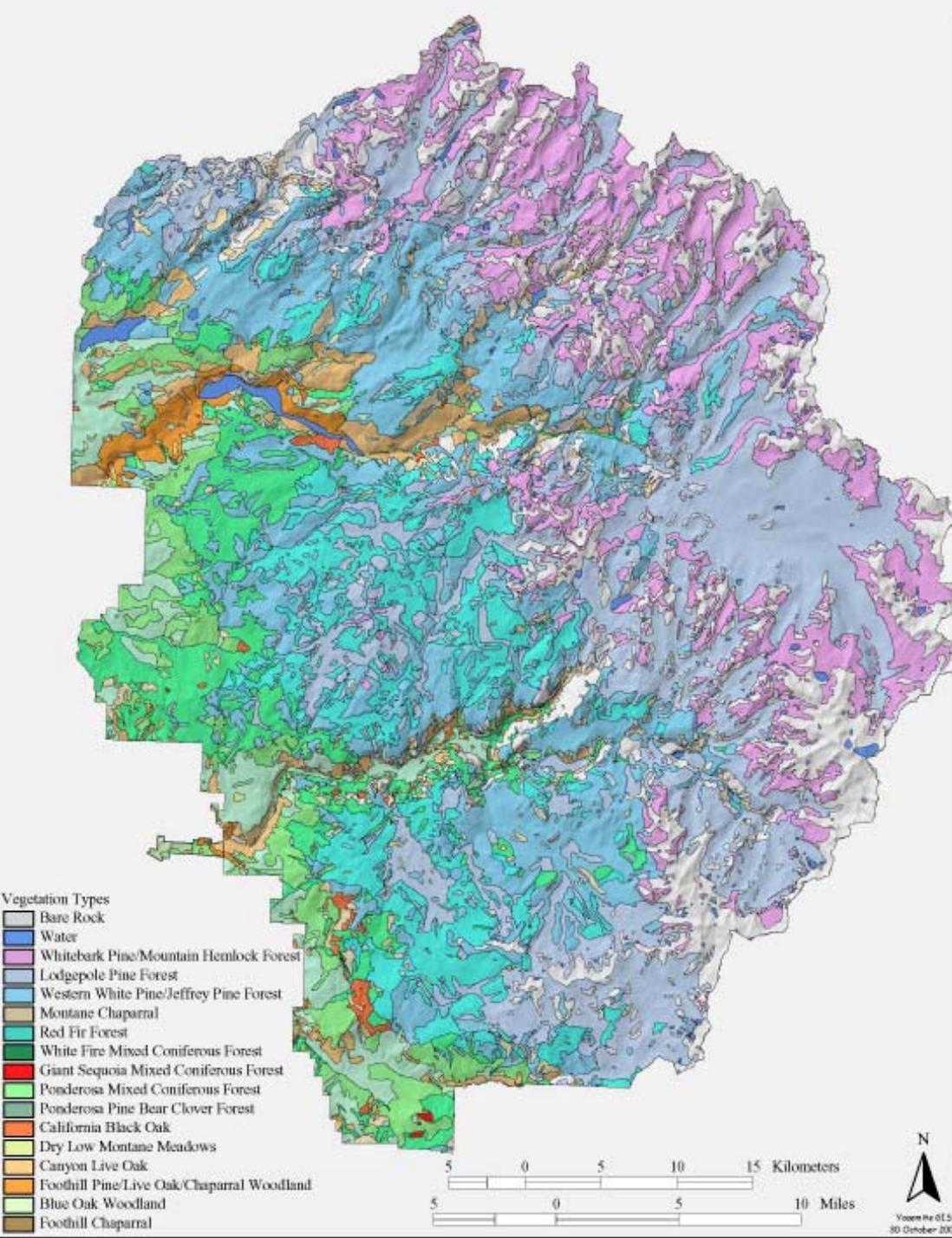


**2002 Air Quality
Lessons Learned
Yosemite National Park**



Vegetation Types

- *Low/mid-elevation ponderosa & mixed conifer has missed more fire cycles, since historic interval was short - in need of ecosystem restoration.*
- *A longer fire cycle, less effective suppression, and WFU has helped keep *high elevation* vegetation in more of a maintenance condition.*



Wildland Fire Use

- Condition Class 1-2
- Fuels discontinuous
- Mostly in designated wilderness
- Slower rates of spread
- Red fir/lodgepole pine
- 2002: Long-term fire protection for the White Wolf developed area (historic lodge, rental tent cabins, park housing, and campground)

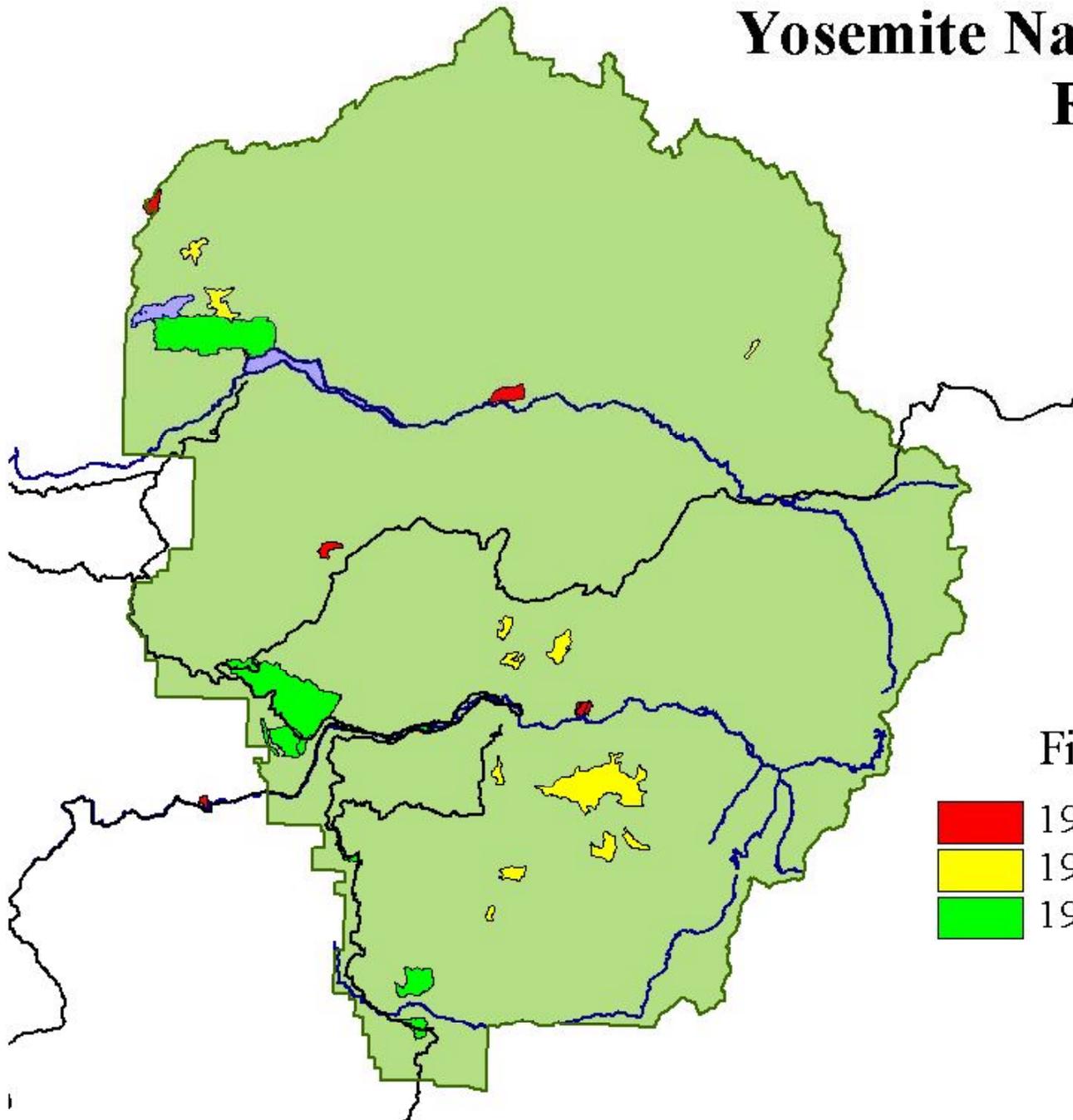


Prescribed Fire/ Mechanical Treatment

- Condition Class 3+
- Continuous fuels
- Focused on WUI protection
- Faster rates of spread
- Ponderosa pine/mixed conifer
- Most park communities and infrastructure are in this vegetation type
- 2002: Completed $\frac{1}{2}$ of a large landscape unit, Gin Flat



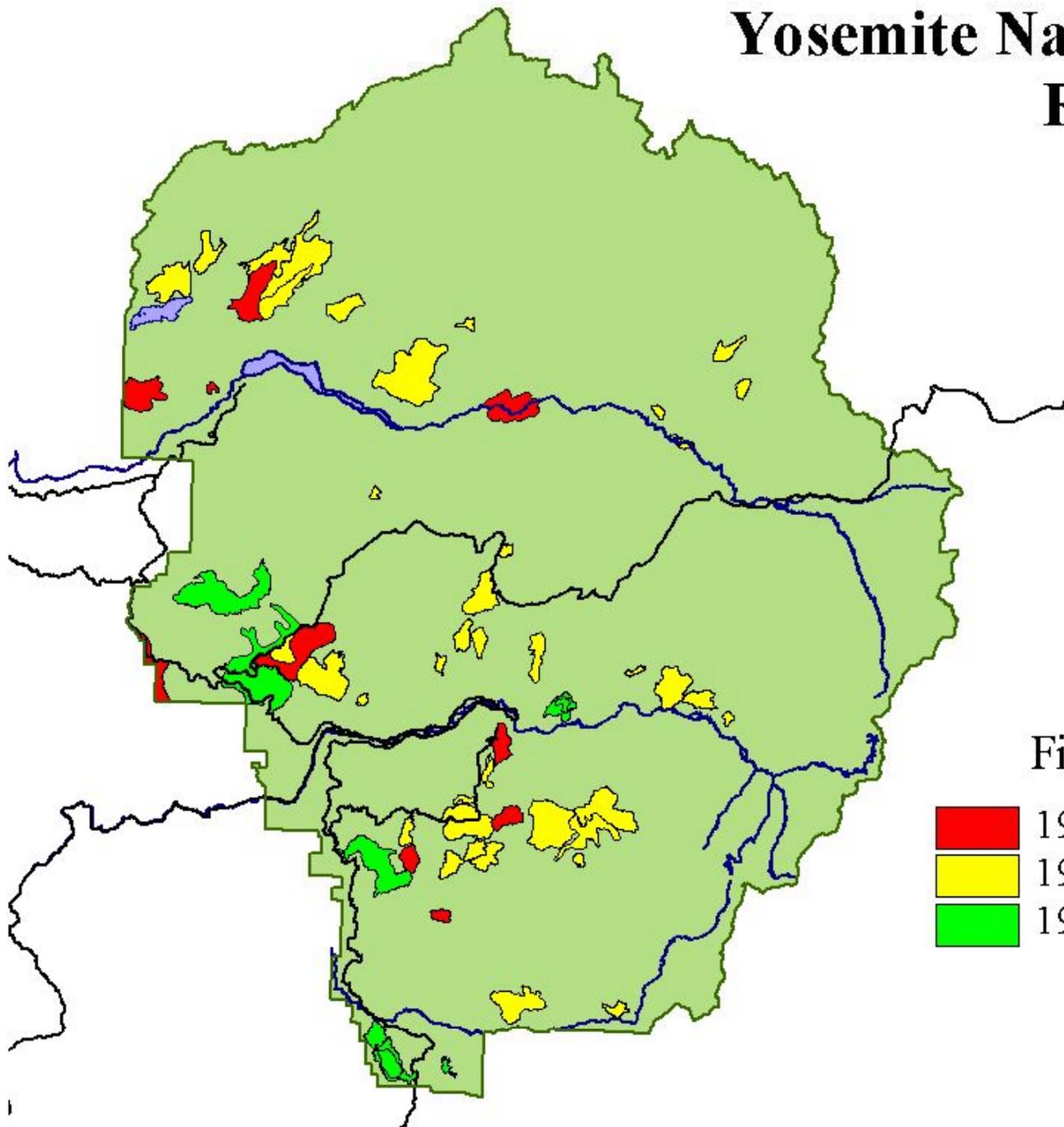
Yosemite National Park Fire History



Fires 1970 - 1979

-  1970-79 Wildland Fires
-  1970-79 Managed Fires
-  1970-79 Prescribed Fires

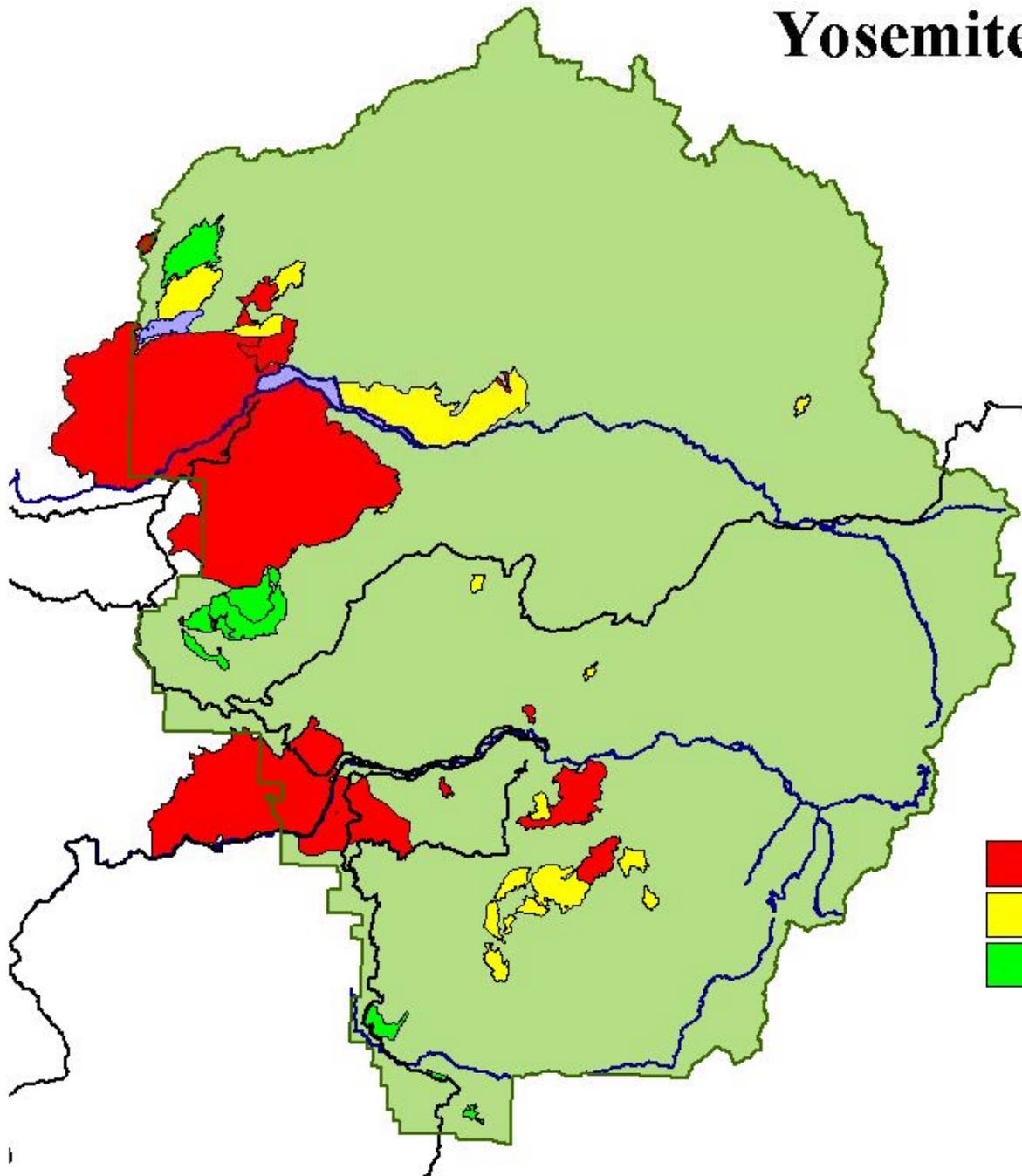
Yosemite National Park Fire History



Fires 1980 - 1989

-  1980-89 Wildland Fires
-  1980-89 Managed Fires
-  1980-89 Prescribed Fires

Yosemite National Park Fire History

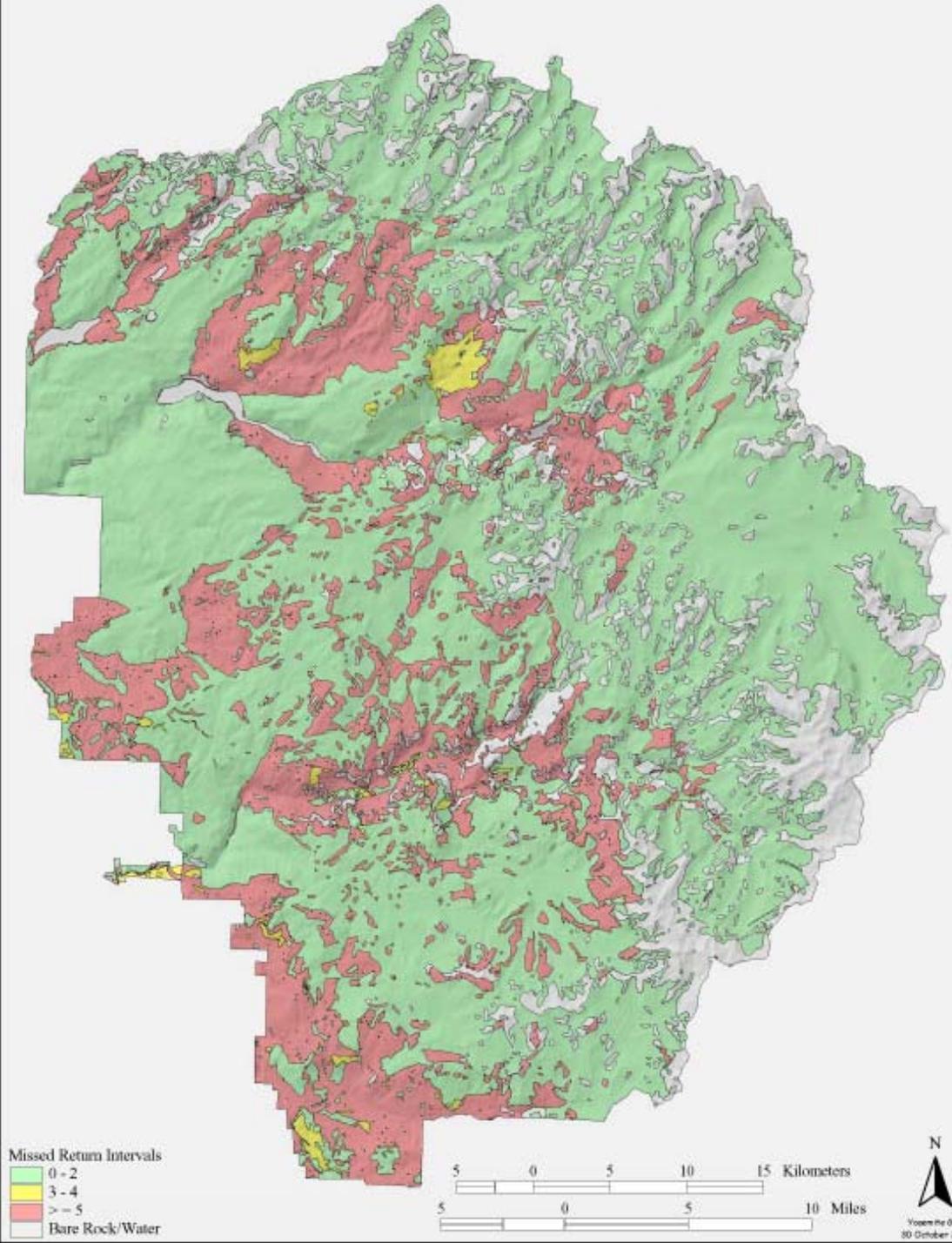


Fires 1990 - 1999

-  1990-99 Wildland Fires
-  1990-99 Managed Fires
-  1990-99 Prescribed Fires

Median Fire Return Interval Departure (FRID)

Fire return interval is the number of years between naturally occurring fire at a specific location that is representative of a typical stand of that vegetation



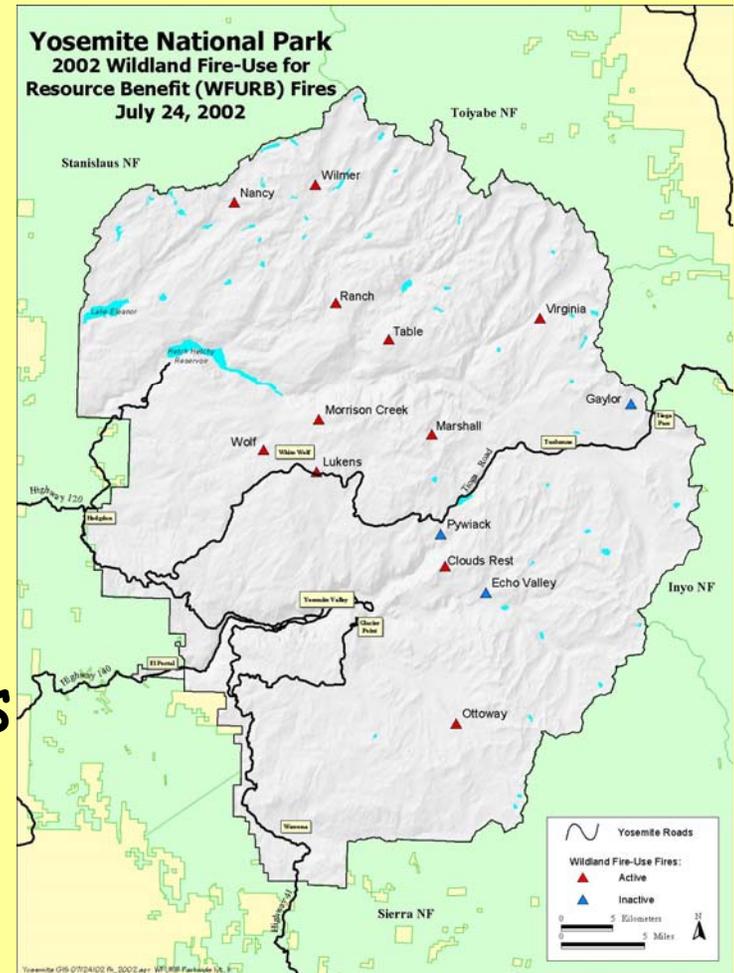
Missed Return Intervals
0 - 2
3 - 4
> = 5
Bare Rock/Water

5 0 5 10 15 Kilometers
5 0 5 10 Miles

N
Vopani for O.E.S.
30 October 2001

2002 Season

- 14 wildland fire use incidents totaling over 2500 acres (9th)
- 6 prescribed fires totaling nearly 3800 acres (3rd)
- Over 300 acres mechanical treatment

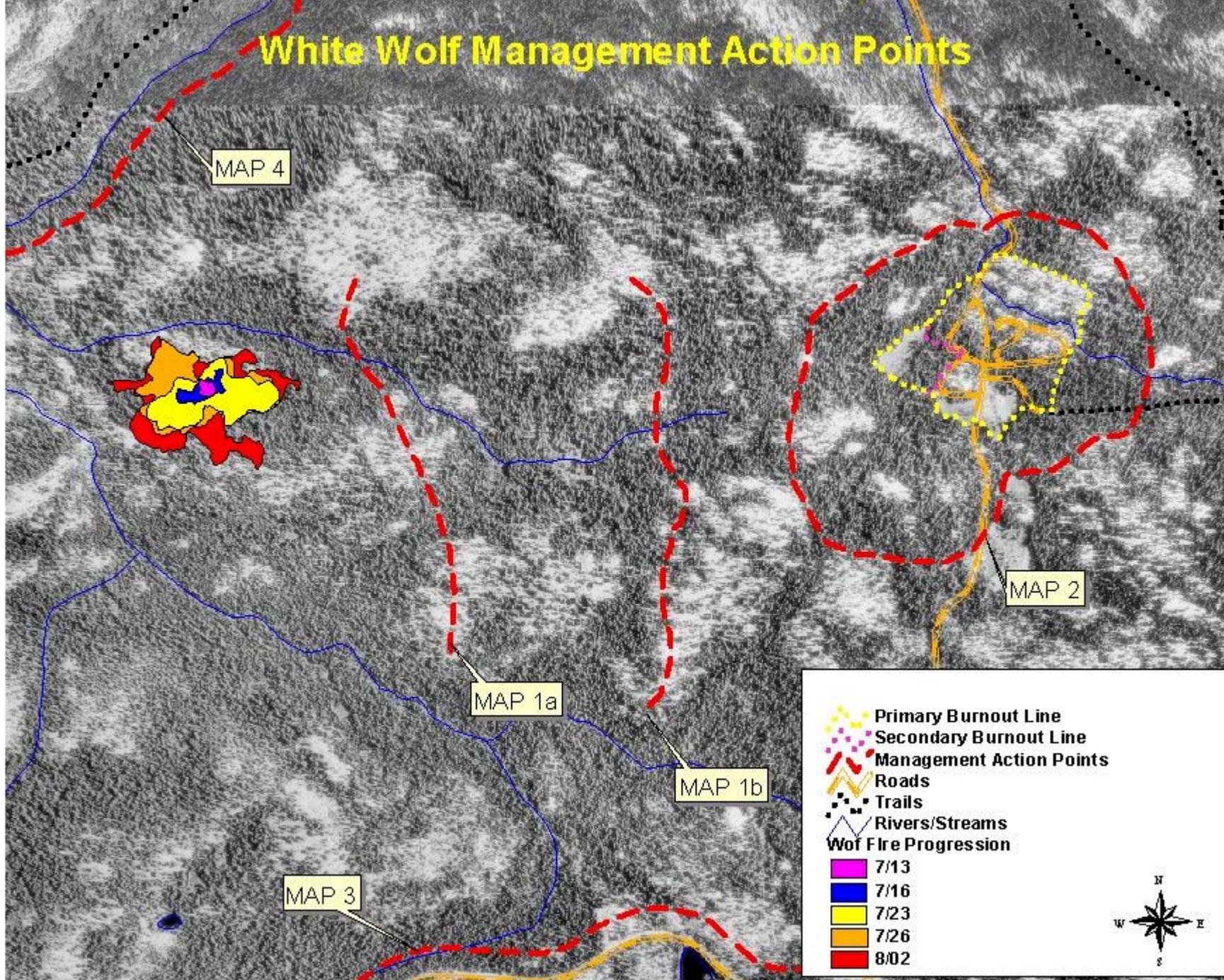




Wolf Fire Behavior



White Wolf Management Action Points



MAP 4

MAP 2

MAP 1a

MAP 1b

MAP 3

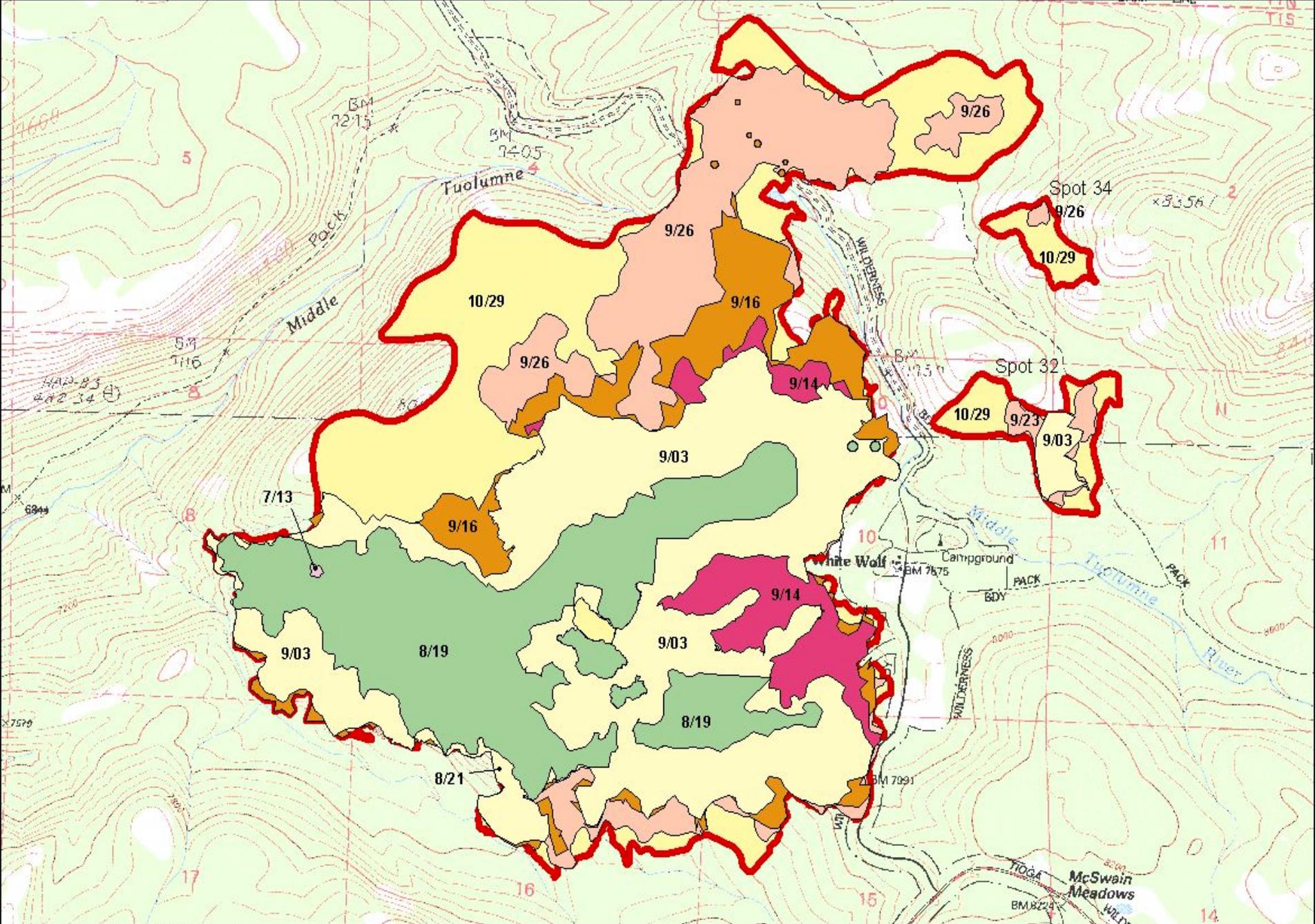
- Primary Burnout Line
- Secondary Burnout Line
- Management Action Points
- Roads
- Trails
- Rivers/Streams
- Wolf Fire Progression
 - 7/13
 - 7/16
 - 7/23
 - 7/26
 - 8/02



1

0

1 Miles



0 1000 2000 Feet

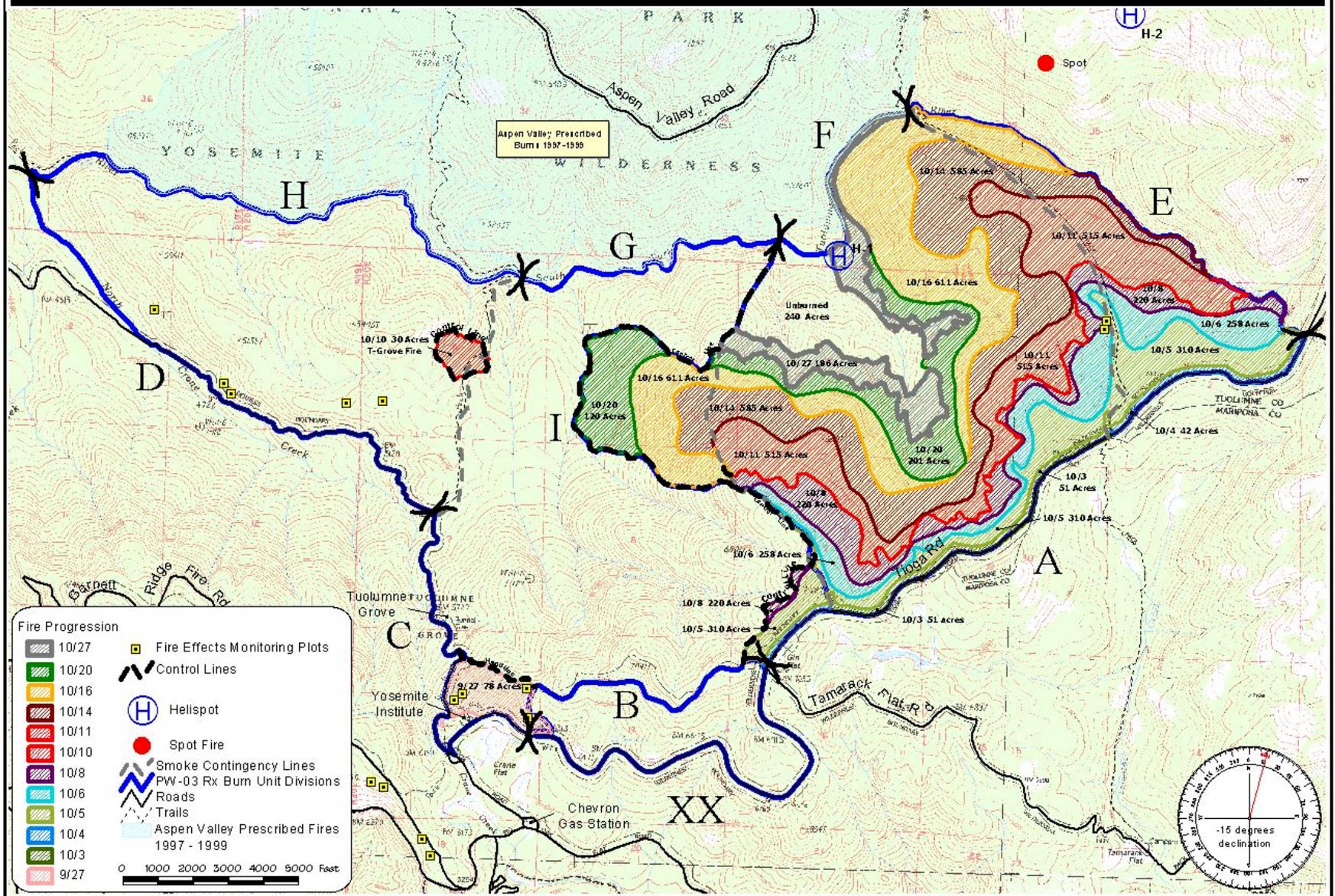
Wolf Fire Progression 7/13 - 10/29 1876 acres

Yosemite National Park
10/30Wolf.lyt Wolf_02.apr

PW-3 Gin Flat Prescribed Burn

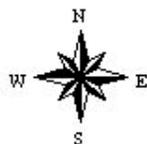
October 29, 2002 3215 Acres

Yosemite National Park



2002 Fuel Treatment Target Areas

- Yosemite NP Boundary
- WUI Zones
- Roads
- Rock
- >4 Missed Fire Return Intervals
- Largest Fires 1990-2001



Hodgdon Meadows

Crane Flat, Tuloumne & Merced Groves

Foresta

El Portal

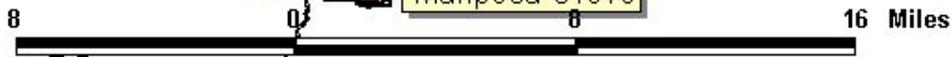
Yosemite West

Wawona

Mariposa Grove

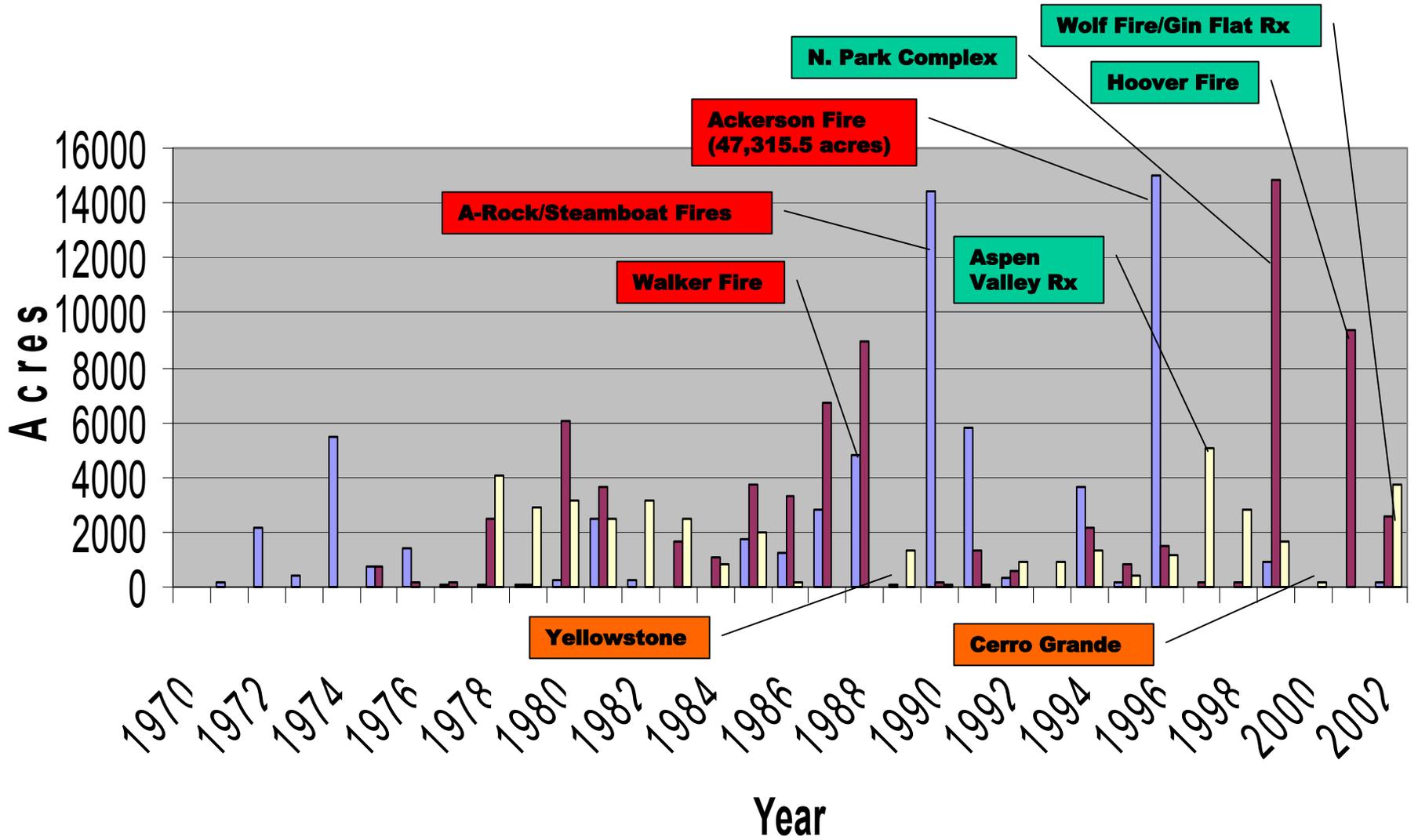
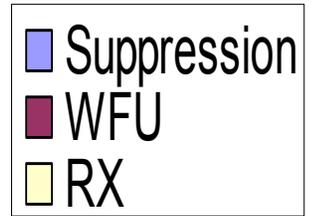
Yosemite Valley

by MB
11/18/01

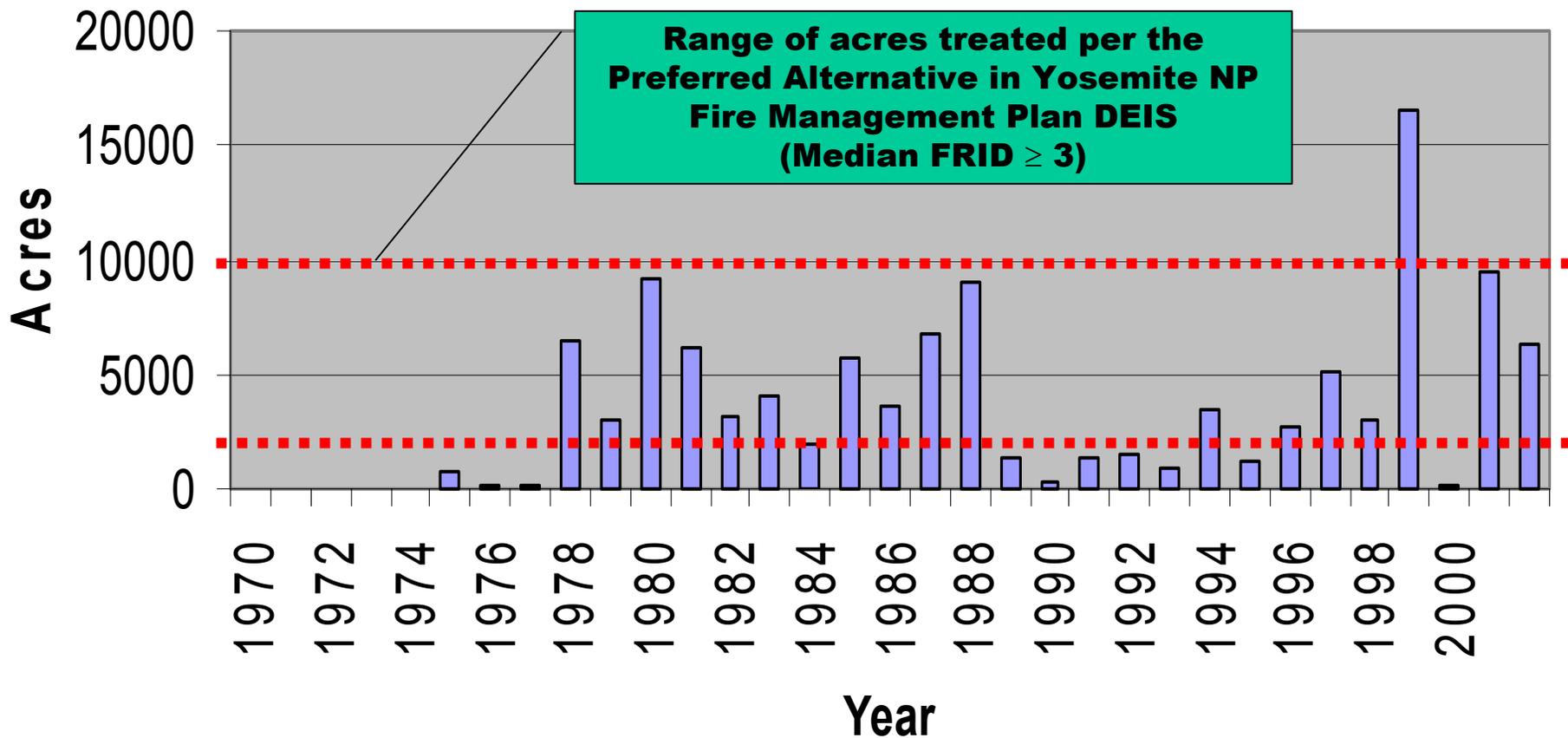


Acres Burned by Strategy

Yosemite National Park 1970-2002



Fire Use (WFU+Rx) Yosemite National Park 1970-2002

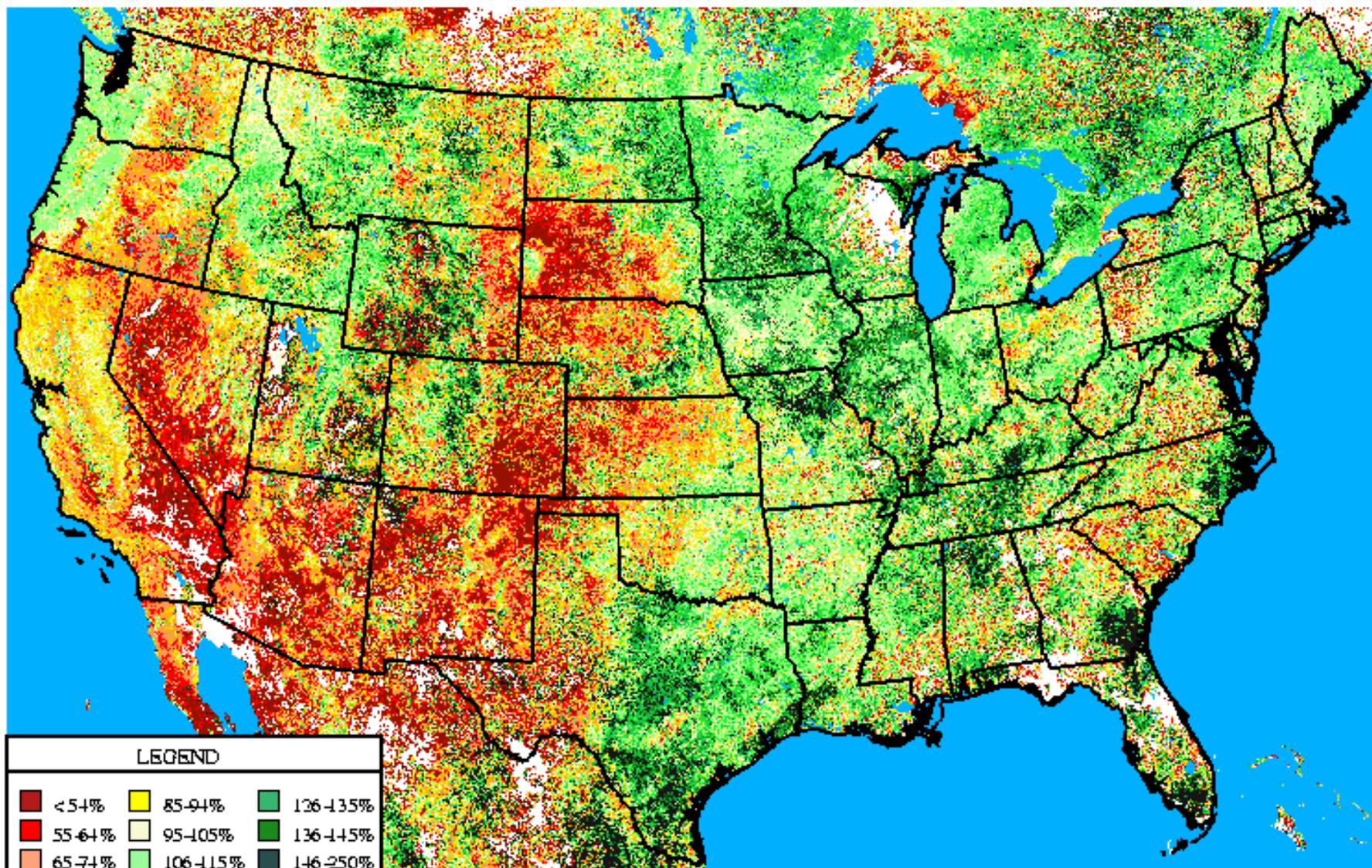


Mean Acres of Annual Accomplishment (FMP DEIS)

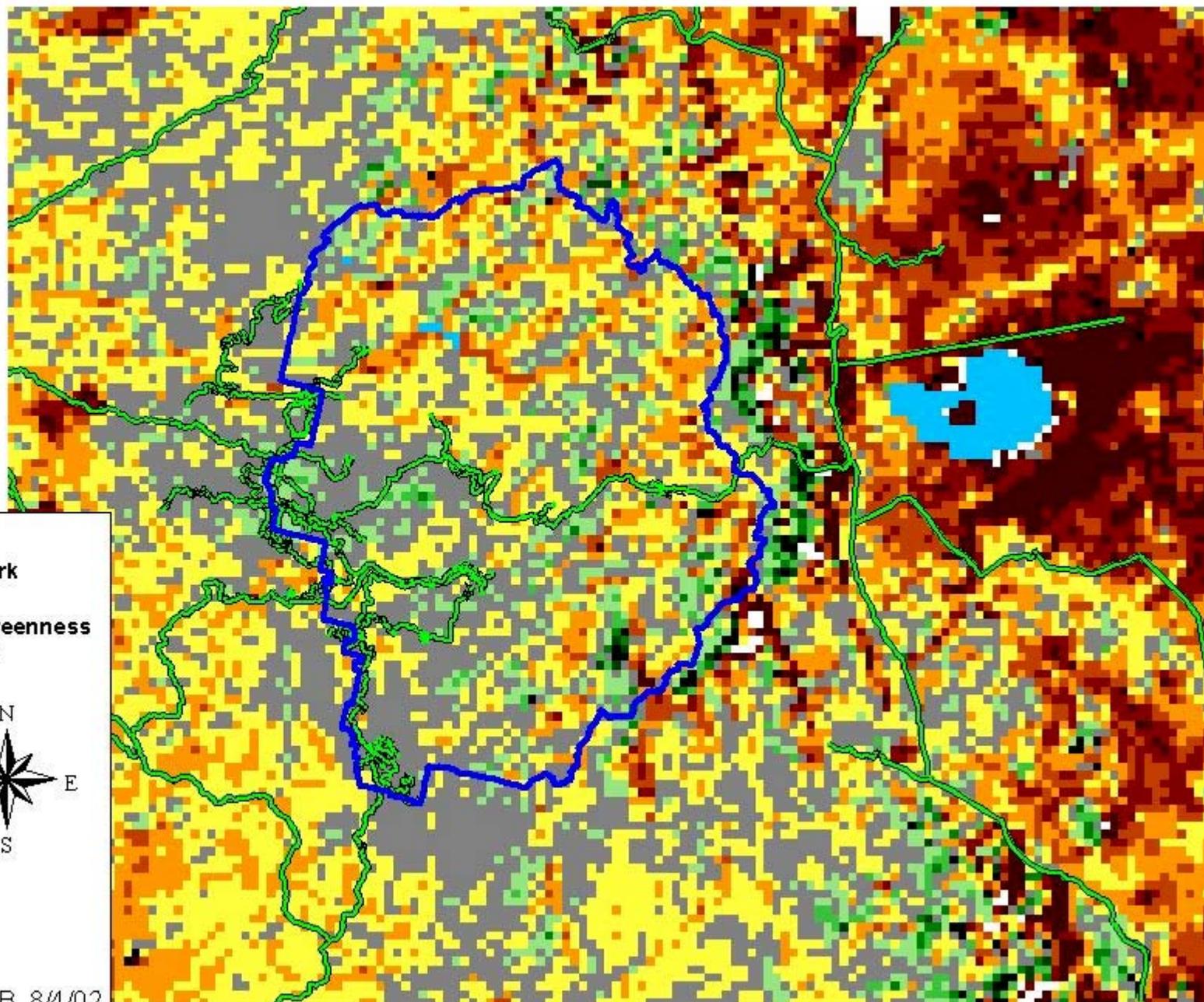
	Alt. A	Alt. B	Alt. C	Alt. D
Wildland/ Urban Interface	Less than 100 acres per year for all developed areas.	~ 1,553 acres treated per year.	~ 766 acres treated per year.	~ 1,095 acres treated per year.
Prescribed Fire	1,472 acres per year (over the past 29 years).	2,520 to 12,872 acres per year.	1,260 to 6,436 acres per year.	<i>1,817 to 9,194 acres per year.</i>
Managed Wildland Fire	2,567 acres per year (average over the past 27 years).	Maximize managed wildland fire with a target of 16,000 acres per year (all treatments) based on fire history indications.		



Departure from Average Greenness: Jul 26 - Aug 01 2002

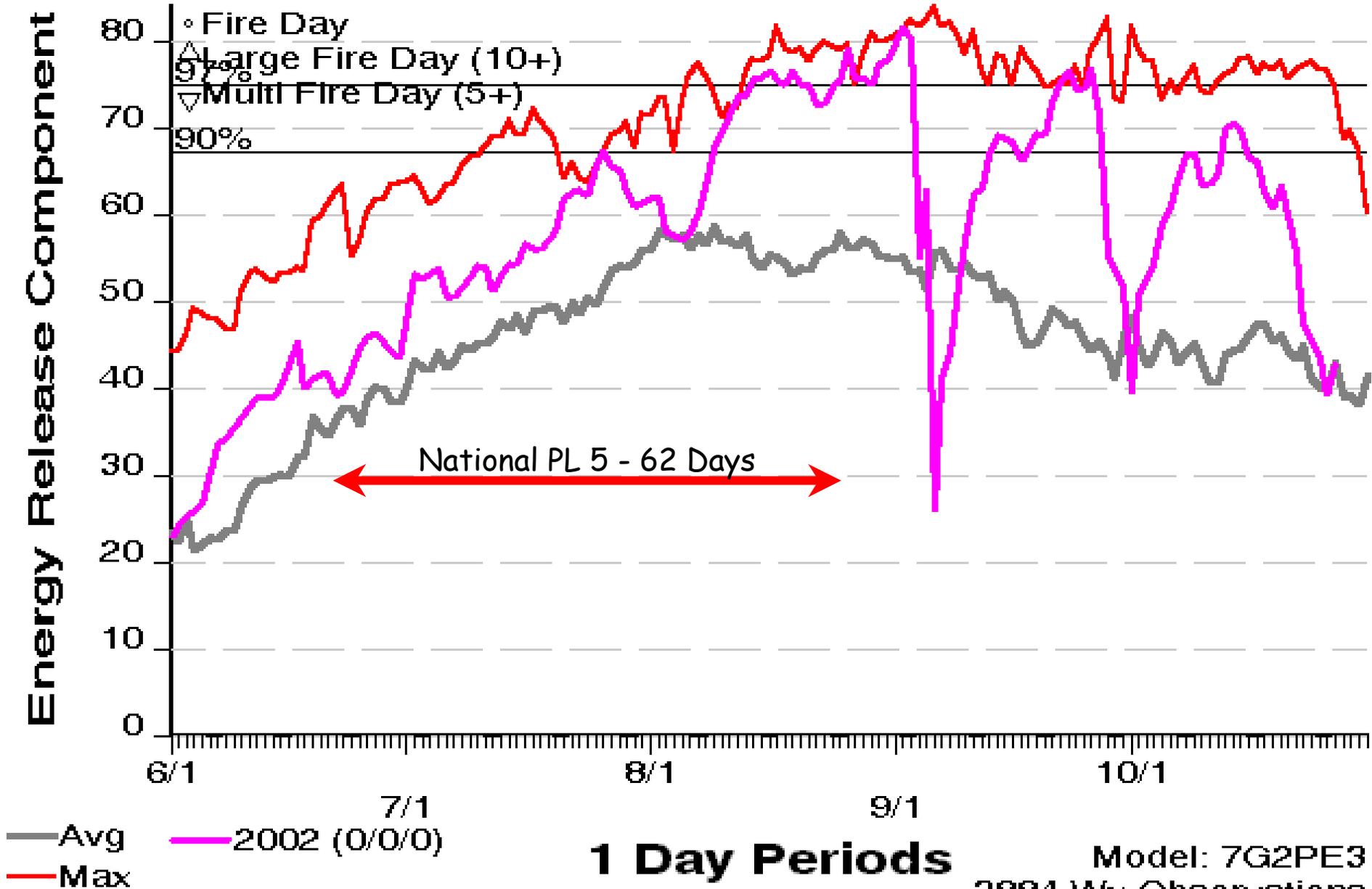


Departure From
Average Greenness
Yosemite
National Park
August 1, 2002



10 0 10 20 30 40 50 Miles

044102-CRANE 1973 - 2001



Model: 7G2PE3
3884 Wx Observations
FF+2.0 11/20/2002-11:06

Areas of Concern: Fire Information



Strategy & Tactics



7:11am





Air Quality



Lessons Learned

- Public can only tolerate a week or less of significant smoke.
- Depending on topography, fuels, and proximity to populations, around 100 acres/day seems to be a significant threshold.
- Large landscape units should be broken into smaller units that can be completed in 3-4 days time.
- Identify strategic sites for placement of air quality monitoring equipment and keep sites consistent throughout project. Share this data with interested parties.
- Ensure web site information is updated and easy to find.
- Ensure all preparation work is complete according to the burn plan (e.g. smoke contingency line).
- Smoke contingency holding line was identified in the planning process and was utilized.
- Ensure all overhead positions are in agreement concerning long-term strategy.



Lessons Learned

- Need to have a dedicated phone line for smoke complaints.
- Consider impacts to public tolerance for smoke from multiple projects within a single airshed and cumulative effects from the season's wildfires.
- Tuolumne County's request to stop or reduce emissions resulted in much higher aviation and personnel costs on the Gin Flat burn.



Incident Reviews/Additional Items

- January 14, 2002 - Sequoia & Yosemite NP staff review Tar Gap and Gin Flat Prescribed Burns
- January 17, 2002 - Yosemite Fire Management Staff met with Tuolumne County APCD Staff to develop action items.
- Include air district staff in burn plan review process, particularly for larger, more complex burns.
- Arrange pre-burn site visits, particularly with Resource Management and operational staff, but air district staff should be invited.
- Develop better guidelines for particulate monitoring sites.
- Resolve state 50 ug/m³ vs. federal 150 ug/m³ thresholds, as applies to violation. Is this reasonable with a background of 20-30 ug/m³?
- Show spatial sequencing from park's 5-yr. project plan to district, for long-range planning.
- Improve public outreach, especially in nearby communities.
 - District & NPS will collaborate to develop a list of groups that would be interested in a briefing on Gin Flat and future fuels management projects at the park (e.g. ne Fire Safe Council, Bard of Supervisors, etc.)
 - Address perception that park doesn't consider local citizens concerns.
 - Better advance community notification.



Incident Reviews/Additional Items

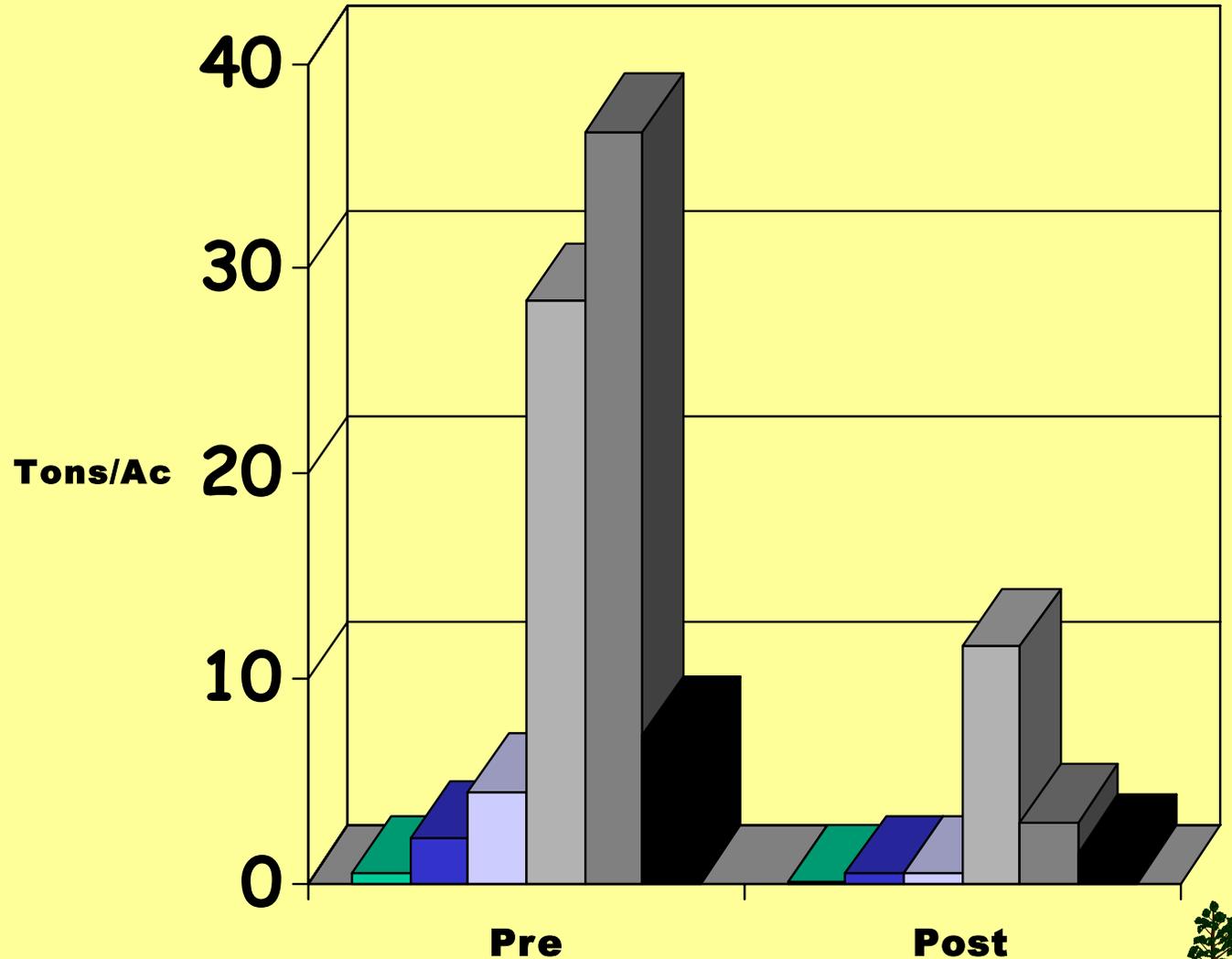
- Parse larger units into units as small as practicable with smoke contingency holding lines - 1 week/500-700 acres seemed to be a point of agreement on total duration, followed by a tangible break in the smoke impact, before another block is ignited nearby.
- Make sincere efforts at implementing mechanical treatments, *where possible*, that lower emissions (chip/haul/biomass, firewood cutting, etc.)
- Emphasize increased use of contract labor to support local economies.
- Ensure anticipated *total daily* acres burned, rather than just acres ignited is reported on the daily validation form.



Fire Effects

Based on 9 FMH Plots
(7 ABCO/2 ABMA)

- 1-Hour TLF
- 10-Hour TLF
- 100-Hour TLF
- 1000-Hour TLF
- Duff
- Litter



Fuel Moistures- Gin Flat Rx

- 1-Hr 7.6% (Rx 3-8%)
- 10-Hr 9.2-9.9% (Rx 5-10%)
- 100-Hr 9.3-11.1% (Rx 7-12%)
- 1000-Hr 10.4-14.9% (Rx 10-20%)
- Duff 14.5-17.2%

Fuel Reduction: Objective 30-70% Total

- 1-Hr 0.5 to 0.1 Ton/Ac (80%)
- 10-Hr 2.2 to 0.5 Ton/Ac (77%)
- 100-Hr 4.5 to 0.5 Ton/Ac (89%)
- 1000-Hr 28.4 to 11.6 Ton/Ac (59%)
- Duff 36.7 to 3.0 Ton/Ac (92%)
- Litter 7.3 to 1.5 Ton/Ac (79%)
- Total 79.6 to 17.2 Ton/Ac (78%)





Costs



2:54pm



Costs - Gin Flat Rx Fire

- Aircraft \$70,350 (18%)
- Personnel \$269,770 (70%)
- Supplies, Equipment, Meals, Lodging \$44,071 (12%)
- Total \$384,191
- \$113/acre



Costs - Wolf Complex

- Aircraft \$37,362 (10%)
- Personnel \$270,853 (70%)
- Supplies, Equipment, Meals, Lodging \$81,099 (20%)
- Total \$389,314
- \$185/acre





Crew 7



Crew 9

Thanks!

**Wolf Fire:
Lightning-struck
Red Fir**



Crew 6

