

Natural Disturbance Approaches to Forest Land Management

Review of Day 1

Questions / Parking Lot

October 6-8, 2009

Hinton, Alberta



Natural Disturbance Approaches to Forest Land Management

*Day 2, Part 1: Exactly What is a Natural
Disturbance “Approach”?*

October 6-8, 2009

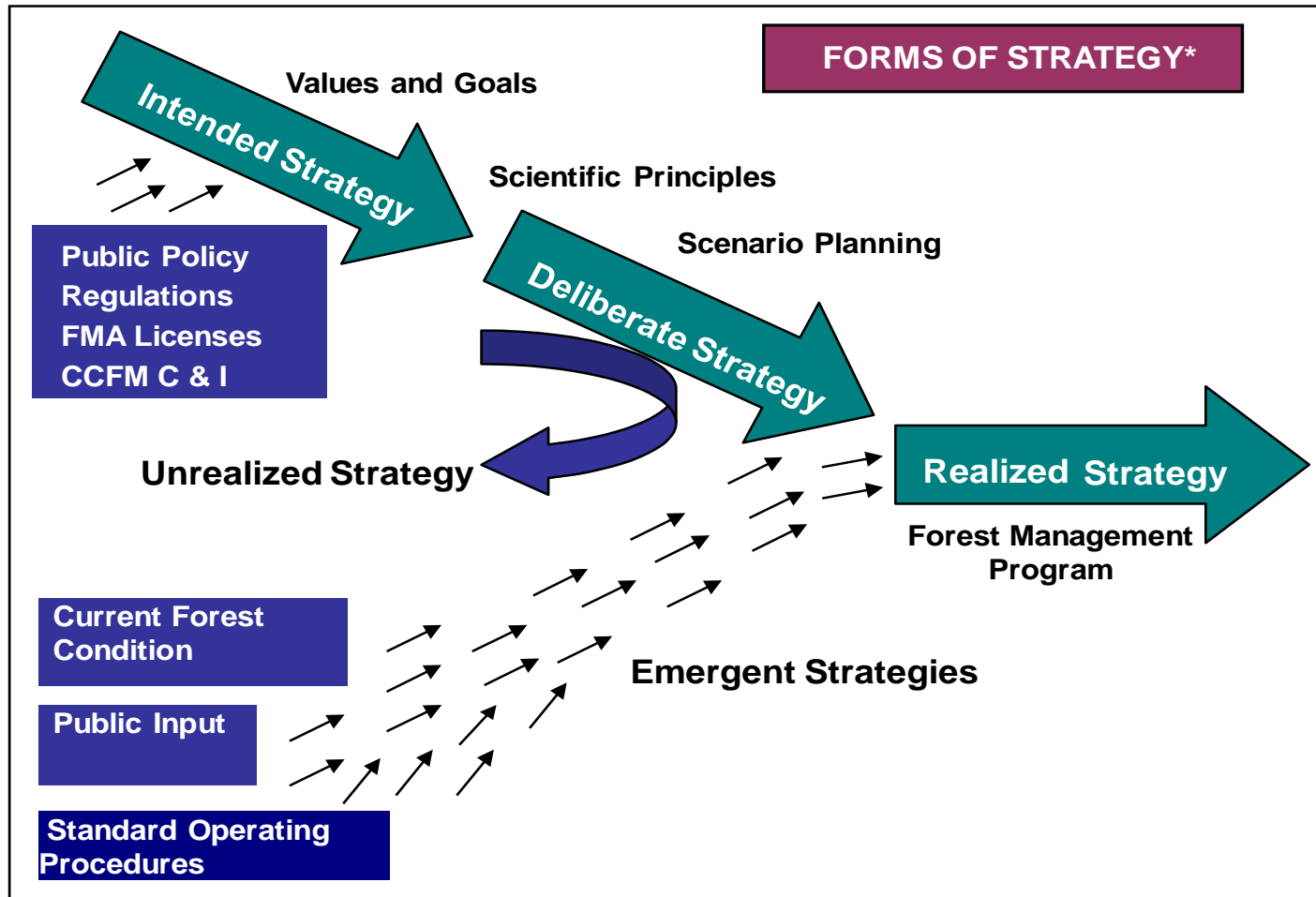
Hinton, Alberta



There is no Single Approach

Ha-haaa!!





Mintzberg (1994) The Rise and Fall of Strategic Planning.

Exactly what is it you want to do?

- 1. Integrate some disturbance pattern indicators and targets into strategic forest management.**
- 2. Develop a realistic set of disturbance pattern metrics and targets for operational for. management.**
- 3. Integrate a comprehensive list of natural pattern indicators at all levels of forest management over time.**
- 4. Use natural patterns as the starting point for forest management planning across jurisdictions.**
- 5. Develop land use plan options using ecosystem health (via natural patterns) as the foundation.**

1. Integrate some natural patterns and targets into strategic forest management.

Billy Bob's Approach

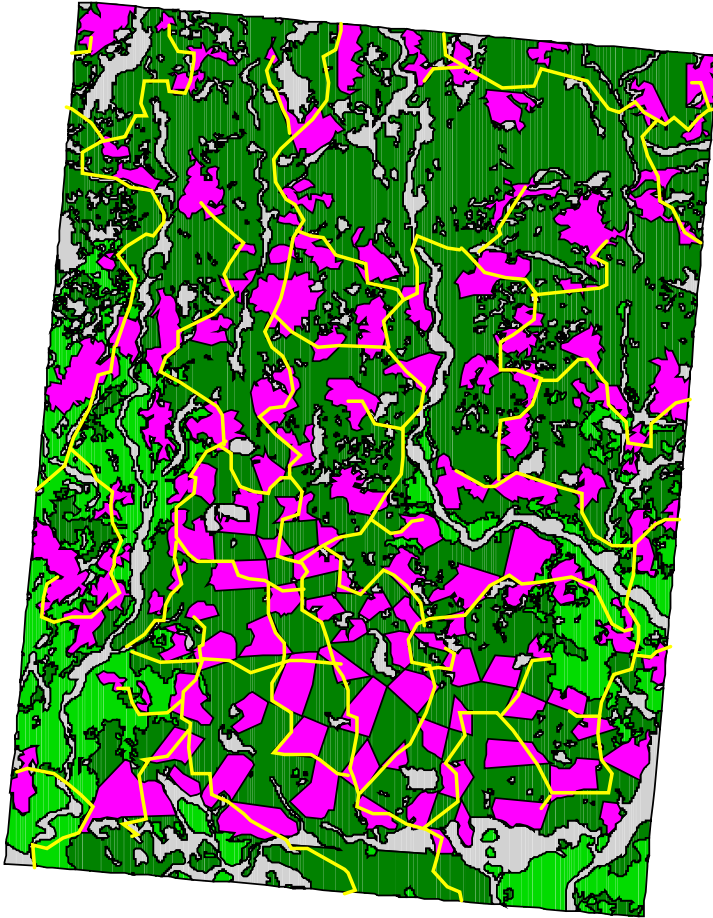
- 1) Do some research (read some 'Quicknotes'),**
- 2) Identify a natural pattern metric that is easy (disturbance event size),**
- 3) Identify a single target limit that is do-able and within the natural range (2,000 ha),**
- 4) Insert as a new fixed target indicator into existing planning and monitoring systems.**

2. Develop a realistic set of disturbance pattern metrics and targets for operational for. management.

Mistik Management's Approach

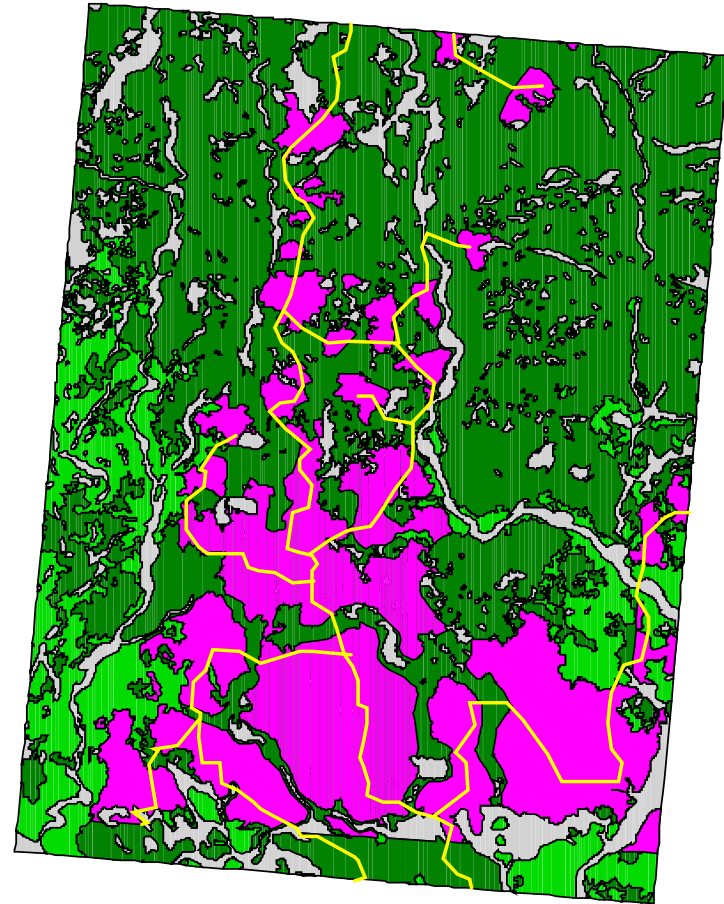
- 1) Initiate and support local research at the operational scale.**
- 2) Identify a pilot study opportunity.**
- 3) Design a more “natural” harvest plan based on 4-5 natural pattern metrics.**
- 4) Provide information to, and solicit input, from stakeholders.**
- 5) Monitor, adjust, & integrate into company policy.**

The Mistohay Experiment



Traditional Plan

2,680 ha in 129 blocks.
Patch size = 3 – 65 ha.
Disturbance edge = 326 km.
122 km of roads.
Cost ??



"Natural" Plan

2,678 ha in 31 blocks.
Patch size = 1 – 1,104 ha.
Disturbance edge = 167 km.
5 km of roads
Cost ??



3. Integrate a comprehensive list of natural pattern indicators at all levels of forest management over time.

Dudley Biomass Inc.'s Approach:

- **Identify your regime.**
- **Identify the gaps.**
- **Identify the possibilities.**
- **Identify the priorities.**
- **Identify the limiting factors.**
- **Identify reality (overlay).**
- **Identify the “how?”**

1. Identify Your Regime

Attribute

Natural

Frequency

Decades

Interval

n/a

Regularity

Highly Variable

Extent

Tiny to Huge

Form

Convolutated

Intensity

High

Relationships

Few

Severity

High

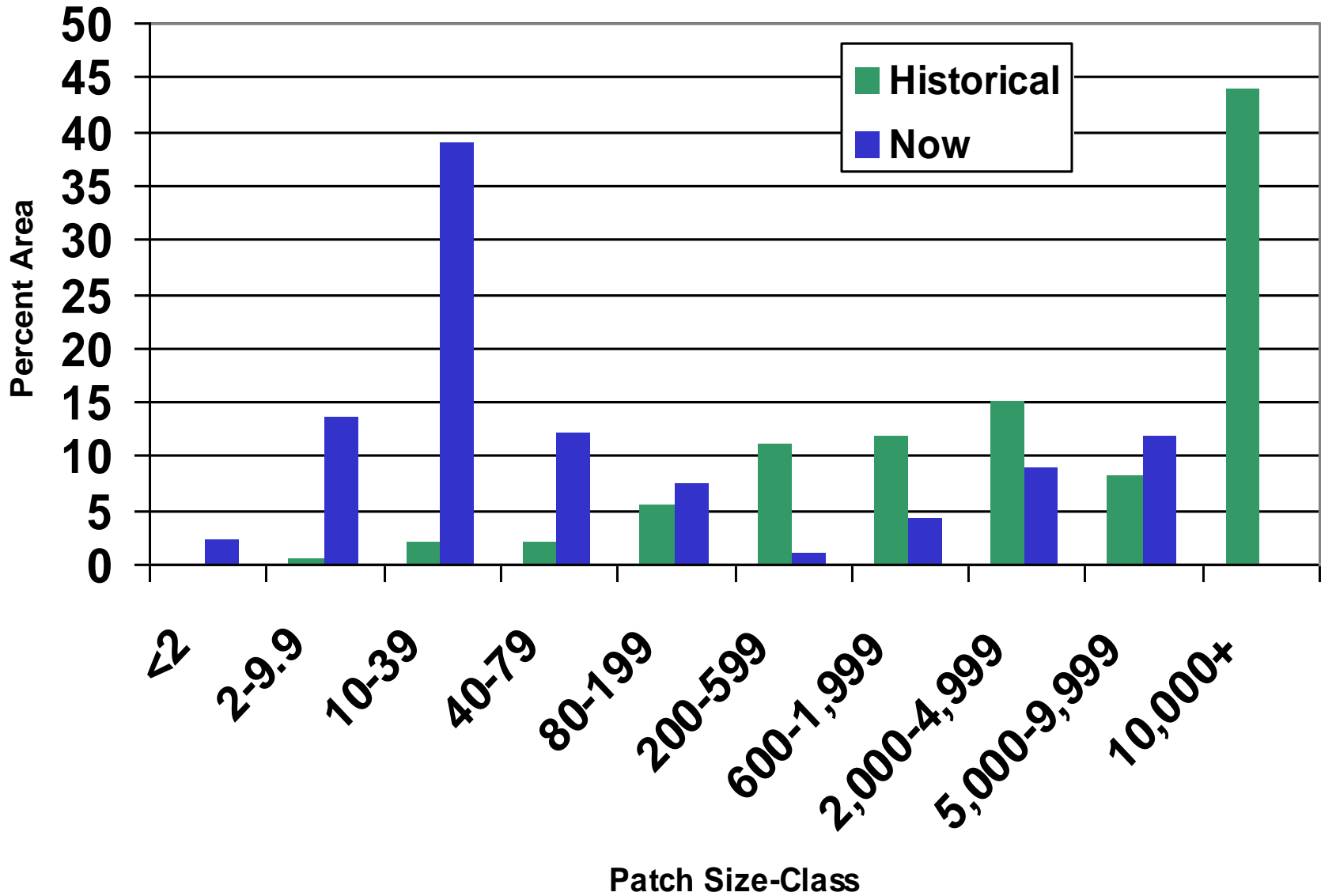
Time

Immediate

2. Identify the Gaps

<u>Attribute</u>	<u>Natural</u>	<u>Current</u>
Frequency	Decades	Decades
Interval	n/a	n/a
Regularity	Highly Variable	Very Regular (T&S)
Extent	Tiny to Huge	Small
Form	Convolutated	Simple
Intensity	High	Extreme
Relationships	Few	Many
Severity	High	Extreme
Time	Immediate	Immediate to long

Disturbance Sizes



3. Identify the Possibilities

<u>Attribute</u>	<u>Natural</u>	<u>Current</u>	<u>Change?</u>
Frequency	Decades	Decades	n/a
Interval	n/a	n/a	n/a
Regularity	Highly Variable	Very Regular (T&S)	V. difficult
Extent	Tiny to Huge	Small	Possible
Form	Convolutated	Simple	Possible
Intensity	High	Extreme	Difficult
Relationships	Few	Many	Possible
Severity	High	Extreme	Possible
Time	Immediate	Immediate to long	Maybe...

4. Identify the Priorities

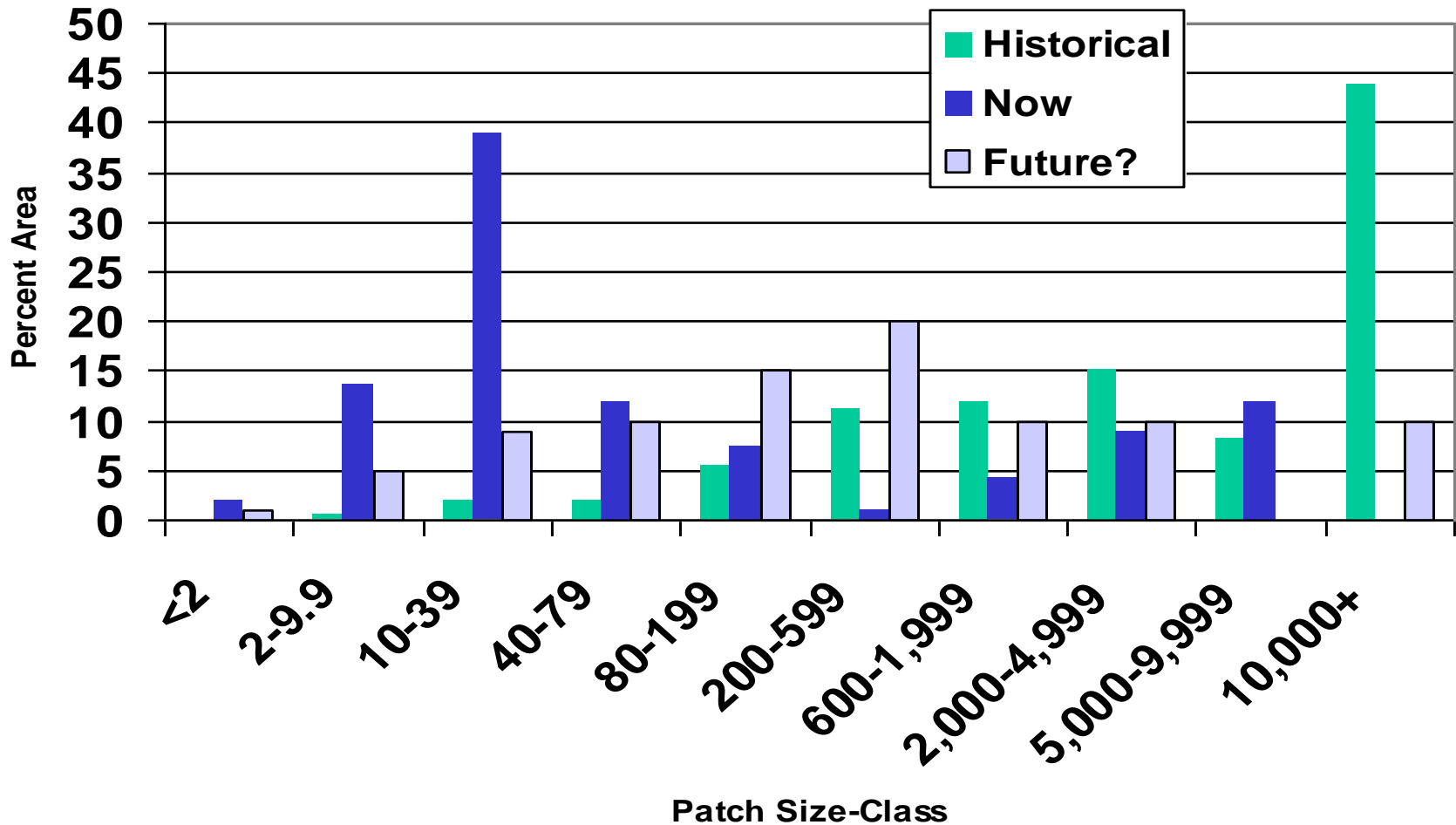
<u>Attribute</u>	<u>Natural</u>	<u>Current</u>	<u>Change?</u>
Frequency	Decades	Decades	n/a
Interval	n/a	n/a	n/a
Regularity	Highly Variable	Very Regular (T&S)	V. difficult
<u>Extent</u>	<u>Tiny to Huge</u>	<u>Small</u>	<u>Possible</u>
Form	Convolutated	Simple	Possible
<u>Intensity</u>	<u>High</u>	<u>Extreme</u>	<u>Difficult</u>
<u>Relationships</u>	<u>Few</u>	<u>Many</u>	<u>Possible</u>
<u>Severity</u>	<u>High</u>	<u>Extreme</u>	<u>Possible</u>
<u>Time</u>	<u>Immediate</u>	<u>Immediate to long</u>	<u>Maybe...</u>

5. Identify the limiting factors.

- **Forest Mgmt. = removal of tree boles.**
- **Public comfort levels.**
- **Product mix.**
- **Reducing / minimizing roads is *potentially* socially treacherous.**
- **Existing regulations (utilization, safety, aesthetics, fine filter habitat, etc).**

6. Identify Reality

Disturbance Sizes



7. Identify the “how?”

- **Replace the traditional block size upper limits with a range of disturbance size targets based on step 6.**
- **Add in an indicator for total residual levels using quartiles of NRV from research.**
- **etc....**

4. Use natural patterns as the starting point for forest management planning across jurisdictions.

For Example: The Hwy40 North Demonstration Project

Use available NRV knowledge as the foundation for a cross-jurisdictional disturbance plan implemented within the existing planning systems, policies, and practices.

Monitoring System

Planning System

Grizzly Bear

Old growth

Nat. Dist Patterns

Fire threat

Birds

Access & Roads

Outfitting

Aesthetics

Riparian zones

Wood costs

Planning & Monitoring System

**Grizzly
Bear**

**Old
growth**

Outfitting

**Wood
costs**

Birds

**Access
&
Roads**

**Riparian
zones**

Aesthetics

**Fire
threat**

A Natural Disturbance Pattern Foundation

The Hwy40 North Demonstration Project

0 2 4 8 Kilometers

02-May-2002

1:288,494

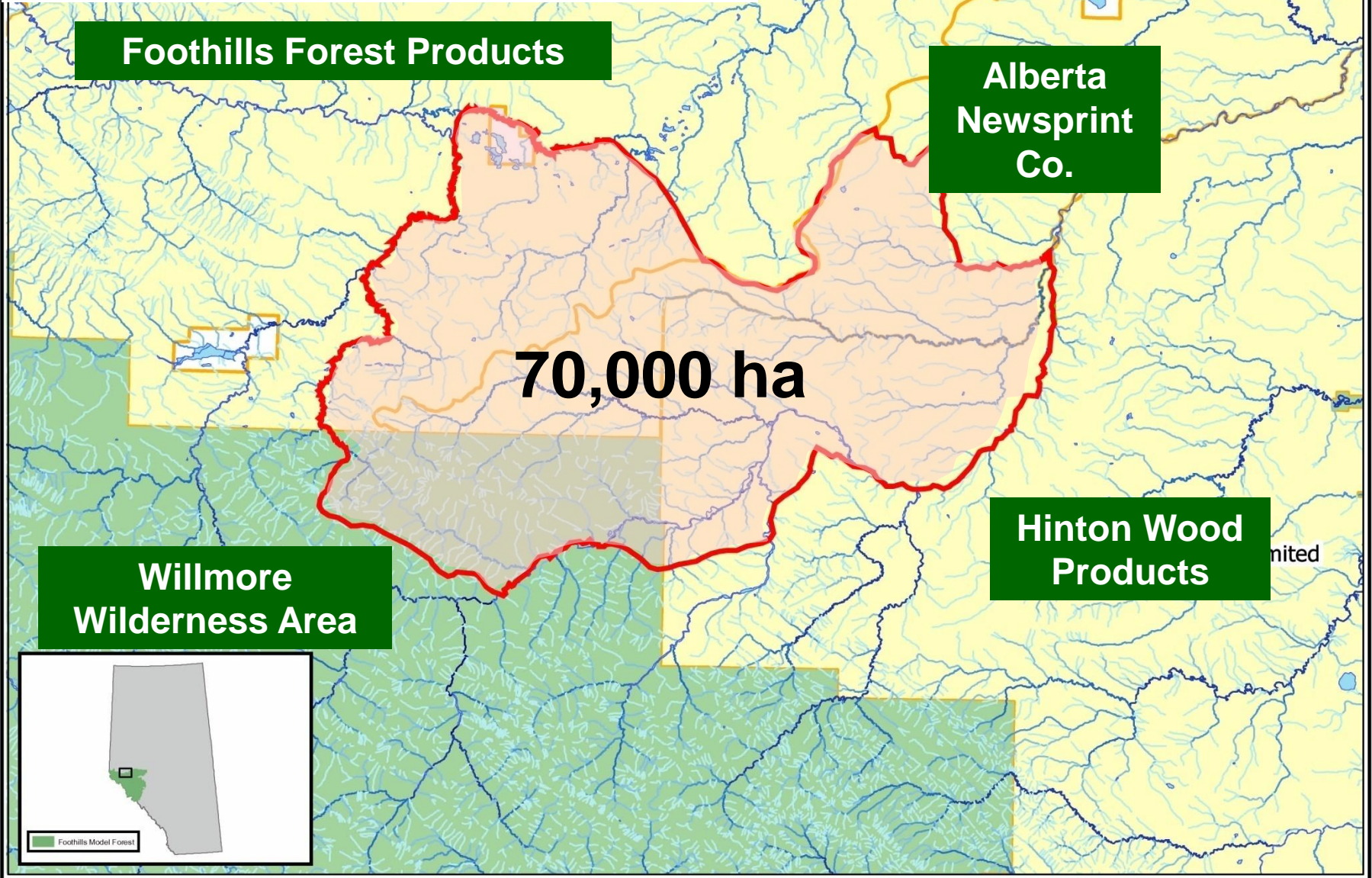
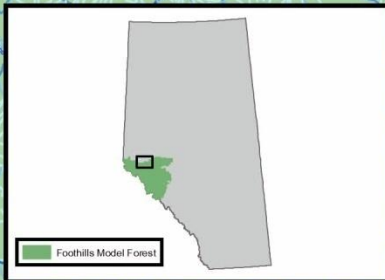
Foothills Forest Products

**Alberta
Newsprint
Co.**

70,000 ha

**Hinton Wood
Products**

**Willmore
Wilderness Area**



Key Features:

- One **disturbance plan**.
- Developed a new **planning process**.
- **Planning indicators**.
- Commitment to **adaptive monitoring**.
- Tested consistency of existing tools, systems and frameworks.

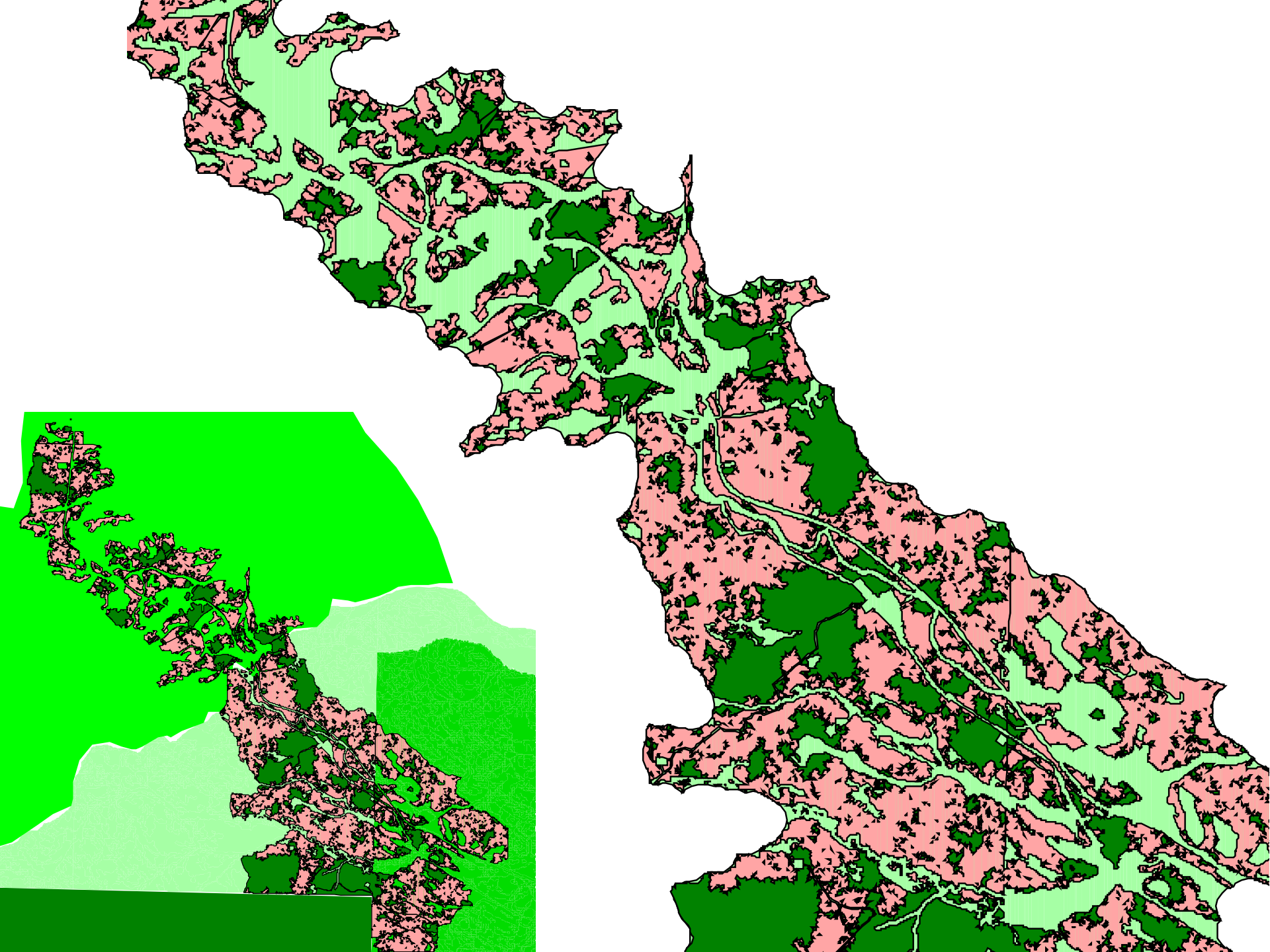
TOOLS

SYSTEMS

The Hwy40 Planning Process:

For each decision:

- 1. What is the natural range of variation (NRV)?**
- 2. What is the current range of variation (CRV)?**
- 3. Why is NRV different than CRV?**
- 4. What management objectives or policies would converge or conflict with moving towards NRV in this case?**
- 5. (How) can we move towards NRV from CRV?**



Status:

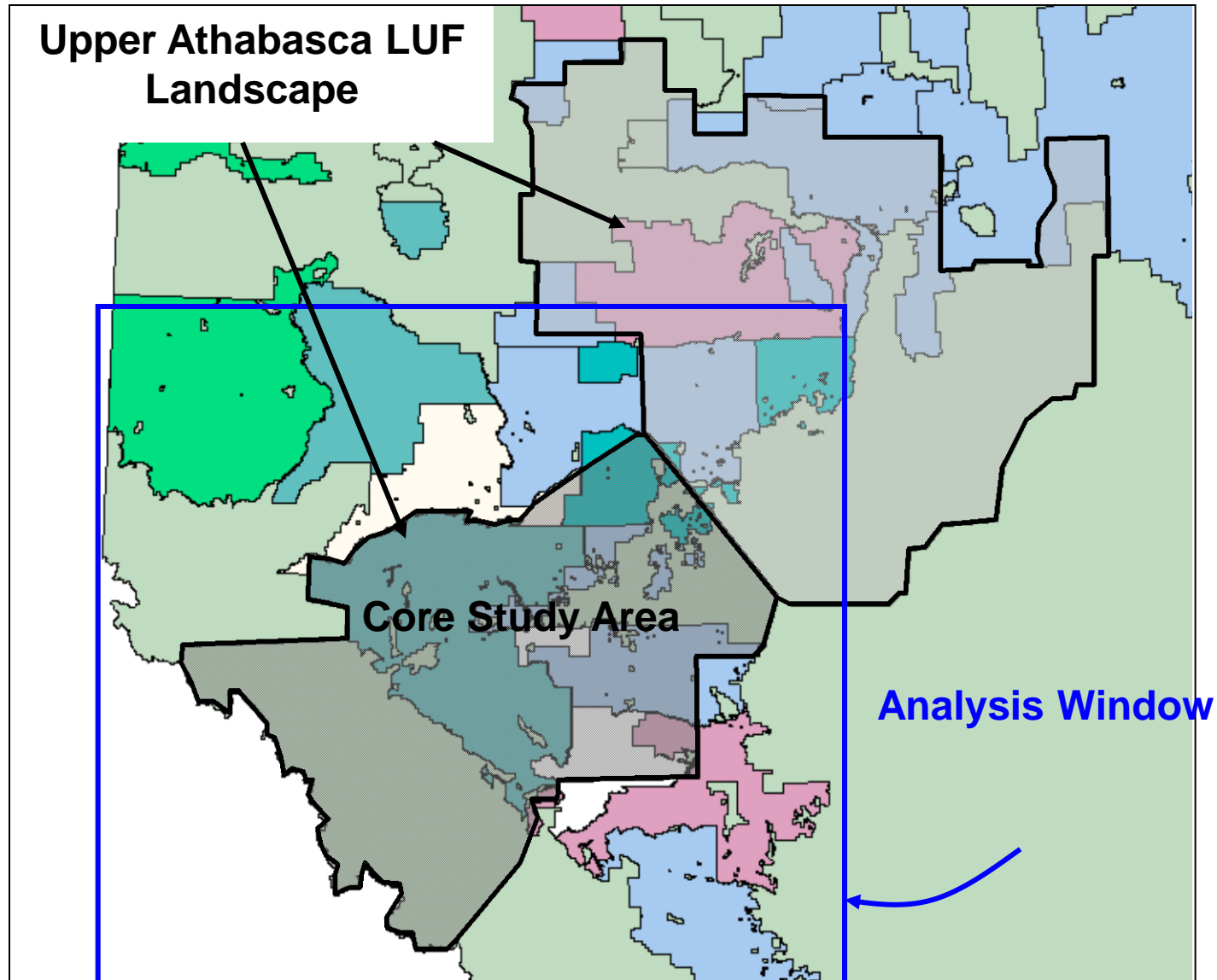
- The plan has a large number of natural features.
- Plans for harvesting and burning are nearly done, but in limbo.
- Limited influence on activities of non-forest management agencies.
- Has its own monitoring strategy & funding.
- Conceptual buy in was high, but some partners balked at the output / team decision.

5. Develop land use plan options using ecosystem health (via natural patterns) as the foundation.

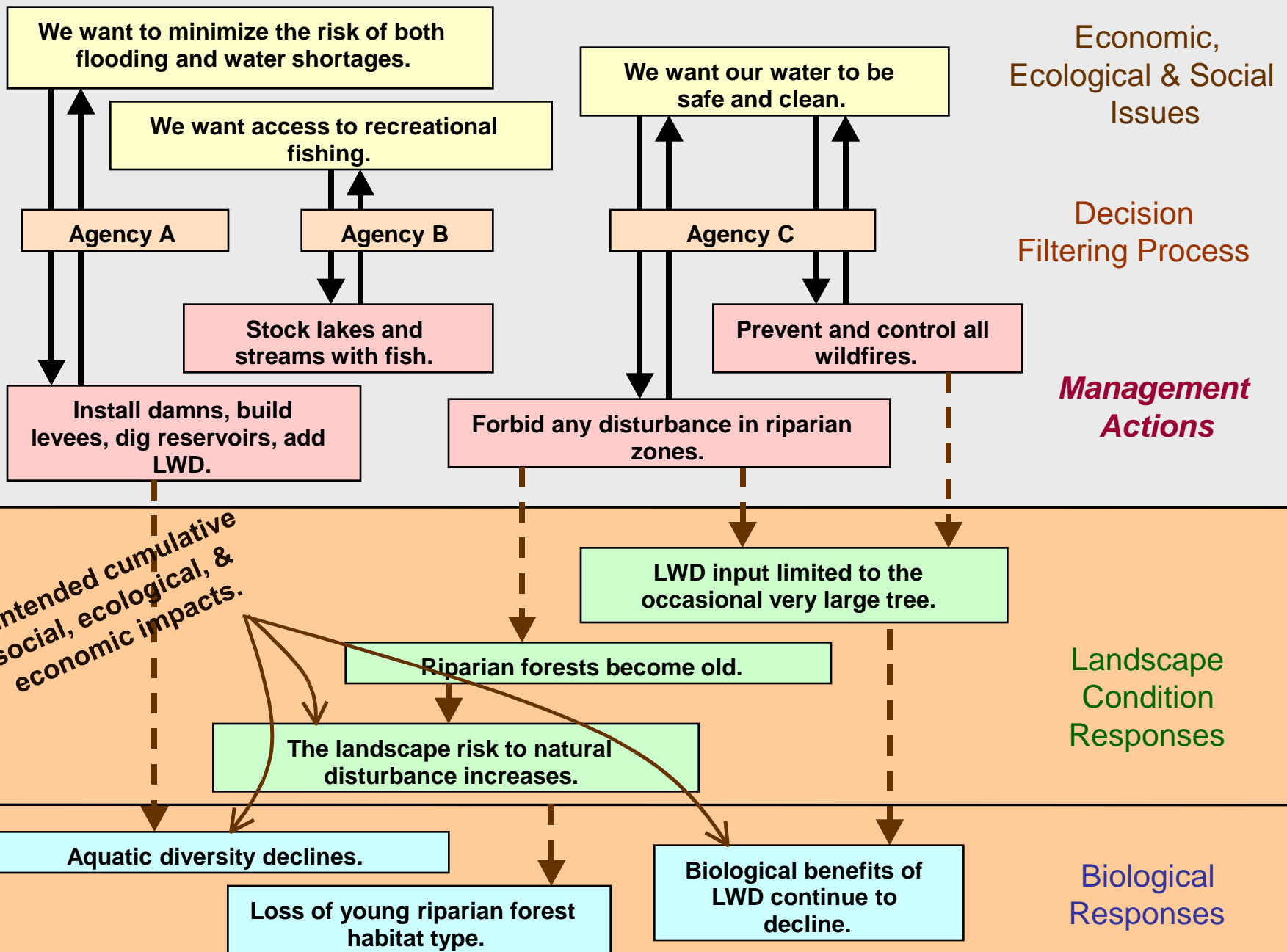
The “Healthy Landscapes” FRI Project

- **Conceptual backdrop for generating “healthy” land use disturbance design options at sub-regional scales.**
- **Independent from, but linked to the LU folks.**
- **Land, water, forest, non-forest – everything.**
- **Pilot study 10 million ha, 20 partners, so far.**
- **Creating some supporting Tools and Systems.**

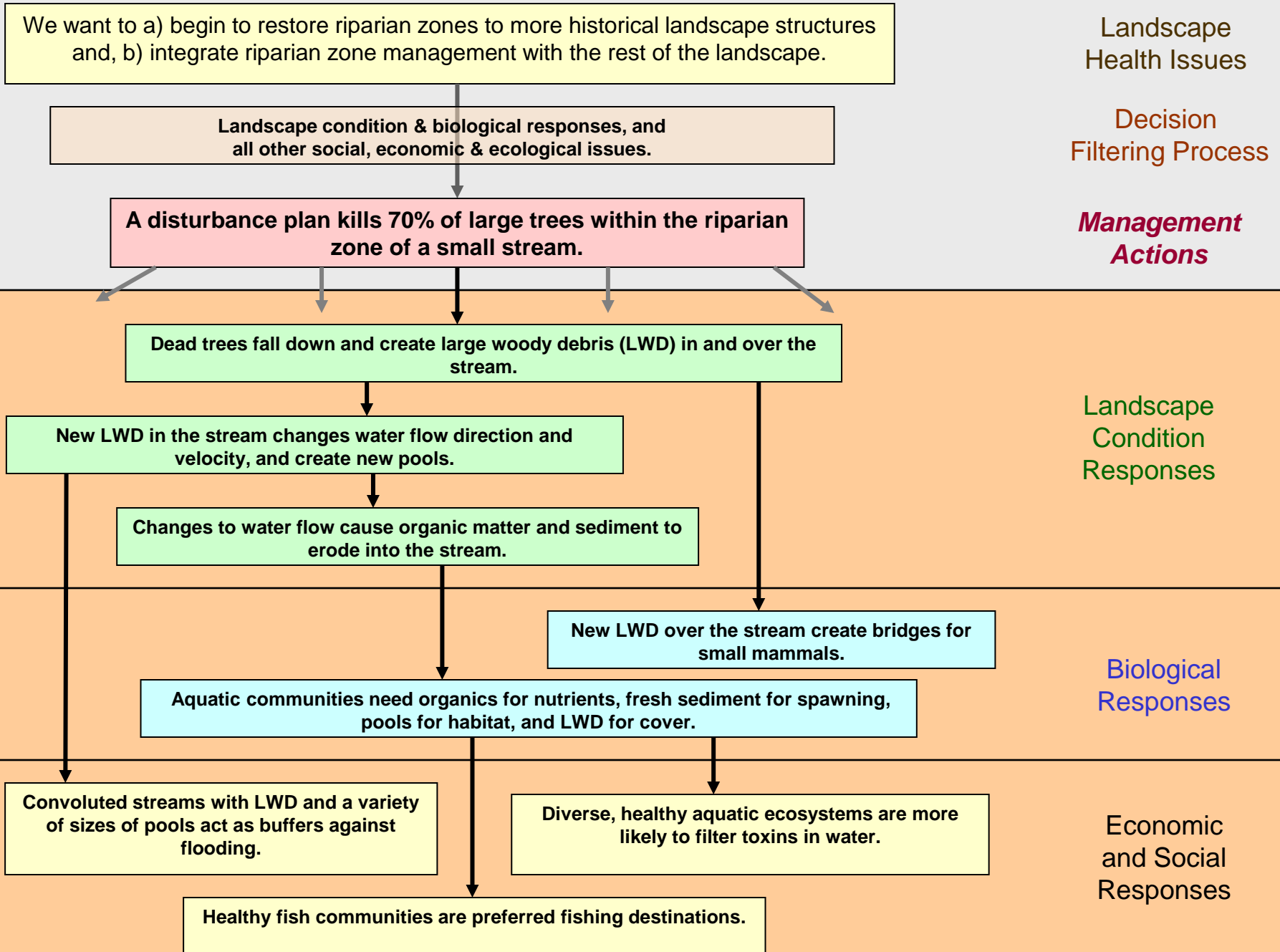
The FRI HL Demonstration Project



Example of the Traditional Land Management Process.



Example of a Healthy Landscape Management Process.



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

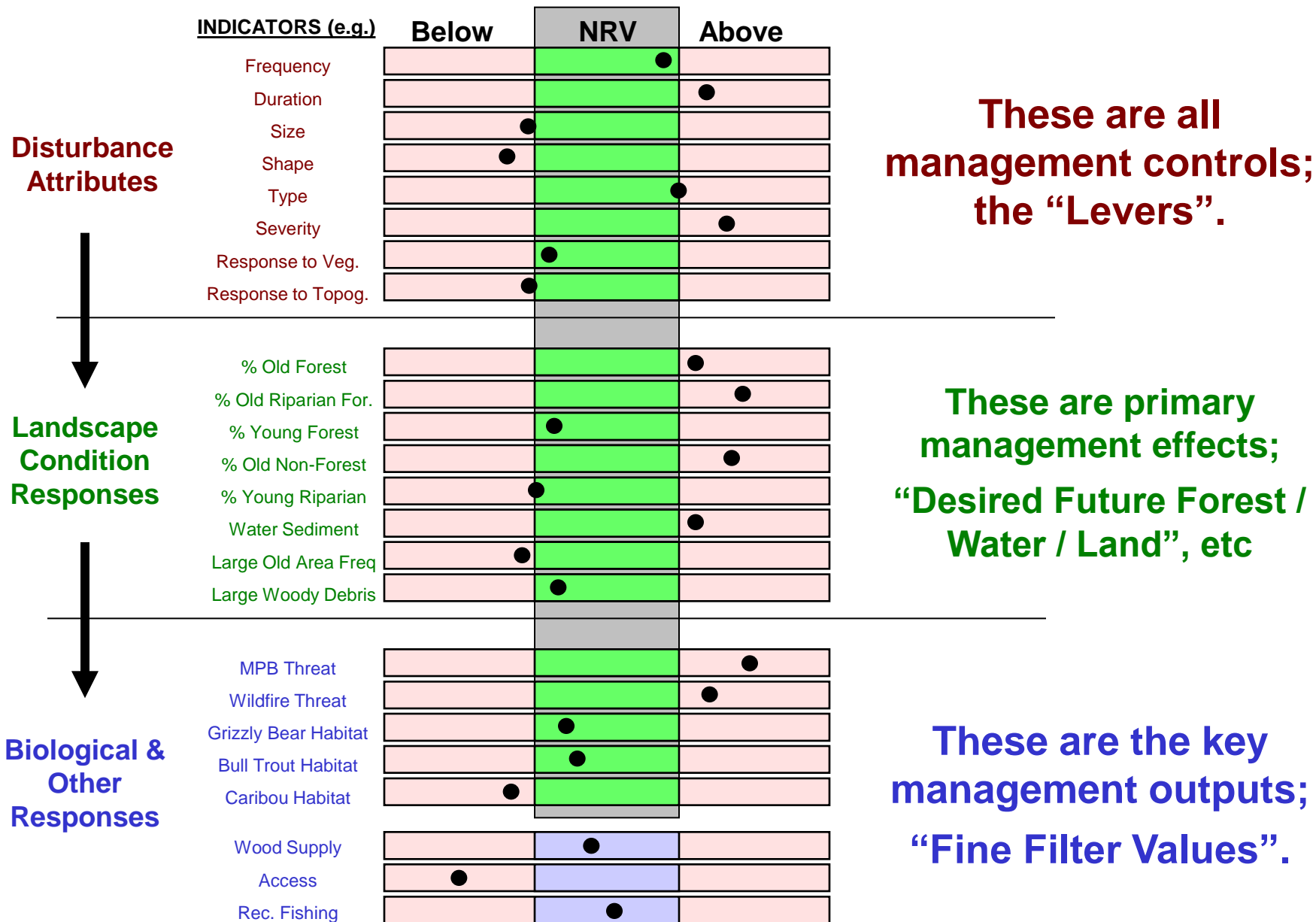
- Fire risk
- MPB risk
- Water quality
- Caribou habitat
- Grizzly bear habitat...

Economic and Social Consequences

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

(Adapted from: D.W. Andison, L. Van Damme, D. Hebert, T. Moore, R. Bonar, S. Boutin, and M. Donnelly. 2009. *The healthy landscape approach to land management*. Foothills Research Institute Natural Disturbance program, Hinton, Alberta. January, 2009.)

The HL Three Box Model

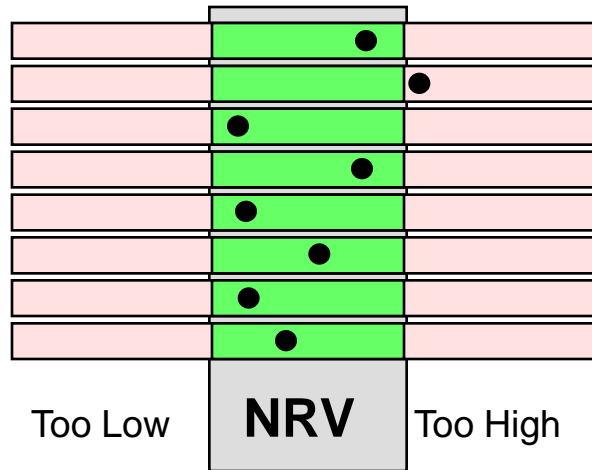


Landscape 1 is “Healthier” than Landscape 2

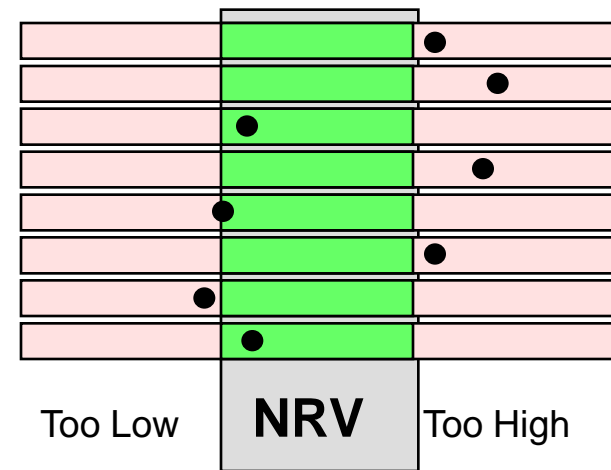
Indicator

Frequency
Duration
Size
Shape
Type
Severity
Response to Veg.
Response to Topog.

Landscape 1



Landscape 2

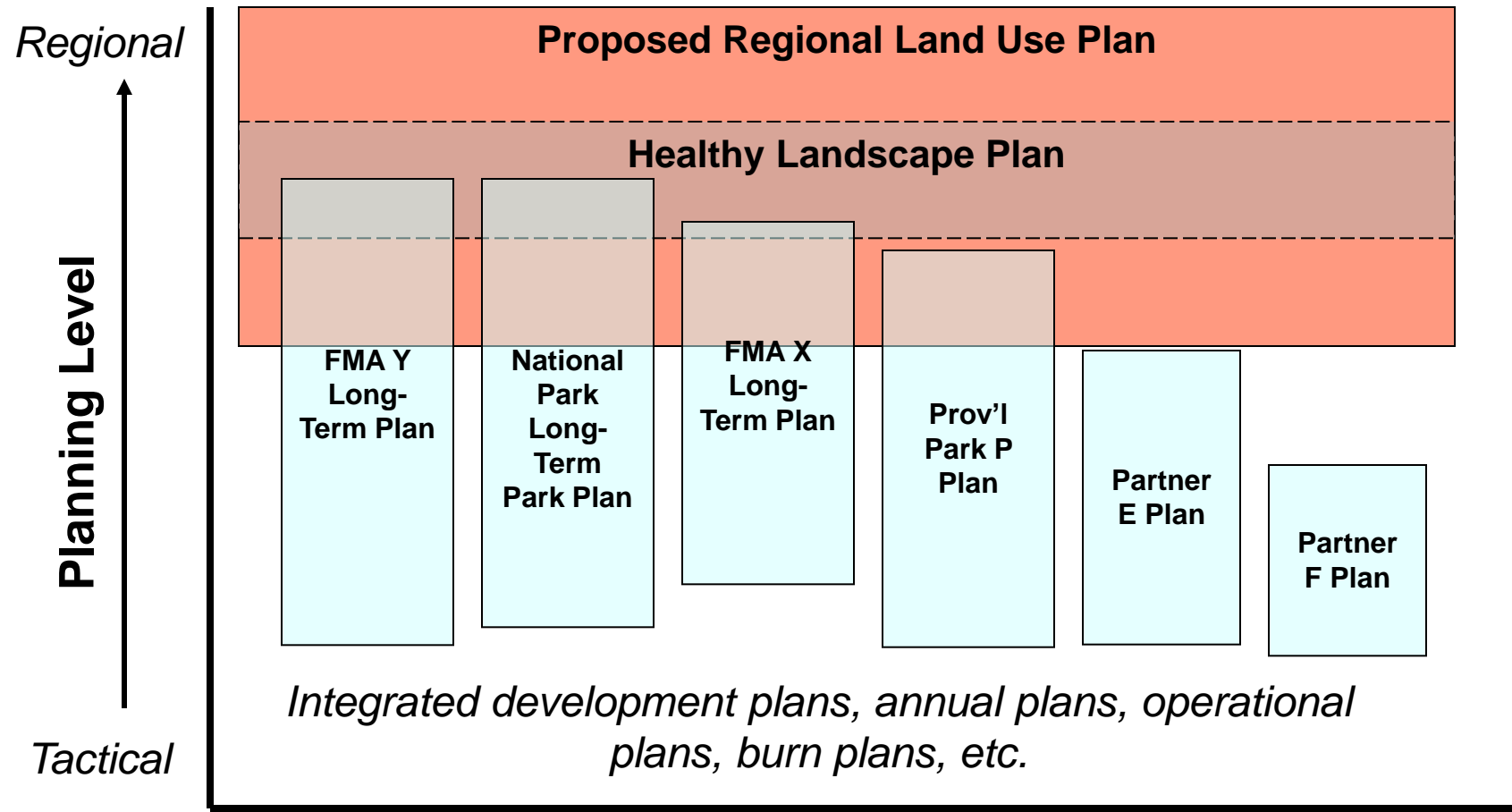


Green = Measurable Historical Range

Red = Beyond Historical Range

Black Dots = Current (point, range)

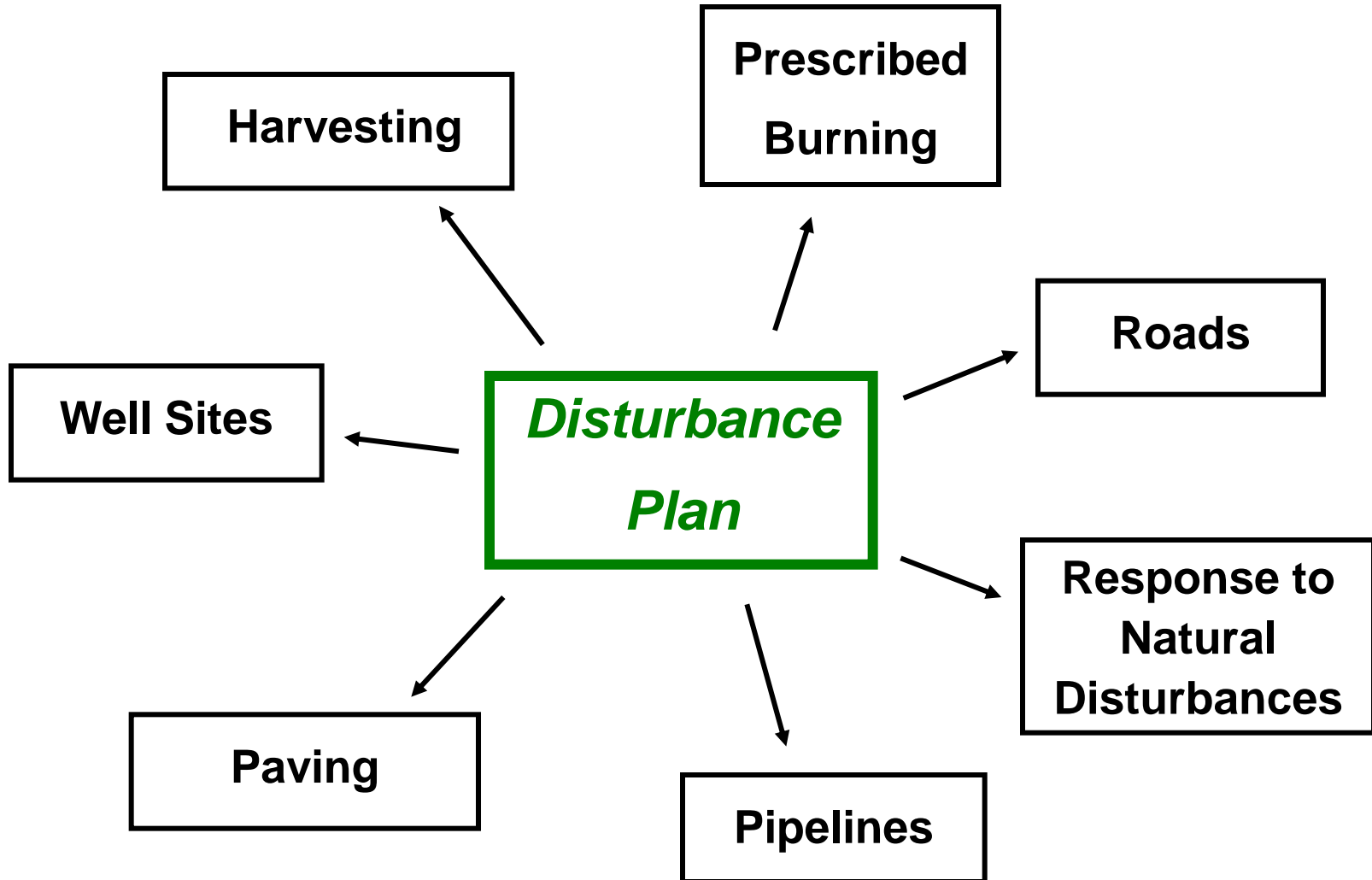
A Healthy Landscape Plan in Context



Partnership Base for the Landscape

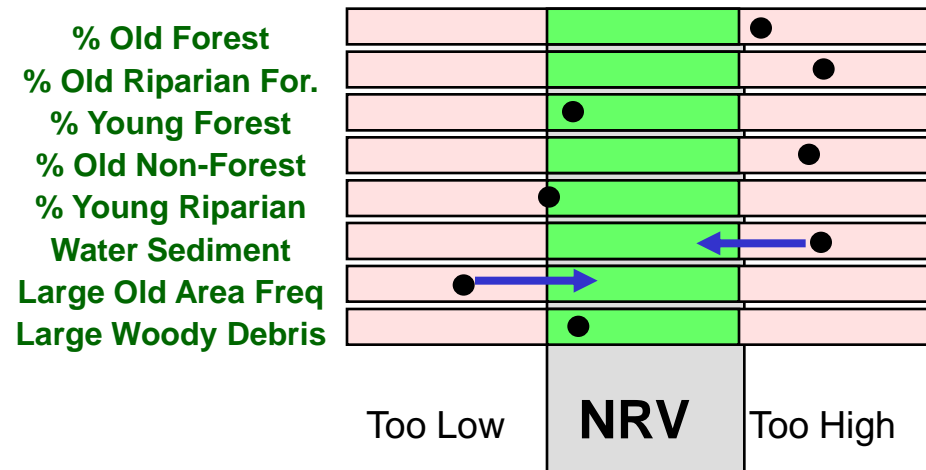
Management Plan = Disturbance Plan

Management Tools = Harvesting, PB's etc.



Management Goal = Landscape Health

Management Objectives = Direction and distance of blue arrows



The point is not to get all of the dots in the green zone. The green zone represents natural thresholds, beyond which there are risks.

***Is any one of these “better”
than another?***