



The ND Program: What Do We Know?

FRI AGM

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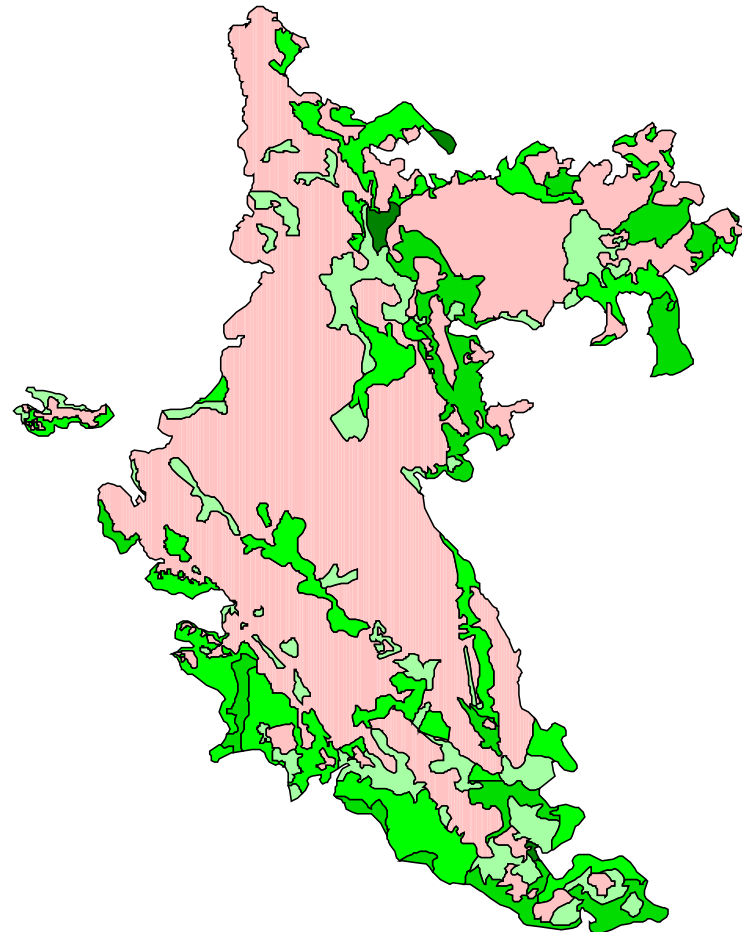
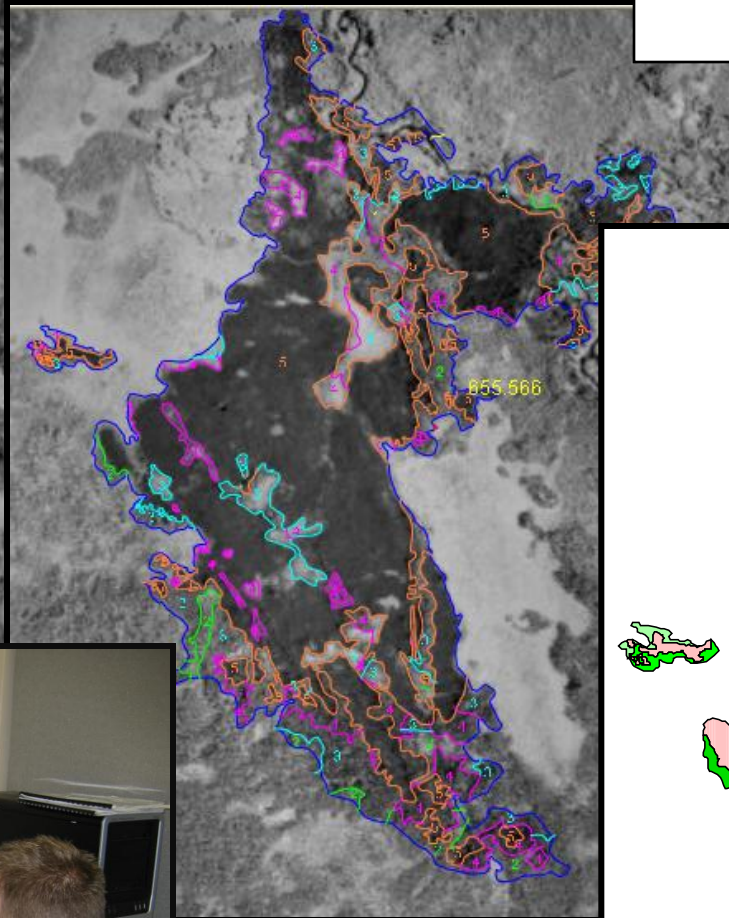
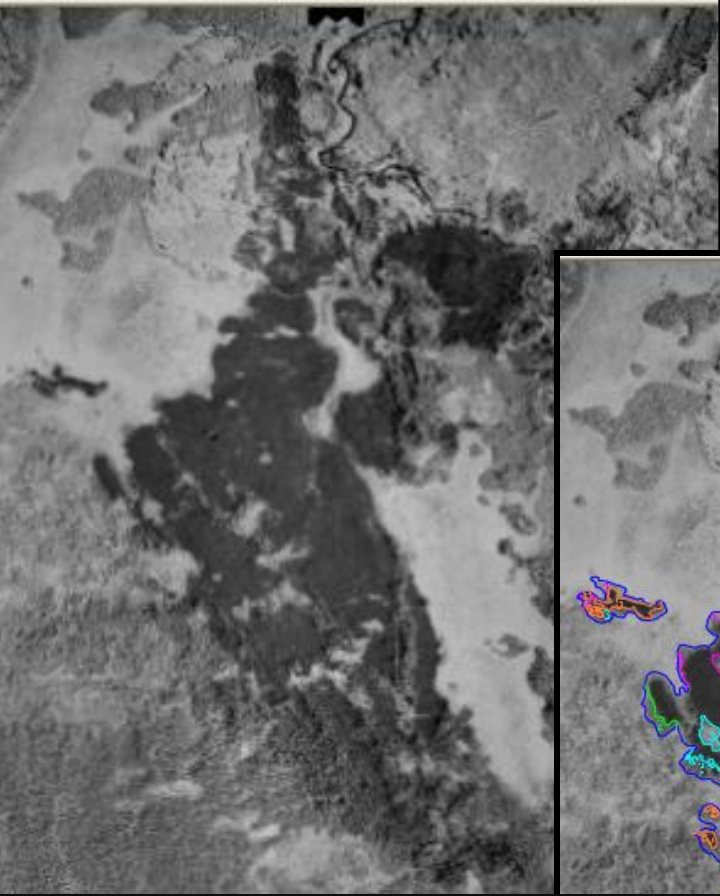
So, what “challenges”
are associated with the
ND Program?

... pull up a chair.

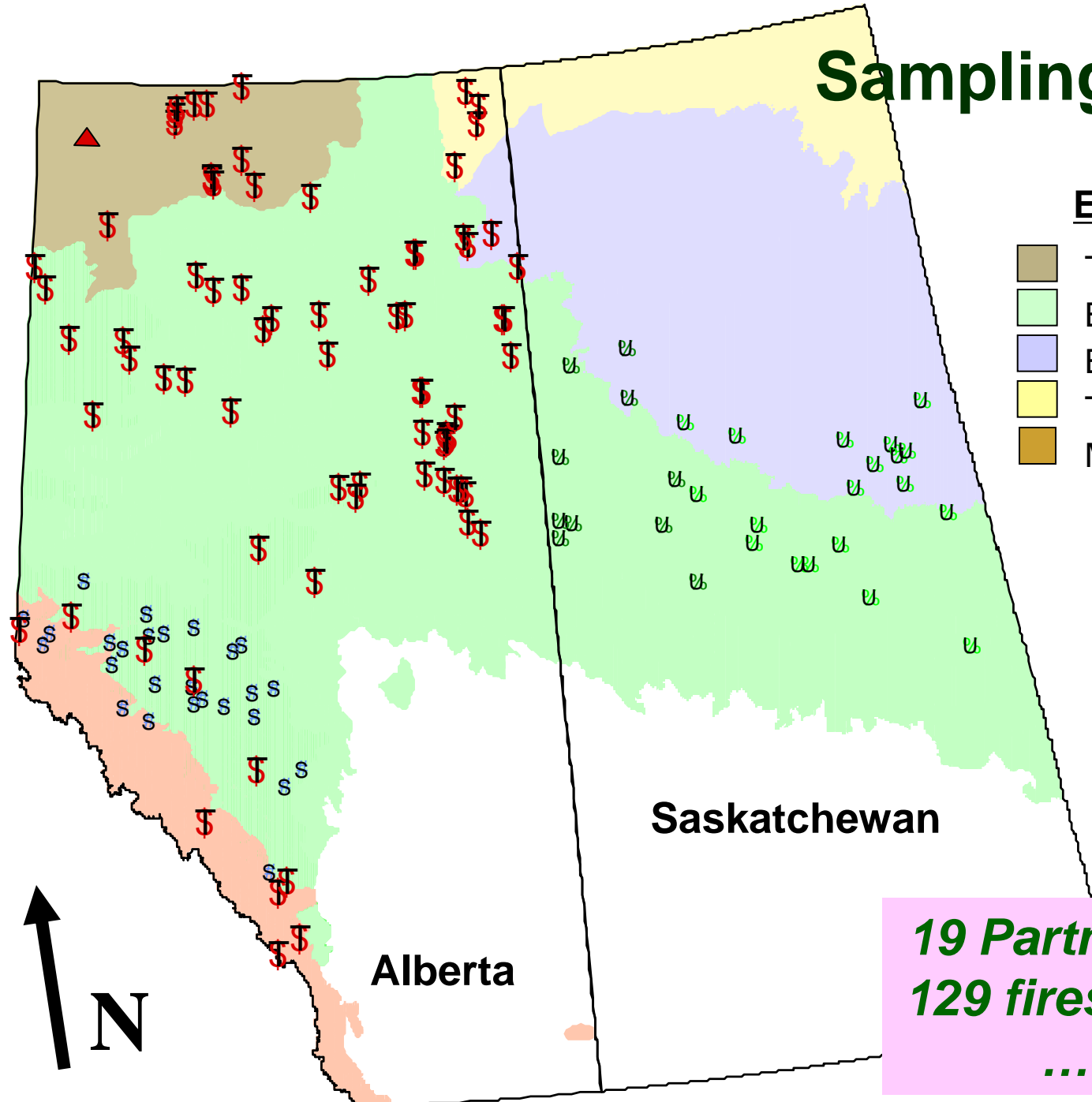
An aerial photograph of a forest landscape. The majority of the area is covered in a dense forest of evergreen trees, appearing in shades of green and brown. In the upper center, there is a distinct, roughly triangular cleared area with a light brown, grassy or bare ground surface. The surrounding forest shows some signs of disturbance, with patches of darker, charred-looking trees interspersed among the greener ones.

Tactical planning challenge:
*How do I design harvest areas /
prescribed burns to have more
natural features?*

First Step:
*Understand Natural
Wildfire Patterns*



Sampling Summary



EcoZones

- Taiga Plains
- Boreal Plains
- Boreal Shield
- Taiga Shield
- Montane Cordillera

Fire Locations

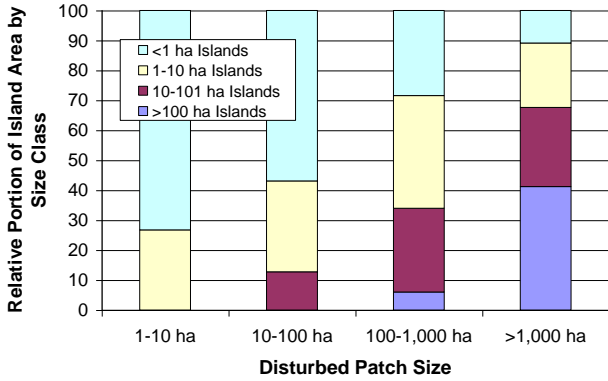
- 1998 Samples
- 2001 Samples
- 2004 Samples
- 2008 Samples

Saskatchewan

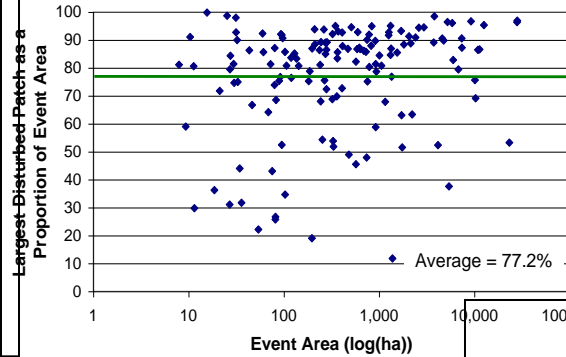
Alberta

**19 Partners, 13 years,
129 fires & 255,000 ha
... so far...**

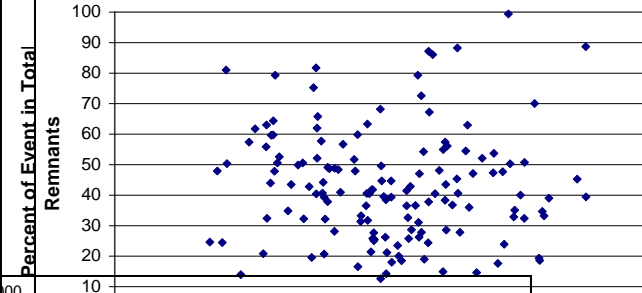
Island Sizes by Disturbed Patch Size



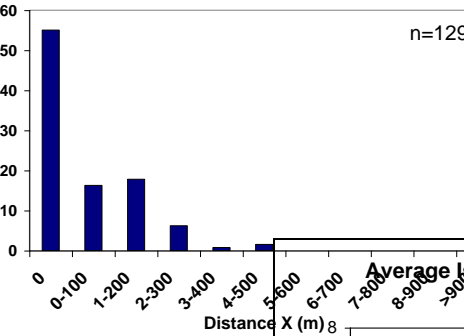
Largest Disturbed Patch Percentage Area for Events >5 ha



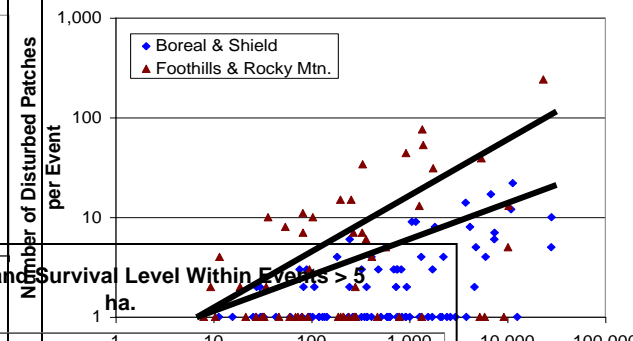
Total Remnants for All Events >5 ha



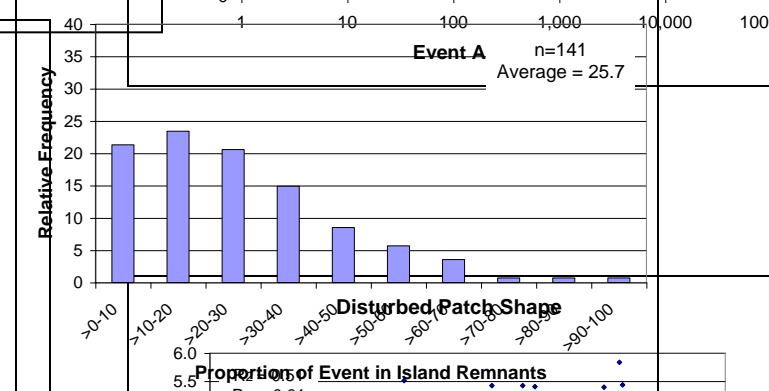
Maximum Distance Between Disturbed Patches of Alberta and Saskatchewan Wildfires



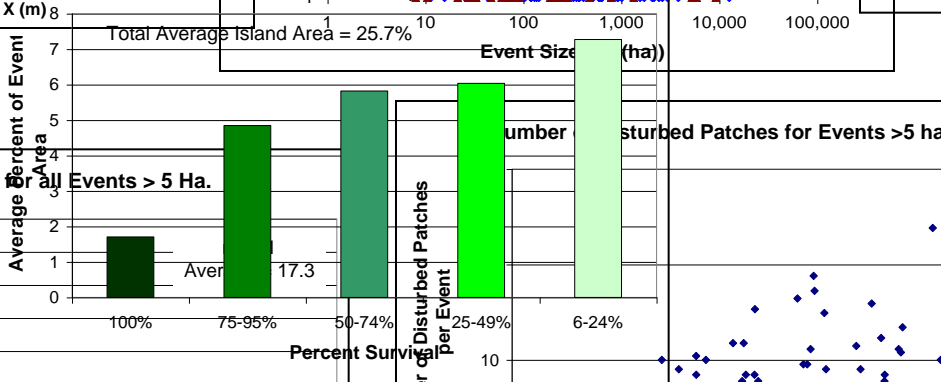
Disturbed Patch Density by Eco-Regions



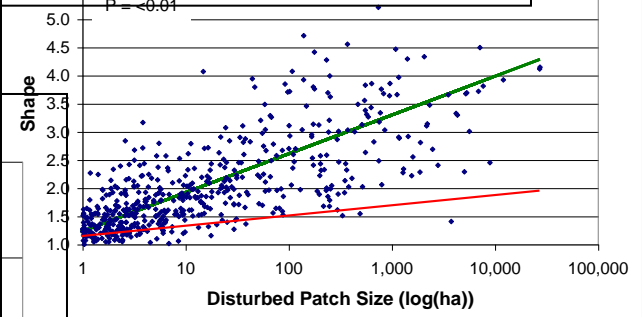
Island Remnants for all Events > 5 Ha.



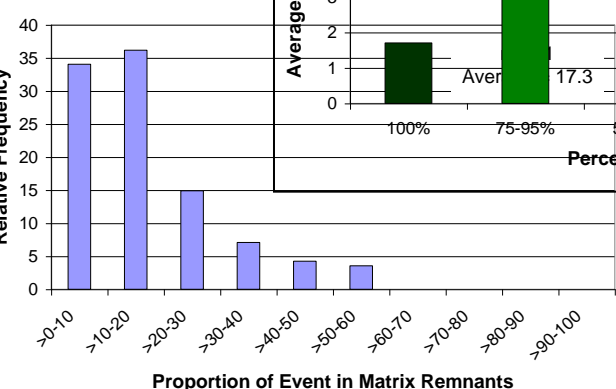
Average Island Survival Level Within Events > 5 ha.



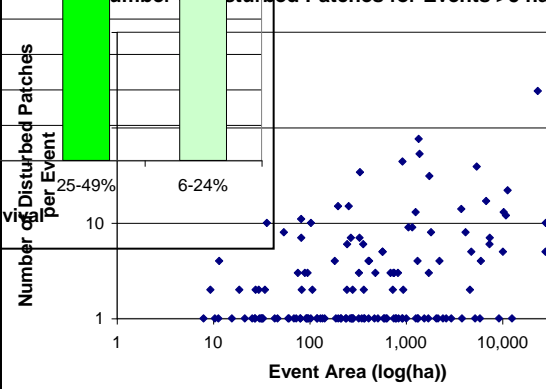
Proportion of Event in Island Remnants



Matrix Remnants

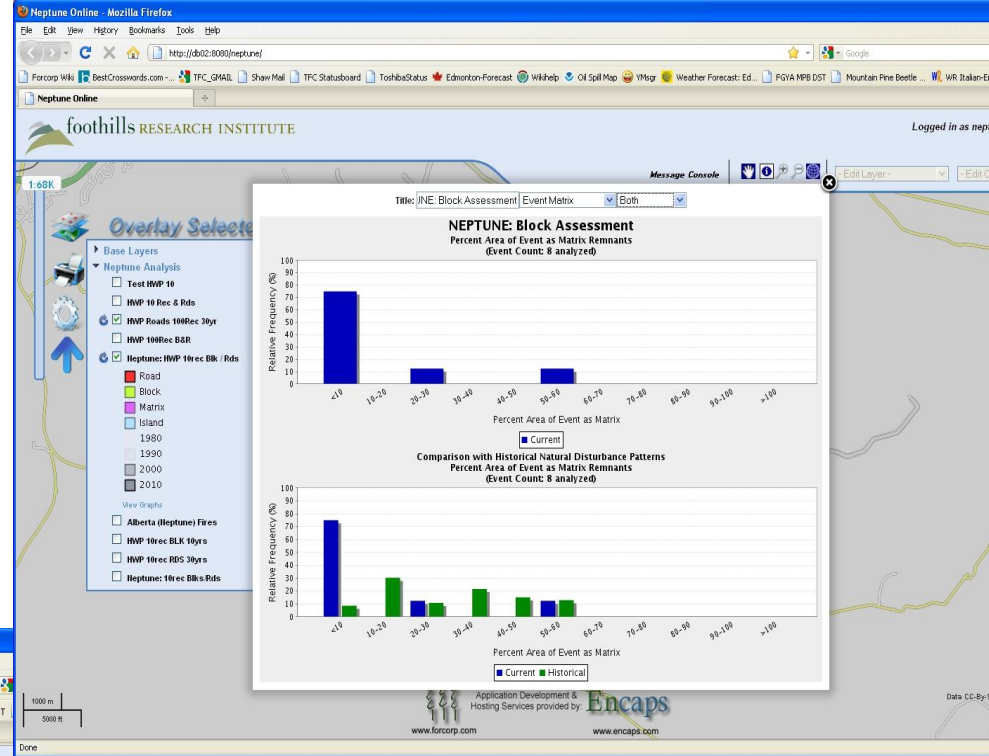


Number of Disturbed Patches for Events >5 ha



Next challenge(s)...

- 1) NEPTUNE V. 2.0
- 2) *Natural Disturbance Event Design* on-line short course.



Overlay Selector

Base Layers

- Neptune Analysis
 - Test HWP 10
 - HWP 10 Rec & Rds
 - HWP Roads 100Rec 30yr
 - HWP 100Rec B&R
 - Neptune: HWP 10rec BLK 1 Rds
- Alberta (Heptune) Fires
- HWP 10rec BLK 10yrs
- HWP 10rec RDS 30yrs
- Neptune: 10rec BLks Rds

ROAD layer

- HWP 100Rec B&R
- Neptune: HWP 10rec BLK 1 Rds

Legend: Road (red), Block (green), Matrix (purple), Island (blue), 1980 (light grey), 1990 (medium grey), 2000 (dark grey), 2010 (black)

Neptune

* **Name:** My Neptune Run

* **Jurisdiction:** AB

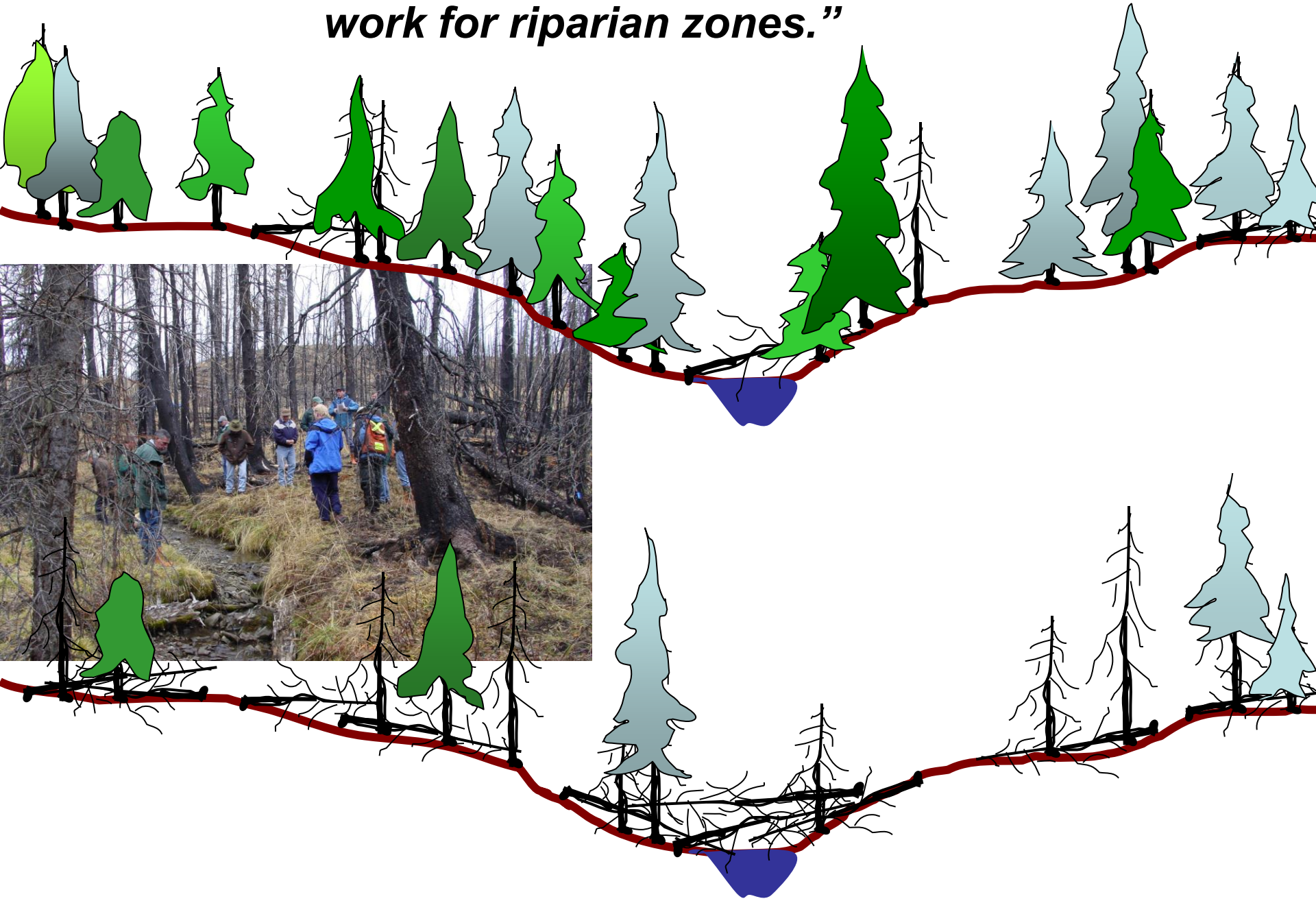
Layer	Source	Tenure
BLOCK	HWP 10rec BLK 10yrs	10
FIRE		
ROAD	HWP 10rec RDS 30yrs	30
WELL		
SEISMIC		
WATER		
OTHER		

* **Start Year:** 1980 * **Reporting Interval:** 10

* **End Year:** 2010 * **Buffer Distance:** 250

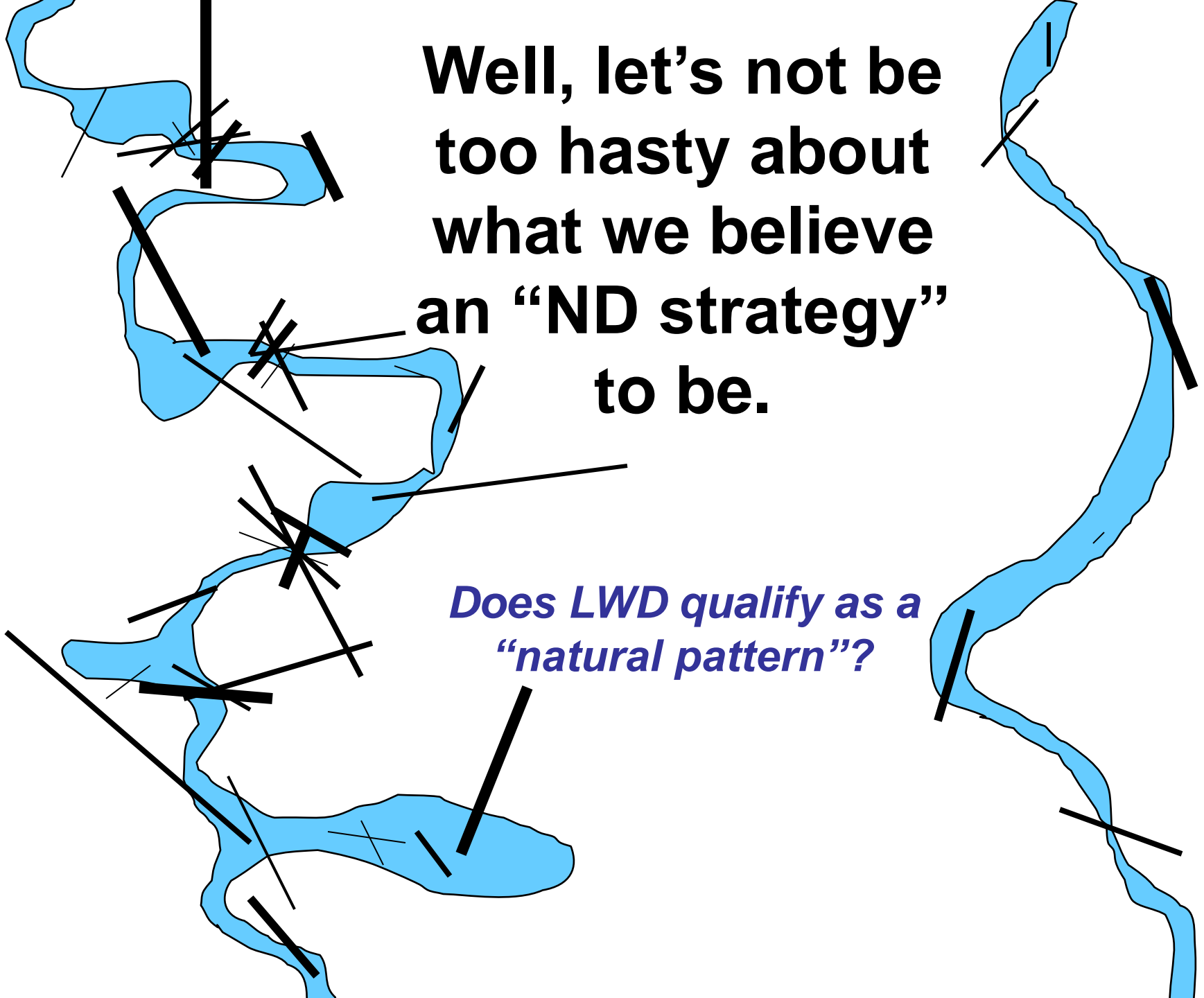
Submit

“Thanks anyways, but an ND strategy does not work for riparian zones.”



Well, let's not be too hasty about what we believe an "ND strategy" to be.

Does LWD qualify as a "natural pattern"?



**Bridge
10-50 yrs**

**Partial
Bridge
20-60 yrs**

**Embedded
50-120 yrs**

**Loose
40-100 yrs**



Strategic Planning Challenge: *How much old forest should we manage for to safely be within the historical range?*

...harvest levels...

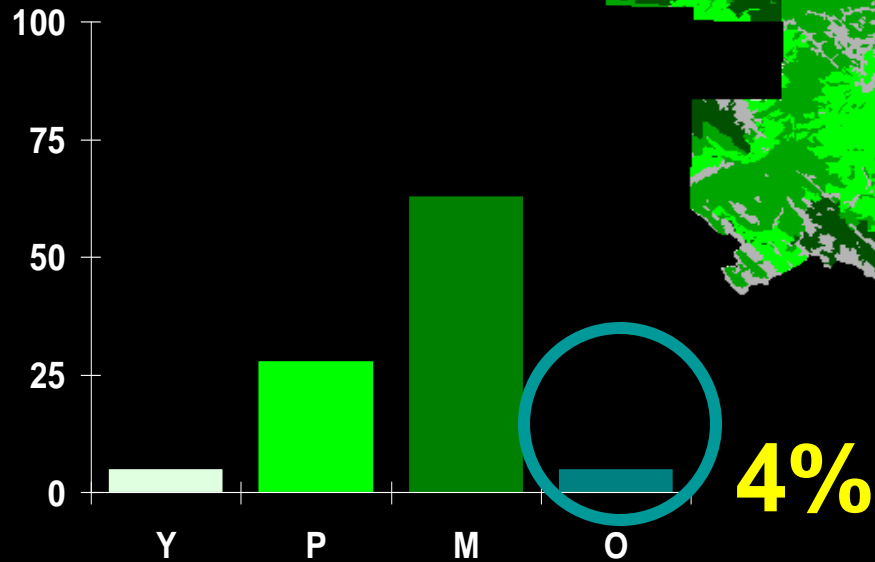
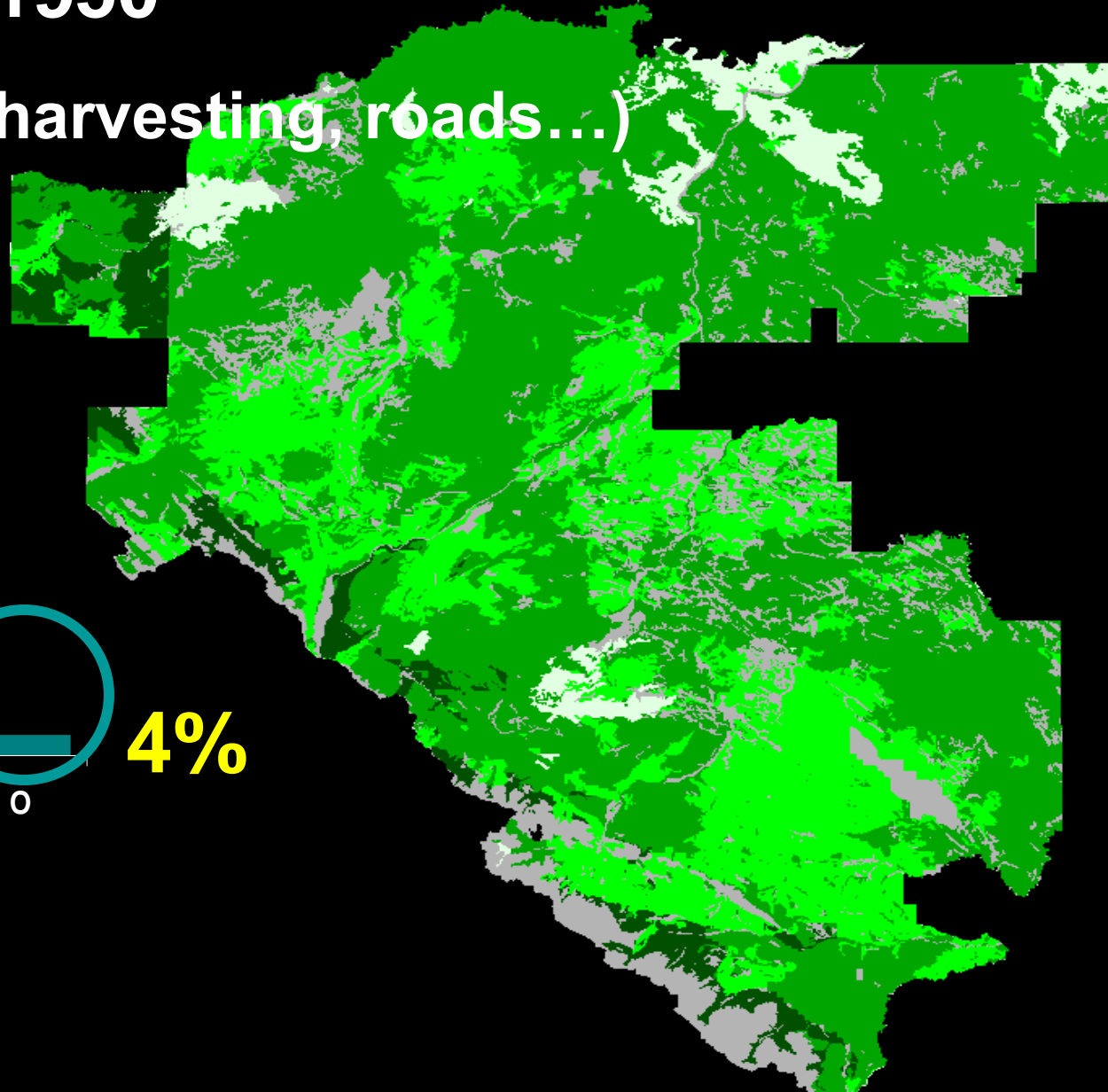
...fire control effectiveness...

...fine filter values...

...and by the way, what the heck is “old forest”?

Hinton Wood Products Pre-Industrial Landscape in 1950

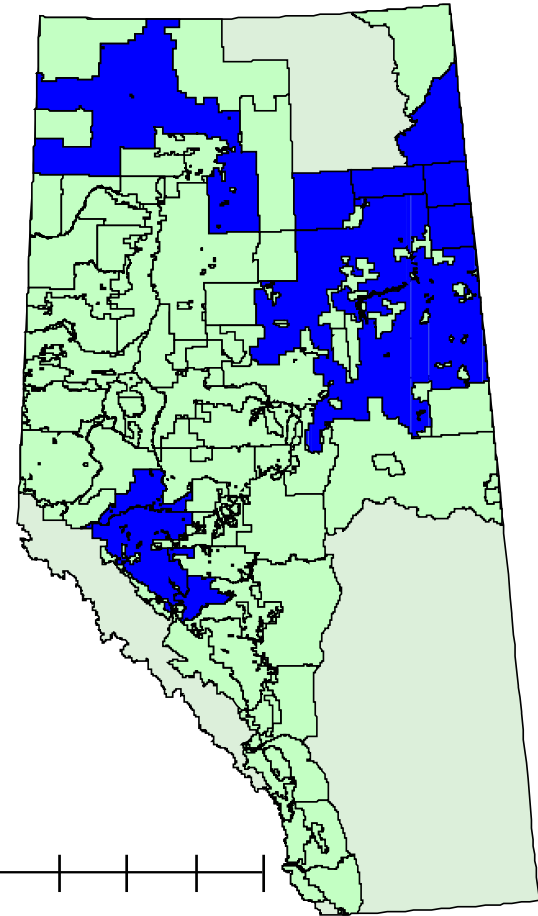
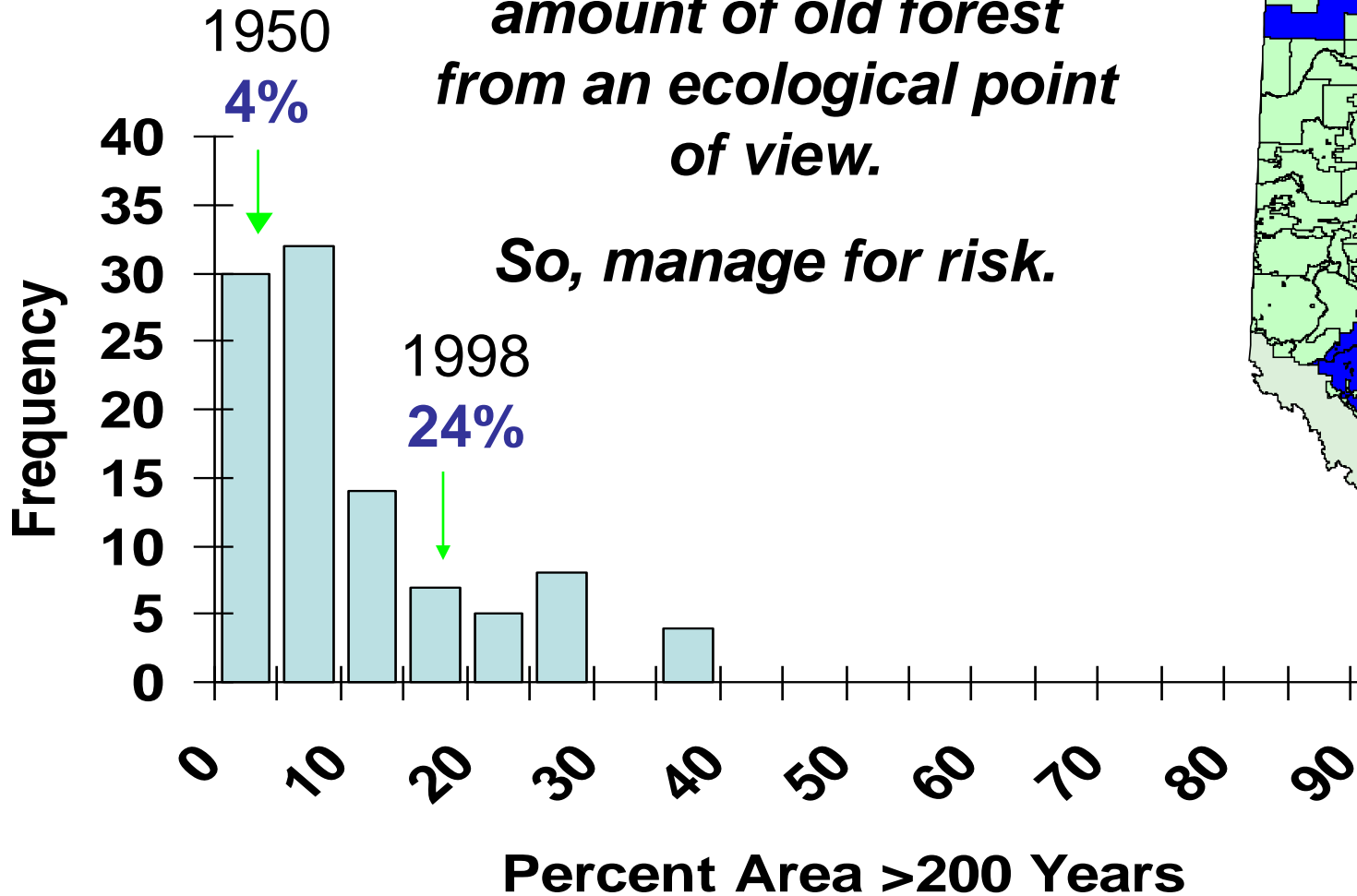
(no fire control, harvesting, roads...)



Natural Range of Old Forest

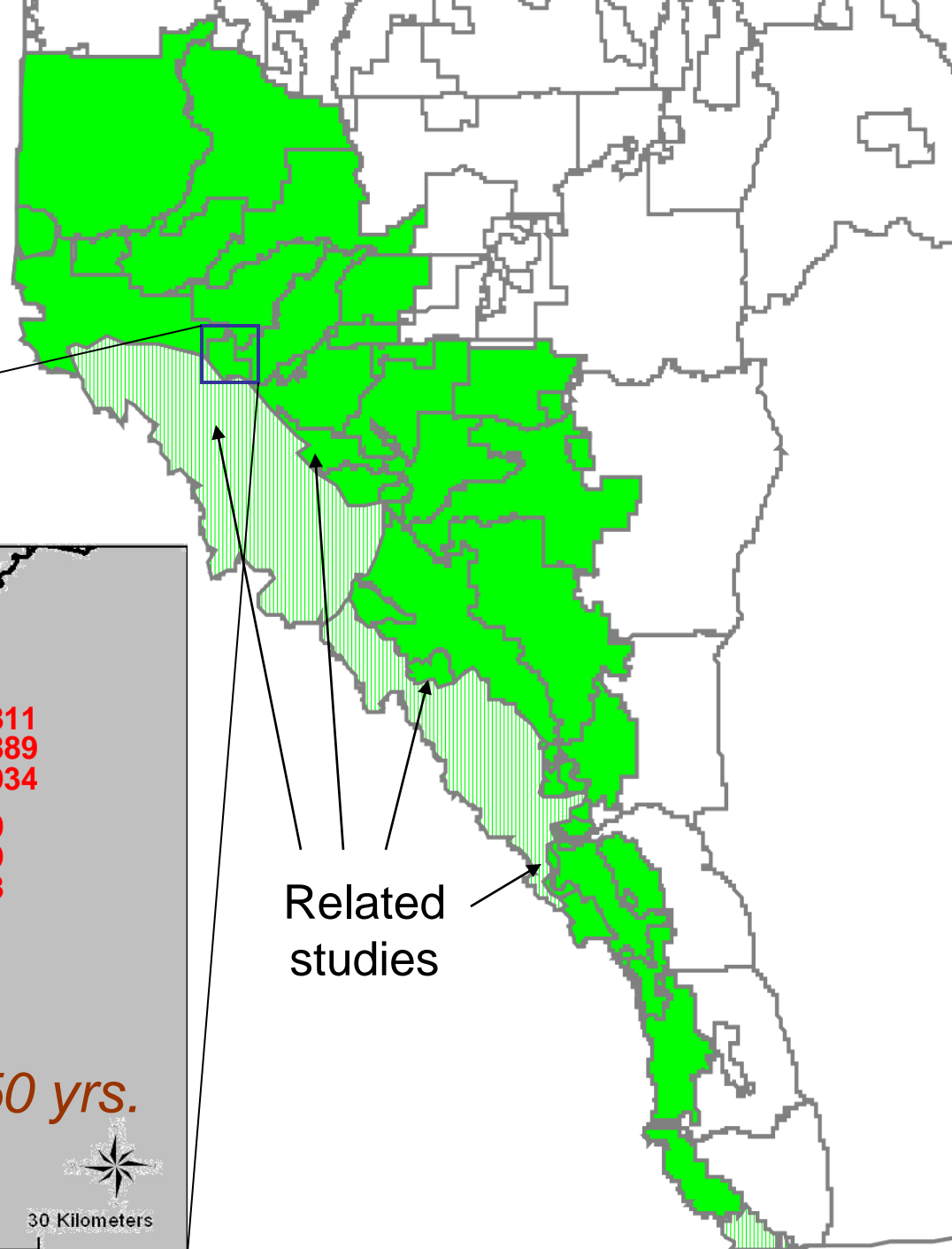
There is no single “best” amount of old forest from an ecological point of view.

So, manage for risk.

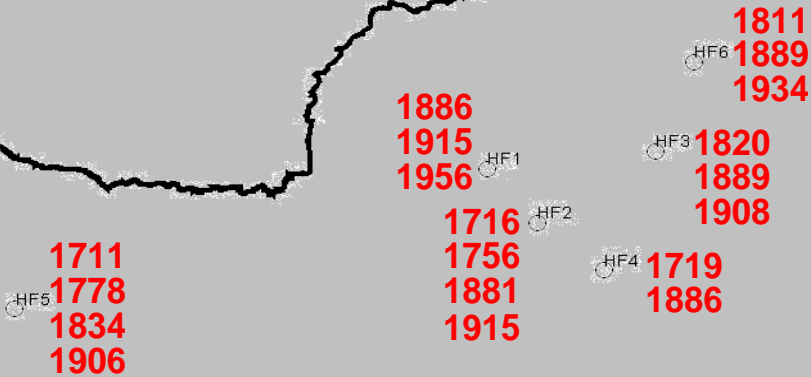


Waaait a minute... What about the “*what is old forest*” question?

What is “Old”?



2009 pilot study



Return intervals of 30-50 yrs.

0 15 30 Kilometers



Related studies

Let's Play: *Where is this fire?*

- **Burned in 1939.**

- **5,224 hectares.**

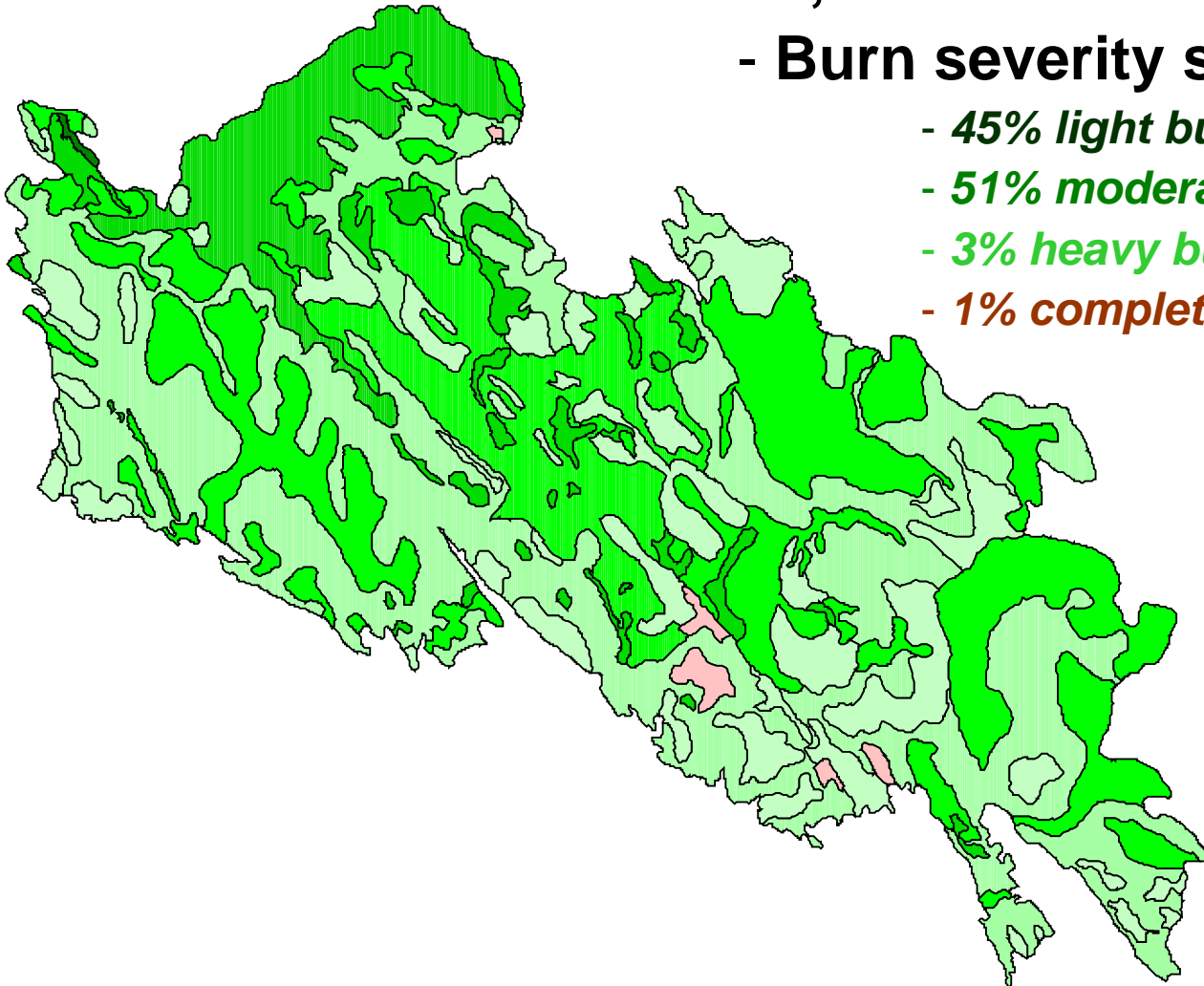
- **Burn severity summary:**

- *45% light burn (0-25% mortality)*

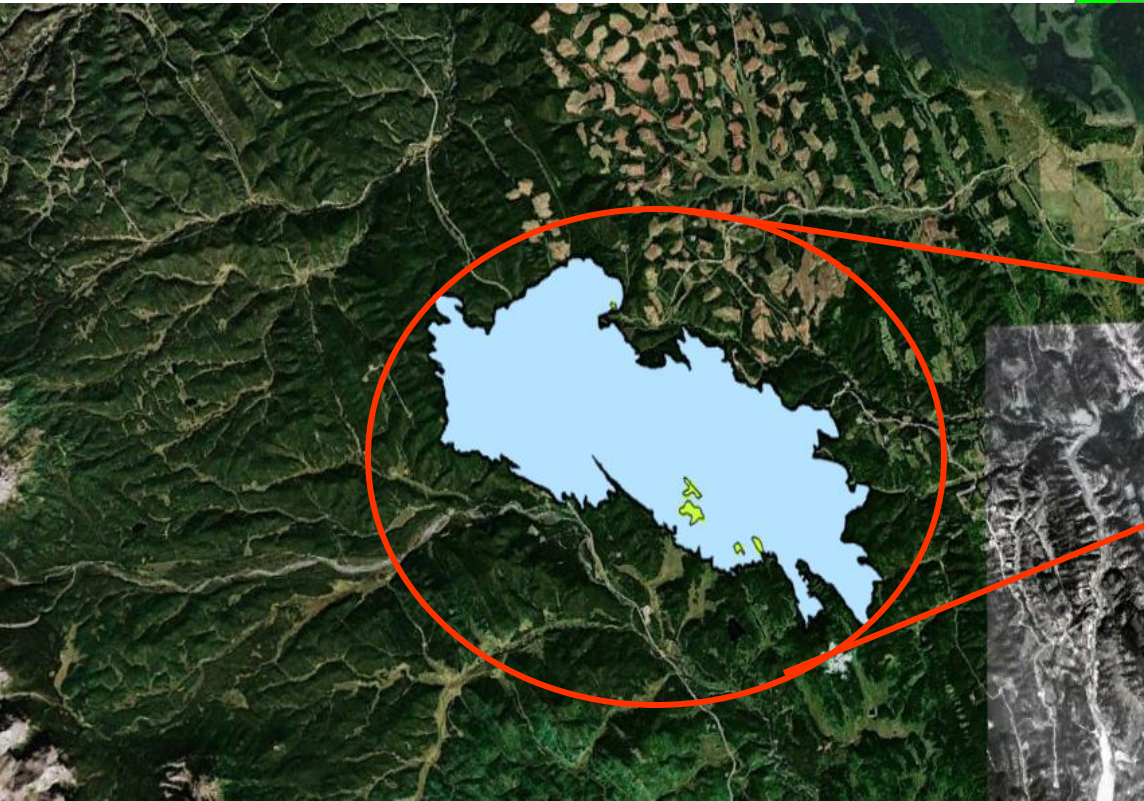
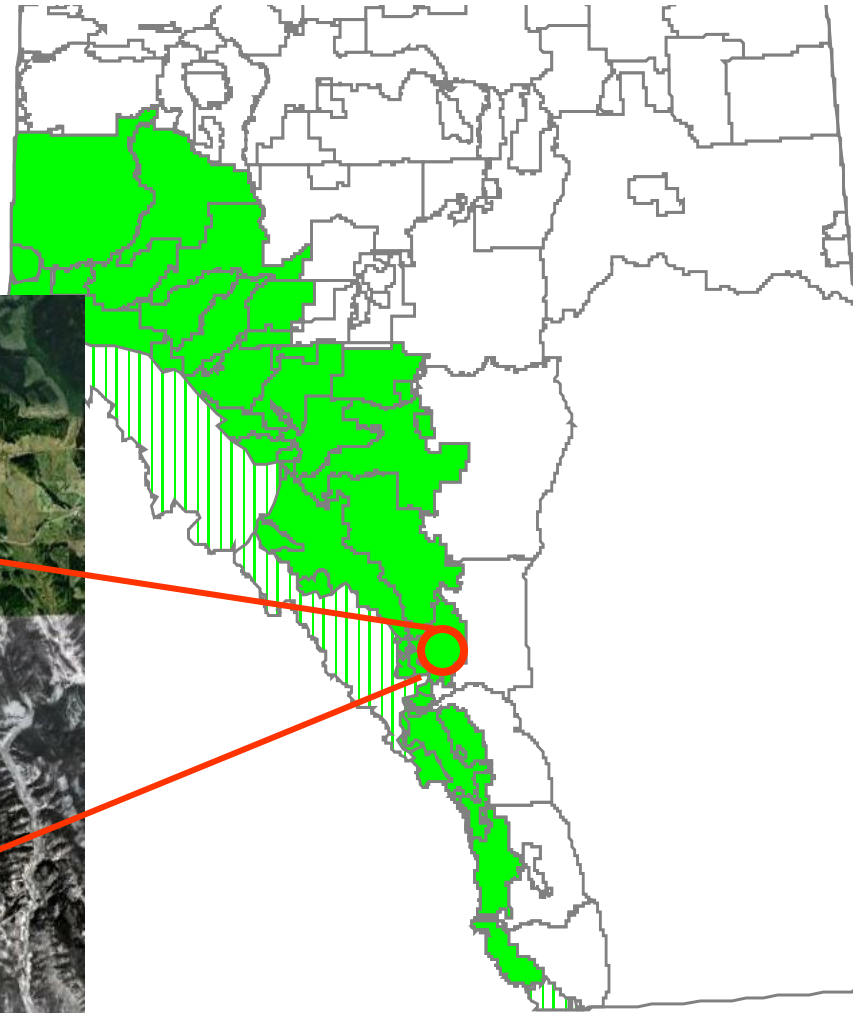
- *51% moderate burn (26-75% mortality)*

- *3% heavy burn (76-95% mortality)*

- *1% complete burn (96-100% mortality)*



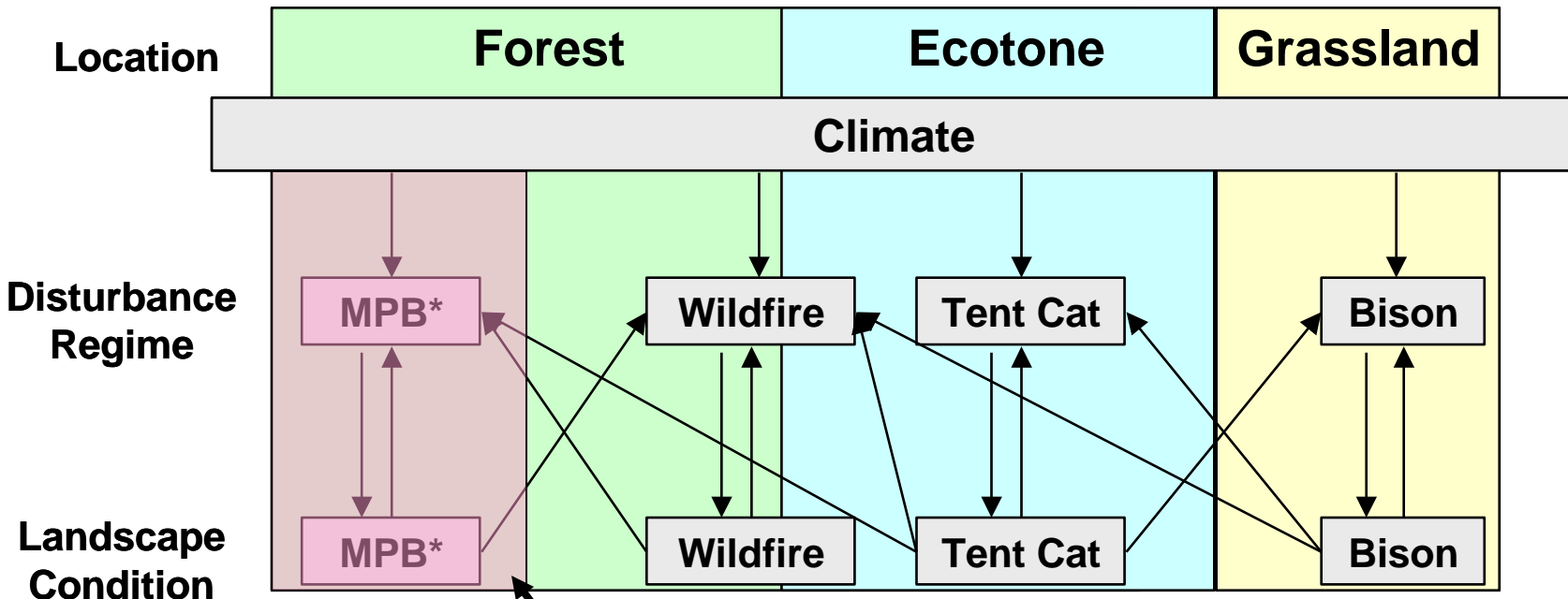
- How common were mixed-severity fires in the foothills?
- How would that translate to changes in diversity, habitat, susceptibility, etc.
- How resilient are foothills ecosystems to climate change and other perturbations? (i.e., MPB)



Land Use Planning Challenge A:

What is the disturbance history of LUZ X, how have we changed it, where is it going, and what are the (biological) risks?

The North Saskatchewan Land Use Zone.



* No historical evidence of Mountain Pine Beetle exists.

Land Use Planning Challenge B:

Is there another way of interpreting the “ND Approach” for land use planning?

The Upper Athabasca LUZ+

- MPB
- Wildfire
- Water
- Recreation
- Natural Gas
- Timber
- Grizzly Bear
- Woodland Caribou



Disturbance Patterns

- Type
- Frequency & Periodicity
- Size & Shape
- Severity
- Tendencies

Landscape Condition

- Seral-stage levels
- Old forest patch sizes
- Edge density
- Coarse woody debris
- Suspended sediment & O²...

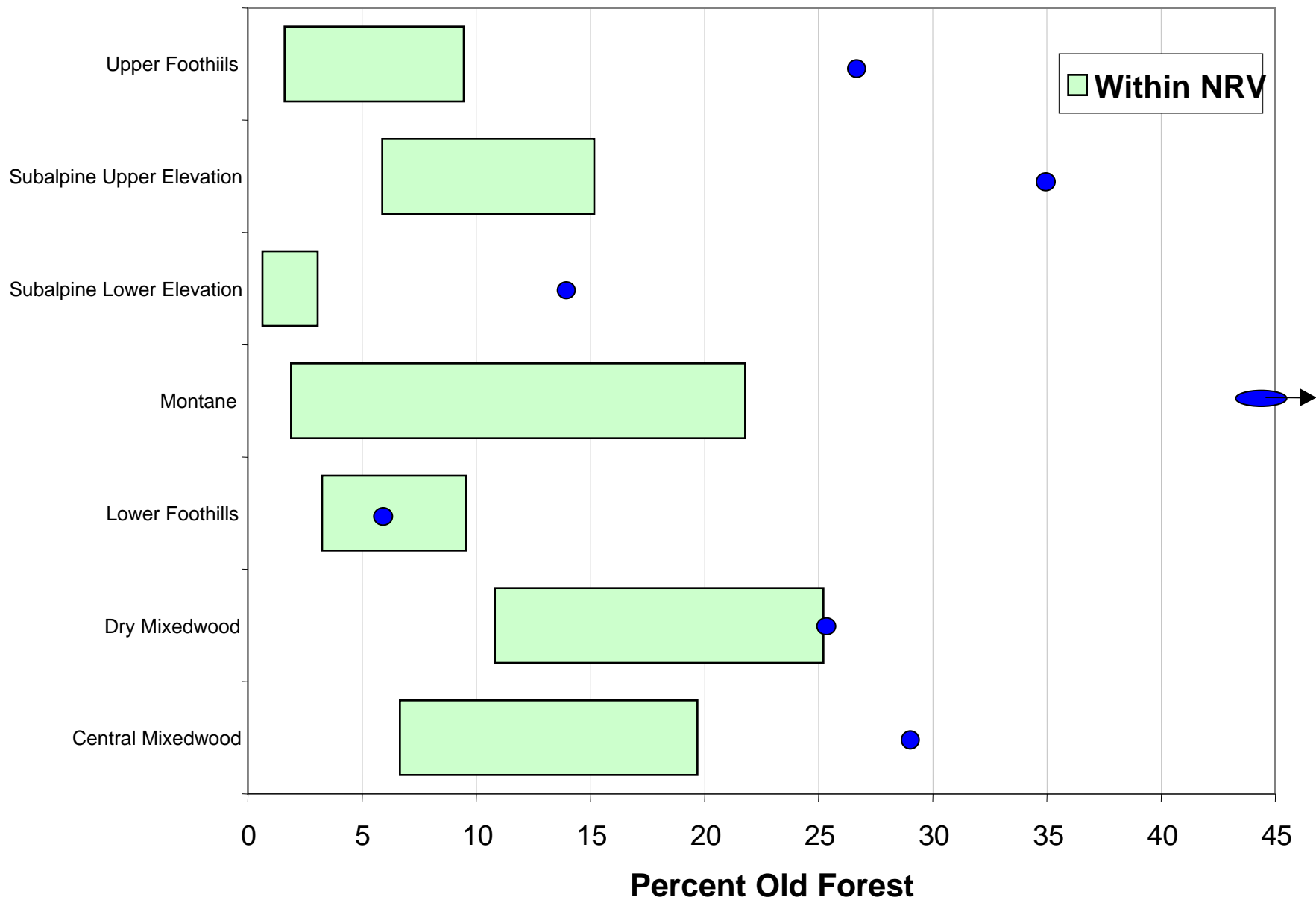
Biological Consequences

- Fire risk
- MPB risk
- Water quality
- Caribou
- Grizzly bear...

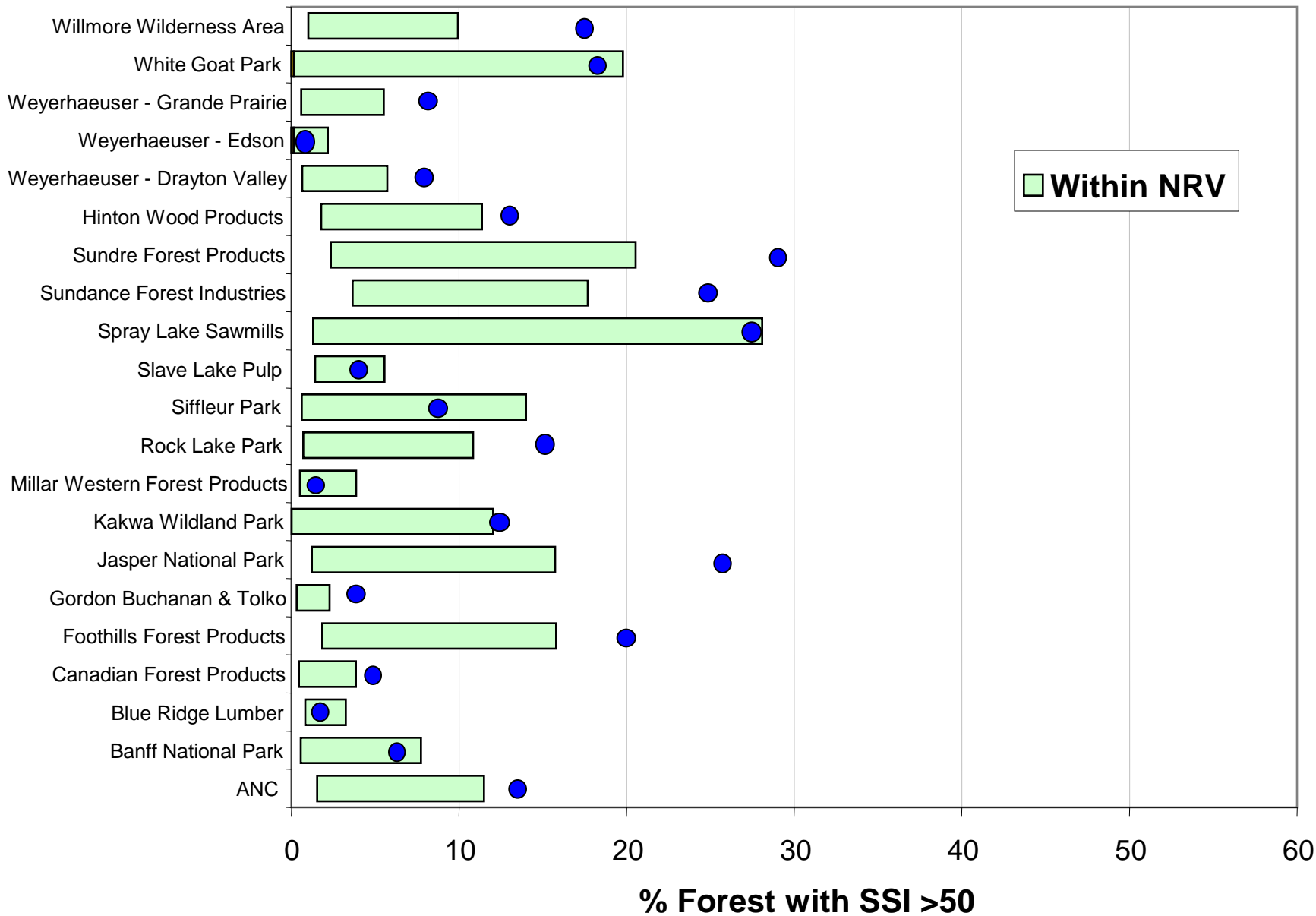
Economic and Social Consequences

- Recreation
- Oil and Gas Extraction
- Clean Water Supply
- Fishing
- Timber Harvesting
- Grazing...

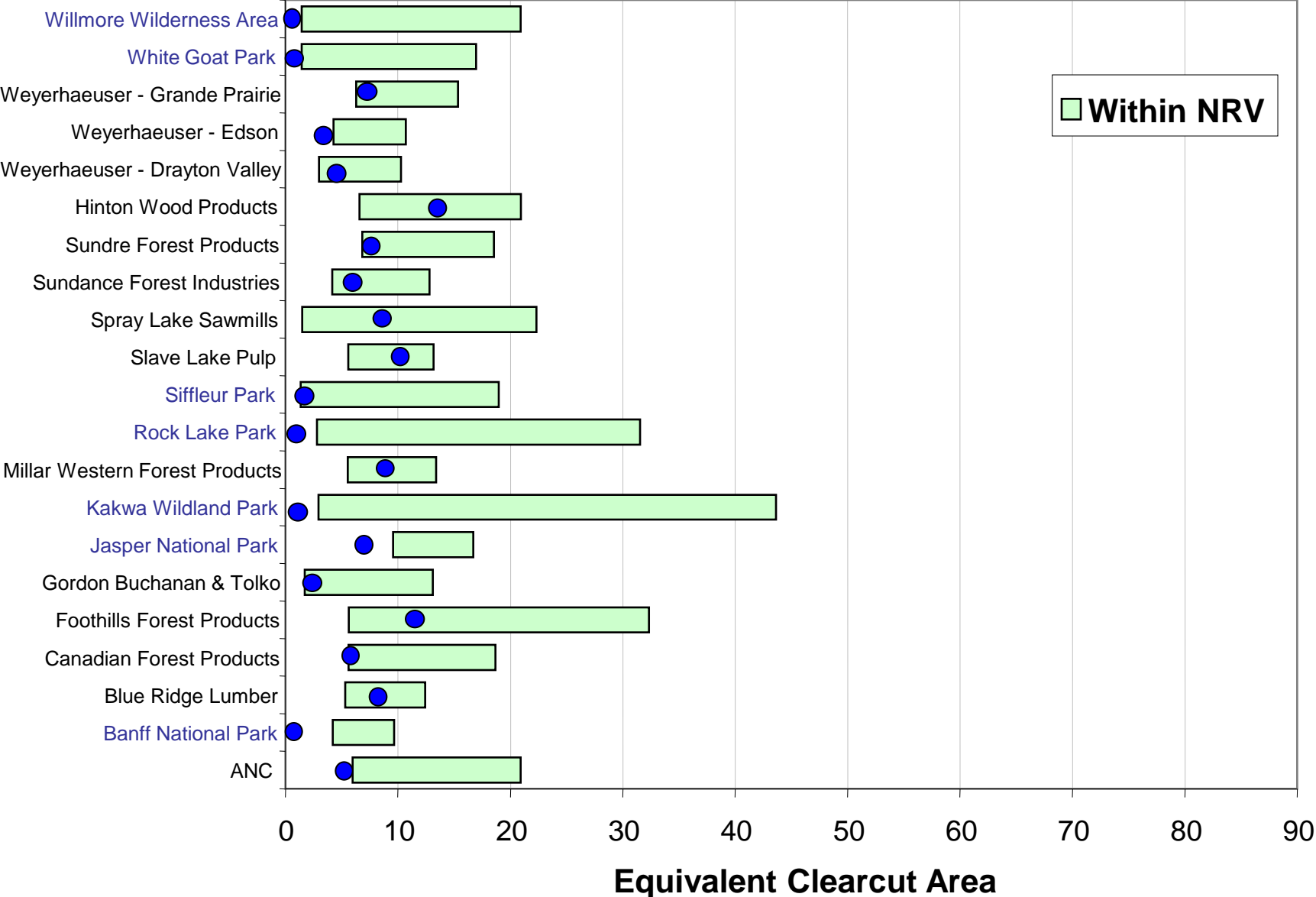
Old Forest NRV and Current Condition by Natural Subregion for the Upper Athabasca Healthy Landscape Study Area



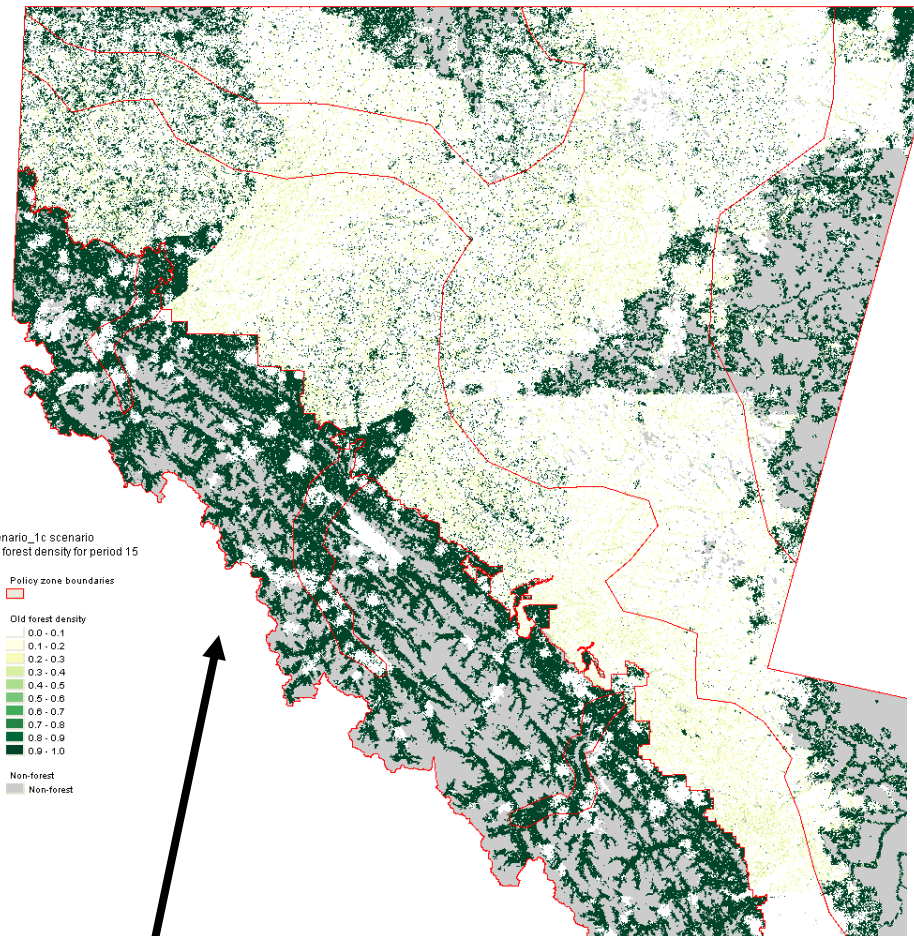
MPB Threat NRV and Current Condition by Jurisdiction for the Upper Athabasca Healthy Landscape Study Area



ECA NRV and Current Condition by Jurisdiction for the Upper Athabasca Healthy Landscape Study Area



Two (of many) Possible Futures:



Scenario_1c scenario
Old forest density for period 15

Policy zone boundaries

Old forest density

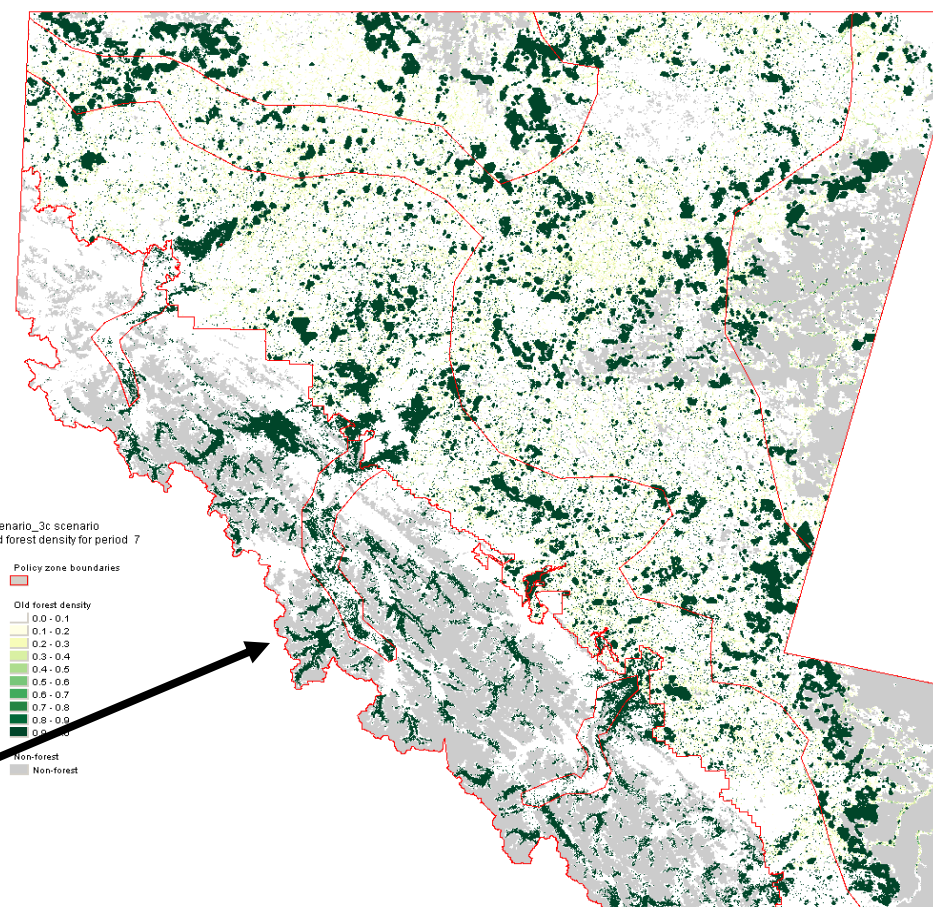
- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

Non-forest

- Non-forest

Business as usual.

Manage for old forest regardless of jurisdiction.



Scenario_3c scenario
Old forest density for period 7

Policy zone boundaries

Old forest density

- 0.0 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

Non-forest

- Non-forest

So, what are the “challenges” associated with the ND Program?

Learning about natural patterns.

Versus

Learning about natural pattern, PLUS exploring questions related to if, how, when, and to what degree to use that knowledge.

So are these challenges... or opportunities?

- Exactly what is a “*natural (disturbance) pattern*”?!
- They do not align well with existing planning, management, regulatory, and policy structures.
- The historical range or condition is often very different than that of today / the future.
 - *Who, or what, really cares?*
- It is not clear how to use what we are learning, at what level, or under what circumstances. – *Exactly what is an ND approach?*
- The natural pattern approach potentially represents a very different philosophy.



Thank you!

