# NPS Hazard Fuels Projects

FETG May 2009

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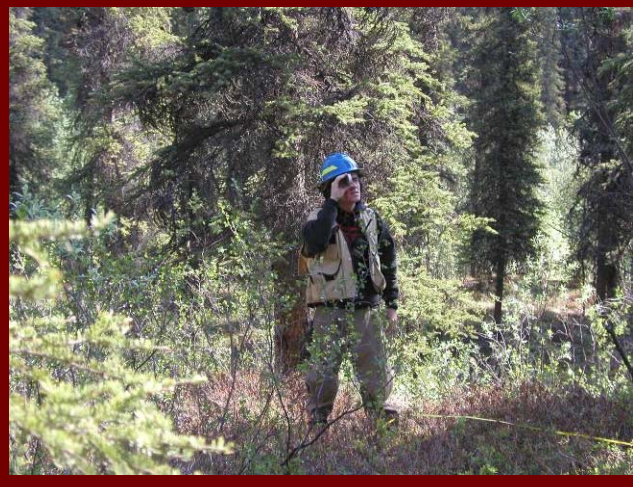
# Denali hazard fuels project

- Create defensible space for infrastructure
- Lessen the wildland fire risk to this area
- Historic HQ reflect the “Period of Historic Significance”

# Developed objectives and monitoring design

- Identified objectives
  - Determine if prescription parameters were met
  - Reduce crown fire potential
  - Concerns of grass increase and duff moisture drying
- Determined efficient means of measuring objectives.



# Plot Data

- Tree density and measurements
- Species cover
- Fuel loading
- Permafrost

27 plots measured in 2003 pre-treatment

2005 post-treatment

2003 pre-treatment

2005 post-treatment

# Thinning in Zone 2

2003 pre-treatment

- 30-foot buffer around the structure
- All flammable vegetation < 50 trees/acre


2005 post-treatment

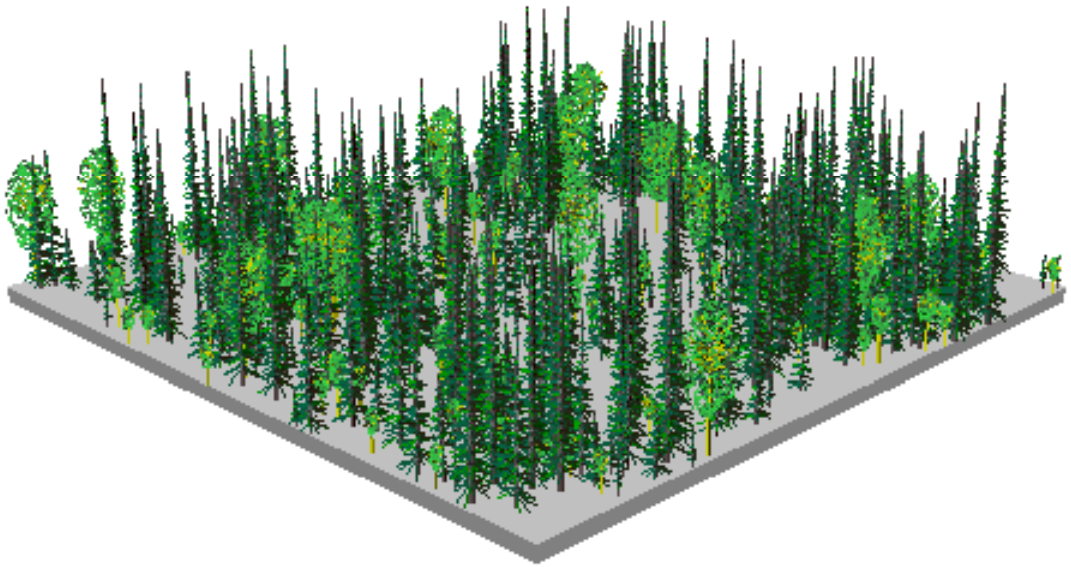
# Thinning in Zone 3

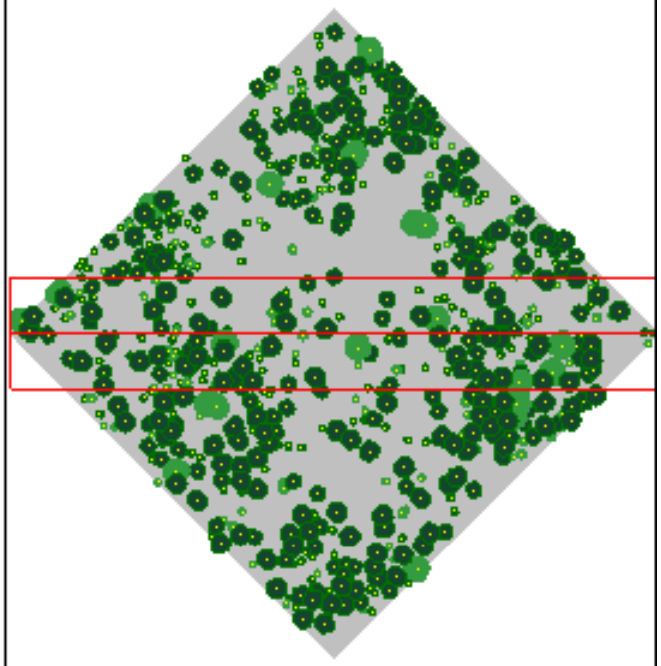
2003 pre-treatment

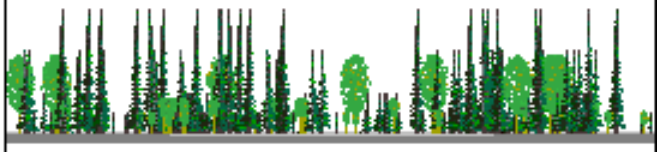
- 30-100 ft buffer around the structure
- 20 ft Crown Spacing ~ 110 trees/acre


2005 post-treatment

# Stand Model of Denali Front Country Zone 3 Open White Spruce Pre-Treatment

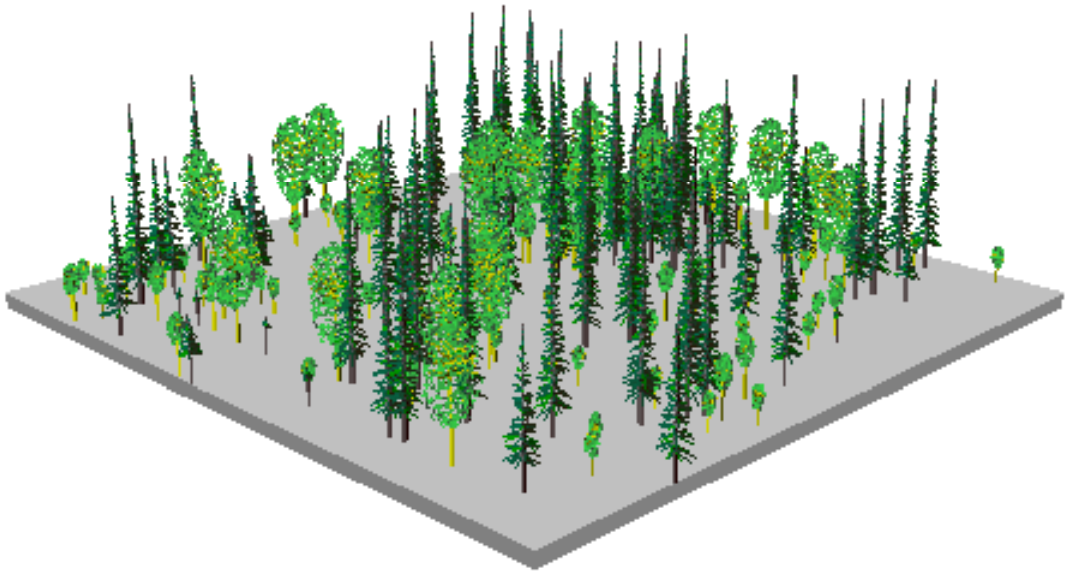


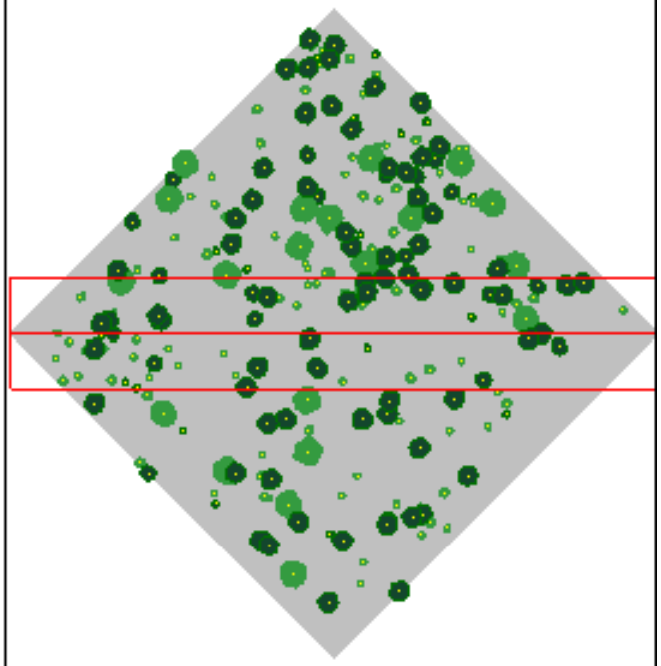


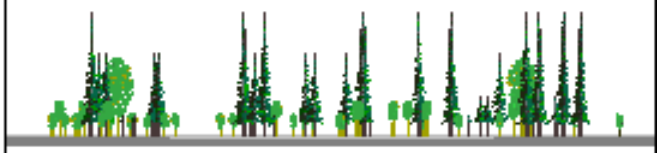


Trees per acre: 750 Height to live crown: 2 ft

# Stand Model of Denali Front Country Zone 3 Open White Spruce Post-Treatment



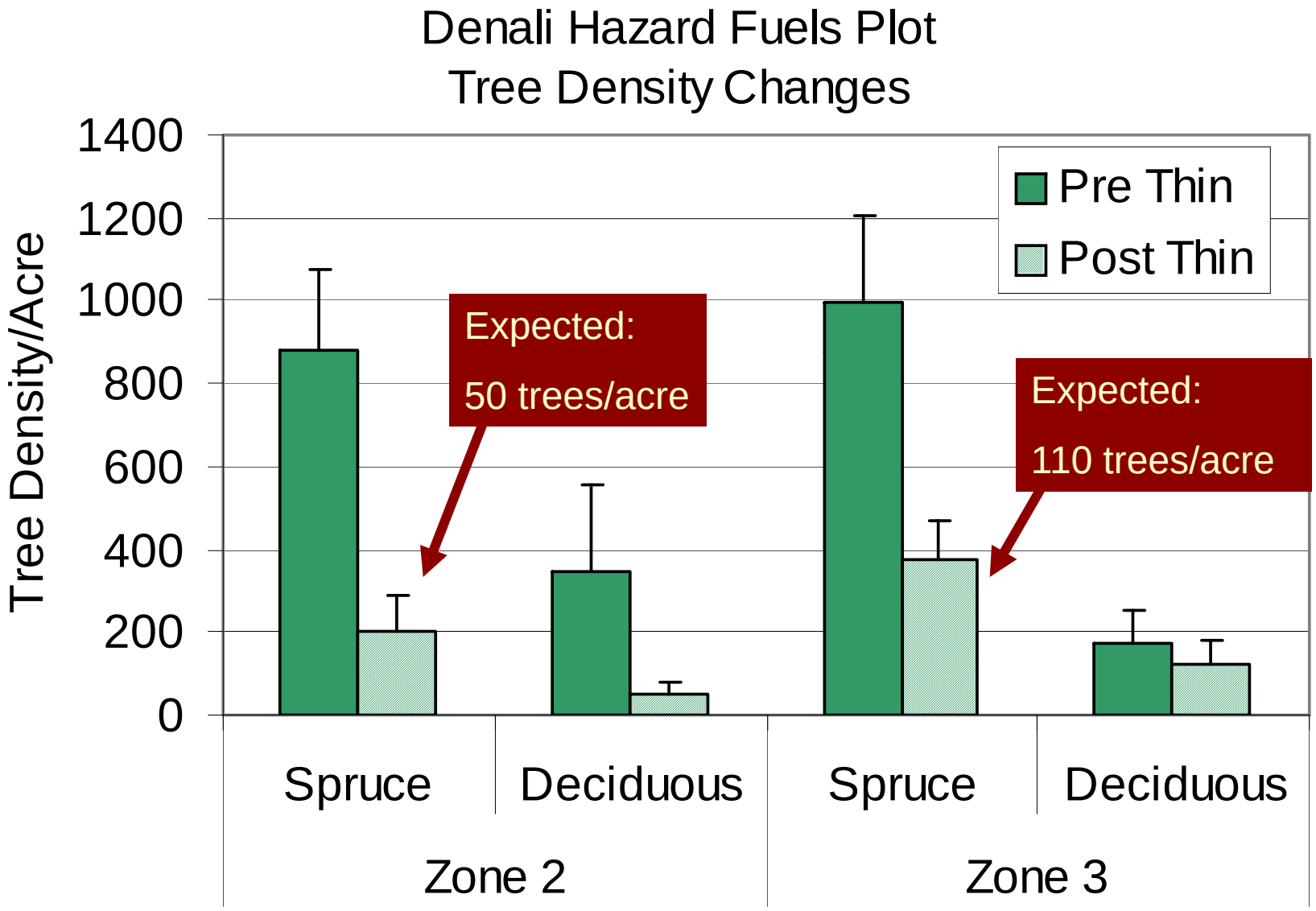




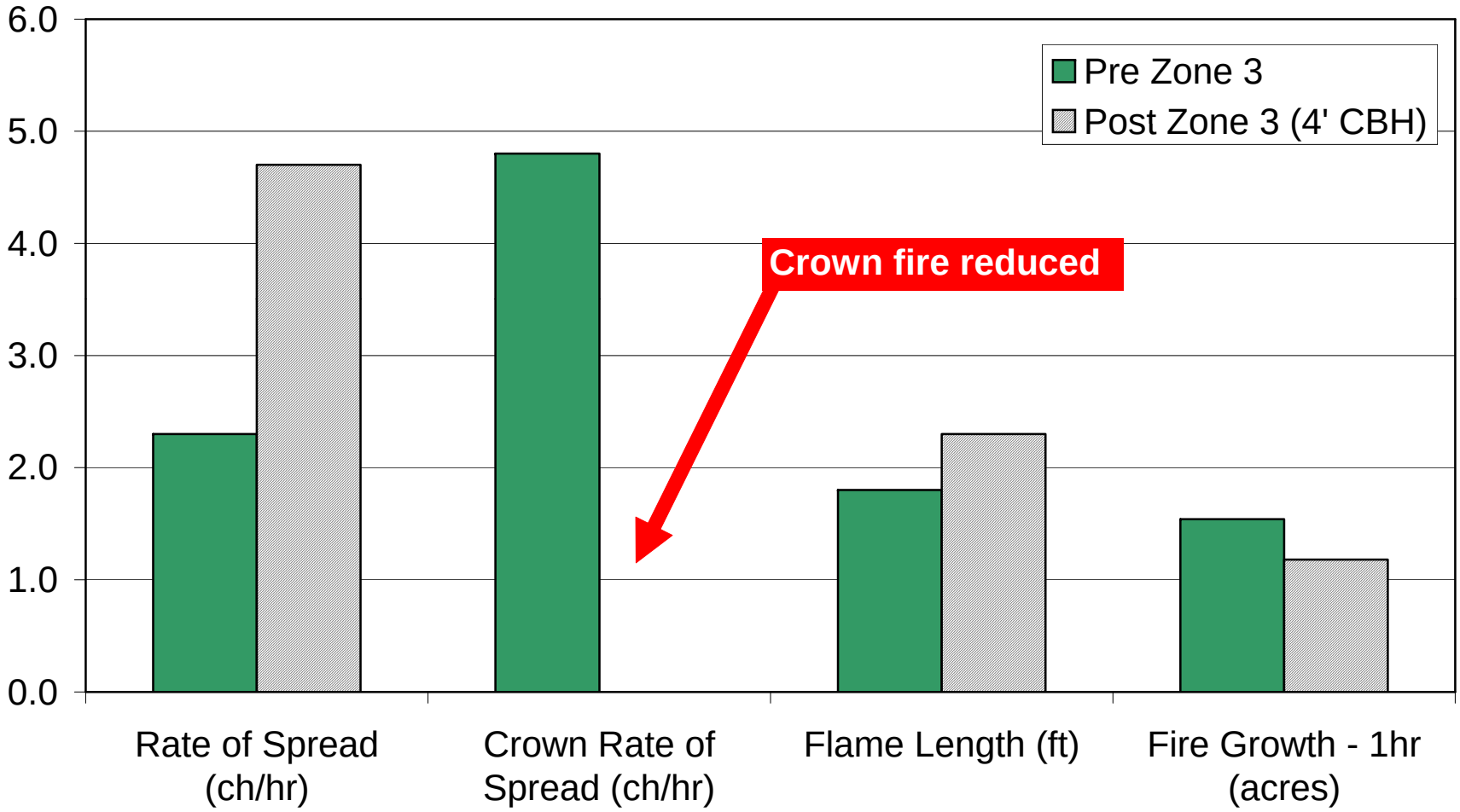
Trees per acre: 250 Height to live crown: 7 ft

# Results

- Prescription implementation: Tree densities & ladder fuel heights
- Fire behavior assessment
- Understory changes

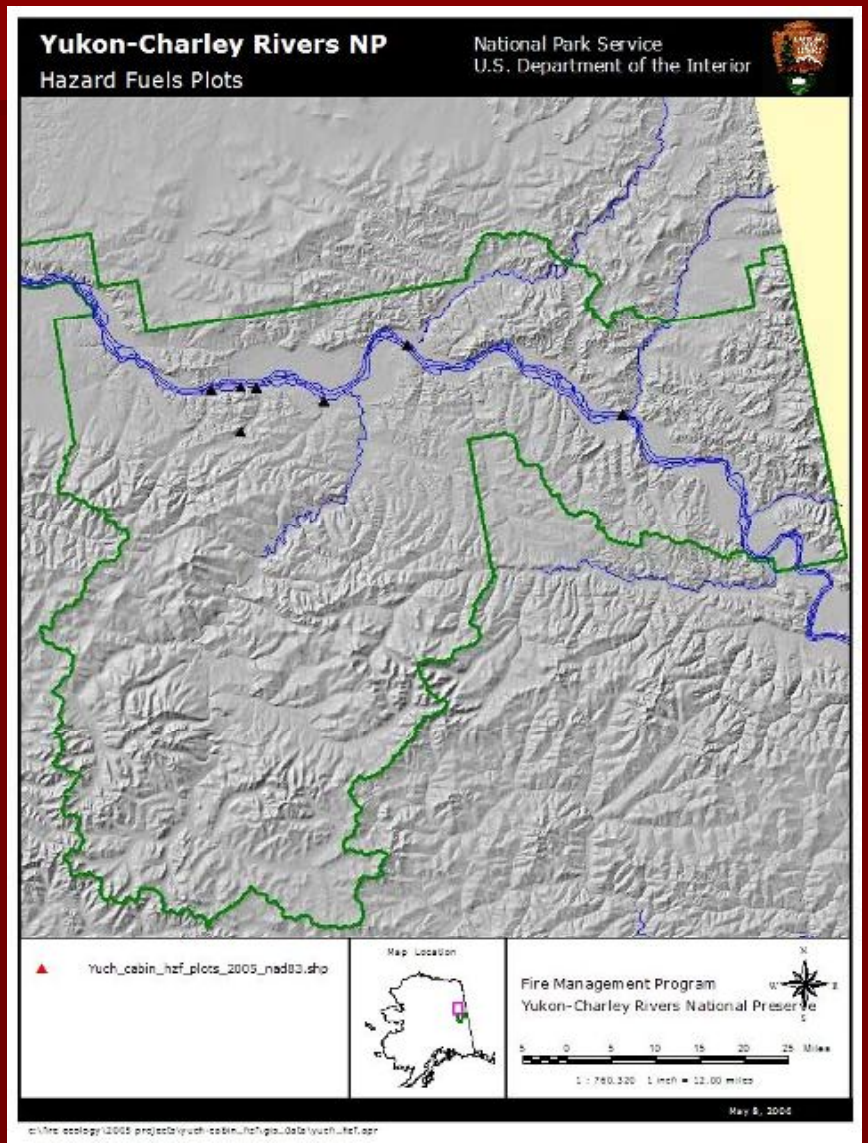

Denali Hazard Fuels Plot
Tree Density Changes
Tree Density/Acre
1400
1200
1000
800
600
400
200
0
Pre Thin
Post Thin
Expected:
50 trees/acre
Expected:
110 trees/acre
Spruce
Deciduous
Spruce
Deciduous
Zone 2
Zone 3

## Fire Behavior Comparisons - Denali Hazard Fuels Treatment Pre/Post




Fuel Model: 9
90th% Weather

# Yukon-Charley River Hazard Fuels Assessment




- 7 Cabin/Historic sites
- At each site:
  - 3 plots in control
  - 3 plots in thinned
- 46 plots measured
  - 2005 post-treatment

# Cheese Camp


32% grass
YUCH-HZF
Cheese-C#01
7/19/05 63°
0-16M

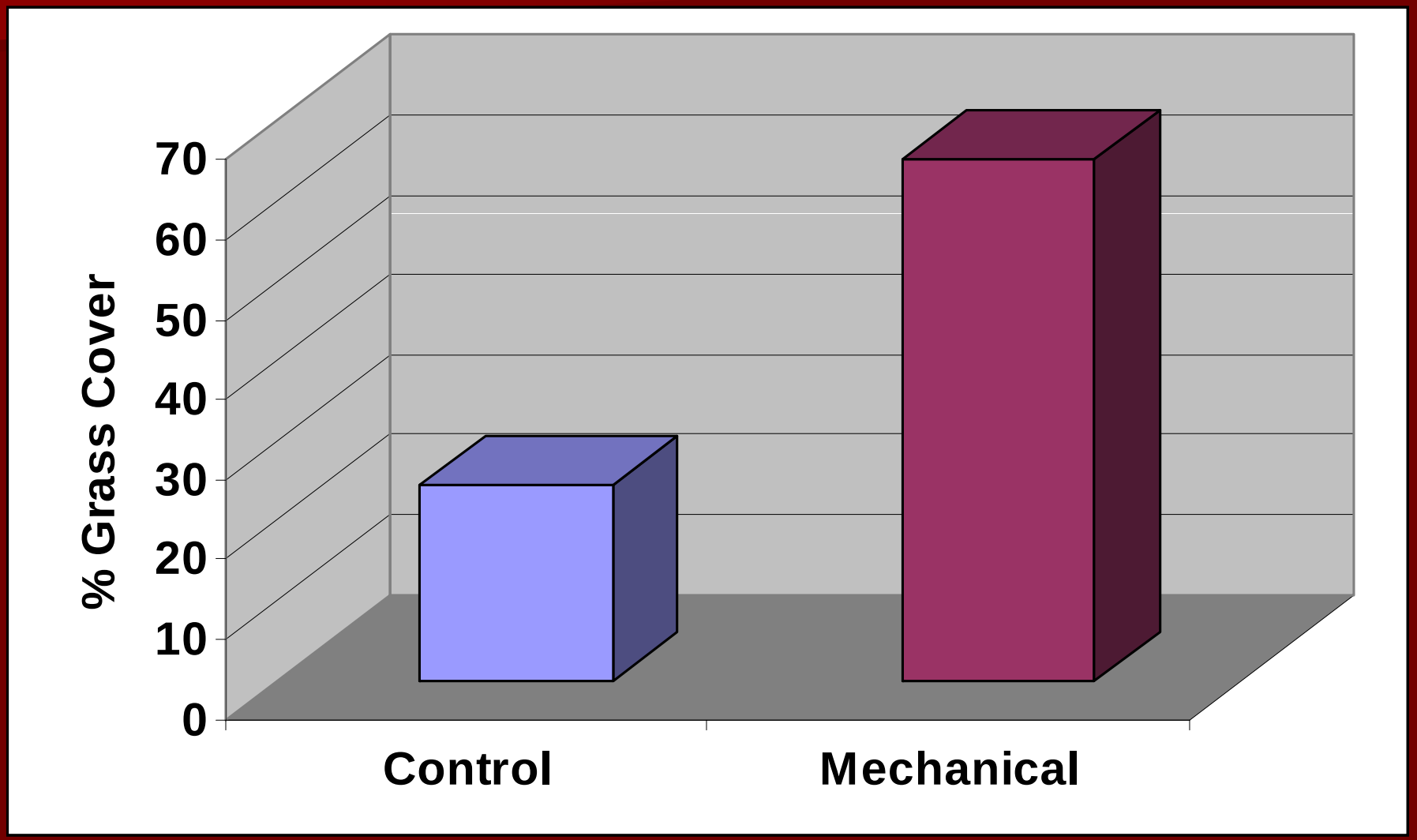

93% grass
YUCH-HZF
Cheese-Tx-01
7/16/05 277°
16-0M

# Slaven's Public Cabin


3.1% Grass cover


14.6% Grass cover

# Yukon-Charley - Hazard fuels treatments



# Grass cover

| CABIN SITE | CONTROL % Grass | THINNED % Grass | Year Thinned |
|---|---|---|---|
| Cheese Camp | 32.3 | 93.8 | 2004 |
| McGregor | 7.3 | 11.5 | 2004 |
| Nation Bluff | 39.6 | 100 | 1999 |
| Ricketts Trainor | 6.3 | 100 | 1998 |
| Sam Creek | 60.4 | 78.1 | 1999 |
| Slaven's Public Use | 3.1 | 14.6 | 2004 |
| Woodchopper Roadhouse | 22.9 | 14.6 | 2004 |

Kenai Peninsula -Caribou Hills Fire – July 2007

# Tree Failure at Denali

- Wind storm
- Numerous trees fell
- Caused by thinning?

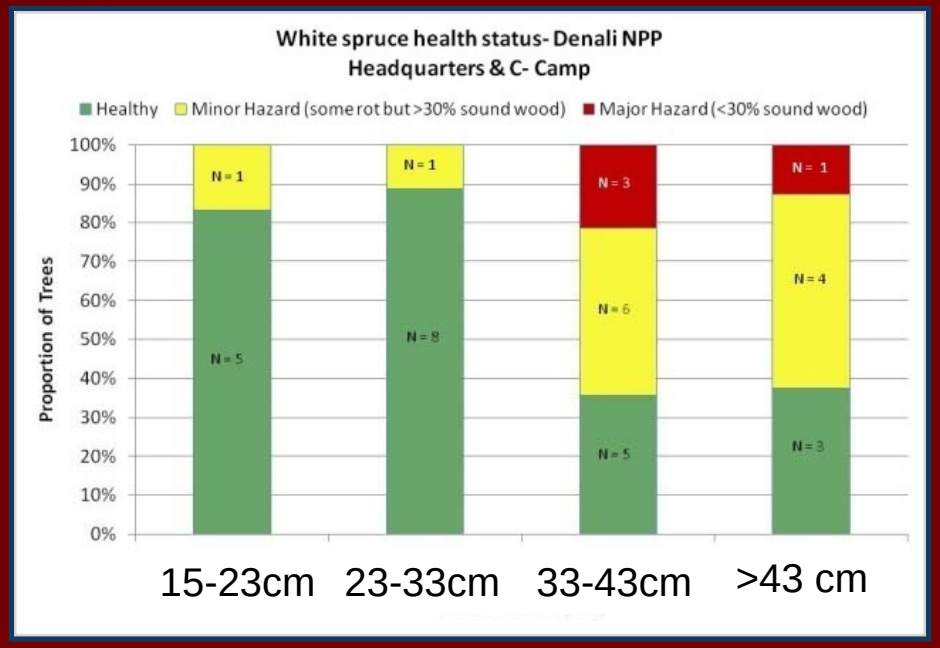
# Hazard Trees near NPS structures?
# A Preliminary Survey at Denali NPP - 2009

Variables measured were:

1) DBH
2) Height
3) Distance from closest structure
4) Presence and extent of rot
5) Evidence of damage and disease

**Were windfall trees rotten?**

# Preliminary Results




- 11% of white spruce trees considered major hazard trees > 60% rot
- Larger diameter trees had rot (>33 cm DBH)
- Not all windfall trees had rot
- Various human-related disturbances

# Adaptive Management – Evaluation

**Presented data to FMO's and discussed results**

- Tree Density: Less thinning - crown fire behavior was still reduced. Changes in RX – less thinning.
- Progressive Thinning: Wind harden trees
- Mixed Size thinning: Leave mix of tree sizes
- Grass: Leave deciduous trees in future thinning projects