

# RIGHT SIZING FACILITIES TO MEET FOREST RESTORATION OBJECTIVES



**Smallwood 2012**

**Flagstaff, Arizona**

**May 2, 2012**

# Presentation Overview

- Introduction
- Byproducts of Forest Restoration
- Fundamentals of a Resource Availability Assessment
- Case Study: Upper Feather River Watershed
- Key Issues to Consider



# Challenges and Opportunities

- Risk of catastrophic wildfire is extreme throughout much of the Inland West.
- Expense to treat forest landscapes at risk is very high.
  - Ranging from \$200 to \$2,500/acre.
- Unemployment in rural communities is very high.
- Value-added utilization of restoration byproducts may:
  - Generate enough revenue to offset some of the restoration costs.
  - Employ local residents.
- Selection of optimized blend of value-added uses matched to the fuel/feedstock available is key.

# Forest Restoration Byproducts

- Small logs
  - 6" to 14" diameter
- Micro logs
  - 2" to 5" diameter
- Limbs/tops
- Brush



## Examples of Current Value-Added Uses

- Lumber
- Power Generation/Thermal Heat Recovery
- Firewood
- Composite Panels
- Posts and Poles
- Landscape Cover/Soil Amendment
- Animal Bedding
- Fuel Pellets
- Other Stuff

## Target Study Area

- Define resource availability – Target Study Area based on economic haul distances required to source fuel/feedstock.
- Typical radial distances from the targeted site are 30, 50, 75, or 100 miles.
  - Radial distance is generally set based on forecasted haul costs and market value of commodities produced.

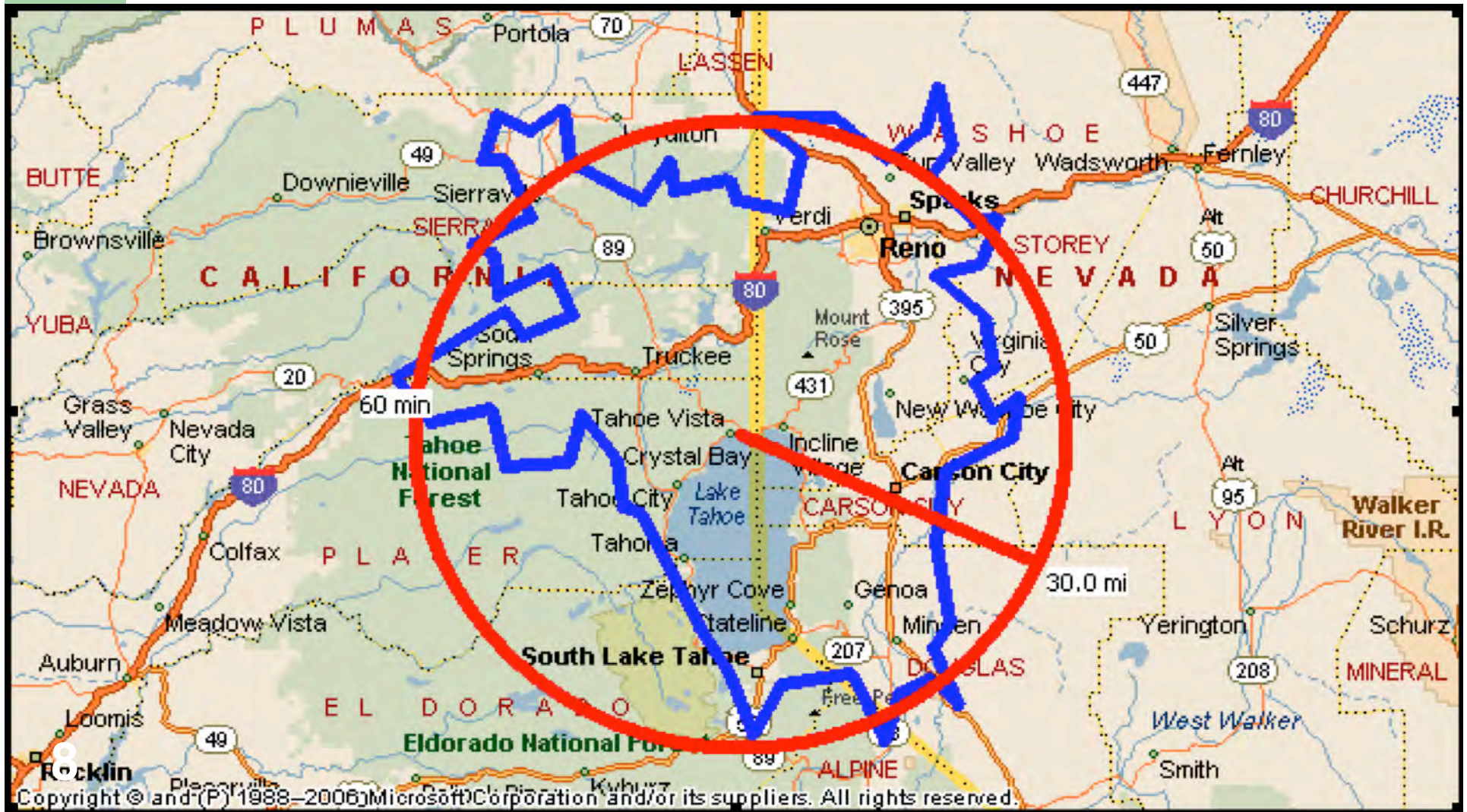


# Confirm Types of Fuel/Feedstock That Meet Project Specifications

- **Forest**
  - Forest operations (fuels reduction, timber harvest residuals)
  - Forest manufacturing byproducts (sawdust, bark, shavings)
- **Agricultural**
  - Byproducts (orchard removals, prunings, shells)
  - Dedicated crops (poplar, willow, eucalyptus, switch grass)
- **Urban**
  - Tree trimmings, general wood waste
  - Clean construction & demolition wood

# Target Study Area

## Kings Beach, CA Project





# Resource Availability Assessment Filters

Three filters used to confirm availability of fuel/feedstock resource:

- **Potential** – Gross estimate.
- **Technical** – More refined based on physical recovery and resource policy factors.
- **Economic** – Very refined using current competition/demand, potential competition, community support and actual costs to harvest, collect, process and transport.

# Current and Potential Competition

- Assess current and potential uses/competition for fuel/feedstock.
- Examples include:
  - Forest products manufacturing facilities.
  - Bioenergy plants.
  - Composite panel manufacturing.
  - Soil amendment/landscape cover.
  - Fuel pellet facility.

# Key State and Federal Policies

- Review policies that may impact fuel/feedstock availability and pricing. Some may only be available for defined periods or are currently being considered:
  - Federal
    - Stewardship Contracting Re-Authorization (2012 Farm Bill)
    - Biomass Crop Assistance Program
  - State
    - Oregon - HB 2210 Tax Credit
    - California - SB 2390 Funding for fuels reduction

# Feedstock Supply Assessment – Key Factors

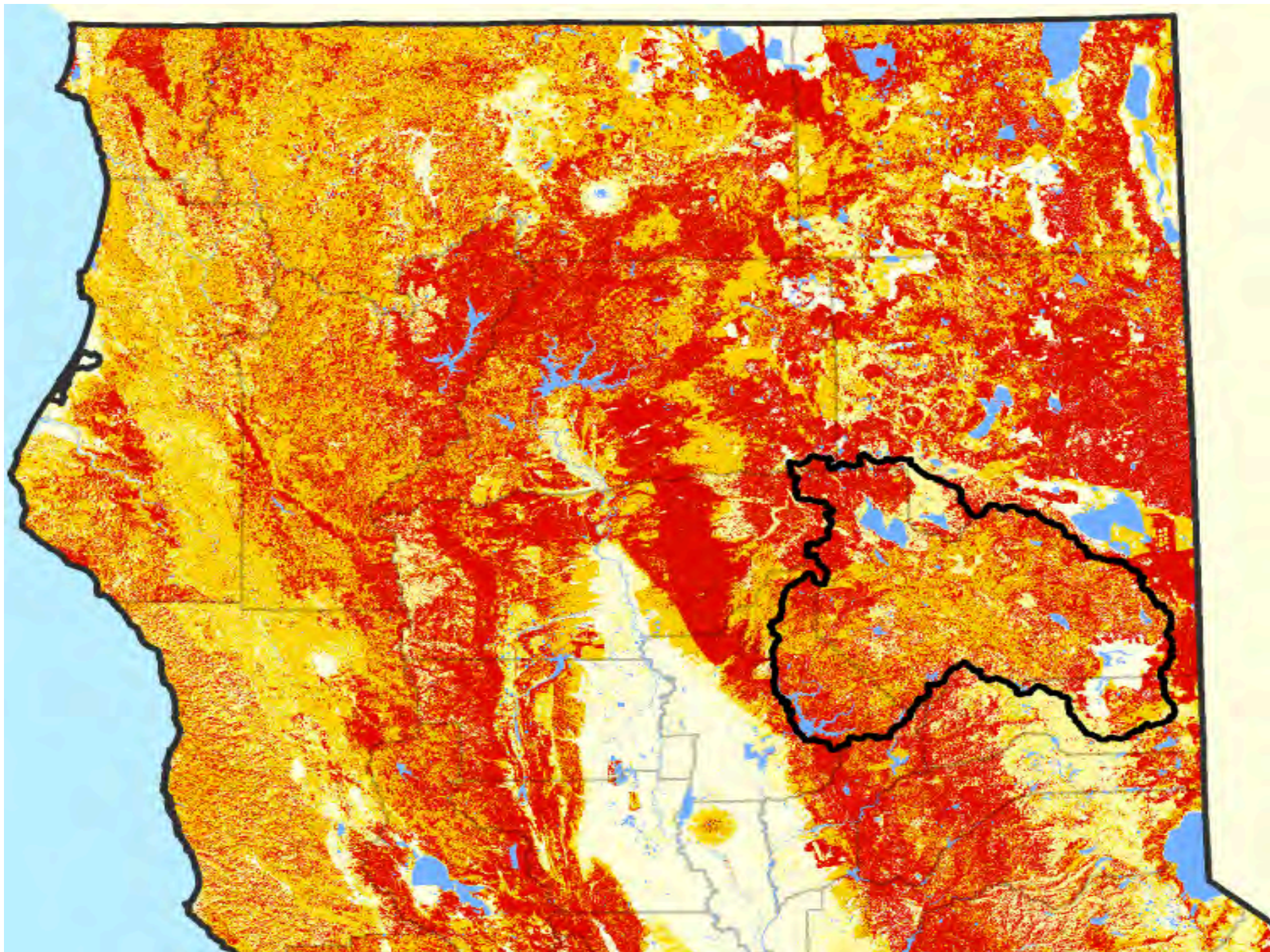
- Feedstocks meet project specifications.
- Sustainable long term supply located within close proximity (30 to 125 mile radius).
- Economically available: collection, processing and transport (accounting for current/potential competition, state/federal policies).
- Available in quantities and from diverse financially viable sources that support project financing:
  - Minimum 10 year supply, 50% - 70% under contract.
  - At least 2.5 - 3 times facility usage (supply coverage ratio).



## ***TARGET STUDY AREA***





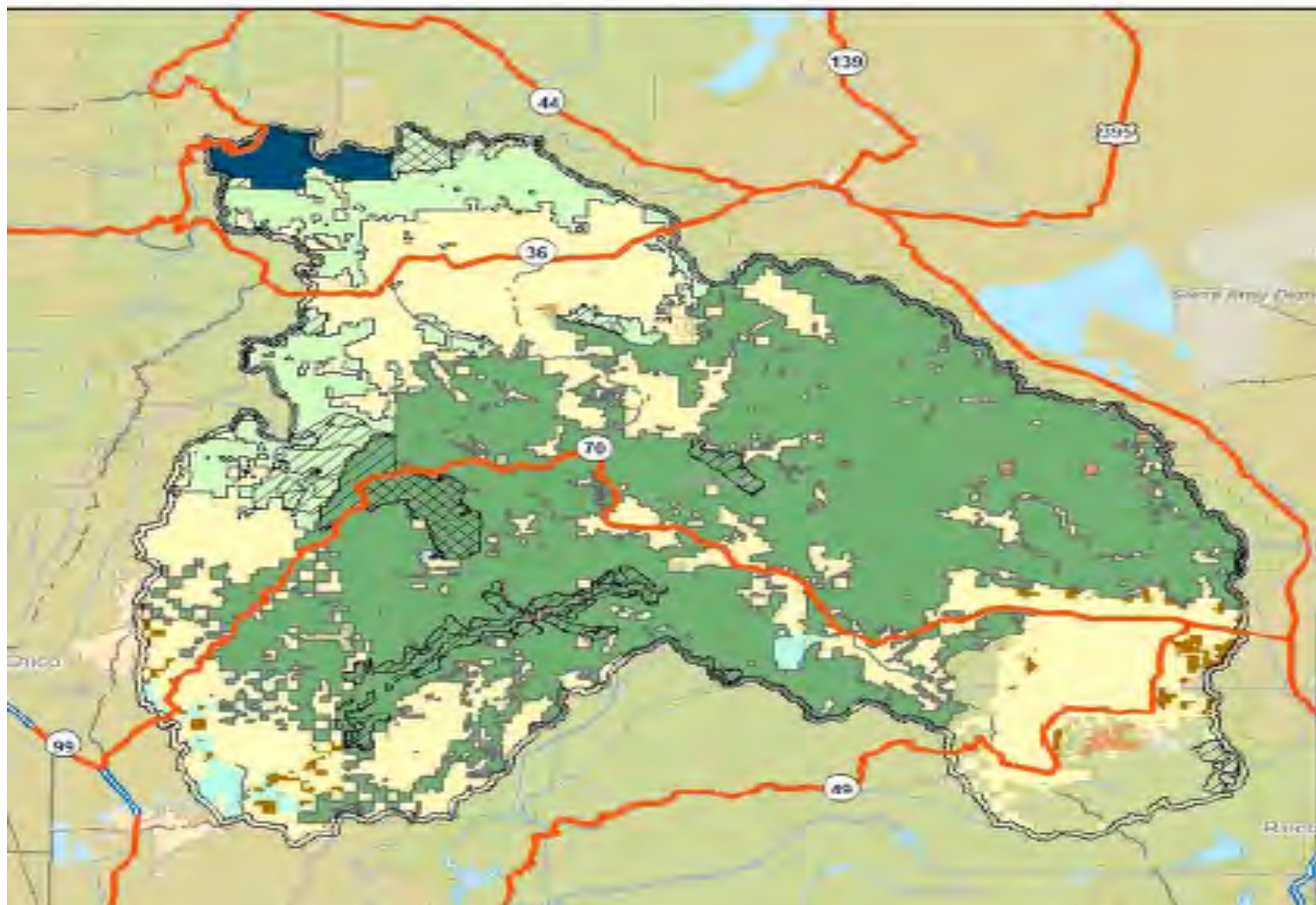




# Current Forest Biomass Value-Added Uses in the TSA

- Lumber
- Power Generation/Waste Heat Recovery
- Firewood
- Rustic Furniture
- Gifts/Specialty Items
- Landscape Cover/Soil Amendment
- Log Homes

# ***TSA OWNERSHIP***





# Forest Cover and Ownership in the Upper Feather River Watershed

LAND OWNER/ MANAGER	FORESTED ACRES	PERCENT OF TOTAL
Bureau of Land Management	2,486	0.2%
California Department of Fish & Game	415	0.0%
California Department of Parks & Recreation	10,850	0.7%
California State Lands Commission	4,123	0.3%
Private	537,914	33.9%
USFS (Net)	1,029,714	64.9%
<b>TOTALS</b>	<b>1,585,502</b>	<b>100.0%</b>

# Transportation System Field Trials

- A four day field trial was conducted to field test innovative chip transport technologies:
  - Stinger Steer Chip Trailer
  - Short Chip Trailer









# Forest Biomass Availability in the Upper Feather River Watershed

BIOMASS SOURCE	LOW RANGE (BDT/YEAR)	HIGH RANGE (BDT/YEAR)
Timber Harvest Residuals	81,120	109,750
Fuels Treatment/ Restoration/ Timber Stand Improvement Activities	51,250	96,250
Fuels Treatment Activities – Fire Safe Councils	550	1,150
<b>TOTAL</b>	<b>132,920</b>	<b>207,150</b>

## Potential Value-Added Utilization Sites in the Region

- Transport cost is the most significant expense when removing biomass from forested landscapes. Location relative to the forest biomass source matters.
- Strategic location of optimized sites were reviewed. Interviews conducted and a site attribute matrix generated. Using this matrix 11 sites were considered and ranked.

CANDIDATE SITES	OWNERSHIP	RANK
GREENVILLE Cheney #2	Indian Valley Community Service District	1
CRESCENT MILLS (FORMER LP SAWMILL)	Cinderlite Trucking	2
EASTERN PLUMAS HEALTH CENTER	EPHC	3
CRESENT MILLS	1 <sup>st</sup> Crescent Capital, LLC	4
SLOAT #1	SPI	5
SLOAT #2	Jon Valdez	6
TWAIN	Delbert and Donna Lehr	7
GREENVILLE SETZER #1	Mary Anson	8
GREENVILLE SETZER #2	Tucker Wilson Trustee	9
INDIAN VALLEY LUMBER	David Schramel	10
CRESCENT MILLS (COUNTY OWNED)	Plumas County	11

# Crescent Mills Site CHP

- Small scale 3 MW, combined heat and power facility.
- Gasification technology considered.
- Capital costs of \$11.9 M.
- Range of fuel prices used for sensitivity analysis.





# Portola EPHC Thermal Energy Facility

- Existing thermal energy system are older diesel fired boilers.
- Average cost to own/operate existing systems is \$26.68/MMBtu.
- Cost to own/operate biomass thermal system is \$21/MMBtu.
- Capital costs are \$845,000.
- Design and engineering around \$150,000.



# Project Right Sizing – Deal Killer Issues to Consider

- Fuel/Feedstock Supply
- Community Support
- Project Economics
- Current Markets
- Financing
- Siting/Infrastructure & Permitting



# QUESTIONS, HECKLING REMARKS?



Tad Mason, CEO  
TSS Consultants  
Rancho Cordova, California  
916.266.0546  
[tmason@tssconsultants.com](mailto:tmason@tssconsultants.com)  
[www.tssconsultants.com](http://www.tssconsultants.com)