

Forest Biomass residuals disposal through public management

An update on the OPR Pilot Projects



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CLERE INC

May 18, 2023



Agenda

Topic one; Overview of OPR Feedstock Pilot Program

Topic Two; Fall River RCD - Market Impact Assessment : Joint Powers Authority overview, and Innovation to Improve Contracting

Topic three; PCWA Water Agency Report, outreach report, and Additions to JPA work related to Member Agencies

Topic four; Mariposa RCD/ Sierra Business Council feedstock assessment and Model Entity coverage of Special Districts and emphasis on existing entities

Topic five; Marin RCD and North Coast Pilot (brief overview)



What is the Problem with the Biomass Waste Market?

THE CHALLENGES

- Prices of biomass are sensitive to external factors
- Wildfires change availability drastically
- Wood is hard to transport
- Wood does not last forever for optimal use
- There is high risk to commit to long term feedstock supply contracts

THE OPPORTUNITIES

- The State and the public are beginning to recognize the forests are overgrown; subsidy is available
- The Forest Service has finally taken its first action on the million acre strategy by approving several Blanket Purchase Orders for Biomass
- Innovative technology is available that is cleaner than ever before
- Our Region has the best timber market in California, if not the West

OPR Pilot Program

FIVE PILOT AREAS

- Fall River RCD: Shasta/Modoc/Lassen
- Humboldt Co./ North Coast Resource Partnership/ The Watershed Research and Training Center: North Coast
- Placer Co. Water Agency: Nevada/El Dorado/Placer Co.
- Marin RCD: Marin County
- Mariposa RCD/ Sierra Business Council Amador, Alpine, Calaveras, Mariposa and Tuolumne

WORK HAPPENING AT OPR

- UC Contracts: Land Owner Support Tool and Price Mechanism Development
- Pursuit of UCOP grant
- Ongoing website development
- Support for amendments for all Pilots
- Future learning cohort meetings

Work Product from Fall River RCD

Introduction to JPA Structures

Joint Powers Authority has been in place since the 1940s in California. This law allows all levels of government to coordinate and share resources to provide better services to their constituents. The Law allows these entities to enter into cross jurisdictional agreements or create new agencies that can work across their borders, utilizing only the powers that the agencies share.



JPA Activities

MANAGE

CONTRACTS

- Manage feedstock supply price mechanism
- Negotiate feedstock contracts
- Provide Insurance for such contracts
- Ongoing management of relationship

PROVIDE

SERVICES

- Third party environmental review
- Mapping
- Insurance pools
- equipment leasing
- Business services

OWN

INFRASTRUCTURE

- Own a mill
- Own a bioenergy plant
- Own a wood products yard
- Own biomass (/?)

Example Joint Powers Agreements and Agencies

- *Eastern Sierra Council of Governments*
- *The Upper Mokelumne River Watershed Authority*
- *Marin Wildfire Prevention Authority*
- *The State Santa Monica Mountains Conservancy and its Partners*
- *West Placer Waste Management Authority*

Options in the Northeast State to Spur Biomass Use

OPTION ONE

- *A JPA is formed to be directly involved in funding public infrastructure like a biomass utilization campus, a sort yard, or biomass conversion or utilization facilities.*

OPTION TWO

- *A JPA is formed to provide a menu of community services (but does not directly own or manage wood products conversion facilities) or own equipment to lease to new businesses or the community.*

OPTION THREE

- *A Wildfire Prevention Authority that includes forest biomass waste disposal as a circular economy measure.*

Continued...

OPTION FOUR

- *JPA Agreement (no entity creation): limited to staff and resources of partners to Agreement and authority of entities.*

OPTION FIVE

- *Utilize existing special district or public entity to offer contract management and risk reduction products, or other services provided from that entity.*

OPTION SIX

- *Explore utilization of state agency to manage contracts and risk products.*

Possible Member Entities



Shasta County

Or other counties



City of Redding

Or other Cities



Fall River RCD

Or other RCDs



California State Conservancies

Federal Partners



Fire or Water District



Key Innovation: Contract Price Concepts

FORMULA RATE CONTRACTS

- A formula rate is the financial model that uses myriad inputs to calculate a charge or rate, such as the electricity charge per kWh.
- Many of the inputs are fixed but some are variable (cost of capital, depreciation, revenue requirement, interest rate etc.).
- So, typically, on an annual basis, the utility submits any changed inputs to the regulatory body for review and possible approval, in this case a “regulatory body” for the purposes of these contracts must be identified to make this price mechanism work. Such a body should be a public agency to ensure transparency, rationality, and equity

PRICE COLLARS

- Generically, a "collar" is a popular financial strategy to limit an uncertain variable's potential outcomes to an acceptable range.
- In business and investments, a collar agreement is a common technique to "hedge" risks or lock-in a given range of possible return outcomes.
- Effectively, a collar sets a ceiling and a floor for a range of values: interest rates, market value adjustments, and risk levels.



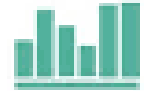
Setting a Formula Rate Price Contract with a Collar: the FRCWC

Combining these two concepts into one contract provision could significantly reduce risk but defining the amounts of financial risk that both parties would understand for the term of the contract, allowing parties to understand the potential for return on investment and understand business model outcomes.

The essential partner with this new provision would be an indemnification provision that would be associated with an insurance product that adequately protected against the risk of the lack of feedstock or disappearance of the biomass offtake business.

Forward Rate Agreement

$$\text{Forward Rate} = R_2 + (R_2 - R_1) \times \left[\frac{T}{T_2 - T_1} \right]$$



Contract Risk Management

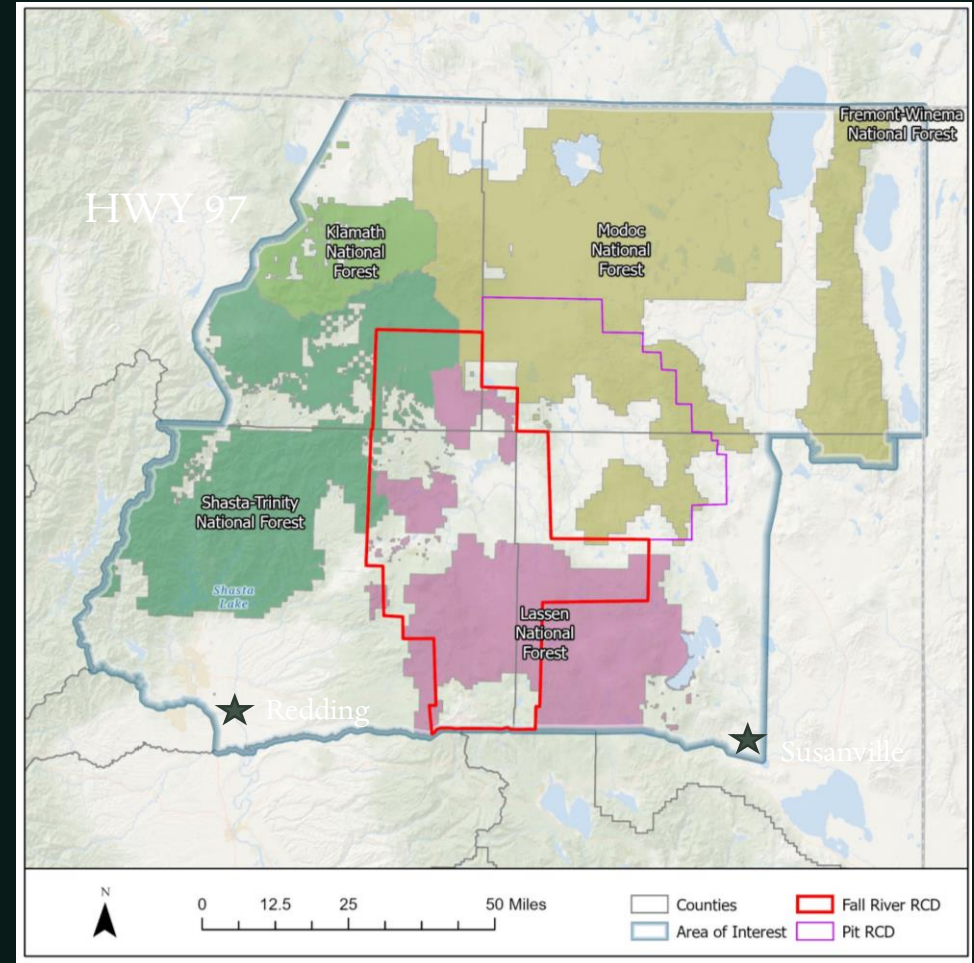
- Buyers and Sellers have high stake in feedstock security
- Indemnification is only as useful as a party to a contract is able to pay
- Insurance tools
- Surety Bonds
- Support from state; department of Insurance, I-Bank, creation of state funding risk accounts through legislation

Who can help create and manage these contracts
and risk reduction tools? A JPA!

Market Capacity Assessment Report

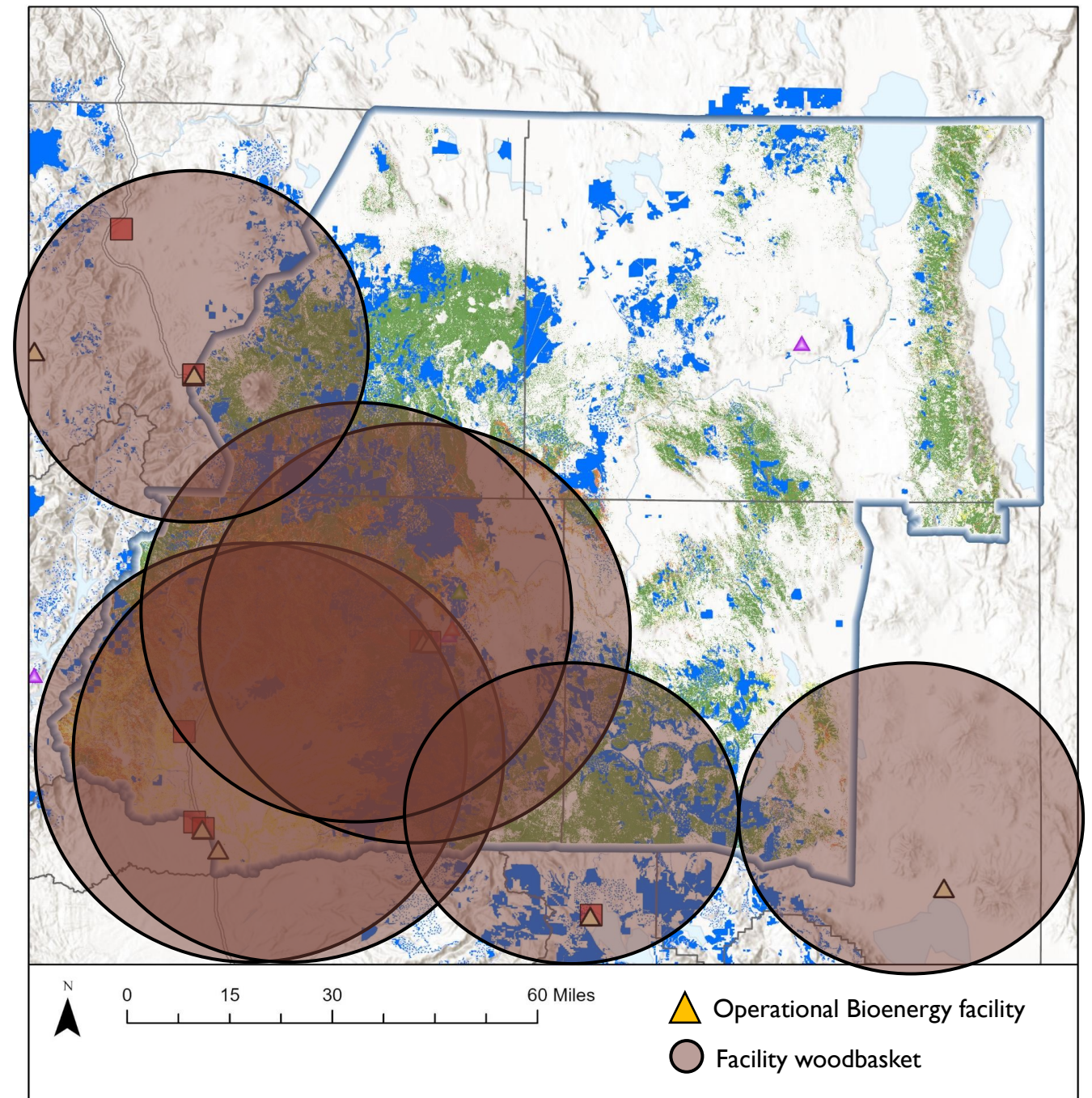
Goals and objectives

- **Goal:** Estimate current business activity and forest-based fiber flow within the region to identify how much additional capacity exists for new and existing wood utilization business development
- **Objective**
 - How much biomass is being generated within the RSA?
 - How much biomass is being utilized within the RSA?
 - How much biomass will there be based on desired treatment levels?



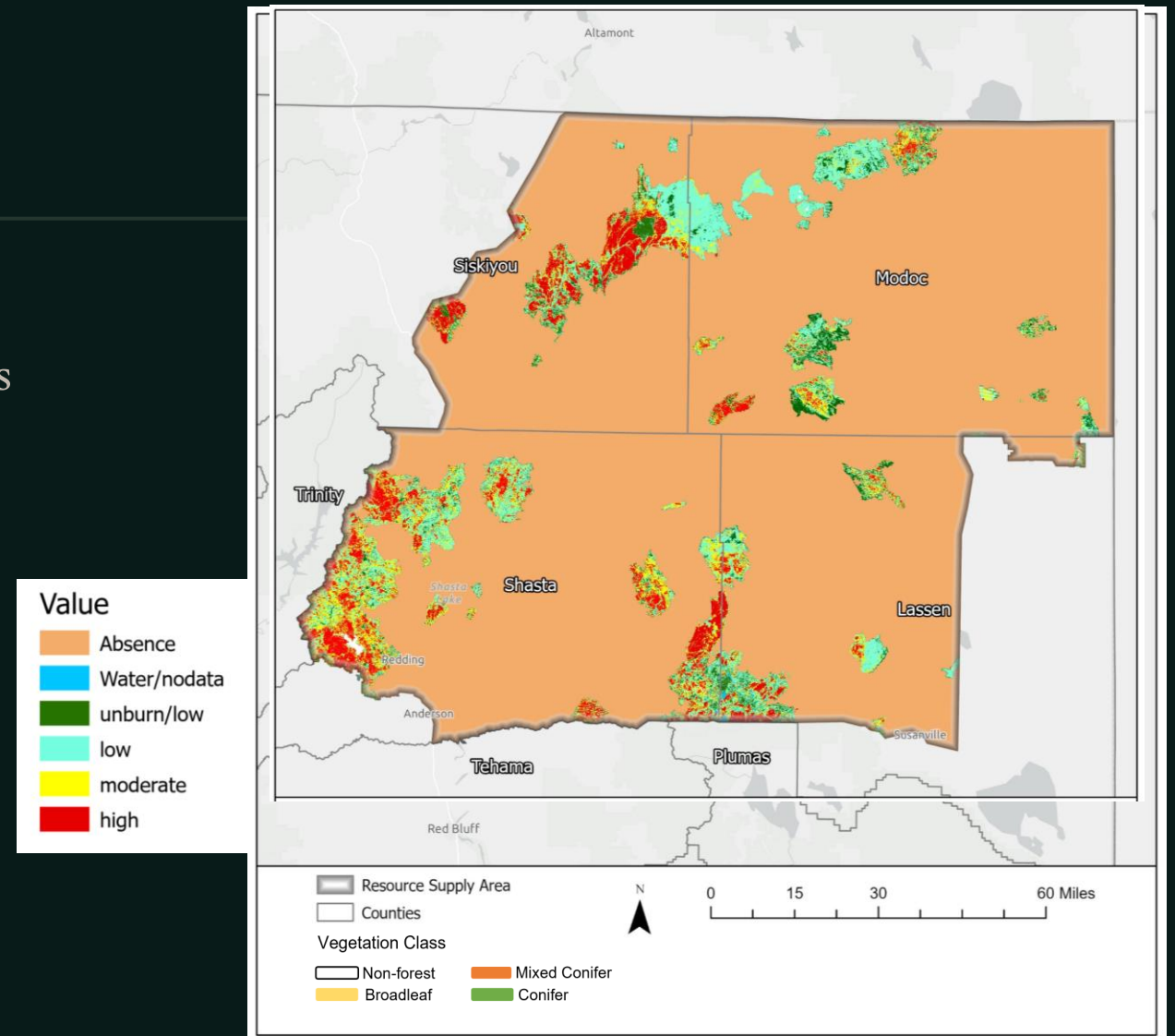
Biomass Availability Overview

- **Gross potential:** estimate without regard to market capacity
- **Potentially available:** estimate based on recorded harvests
- **Practically available (“technically”):** a fraction of potentially available to account for procurement limitations
- **Net available (“economically”):** practically available biomass under no competition from other end-users



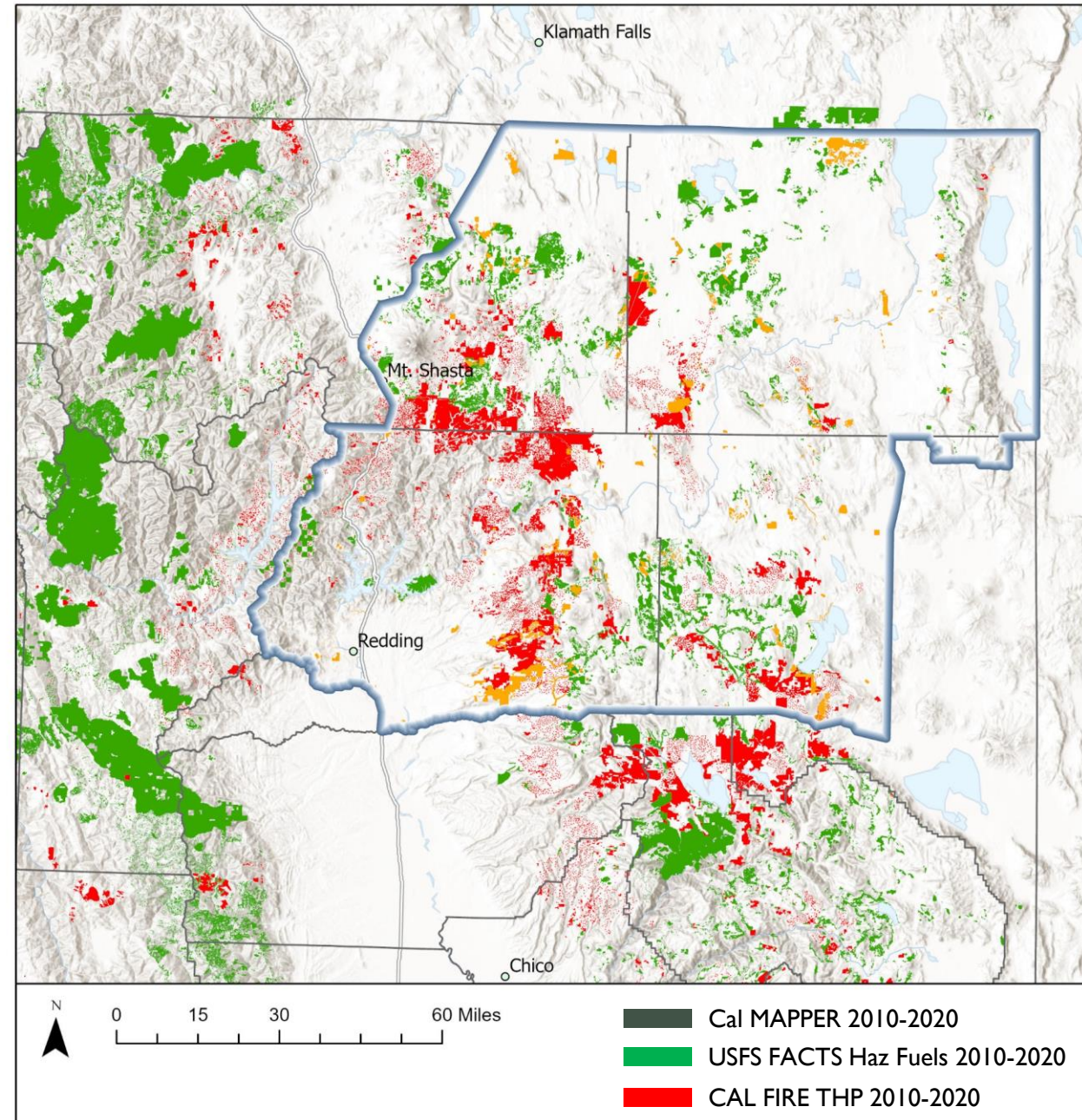
Gross Potential

- Purpose: Summarize forest structure characteristics, and to quantify the amount of biomass along roads in fire-affected areas
- Data
 - Oregon State University Landscape Ecology, Modeling, Mapping and Analysis (LEMMA) – forest structure maps (2017)
 - Monitoring Burn Severity Trends (2017-2021)
- Analysis
 - Suitability analysis for biomass operability
 - Calculate recently burned biomass 100ft from roads, and 101-1000 ft from roads and above 20in diameter at breast height (DBH)



Potentially Available

- **Purpose:** Estimate market capacity through 10-year harvest record
- **Data**
 - BOE Timber Tax and Harvest Yield Schedules
 - CAL FIRE Timber Harvest Plan
 - USDA Forest Service Forest Activity Tracking System (FACTS) Hazardous Fuels
 - CAL FIRE's "CalMAPPER" forest treatment tracking
- **Analysis**
 - Market capacity by area – average acres treated per year
 - Market capacity by volume – average bone dry ton (BDT) generated per year



Practical and Net Availability

- **Purpose:** Apply constraints to biomass delivery and incorporate existing biomass utilization into final volume estimates
- **Data**
 - Interviews with over 17 industry experts, landowners, and facility operators
 - UC ANR Power Plant GIS Database
- **Analysis**
 - Apply 60% conversion factor to potentially available
 - Net available = practically available – existing demand



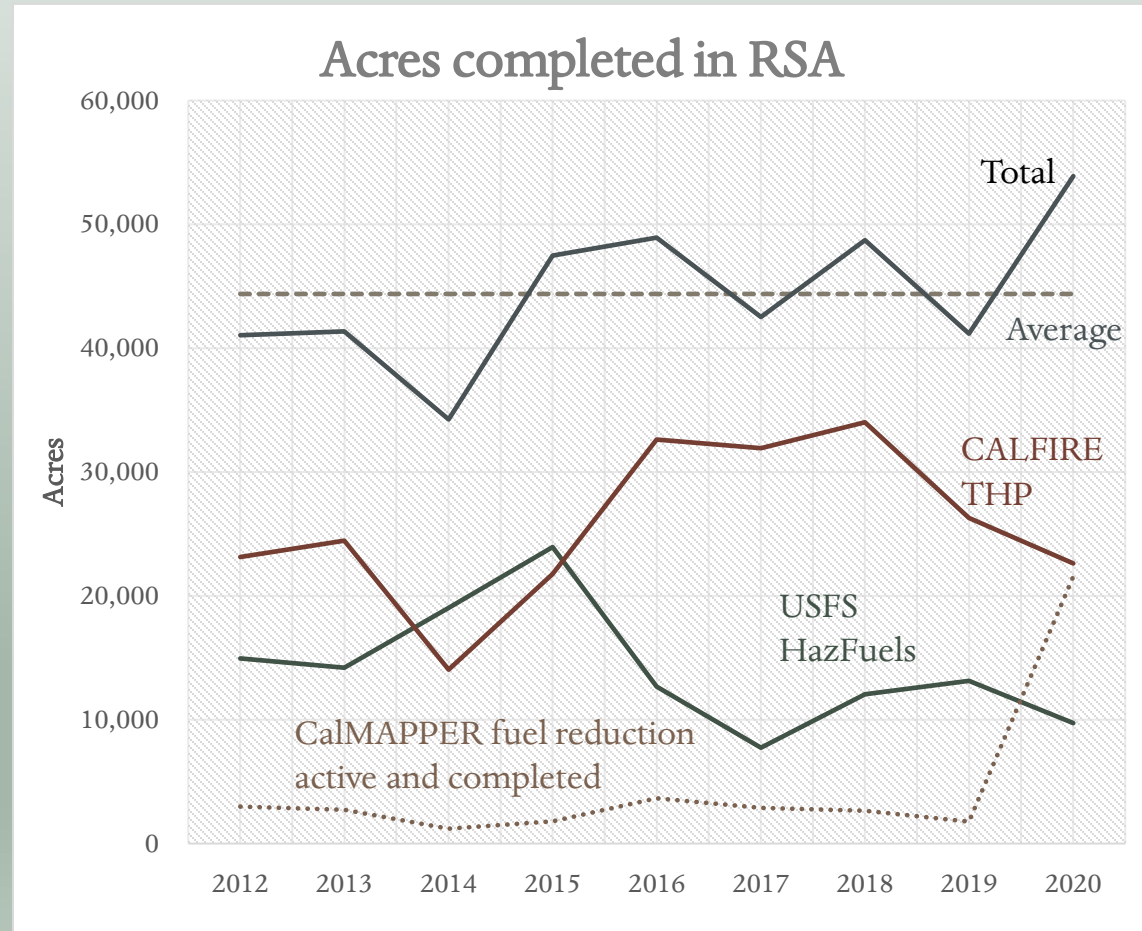
TSS Consultants 2017

Bioenergy	Type	MW nameplate
Burney Forest Power	Bioenergy	31
Honey Lake Power	Bioenergy	31
Roseburg Forest Products Biomass Power	Bioenergy	15
Shasta Sustainable Resource Management	Bioenergy	55
Sierra Pacific Anderson Biomass Power II	Bioenergy	30
Sierra Pacific Burney Biomass Power	Bioenergy	20
Total		182

Results

Market capacity by area

- Average of 44,364 acres are treated per year
- Mostly through private landowners
- Fuel reduction funded through CALFIRE grants are increasing



Annual Forest-based Biomass Practically Available	Totals BDT per year
Harvest residue	206,164
Pre-commercial harvests	-
Fuels reductions and forest health	212,758
Standing dead	
Concurrent with harvests	42,982
Fire salvage - 100ft of roads	47,108
Fire salvage - 101-1000ft of roads	99,947
<u>Practically Available</u>	<u>608,960</u>
Utility vegetation management	12,000
Sawmill residues	519,175
<u>GRAND TOTALS</u>	<u>1,140,135</u>
Reliable basis	938,098 (±46,000)
Existing Biomass Utilization	730,489
Net Availability of unutilized biomass	409,646
Reliable basis	207,609

Practically Available Estimate Summary

- Practically available estimates were subtracted from current biomass utilization capacity
- This does not consider future projections, improved economics, or location of available biomass
- Equivalent to 55 MW

Implications for OPR Pilot project

- An excess of 200,000 BDT reliably generated on a year to year basis
 - More when accounting for irregular and opportunistic estimates of road, powerline, and non-industrial landowners
 - New facility development may need to consider magnifying capacity across the entire supply chain
- A JPA could support managing the quantity, quality, and prices of existing and expected material as more favorable markets develop
- Summer/Fall of 2023 focus on UC Davis FRREDSS model conversion for use to develop biomass price for long term contracts



Next Steps

- Set up meetings with important RCD, County, and tribal leaders.
- Set up meetings with important industry leaders
- Discuss with State and Federal Partners
- Develop financial models to fund a JPA
- Describe what steps would be needed to establish a JPA





MARIPOSA RCD/SIERRA BUSINESS COUNCIL PILOT

Options for Amador, Alpine, Calaveras, Mariposa and Tuolumne Counties



The way to get started is to quit talking and begin doing. ~ Walt Disney

TSS Consultants Work

- feedstock supply availability and cost analysis recently completed
- workforce infrastructure review of the Central Sierra region in progress
- Future work includes:
 - Conduct siting review and feasibility study for value-add utilization yard
 - Review value-add utilization technology options



CLERE Inc Contributions



ASSESSMENT OF PUBLIC ENTITY OPTIONS IN REGION

- Discussion of existing JPAs and special districts
- Analysis of CSD success at Northstar CSD / applications in region
- Discussion about new Climate Resilience Districts
- Consideration of Rural Counties Representatives of California entities

SUPPORT FOR SBC

- Meet with local entities
- Develop plans to further aggregation efforts



Two Special District Entity Models

COMMUNITY SERVICE DISTRICT

- A community services district is a California Special District, a form of local government created by a local community to meet a specific need or needs. Inadequate tax bases and competing demands for existing taxes make it hard for cities and counties to provide all the services or the quality of services their citizens desire. When residents want new services or higher level of services, they can form a special district to pay for and administer them.

CLIMATE RESILIENCE DISTRICT

- With local government participation a climate resilience financing districts can undertake projects and programs to address climate change including wildfire, sea level rise, extreme heat and cold, drought, flooding, and related matters. The districts would be able to raise revenue through tax increment funding, voter-approved supplemental property taxes, property benefit assessments or fees.



Sierra Business Council Work

PRIVATE LANDOWNER ISSUES

Hold a series of in-person and virtual community engagement workshops. These primary objectives will include,

- Build community interest and establish a transparent working relationship with private landowners.
- Develop a larger understanding of key issues through engagement with private property landowners.
- Identify barriers to procurement of woody feedstock from private lands, including consideration of UC online landowner tools

ENGAGEMENT WITH EXISTING LOCAL AGENCIES

- Engage with Local Counties and Cities about their interest in solving this issue and participating in public entity solution
- Do further outreach with active Tuolumne business community
- Contact JPA entities and other special districts about their capacity and interest:
 - Central Sierra Economic Development District
 - UMRWA Upper Mokumne River Watershed Authority



PCWA Pilot Overview

Nevada, Placer and El
Dorado Counties

Placer County Water Agency Pilot



WATER AGENCY FOREST HEALTH REPORT *COMPLETED*

- Collaborate agencies in forested regions; Yuba Water Agency, Calaveras County Water Dist. and East Bay MUD, as well as El Dorado Irrigation District, El Dorado County Water Agency, North Tahoe Public Utility District, and North Star Community Services District, to gather and compile information that could contribute to concepts supporting water agencies advancing forest health and biomass utilization.

PUBLIC ENTITY OPTIONS REPORT *IN PROGRESS*

- Research whether the inclusion of a state entity on the board of a theoretical JPA will permit the JPA entry into Good Neighbor Authority Contracts with the USFS
- Provide a roadmap for how a non-profit entity could serve on the board of a theoretical JPA.
- Investigate whether or not biomass from privately held lands undergoing vegetation treatment within the TCSI program and those that are not a part of TCSI, are interconnected within the feedstock supply chain and the barriers and opportunities unique to them that could be solved with public entity management.

COMMUNITY COLLABORATION REPORT *IN PROGRESS*

- Provide a review and update of the SNC's report on TCSI ("Waypoints on the Road to Resilience: Considerations for the Sierra Nevada Conservancy") regarding recommendations for the application of TCSI principles to increase pace and scale of forest restoration and wildfire risk reduction work. **(Completed)**
- Building upon the SNC's report, initiate robust TCSI stakeholder engagement and work together to explore strategies to increase the amount of residual biomass removed from forest health and fuel reductions projects and create a report summarizing recommendations related to future biomass management

Pilot Project Site

- PCWA owns land in Ophir California which they contemplate for placement of biomass utilization
- Currently exploring possibility with County of Placer for permitting
- Amendment of OPR Scope of Work to explore engineering options and limitations with Black and Veatch Co.,
- In extended discussions with new biomass conversion technology:



We designed our system from a clean sheet, optimized for resource circularity and giga-scale impact (removing billions of tons of CO₂ from the atmosphere every year). Leveraging advanced manufacturing and process optimization, our bioenergy system is in a class of its own

Other Two Pilot Activities

NORTH COAST REGION

- The Watershed Research and Training Center (WRTC) has been hired by North Coast Regional Partnership (NCRP) through Humboldt County
- Competitive RFP process to award up to three pilot projects to test various scales of feedstock aggregation
- Focusing on small non-industrial landowners and opportunities for tribal leadership
- Initial outreach to broad array of regional stakeholders has begun

MARIN COUNTY

- Spatial Informatics Group lead consultant providing GHG analysis of biomass conversion efforts
- TSS Consultant providing similar feedstock work
- TSS and Wildephor providing technology assessment options for utilization of biomass
- CLERE Inc providing recommendations on policy and legal avenues to achieving utilization based on feedstock and technology assessment
- Amendment will cover more work on private landowner UC online tool

Thank you

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