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Fire Effects Monitoring of Prescribed Burns and the Cavity and Ham Lake Wildfires

Bruce Anderson and Fred Ossman

Superior National Forest



EIS Purpose & Need

“Improve public safety *by* reducing the potential for high intensity wild land fires to spread from the BWCAW into areas of intermingled ownership...and across the international border into Canada...This will be accomplished in a manner which is sensitive to ecological and wilderness values.....”

Issues

- **How Would Wildfire Risk Be Reduced and Public Safety Improved?**
- **How Would Wilderness Values Be Affected?**
- **How Would Air Quality Be Affected?**
- **How Would Vegetation and TES Plants Be Affected?**
- **How Would Wildlife, Including TES Species, Be Affected?**
- **How Would Aquatic Resources Be Affected?**
- **How Would Soils Be Affected?**

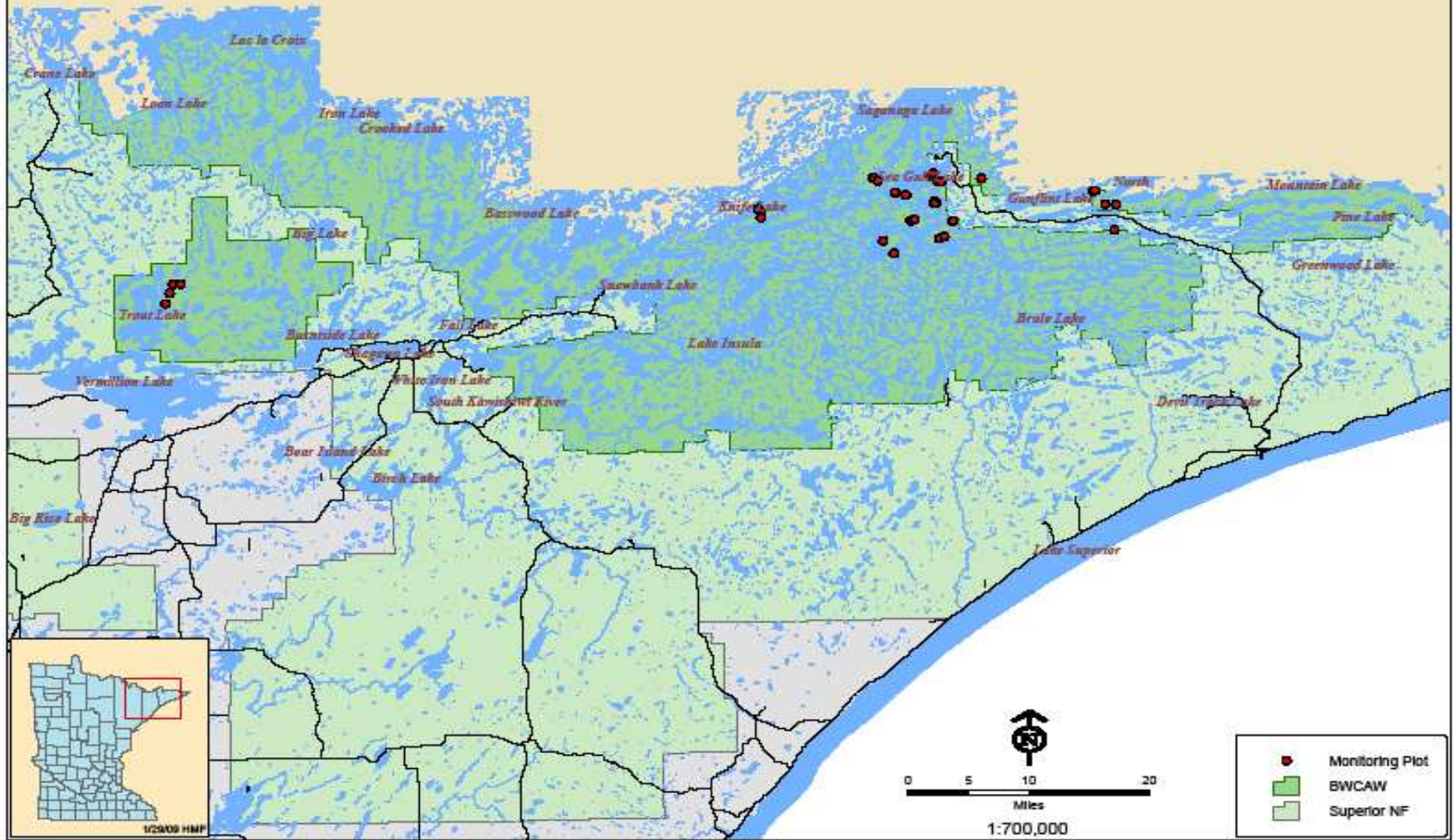


Our Initial Monitoring Focused On

- **Fuel Reduction**
- **Fire Effects on Soil organic layer**
- **Effects on Vegetation including**
 - Vegetative Communities composition
 - Old forest
 - Conifer species
 - NNIS plants.
 - Rare Plant
- **Rare Wildlife (most notably eagles)**



Superior National Forest BWCAW Monitoring Plots



Mitigation Effectiveness



Shoreline Old Forest.



Interior Old Forest.



NNIS.



Rare Wildlife Species.

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Monitoring Program Adjustments



Blow Down Effects



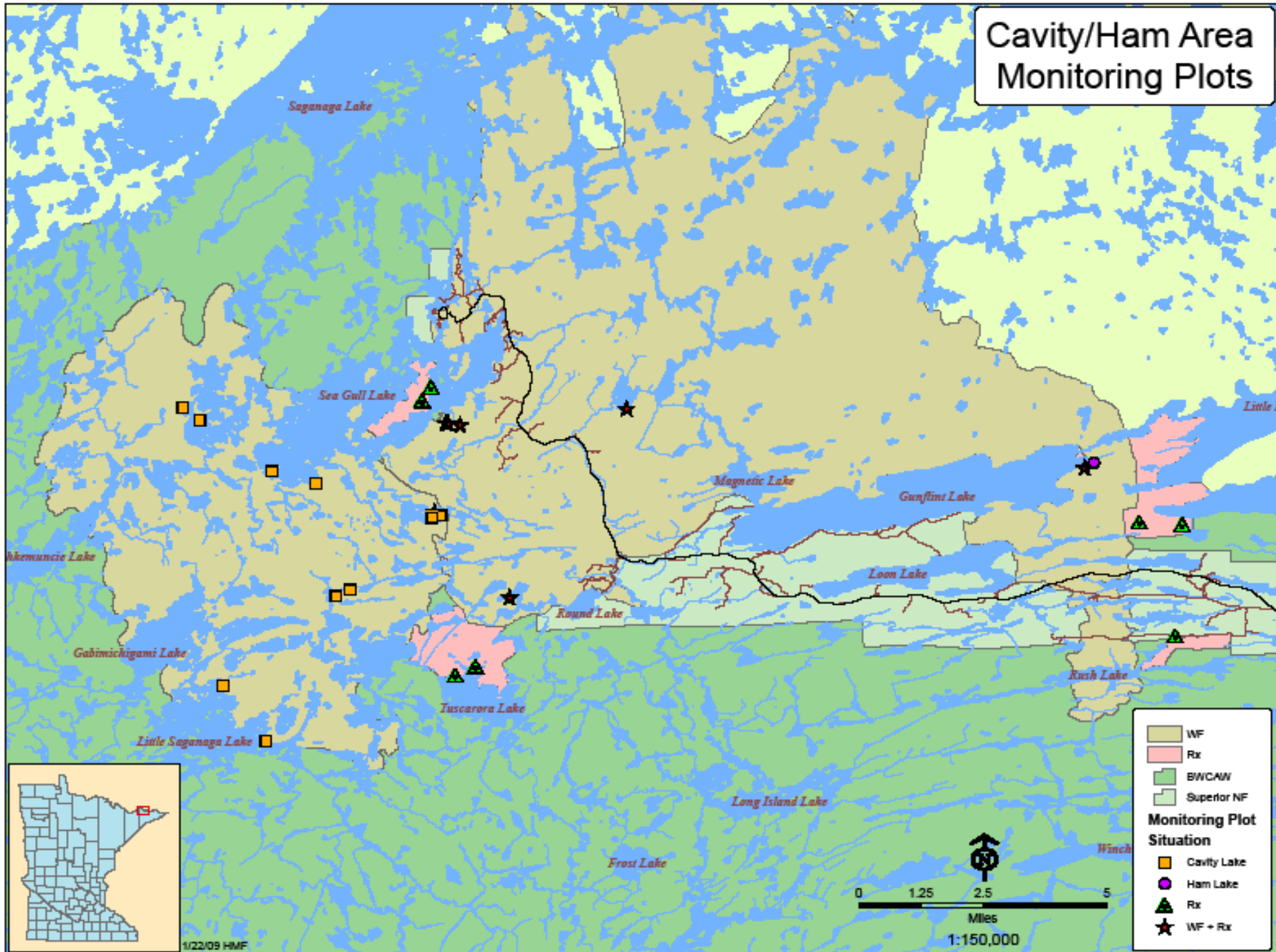
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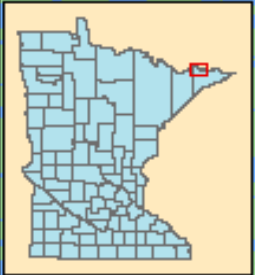


Ham Lake Wildfire

Cavity/Ham Area Monitoring Plots



	WF
	Rx
	B/WCAW
	Superior NF
Monitoring Plot Situation	
	Cavity Lake
	Ham Lake
	Rx
	WF + Rx



1/22/09 HMF

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Monitoring Findings



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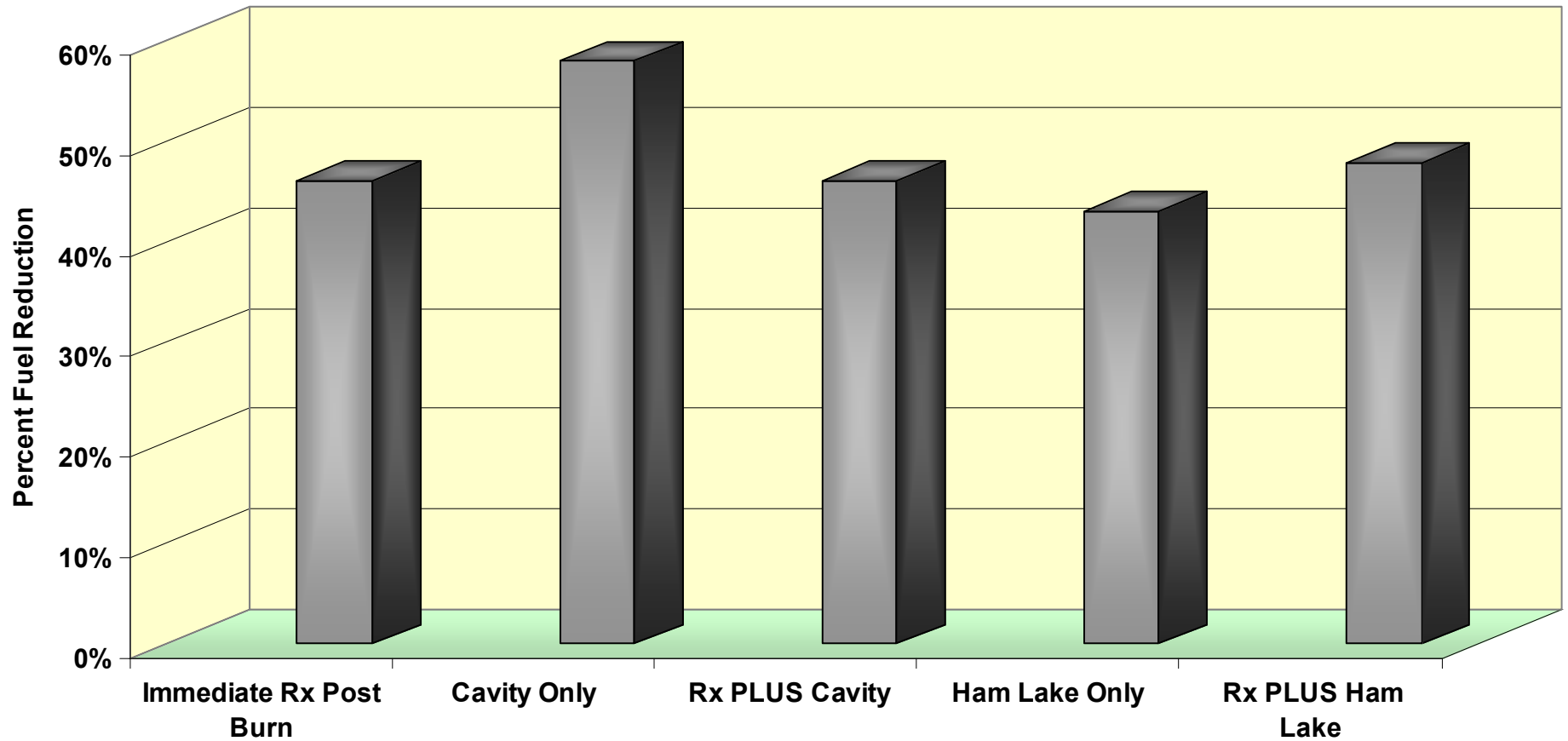
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Fuel Reduction Findings



FUEL REDUCTION



Increase Of Fuel Loading Post Burn Due To Snag Recruitment



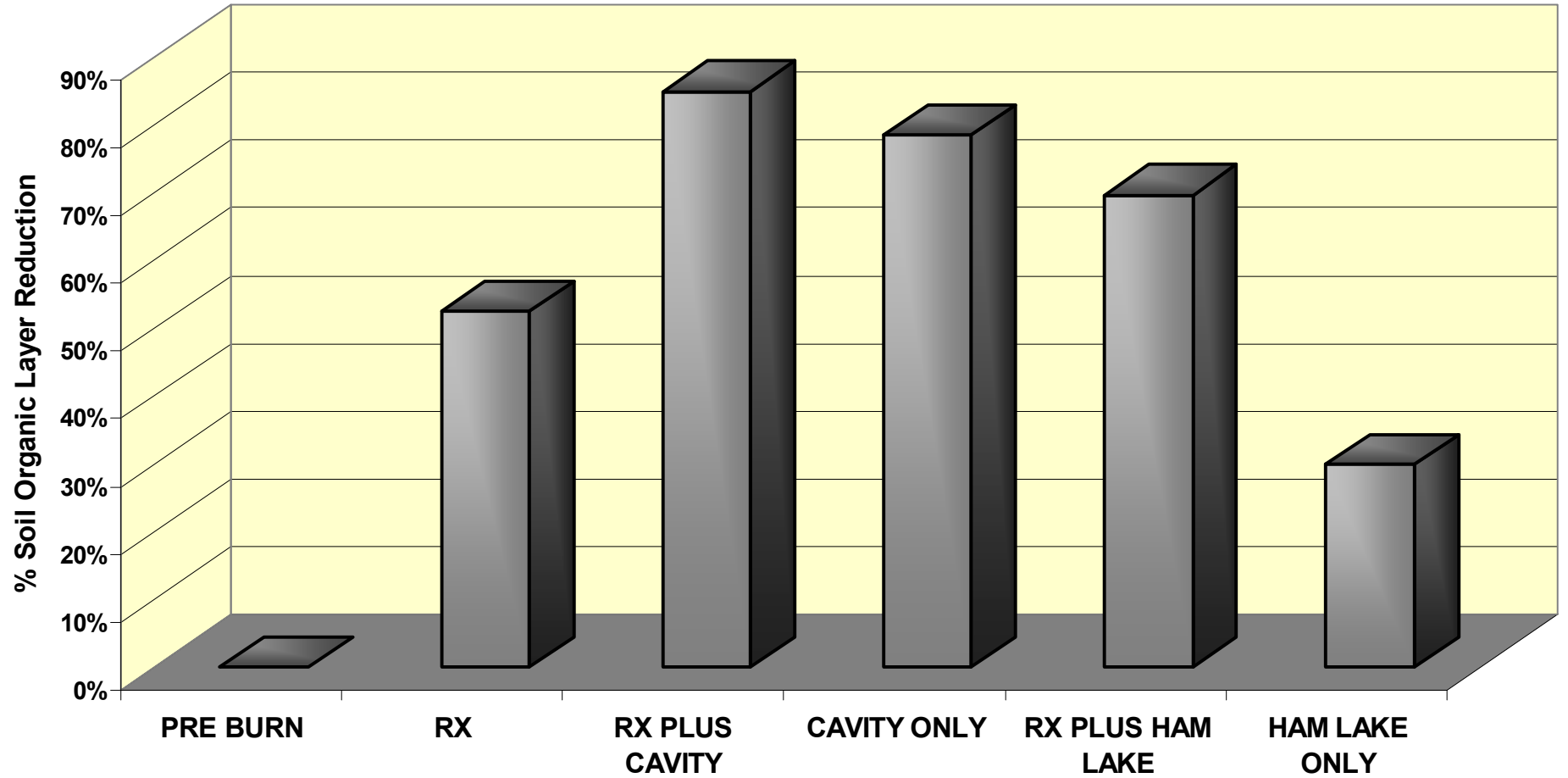
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Effects on Soils

SOILS; Percent Reduction in Soil Organic Layer



Rx vs Cavity Wildfire Reduction in



Rx Burn-50% Reduction



Cavity Fire-79% Reduction

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Burn Severity



Burn Intensity relates to the amount and rate of surface fuel consumption.



Fire Severity reflects the amount of heat that is released by a fire and how it affects soils, vegetation, other resources.



BURN SEVERITY COMPARISONS



Low Severity

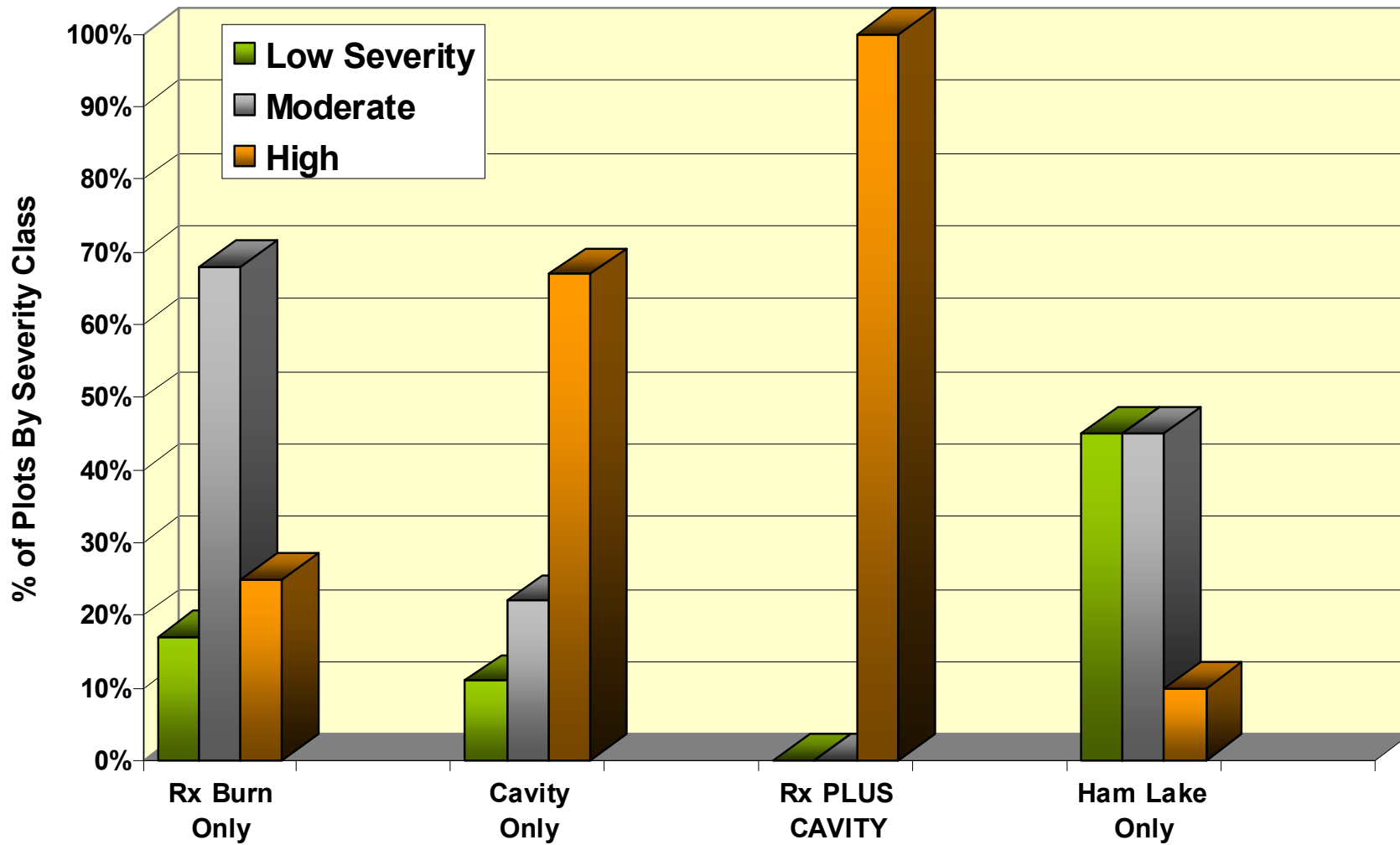


Moderate Severity



High Severity

Burn Severity By Fire Type



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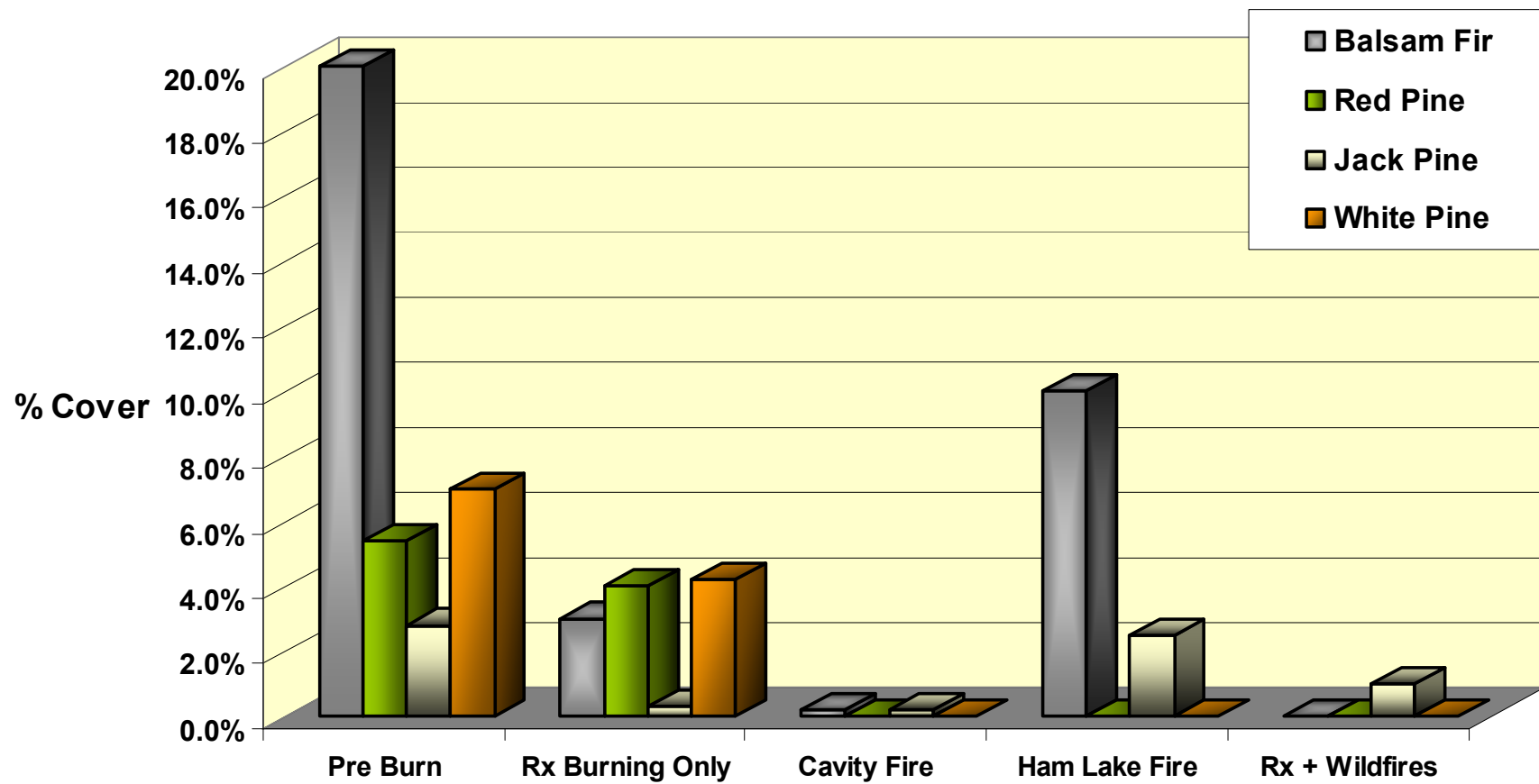
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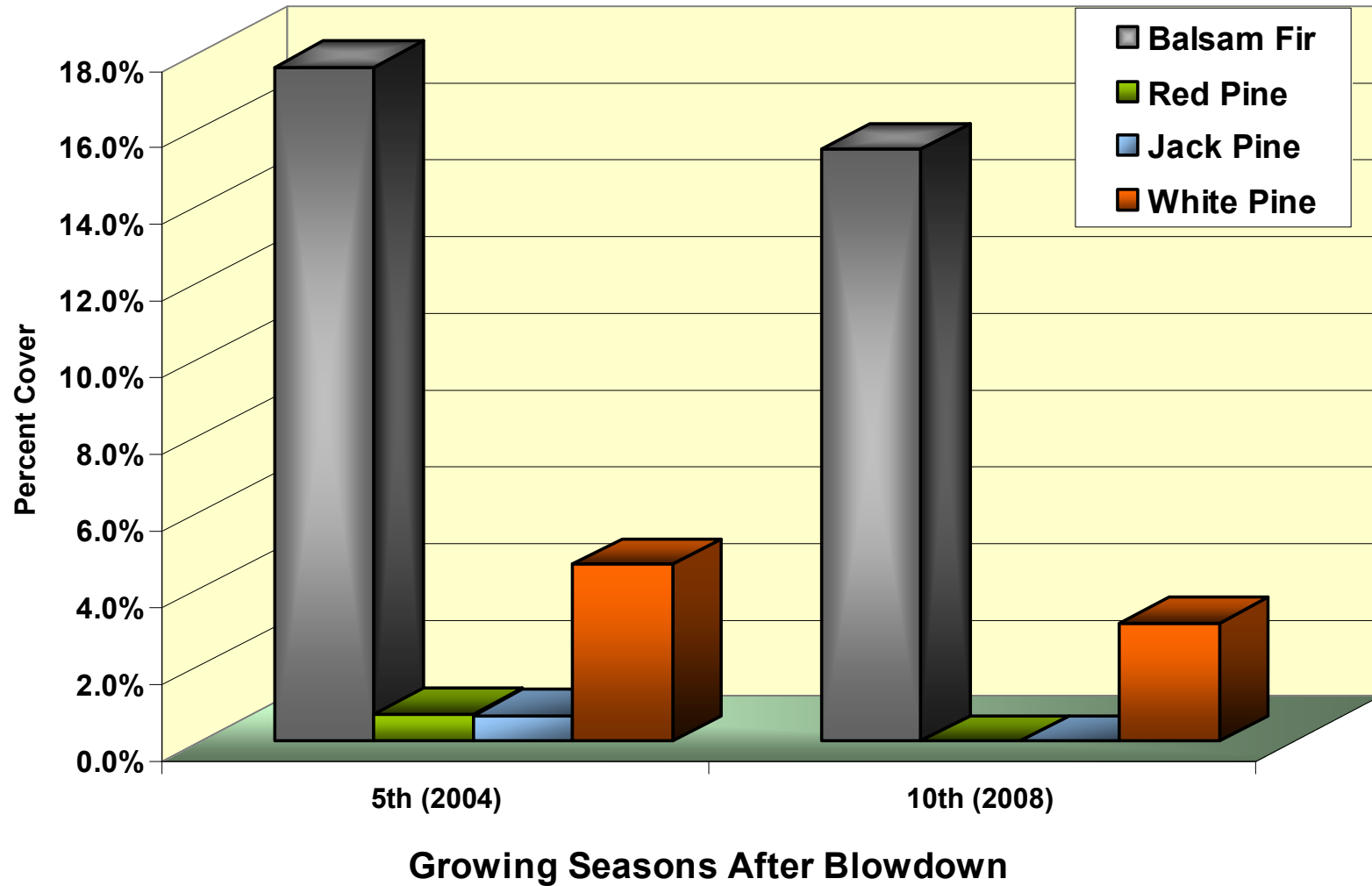
Conifer Abundance



Change In Conifer Abundance Following Burning



Change in Conifer Abundance Following 1999 Blowdown



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Vegetative Communities



Dominant Post Burn Vegetation-All Burns



Dominant Post Blow-down Vegetation Succession



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Mitigation Effectiveness



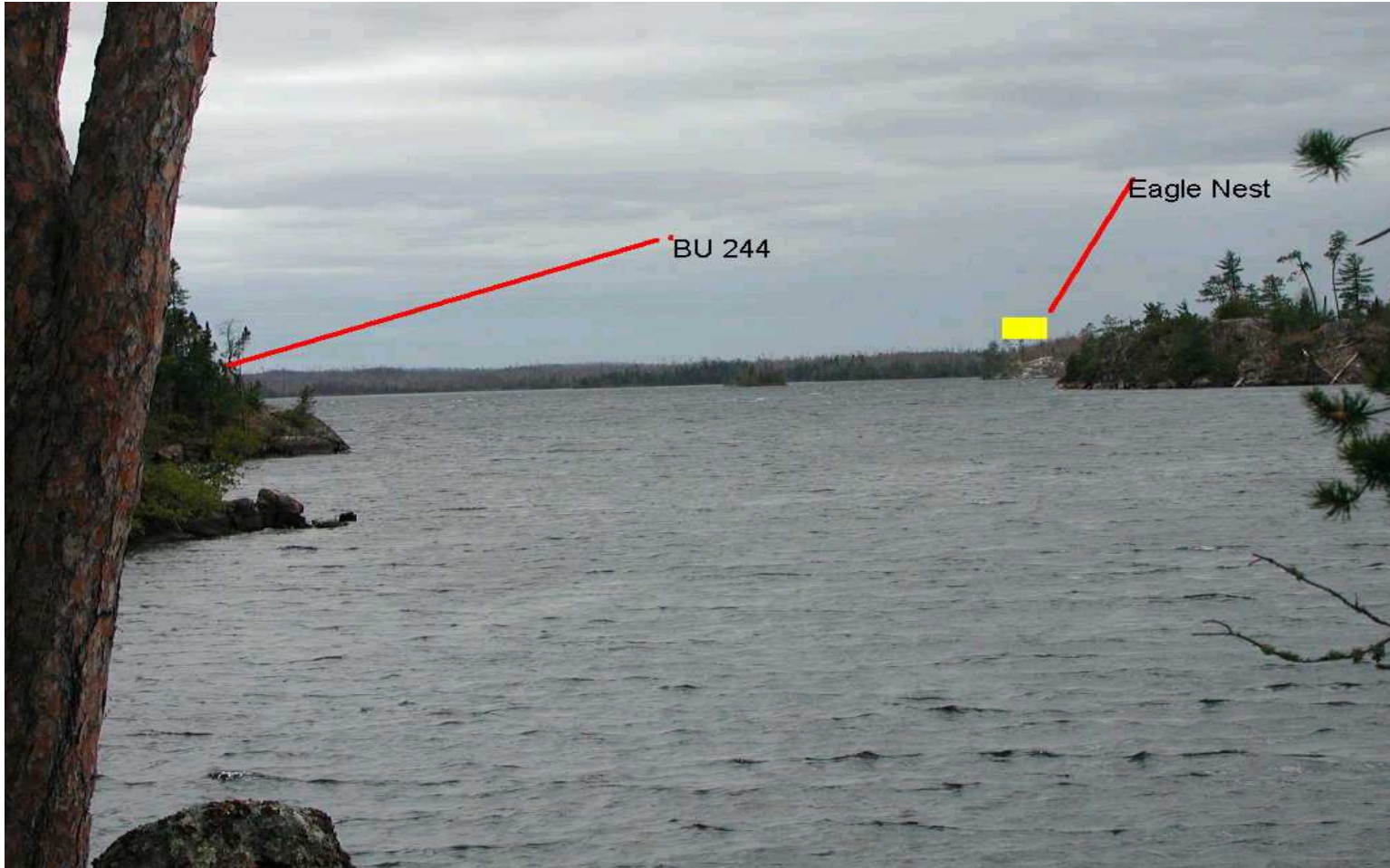
Pre Wetting Meditation Lake side of BU 393.

Shoreline Forest Survival




56% of Shoreline Forest Survived and 44% Died


Wildlife Protection



BU 244. Nest Located on island adjacent to BU. Burn occurred during September.



**What has our monitoring
shown the past seven
years in terms of
addressing Fire/Fuels
Questions?**



**(1) Did prescribed
burns reduce
hazardous fuels?**

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Yes

**Rx burns reduced hazardous fuel loading
46% on average.**



(2) How Long Are Treatments Effective In Reducing Wildfire Risk?

**That depends on several
variables including:**



(a) Establishment & increase of ladder fuels such as balsam fir.



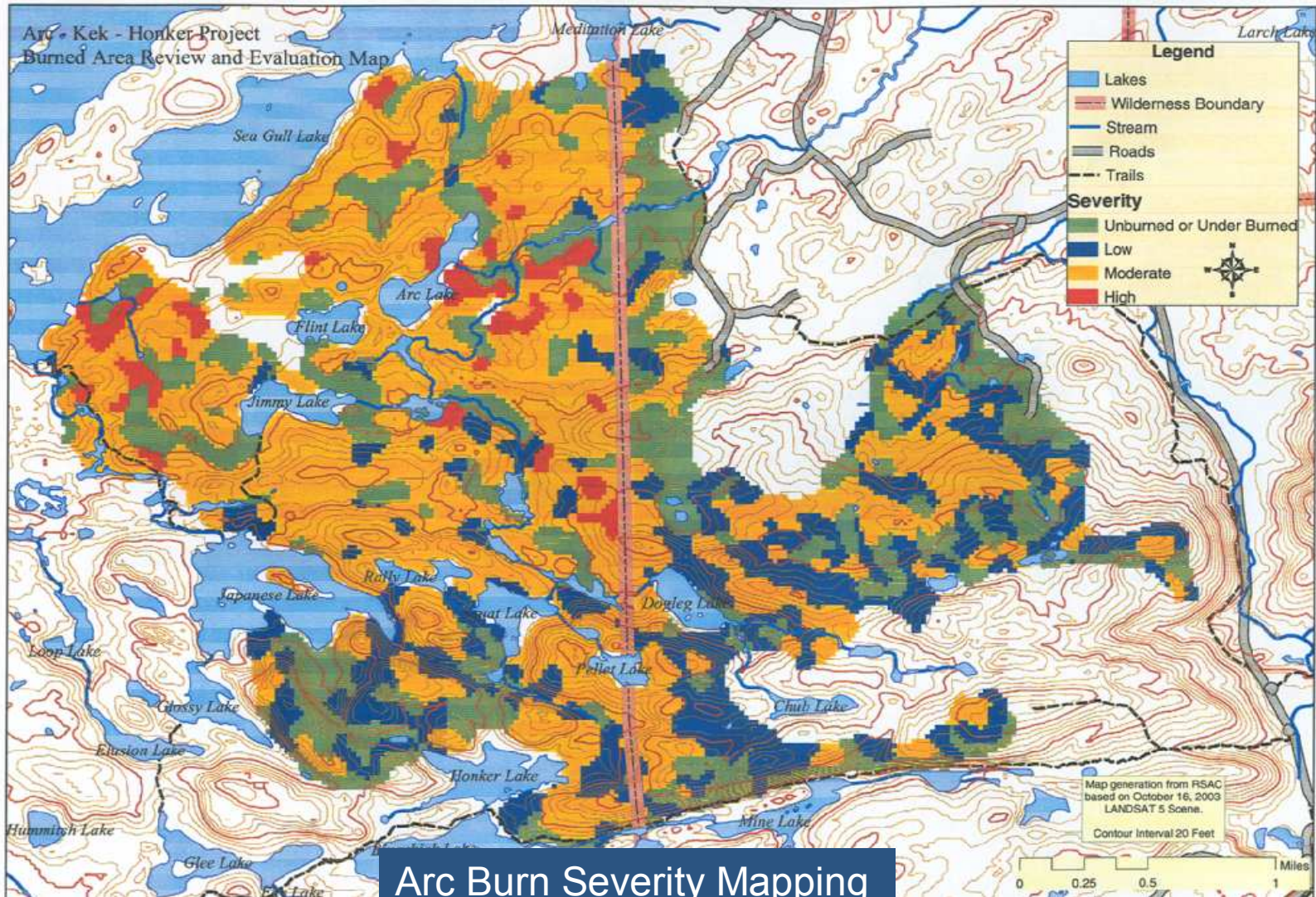
Balsam Fir 5 years following burning

(b) Recruitment of down fuels



Increase Of Fuel Loading Post Burn Due To Snag Recruitment


(c) The Extent Of BU Treated.



Arc Burn Severity Mapping

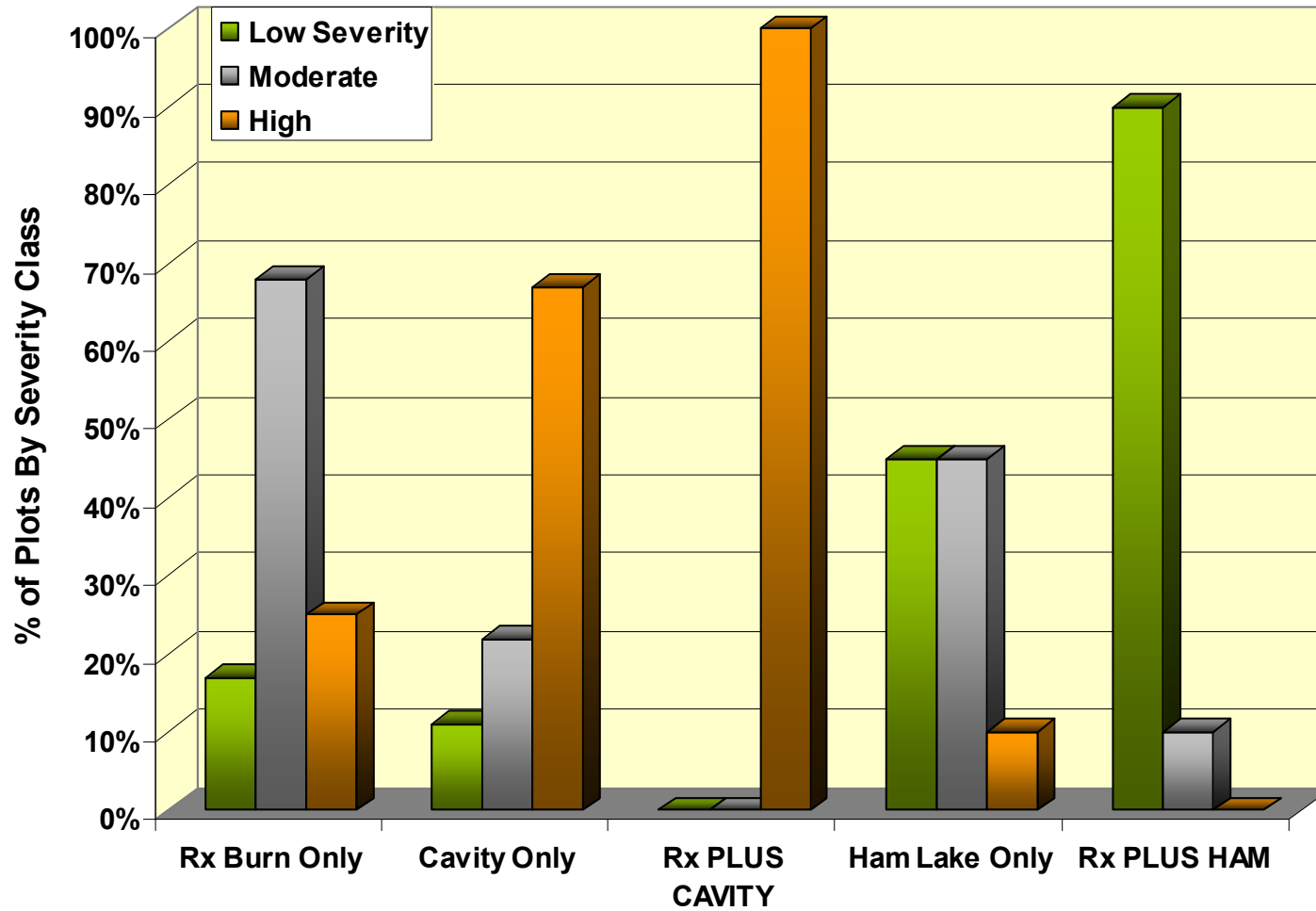
(d) Where Burning Occurred, Were Fuels Adequately Consumed?






(3) Did fuel reduction practices affect wildfire behavior, spread, intensity, **severity, and environmental impacts?**

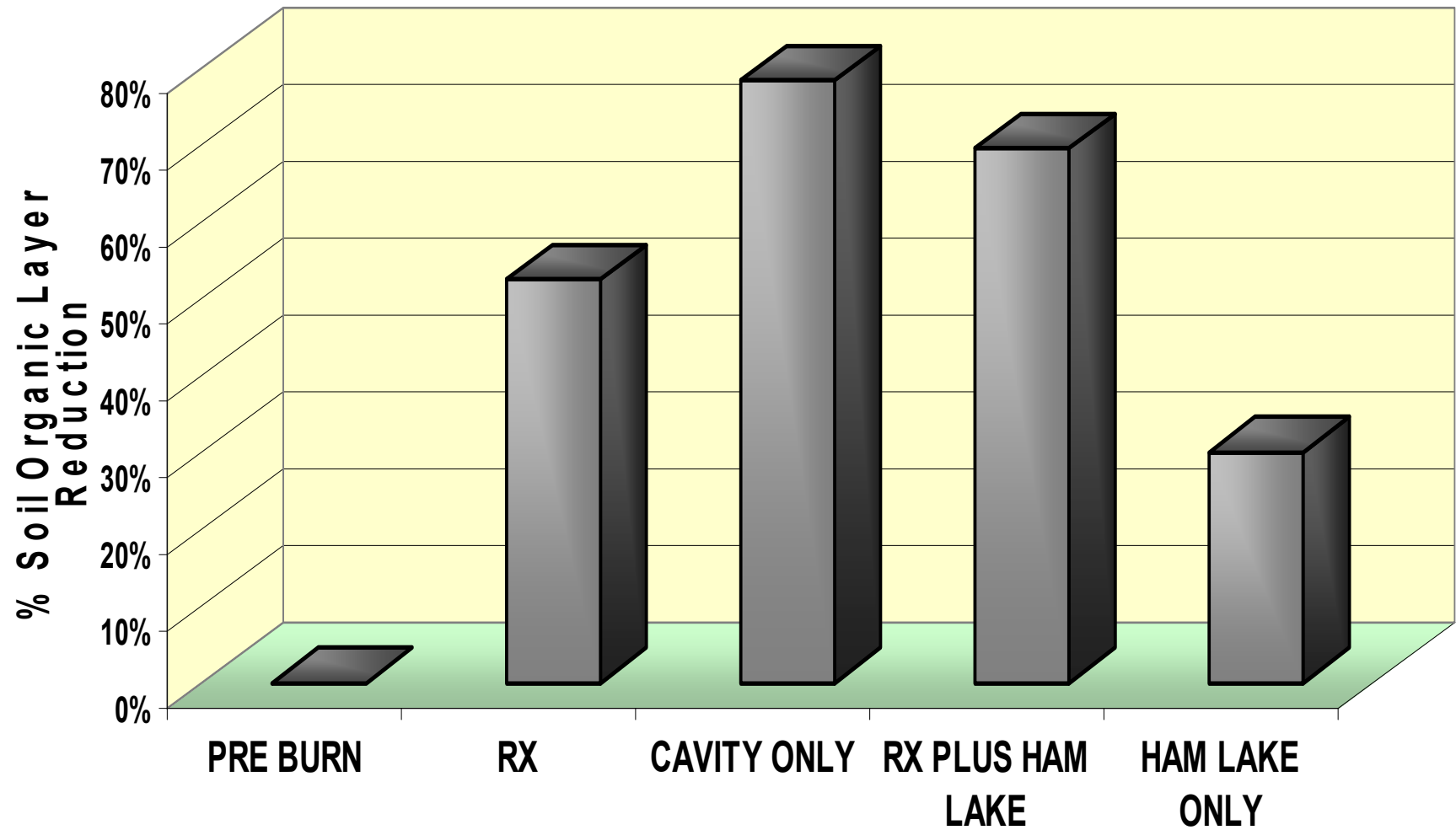
Burn Severity By Fire Type





(4) How Do Environmental Effects Compare Between Prescribed Burns Vs. Wildfires?

Percent Reduction in Soil Organic Layer



Shoreline Forest Survival

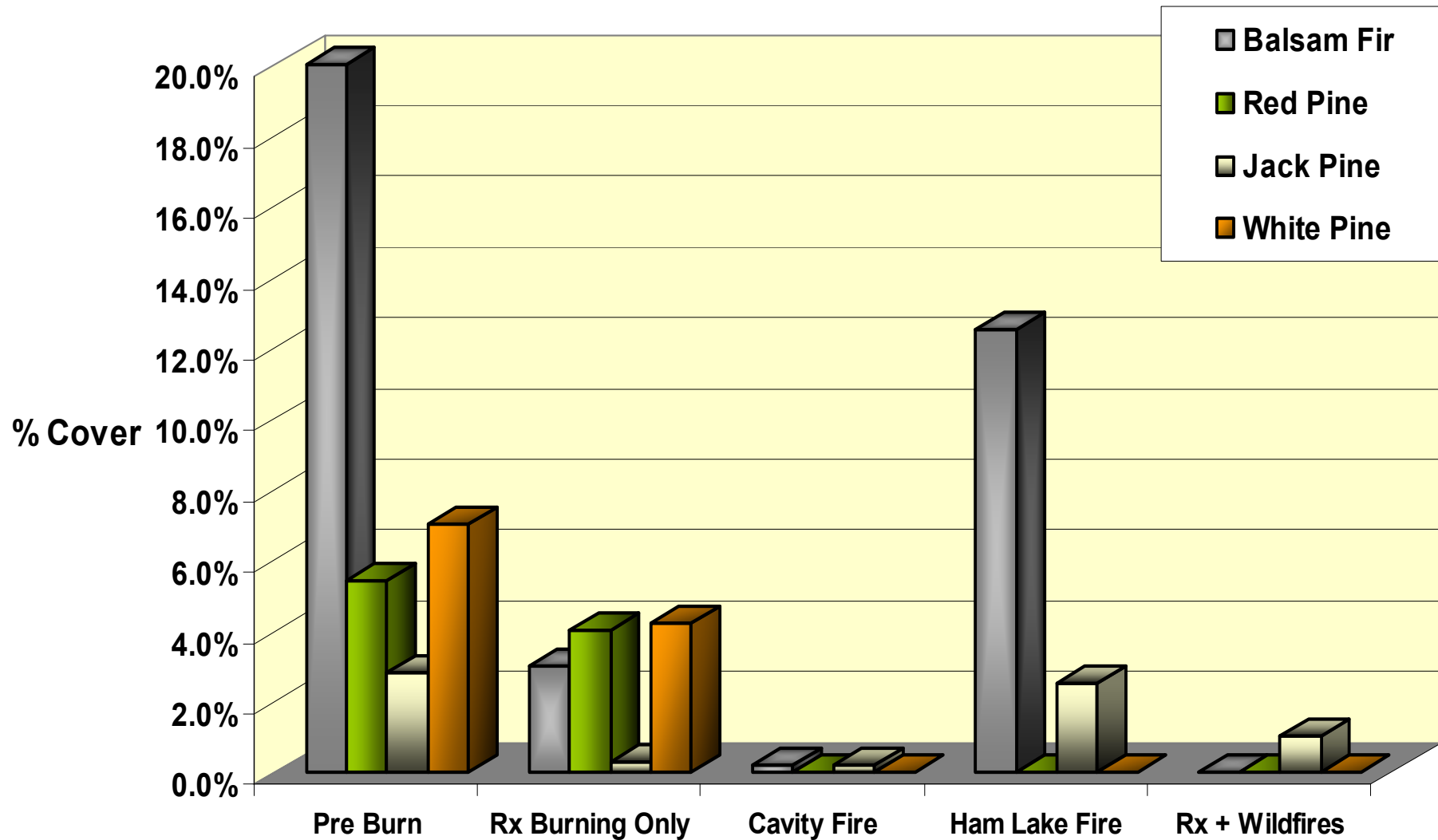


Rx Burn-56% Survival



Wildfire-Much Greater Shoreline Loss

Change In Conifer Abundance Following Burning



Vegetation



Cavity



Rx



NNIS Establishment and Spread




Campsite 29 thistle on latrine trail



Bull thistle @ Safety Zone.

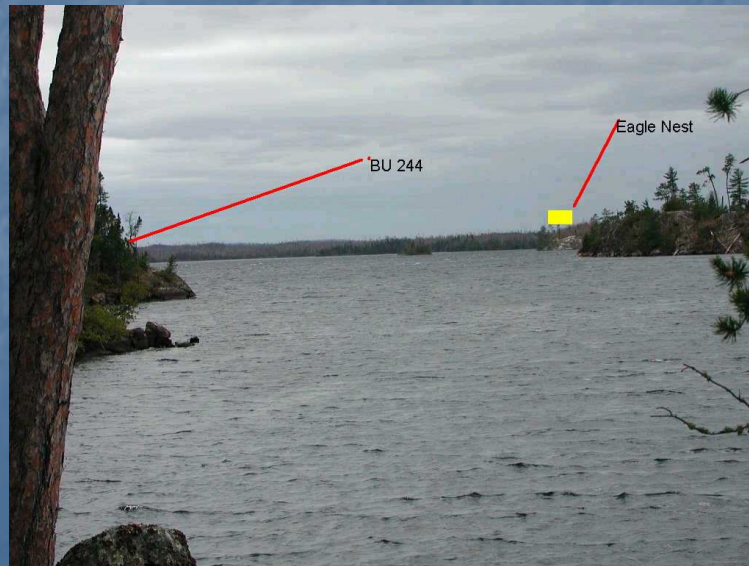



Yellow Hawkweed at Campsite



(5) Can prescribed burns, Wildland fire Use, and logging be utilized to meet land management plan objectives within fire adapted ecosystems?

Yes





(6) How will anticipated ecological responses vary between suppressed fires vs. wild land fire use vs. prescribed burns vs. large wildfires?

Some important factors to consider related to ecological response include:

- (1) **Fire severity** resulting from **fuel loading, drought, Energy Release Components, time of year, & weather conditions.**
- (2) **Size & Configuration** of fire.
- (3) **Mosaic or Heterogeneous** nature of burn severity within that burn pattern and
- (4) **Surviving seed sources.**

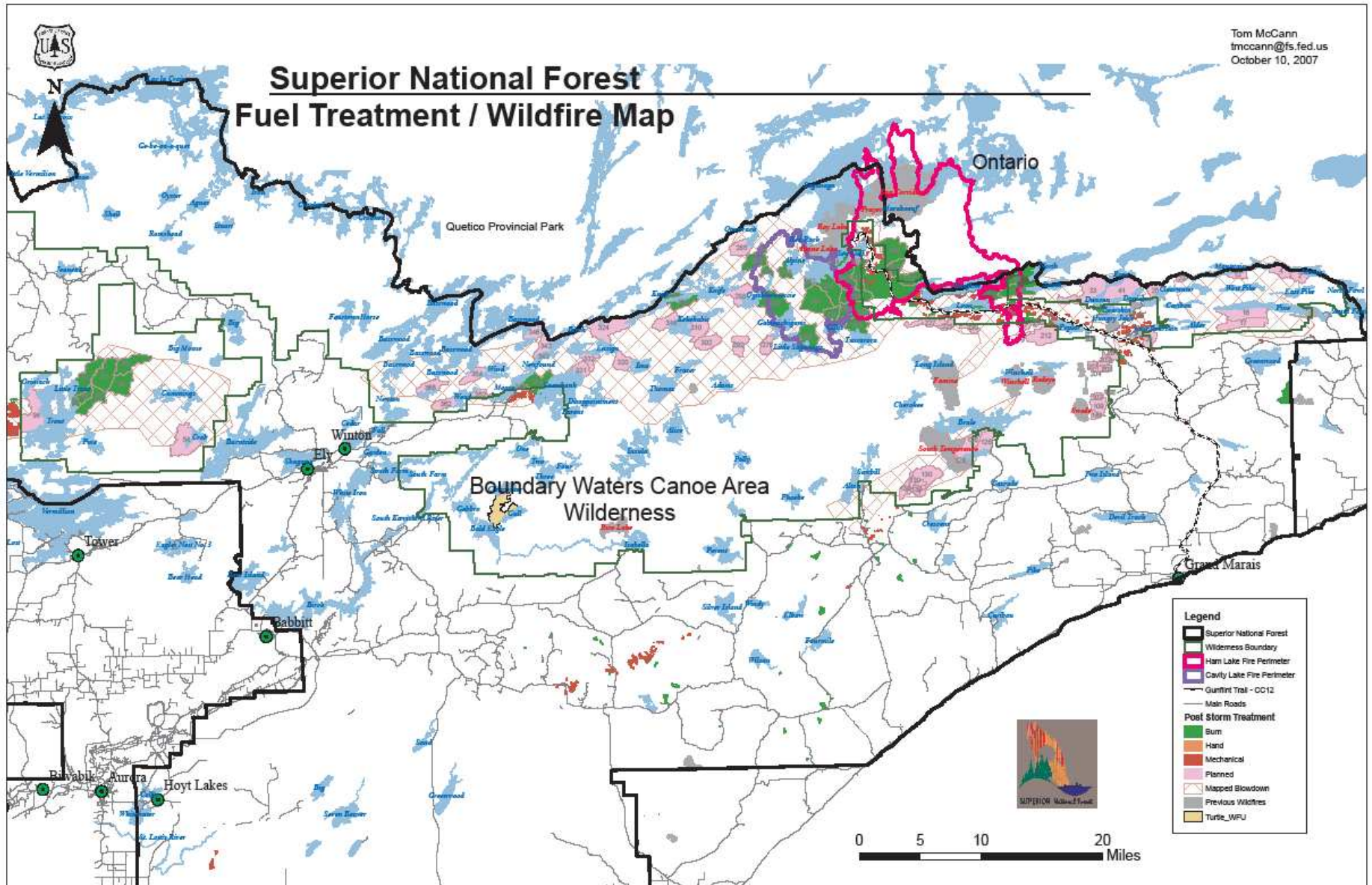
Suppressed Fires



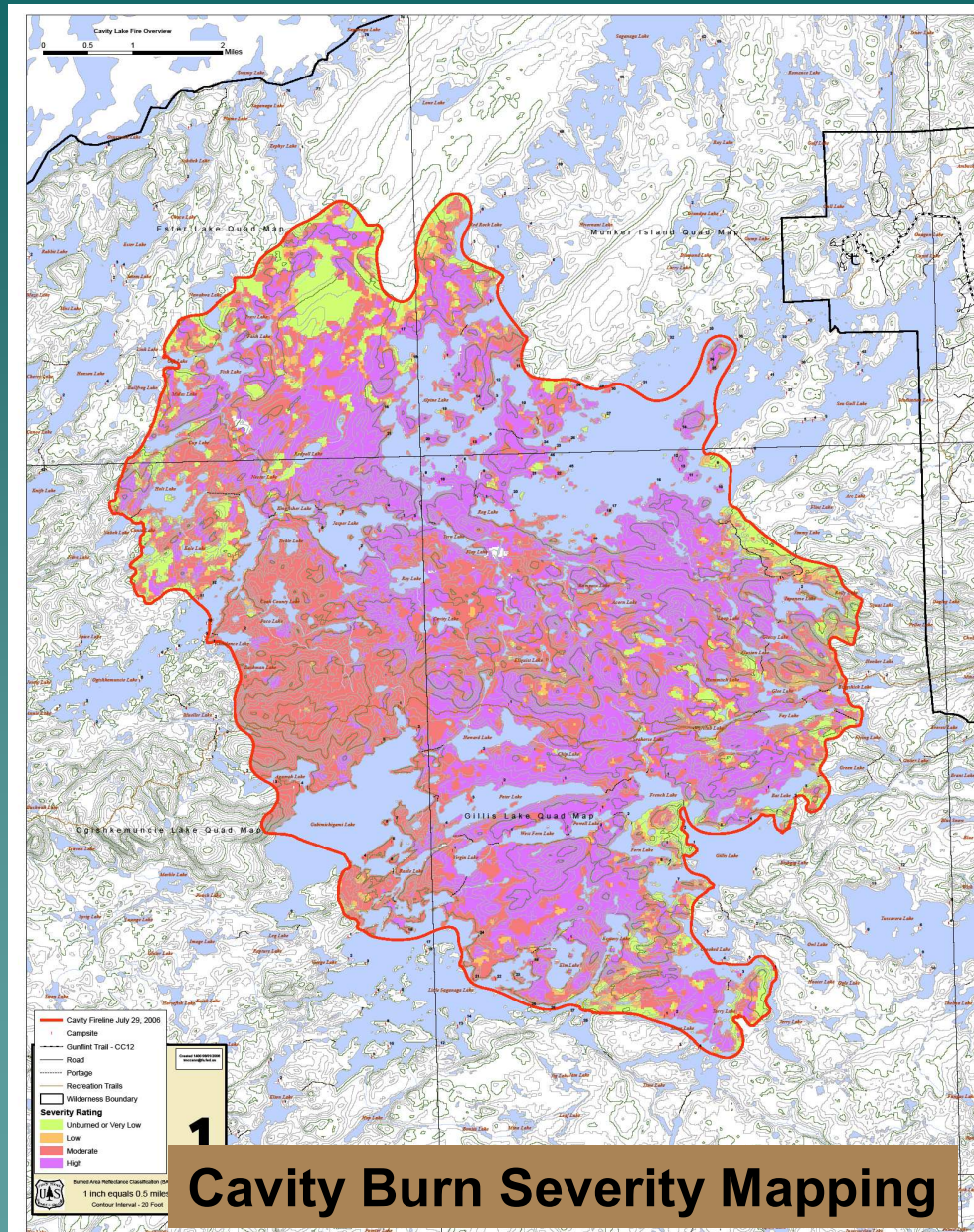
High Severity Fires



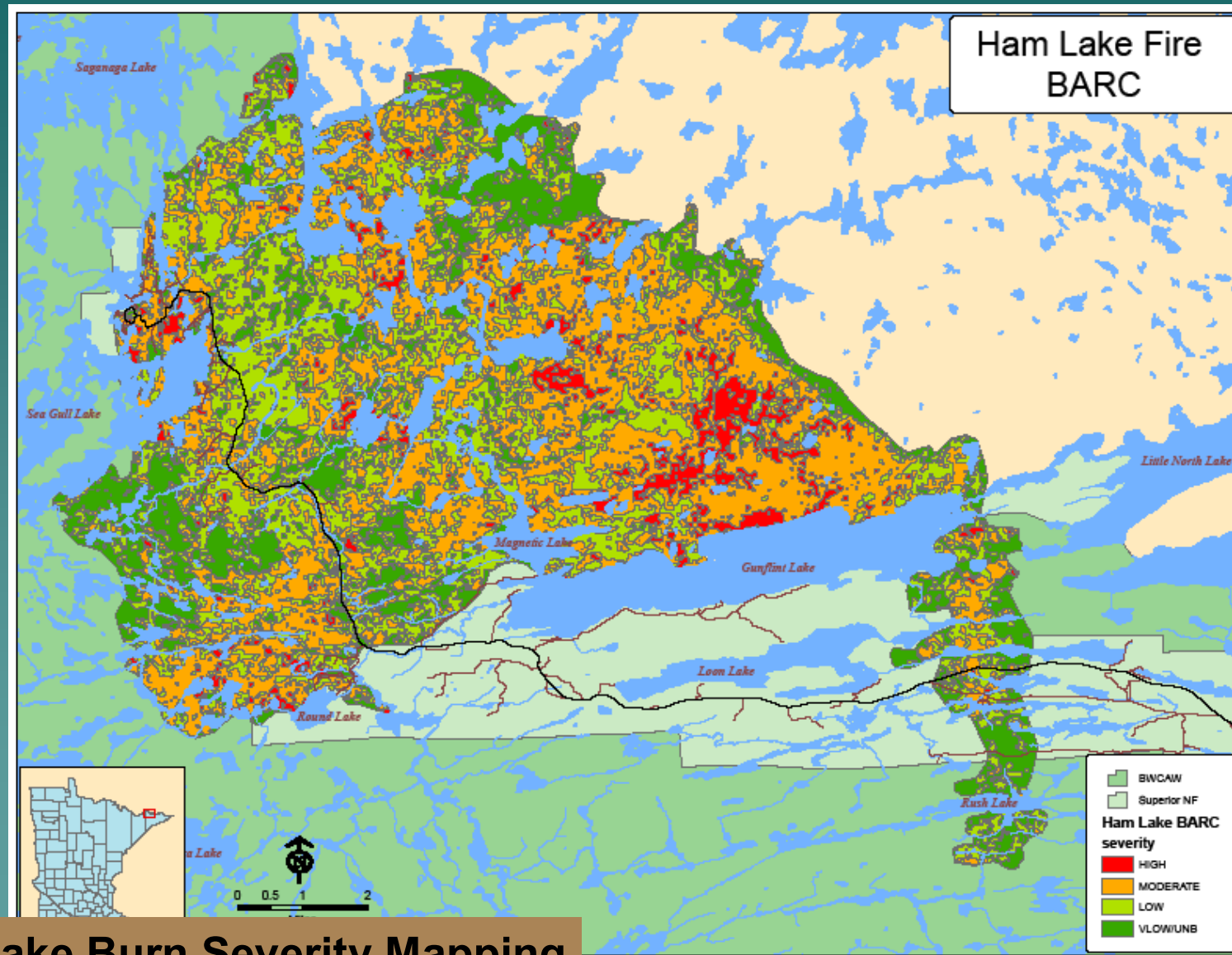
Size & Configuration of Fire



Mosaic of Burn Severity-Late Summer Wildfire.

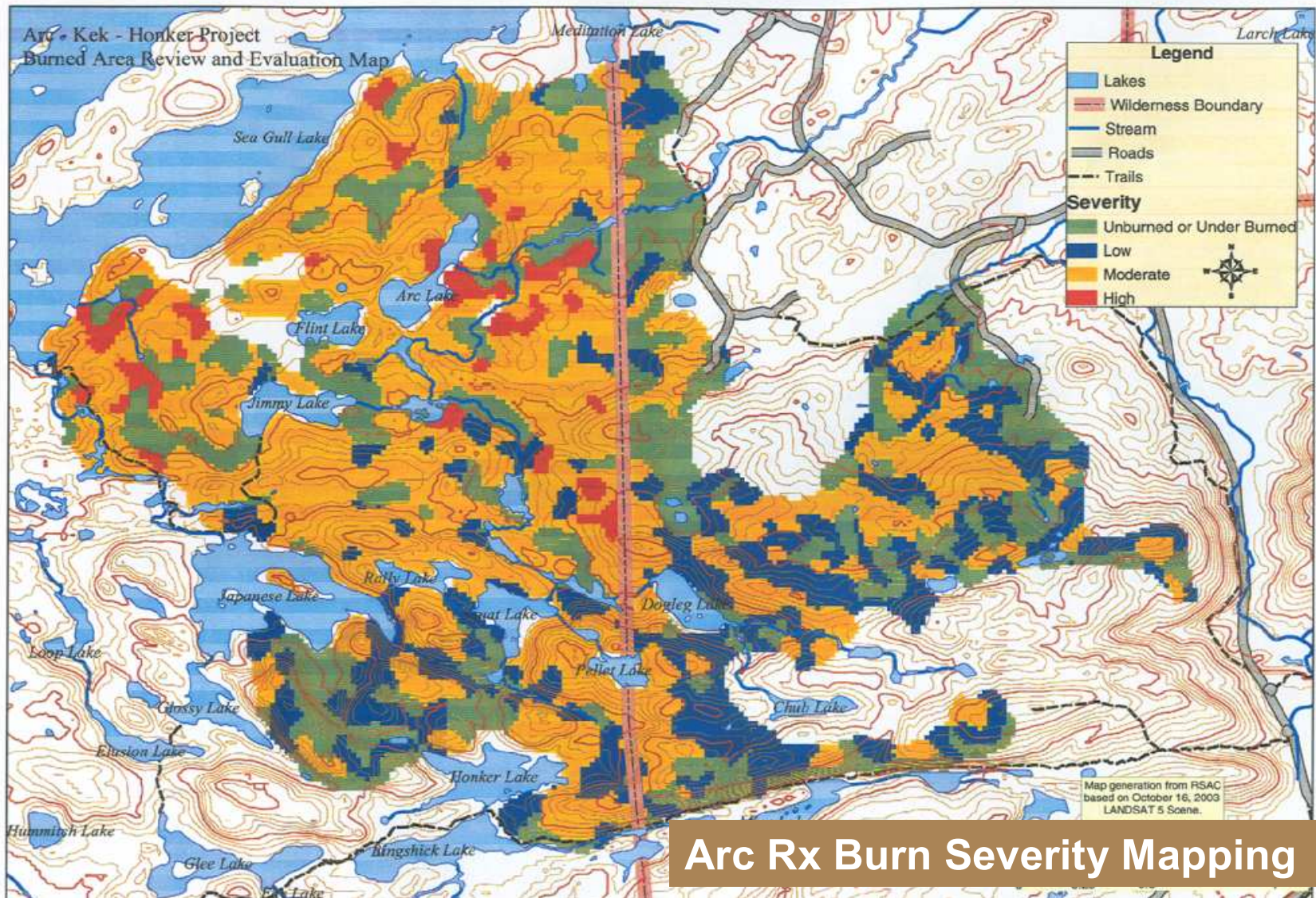


Mosaic of Burn Severity-Late Spring Wildfire.



Ham Lake Burn Severity Mapping

Mosaic of Burn Severity-Rx Burn

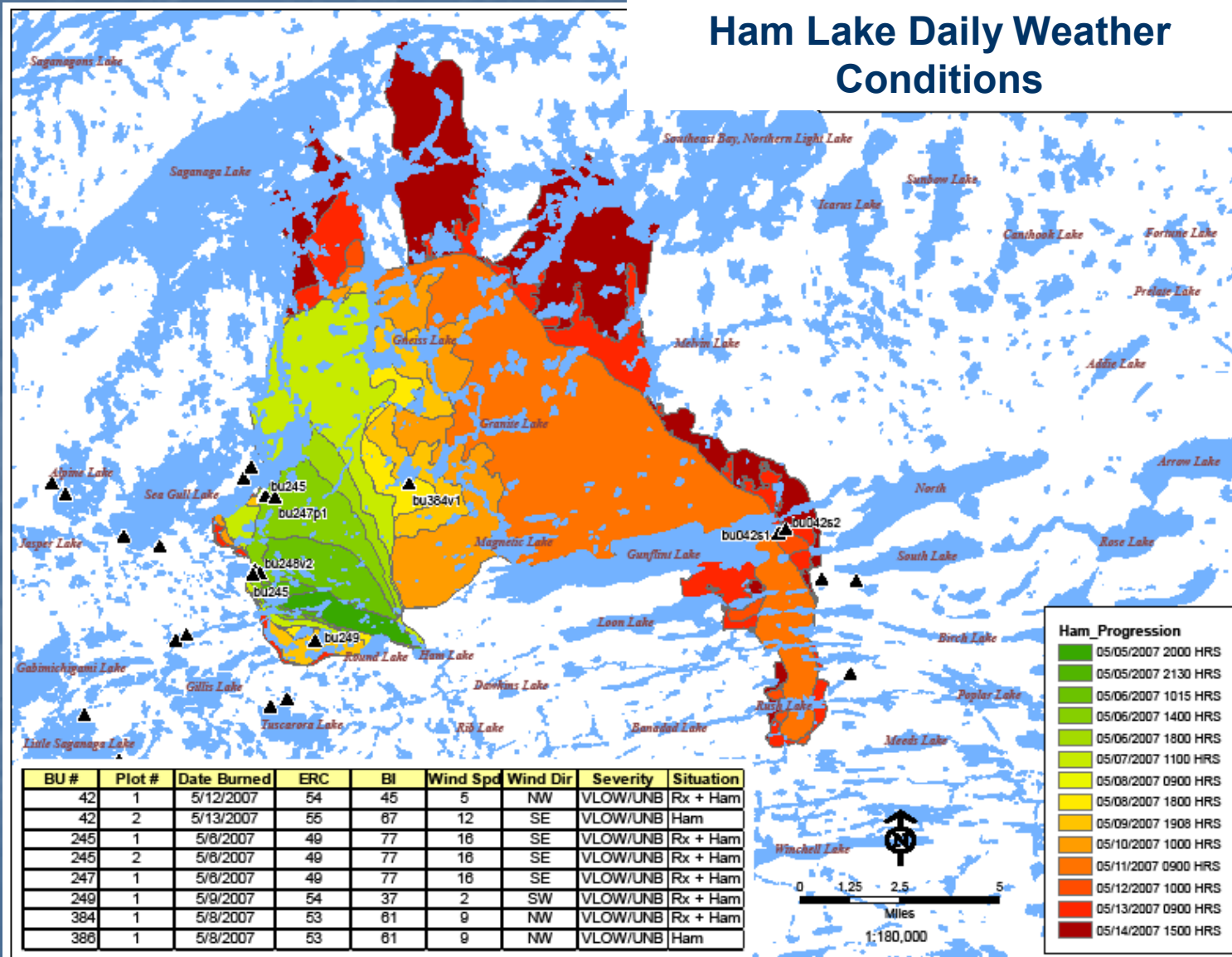


Surviving Seed Sources

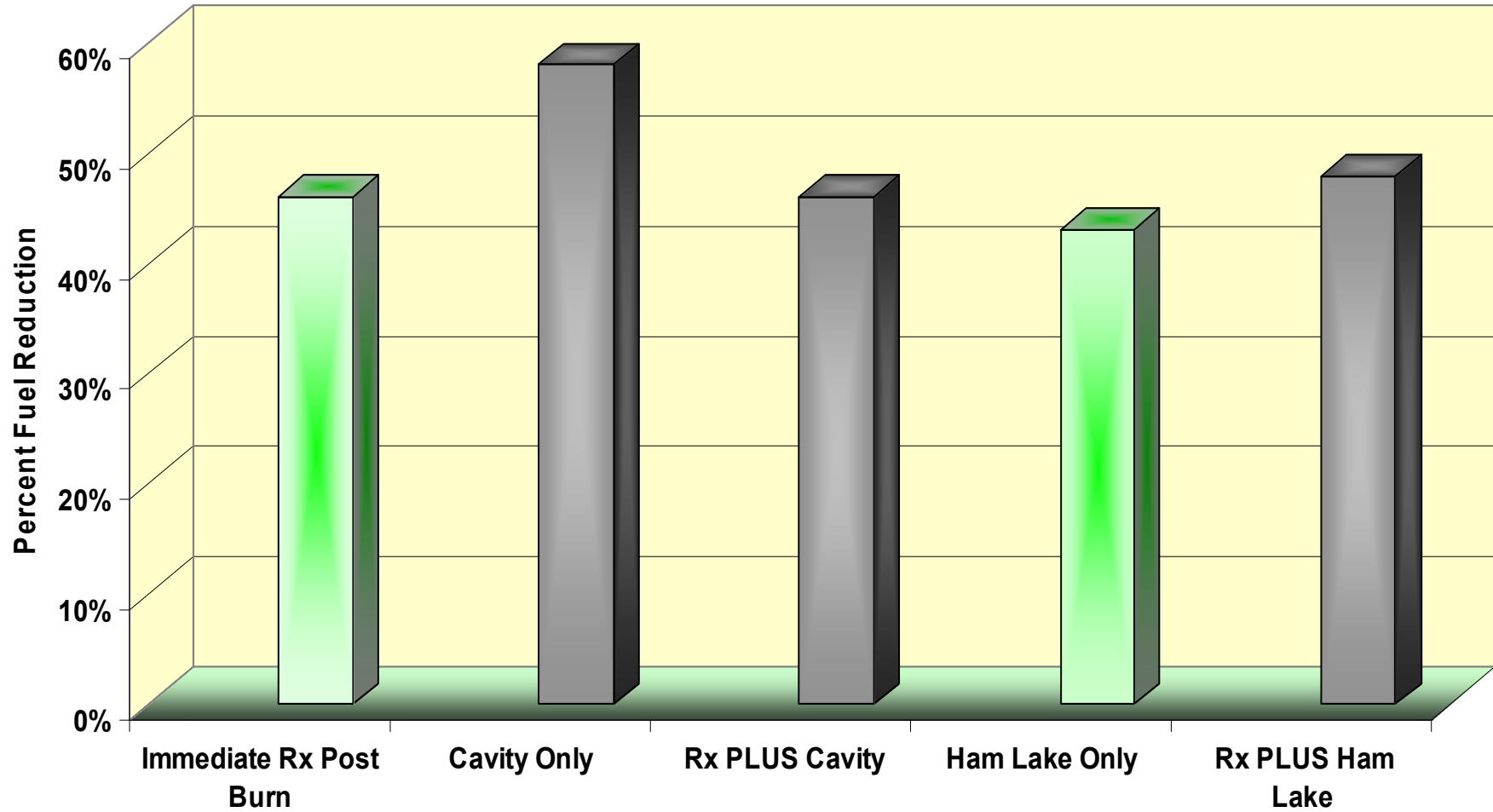


Wild land Fire Use

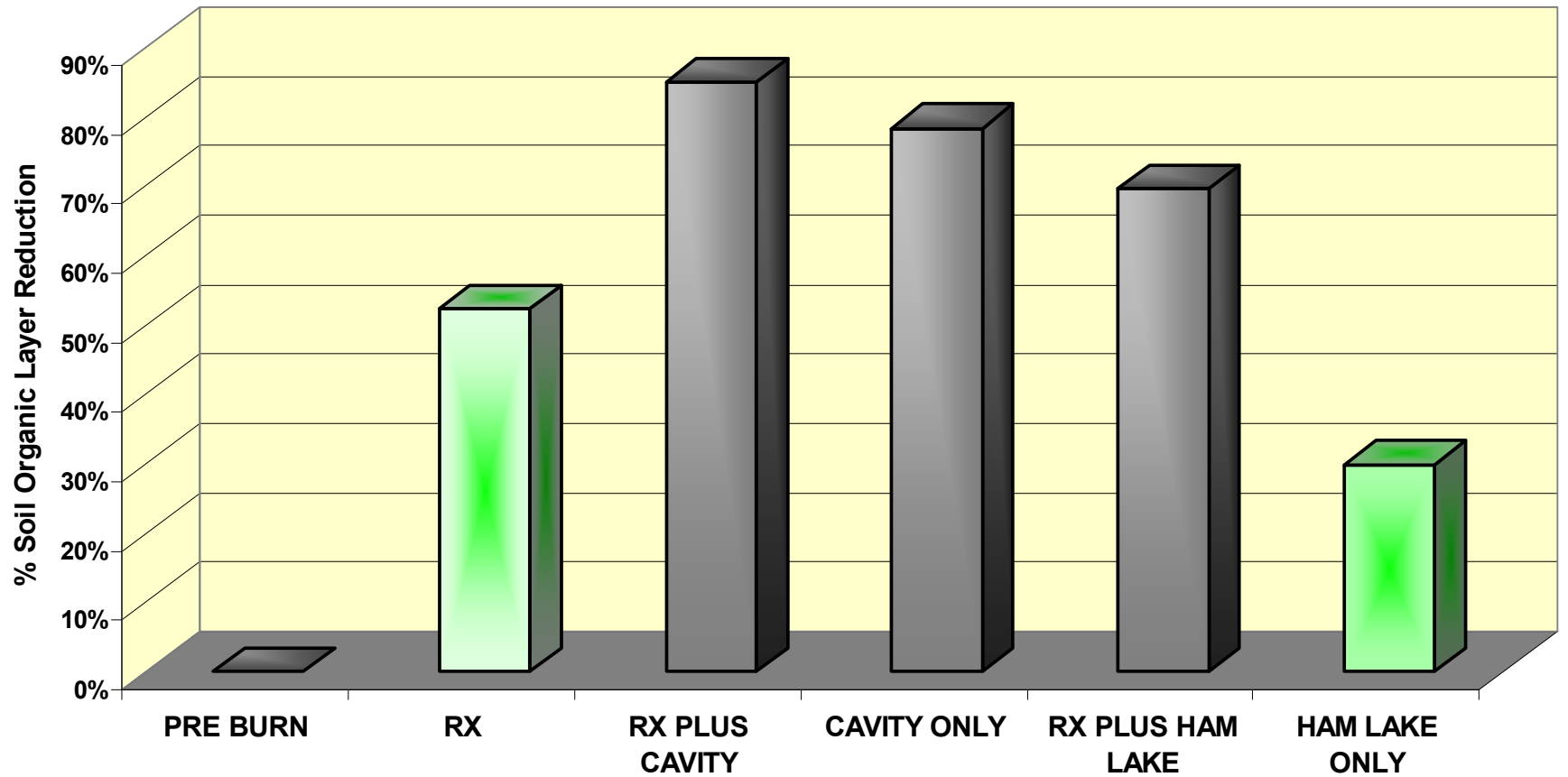
Ham Lake Daily Weather Conditions



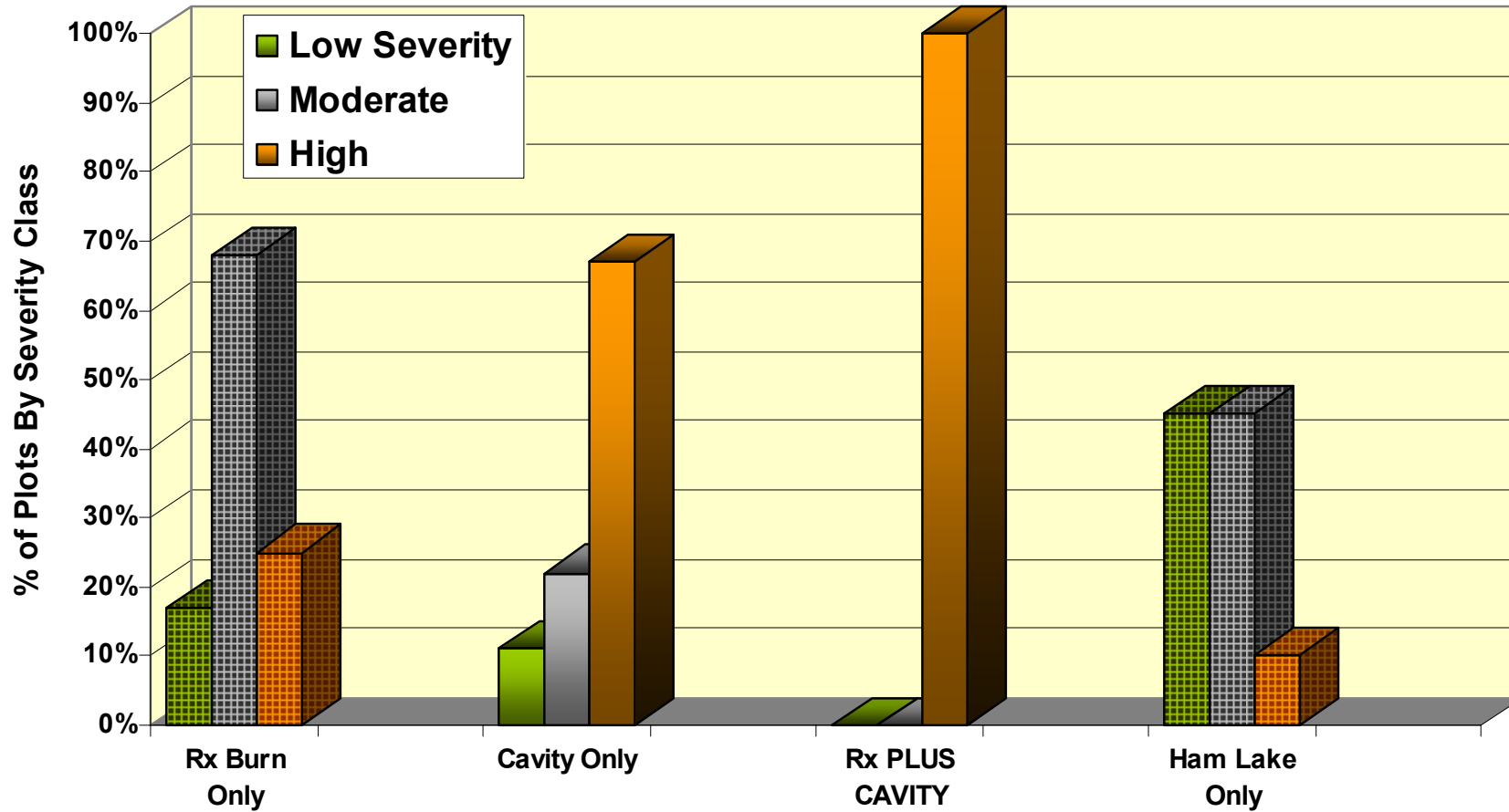
Percent Reduction of Blow Down Fuels

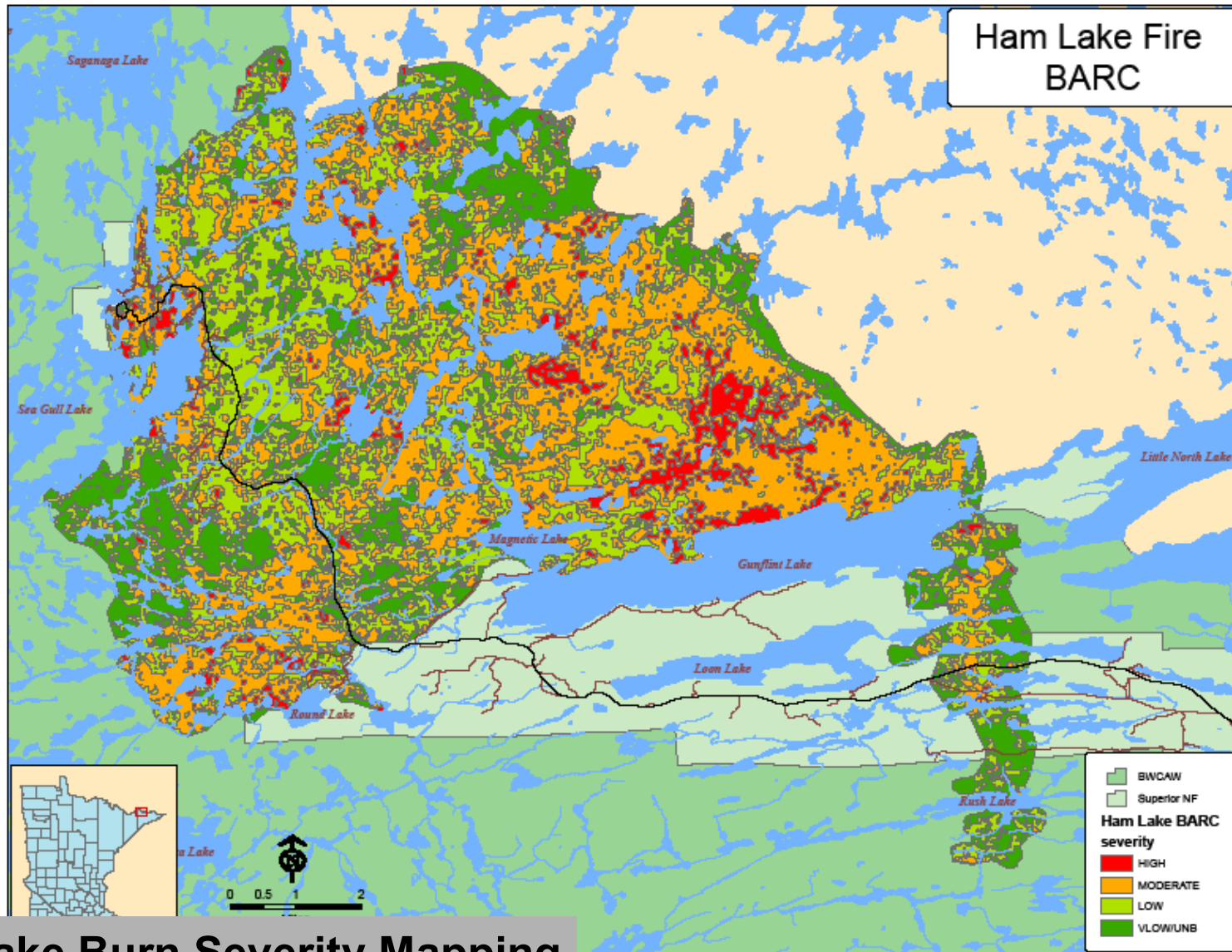


Percent Reduction in Soil Organic Layer



Burn Severity By Fire Type





Ham Lake Burn Severity Mapping

(7) What Are the Key Public Messages To Understand Fire & fuels management?

- **PB's did prevent or diminish escape of wildfires into populated areas.**
- **Mitigation used during PB operations did protect or minimize fire effects on other resources.**
- **Blow down fuels can remain a hazardous fuel threat for many years.**
- **There are notable fire effects differences between early and late season wildfires.**
- **Landscapes do recover with time.**

Jack Pine Forest Recovery 30 years following Event



Dryden 18 Fire. 1973 Blow down that burned in 1974 and again in 1980
