

## Coordinated Resource Offering Protocol (CROP) Project Summary

October 2007

This summary report provides a condensed overview of the results of the ten (10) CROP pilot projects conducted across the US during 2006-2007.

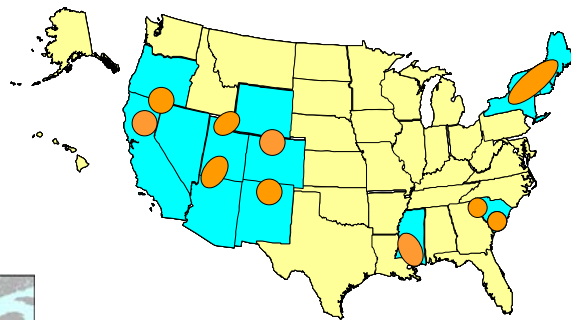
### Why CROP?

The Federal CROP study pilot projects began in 2006 to address the growing fuel load problem and the realized potential for fostering catastrophic wildfires within major forest systems across the United States. The CROP model was initially developed in 2003, by Oregon-based Mater Engineering, to target unlevelized, erratic resource offerings from public forest lands that directly discouraged investor interest in working with public agencies to remove woody biomass from high fire risk forests and to restore forest health. The CROP model's basic tenants are:

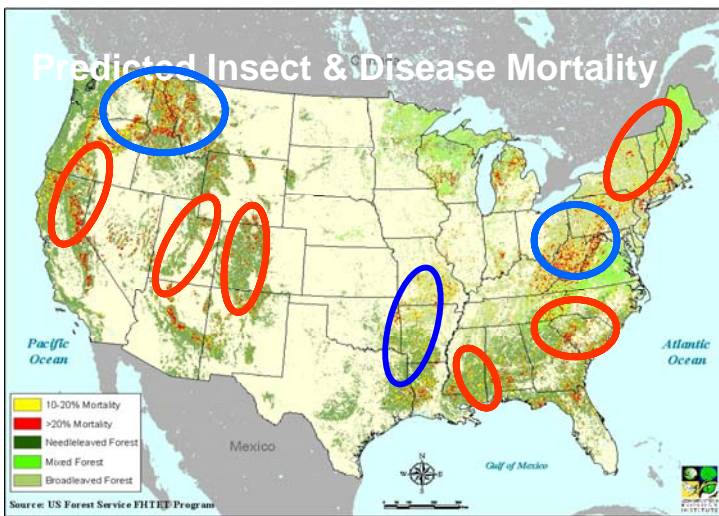
- Focus on the volume **proposed to be removed** from the forest floor within a target period (5 years out). This is unlike other forest biomass projects that focus on *biomass inventory*. The deliverable is biomass *removal performance*, not biomass *inventory* that may or may not lead to biomass removal.
- Work within a large enough geographic landscape (typically a 100-mile radial distance from a defined centerpoint) that would:
  - Mandate **coordination of removal** between public agencies within the CROP landscape.
  - Facilitate the use of long-term multi-agency stewardship contracts to achieve biomass removal performance within the CROP landscape.
  - **Heighten public trust** and support for biomass removal from public forest lands by focusing predominately on *small diameter* removal at *landscape scale* within a *transparent process*.
  - **Increase the certainty** of levelized offerings from public agencies focused on biomass removal within the CROP landscape.
  - **Invite investment** back into the forest landscape to achieve fuel load reduction mandates and forest restoration.

Since 2006, 10 Forest Service- and BLM-funded CROP pilot projects encompassing 30 million acres of forestland across the US has been completed. The CROP evaluations were conducted in 9 geographic regions where forest restoration and fuel load reduction efforts are high priorities. For example, CROP pilots were targeted in regions that have high-predicted insect and disease mortality increasing risk of catastrophic wildfire. The predicted insect and disease mortality map below was developed for the CROP project by the Conservation Biology Institute using 190 insect and disease models (for 2006) prepared by government agencies across the US. The map show 10%-20% mortality rates (yellow), and >20% mortality rates (red). The maps below illustrate the correlation of mortality rates to selected CROP pilot project locations:

**CROP pilot project locations . . .**



**Predicted Insect and Disease Mortality**



. . . **match with high mortality rate regions!**

- red circles = completed CROP pilots
- blue circles = other high priority regions for CROP
- red on map = >20% mortality rate
- yellow on map = 10% - 20% mortality rate

CROP pilot projects were offered in other regions where high mortality rates are noted in the map above, but intense workloads prevented agency participation.

Regardless, the list of agencies that did participate and provide valuable resource removal data for the CROP projects is impressive:

- 36 national forests
- 105 ranger districts
- 41 BLM field offices
- multiple state agencies in 15 states
- 183 counties
- 280 townships

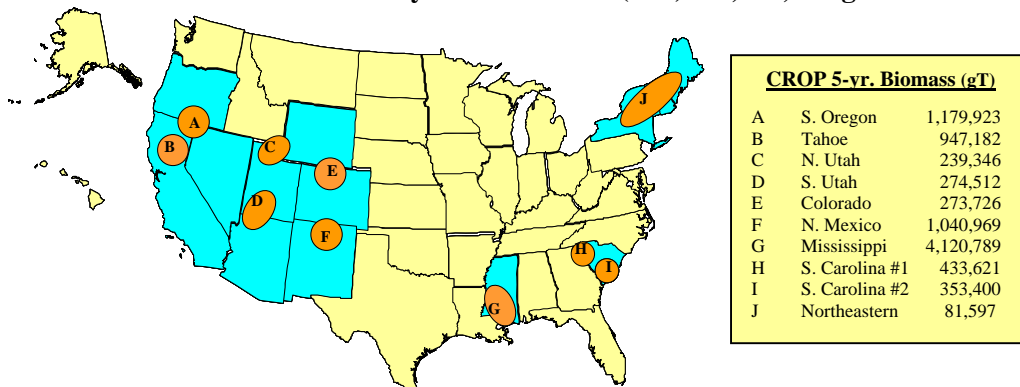
All CROP projects were started and completed within a nine calendar month (or shorter) period of time.

### CROP Results

All regions have signed off on the CROP data and mapping where pilots occurred detailing proposed resource removal over the next 5 years. Proposed volumes to be removed for all 10 CROP landscapes during the next 5 years, contingent on final project planning and decisions, are:

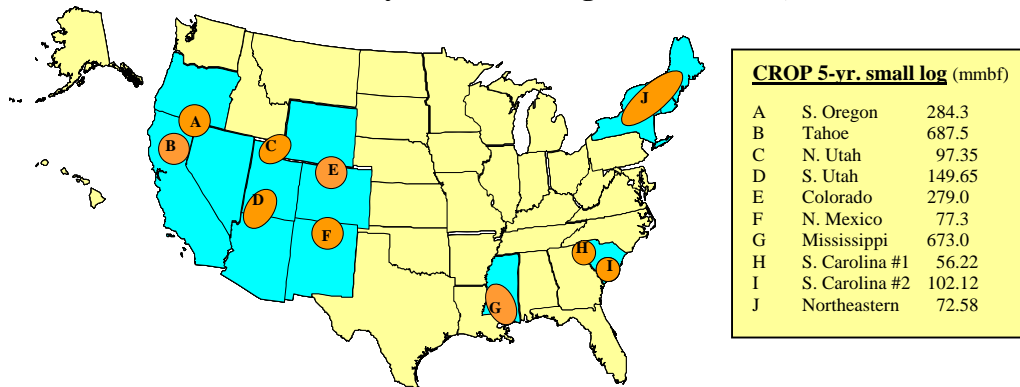
- **8,945,065 green tons of biomass** (less than 7 inches diameter breast height [dbh]).  
*Enough annual biomass volume to construct over 10 new 15 Mw power plants requiring 160,000 green tons of biomass each year.*

**5-yr total biomass (<7"): 8,945,065 gT**



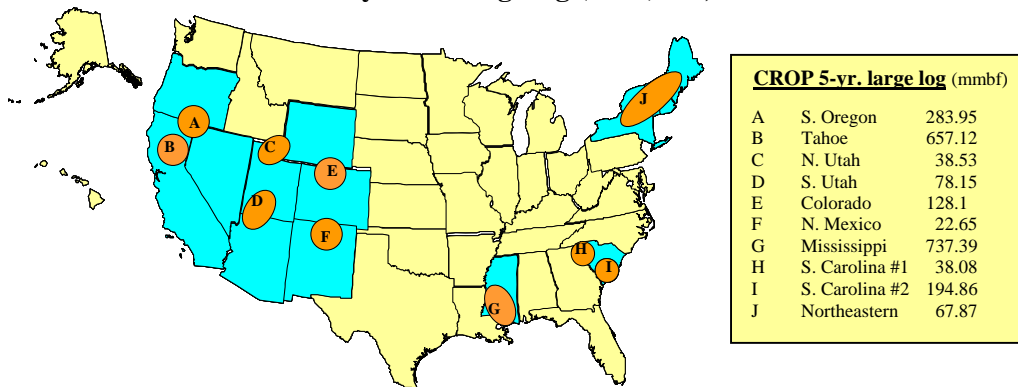
- **2,479 million board feet of small logs (7 to 12 inches dbh).** *Enough annual volume to support 20 new dedicated small-log processing mills requiring 25 million board feet of wood supply each year.*

**5-yr total small log (>7"-12'"): 2,479.02 mmbf**



- **2,247 million board feet of large logs (greater than 12 inches).** *Enough annual volume to support 7 new large-log processing mills requiring 60 million board feet of wood supply each year.*

**5-yr total large log (>12'"): 2,246.69 mmbf**



- If solid wood manufacturing facilities were constructed to handle the small and large log resource removal within the CROP landscapes, more than 3,000 direct fulltime, family-wage jobs would be created. This figure does not include the jobs that would be created

for processing the biomass volume to be removed within the CROP landscapes over the next 5 years.

- Over **60 percent** of all wood resource to be removed within the CROP landscapes during the next 5 years **will be biomass (less than 7 inches dbh) and small-diameter (7 to 12 inches dbh) material** (see table).
- Assuming 200,000 high-risk acres could emit up to 16 million tons of carbon into the atmosphere when fire occurs, removing woody biomass in a coordinated fashion within the CROP landscapes over the next 5 years could **prevent approximately 2.4 billion tons of carbon being emitted into the atmosphere.**

Crop Landscape Region	Biomass and Small logs as a percentage of total 5-Year removal
Southern Oregon	65 %
Northern Utah	84%
Southern Utah	72%
Colorado	72%
New Mexico	93%
South Carolina - 1 Francis Marion NF	77%
South Carolina - 2 Sumpter NF	46%
Northeastern	57%
Tahoe (CA)	57%
Mississippi (Includes Katrina-downed biomass)	91%

Investment results are already being seen in regions where CROP projects have occurred:

- ❑ Southern Oregon CROP completed in 2006: MOU for multi-year levelized biomass removal was signed, followed by the announcement of a new 13 MW powerplant investment and the addition of a new small log processing line to an existing sawmilling operation. Total investment in the region is estimated at \$30 million with 60 fulltime, family-wage jobs saved and an additional 85 jobs created.
- ❑ Colorado CROP completed in 2007: new small log mill and pellet mill to be constructed.
- ❑ Central Oregon CROP (a 2005 CROP project that became the benchmark for the CROP pilots just completed): MOU for multi-year levelized biomass removal was signed, followed by over \$40 million in investment to the region (new small log processing; new powerplant construction; new logging equipment; new secondary wood processing), plus an additional \$60 million investment planned by the end of 2008.

The following pages provide a 1-page summary of key CROP results *per pilot region* across the US. More extensive data is included in each of the region’s CROP reports, but these summaries capture the essence of resources to be offered during the next five years for biomass, small logs, and large logs within each of those regions based on the CROP data supplied.

**CROP Summary – Colorado:**  
('06 - '10)  
(100-mile radius from Kremmling)

**BLM: (CO = 5%; WY = 1%)\***

- A Royal Gorge District (CO)
- B White River District (CO)
- C Little Snake District (CO)
- D Glenwood Springs District (CO)
- E Kremmling District (CO)
- F Rawlins District (WY)

**WY - SFD: (1%)**

- G SFD

**Arapaho/Roosevelt NF (RDs): (21%)**

- H Clear Creek
- I Sulphur
- J Canyon Lakes
- K Boulder

**Grand Mesa, U & G NFs (RDs): (1%)**

- L Grand Valley
- M Gunnison
- N Paonia

**Medicine Bow/Routt NFs (RDs): (32%)**

- O Brush Creek/Hayden
- P Laramie
- Q Hahns Peak/Bears Ear
- R Parks
- S Yampa

**Pike NF (RDs): (6%)**

- T Pikes Peak
- U South Platte
- V South Park

**San Isabel NF (RDs): (3%)**

- W Leadville
- X Salida

**White River NF (RDs): (19%)**

- Y Aspen/Sopris
- Z Dillon
- AA Holy Cross/Eagle
- AB Blanco
- AC Rifle

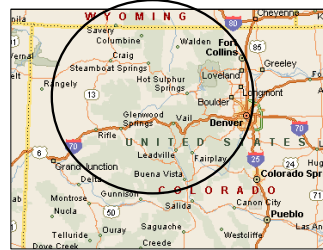
**Colorado Counties: (1%)**

- AD Jefferson
- AE Summit

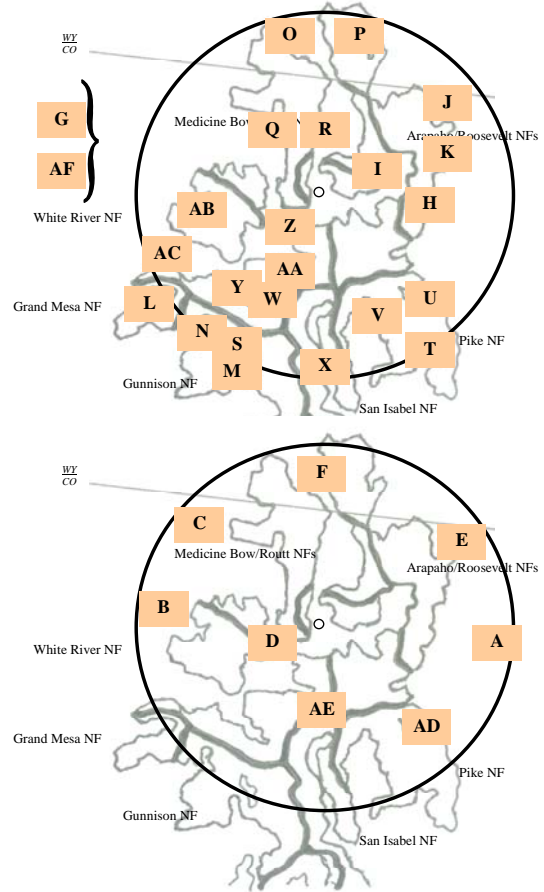
**Colorado DNR: (10%)**

- AF CO-DNR

\* % of 5-year total

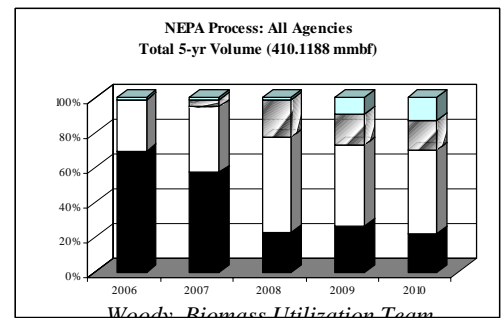


<b>Key Species:</b> (% of 5-yr volume)	
Lodgepole Pine	78%
Ponderosa Pine	8%
Douglas Fir	5%
Engelmann Spruce	3%
Aspen	2%
Other (<1%)	4%



gT = green tons (up to 7" dbh)  
S = small log mmbf (>7"-12" dbh)  
L = large log mmbf (>12" dbh)

		(gT)		mmbf	
		Biomass (gT)	Small Logs	Large Logs	
2006		58181.25	72.63075	36.7465	
2007		51245	53.13	25.56	
2008		61005.5	60.74625	25.34075	
2009		57531.75	53.536	22.3665	
2010		45763	39.06275	18.10475	
Totals		273726.5	279.10575	128.1185	
%		12%	60%	28%	
mmbf		54.7453			



**CROP Summary – Northern Utah:**  
 ('06 - '10)  
 (100-mile radius from Manila)

**BLM (CO): (24%)\***

- A Little Snake
- B White River

**BLM (UT): (<1%)**

- C Salt Lake
- D Price

**BLM (WY): (2%)**

- E Kemmerer
- F Pinedale
- G Rock Springs

**Counties: (<1%)**

- H Daggett

**UT-DFEFL: (<1%)**

- I NE Area

**WY-SFD: (1%)**

- J WY-SFD

**UDOT: (<1%)**

- K UDOT

**Ashlev NF: (45%)**

- L Flaming Gorge
- M Vernal
- N Roosevelt/Duc.

**Uinta NF: (4%)**

- O Heber

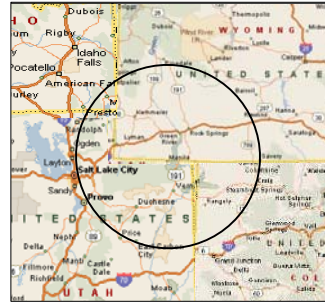
**Wasatch-Cache NF: (12%)**

- P Ogden
- Q Kamas
- R Mtn. View/Evanston
- S Logan

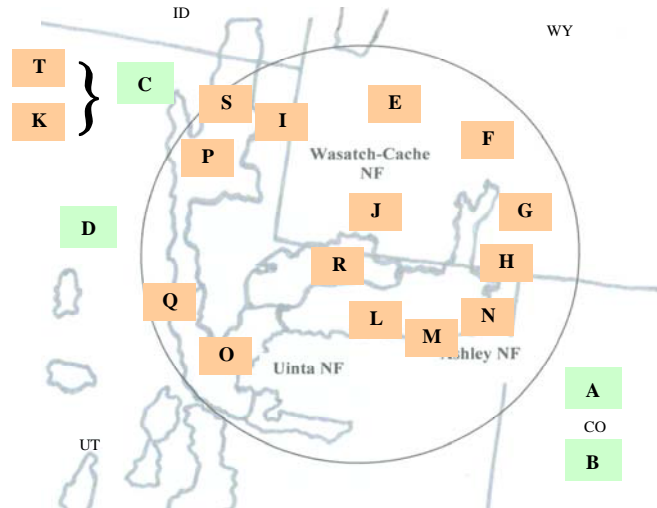
**Utah Trust Lands: (12%)**

- T Utah Trust Lands

\* % of 5-year total



<b>Key Species:</b> (% of 5-yr volume)	
Lodgepole Pine	31%
Douglas Fir	19%
Subalpine Fir	13%
Ponderosa Pine	12%
Aspen	12%
Engelmann Spruce	10%
Pinyon pine/Juniper	2%
Other (<1%)	1%



gT = green tons (up to 7" dbh)  
 S = small log mmbf (>7"-12" dbh)  
 L = large log mmbf (>12" dbh)

	gT	mmbf	mmbf
	Biomass	Small Log	Large Log
2006	50596.54	22.357755	11.340905
2007	62242.79	18.526955	9.271955
2008	51605.665	20.87008	7.578255
2009	35773.79	17.702435	5.038425
2010	39130.04	17.906685	5.306175
Totals	239348.825	97.36391	38.535715
%	26%	53%	21%
mmbf	47.869765		

183.76939

**CROP Summary – Mississippi:**  
 ('07 - '11)  
 (100 miles N/S; 60 miles E/W radius from Mt. Olive)

**Delta NF: (6%)\***

A Delta

**Homochitto NF: (22%)\***

B Homochitto

**De Soto NF: (48%)\***

C De Soto

D Chickasawhay

**Bienville NF: (24%)\***

E Bienville

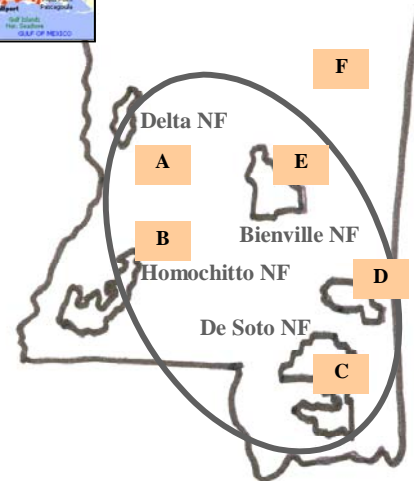
**MS DWF & P: (<1%)\***

F MS DWF & P

\* % of 5-year total



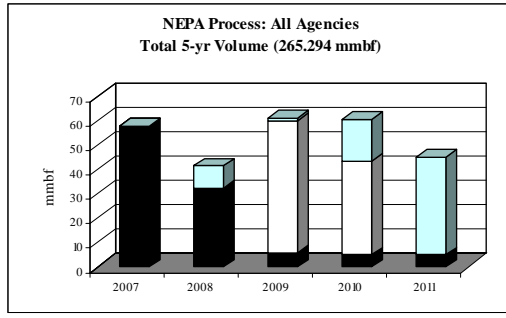
<b>Key Species:</b> (% of 5-yr volume)	
Southern Yellow Pine	80%
Waxy Species	8%
Gum Species	4%
Red Oak	3%
Hardwoods	2%
Oak Species	2%
Green Ash	1%
Poplar	1%



gT = green tons (up to 7" dbh)  
 S = small log mmbf (>7"-12" dbh)  
 L = large log mmbf (>12" dbh)

□ not started  
 ▨ just started  
 ◻ in process  
 ■ approved

	gT	mmbf	
	Biomass	Small Log	Large Log
2007	37605	21.855	28.586
2008	34800	16.92	17.66
2009	15190	25.6775	32.609
2010	51890	24.815	25.486
2011	88140	20.28	7.15
Totals	227625	109.5475	111.491
%	17%	41%	42%
mmbf	45.525	266.5635	



Plus:

	gT	mmbf	
	Biomass	Small log	Large log
16 <sup>th</sup> Section lands	355,560	6.16	7.75
Katrina-downed pine	3,537,604	239.12	302.8



**CROP Summary – Tahoe:**  
(‘07 - ‘11)  
(100-mile radius from Nevada City)

**Plumas NF (RDs): (37%)\***

- A Beckwourth
- B Mt. Hough
- C Feather River

**Lassen NF: (17%)**

- D Lassen NF  
(No RD data available)

**Eldorado NF (RDs): (13%)**

- E Georgetown
- F Placerville
- G Pacific
- H Amador

**Stanislaus NF (RDs): (12%)**

- I Mi-Wok
- J Calaveras
- K Summit

**Tahoe NF (RDs): (10%)**

- L Yuba River
- M American River
- N Sierraville
- O Truckee

**Lake Tahoe BMU: (6%)**

- P Lake Tahoe BMU

**Mendocino NF (RDs): (2%)**

- Q Grindstone
- R Upper Lake & Covelo

**Humboldt-Toiyabe NF (RDs): (1%)**

- S Carson
- T Bridgeport

**NV DOF-DSL: (1%)**

- U NV DOF-DSL

**UC Center of Forestry: (1%)**

- V Blodgett Forest
- W Baker Forest

**Boggs Mtn. State Forest: (<1%)**

- X Boggs Mtn. State Forest

**NV BLM: (<1%)**

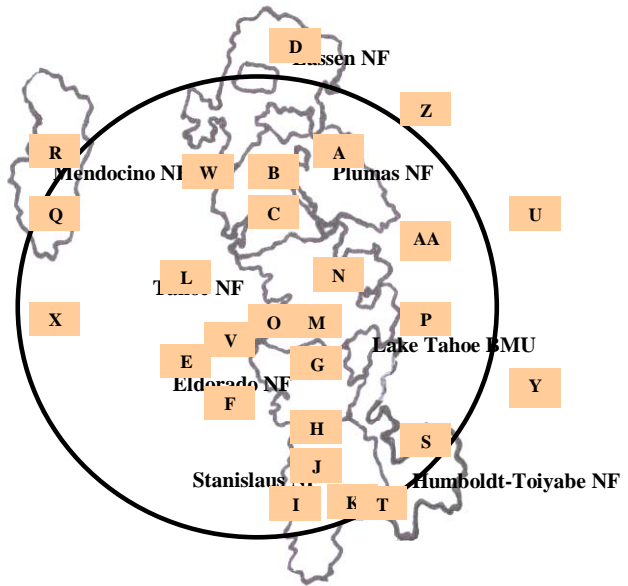
- Y NV BLM

**CA BLM (FOs): (<1%)**

- Z Eagle Lake
- AA Folsom



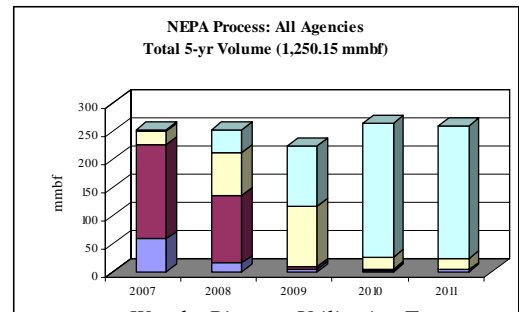
<b>Key Species:</b> (% of 5-yr volume)	
White Fir	32%
Ponderosa P/Jeffrey P	17%
White Fir/Red Fir	12%
Douglas Fir	10%
Ponderosa Pine	6%
Incense Cedar	6%
Red Fir	5%
Other Conifers	4%
Sugar Pine	4%
Jeffrey Pine	1%
Lodgepole Pine	1%
Tan Oak	1%
Other	<1%



\* % of 5-year total  
Note: A portion of Plumas NFs volume may be removed but not available for public offering.

gT = green tons (up to 7" dbh)  
S = small log mmbf (>7"-12" dbh)  
L = large log mmbf (>12" dbh)

	gT	mmbf	
		Biomass	Small Log
2007	182872.4	140.9485275	130.4777403
2008	193527.4	134.5171684	135.4165892
2009	183502.4	130.7218348	113.535587
2010	203127.4	142.2418348	138.100587
2011	184152.4	139.0868348	139.600587
Totals	947182.01	687.5162003	657.1310905
%	12%	45%	43%
mmbf	189.4364		



**CROP Summary – New Mexico:**  
 ('06 - '10)  
 (100-mile radius from Santa Fe)



<b>Key Species:</b> (% of 5-yr volume)	
Ponderosa Pine	74%
Pinyon pine/Juniper	10%
White Fir	9%
Douglas Fir	6%
Other (<1%)	1%

**BLM (Dist.'s): (<1%)\***

- A Albuquerque
- B Farmington

**Carson NF (RDs): (19%)**

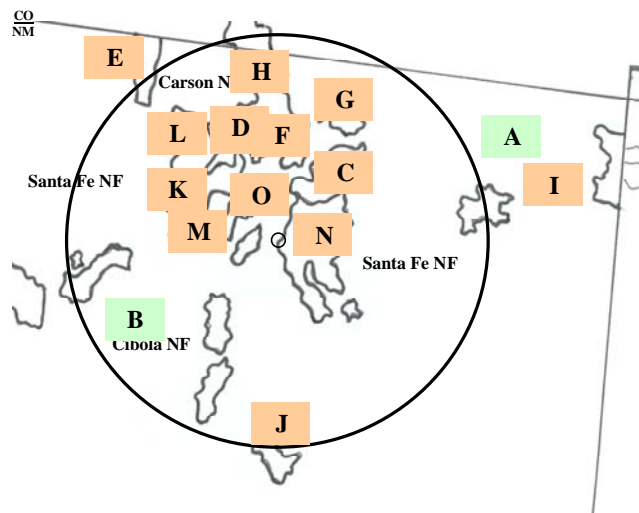
- C Camino Real
- D Canjilon
- E Jicarilla
- F El Rito
- G Questa
- H Tres Piedras

**Cibola NF (NG & RD): (9%)**

- I Kiowa & Rita Blanca
- J Mountainair

**Santa Fe NF (RDs): (72%)\***

- K Coyote
- L Cuba
- M Jemez
- N Pecos/Las Vegas
- O Espanola

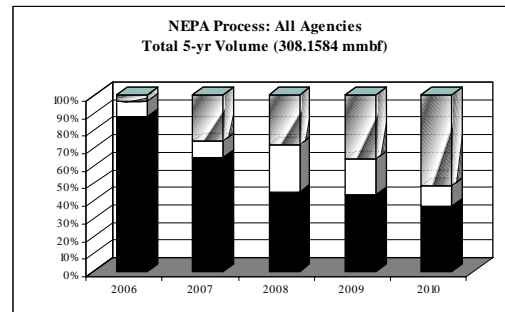


\* % of 5-year total

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 S = small log mmbf (>7"-12" dbh)  
 L = large log mmbf (>12" dbh)

	gT	mmbf	
	Biomass	Small Log	Large Log
2006	157138.75	11.101	3.26225
2007	240535.98	15.48852	4.18368
2008	230687.38	17.29472	5.3877
2009	199629.68	16.45256	4.2608
2010	212977.18	16.97256	5.5608
Totals	1040968.97	77.30936	22.65523
%	68%	25%	7%
mmbf	208.193794		

not started  
 just started  
 in process  
 approved



**CROP Summary – Southern Oregon/Northern California:**

('06 - '10)

(100-mile radius from Lakeview, OR)

**BLM: (CA = 1%; OR = 8%)\***

- A Eagle Lake District (CA)
- B Alturas District (CA)
- C Surprise District (CA)
- D Burns District (OR)
- E Lakeview District (OR)

**OR - DOF: (4%)**

- F DOF

**Fremont-Winema NF (RDs): (41%)**

- G SE Zone–Lakeview/Bly
- H NE Zone–Silver Lake/Paisley
- I SW Zone–Chiloquin/Klamath
- J NW Zone–Chemult

**Shasta-Trinity NF: (17%)**

- K Mt. Shasta-McCloud Mgt. Unit

**Modoc NF (RDs): (19%)**

- L Warner Mtn.
- M Devils Garden
- N Big Valley
- O Doublehead

**Klamath NF (RD): (8%)**

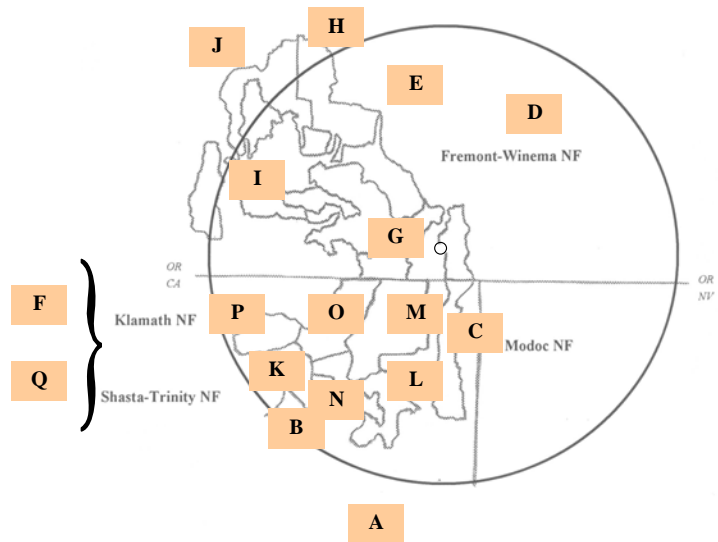
- P Goosenest

**OR - DSL: (2%)**

- Q DSL



<b>Key Species:</b> (% of 5-yr volume)	
Ponderosa Pine	50%
White Fir	25%
Lodgepole Pine	14%
Juniper	5%
Other Conifers	2%
Jeffrey Pine	1%
Douglas Fir	1%
Incense Cedar	1%
Knobcone Pine	1%
Sugar Pine	<1%



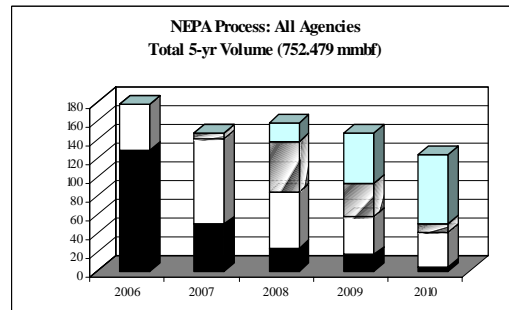
\* % of 5-year total

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 L = large log mmbf (>12" dbh)

	gT	mmbf	
	Biomass	Small Log	Large Log
2006	285125.5102	64.292574	66.64043223
2007	220737.2339	57.27669064	55.61689684
2008	270861.4812	58.48988663	55.78514069
2009	215030.0886	54.33014315	59.21929954
2010	188170.3815	49.92775859	46.68697723
Totals	1179924.695	284.3170527	283.9487465
%	29%	35%	35%
mmbf	235.9849391		

804.2507383

<input type="checkbox"/>	not started
<input checked="" type="checkbox"/>	just started
<input type="checkbox"/>	in process
<input checked="" type="checkbox"/>	approved



**CROP Summary – South Carolina 1:**  
 ('06 - '10)  
 (50-mile radius from Foreston)



<b>Key Species:</b> ( % of 5-yr volume )	
Loblolly Pine	80%
Slash Pine	5%
Gum Species	5%
Other Hardwoods	3%
Red Maple	3%
Oak Species	2%
Bald Cypress	2%
Longleaf Pine	1%
Scrub Oak	<1%

**Francis Marion NF: (75%)\***

A Francis Marion

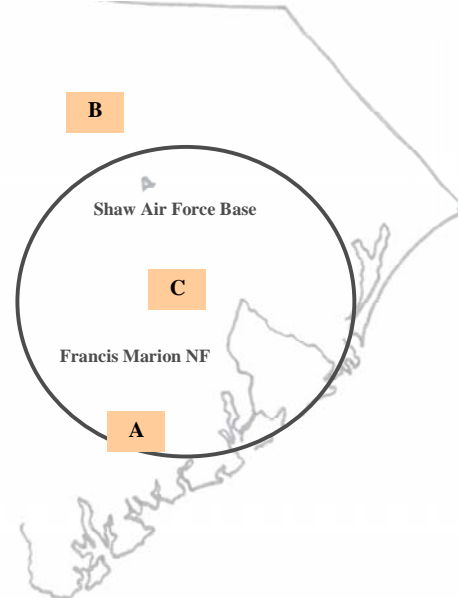
**South Carolina Commission: (24%)\***

B SC Forestry Commission

**Shaw AFB: (1%)\***

C Shaw AFB

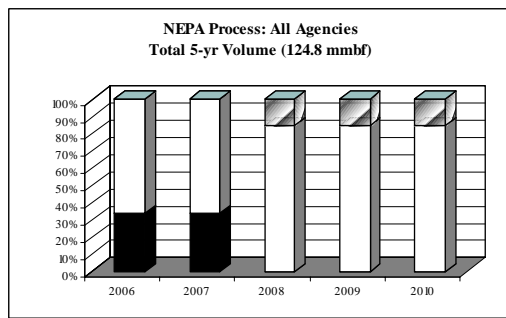
\* % of 5-year total



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 L = large log mmbf (>12" dbh)

□ not started  
 ▨ just started  
 □ in process  
 ■ approved

	gT	mmbf	
	Biomass	Small Log	Large Log
2006	103293.2143	10.20225	5.403
2007	104143.1743	10.46059	5.5192
2008	77848.23429	11.77538	8.914
2009	74941.17429	11.7654	9.08117
2010	73394.85429	12.01945	9.1664
Totals	433620.6514	56.22307	38.08377
%	43%	34%	23%
mmbf	72.27010857	<b>166.5769486</b>	



**CROP Summary – South Carolina 2:**

(’06 - ’10)

(50-mile radius from Saluda)



<b>Key Species:</b> ( % of 5-yr volume )	
Loblolly Pine	76%
Longleaf Pine	12%
Slash Pine	9%
Gum Species	2%
Oak Species	1%
Hardwoods	1%

**Charleston AFB: (<1%)\***

- A Charleston AFB  
(Located in North, SC)

**SC DNR: (<1%)**

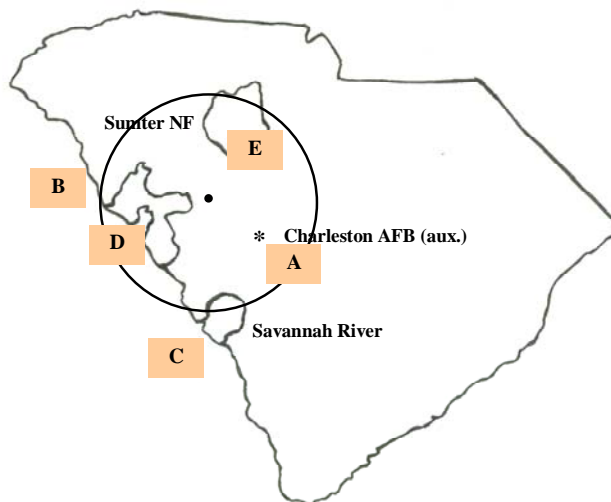
- B SC DNR

**Savannah River: (49%)**

- C Savannah River

**Sumter NF (RDs): (50%)**

- D Long Cane
- E Enoree

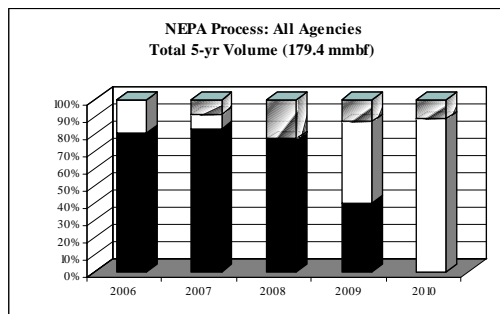


\* % of 5-year total

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S = small log mmbf (>7"-12" dbh)  
L = large log mmbf (>12" dbh)

not started
just started
in process
approved

	gT	mmbf	
	Biomass	Small Log	Large Log
2006	69960	19.825	31.61914272
2007	69960	20.125	34.09714286
2008	71160	20.325	38.415
2009	71160	20.725	43.115
2010	71760	21.125	47.615
Totals	354000	102.125	194.8612856
%	17%	29%	55%
mmbf	59	355.9862856	



**CROP Summary – Southern Utah:**

('06 - '10)

(125-mi. (N & S) 100-mi. (E & W) from Panguitch

**BLM:** (UT = 29%; AZ = 3%)\*

- A Arizona Strip FO (AZ)
  - B Price FO (UT)
  - C Cedar City FO (UT)
  - D Fillmore FO (UT)
  - E GSENM FO\*\* (UT)
  - F Richfield FO (UT)
  - G St. George FO (UT)
  - H Kanab FO (UT)
- (FO - field office)

**Dixie NF (RDs):** (29%)

- I Escalante
- J Cedar City
- K Pine Valley
- L Powell

**Kaibab NF (RD):** (12%)

- M North Kaibab

**Manti-La Sal NF (RDs):** (6%)

- N Ferron/Price
- O Sanpete

**Fishlake NF (RDs):** (20%)

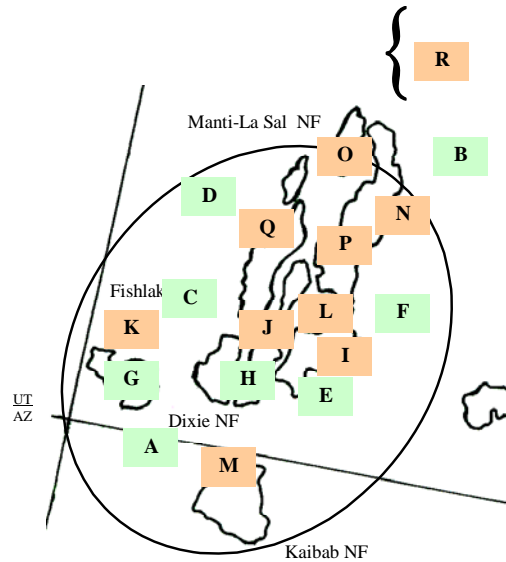
- P East Zone-Fremont/Richfield
- Q West Zone-Beaver/Fillmore

**Utah Trust Lands:** (1%)

- R Utah Trust Lands



<b>Key Species:</b> (% of 5-yr volume)	
Pinyon P/Juniper	35%
Engelmann Spruce	28%
Ponderosa Pine	16%
Aspen	7%
Subalpine Fir	5%
Douglas Fir	3%
White Fir	2%
Mixed Fir (DF, SaF, WF)	1%
Other	3%

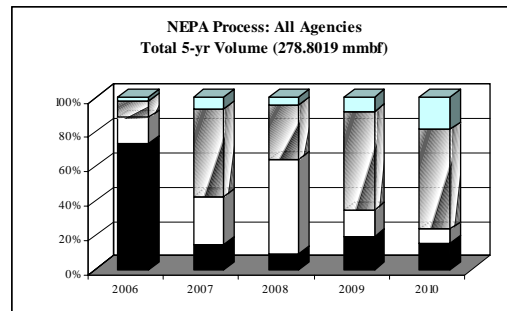
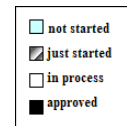


\* % of 5-year total

\*\* GSENM – Grand Staircase Escalante National Monument

gT = green tons (up to 7" dbh)  
S = small log mmbf (>7"-12" dbh)  
L = large log mmbf (>12" dbh)

	gT	mmbf	
	Biomass	Small log	Large Log
2006	39972.25	18.27555	16.4098
2007	54135.75	30.7397545	18.757
2008	85806.75	50.62945	17.2704
2009	46291.25	21.89795	12.3474
2010	48306.25	28.10475	13.3674
Totals	274512.25	149.6474545	78.152
%	19%	53%	28%
mmbf	54.90245		



**CROP Summary – Northeastern:**

('06 - '10)

(75-mile radius from Hanover, NH)

(NY; VT; NH; ME; & MA)



<b>Key Species:</b> (% of 5-yr volume)	
Hardwoods	48%
Softwoods	13%
Sugar Maple	12%
Yellow Birch	6%
Red Maple	6%
White Pine	5%
Beech	3%
Paper Birch	3%
Spruce Species	3%

**White Mtn. NF (RDs): (65%)\***

- A Androscoggin
- B Saco
- C Ampe

**NH DF & L: (17%)**

- D NH DF & L

**Green Mtn. NF (RDs): (11%)**

- E Manchester
- F Rochester
- G Middlebury

**MA DCR: (1.5%)**

- H MA DCR

**NH Counties: (1.5%)**

- I Sullivan
- J Grafton

**VT DNR: no data provided**

**VT Counties: (1.5%)**

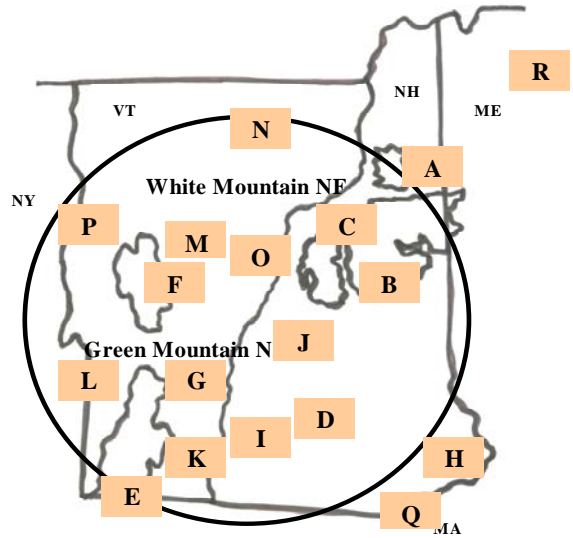
- K Windsor
- L Rutland
- M Washington
- N Orleans
- O Orange
- P Addison

**MA DFW:**

- Q MA DFW (1.5%)

**ME IFW:**

- R ME IFW (1%)



\* % of 5-year total

gT = green tons (up to 7" dbh)  
S = small log mmbf (>7"-12" dbh)  
L = large log mmbf (>12" dbh)

<input type="checkbox"/>	not started
<input checked="" type="checkbox"/>	just started
<input type="checkbox"/>	in process
<input checked="" type="checkbox"/>	approved

	gT	mmbf	
	Biomass	Small Log	Large Log
2006	9578.7	11.948763	11.363205
2007	16779.50001	15.477766	14.982862
2008	22081.55	15.775233	13.978055
2009	22454.75	16.530483	14.935505
2010	10702.75	12.848183	12.615705
Totals	81597.25001	72.58042801	67.87533201
%	10%	46%	43%
mmbf	16.31945	<b>156.77521</b>	

