

Paying For Forest Health: Improving the Economics of Forest Restoration and Biomass Power in California

Presentation to the California Ad Hoc Biomass Working Group

May 20, 2020

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Topics and Flow




- Why the Sierra Institute for Community and Environment?
- The problem and key issues
- Improving forest health through biomass Utilization
- Biomass Power (SB1122)
- “The “campus” approach to wood Utilization
 - Multi-product development and revenue streams
- Payment for Ecosystem Services (PES) to pay for restoration
- Carbon capture—Carbon neutral California by 2045

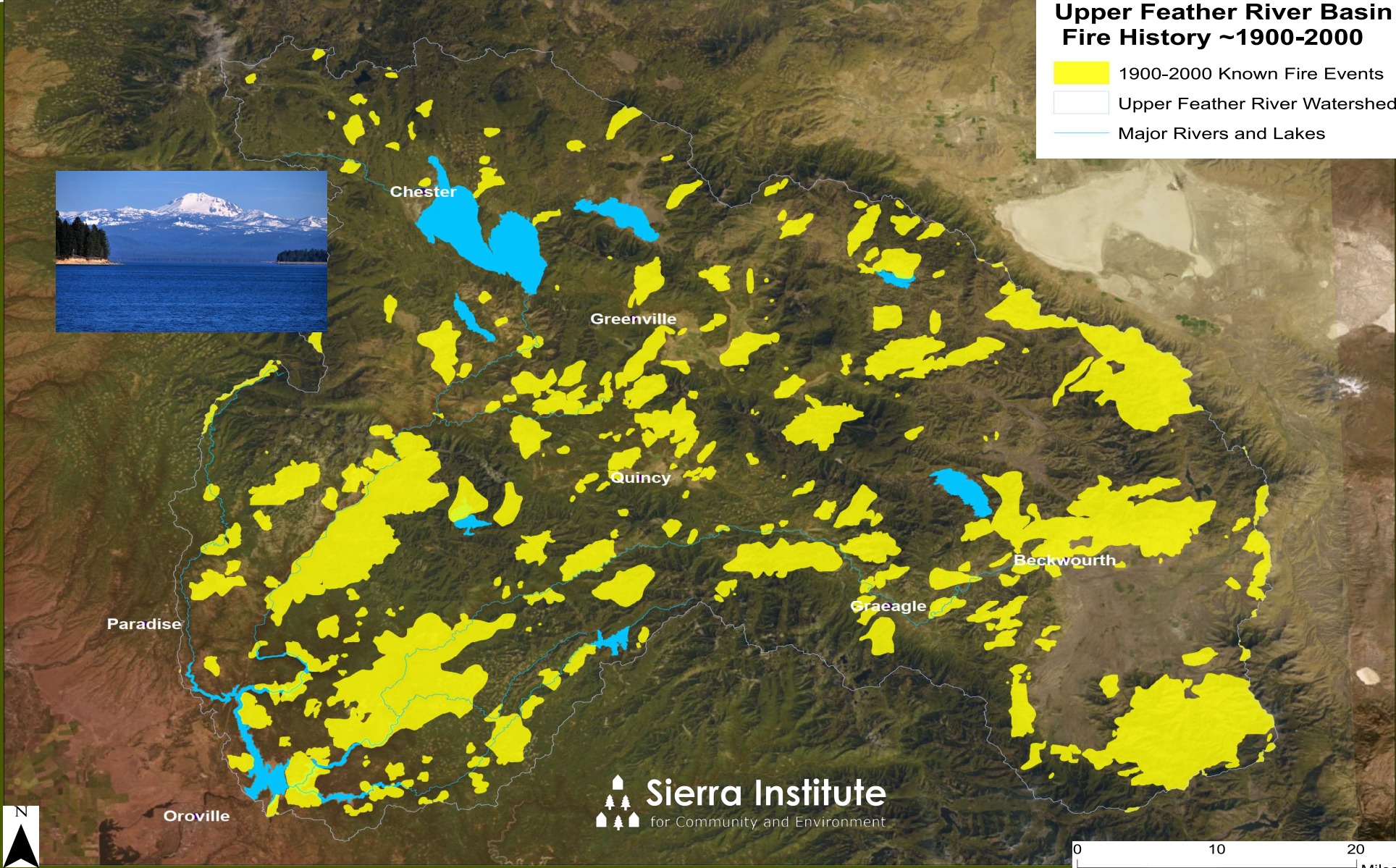
Plumas County: Rural and Heavily Forested, and a Vital Watershed



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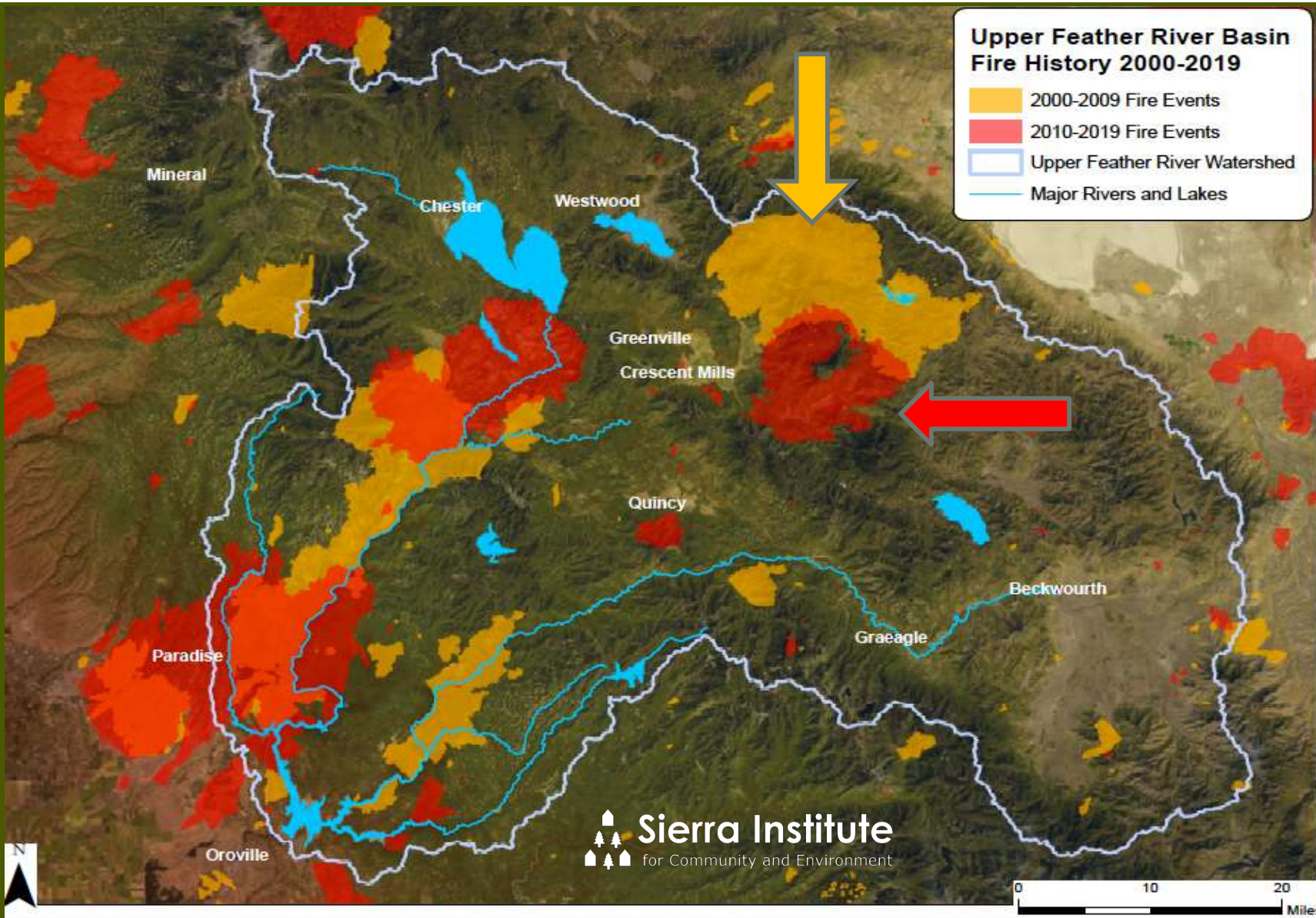
Upper Feather River Basin Fire History ~1900-2000

-  1900-2000 Known Fire Events
-  Upper Feather River Watershed
-  Major Rivers and Lakes



Upper Feather River Basin Fire History 2000-2019

- 2000-2009 Fire Events
- 2010-2019 Fire Events
- Upper Feather River Watershed
- Major Rivers and Lakes



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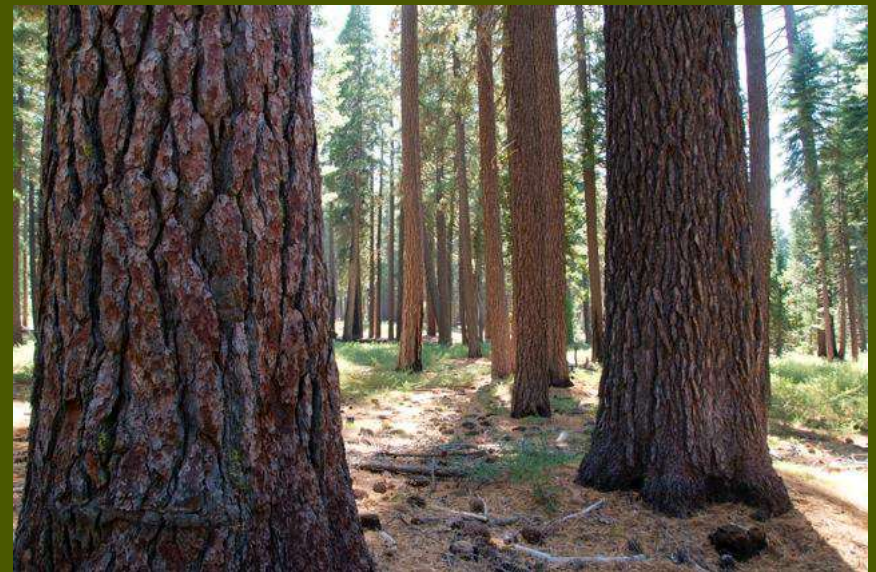
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Thinning and Pile Burning

Value of Increasing Wood Utilization

- Reduce the risk of wildfire
- Improve forest and watershed health
- Improve air quality, reduce black carbon emissions
- Revitalize the wood products industry, create jobs
- Reduced reliance on fossil fuels
- Stabilize heating costs



Forest and watershed restoration in California will not succeed without investment in wood utilization technologies and development of markets that increase the value of low value wood products.

Senate Bill 1122 and the Bioenergy Market Adjusting Tariff Program

BioMAT

3 MW*

Investor Owned Utilities must buy power
PG&E, Southern California Edison,
San Diego Gas & Electric

Some Barriers to Development

High capital costs relative to size

Securing investment in poorer rural areas

Securing long-term fuel supply agreements

Availability of suitable sites

(brownfield liability issues)

PG&E Bankruptcy

High capital costs and a dearth of investors

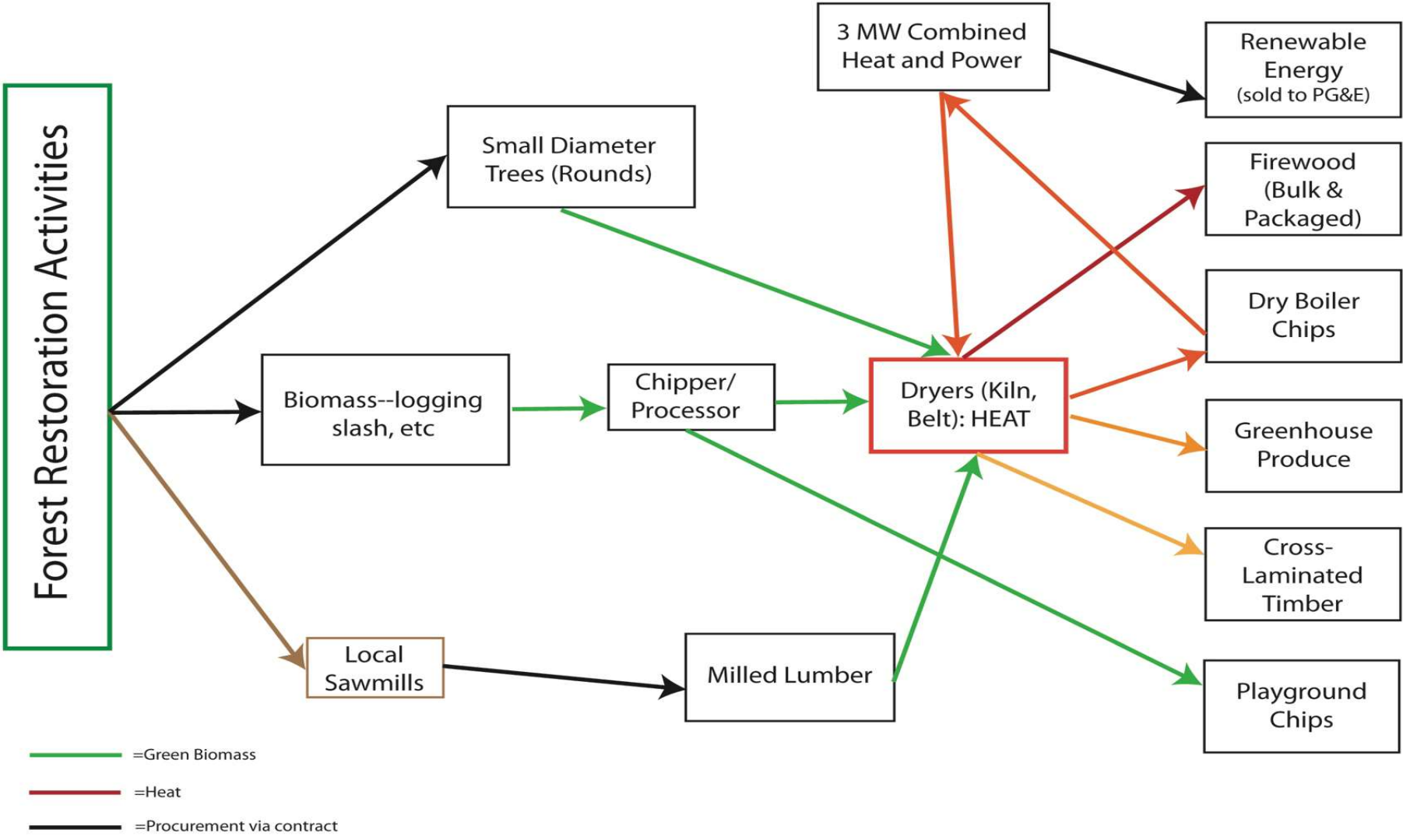
Sierra Institute's Wood Product Campus

Co-Product Development and Integrated Product Yards

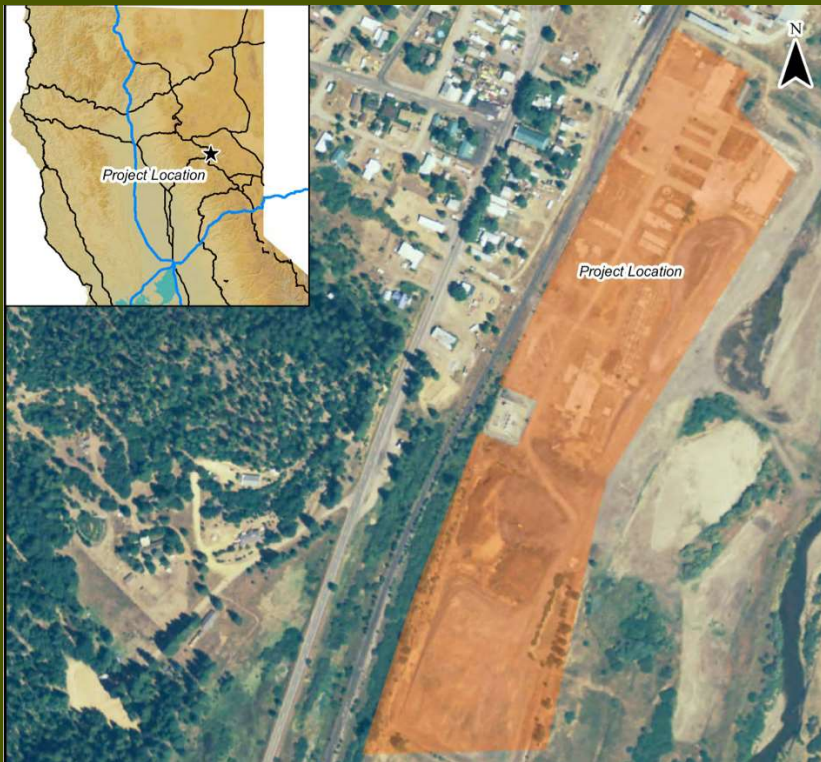
- Woodchips (beyond electricity)
- Firewood
- Post and Poles
- Wood Pellets
- Wood Shavings
- Greenhouse
- Biochar



Indian Valley Wood Products Campus Process Flow Diagram



Former LP mill site redevelopment— Crescent Mills / Indian Valley Campus



2018



Cleanup in progress 2019



Launching the first business: Chip production





Cross laminated timber building construction—December 2017



Full building
erected in two
days.



Successful Wood Utilization Campus Projects Elsewhere

<p>Integrated Biomass Resources^{13,14}</p>	<p>OR</p>	<p>Wallowa</p>	<p>Operational</p>	<p>0.5</p>	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Firewood 2. Condensed energy heat logs 3. Round wood (poles for orchard and vineyard stakes, trellising hoops, or fences) 4. Lumberjacks / vegetation management <p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Wood recycling: Chips, mulch etc. 2. Animal bedding, 	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Kiln-dried firewood, <p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Biochar 2. Soil Amendments 3. Renewable Gas <p><u>Potential:</u></p> <ol style="list-style-type: none"> 1. Greenhouse 2. Aqua energy crop research
<p>ReVenture Park¹¹</p>	<p>NC</p>	<p>Charlotte</p>	<p>Operational</p>	<p>3.5</p>	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Adjacent to several sawmills and close access to urban waste 	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Custom soil blending
<p>Biomass One¹²</p>	<p>OR</p>	<p>White City</p>	<p>Operational</p>	<p>30</p>	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 2. Landscaping materials (compost, bark, wood chips etc.) 3. Tub Grinder for rent 4. Wood debris yard and debris bins 	<p><u>Confirmed:</u></p> <ol style="list-style-type: none"> 1. Custom soil blending

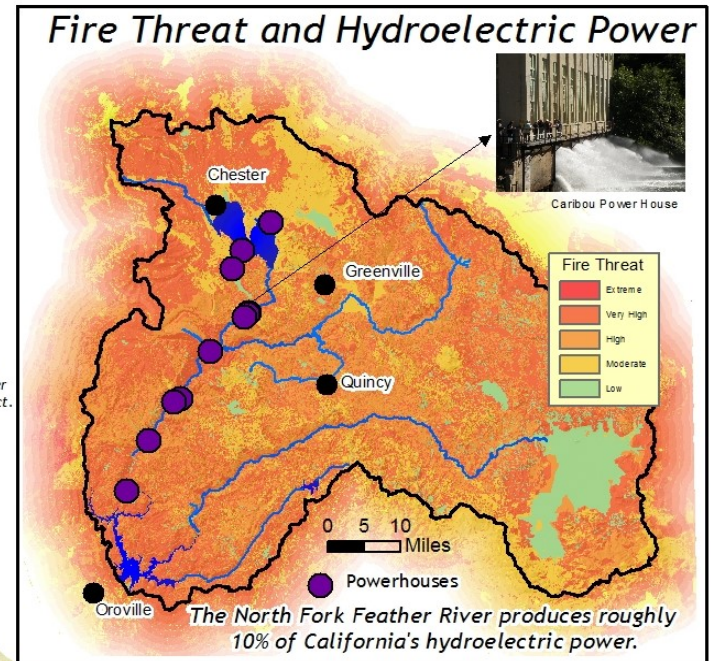
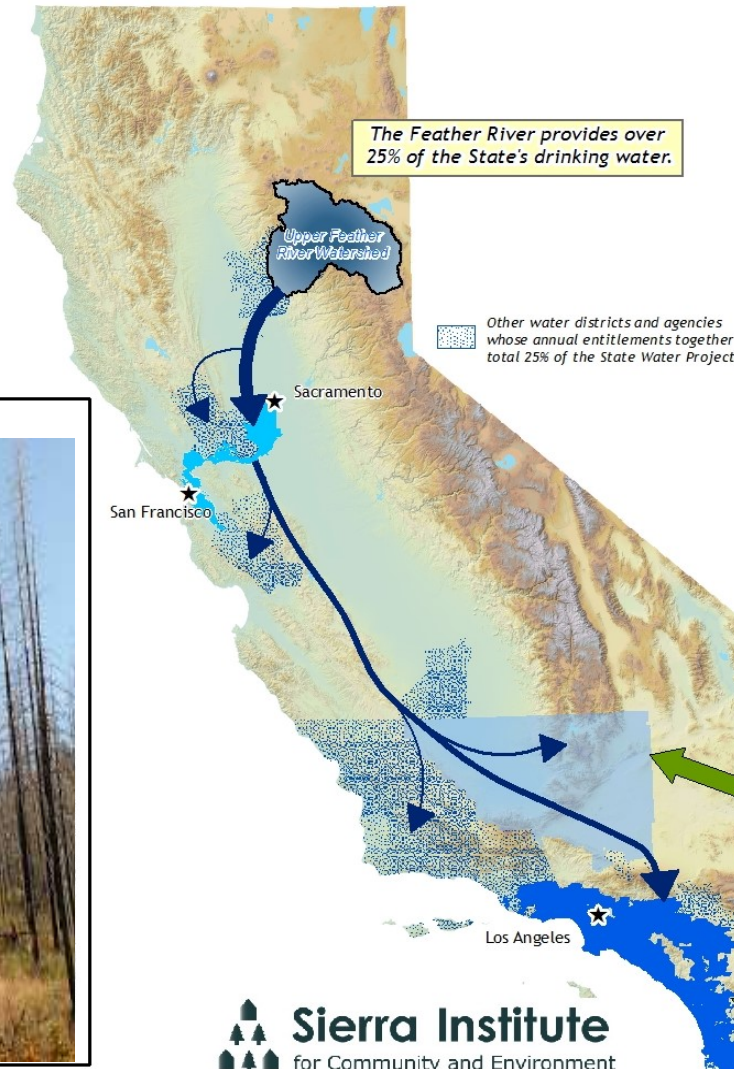
MW

The Upper Feather River: *Fire, Water Supply, and Energy*

The Upper Feather River Watershed is roughly the size of Yellowstone National Park and fills the principal water storage facility for the State Water Project.

Since 1960, annual flows have decreased by 400,000 acre-feet.

State Water Project deliveries vary from year to year based on supply, but annual entitlements total 4.1 million acre-feet.



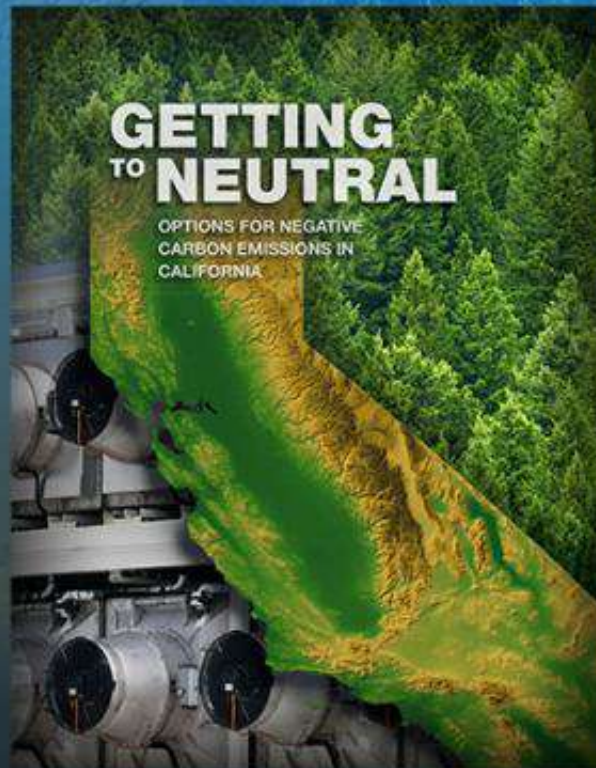
Forests and Fires



The Kern County Water Agency and the Antelope Valley - East Kern Water Agency have annual entitlements for 25% of the State Water Project (1 million acre-feet).

The Metropolitan Water District has an annual entitlement of 50% of the State Water Project (2 million acre-feet).

Value of Increasing Wood Utilization



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Thank you!

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Select Technology/Developer

Secure a fixed price contract
guaranteed production level

Secure a PPA: Conduct system impact study;
enter queue; strike

Secure 10 years of supply

Develop the financial Stack: grants, loans,
investors