



# Impact of Prescribed Burning on Growth and Dynamics of Forest Stands

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Northwest Science and  
Information



# Partners/ Collaborators

Forestry Futures Trust

Enhanced Forest Productivity Science Program –

Forest Ecosystem Science Co-operative Inc. (Forest Co-op)

Forest Co-op Partners participating in this project include the following:

Abitibi-Consolidated Company of Canada

Bowater Canadian Forest Products Inc.

Confederation College

Domtar Inc.

Neenah Paper Company of Canada

Ontario Ministry of Natural Resources

- Northeast & Northwest Science and Information

- North West ,Northeast, Provincial (branch) Fire Program

Tembec Industries Inc. & Forestry Research Partnership

Weyerhaeuser

Buchanan

# Financials

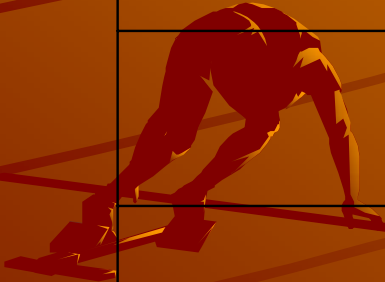
## Multiyear and Partner Funding Plan.

		2006-2007 (\$)	2007-2008 (\$)	Total (all years of project)
<b>Total Cash Contribution</b>				
•Planned		75,000	75,000	150,000
•Actual		75,000	75,000	150,000
<b>Total In-kind Contribution</b>				
•Planned		108,500	78,500	187,000
•Actual		175,900	177,075	352,975
<b>Total</b>		<b>250,900</b>	<b>252,075</b>	<b>502,975</b>

# Financials

**Table 3: Total Project Costs (All Years) to Date**

<b>Fiscal Year</b>	<b>Total EFPS</b>	<b>Total Non-EFPS</b>	<b>Total Project Cost</b>
<b>Year 1</b>	<b>75,000</b>	<b>250,900</b>	<b>325,900</b>
<b>Year 2</b>	<b>75,000</b>	<b>252,075</b>	<b>327,075</b>
<b>Total</b>	<b>150,000</b>	<b>502,975</b>	<b>652,965</b>

A silhouette of a sprinter in a starting crouch on a track, positioned in the bottom-left corner of the table area.

# Project Overview

- ✦ This two year project investigated the impact of prescribed burns on forest growth and yield, site productivity and early floristics.
- ✦ A series of 'matched' plots was established in 14 to 35 year old plantations on sites with broadly contrasting disturbance histories: wildfire, prescribed burn, and mechanical site preparation.
- ✦ Plot matching was on the basis of disturbance history, species planted, stock type, soil group, management intensity, stand age, and ecoregion.



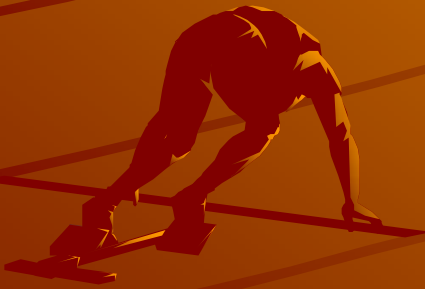
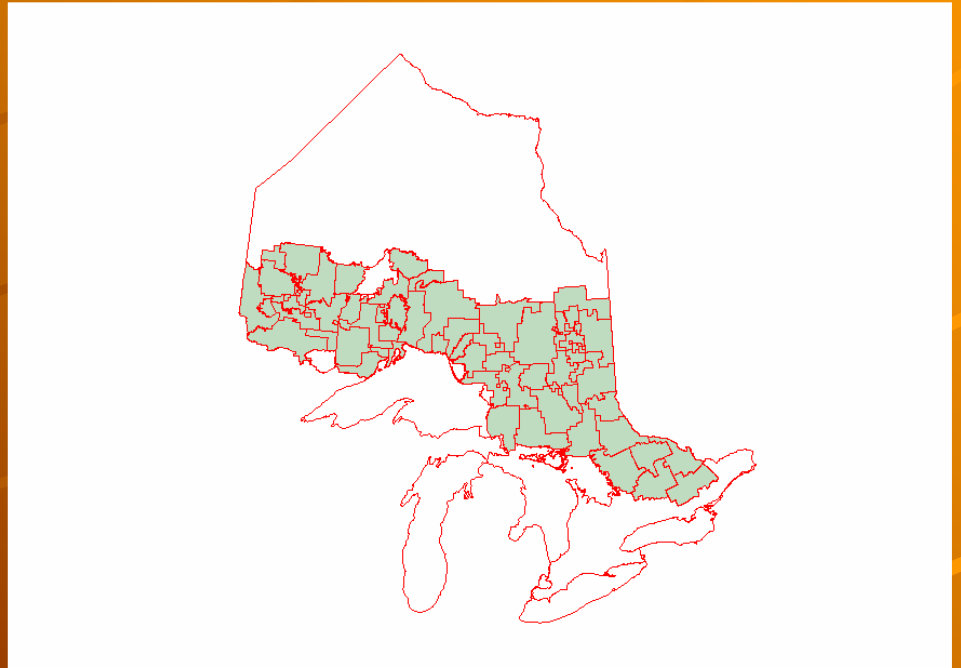
# Project Overview

- ✦ **Old prescribed burn plans and post burn reports were collected from across the boreal region and spatially mapped.**
- ✦ **The FEC and Growth and Yield sampling methodologies were utilized to ensure consistency with existing datasets, and to facilitate the longer term maintenance of the plot network**



# Scope

The scope of the project is  
Prescribed Burns with standard  
silviculture practices, found within  
the boreal forest



# Project Design

Comparison of the Growth and Yield within the two Standard Forest Units sampled (Pjpure and Sb pure) Plantations on which did not receive a PB with those that did and natural stands of the same strata.

The goal was to catalogue, locate and measure the plots to determine if there is an enhanced growth response as well as a difference in basic vegetation groups



# Project Design

The stratification will be comparing wildfire, to PB's to a recommended basic silvicultural treatment for that forest unit/ site.

Sites will be of the same age or age group and be paired to make direct correlation easier

Only 2 forest units (Pj Pure, Sb Pure) will be compared in this study to make it operationally feasible



# Project Design

Effort was made to ensure soil type, stock types, planting methods and other productivity related variables are consistent across sample.

Ordination of the floristic data with the current ELC data set to compare the species compositions to those found in existing Ecosite's

The data for the sample plots will be entered into the Forest Coop Growth and Yield Business Unit and ELC data bases.



# Implementation Schedule

## Year one (2006-2007)

- Data Mining for historic data
- Development of spatially explicit data base structure
- Field location and validation
- Initial plot measurements
- Initial report and data review

## Year 2 (2007-2008)

- Review of methodology and sampling procedures
- Finalization of field sampling
- Collation of results
- Final reports



# Achievements

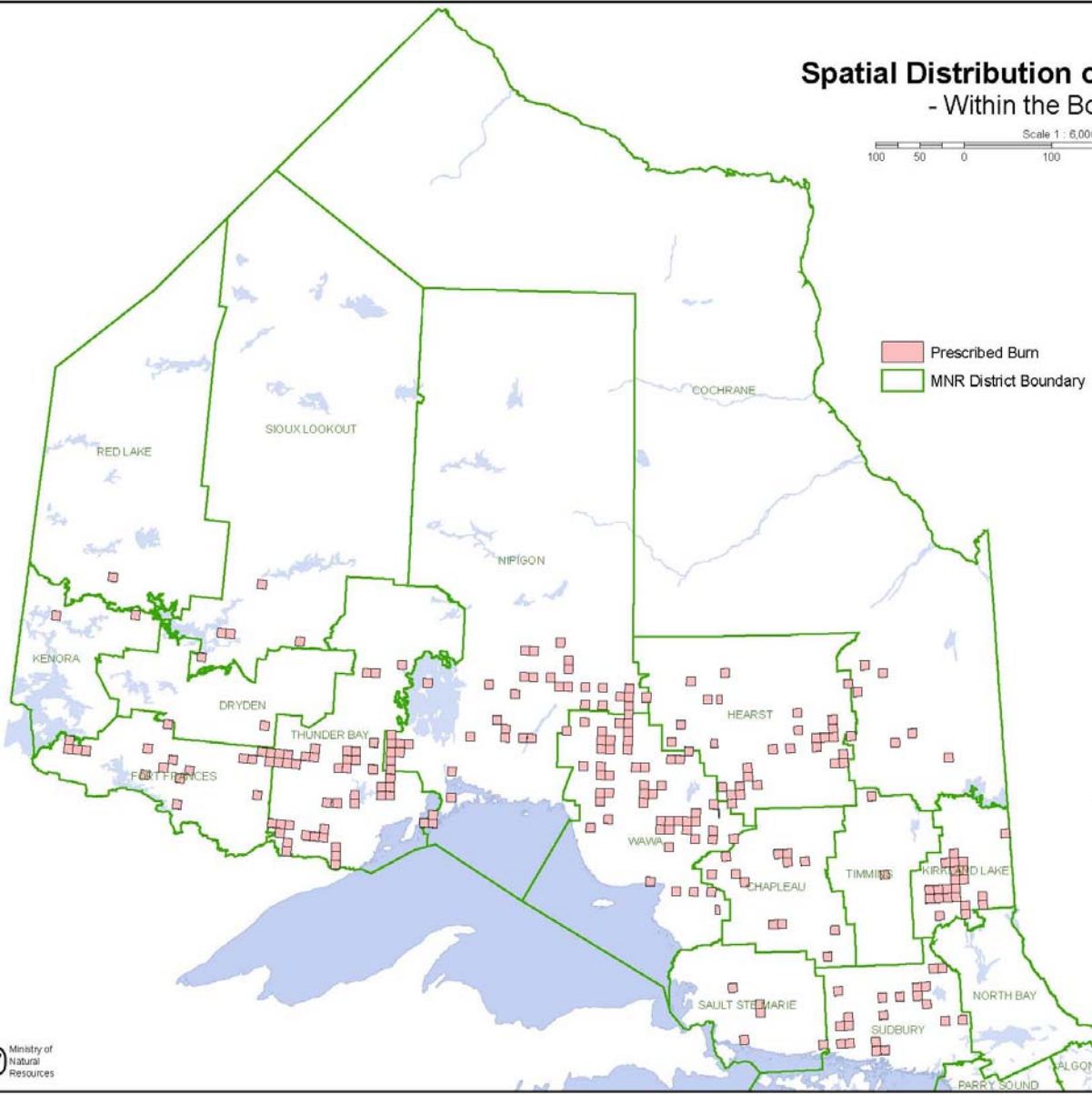


- All Pb's on record have been catalogued (382) from both regions
- Over 300 stands within 192 Pb's have been recon'd 129 potential burns were identified
- Field work established on 89 Pb's ,282 plots, 105 in non burned areas were established
- Most Pb's had more than one stand within them
- OMNR Fire Program has overachieved on all in-kind contributions and collaboration
- Ongoing historic record management and data base development
- All burns are captured on a unique spatial layer with associated FRI data
- Scans of old records are complete

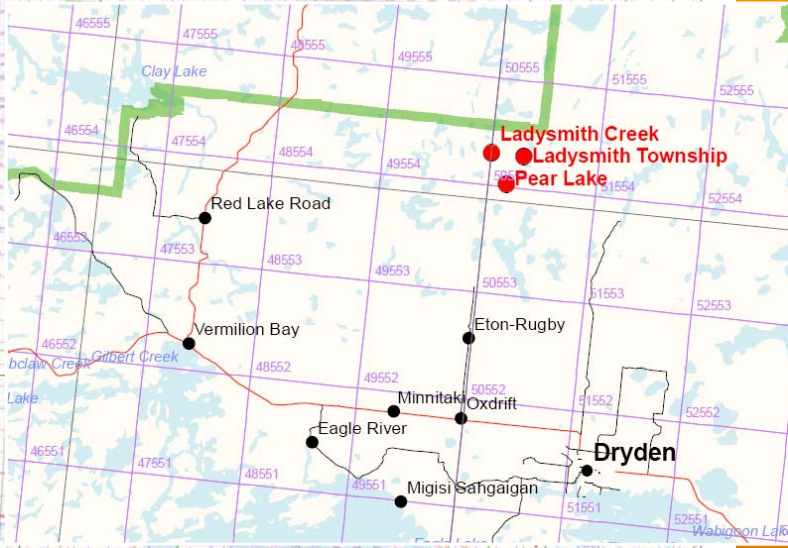
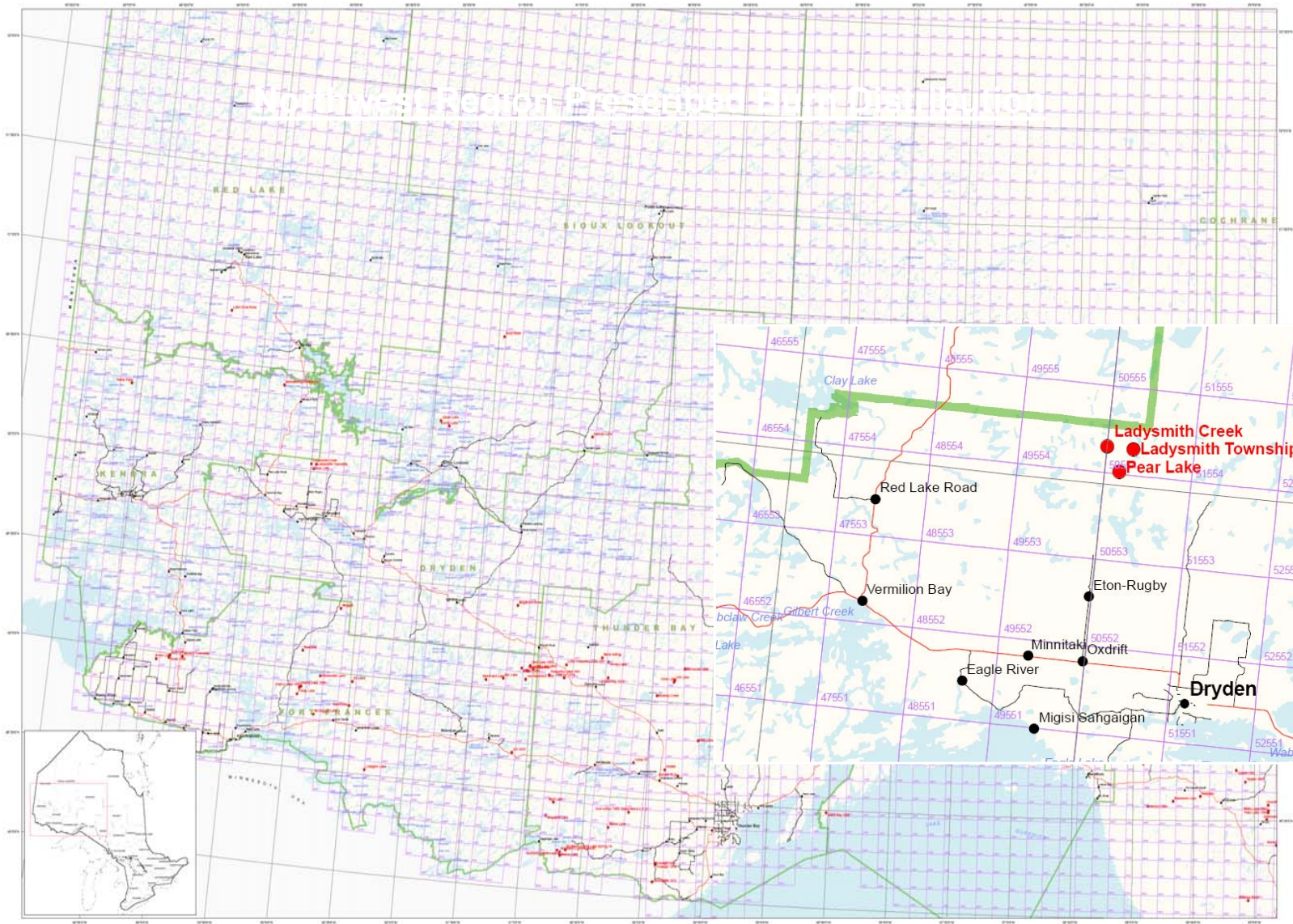
# Spatial Distribution of Prescribed Burns - Within the Boreal Forest -

Scale 1 : 6,000,000  
100 50 0 100 200 300 kilometers

Prescribed Burn  
MNR District Boundary



# Northwest Region - Prescribed Burn Period Disturbance



PRESCRIBED BURNS WITHIN THE BOREAL FOREST  
NORTHWEST REGION

- Prescribed Burn
- Road
- Highway
- Road
- Green Boundary
- Lake

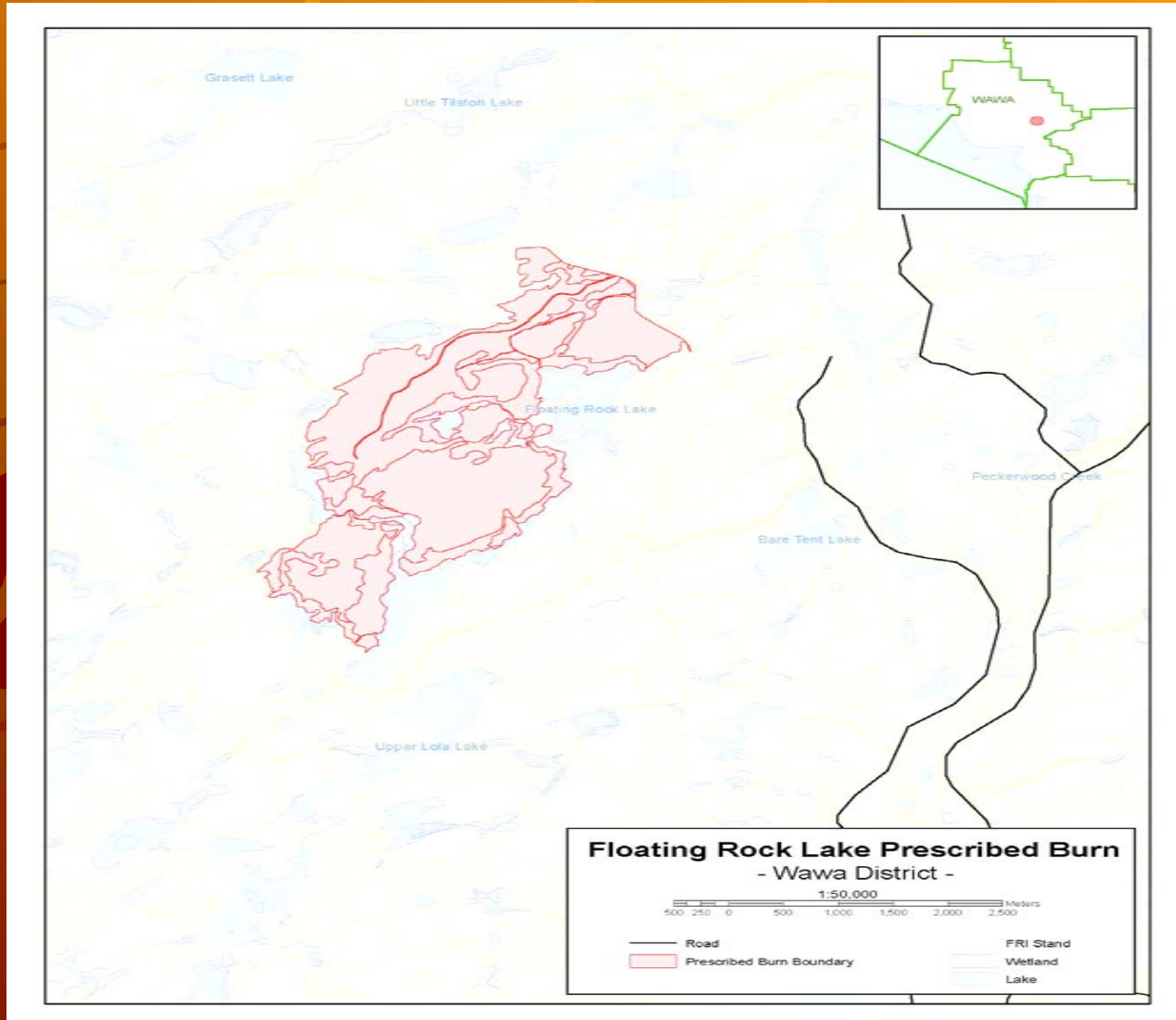
Scale 1:100,000



ONTARIO LEGISLATION  
Municipal Act, 2001  
Municipalities Act, 2001  
Municipalities Act, 2001  
Municipalities Act, 2001  
Municipalities Act, 2001



# Floating Rock Lake PB , Stand level Map



# Deliverables

- ✦ . Annual interim reports were produced detailing production and objectives met or exceeded.
- ✦ The Coop sponsored a industrial NSERC candidate who will be taking the floristic work to a much finer (species specific) level
- ✦ The interim and final reports were presented at the Forest Co-op Growth and Yield Business Unit spring and fall meetings.
- ✦ Individual plot fact sheets and overview fact sheets will be developed to Forest Co-ops new standard
- ✦ The information can be used to develop the outline and materials for workshops from the Forest management competency group, Forest Standards and Evaluation Section in module # 3, Silvicultural Operations.
- ✦ A full spatial dataset has been created with links to the Forest Resource Inventory

# Analysis

## Results

Total of 700 new and historic plots fit the sampling criteria  
Basic Stand Level elements were compared between Pb's ,  
natural stands and stands with normal silviculture

Volume, Ba, Qmdbh showed positive result, Jack Pine More  
significantly than Black Spruce.

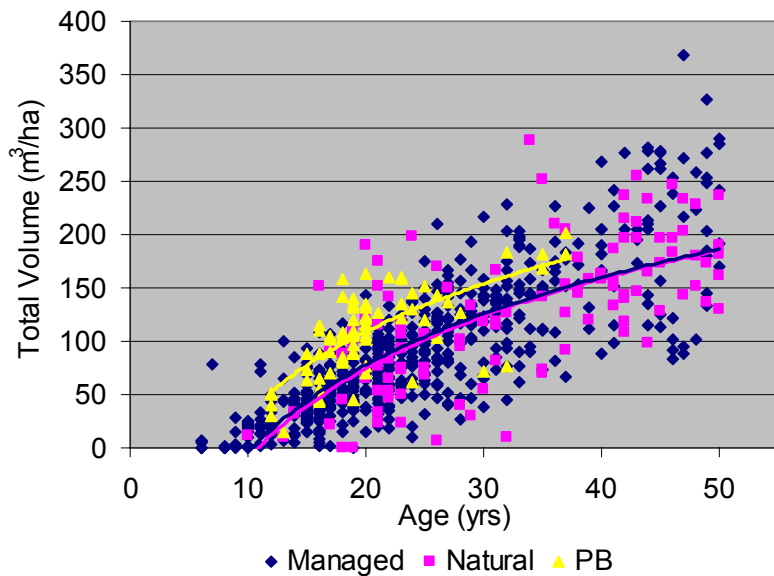
Ht, density, mortality showed little to no effect from Pb's  
Higher earlier hts from all strata came together around 50yrs

Vegetation showed different levels showed variable response.  
More work is being done to validate this

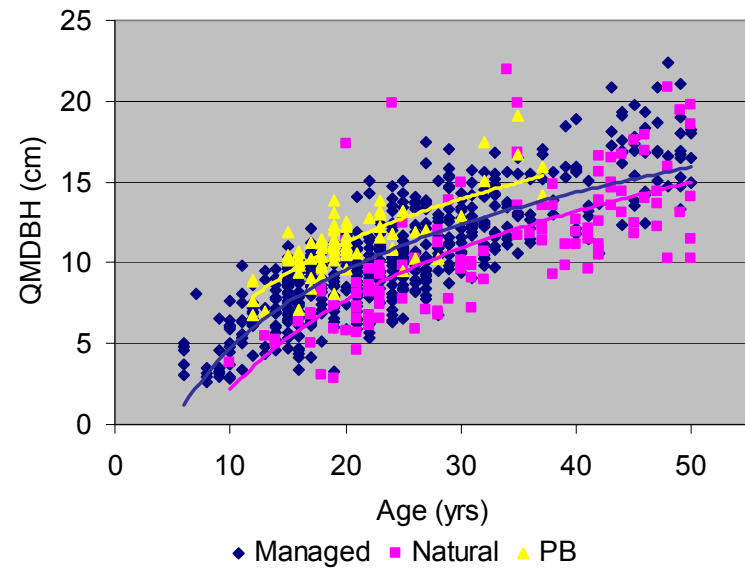


# Analysis

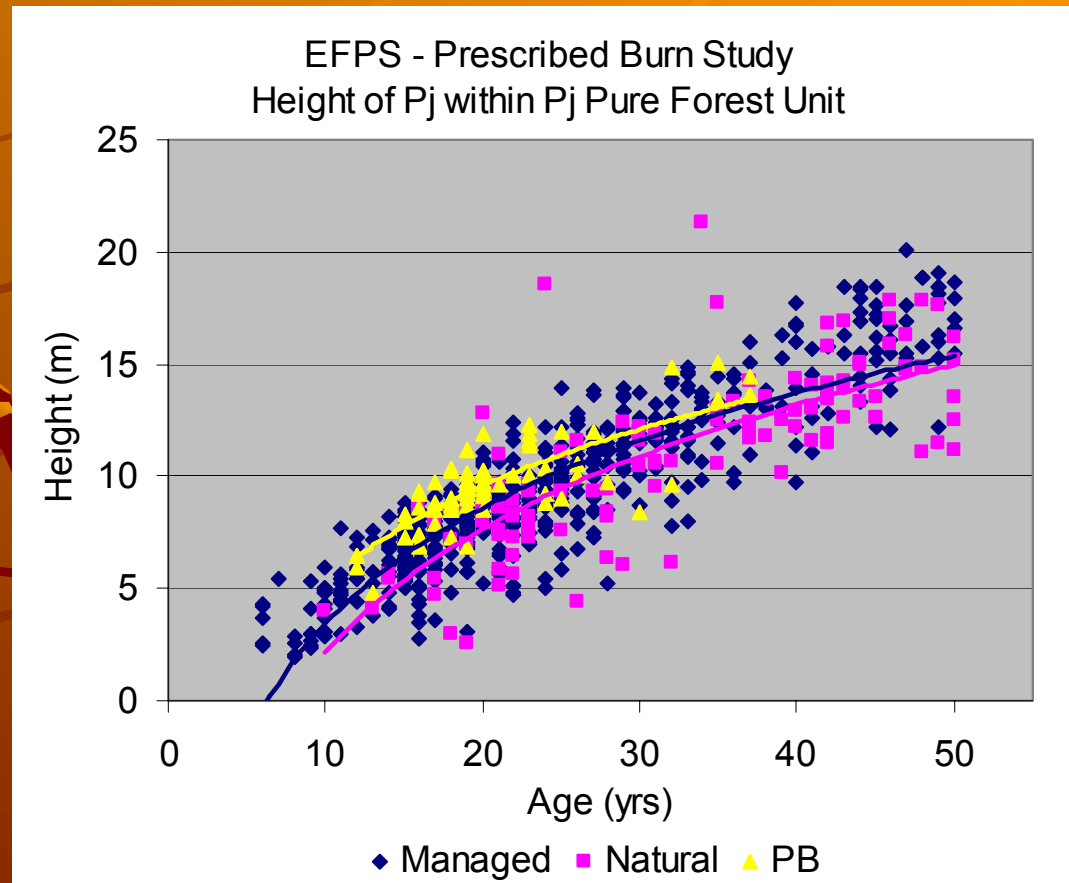
EFPS - Prescribed Burn Study  
Total Volume of Pj within Pj Pure Forest Unit



EFPS - Prescribed Burn Study  
QMDBH of Pj within Pj Pure Forest Unit



# Analysis



# Analysis

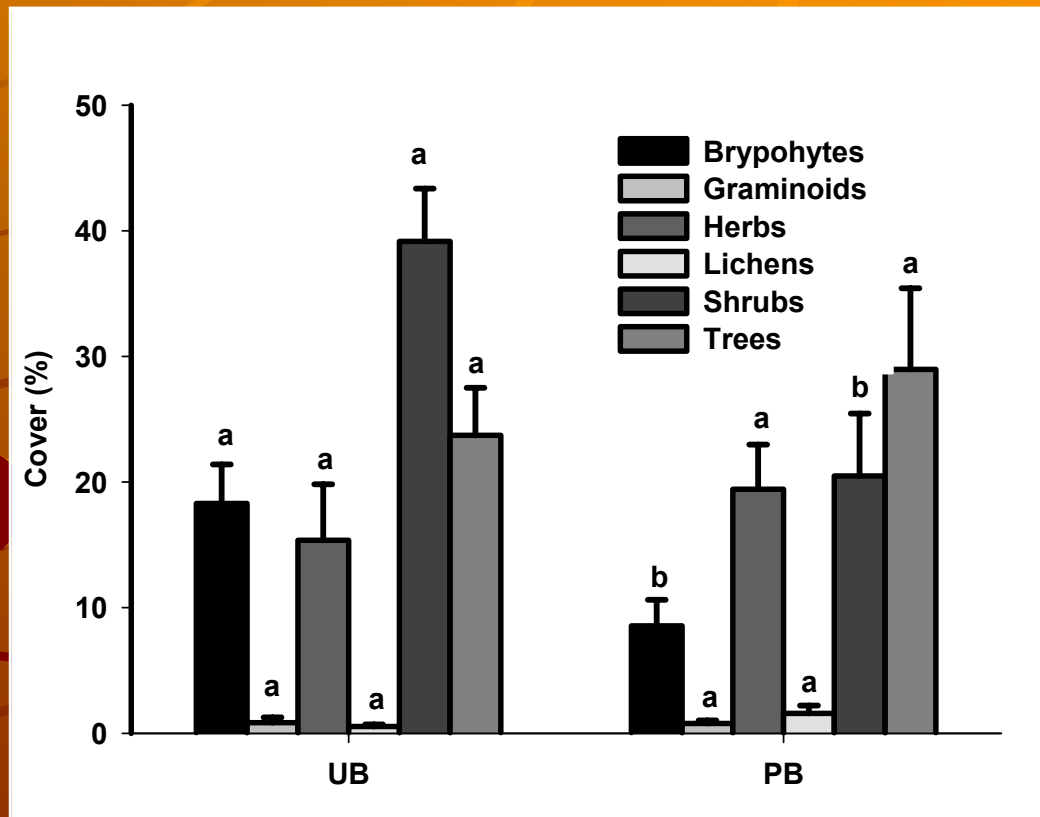


Figure 5. Mean ( $n=18$ ) $\pm$  SE of total abundance (percent cover) by life form for the unburned and prescribe burned plots including; bryophytes, graminoids, herbs, lichens, shrubs (and small trees), and trees. Dissimilar letters signify significantly different results.

# Looking Forward

- ◆ This data set and the massive effort involved in collating and validating the locations and history are a stepping stone to a plethora of potential new study's
- ◆ Interest is being shown right now many fronts, Academia ,Fire, SIB and industry



- ◆ Datasets (spatial and tabular) are being collated into a easy to navigate system that will assist future researchers in laying the ground work for their study's

# The End (or the beginning)

