The Healthy Landscape Approach to Landscape Management Planning

Wildland Fire Canada 2010

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BANDALOOP
LANDSCAPE-ECOSYSTEM SERVICES

foothills
RESEARCH INSTITUTE
research growing into practice.

Who Is FRI?

- Foothills Research Institute (formerly Foothills Model Forest)
- Non-profit corporation founded in 1992.
- Partner driven knowledge & tool development
- 12 "Program" areas.
- Founding member of the Canadian Model Forest Network.
- Original land base ~ 3 million ha in the Hinton-Jasper area, but now much of western boreal Canada.

- *Always interested in new partnerships!*

foothills
RESEARCH
INSTITUTE
research growing into practice.

The FRI Natural Disturbance Program

Understand patterns and process of natural disturbance,

and help partners integrate them into forest land management & planning.

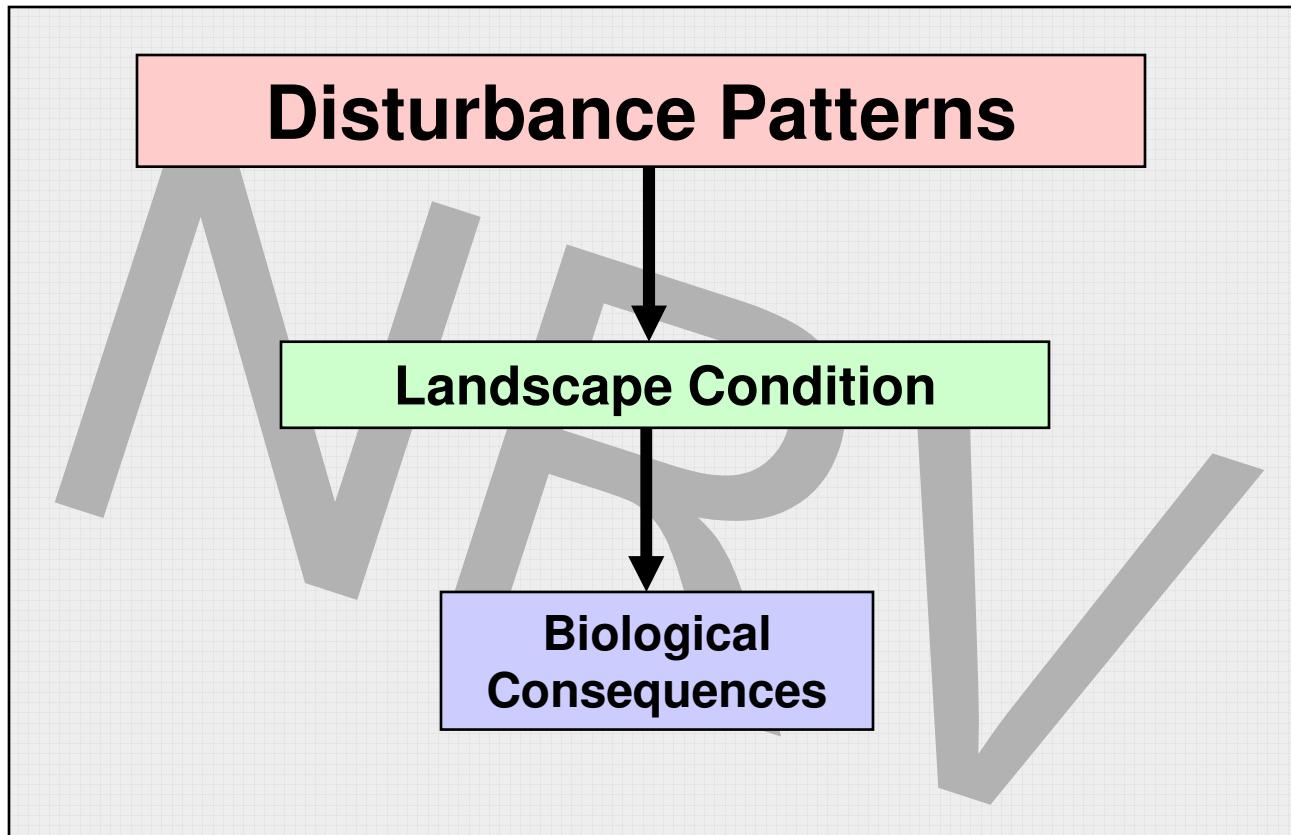# Original Interpretation of an _NRV Strategy:_

Coarse decision-making filters for forest management.

Another Interpretation:

**Use natural patterns as the foundation for
<u>a process</u> of developing and evaluating
regional land use plans and policies.**

The Three Box NRV Model

**Economic and Social Need A**

Disturbance Patterns

Landscape Condition

Biological Consequences

NRV

Management controls;
"Levers"

Primary management effects;
"Desired Future Forest"

Management outputs;
"Fine Filter Values"

The Traditional Model

E&S Need A

E&S Need B

E&S Need C

E&S Need D

Disturbance Patterns

Disturbance Patterns

Disturbance Patterns

Disturbance Patterns

Landscape Condition

Landscape Condition

Landscape Condition

Landscape Condition

Biological Consequences

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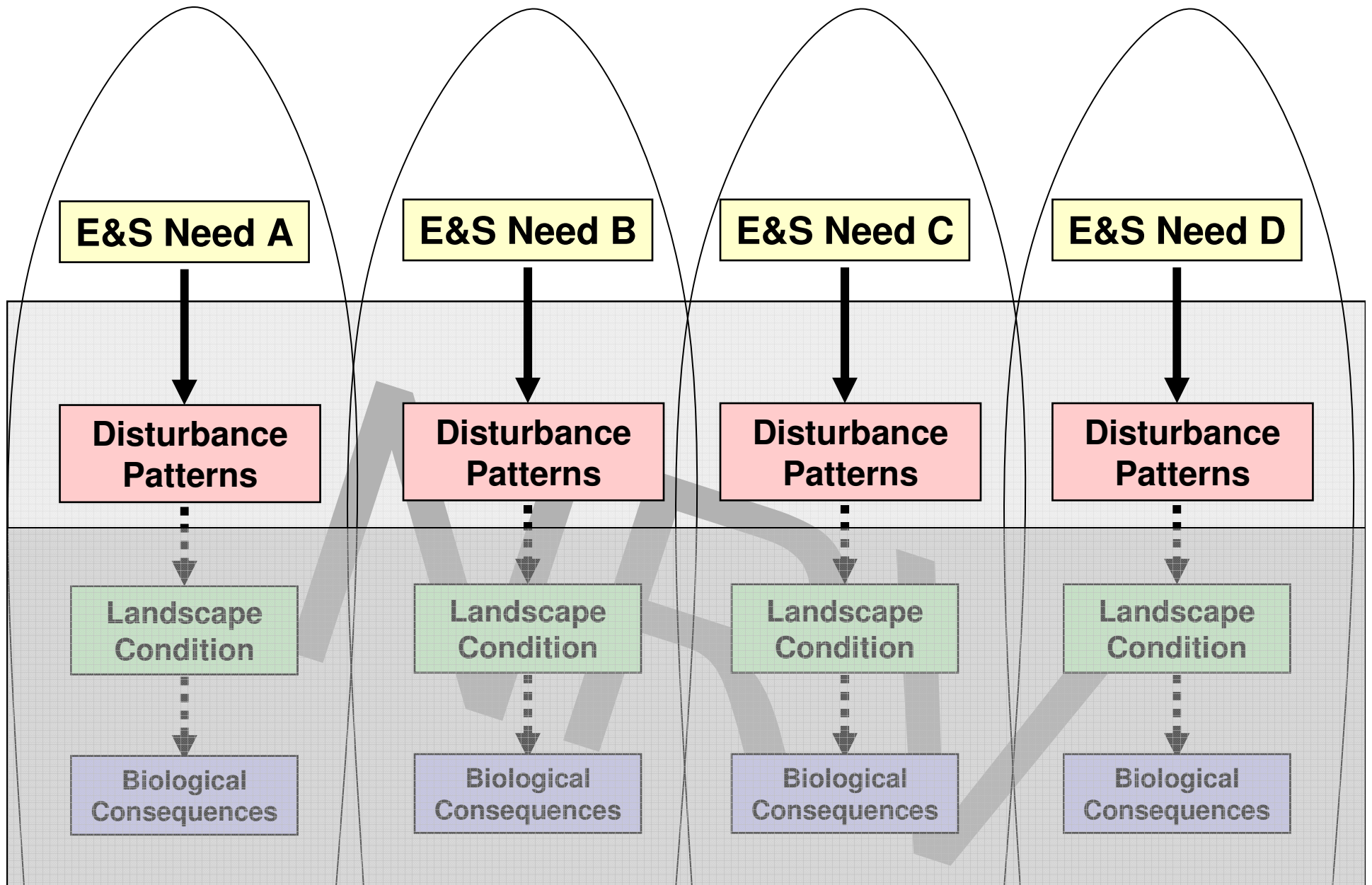
The Healthy Landscape Model
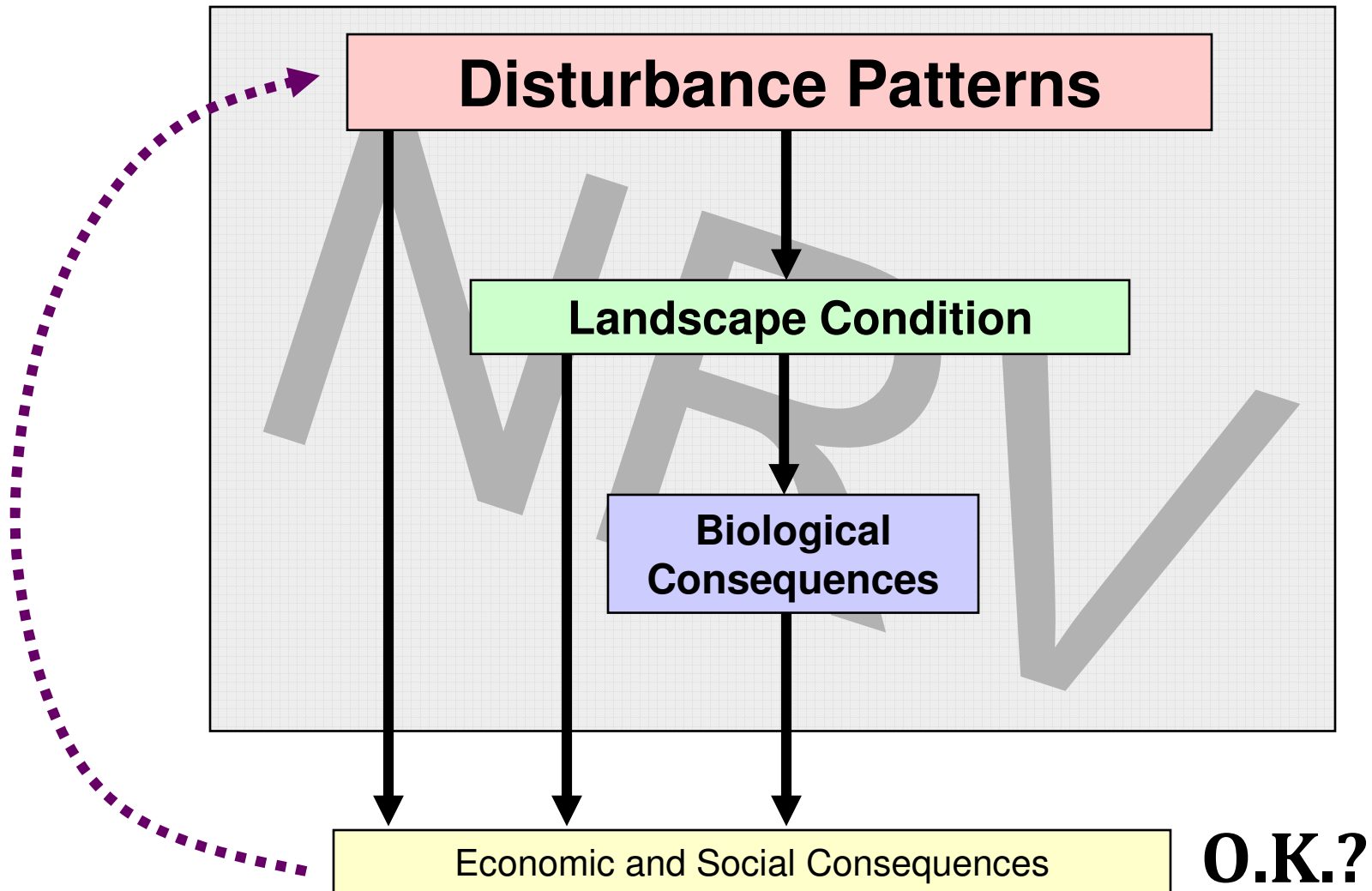
# The Healthy Landscape Hypothesis:

1. Landscape health is the ultimate measure of FULL sustainability.

2. Landscape health is directly related to biodiversity & ecosystem function.

3. Natural patterns are a proxy for biodiversity & ecosystem function.

4. Natural patterns can be used as a universal foundation for **_all_** landscape management.

5. We can differentiate a "healthy" from an "unhealthy" landscape via simple indicators.
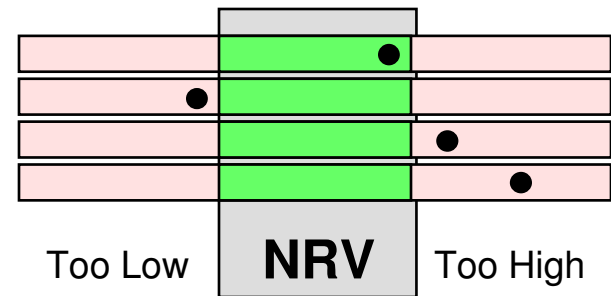
Landscape 1 is "Healthier" than Landscape 2

Indicator	Landscape 1	Landscape 2

Frequency
Size
Shape
Severity

Too Low   **NRV**   Too High
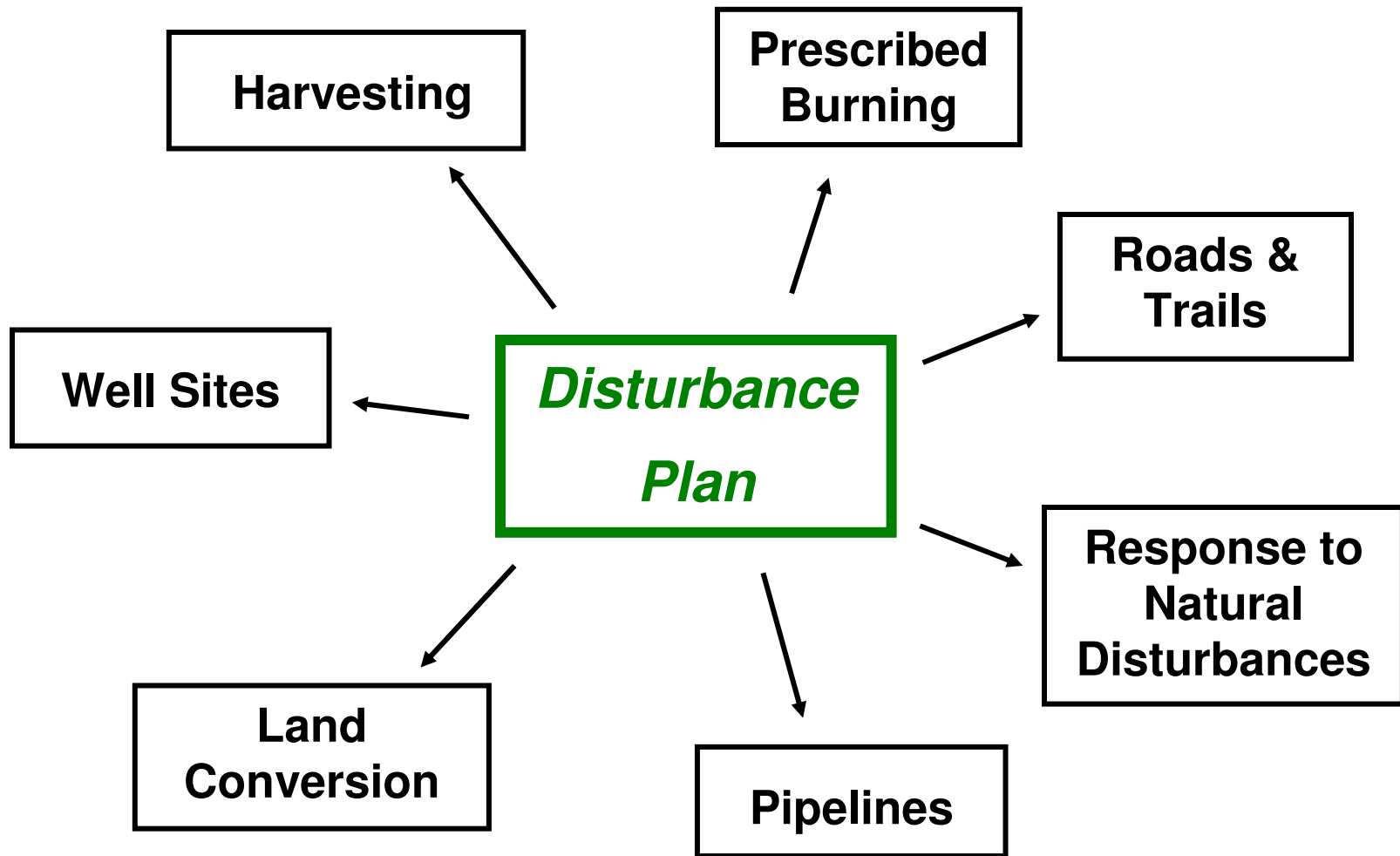
Too Low   **NRV**   Too High
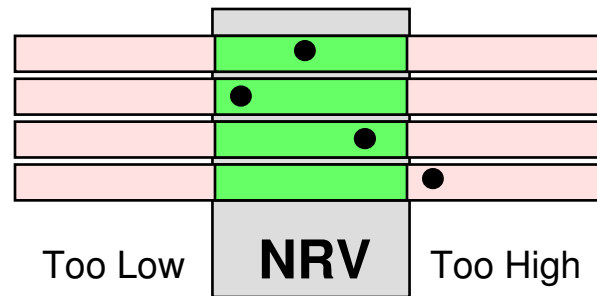
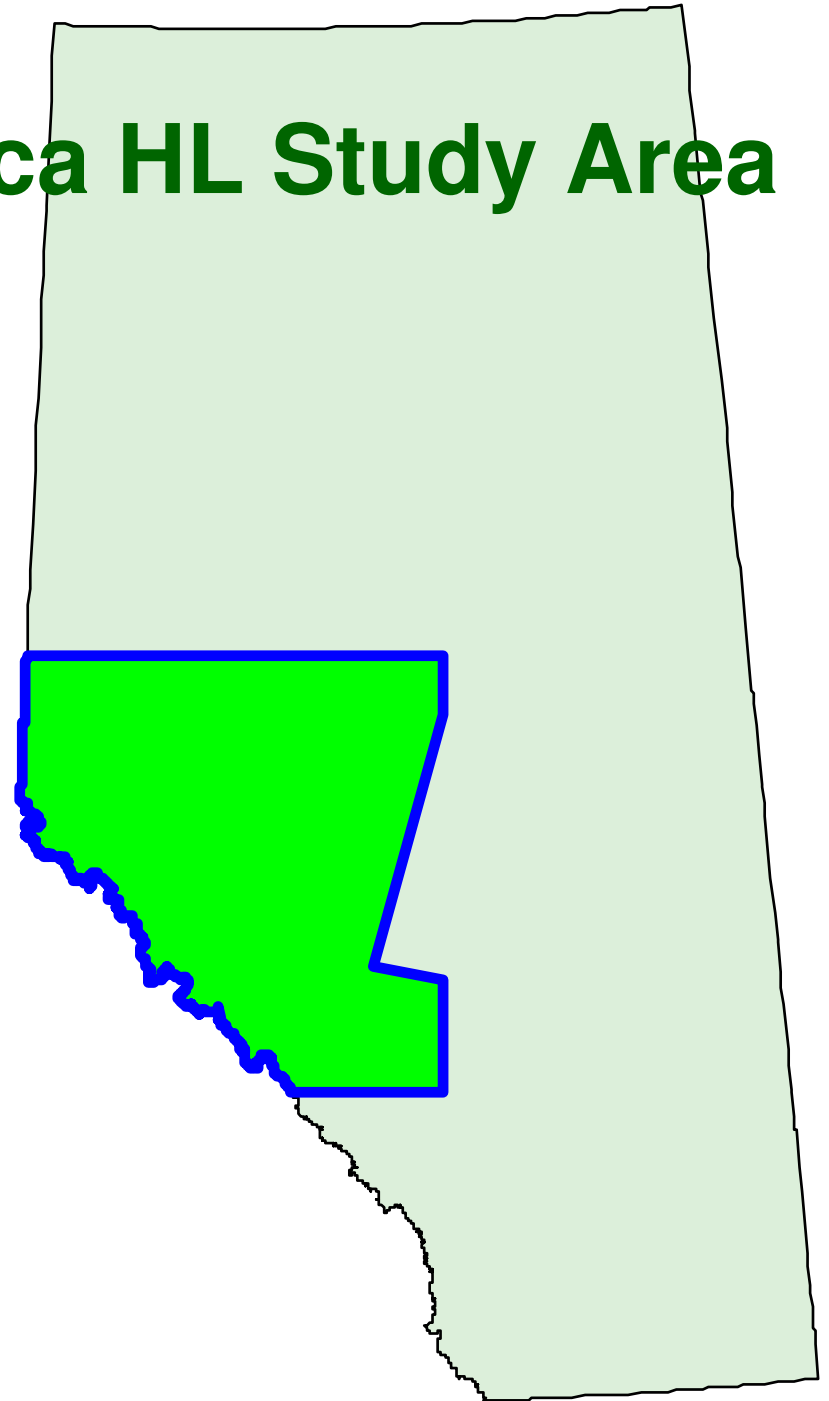*Green = Measurable Historical Range*

Red = Beyond Historical Range
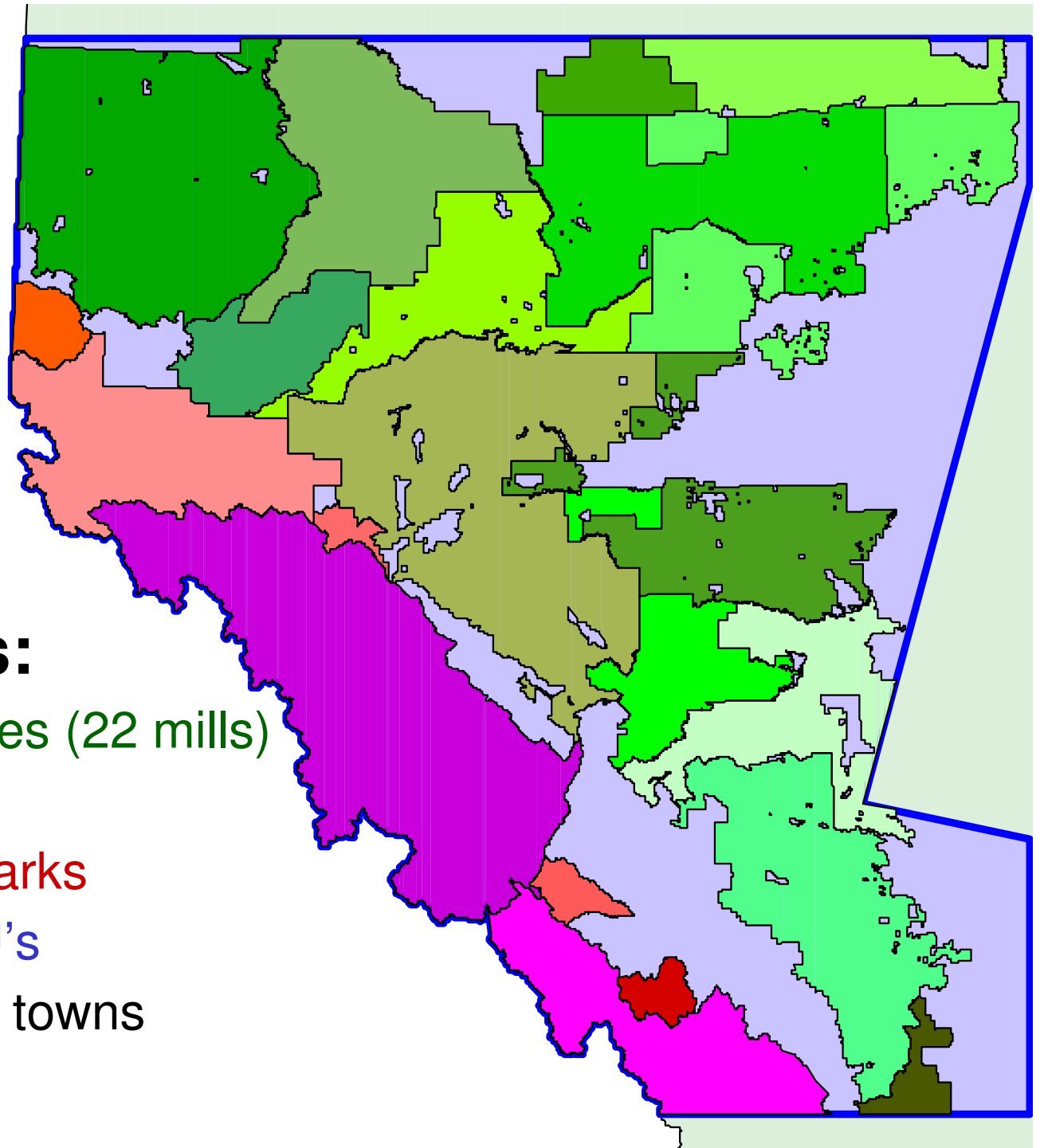
Black Dots = Current (point)

The Upper Athabasca HL Study Area

11 Million ha

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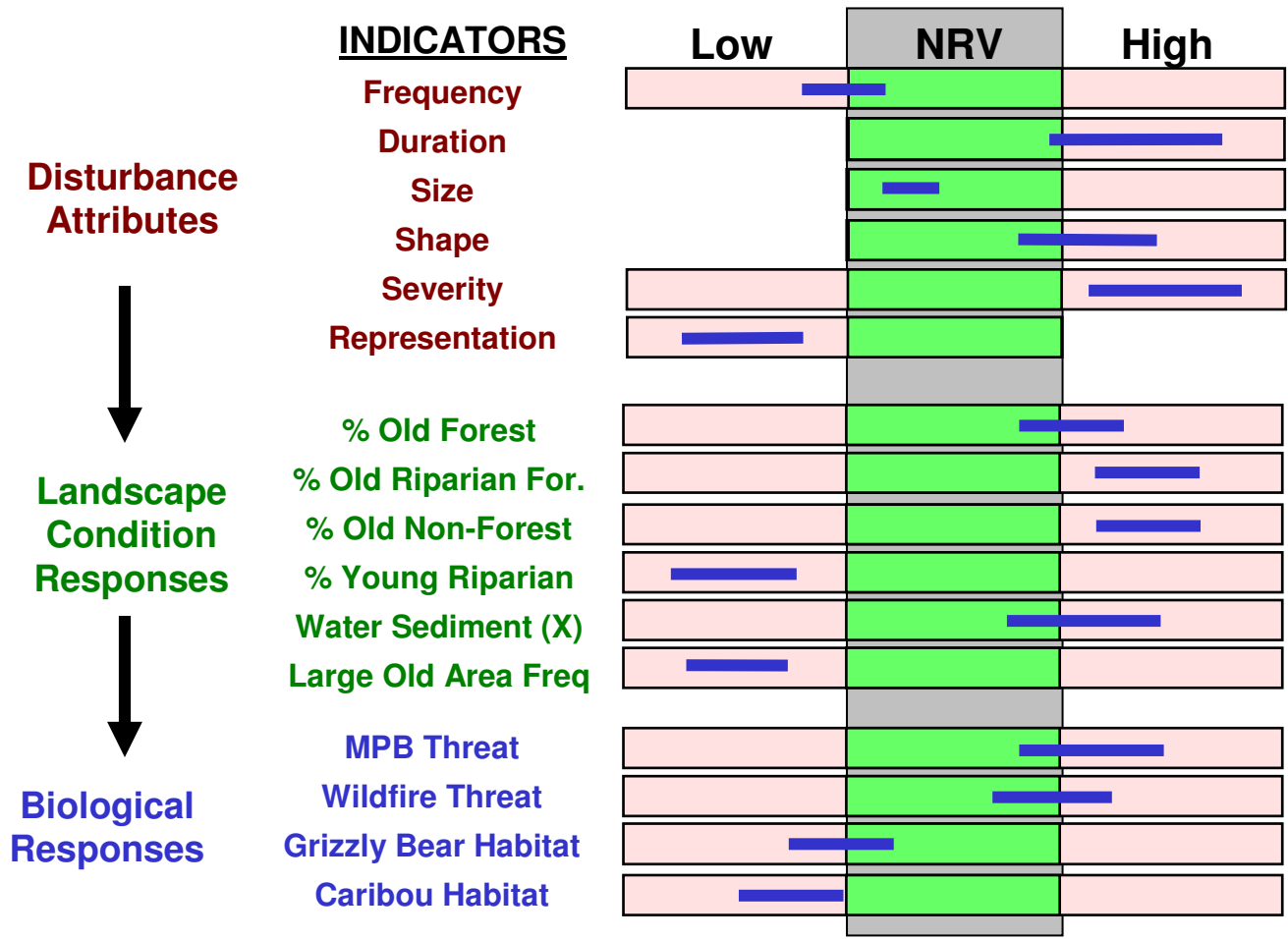- Grizzly Bear
- Woodland Caribou

Jurisdictions:

-14 For. Mgmt. tenures (22 mills)

- 2 national parks

- 5 large provincial parks

- >10 provincial FMU's

- >20 municipalities / towns

Current Condition of the UA Landscape

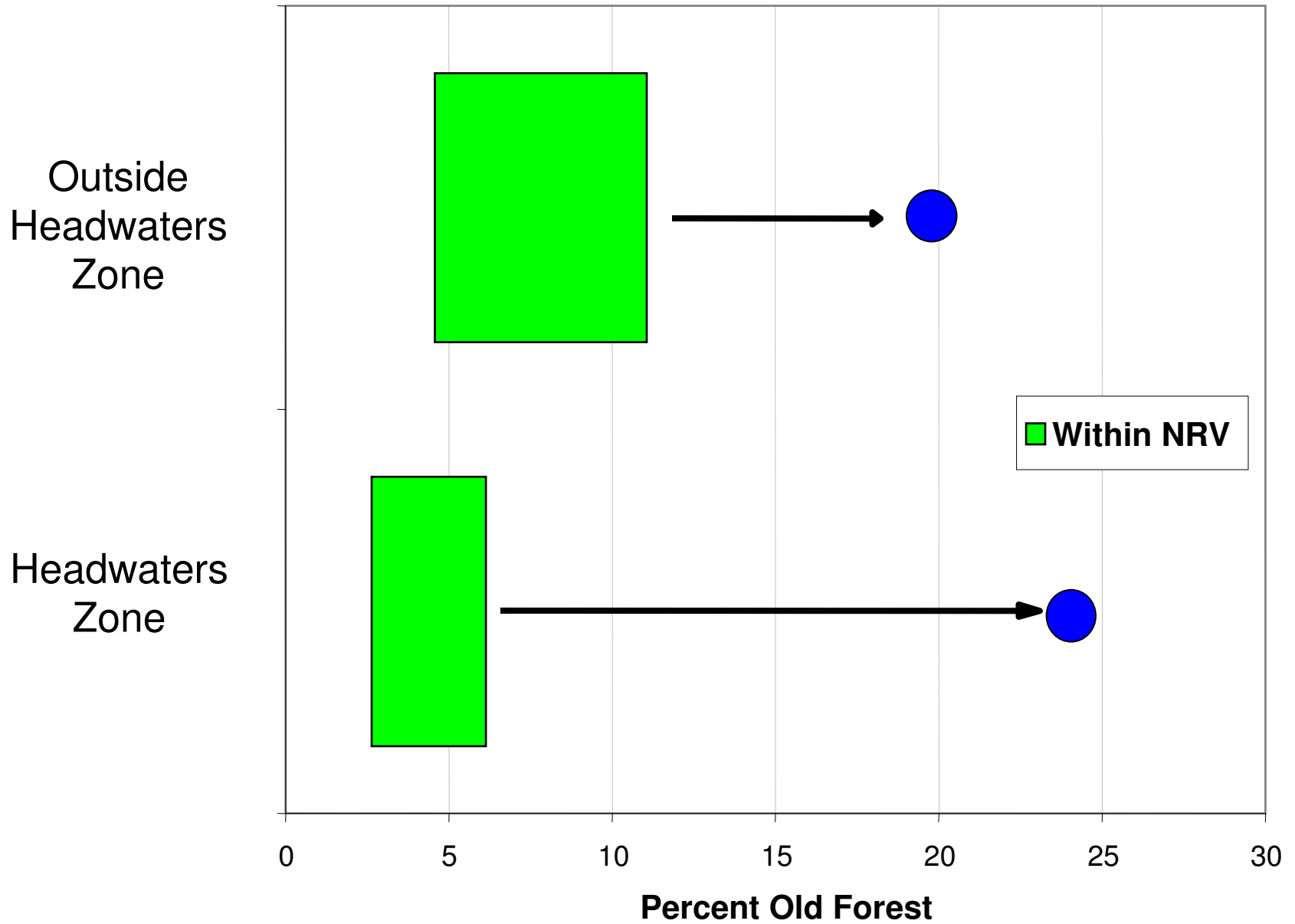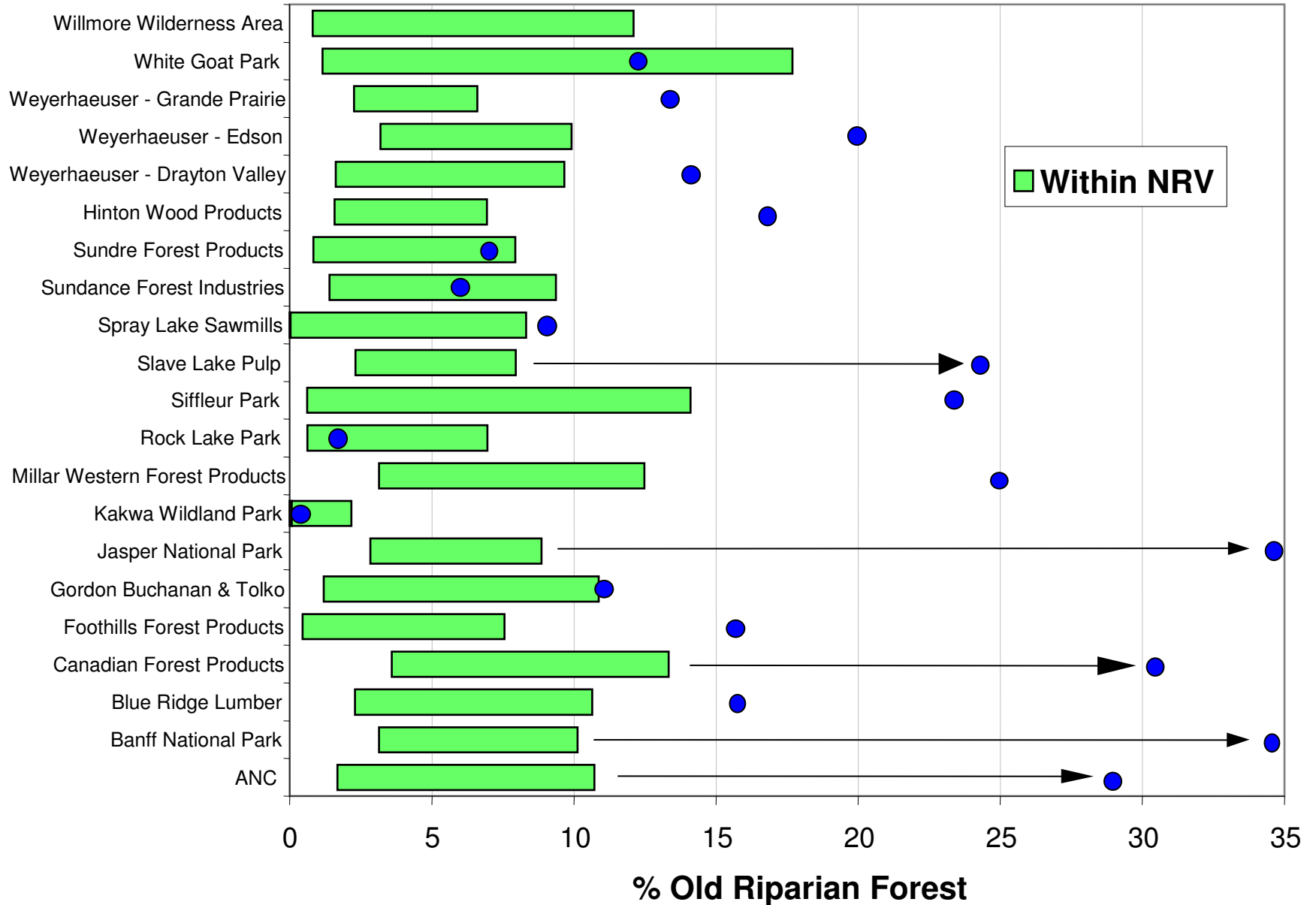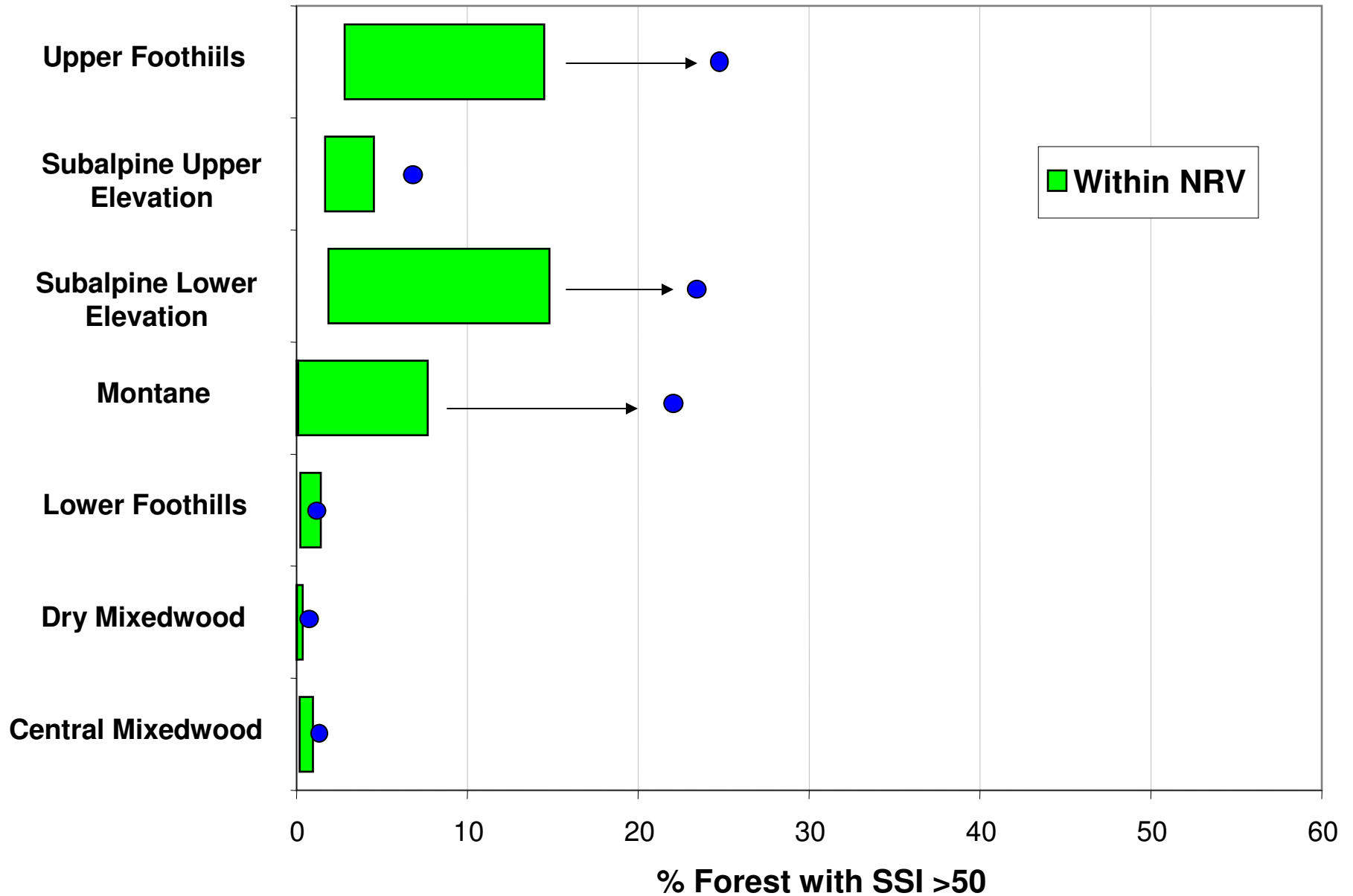# Old Forest NRV and Current Condition For "Headwaters" for the Upper Athabasca Healthy Landscape Study Area

Legend: ■ Within NRV

X-axis: Percent Old Forest (0, 5, 10, 15, 20, 25, 30)

Y-axis categories: Outside Headwaters Zone; Headwaters Zone

Old Riparian NRV and Current Condition by Jurisdiction for the Upper Athabsca Heathly Landscape Study Area

Legend: ▨ Within NRV

Y-axis (Jurisdiction, top to bottom):
- Willmore Wilderness Area
- White Goat Park
- Weyerhaeuser - Grande Prairie
- Weyerhaeuser - Edson
- Weyerhaeuser - Drayton Valley
- Hinton Wood Products
- Sundre Forest Products
- Sundance Forest Industries
- Spray Lake Sawmills
- Slave Lake Pulp
- Siffleur Park
- Rock Lake Park
- Millar Western Forest Products
- Kakwa Wildland Park
- Jasper National Park
- Gordon Buchanan & Tolko
- Foothills Forest Products
- Canadian Forest Products
- Blue Ridge Lumber
- Banff National Park
- ANC

X-axis: % Old Riparian Forest (0, 5, 10, 15, 20, 25, 30, 35)

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

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

Within NRV

Wildfire Threat

Jurisdictions (top to bottom):
- Willmore Wilderness Area
- White Goat Park
- Weyerhaeuser - Grande Prairie
- Weyerhaeuser - Edson
- Weyerhaeuser - Drayton Valley
- Hinton Wood Products
- Sundre Forest Products
- Sundance Forest Industries
- Spray Lake Sawmills
- Slave Lake Pulp
- Siffleur Park
- Rock Lake Park
- Millar Western Forest Products
- Kakwa Wildland Park
- Jasper National Park
- Gordon Buchanan & Tolko
- Foothills Forest Products
- Canadian Forest Products
- Blue Ridge Lumber
- Banff National Park
- ANC

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
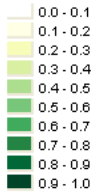
Non-forest
Non-forest
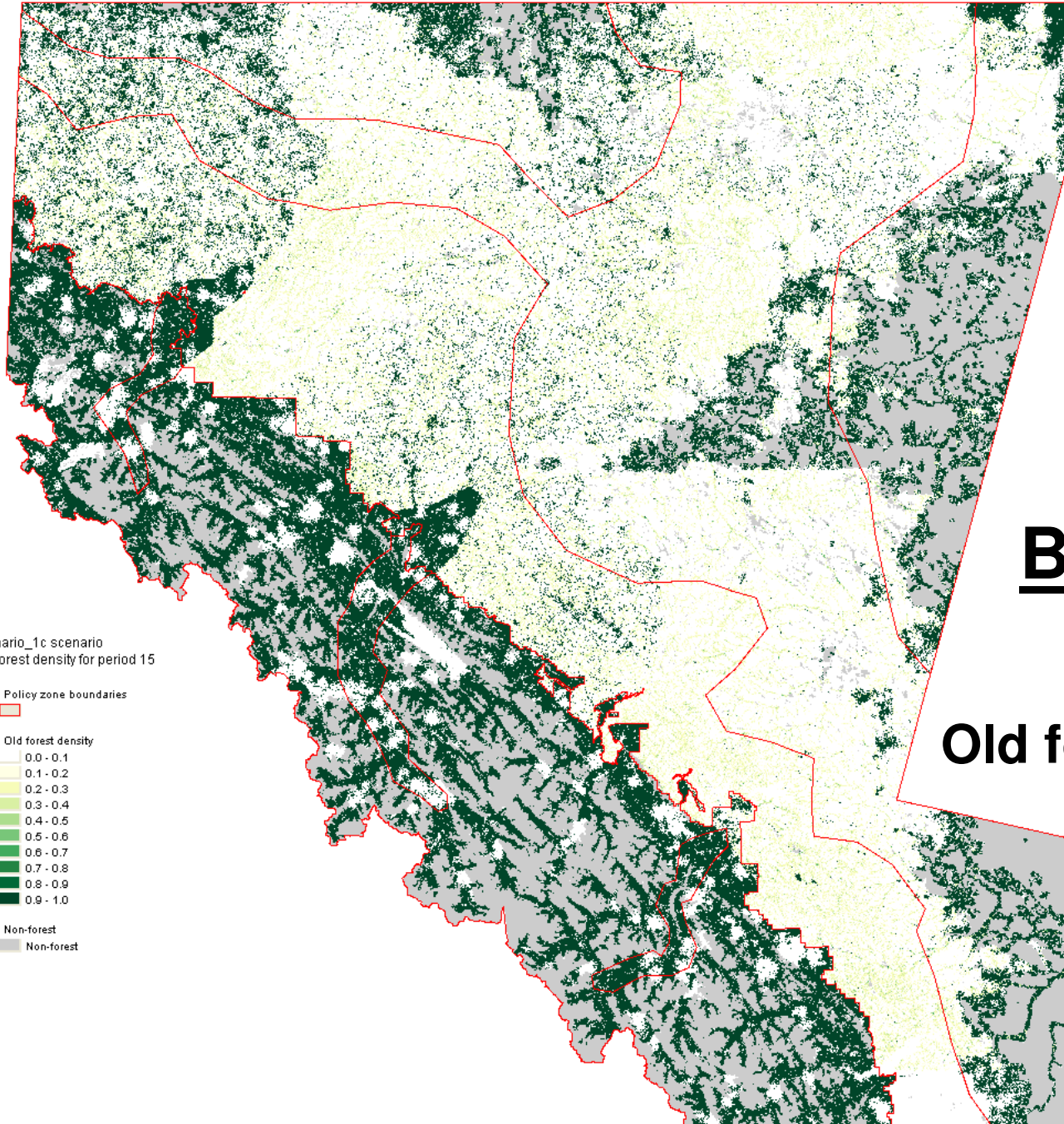
Business as Usual

Old forest at 100 years

(AAC, 25%)

Scenario_1C
Fire hazard density by watershed for period 5

Policy zone boundaries

Non-forest
Non-forest

Fire hazard density by watershed
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
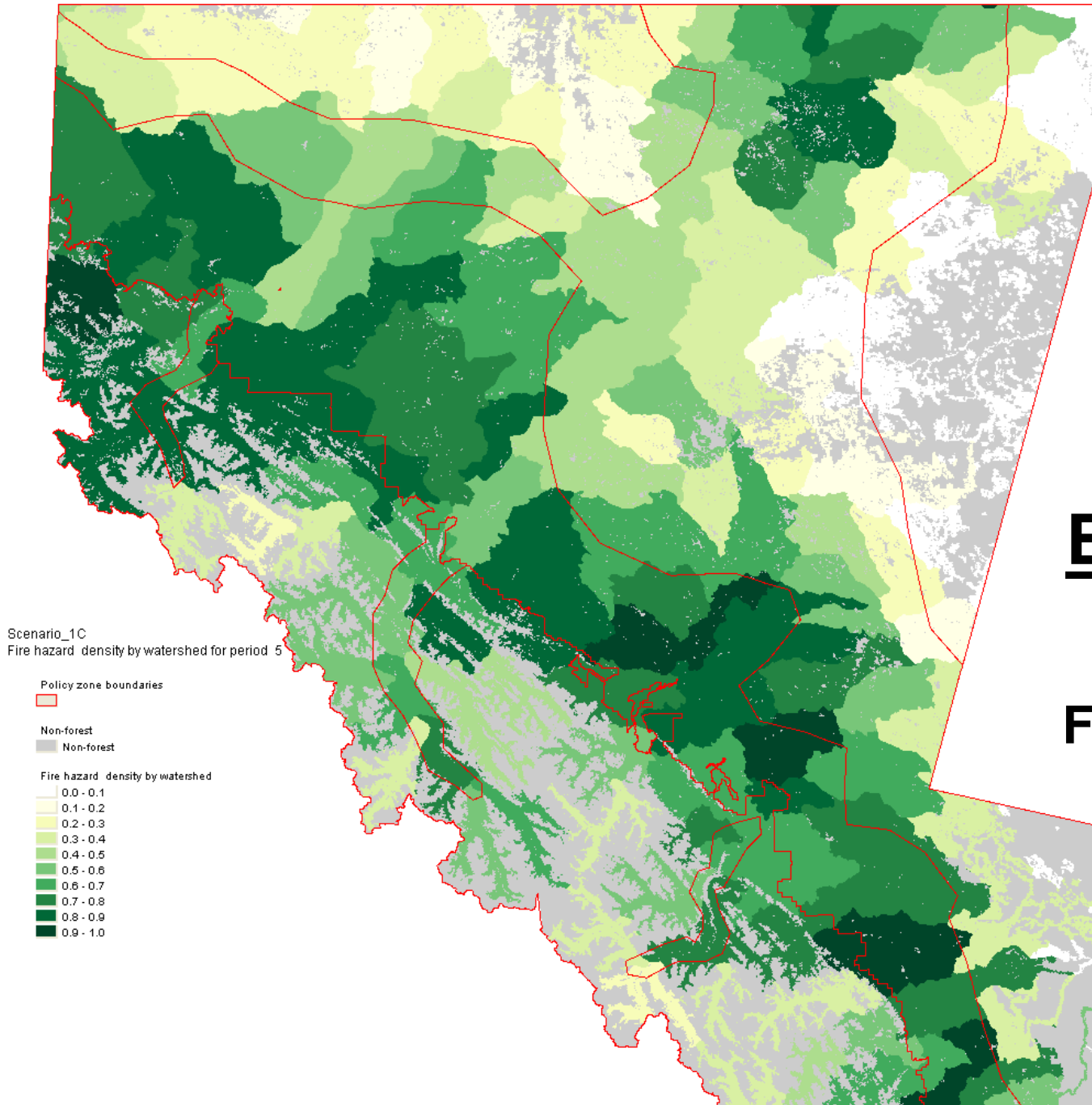
Business as Usual

Fire hazard at 50 years

Scenario_1C
Caribou (gross area) density by watershed for period 10

Policy zone boundaries

Non-forest
Non-forest

Caribou (gross area) density by watershed
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

<u>Business as Usual</u>

Caribou at 100 years

(water, riparian, LWD…)
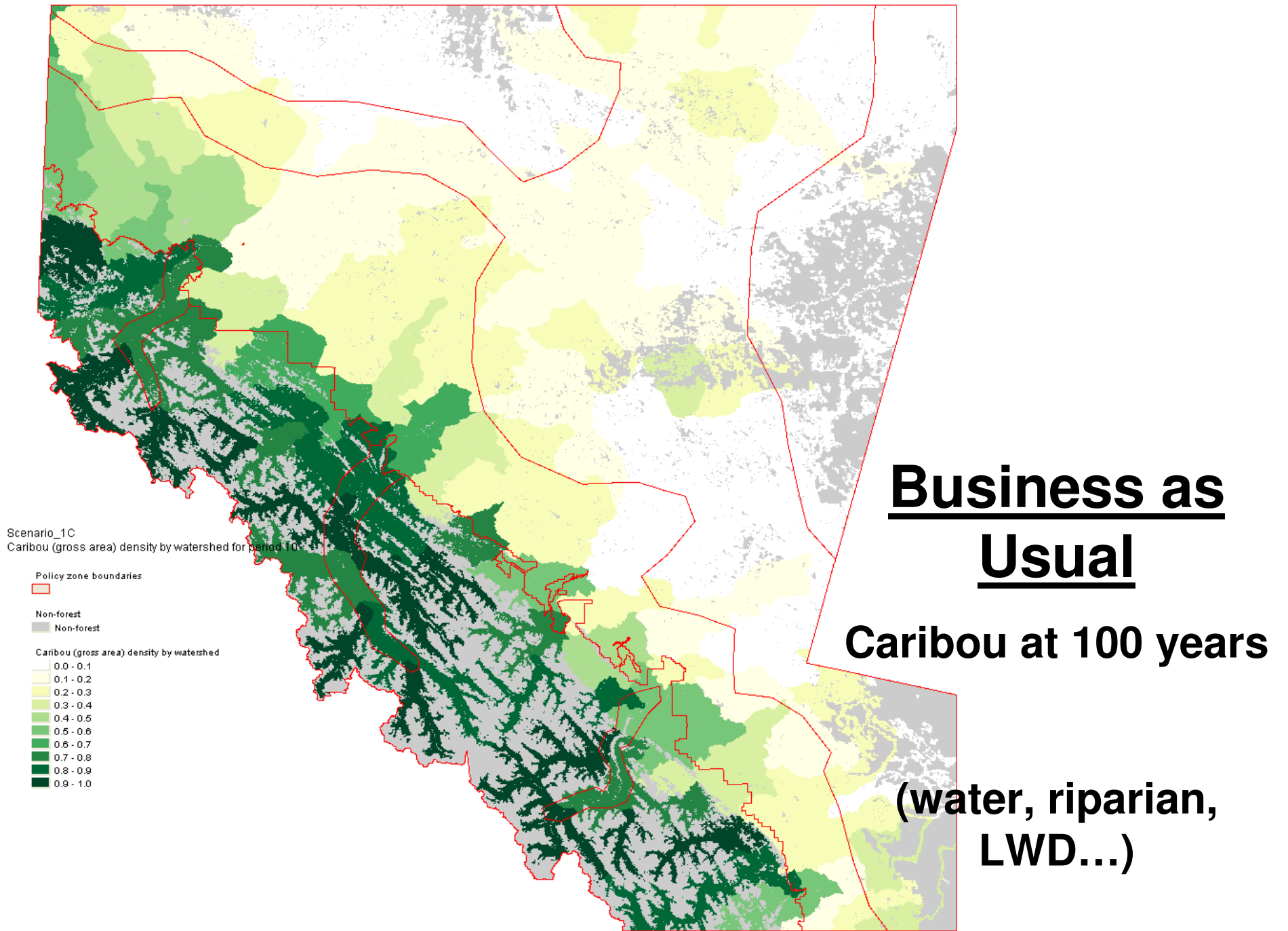
Create a New Scenario:

| INDICATORS | Low | NRV | High |
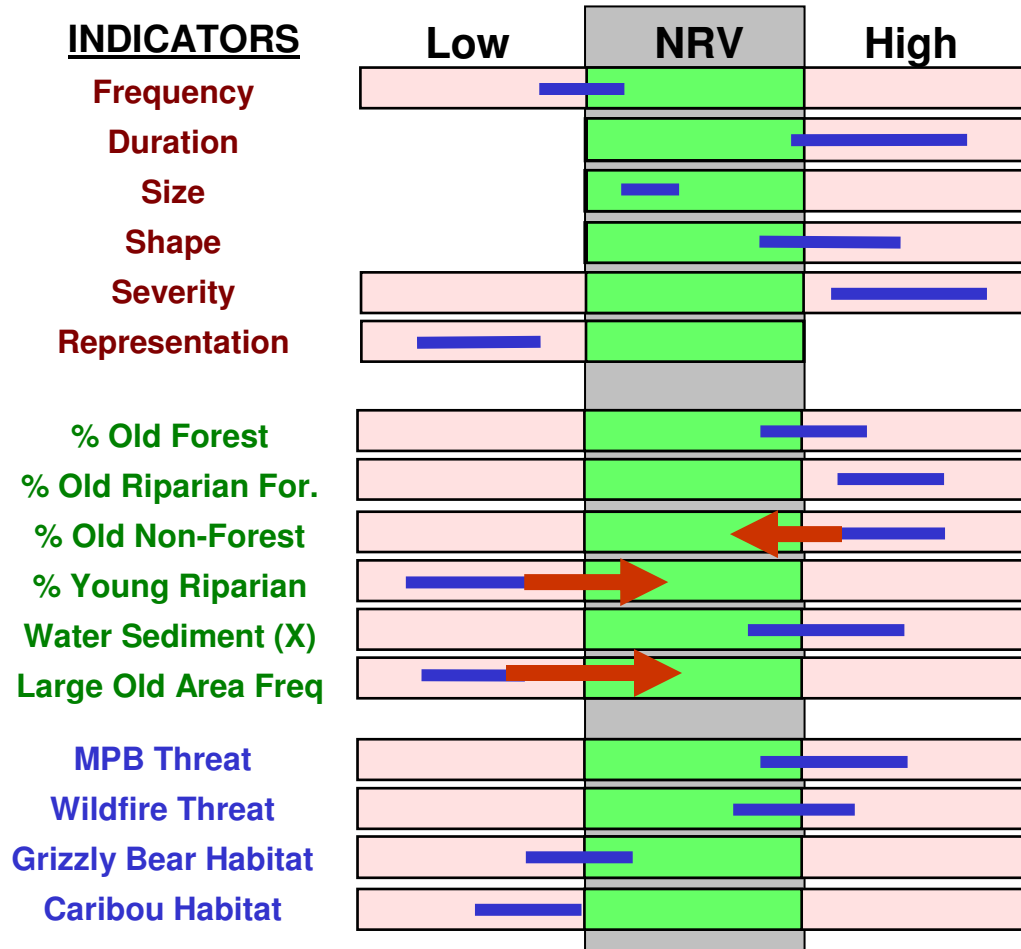
How? Ignore admin boundaries, rotate watersheds, allow very large disturbance events, *...and assume that fire is available.*

Scenario_3c scenario
Old forest density for period 7

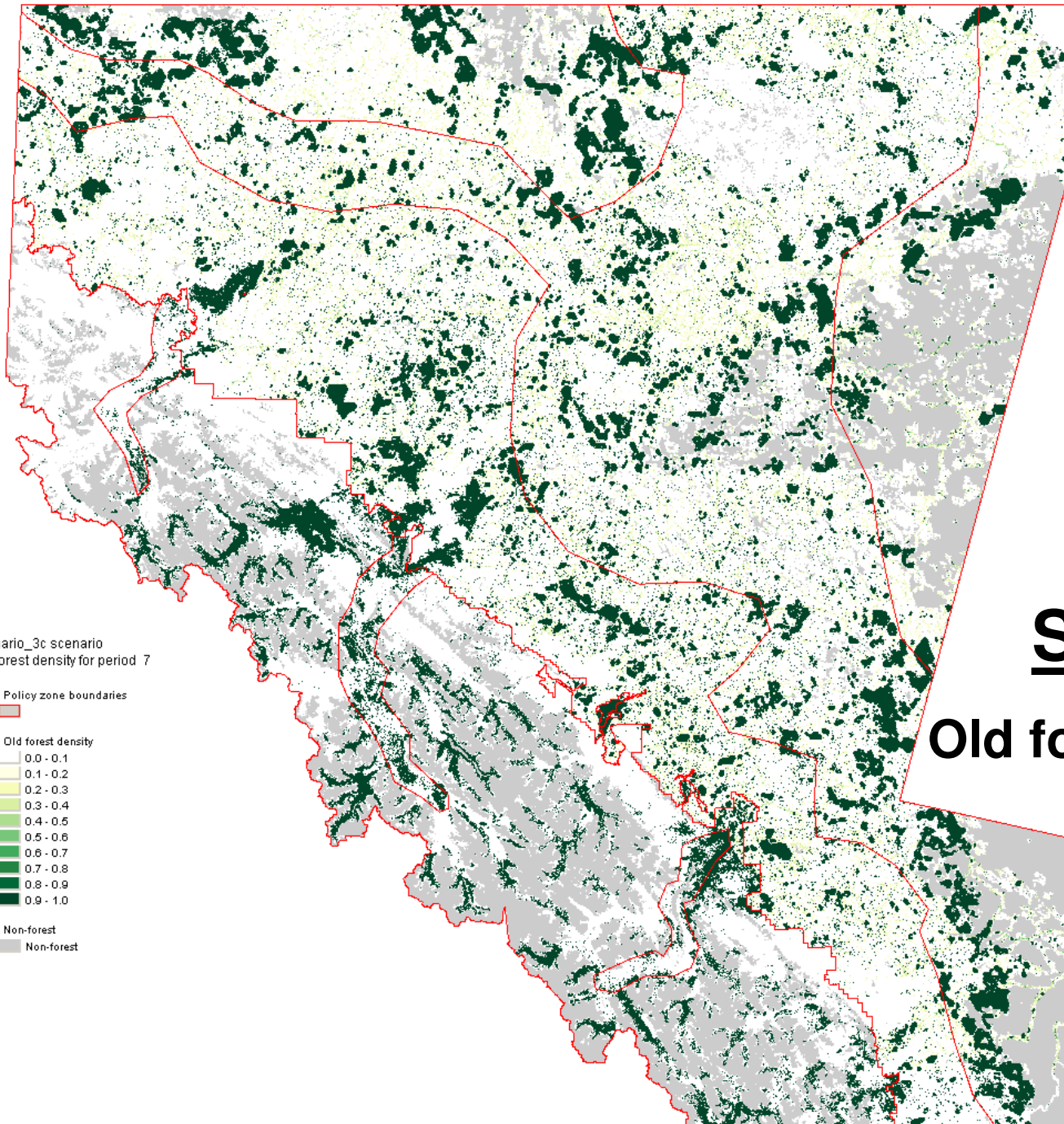Policy zone boundaries

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
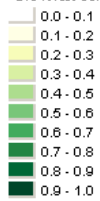
Non-forest
Non-forest

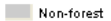## Scenario 9

Old forest at 100 years

Scenario_9 scenario
Caribou (gross area) density by watershed for period 10

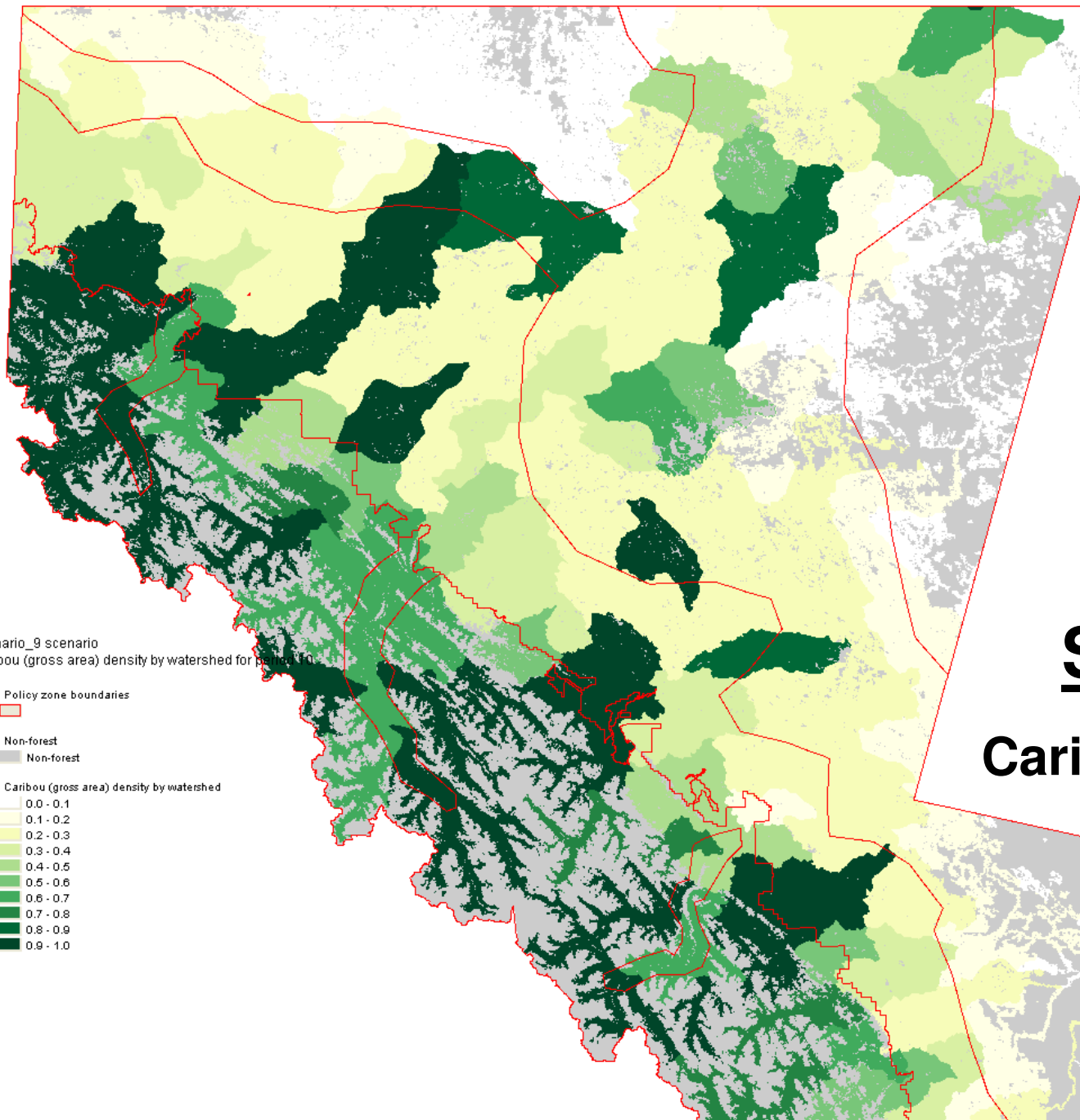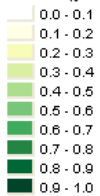Policy zone boundaries

Non-forest
Non-forest

Caribou (gross area) density by watershed
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

Scenario 9

Caribou at 100 years

Does HL Have Legs?

- **Different perspective.**
  - inputs/outputs, process, importance of journey.

- **Tool & information mining.**

- **It resonates.**
  - Integrative
  - Cumulative
  - Simple & tractable
  - Science-based and ecosystem focused
  - Creates a new home for existing tools and new ideas

- **Plenty of policy challenges.**
  - Tenure (forest, energy)
  - Use of fire
  - Risk sharing
  - Roles and responsibilities

- **Change is hard.**

Thank you!