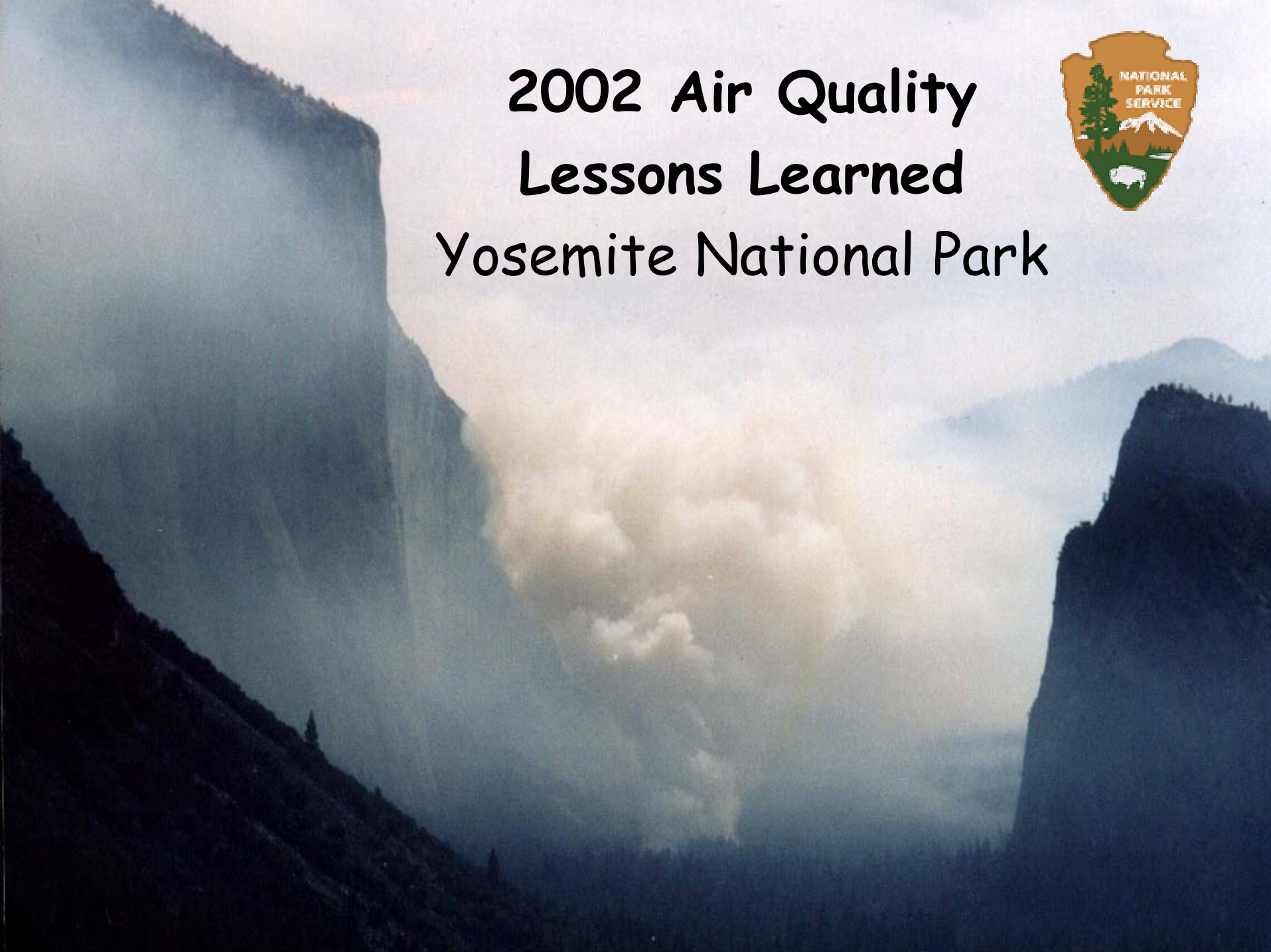
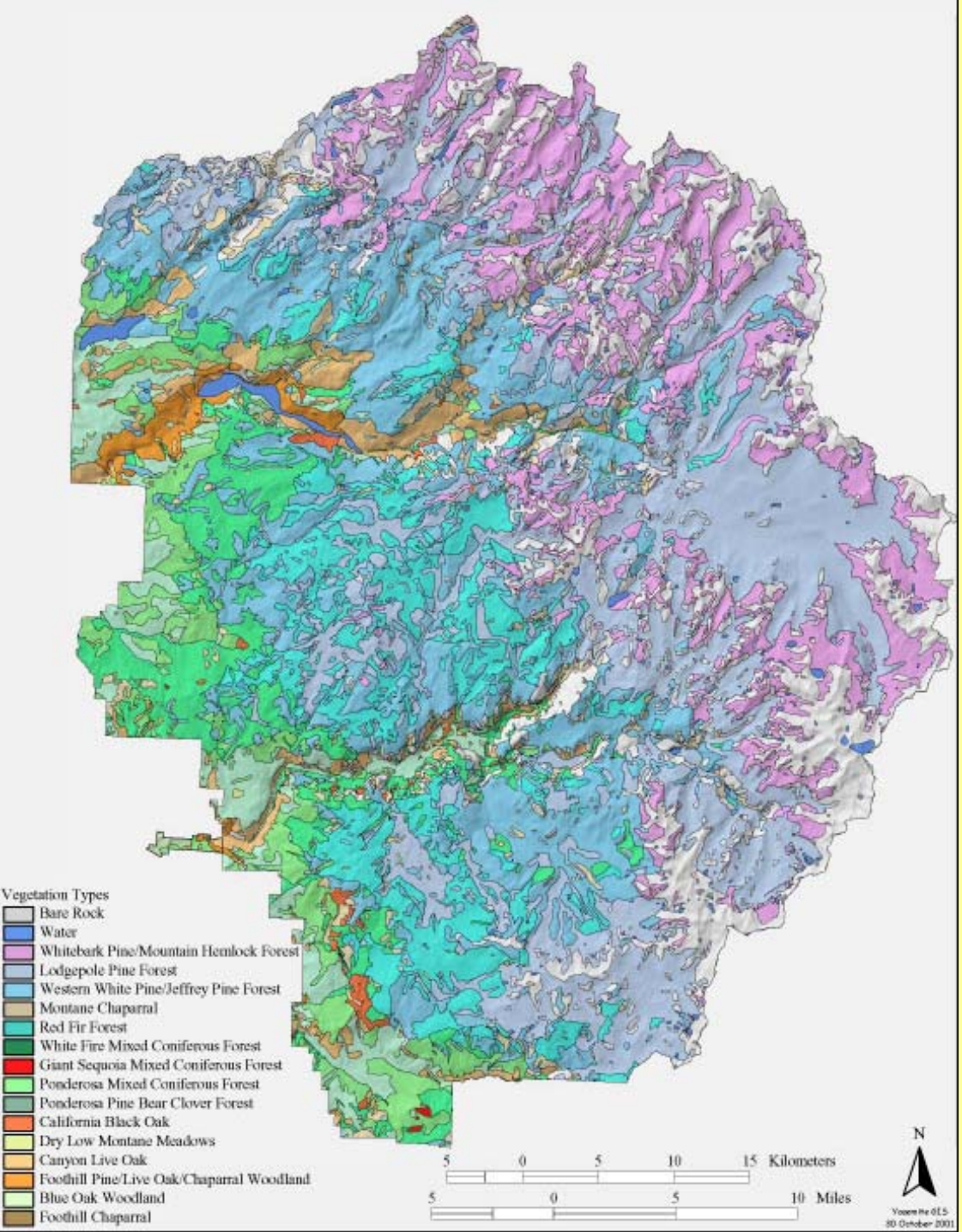
2002 Air Quality Lessons Learned

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.

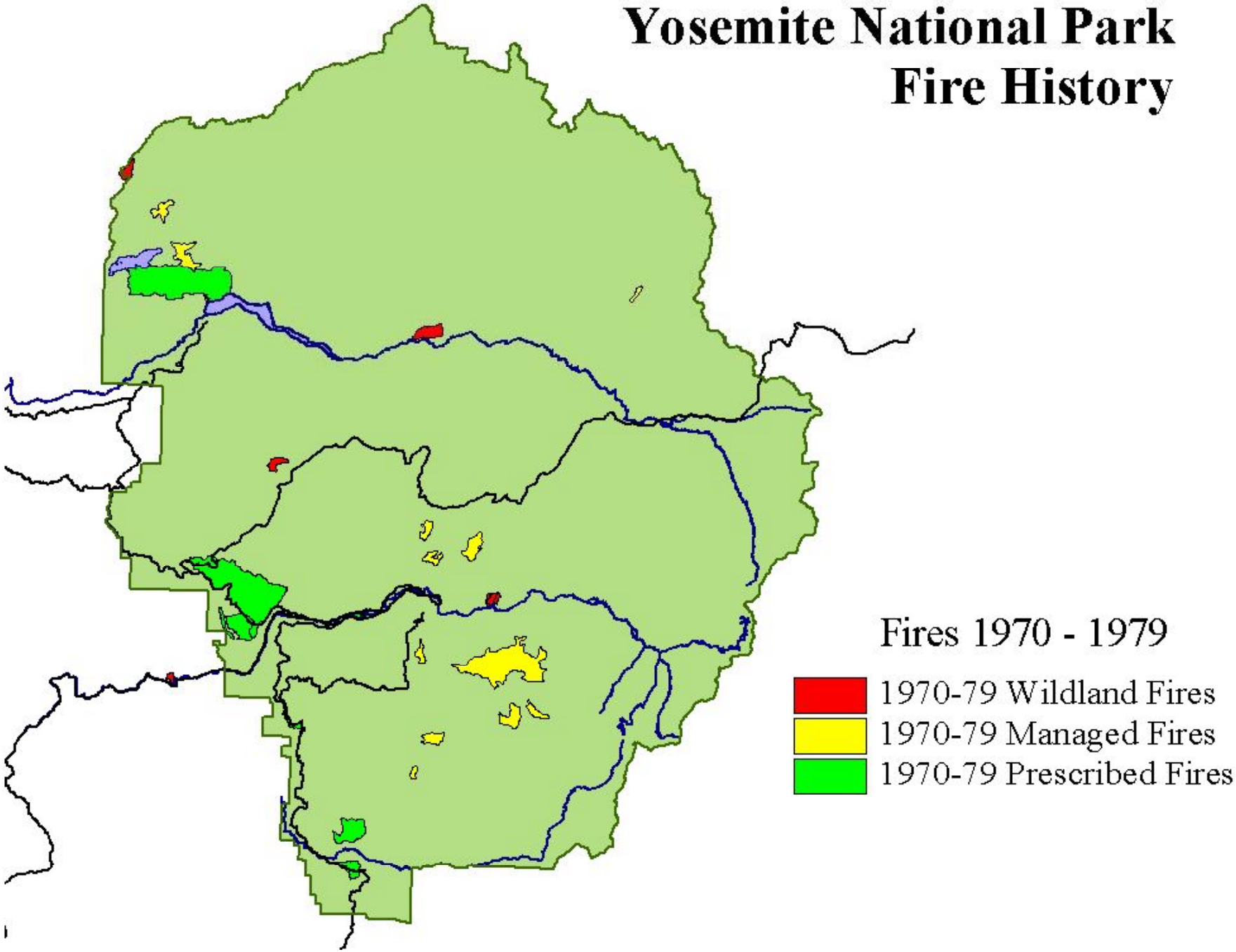
Wildland Fire Use

- 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)

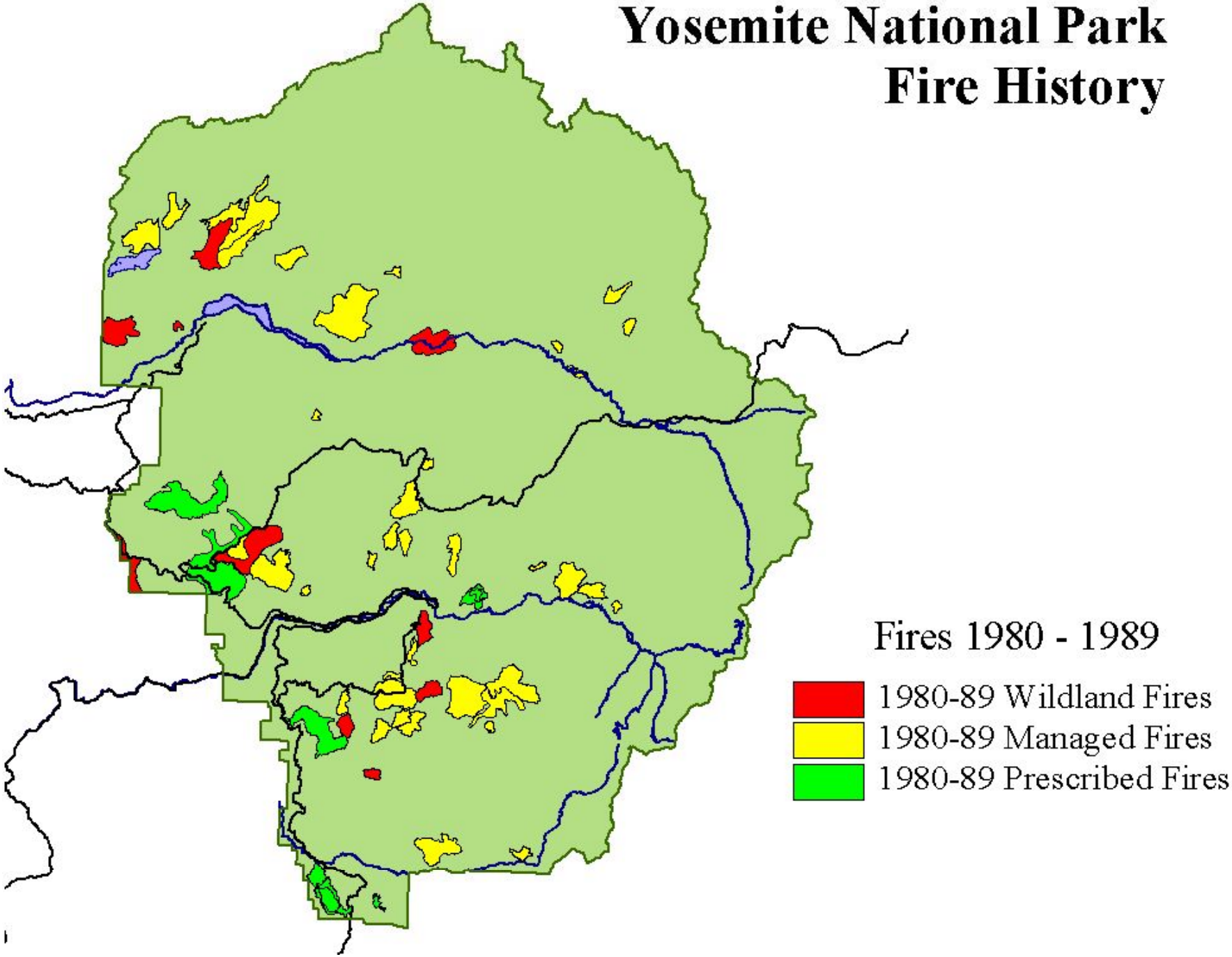
Prescribed Fire/ Mechanical Treatment

- 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

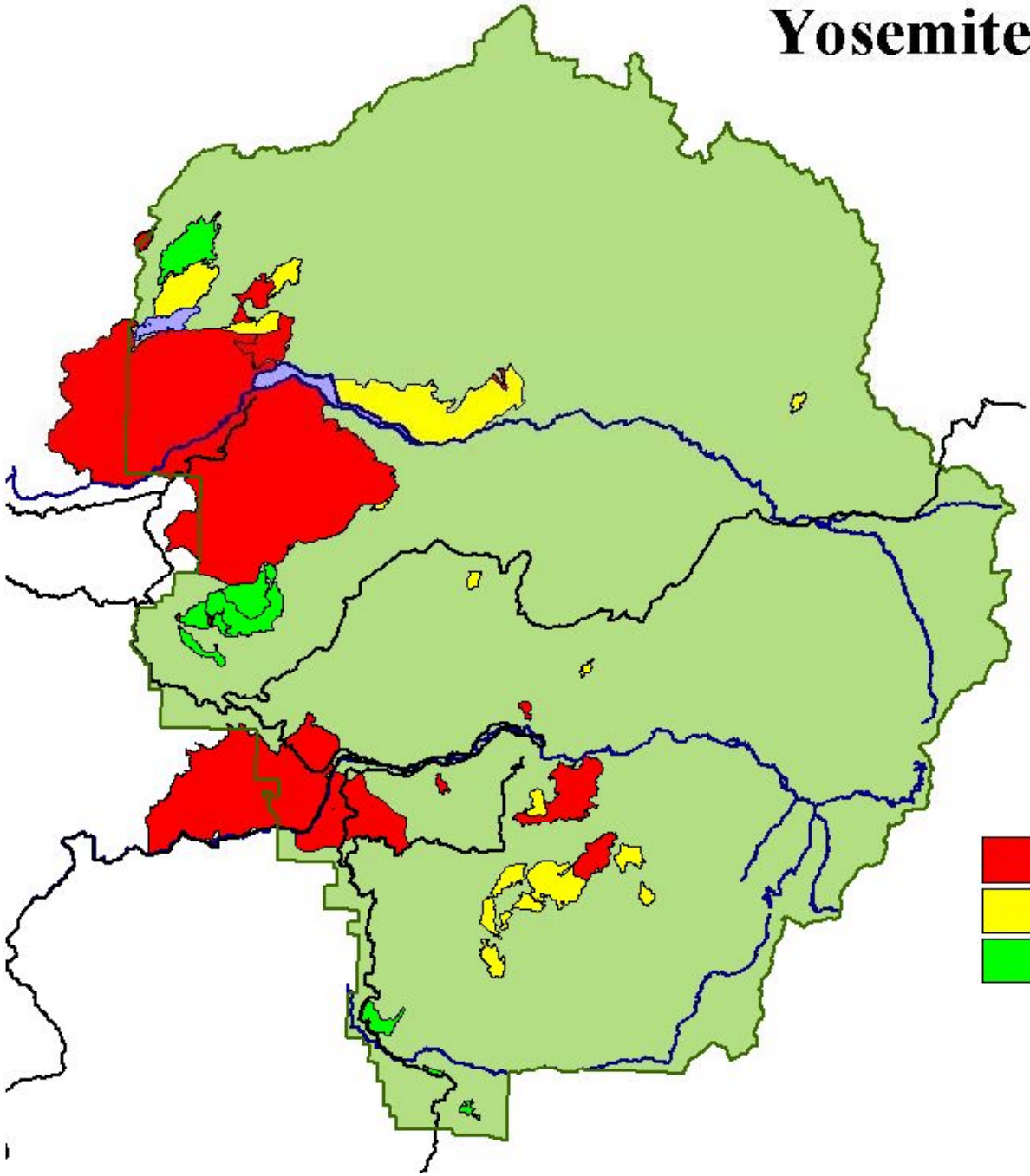
Yosemite National Park
Fire History



Yosemite National Park
Fire History

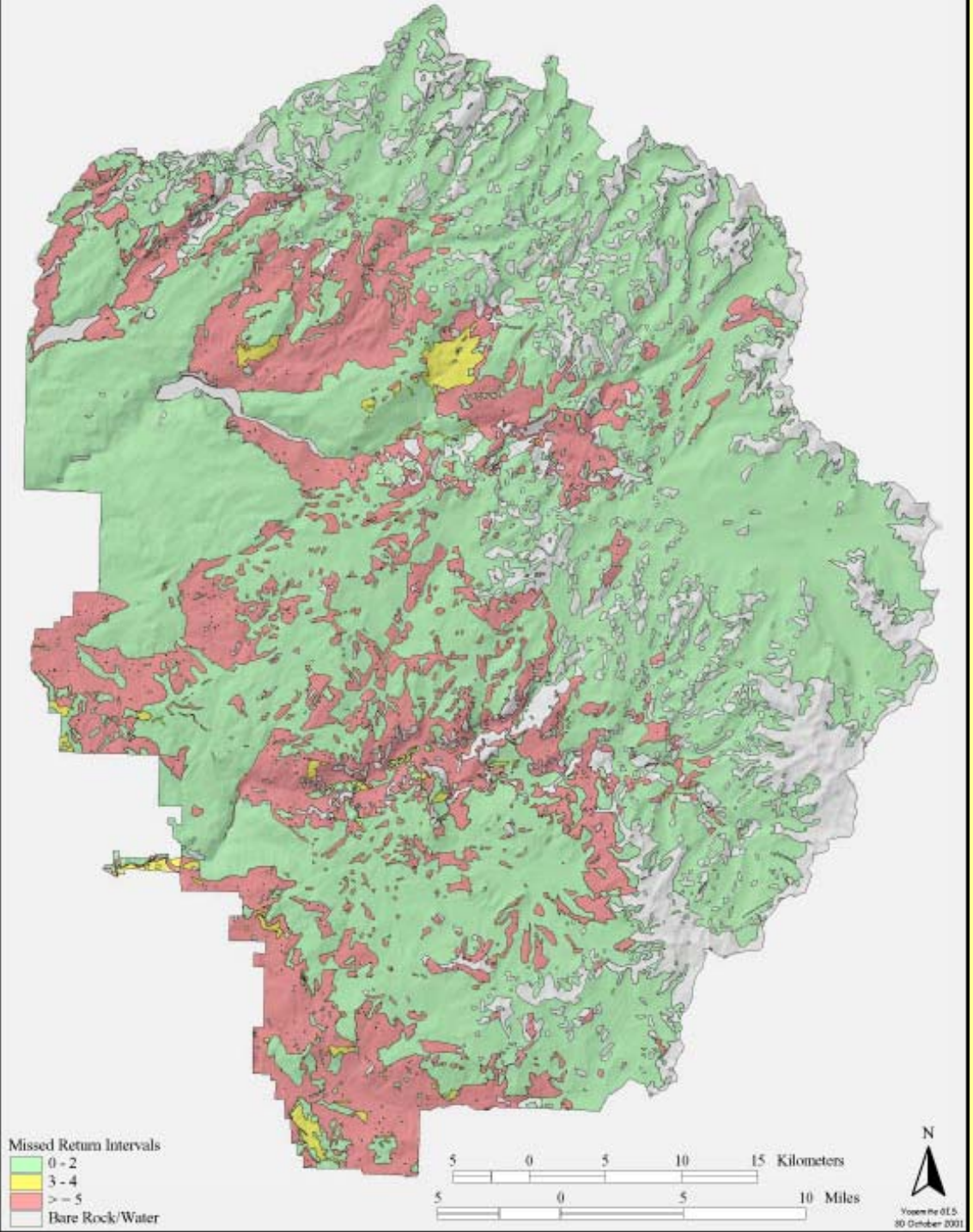


Yosemite National Park
Fire History



Fires 1990 - 1999

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

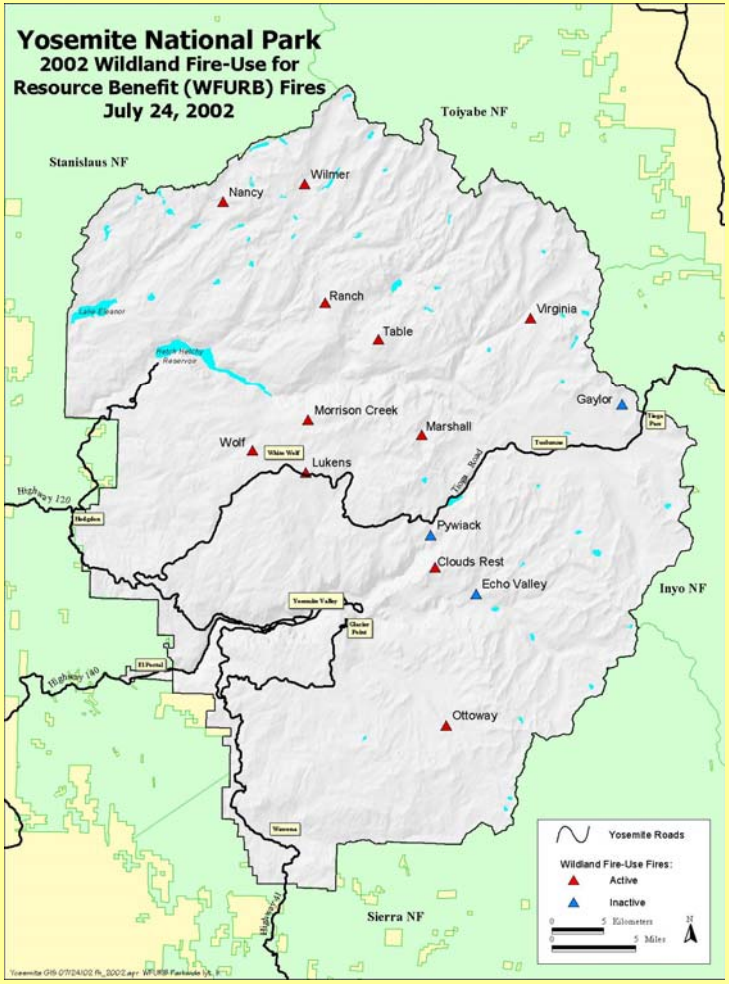


Median Fire Return Interval Departure (FRID)

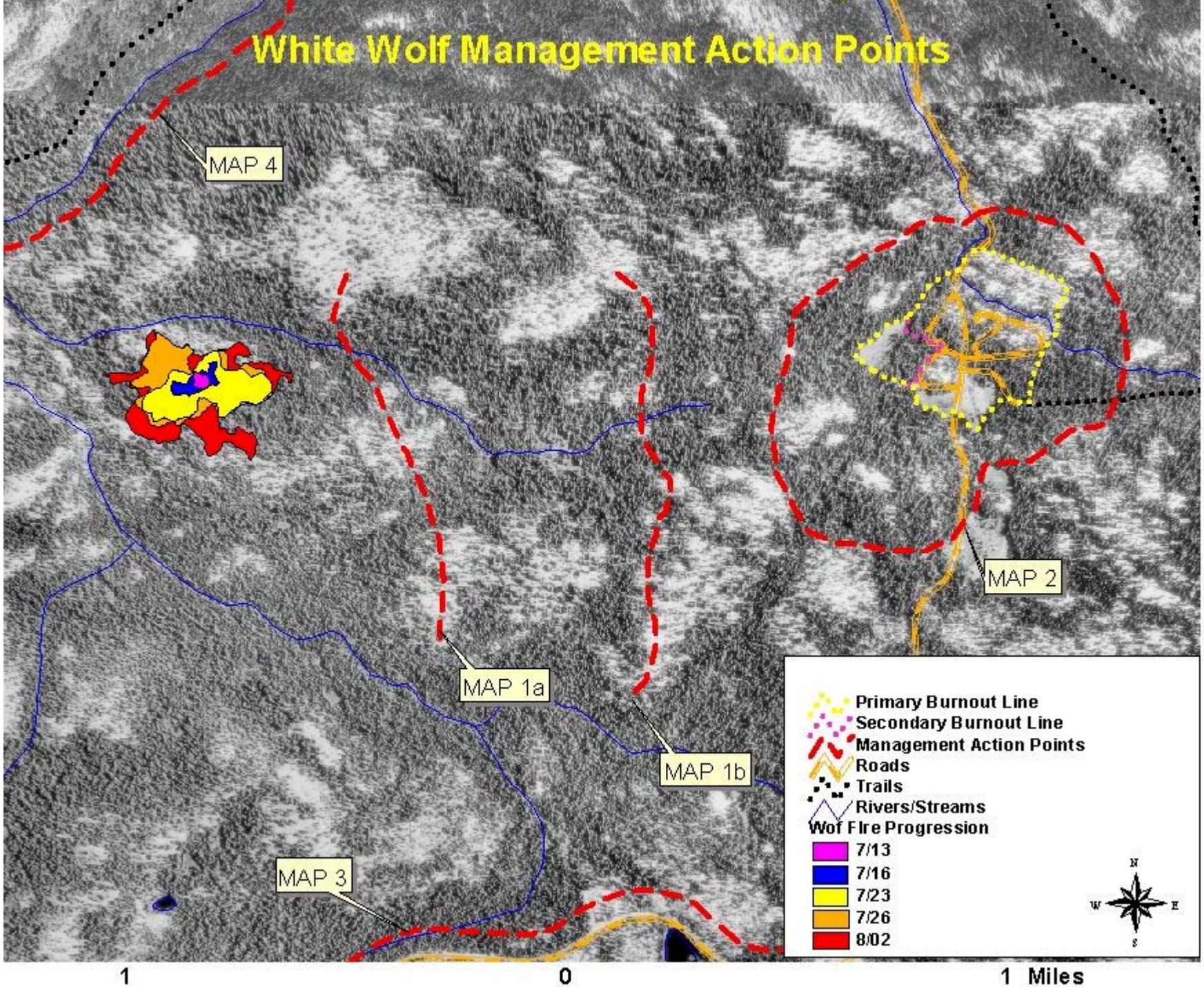
Fire return interval is the number of years between naturally occurring fire at a specific location that is representative of a typical stand of that vegetation

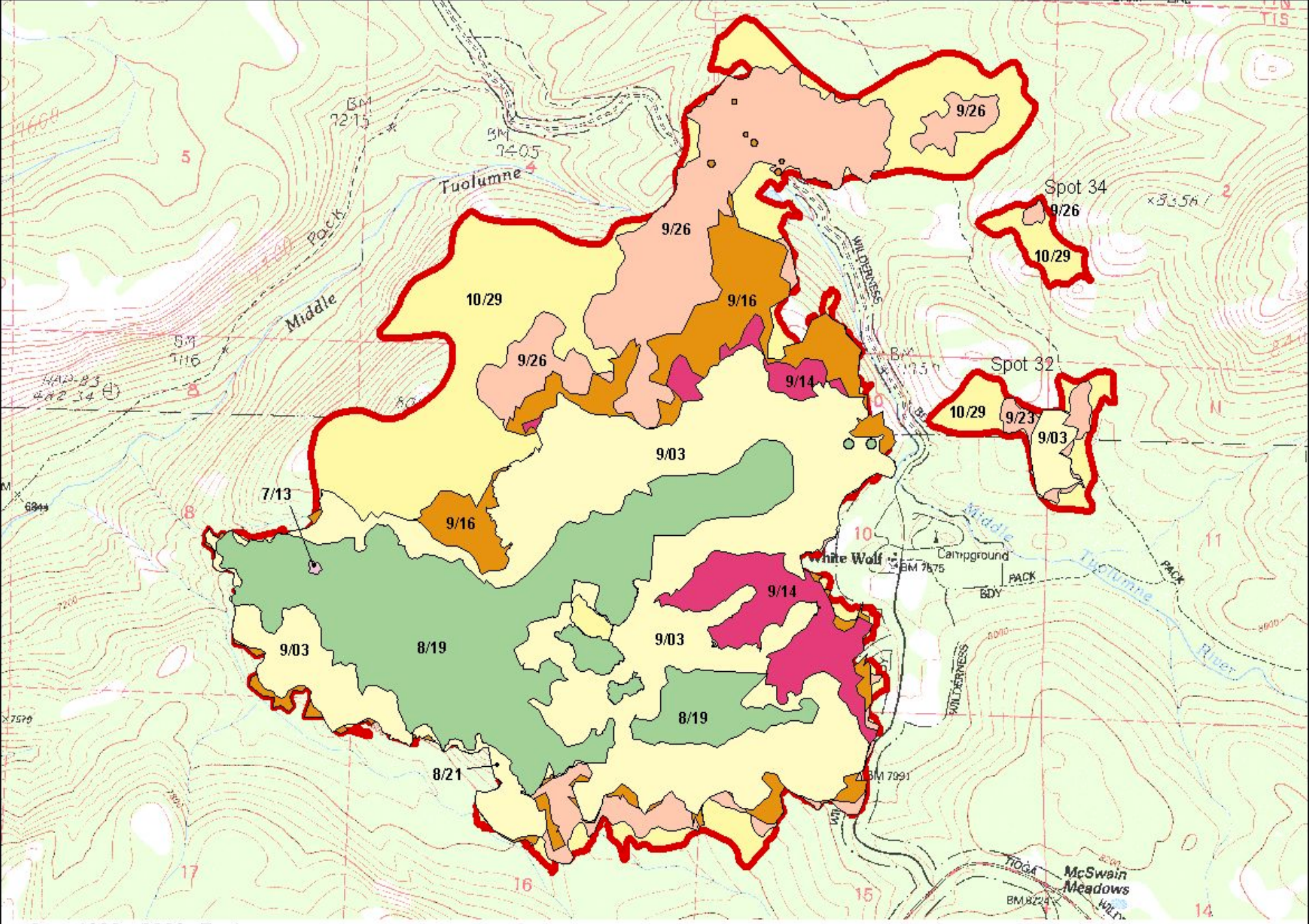
2002 Season

- 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
Wof Fire Progression
7/13
7/16
7/23
7/26
8/02
N
W
E
S
1
0
1 Miles



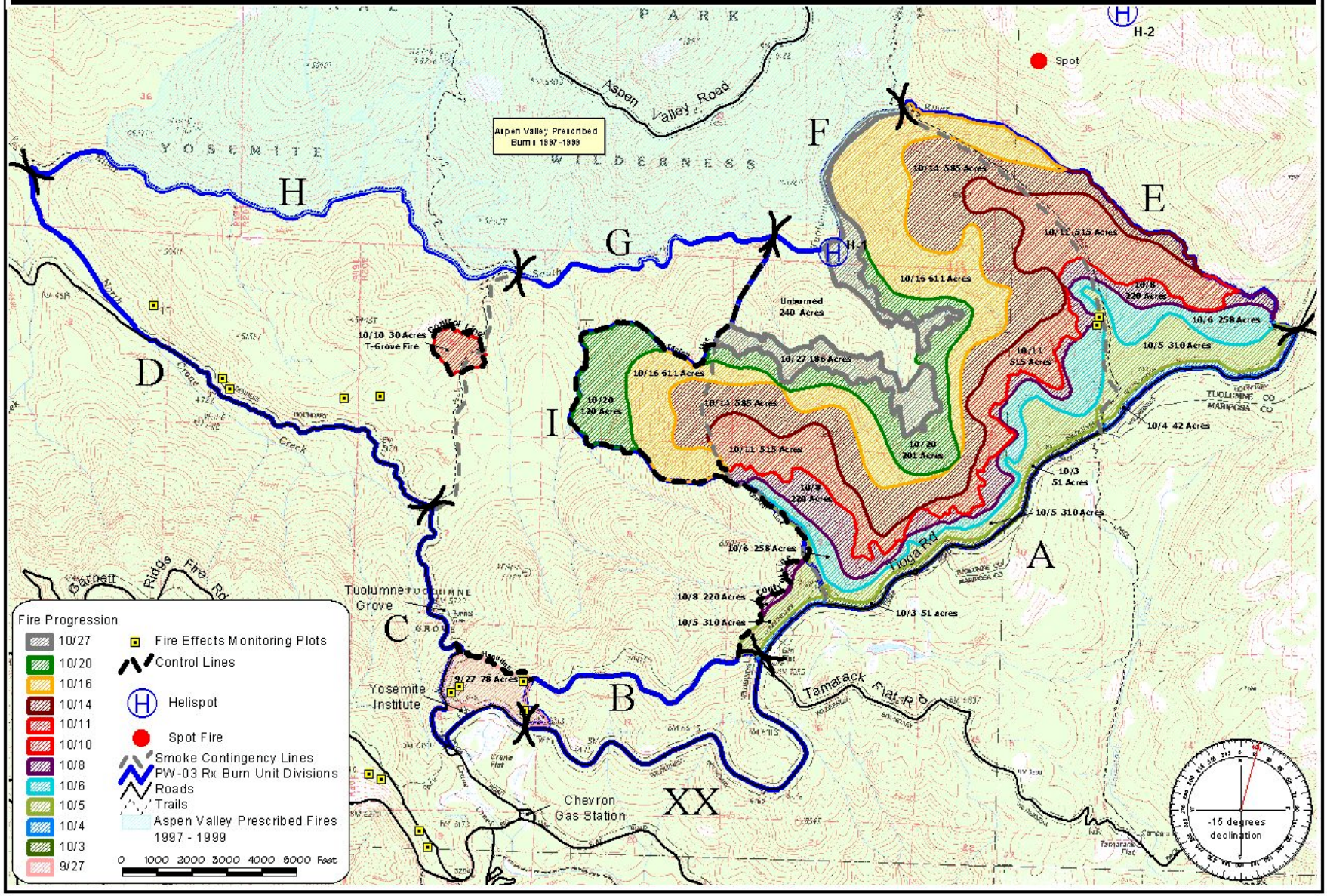
Wolf Fire Progression 7/13 - 10/29 1876 acres

Yosemite National Park
10/30Wolf lyt Wolf_02.apr

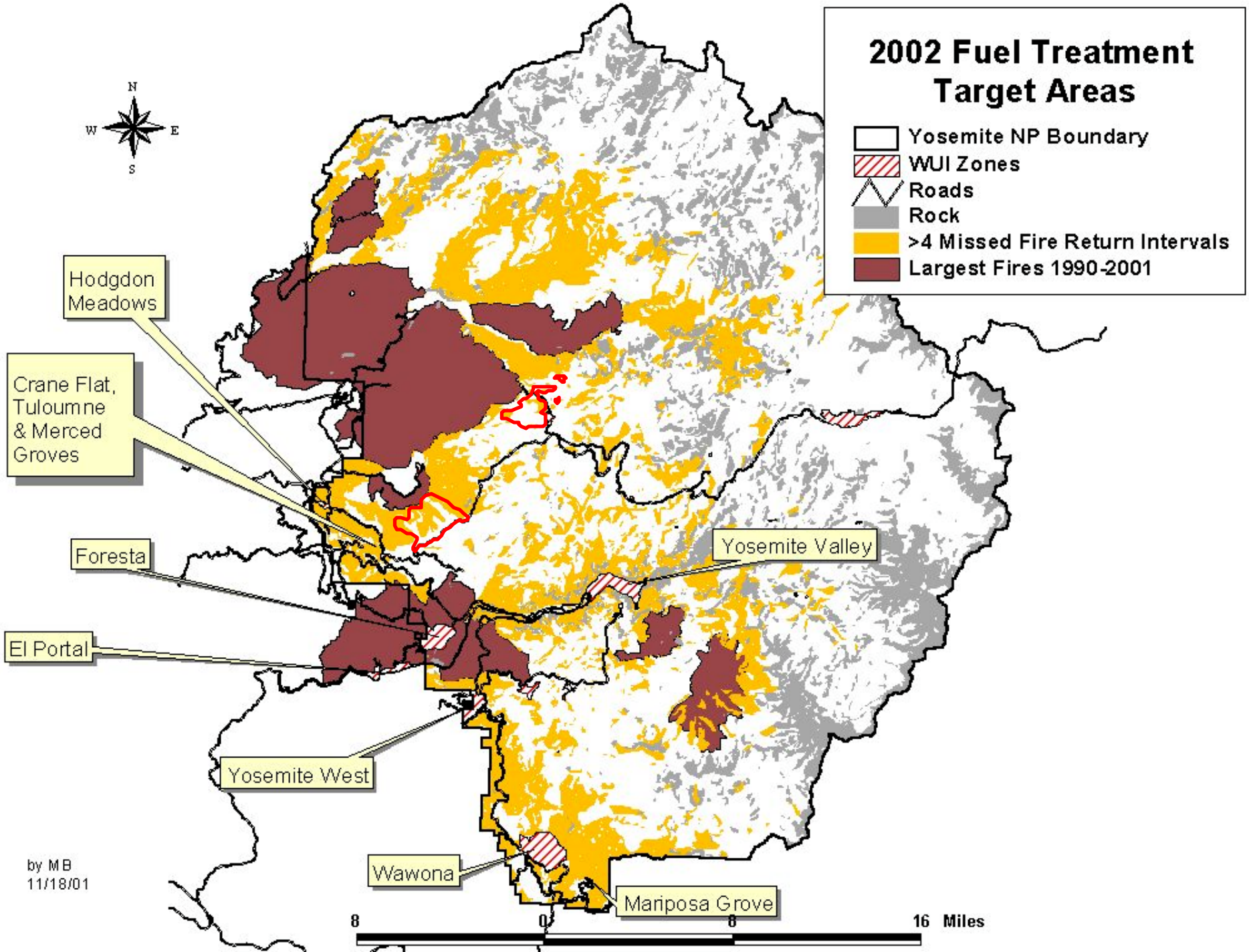
PW-3 Gin Flat Prescribed Burn

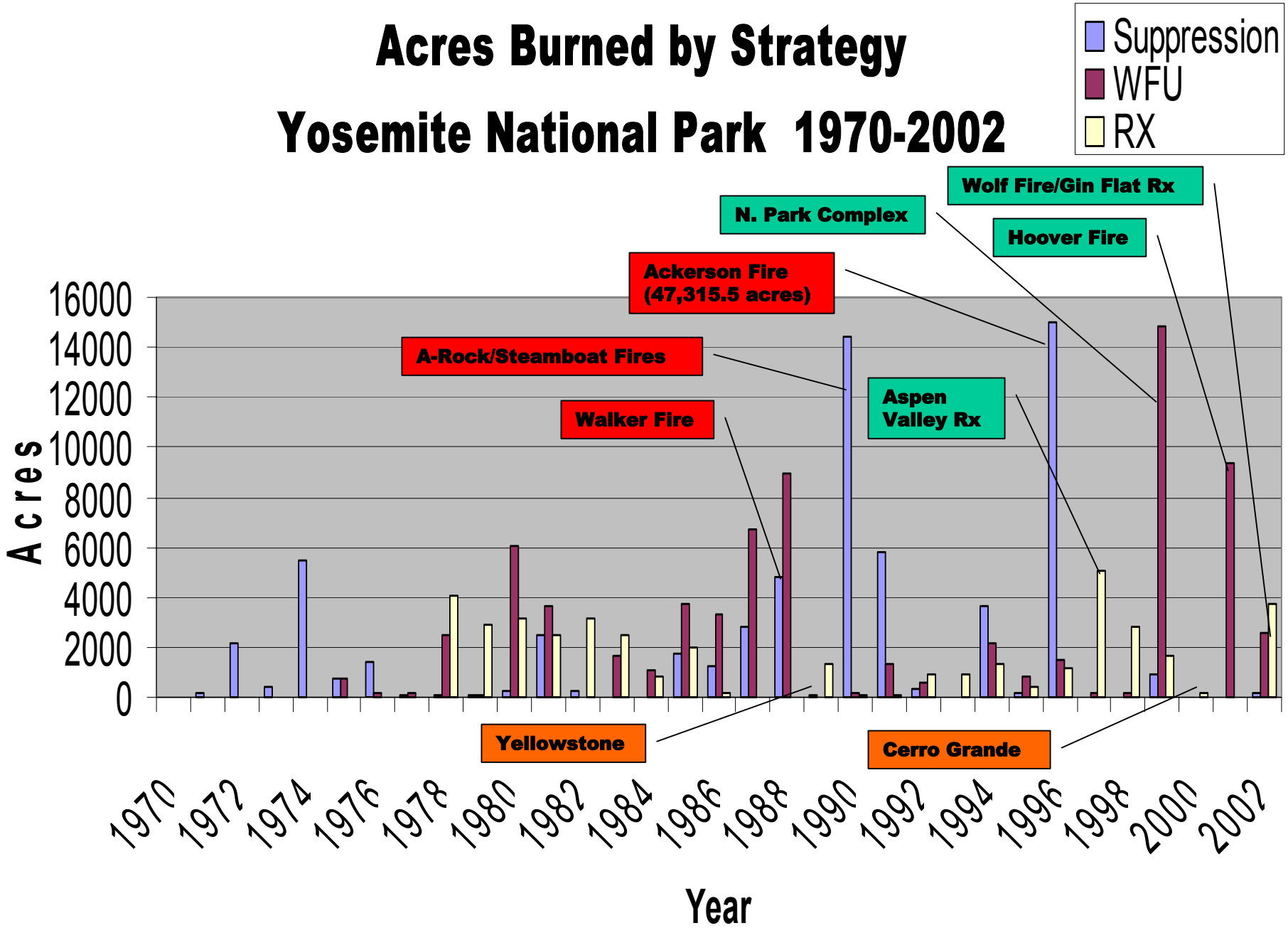
October 29, 2002 3215 Acres

Yosemite National Park

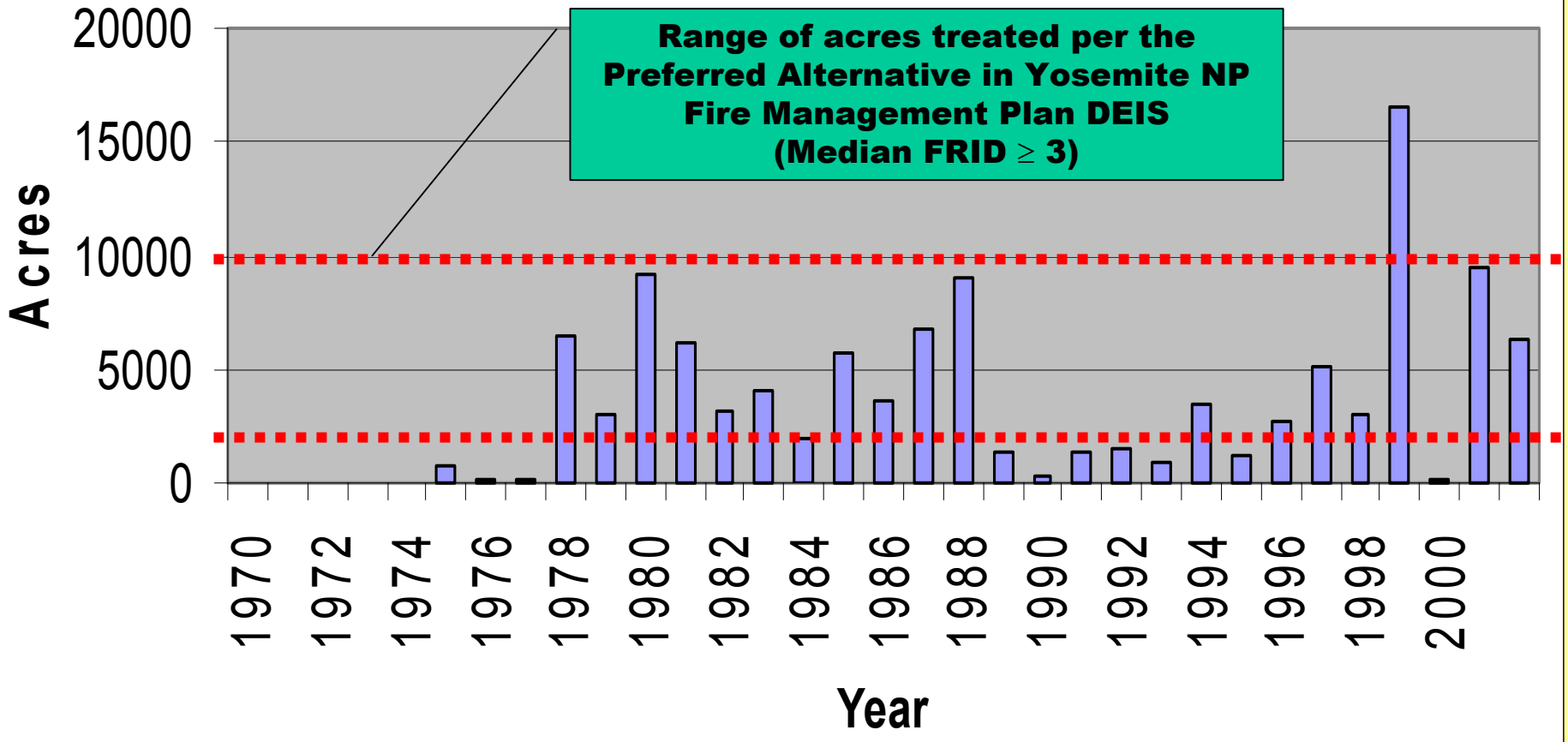


Plot date: October 29, 2002 c:\avprojects\rx-pw03_local.apr


2002 Fuel Treatment Target Areas
Yosemite NP Boundary
WUI Zones
Roads
Rock
>4 Missed Fire Return Intervals
Largest Fires 1990-2001
N
W
E
S
Hodgdon Meadows
Crane Flat, Tuloumne & Merced Groves
Foresta
El Portal
Yosemite Valley
Yosemite West
Wawona
Mariposa Grove
by MB
11/18/01
8
0
8
16 Miles


Acres Burned by Strategy
Yosemite National Park 1970-2002
Suppression
WFU
RX
Wolf Fire/Gin Flat Rx
N. Park Complex
Hoover Fire
Ackerson Fire
(47,315.5 acres)
A-Rock/Steamboat Fires
Aspen
Valley Rx
Walker Fire
Yellowstone
Cerro Grande
Acres
16000
14000
12000
10000
8000
6000
4000
2000
0
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
Year

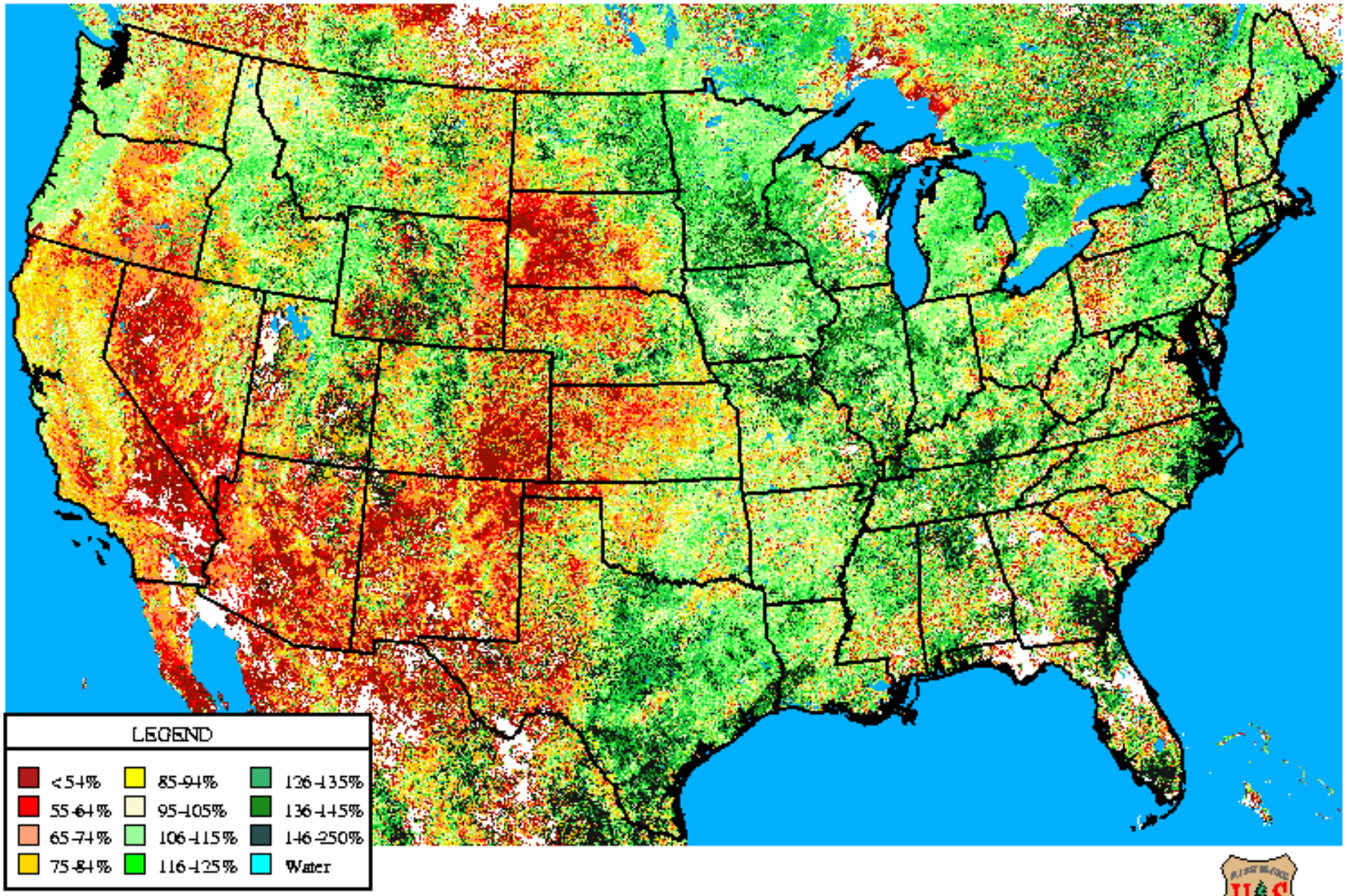
Fire Use (WFU+Rx)
Yosemite National Park 1970-2002



Mean Acres of Annual Accomplishment (FMP DEIS)

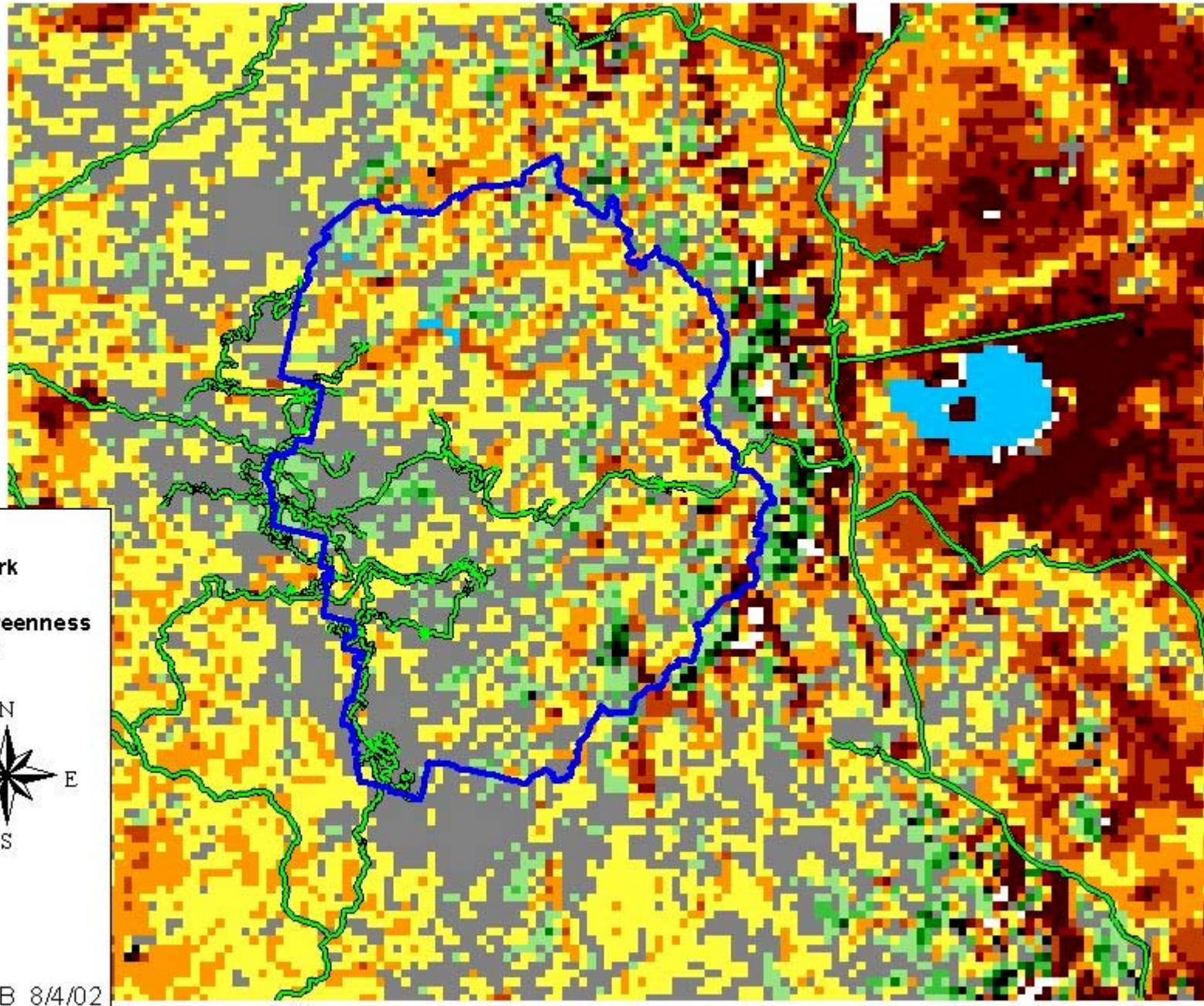
	Alt. A	Alt. B	Alt. C	Alt. D
Wildland/ Urban Interface	Less than 100 acres per year for all developed areas.	~ 1,553 acres treated per year.	~ 766 acres treated per year.	~ 1,095 acres treated per year.
Prescribed Fire	1,472 acres per year (over the past 29 years).	2,520 to 12,872 acres per year.	1,260 to 6,436 acres per year.	*1,817 to 9,194 acres per year.*
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.		

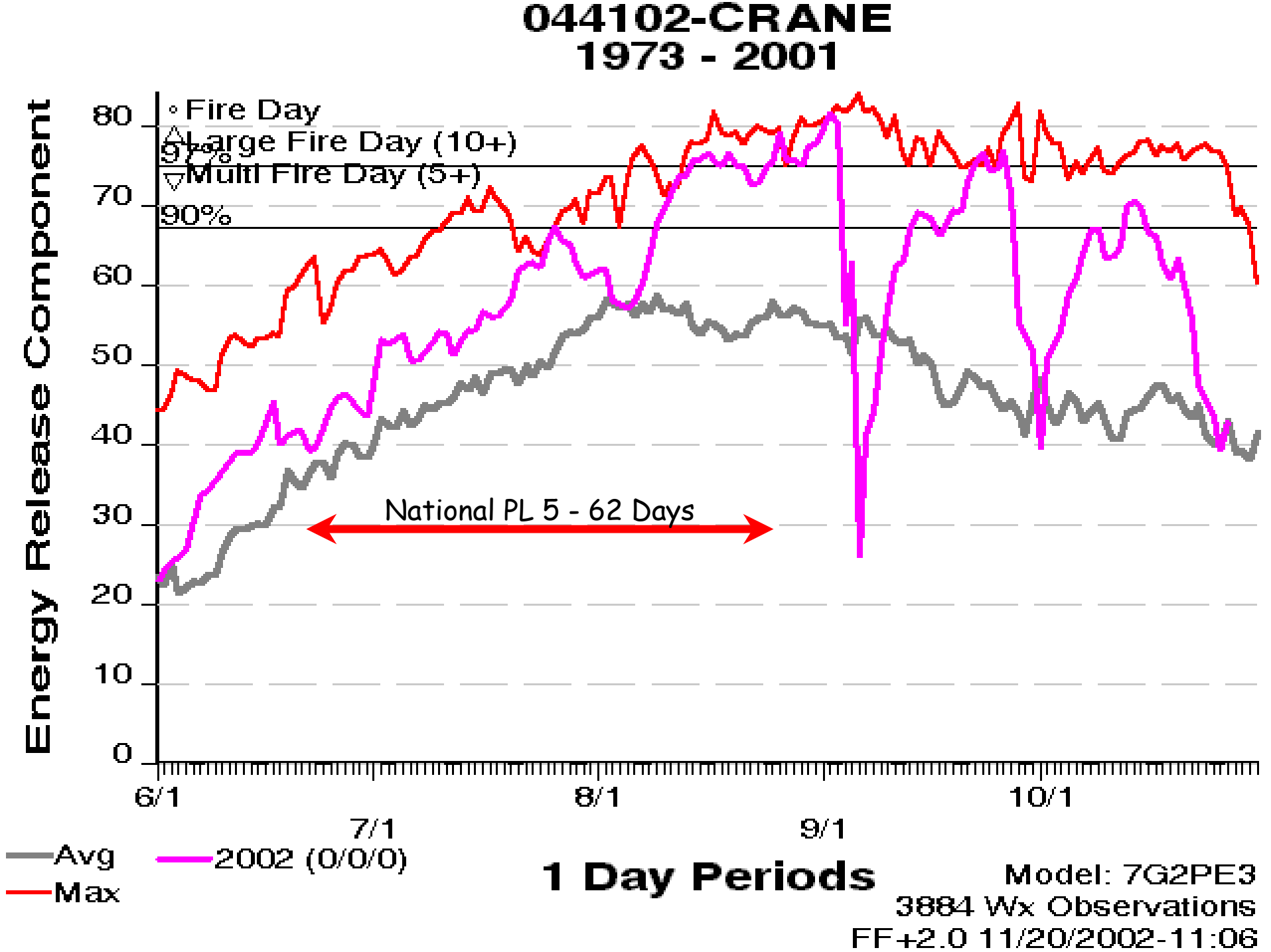
Departure from Average Greenness:Jul 26 –Aug 01 2002



WFAS-MAPS Graphics National Interagency Fire Center Boise,ID

Departure From Average Greenness Yosemite National Park August 1, 2002




044102-CRANE
1973 - 2001
Fire Day
Large Fire Day (10+)
Multi Fire Day (5+)
97%
90%
National PL 5 - 62 Days
Energy Release Component
80
70
60
50
40
30
20
10
0
6/1
7/1
8/1
9/1
10/1
Avg
Max
2002 (0/0/0)
1 Day Periods
Model: 7G2PE3
3884 Wx Observations
FF+2.0 11/20/2002-11:06

Areas of Concern: Fire Information

Strategy & Tactics

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.

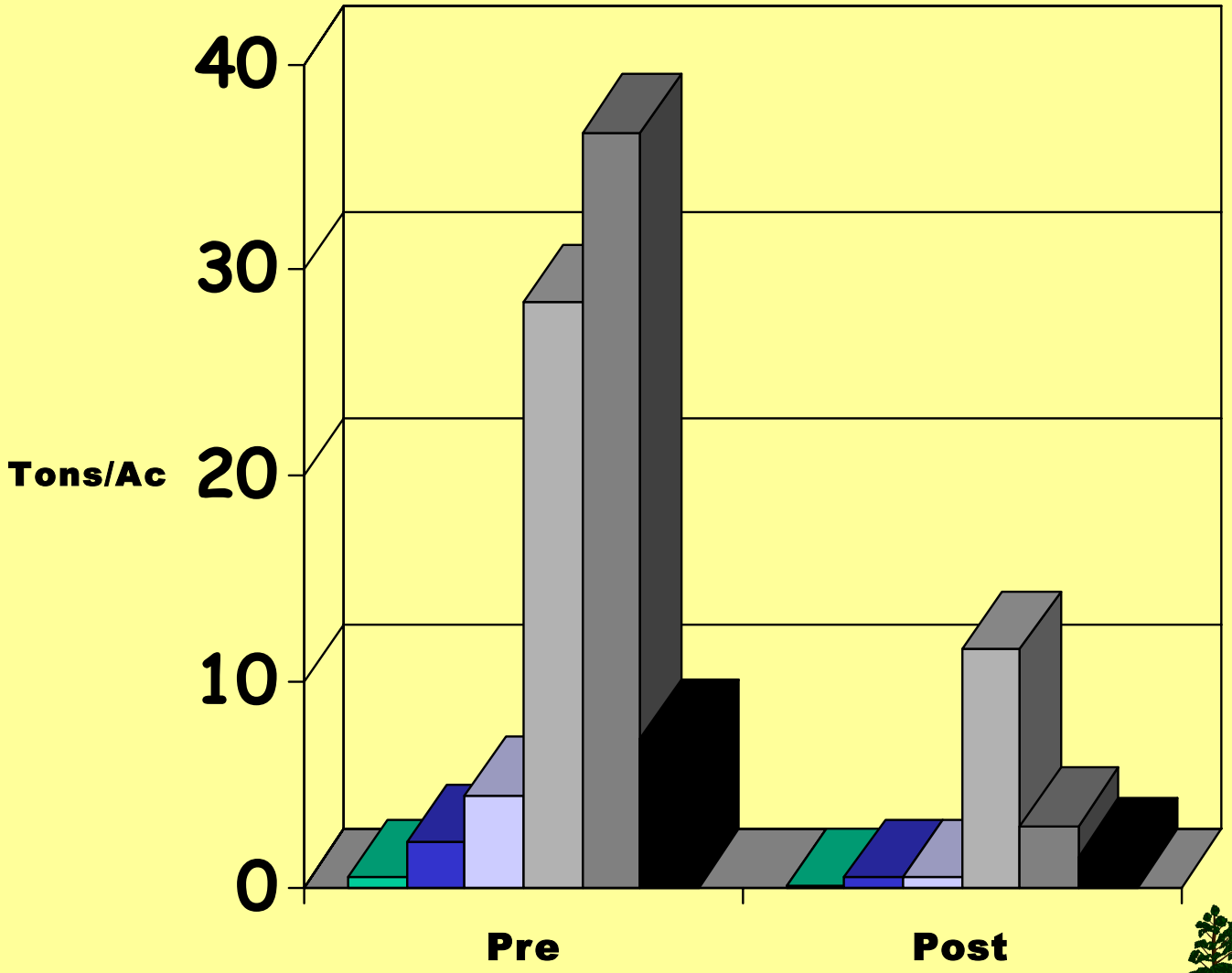
Incident Reviews/Additional Items

- 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)



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

Costs – Gin Flat Rx Fire

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

Costs – Wolf Complex

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

Crew 7

Crew 9

Thanks!

Wolf Fire:
Lightning-struck
Red Fir

Crew 6