Using Natural Disturbance Patterns for Sustainable Forest Management

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foothills MODEL FOREST

research growing into practice.

What is “Natural Disturbance”?

- Forest Fires
- Floods
- Wind Storms
- Insect and Disease
- Landslides
- Browse
- …

Fire is the main disturbance agent
in this area

Is fire bad for ecosystems?

Soil temp

Light

Cover

Micro-climate

Soil nutrient availability

Downed woody debris

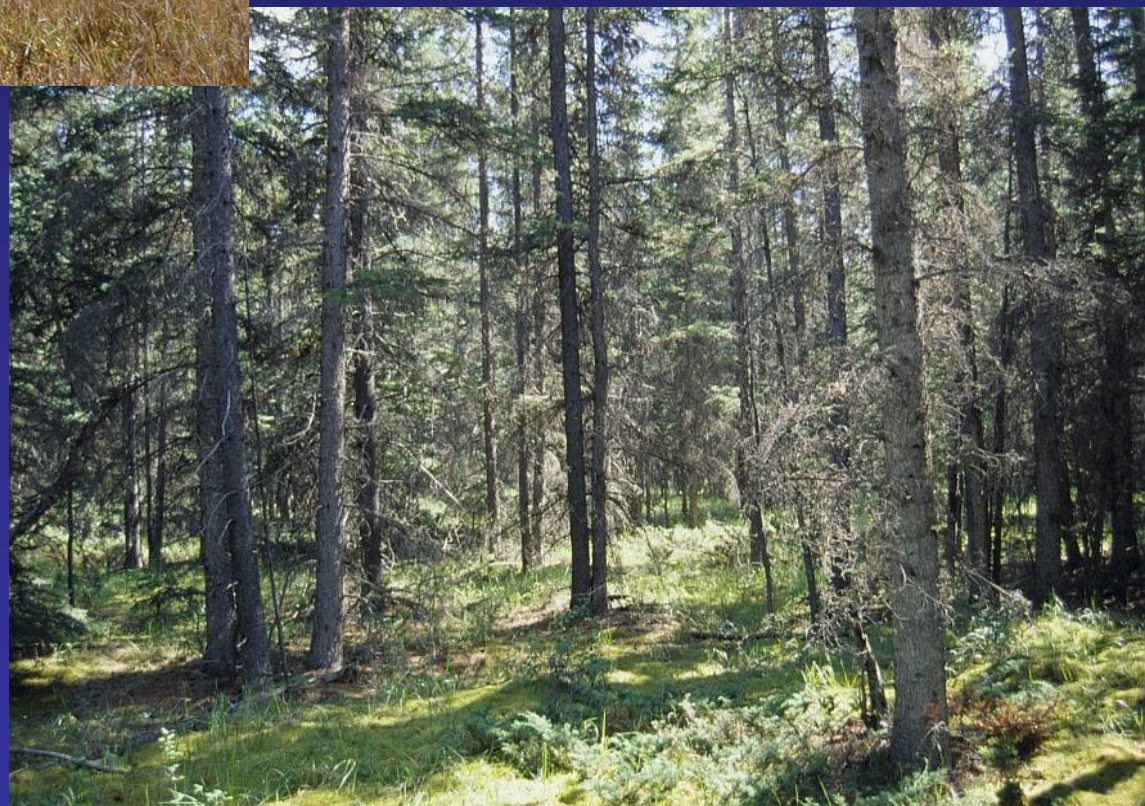
Injured trees

Dead standing trees

Species shift

Fire affects ecosystems in many ways and at many scales

Before Fire Control



After Fire Control
(Jasper Park)

Humans are also disturbance agents

Foothills Model Forest

Natural Disturbance Program

Sound science

What are the patterns and processes of natural disturbance?

…put into practice

Committed to finding integration solutions to make best use of our new knowledge.

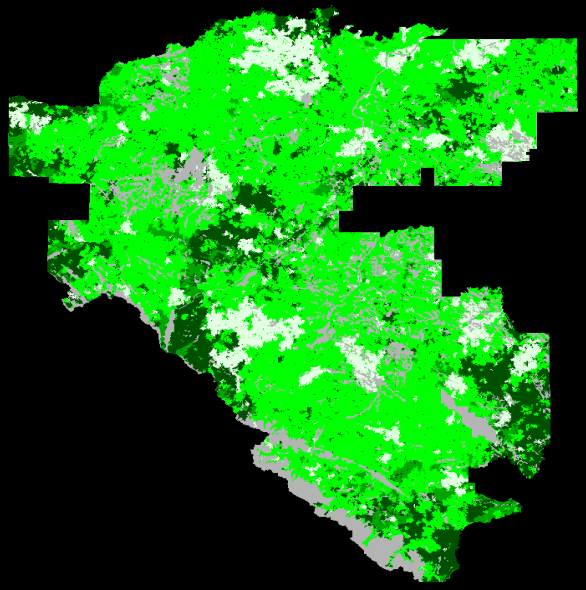
…by all partners through collaboration.

Directed by a team of collaborators, including companies, government, parks, and others.

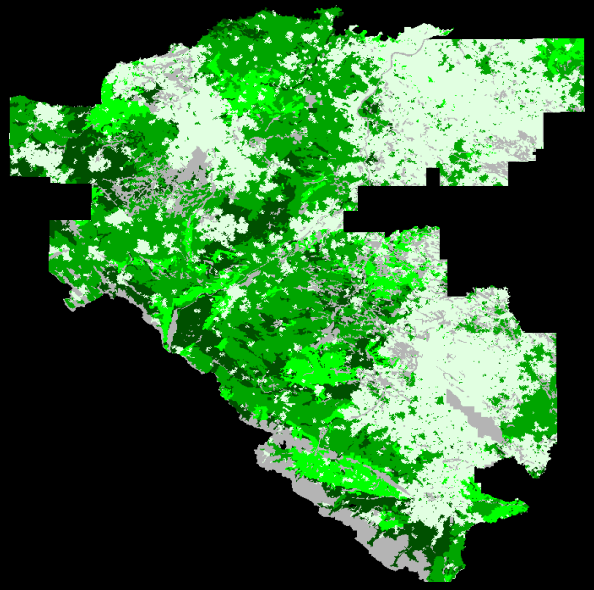
What do we know so far about disturbance patterns?

Plenty.

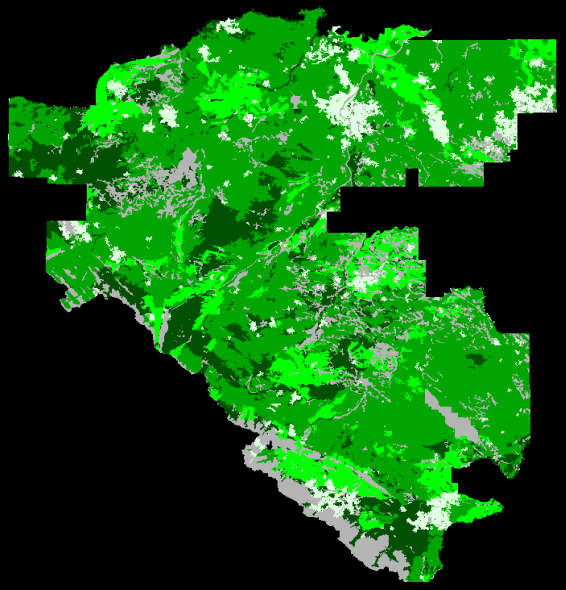
Old Forest Moves Around in Time and Space



1800 (5%)



1850 (10%)



1900 (13%)

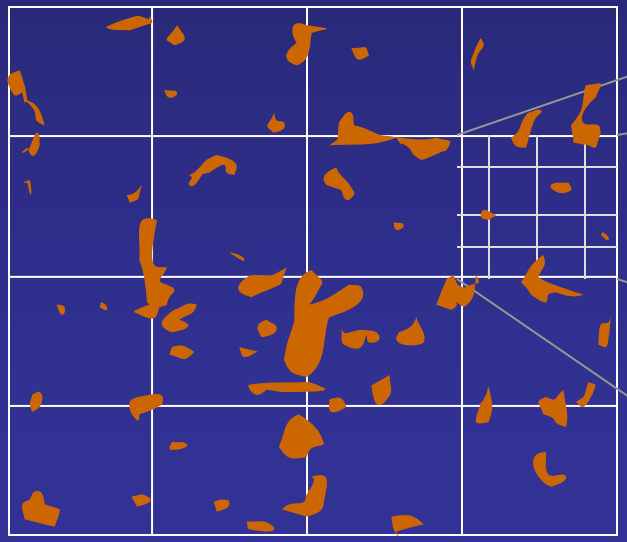
Old Forest Levels

	Pct. Forest > 200 yrs.	Occurred
	0%	Never
4% in 1950 →	>0-10%	62% of the time
	11-20%	19% of the time
	21-30%	9% of the time
24% in 1998 →	31-40%	6% of the time
	41-100%	6% of the time

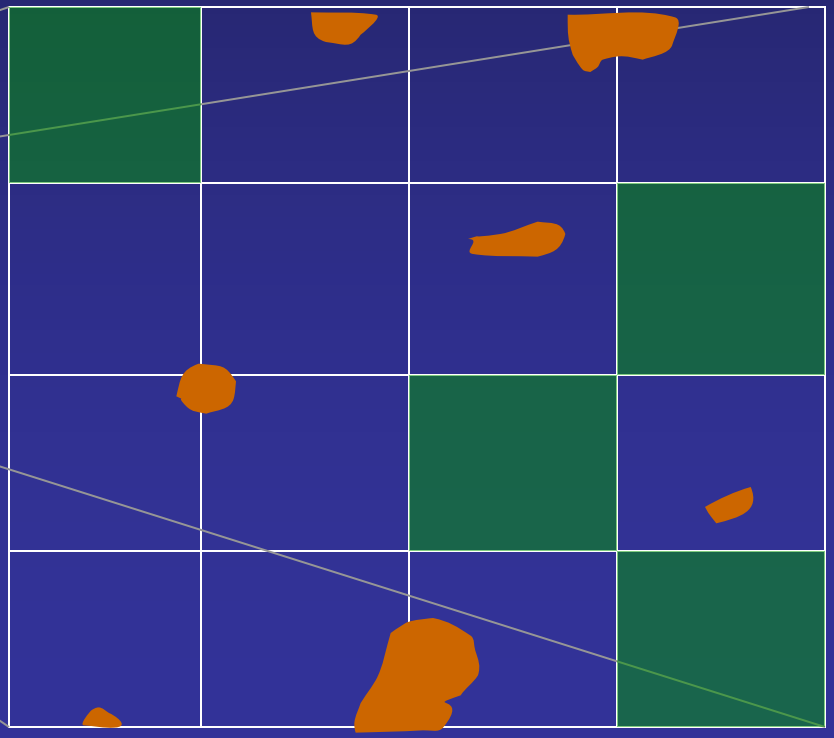
There is no single "best" amount of old forest from an ecological point of view.

Old Forest Should be Managed at ALL Scales.

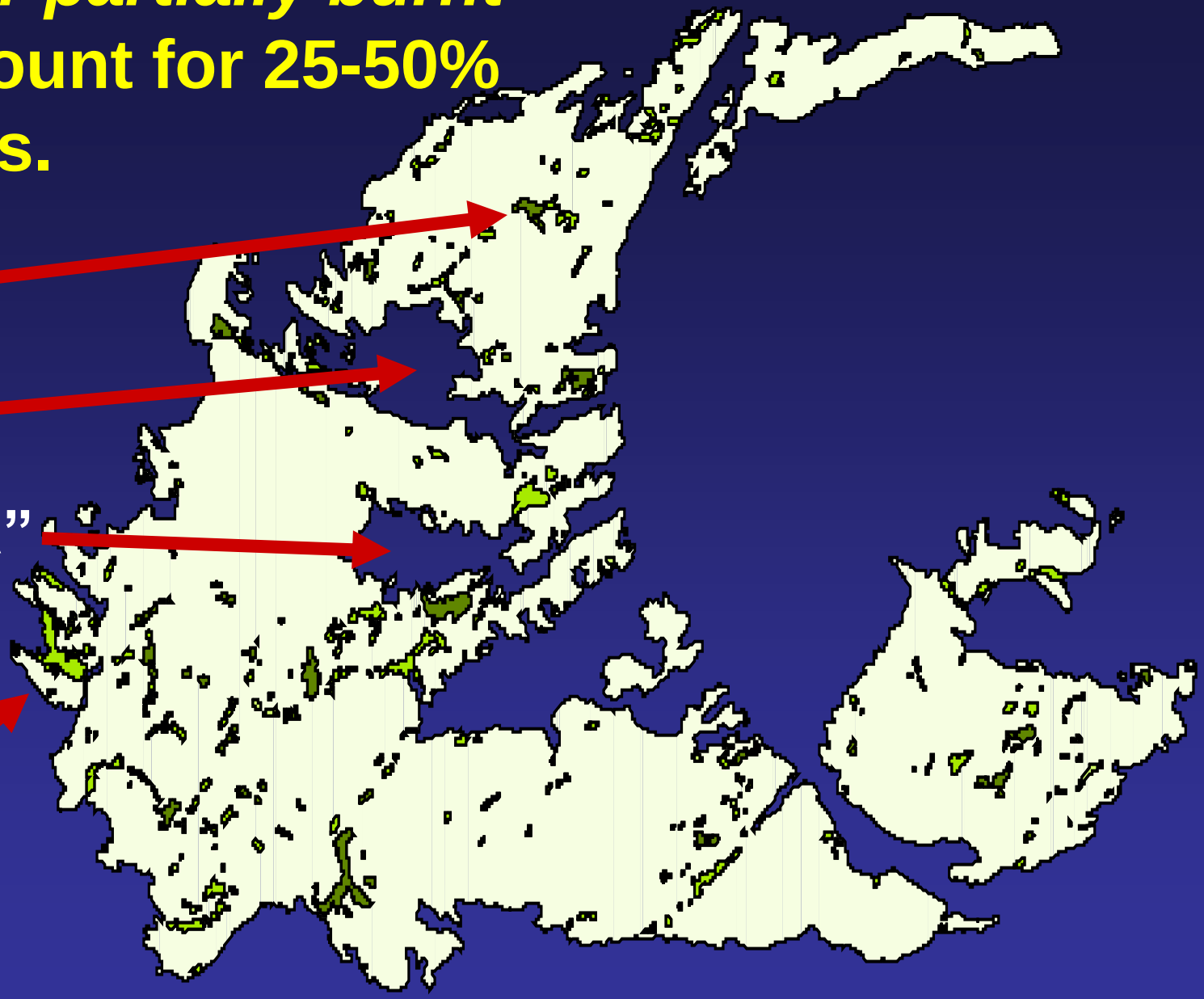
500,000 ha landscapes never run out of “old” forest in Alberta’s foothills



30,000 ha landscapes run out of “old” forest 16% of the time in Alberta’s foothills

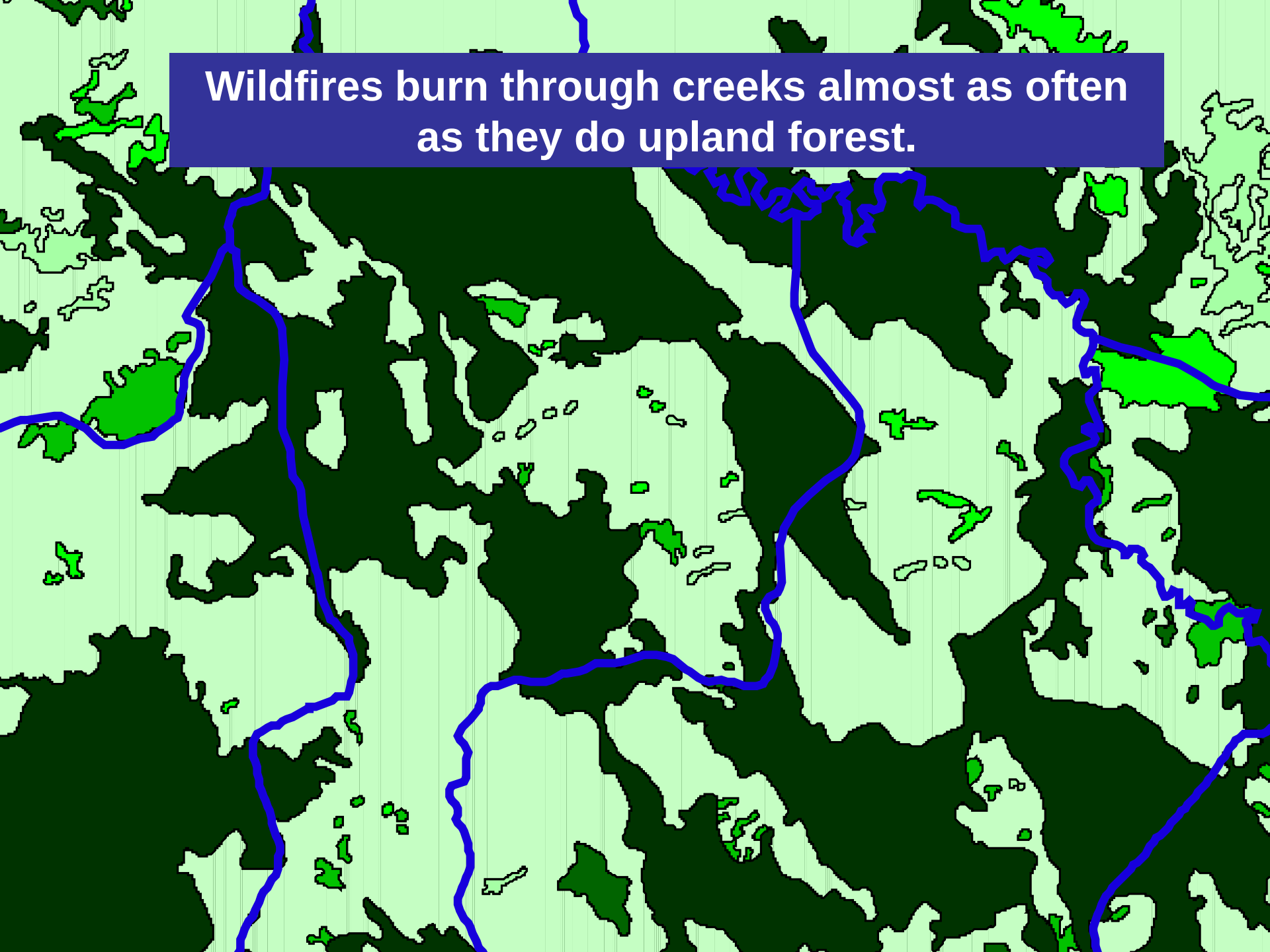


***Unburnt or partially burnt areas* account for 25-50% of wildfires.**



Unburnt Island Sizes

4,225 islands	***<1 ha***
466 islands	**1-2 ha**
350 islands	**2-10 ha**
67 islands	**10-100 ha**
4 islands	**> 100 ha**


Wildfires burn through creeks almost as often as they do upland forest.

Fires facilitate natural processes in rivers-

Fish habitat

Flood control

Erosion control

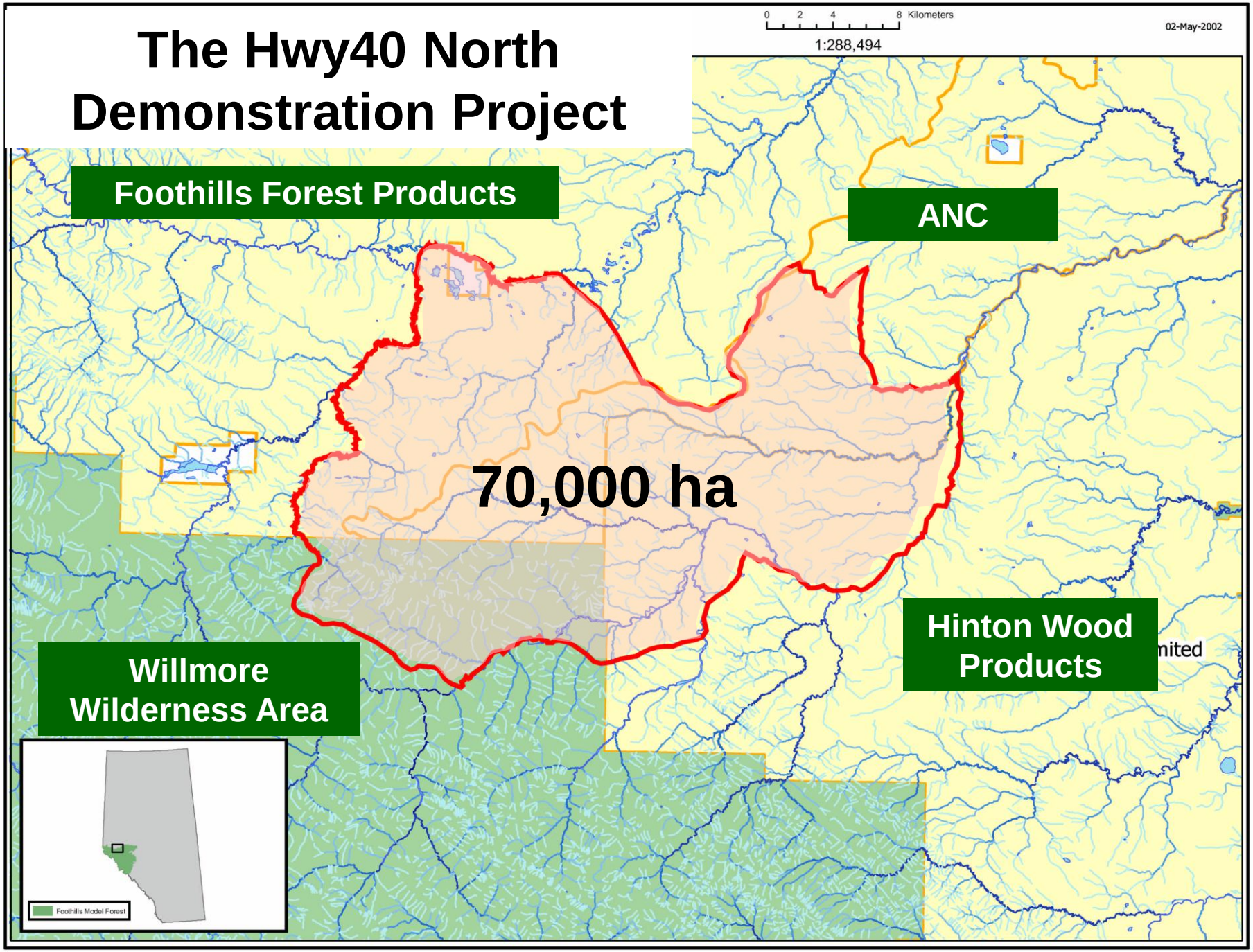
Disturbance frequency
Seral-stage percentages
Old growth spatio-temporal tendencies
Disturbance types / severity
Disturbance event sizes
Patch size distribution
Patch shape distribution
Event mosaics
Area of island remnants
Numbers of island remnants
Island remnant locations
Edge architecture
Within patch heterogeneity
Coarse woody debris
Dead & live standing individuals
Mineral soil exposure
Biomass loads
Soil nutrients
Soil compaction
Disturbance probabilities
Water temperatures
Water flows
Water nutrients

...and there are LOTS of natural patterns,

- and LOTS of ecological “So What’s”.

If you get the disturbance patterns right, it will go a long way to providing sustainable solutions for biodiversity.

The Hwy40 North Demonstration Project



The Team:

West Fraser

ANC

Foothills FP

Willmore

ASRD Regulator

ASRD F&W

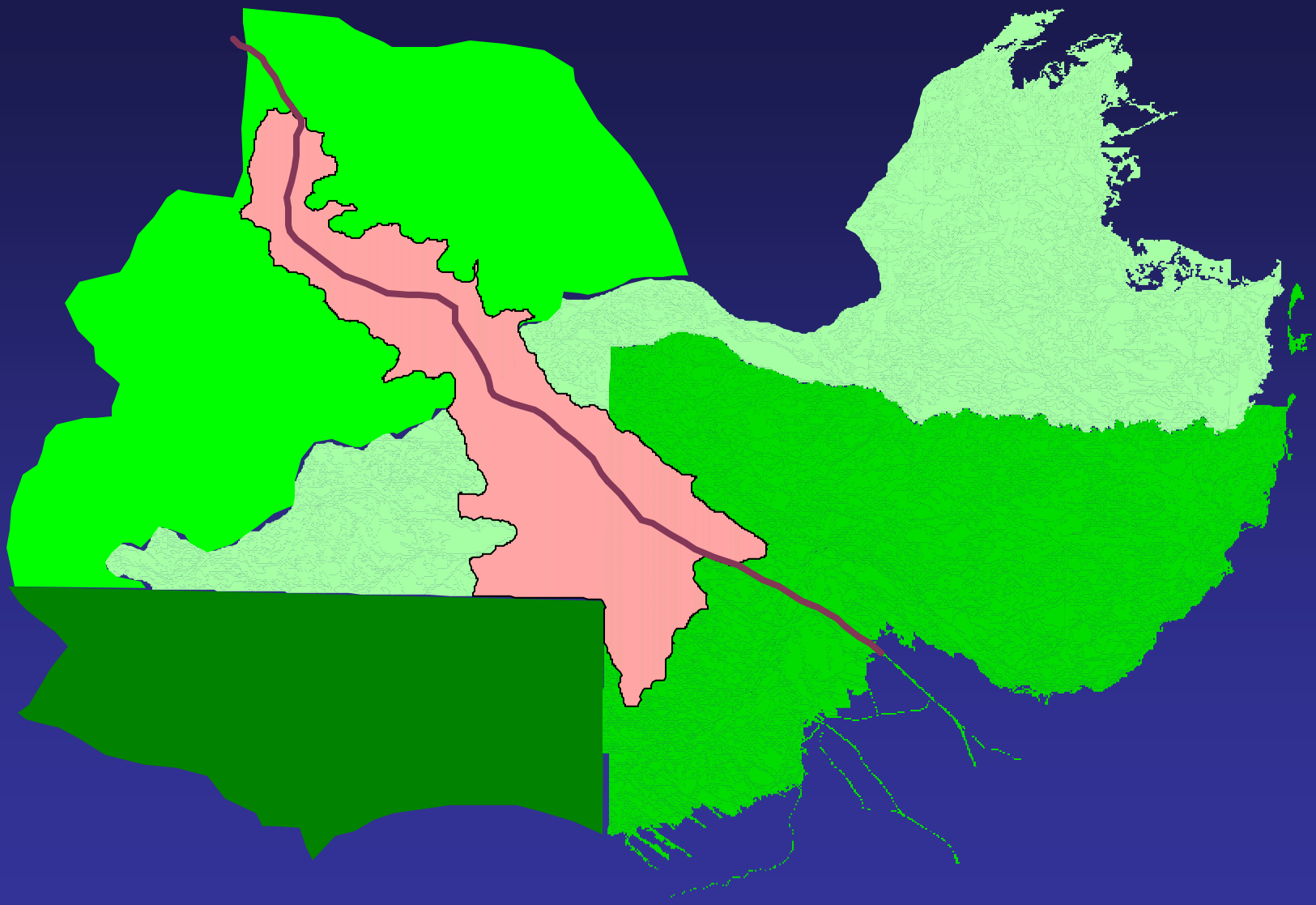
ASRD Fire

Alberta Energy

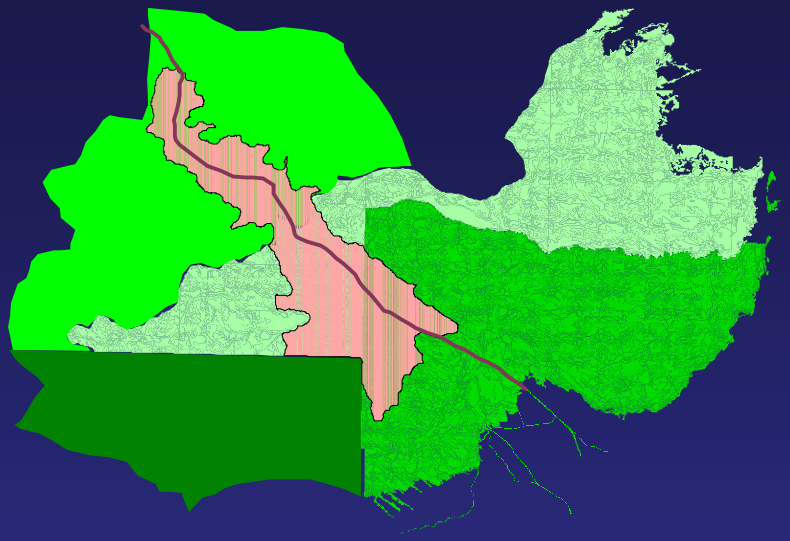
CAPP

FMF Disturbance Expert

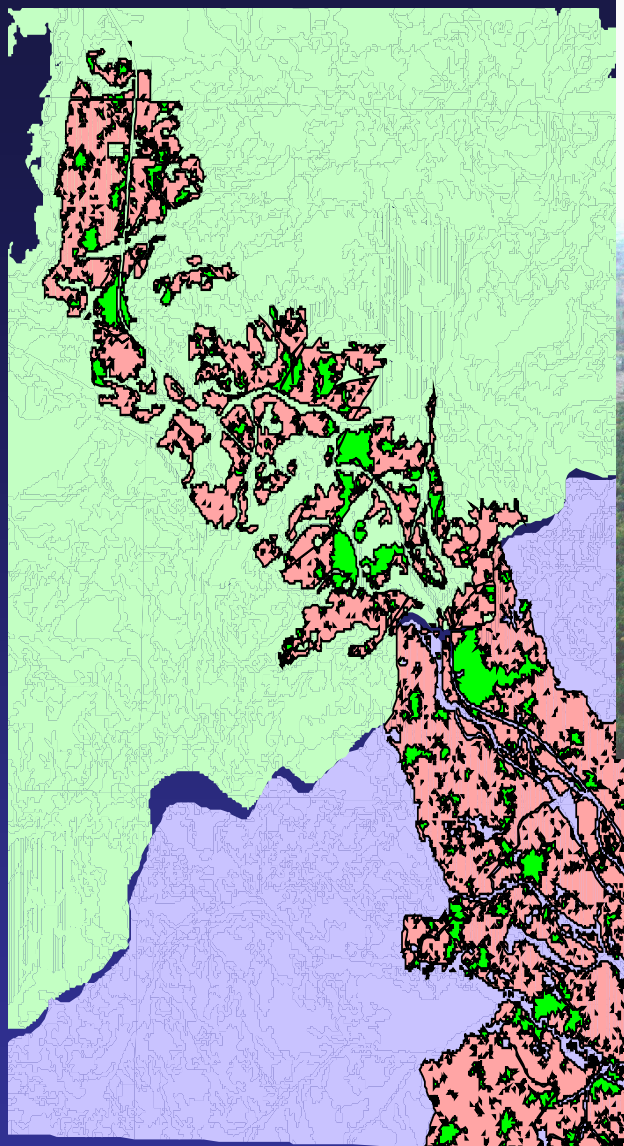
The Plan (so far)



Why here?



- Good timber values
- Barrier to eastward movement of fire AND mountain pine beetle
- Great visibility and education opportunity
- Reduces new roads
- Covers existing oil and gas development
- Leaves lots of remaining old forest intact



Now What?

-Team finishes the plan.

- Partners develop their plans and submit for approval.

- Begin monitoring now:
  - Grizzly bear
  - Woodland caribou
  - Fish
  - Soils
  - Birds…

- Start looking for education opportunities (***pullouts***?!).

- Talk about it.

Summary

- **Hwy40 is an applied demonstration of a *disturbance plan* based on sound science.**
- **Disturbance does not respect administrative boundaries.**
- **Project will be evaluated on 2 levels:**
  - ***Degree to which it provides sustainable solutions for other values.***
  - ***Degree to which the framework is robust, accepted, feasible, and supported.***