

Yosemite Fire Management

Taro Pusina
Deputy Fire Chief
Prescribed Fire and Fuels
Taro_Pusina@nps.gov
209-375-9576

Yosemite National Park

National Park Service
U.S. Department of the Interior



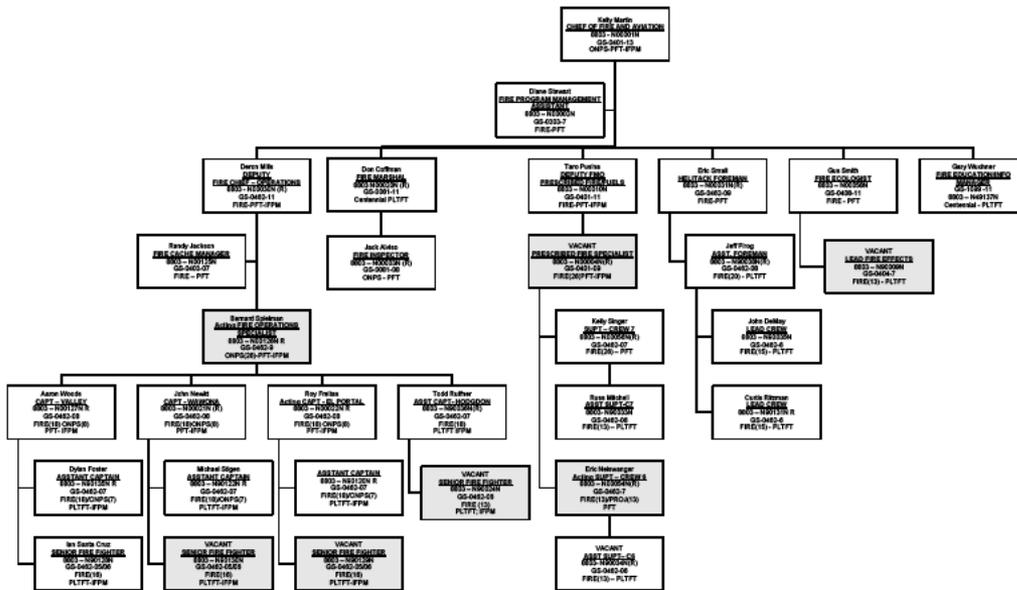
Brief History of Fire in Yosemite

- **Until 1970 all fires aggressively suppressed**
- **1968 fire recognized as an important ecosystem process**
 - **Research by Dr. Harold Biswell and USGS Research Scientist Jan Van Wagtenonk**
- **1970 Yosemite's first Fire Management Plan**
 - **Prescribed fire**
 - **Natural fire**
 - **Mechanical thinning (Mariposa giant sequoia grove)**
- **1990 and 2004 FMP revisions.**
- **Complex, diverse, science based program - all fire disciplines embraced**
 - **Wildland**
 - **Prescribed**
 - **Structural**
 - **Prevention**
 - **Fire science, ecology and effects**
- **Utilizes adaptive management strategies**
- **Prescribed fire program attempts to mimic the natural fire process (lightning starts) when conditions are favorable to achieve science based objectives and, reduce hazardous fuel accumulations and protect sensitive values**



Yosemite Fire Organization

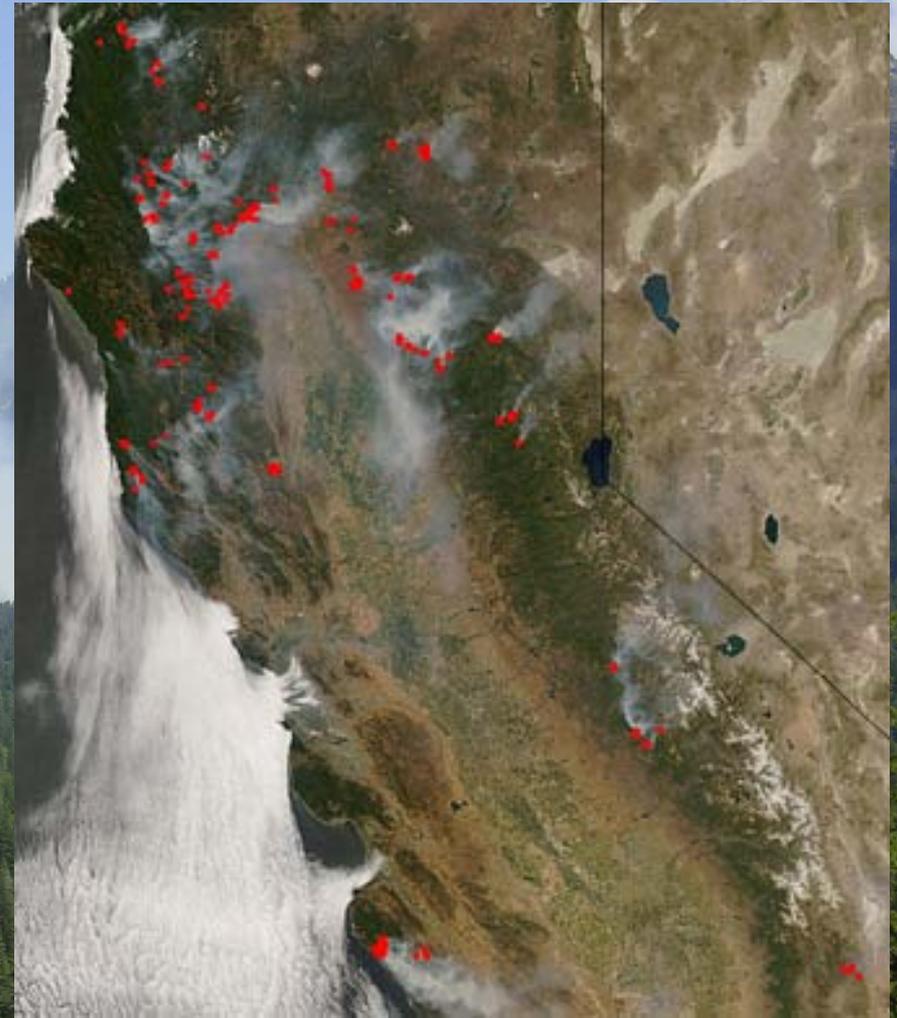
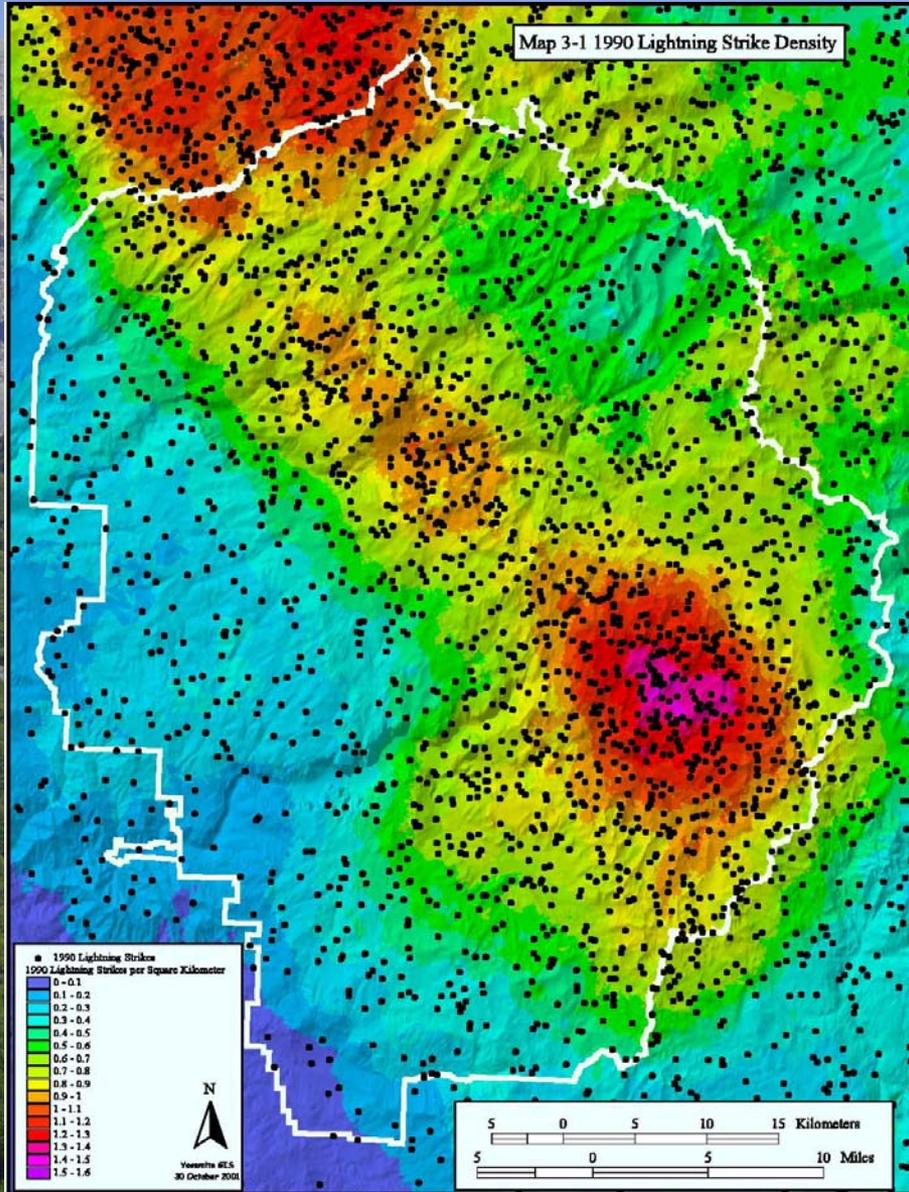
2010 YOSEMITE FIRE AND AVIATION MANAGEMENT ORGANIZATION



UPDATED 7/08/2010



Lots of Lightning

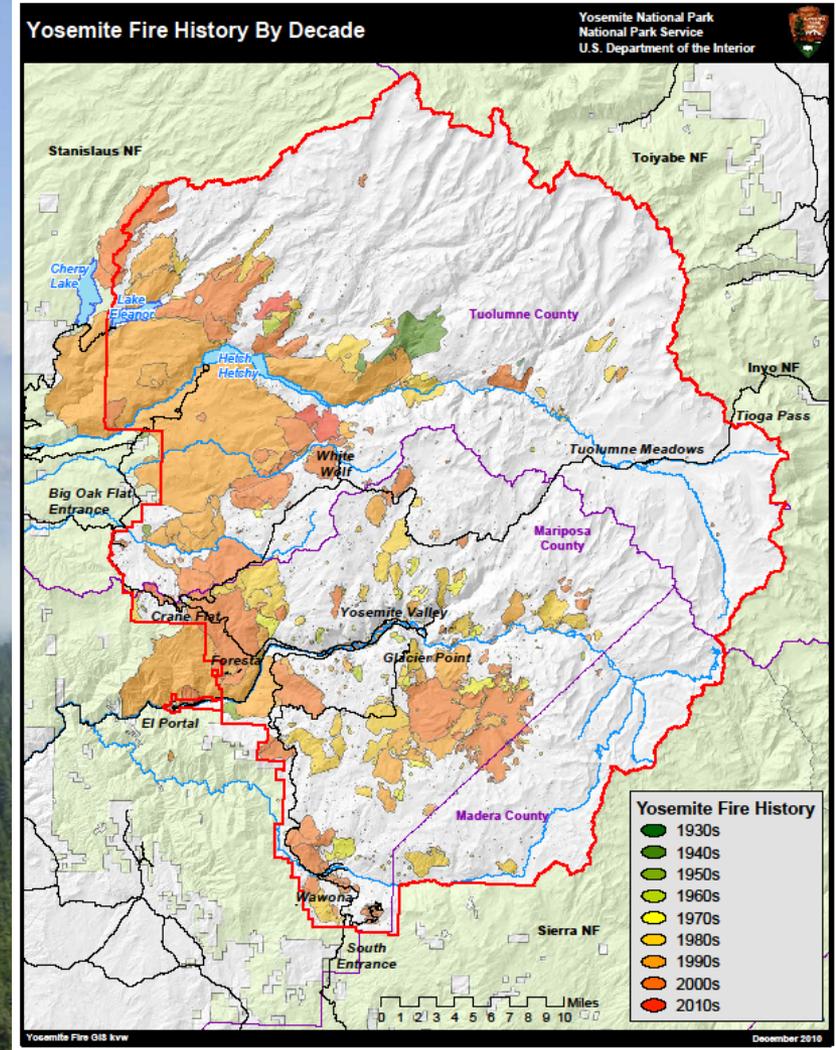


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And Subsequent Fires



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Vegetation Change



1907

Today

Tuolumne River Drainage

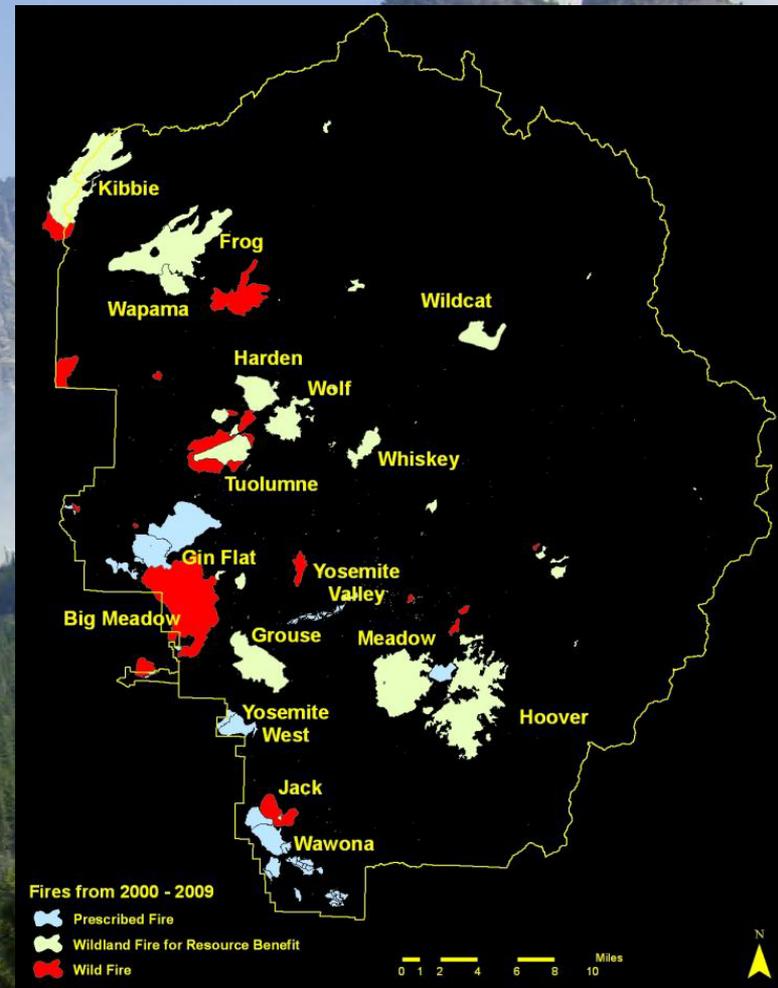
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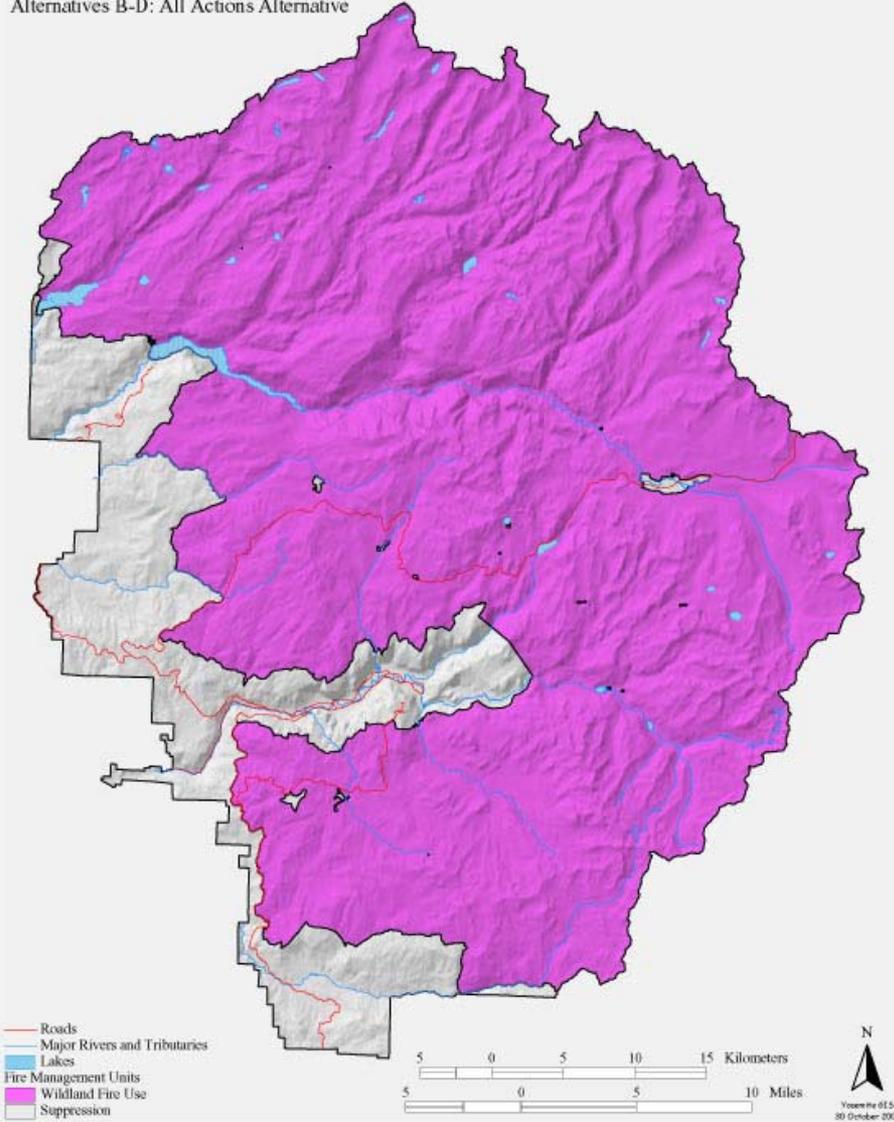


Fire History 2000 - 2009

- 67,663 ac. - all fire types
- ~6,800 ac/yr average
- +/- 10,000 ac/yr short every year



Map 2-13
Fire Management Units
Alternatives B-D: All Actions Alternative



Fire Management Units

- 747,955 Total Acres
- 619,888 Wilderness (83%)
- 128,067 Suppression (17%)

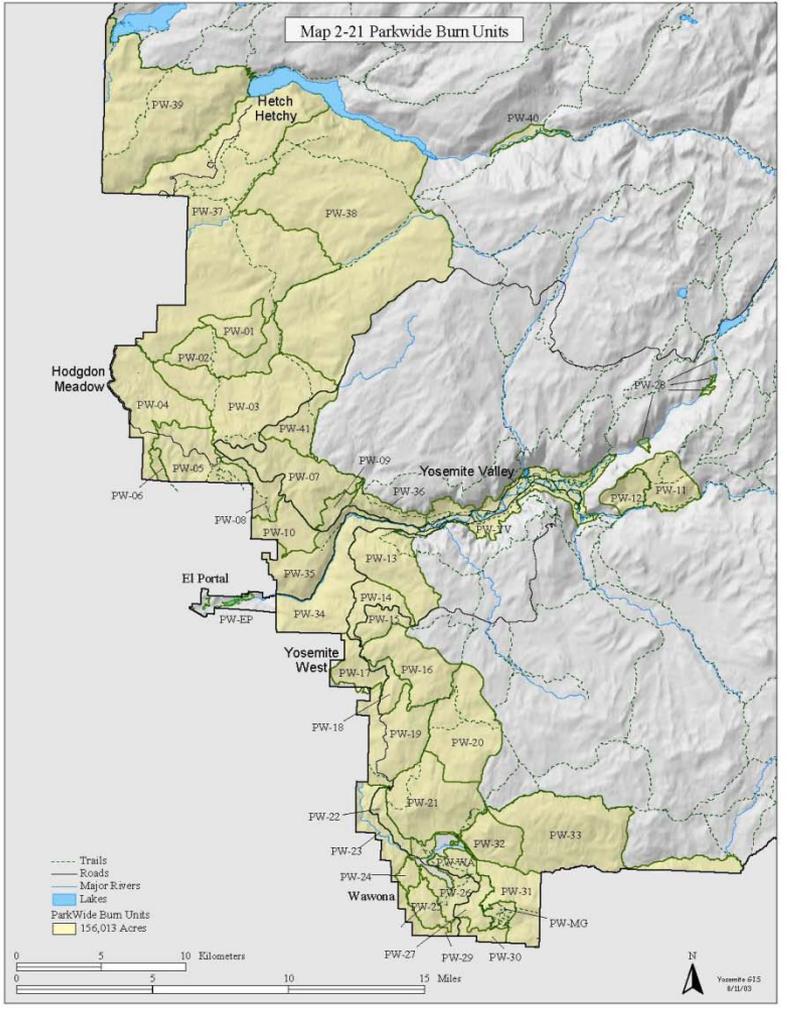


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39 Parkwide Burn Units 156,013 acres



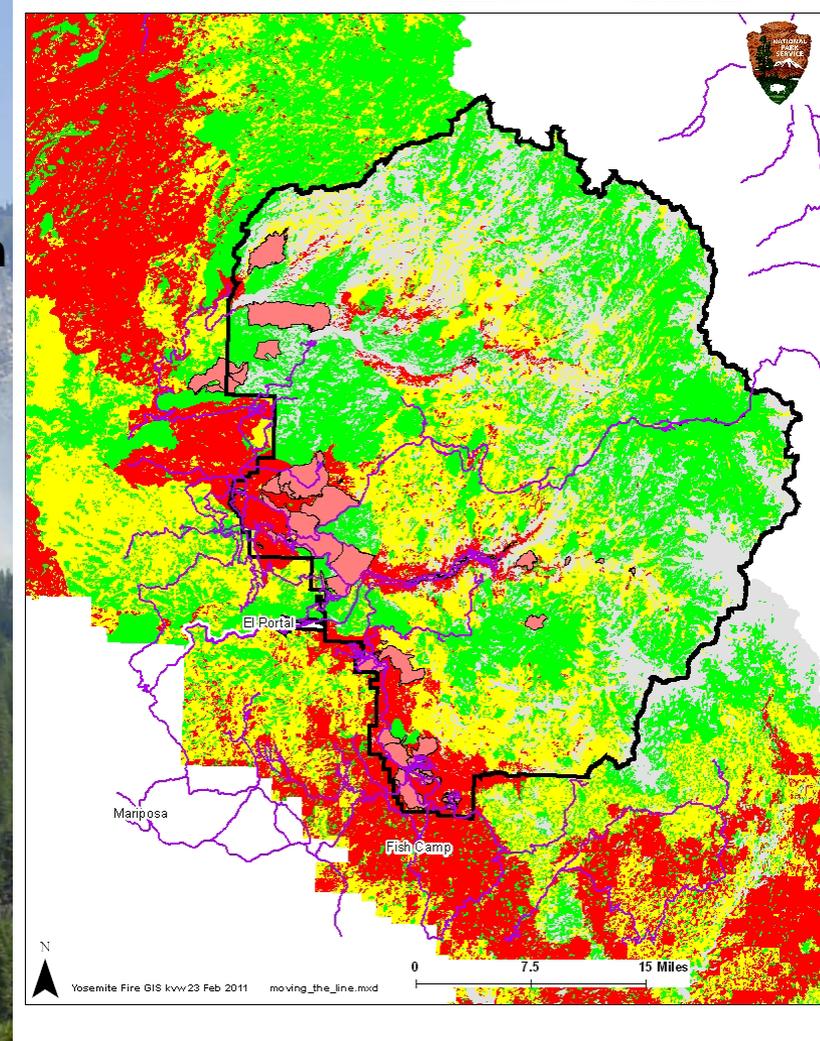
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Fire Return Interval Departure

- 4-12 yr. fire interval/frequency @ 4000'
- 16,000 ac/yr burned annually
- Majority of front country (communities) high FRID

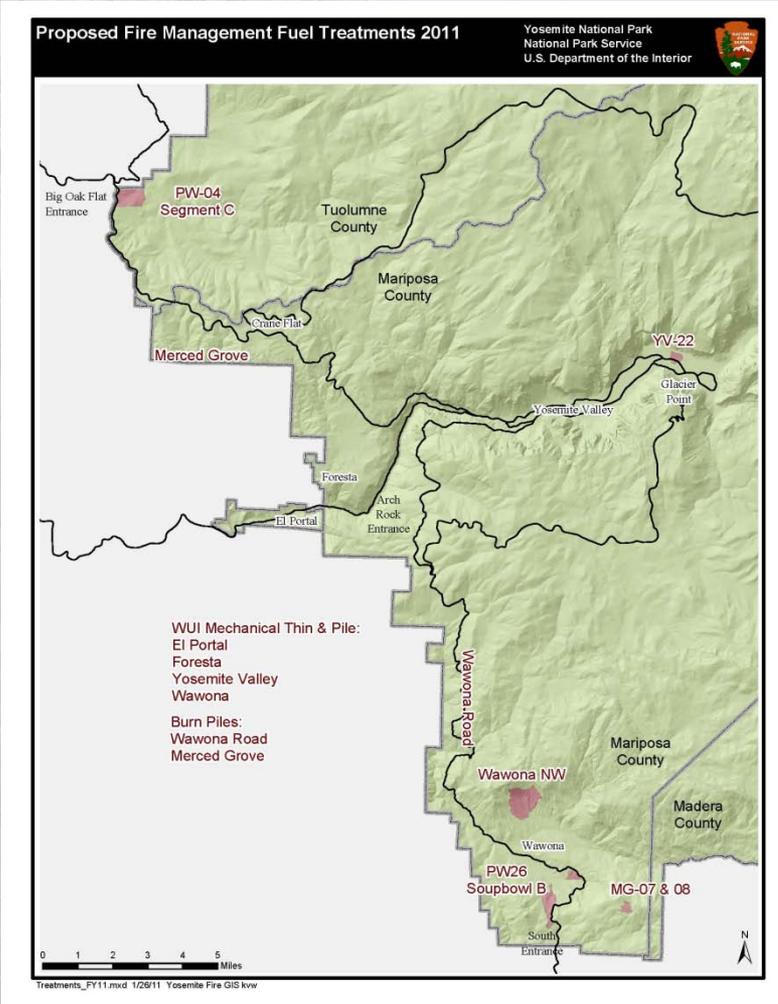


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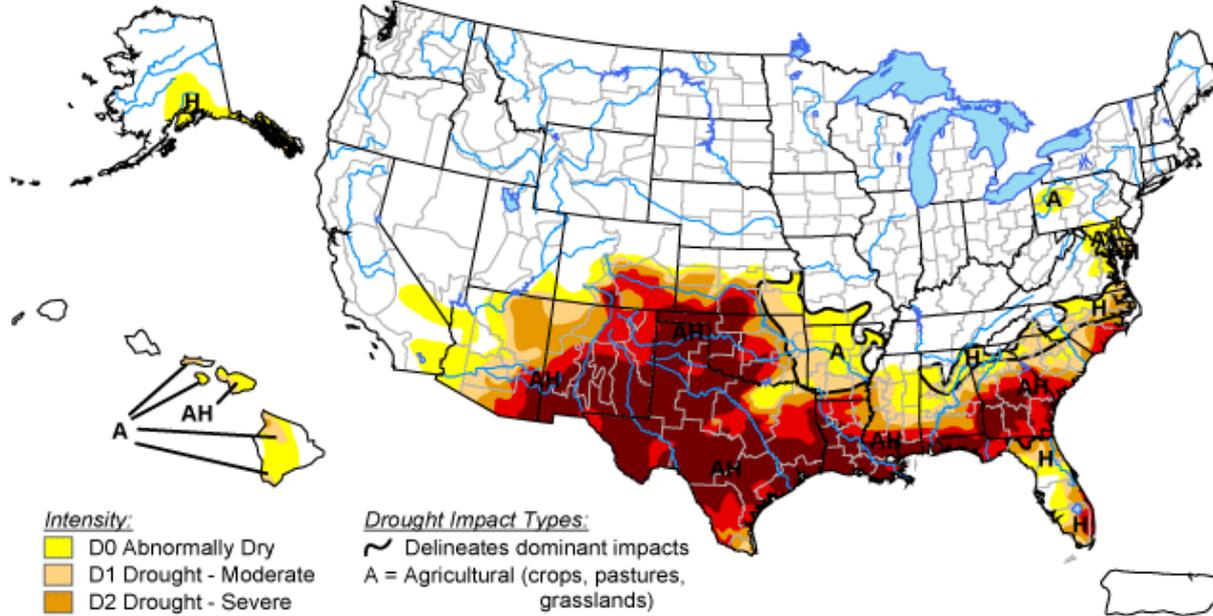
2011 Prescribed Fire & Fuels Projects



Drought Monitor

U.S. Drought Monitor

July 12, 2011
Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, July 14, 2011
Author: David Miskus, NOAA/NWS/NCEP/CPC

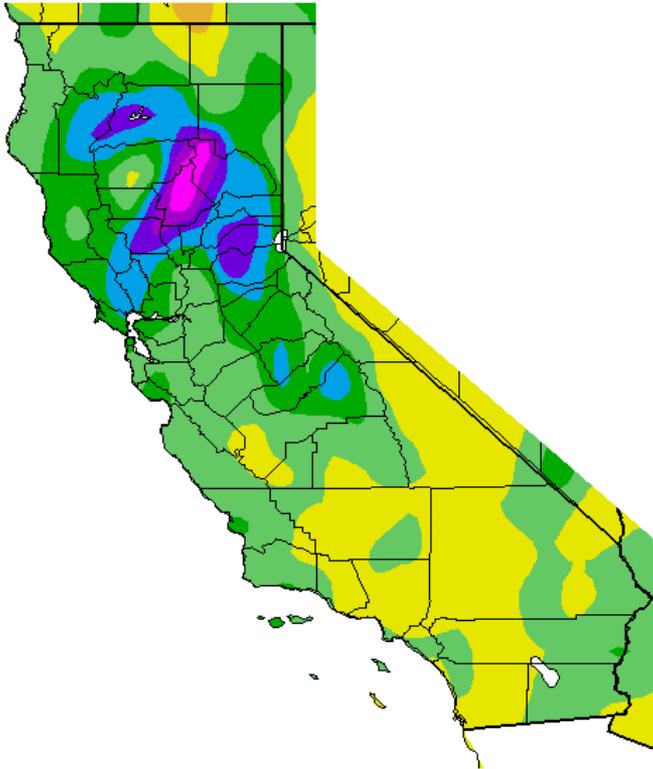
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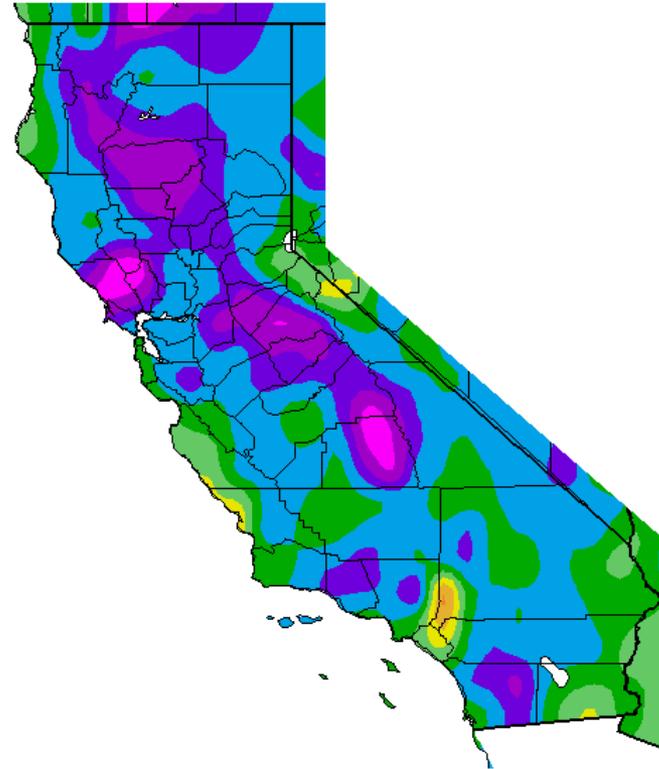
Precipitation & Temperature

Precipitation Departure from Average (in.)
4/20/2011 – 7/18/2011



Generated 7/19/2011 at WRCC using provisional data.
NOAA Regional Climate Centers

Ave. Temperature dep from Ave (deg F)
5/21/2011 – 7/19/2011

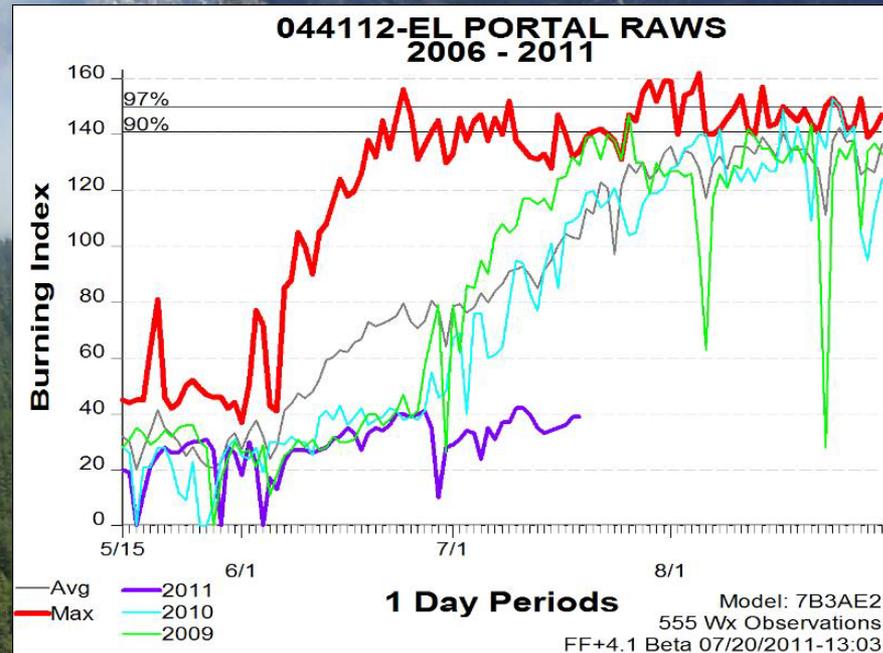
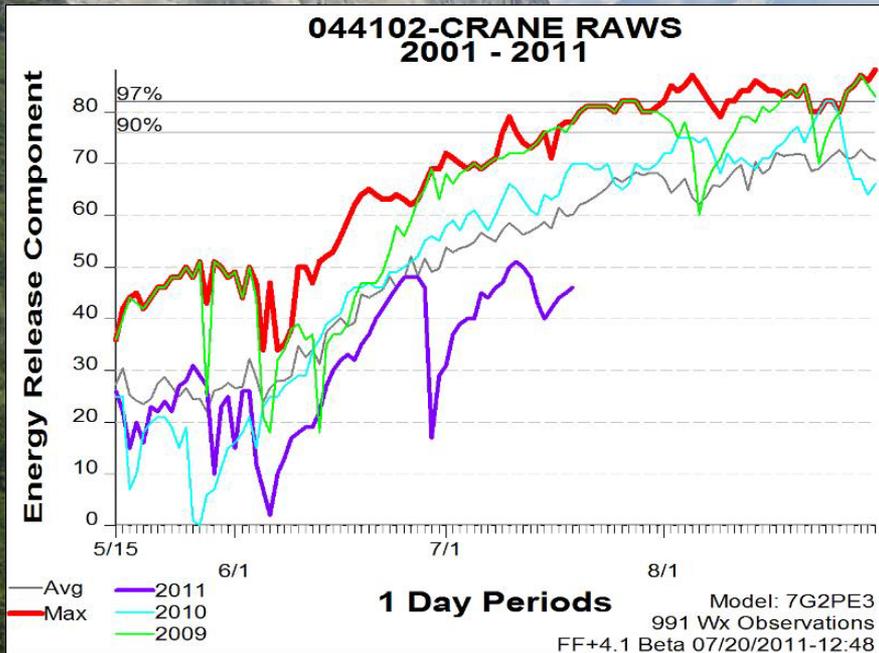


Generated 7/20/2011 at WRCC using provisional data.
NOAA Regional Climate Centers



Energy Release Component and Burn Index

- ERC is rating system to determine how hot a fire could burn
- ERC is a function of the moisture content of live and dead fuels
- ERC Tracks seasonal, longer term fire danger trends
- Fine fuels have little influence and wind has none – BI better indicator.
- BI considers winds, more daily variability



Objectives From FMP for Prescribed Fire

Stand Density, Species Composition and Fuel Loading

Forest Type	Density	Species composition	Surface fuel loading ¹
Ponderosa pine/mixed conifer	4- 91 trees/acre < 31.5" 4-30 trees/ac > 31.5"	60-95% pine, 15-40% cedar, 1-10% oak	5-30 t/ac; 20-40% 30-60 t/ac; 20-50% >60 t/ac; 5 -20%
Ponderosa pine/bear clover	No objectives in FMP	No objectives in FMP	No objectives in FMP
White fir/mixed conifer	20-89 trees/ac. < 31.5" 4-20 trees/ac. > 31.5"	40-65% fir, 15-50% pine, 0- 10% cedar	5-30 t/ac; 20-40% 30-60 t/ac; 20-50% >60 t/ac; 5 -20%



Canopy Gap Size and Distribution

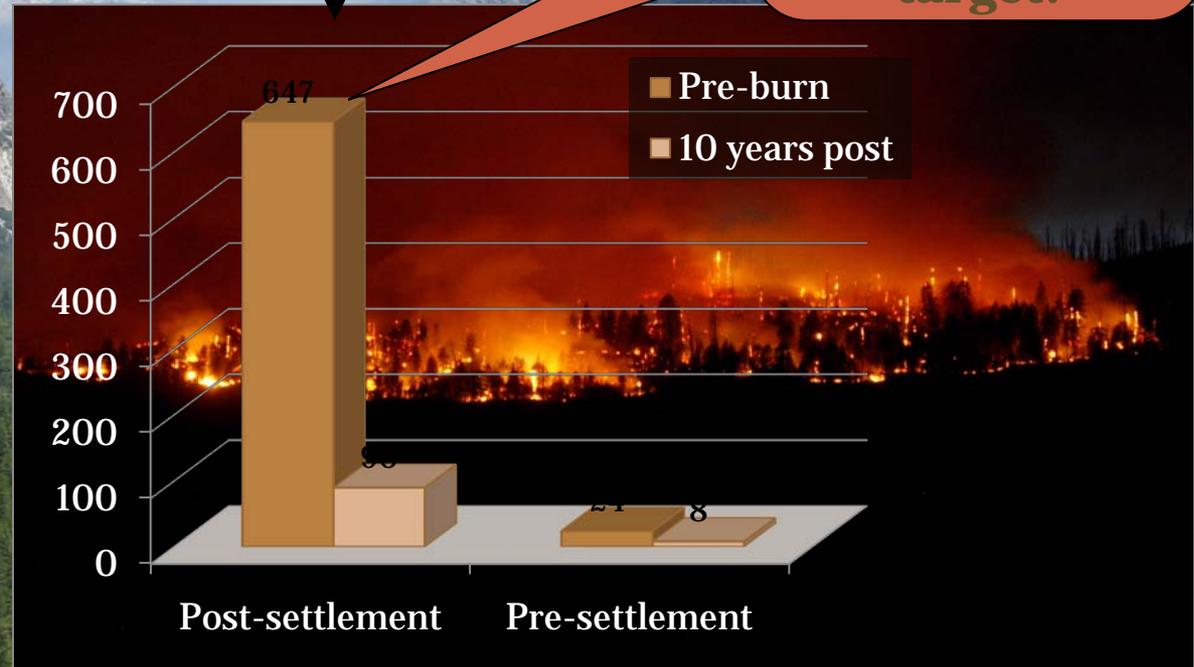
Forest type	Fire Return Interval	Season	Fire Severity	Gap distribution
Ponderosa pine/mixed conifer	3 – 14 years 9 years (median)	< 30% Jan.- late Aug. 50- 70% late Aug-Oct. 30-50% Oct.-Dec.	Lower slopes: 60-100% low, 5 -35% mod., 5 -10% High. Upper slopes: 0-35% L, 20- 35%M, 30-90%H.	75-95%: ¼ - 2.5 ac. 5-25%: 2.5 – 25 ac. <1%: > 25ac.
Ponderosa pine/bear clover	2 – 6 years 4 years (median)	No objectives in FMP	No objectives in FMP	No objectives in FMP
White fir/mixed conifer	3 – 35 years 8 years (medians)	0-20% June -late Aug. 40 -60% late Aug.-Oct 30-50% Oct-Dec.	Lower slopes:60-100% low, 5- 35% M, 5-10% H Upper slopes: 0-35% L, 20- 35%M, 30-90%H.	75-95%: ¼ - 2.5 ac. 5-25%: 2.5 – 25 ac. <1%: > 25ac.



FMP Objectives Stem Density in Mixed Conifer

Desired conditions in FMP
20 – 89 trees/acre < 31 in. dbh
4 – 20 trees/ac >31 in. dbh

That's ~560 more trees < 31 inches dbh than our target!



Results Stem Density in Mixed Conifer

Desired conditions in FMP
20 – 89 trees/acre < 31" DBH
4 – 20 trees/acre > 31" DBH



The two burns killed ~600 trees < 31 inches dbh.

Full disclosure statement: Based on 3 plots.

FMP Objectives Species Composition in Mixed Conifer

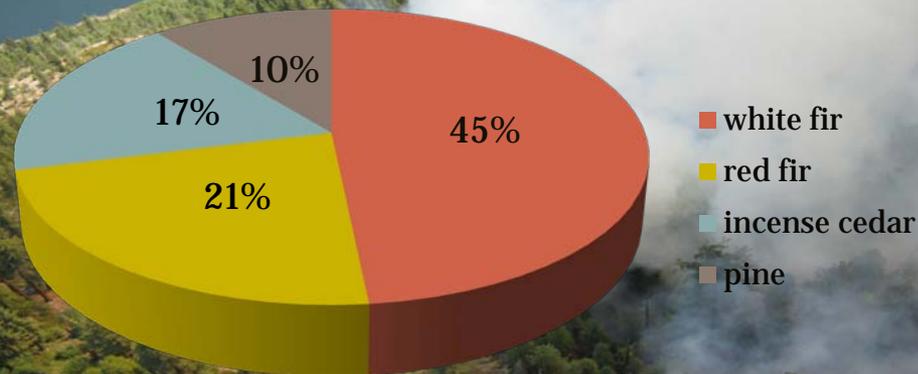
Desired conditions from FMP

40 – 65% fir (red and white combined)

15 – 50% pine (sugar, ponderosa, Jeffrey)

0 – 10% incense cedar

preburn species composition



66% combined white and red fir

Results - Species Composition Mixed Conifer

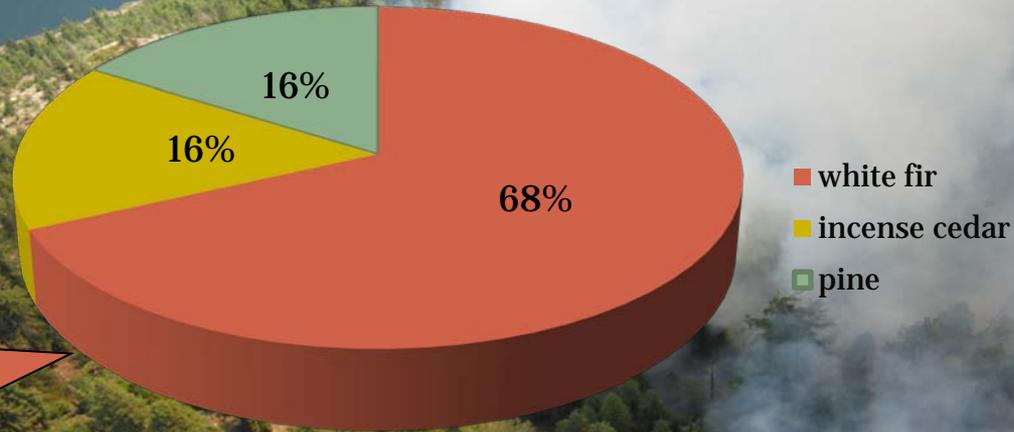
Desired conditions from FMP

40 – 65% fir

15 – 50% pine

0 – 10% cedar

10 years post 2nd burn



Outside of target for fir and cedar, and just barely inside for pine

66% combined white and red fir

Discussion

- We are meeting our stocking objectives 10 years after the second burn. Future burns would be considered maintenance (reduce fuels and FRID).
- Species composition is not responding as well.
 - White fir and cedar above the high end of the range.
 - Pine at the low end of the range.
 - We should be very concerned about the persistence of pine in this forest type.
- We should create larger canopy gaps so that ponderosa and sugar pine can recruit into this forest type (hypothesis).
 - Many people who come to the park do not like to see the trees we kill with fire.



Impediments to Restoring Fire as an Ecosystem Process



Smoke!

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Public Perception of Fire



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Other Impediments

Social, Political and Economic Values

- Impacts to gateway communities
- Safety of fire fighters and public
- Risk (homes, property, natural resource, cultural resources values)
- Balancing visitors' experience with restoration goals
- Cost
- Declining Federal budget for fuels treatments
- Uncertainty!





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