Update on Implementation of the Bioenergy Action Plan

Forest Bioenergy
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Bioenegry Action Plan Goals

- Increase environmentally and economically sustainable energy production from organic waste.
- Encourage development of diverse bioenergy technologies.
- Create jobs and stimulate economic development, especially in rural regions of the state.
- Reduce fire danger, improve air quality, and

2012 Biomass Action Plan State Agency Actions

Action 1-Increase Sustainable Utilization of Biomass

Action 2-Increase Research, Development and Demonstration of Bioenergy Technologies

Action3-Addressing Permitting, Regulatory, Statutory, and Utility Interconnection Challenges

Action 4-Incentivize and Monetize the Benefits of Bioenergy

Participating State Agencies

Natural Resources Agency
Environmental Protection Agency
Air Resources Board
Department of Food and Agriculture
Public Utilities Commission
Energy Commission
Department of Forestry and Fire Prevention
Department of Resources Recycling and Recovery
Central Valley Regional Water Quality Control Board
Biomass Collaborative
Sierra Nevada Conservancy

BAP Action 1-Actions to Increase Sustainable Utilization of Biomass

1.1-Forest Biomass harvested for Wildfire Fuel Reduction

- 1.1.1-Identify and promote small scale bioenergy projects (CNRA, SNC, CAL FIRE, CEC)
- 1.1.2-Identify fire threat maps to power line infrastructure (CPUC,CAL FIRE, USFS, SNC)
- 1.1.3-Outreach to landowners on regulatory options to promote fuel hazard reduction (CAL FIRE, CNRA, USFS, CEC,ARB)

1.2-Sustainability standards for Forest Biomass Feedstock (CAL FIRE, CNRA, USFS, ARB)

1.3-Public Education and Outreach (BOF, CAL FIRE)

1.6-Biomass Resource Assessment Update (CEC, CNRA, CAL FIRE)

Background

Sources of Forest Biomass include logging slash, lumber mill wastes, small non-merchantable logs and shrubs

Policy Issues

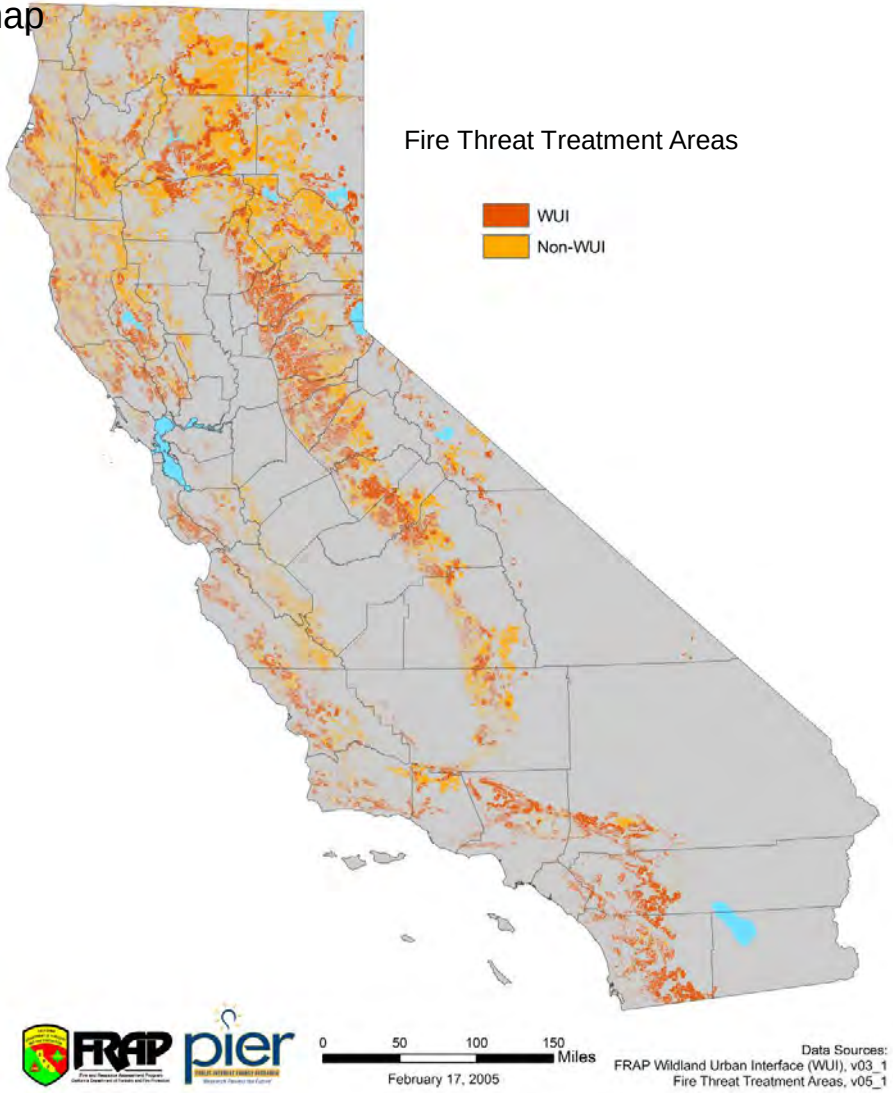
- Reduced wildfire impacts to public health and safety (Public Resources Code, CA Fire Plan)
- Renewable Energy from Biomass Resources (RPS - SB107, 2006 and SB1078, 2002)
- Carbon sequestration - for mitigating global climate changes (AB32, 2006; AB1504, 2010)

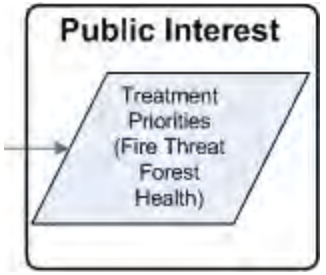
Public Benefits

- Improve air quality (fewer fire emissions)
- Reduce net carbon emissions
- Create fire safe communities
- Promote healthy, resilient forests
- Produce lumber, energy and other products

Treatment Priorities

Example treatment priorities map

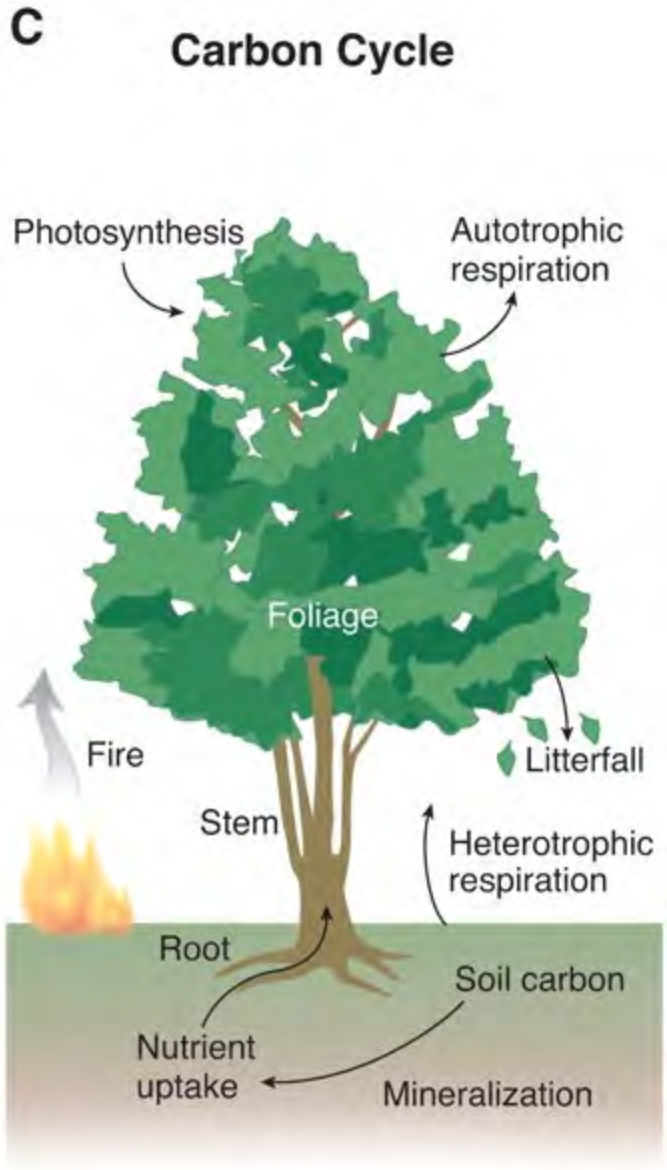




Estimates for treatment priorities are reported within hauling distance

Potential Priority Areas

- Fire Threat
- Forest Health
- Insect and Disease Risk



Forest Biomass Pools

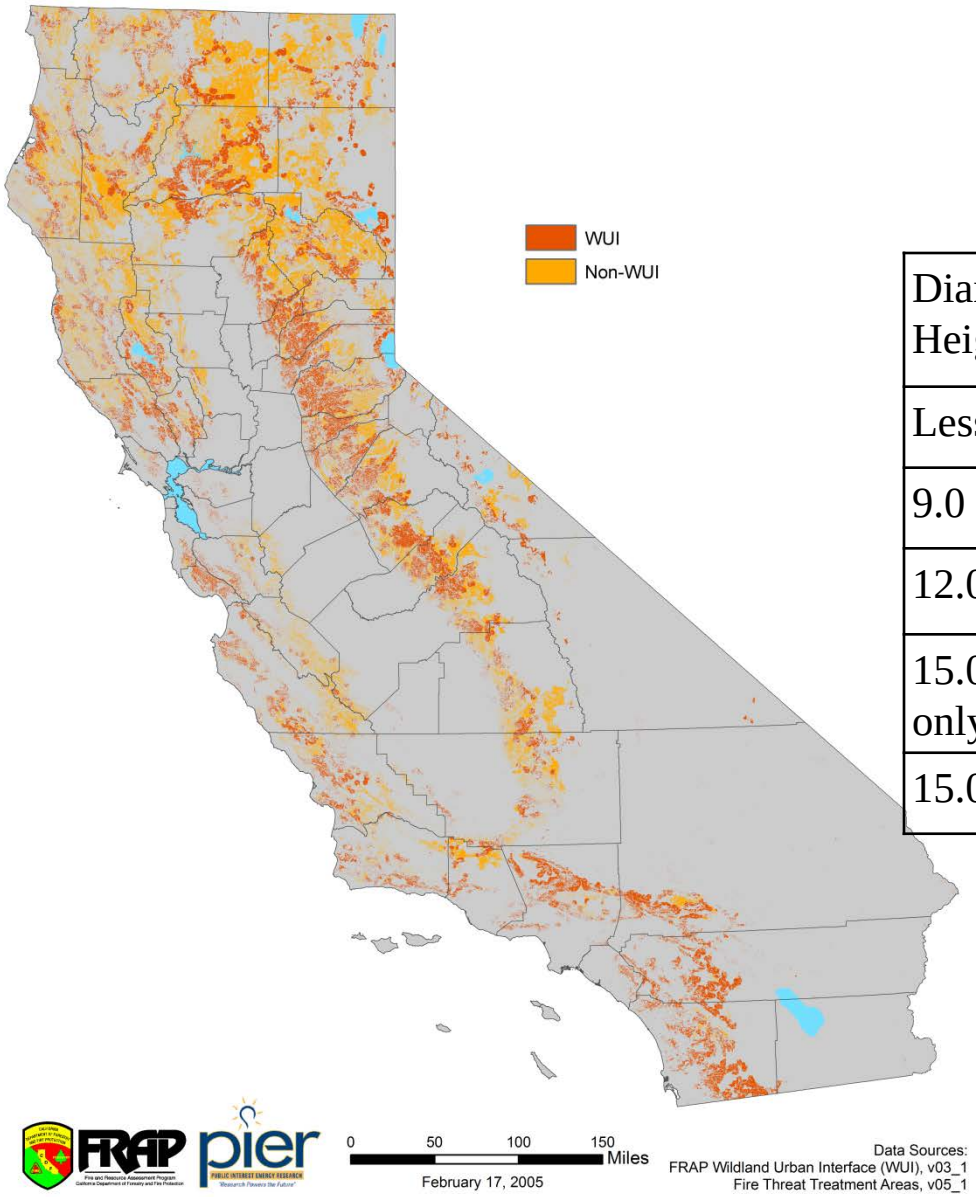
- Bole (trunk)
- Branch and Leaf Foliage
- Roots
- Down Woody Debris
- Soil Organics

Forest Biomass Sources

- Logging Slash
- Mill Wastes
- Forest Thinning operations
- Fire Threat Reduction Treatments (Forest and Shrub biomass potential)

G. B. Bonan Science 320, 1444 -1449 (2008)

Modeled Fire Threat Treatments



Diameter (inches) at Breast Height	Tree Volume Removed*
Less than 9.0	90%
9.0 -11.9	50%
12.0 –14.9	20%
15.0 and greater (private land only)	5%
15.0 to 29.9 (national forests)	5%

- Example Fire Threat reduction treatment (above) modeled every 25 years on private lands and 50 years on Federal lands

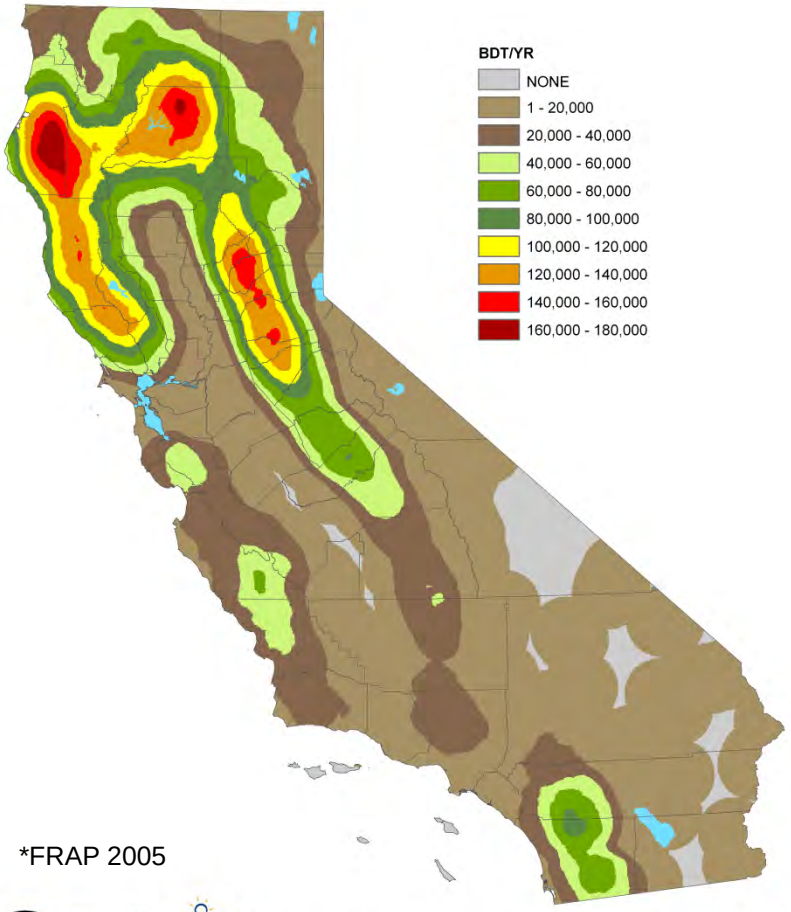
Untreated and Treated

Table 17. Annual biomass opportunity as new product source for energy production in FTTA (BDT/y, MWe, MWh/y)

Energy factor	Owner	Forestry biomass fire threat treatment area and harvest area			
		FTTA slash and thinnings	FTTA shrub	Harvest slash and thinnings	Potential
BDT/y	Private	1,792,752	345,534	1,261,099	3,399,386
	Federal	533,374	101,341	198,418	833,133
	State_local	30,391	12,585	12,900	55,877
	Total	2,356,517	459,461	1,472,417	4,288,395
MWe	Private	318	54	224	597
	Federal	95	16	35	146
	State_local	5	2	2	10
	Total	419	72	262	753
MWh/y	Private	2,371,601	405,079	1,668,286	4,444,966
	Federal	705,591	118,805	262,484	1,086,879
	State_local	40,204	14,754	17,065	72,024
	Total	3,117,395	538,638	1,947,835	5,603,869

Estimated Annual Biomass Potential from Fire Threat reduction and Average Timber Harvest Volume in California*

Yellow and Red areas represent greater than 100,000 BDT/y within the 25 mile search window



*FRAP 2005

Annual Electrical Capacity (MWe) of slash and thinning from Fire Threat Treatment Area and average annual Harvest (1999-2003)

CALIFORNIA FOREST BIOMASS SUSTAINABILITY MODEL 2013

Mark Rosenberg
Fire and Resource Assessment Program
California Department of Forestry and Fire Protection
November, 2012

Biomass In CA

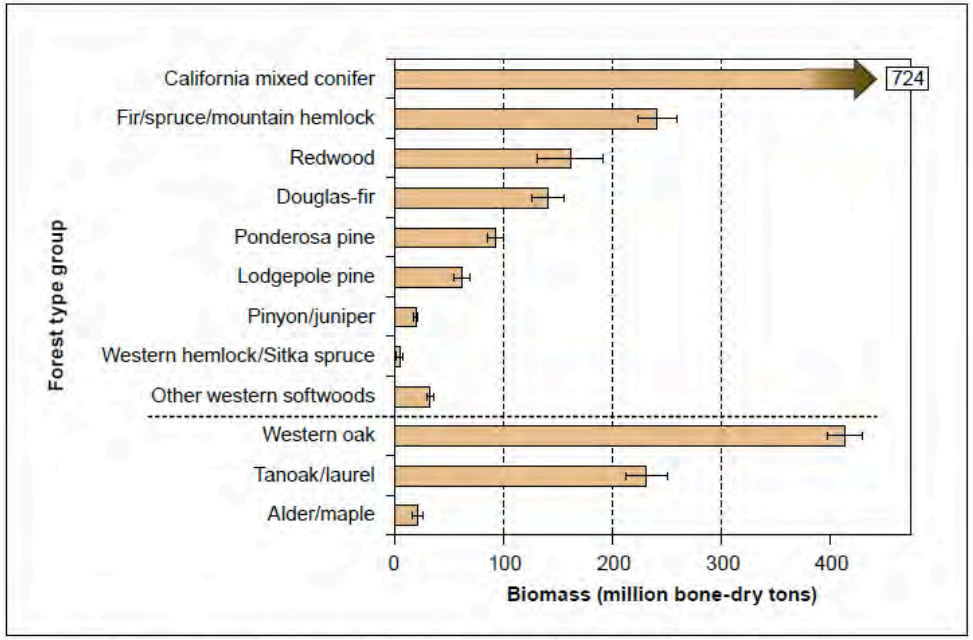


Figure 31—Aboveground live tree biomass by forest type group on forest land in California, 2001–2005.

- FIA (2005) estimates
  - over 2 billion tons of biomass in live trees 1” DBH and greater
  - 1.5 billion tons on Timberlands (FIA 2005).
- Softwood forests:
  - 2x the biomass of Hardwood types
  - Mostly in trees larger than 21” DBH.
- Hardwood biomass
  - Concentrated in trees with 9”-12” DBH.
- National Forest Service lands
  - 50% of Forest Biomass
  - 1/4 of this is reserved
- Down Woody Material (DWM)
  - Approximately 500 million tons

Model Overview

- Goal

  - Review FPA rules ability to protect biomass/carbon in face of increasing price scenarios

  - Model intensity and scale of treatment, in part by evaluating competition for saw logs and demand for small diameter material

  - The Spatial model applies harvest prescriptions constrained by the forest practice rules and USFS land management plans to forest inventories (FIA)

  - Examine biomass availability for a user specified price point. The model will use “current lumber” market prices to parse out availability for either the lumber market or biomass market.

Approach

- Develop Baseline Estimates
- Model biomass availability under the forest practice rules and based on land owner types, and also USFS land management plans.
- Evaluate impacts on prescriptions, treatment timing, general location and sustainability of ecosystem services.

Methods

- Integrate baseline data for vegetation, forest inventory, regulatory and land management plans and transportation infrastructure into a common framework (GIS) for modeling
- Establish baseline annual biomass and timber volume estimates based on historic, ‘business as usual’ harvest levels on public and private lands.
- Constrain baseline estimates by the FPA rules
- Model a Moderate and High biomass price scenario to compare against a business as usual price point

- Develop a model interface to interactively conduct additional price point analyses’.

Cooperative Project Timeline

- Development of dynamic link library (DLL) for computing biomass using regional equations specific to species and by major AGB components (Zhou and Hemstrom, 2009) – Completed
- Develop forest inventory strata logic on private lands – Nov./Dec. 2012
- Generate statewide GIS-based strata layer from vegetation GIS data – Nov. 2012
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- Develop forest inventory strata estimates – Dec. 2012
- Merge inventory strata estimates for forestland volume, carbon and biomass – Jan. 2013
- Develop custom prescriptions for treatment effect modeling – Feb./Mar. 2013
- Growth and yield modeling – Apr. 2013
- Web application development – Dec. 2013

Challenges

- Balancing ratepayer benefits and environmental benefits
- Relatively high cost of forest biomass distributed energy generation and sensitivity to feedstock prices
- Interconnection costs
- Environmental and permitting costs
- Air quality and environmental justice concerns
- Funding
- Sustainability