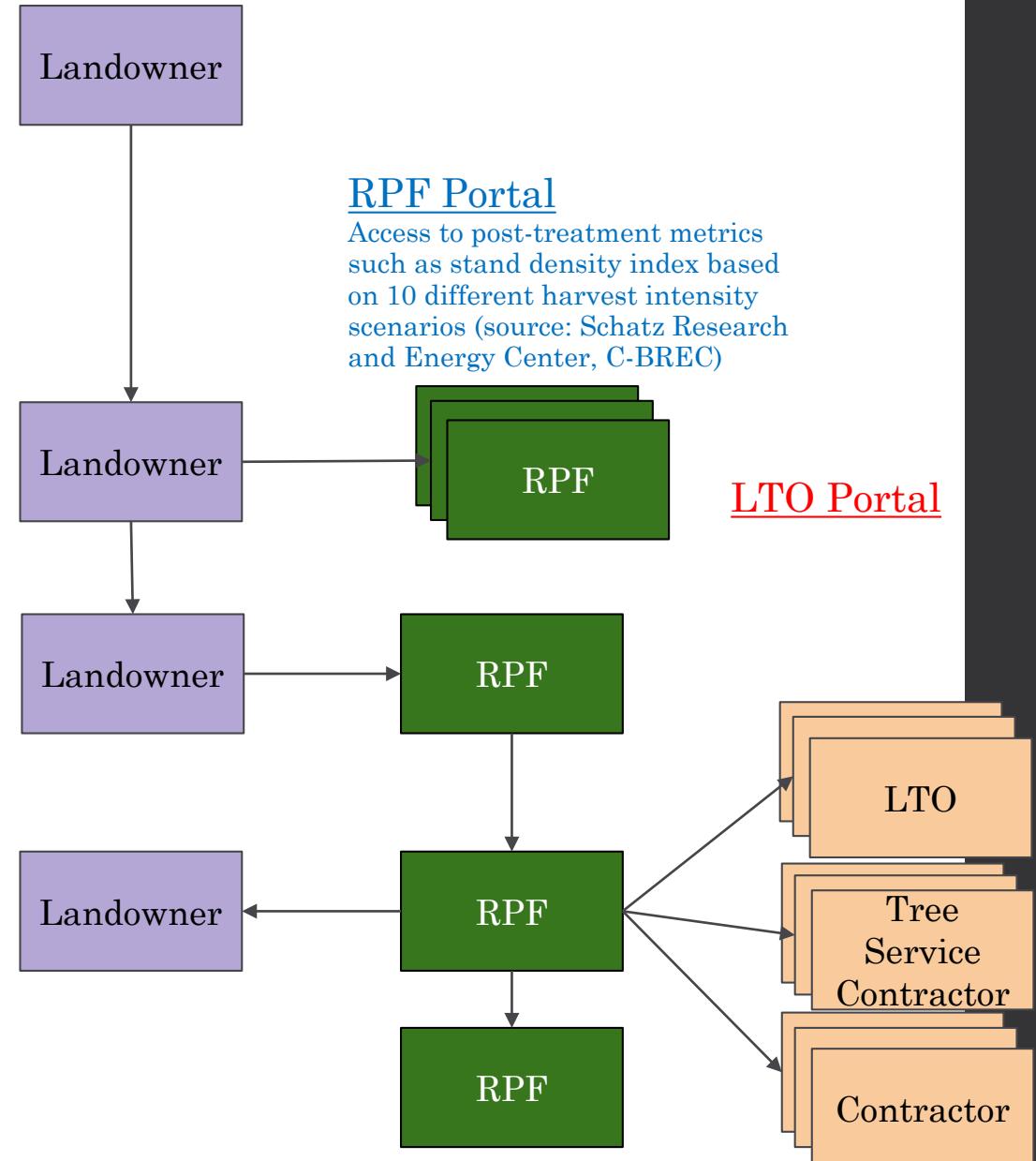
3. Invite RPF – Choose from list of local consulting foresters to support plan development and contract oversight;

4. Contract with RPF – Select forestry outfit that best fits your needs

- a. Ability to share GPS data (.kml/.kmz) from Avenza (or similar) through portal;

5. Planning and Property Treatment – RPF leads and oversees projects;

6. Project Follow up – RPF closes project status on the Working Forest Planner.



Forest Industry Directory

Facilitating cooperation and creativity in California wood markets and
forest industry

Goal

Motivation

While large wood product markets facilitate the forest economy, an abundance of small scale markets exist at the local level and have the ability to grow with more awareness. Making products and services readily searchable, cooperation and collaboration becomes easier

Solution

Replicate the Forest Industry Directory from other states and create a voluntary database for companies to list their products, demand, services, and equipment;

Complement the UC ANR wood product and biomass facilities database to highlight the various wood markets operating at a more local scale.



Oregon State University | Oregon Wood Innovation Center

Search icon User icon Menu icon

Oregon Forest Industry Directory

- HOME
- COMPANIES
- COMPANIES THAT BUY
- COMPANIES THAT SELL
- SERVICES
- CLASSIFIED ADS

Welcome to the Oregon Forest Industry Directory!

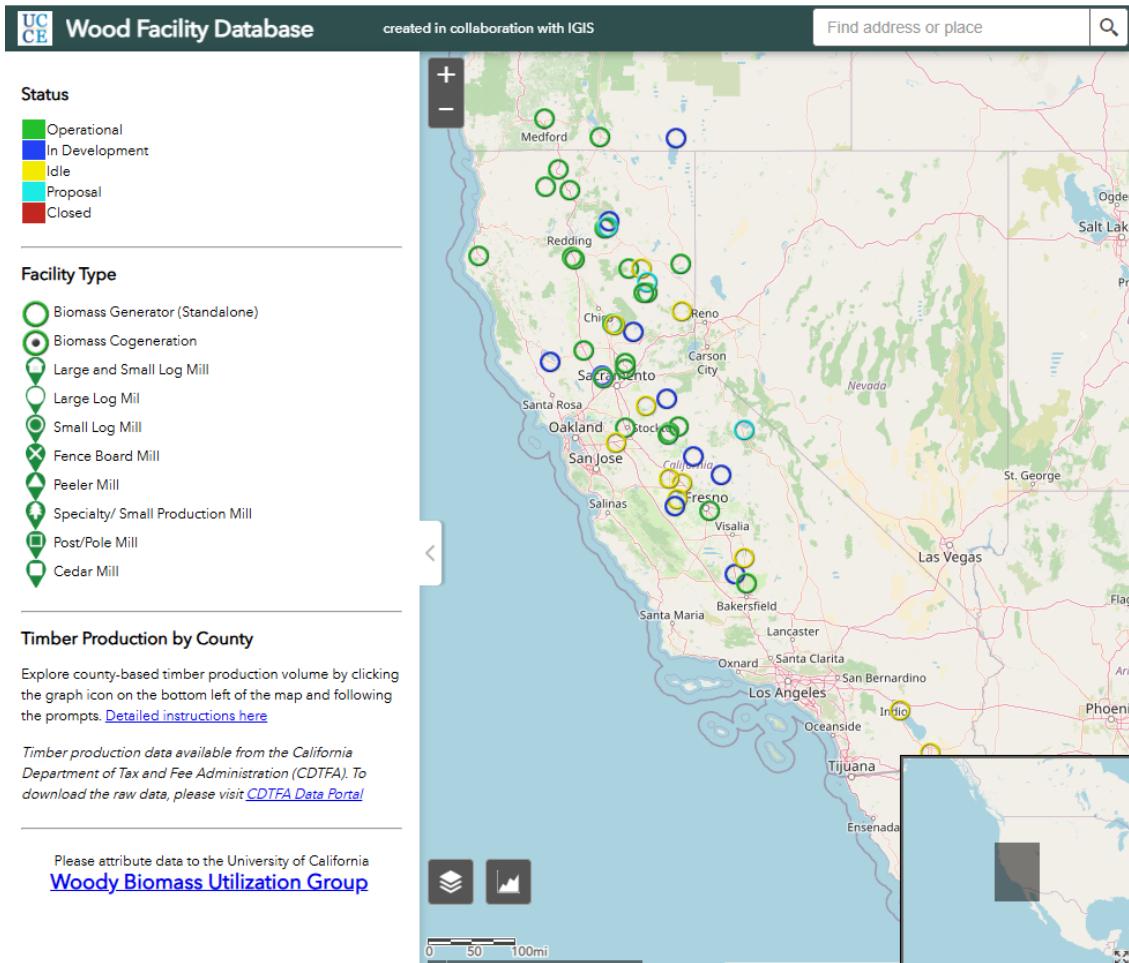
The directory facilitates the establishment of *business connections* between the broad array of interests in Oregon's forestry sector. The Directory serves a number of purposes including:

- Helping *woodland owners* find contact information for log buyers, non-timber forest product buyers, and forestry consultants & contractors;
- Assisting the primary manufacturing industry (*sawmills, plywood mills, log home builders, and chipping contractors*) to find sources of logs and buyers for their products;
- Helping secondary/value-added firms (*moulding, millwork, furniture and*



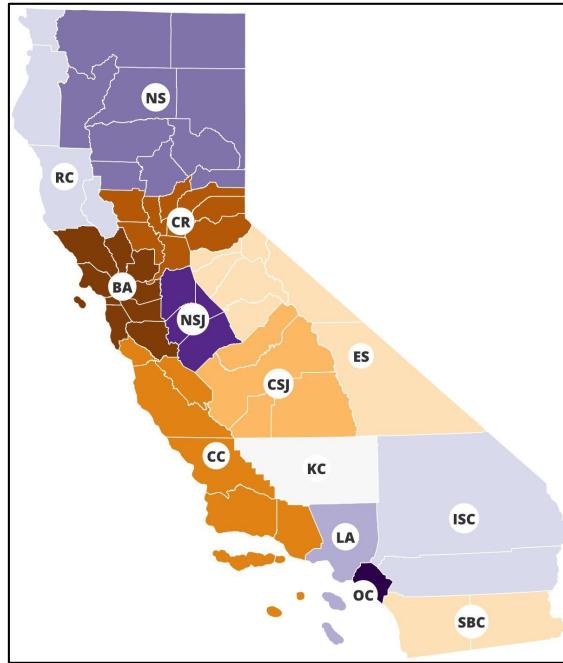
UC ANR facility database

- Current information on capacity, development, and status of facilities;
- Minimum annual consumption threshold
 - Sawmill – 0.5 MMBF log,
 - Biomass – 2,500 green tons, or 8,750 cubic yards;
- Has a limited number of wood product options to represent.



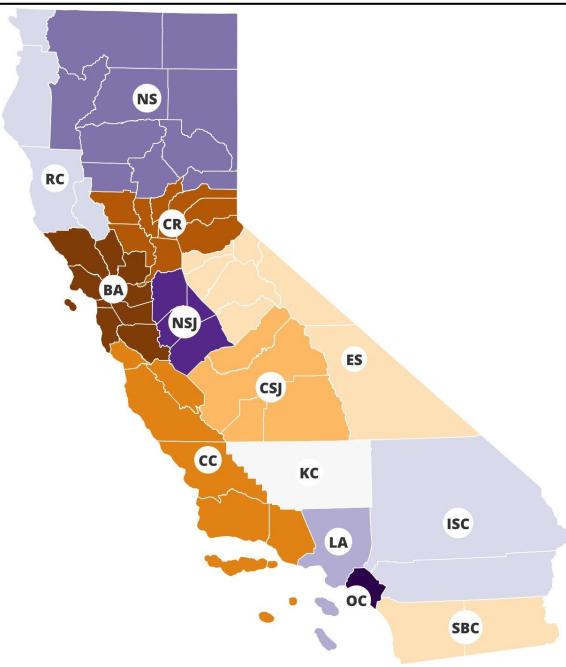
Companies that Buy and Sell

- Over 50 timber-based, non-timber, and special forest products available;
- Distinct regions are based on California Jobs First designations, in recognition of its potential utility for GoBiz;
- Assisting the primary manufacturing industry to find sources of logs and buyers for their products;
- Helping secondary/value-added firms find sources of lumber, panel products, and other raw materials;
- Enabling entrepreneurs and architects to find the suppliers and partners they need to commercialize a product/project.



Companies that provide Services

- Over 70 types of professional, contractor, or legal services available for companies to select from;
- Provides professionals and general public with information on what and where services can be accessed;
- Services are separated into (1) Forestry, and (2) Manufacturing / Secondary manufacturing services.
 - e.g. land management planning, vs. custom sawmilling;
- 50 types of equipment options to select;
- A description box at the bottom for companies to explain the details of their services or equipment models, if they prefer.



source: <https://www.flickr.com/photos/blmoregon/28694211688/in/album-72157627139800278/>

Offtaker Portal

Detail



Loamist

The Biomass Platform



Andy Miller
Co-Founder & CEO

Jan 2025

www.loamist.com





Andy Miller
CEO & Co-founder



Pete Christensen
COO & Co-founder



Chelsea Samuelson
Head of Operations



Activate





Loamist

The Biomass Platform

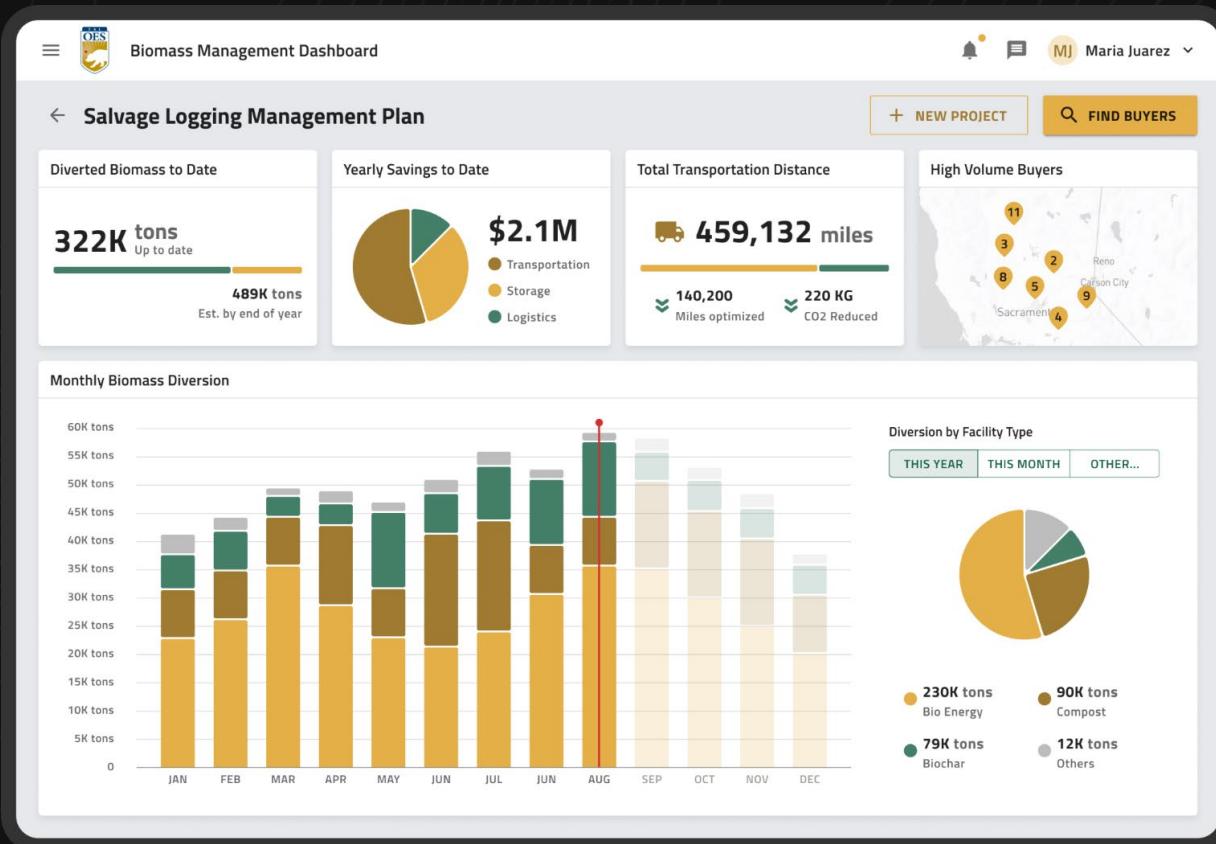
Measure

Coordinate

Transact

Measure, Coordinate, Transact

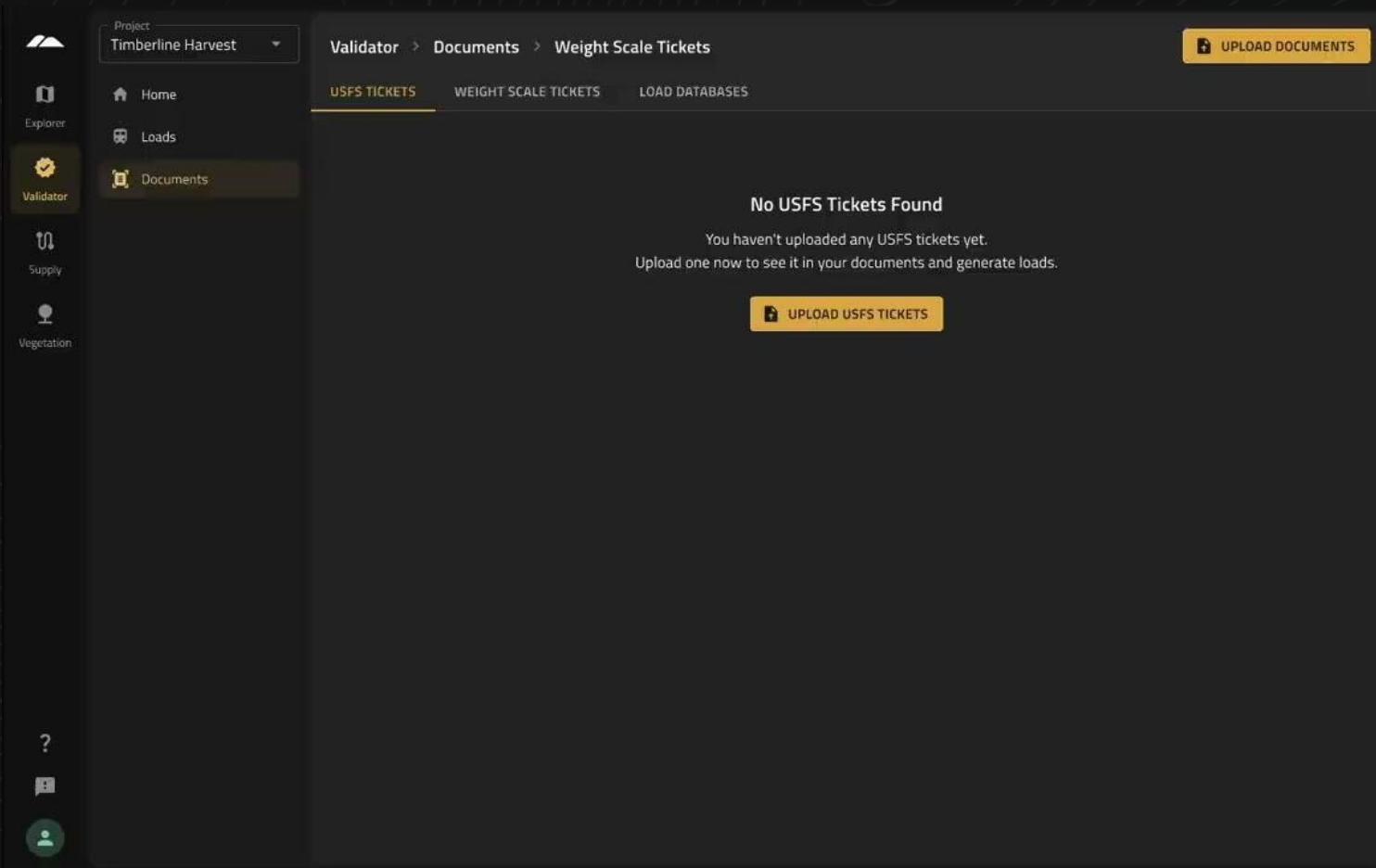
Measure - For land managers, we track and quantify where the biomass goes and how much it costs.



- Truck miles, labor hours, tip fees.
- Meet compliance requirements.
- Establish baseline to optimize for fire risk, safety, and transportation.



VALIDATOR - Supply-Chain Audit and Chain of Custody software

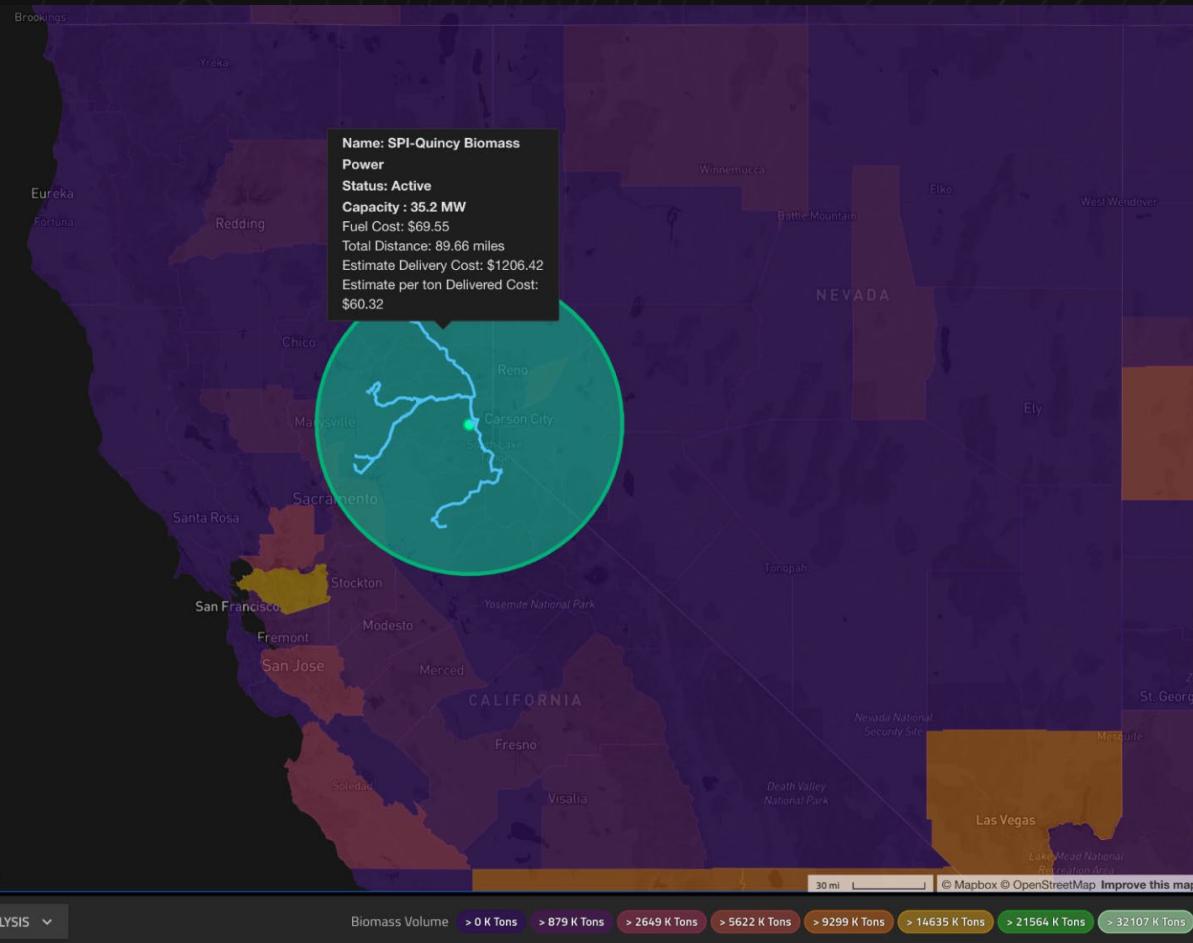


- Transportation Subsidies
- CoC for regulated Markets (LCFS / RFS / Carbon Markets)
- Certificates of Compliance



Measure, Coordinate, Transact

Coordinate - Geospatial analysis to support project CapEx / OpEx modeling



- Instant Feedstock analysis
- Transportation Analysis
- Local Market Analysis
- FIA Growth : Removals Analysis
- Pricing Estimates

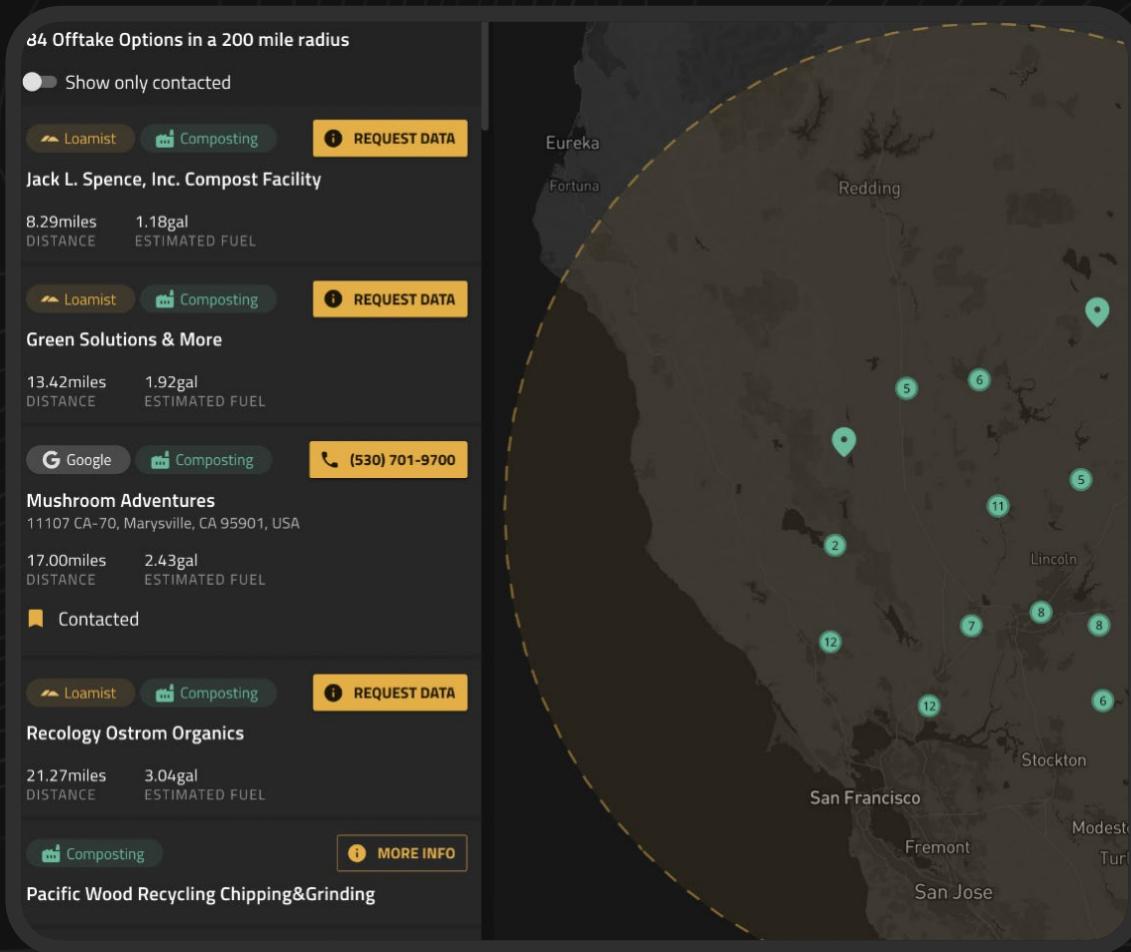
Measure, Coordinate, Transact

Offtaker Portal - Find nearest offtake options



Measure, Coordinate, Transact

Transact - Offtakers identify and procure material where it is and will be



- Supply aggregation
- Options
- Spot purchases
- Long term offtake

Coming 2025

THE END

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Next Steps

Next Steps

- Ongoing maintenance and validation of information;
- Forest Industry Directory
 - Feature refinement and outreach campaign to get critical mass;
- Working Forest Planner
 - Trial runs with participating Landowners, RPFs, LTOs process,
 - Integrate contract databases being developed;
- Offtaker Portal.

Thank you

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Spatial Informatics Group and Ascent Environmental

CEQA / NEPA permitted landscapes

A photograph of a snowy forest. In the foreground, a green harvester is working on a fallen tree. Another green harvester is visible in the background to the right. The ground is covered in snow and bare ground, and the trees are tall and thin.

Locating Planned Projects



SIG

ASCENT

There is A lot of Woody Material Across the Landscape.....



01

Is it Operationally Feasible to Harvest?

02

Is it Permitted to Allow Harvest via CEQA/NEPA Processes?

03

Is it Economically Feasible to Harvest?

Related Mapping Efforts



01

Task Force Treatment Tracker

02

**SW Ecological Research
Institute**

03

Various Regional Efforts