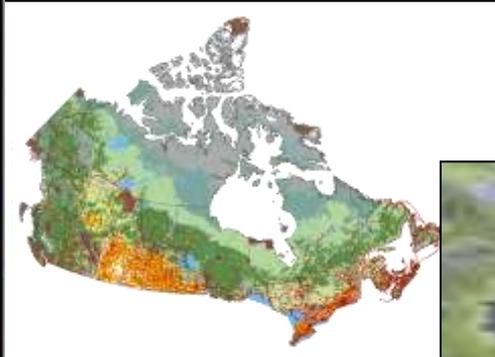
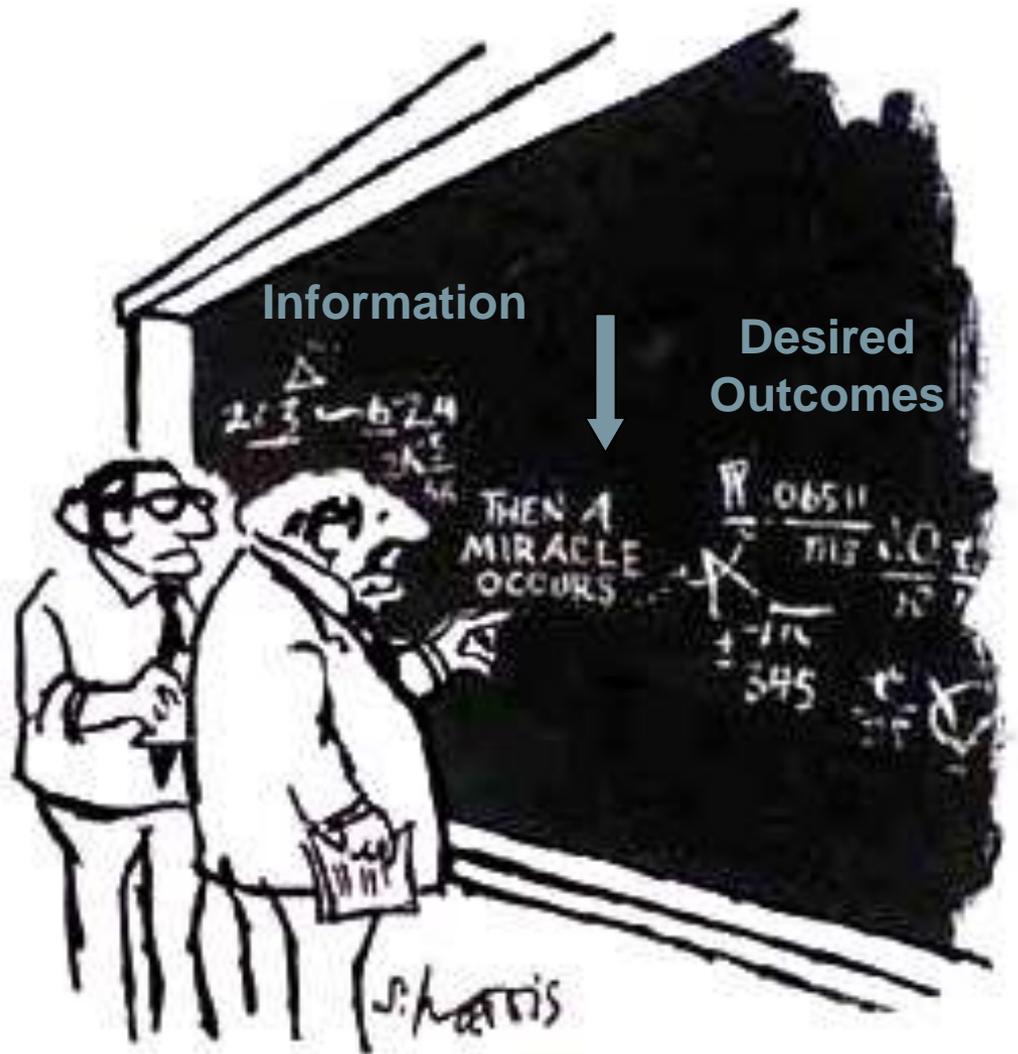


Approaches to Conservation Assessment for Regional Planning



Fiona Schmiegelow
University of Alberta
Dawson, Jan.18, 2012

... intelligent tinkering



"I THINK YOU SHOULD BE MORE EXPLICIT
HERE IN STEP TWO."



*"So what's the problem here fellas?
C'mon now -- it's only rocket science!"*

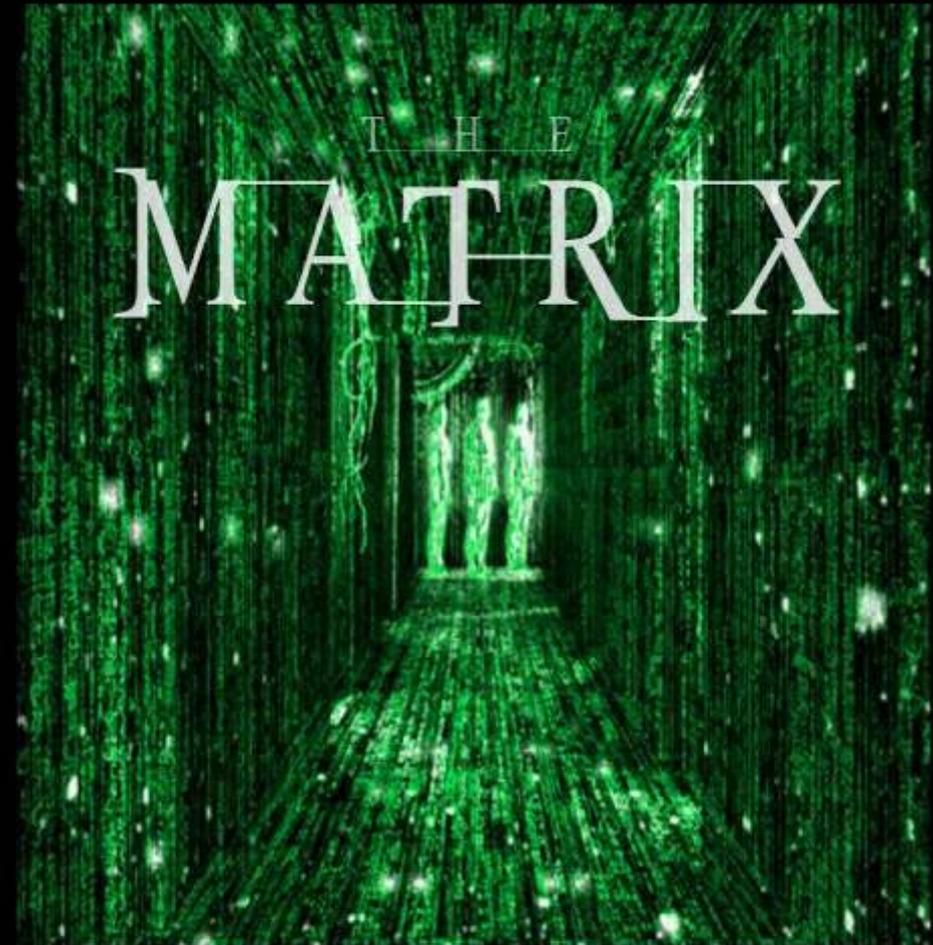
Two ships in the night...



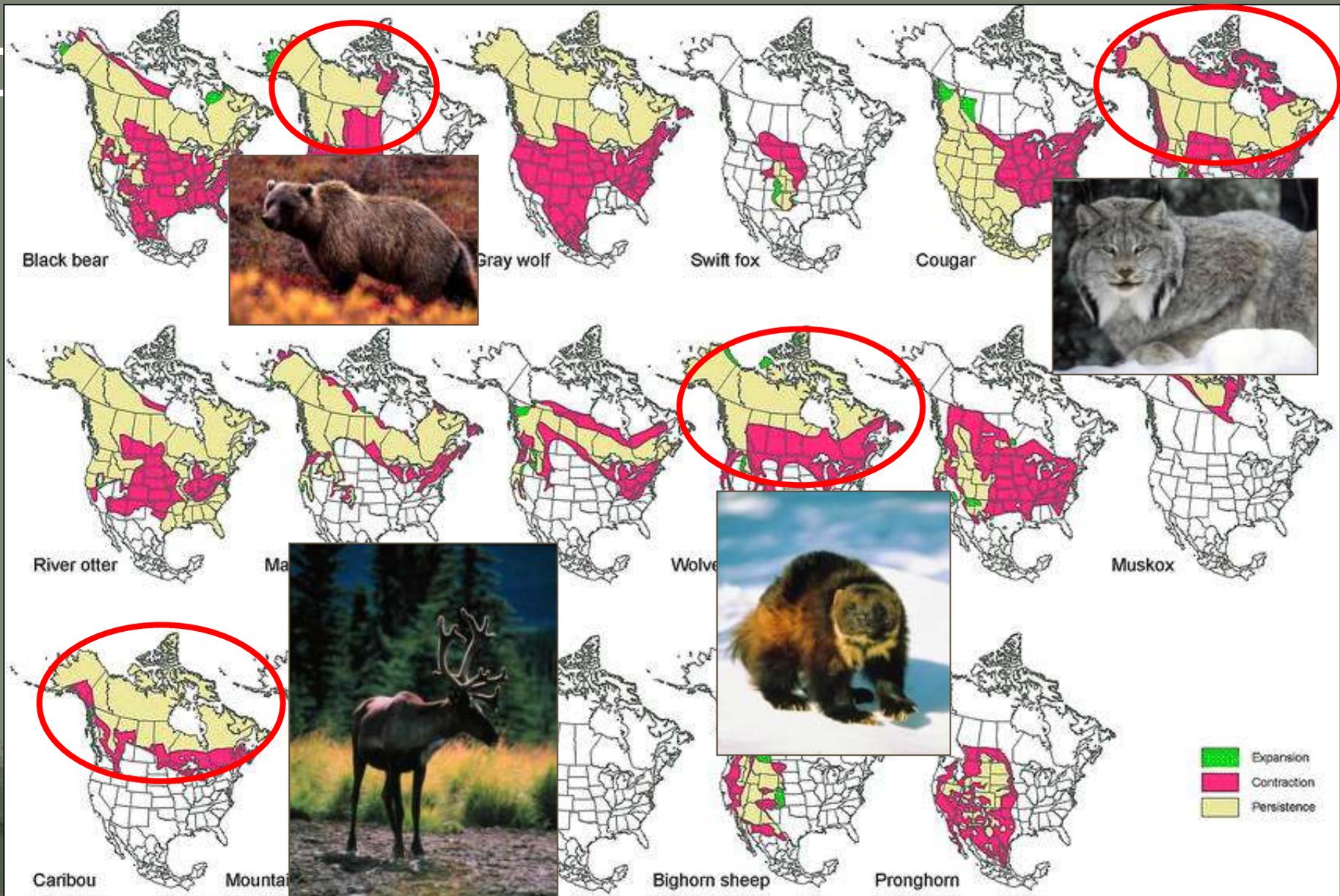
Conservation

Resource
Management

Paradigms in Conservation



Closer to home... range contractions of large mammals throughout North America





Functioning predator/prey communities – a global rarity



Key ecological processes still shape landscapes at large scales



What is the “matrix”?

“A situation or surrounding substance within which something else originates, develops, or is contained.”

“That which gives form or origin to anything.”

“An enclosure within which something originates or develops (from the Latin for womb)”

\Ma"trix\, n.; pl. Matrices. [L., fr. mater mother. See Mother.] 1. (Anat.) The womb.

Reactive vs. Pro-active Planning



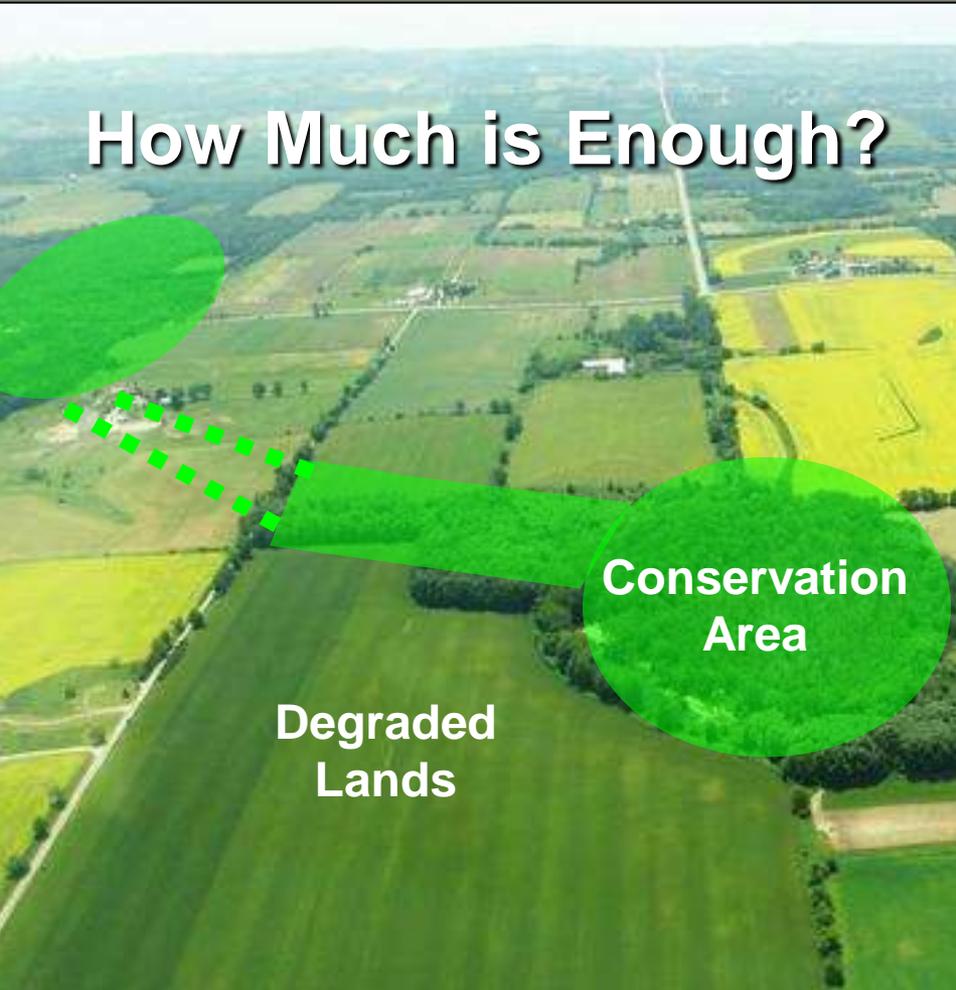
Managing for Scarcity



Managing for Abundance

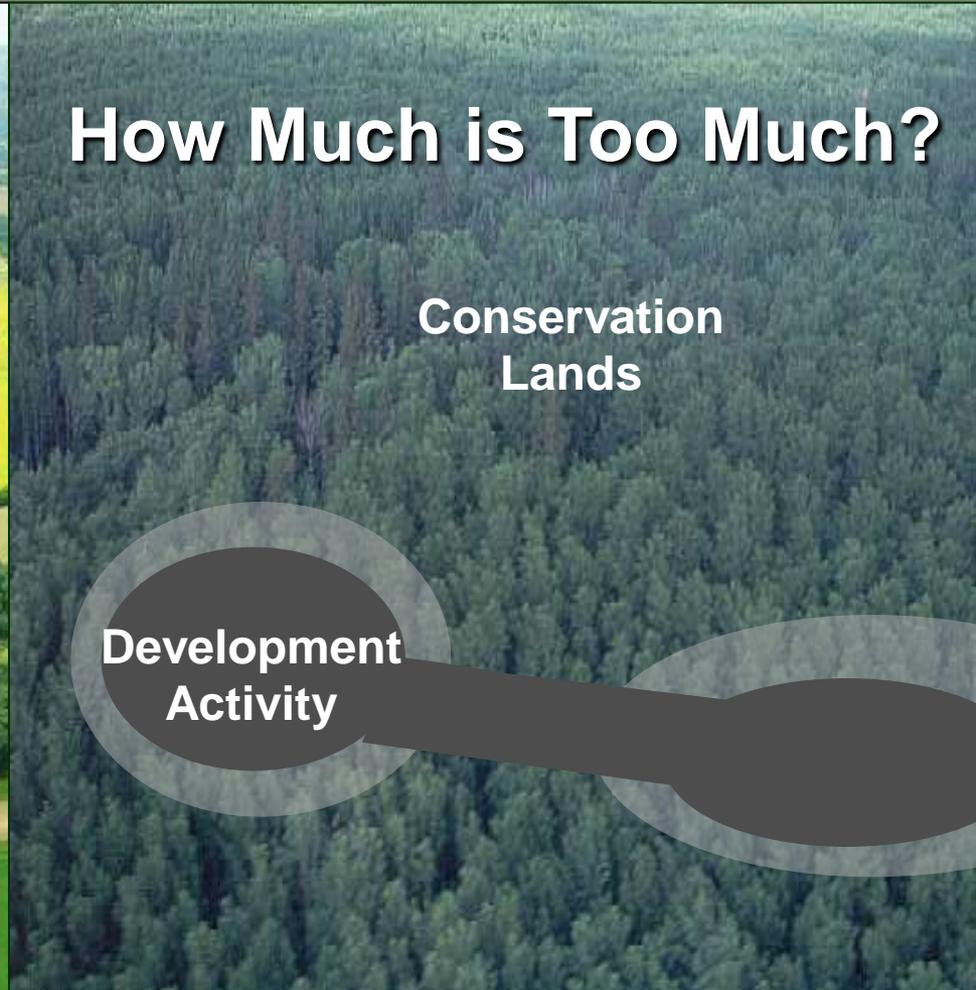
Paradigms in Conservation

How Much is Enough?



Classic Conservation Model

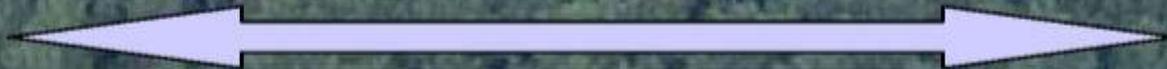
How Much is Too Much?



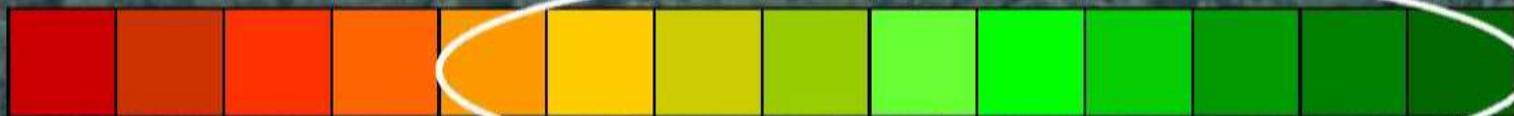
Conservation Matrix Model



Altered



Intact



Domain of Sustainability ?

“Landscapes of
Regret”

“Landscapes of
Opportunity”

Sustainability... the final frontier



Sustainability as a Grand Experiment



Many Uncertainties

- knowledge of systems is incomplete
- natural environmental variability is high
- responses to resource development are often unknown
- climate change
- socially acceptable levels of risk vary



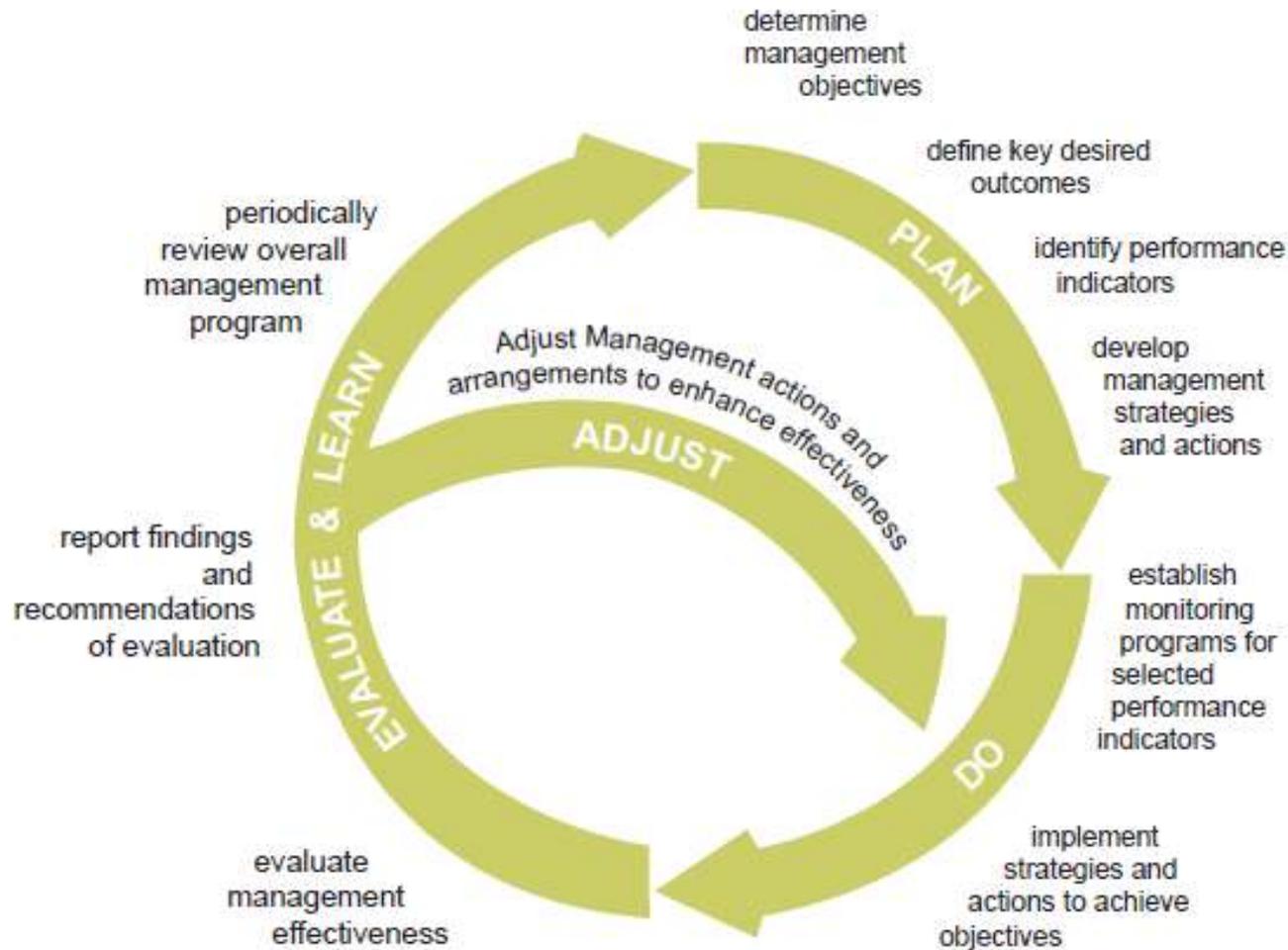
Adaptive Management

What is Adaptive Management?

A structured process of learning that recognizes that unknowns and uncertainties exist in the course of achieving management goals, and that these increase risk, but should not be crippling.

- Support local economies and communities
- Avoid unintended outcomes
- Do not foreclose future opportunities (precautionary)
- Enhance learning by reducing uncertainties and identifying truly sustainable practices
- A foundation for land-use planning
- Conservation by design

The Adaptive Management Cycle



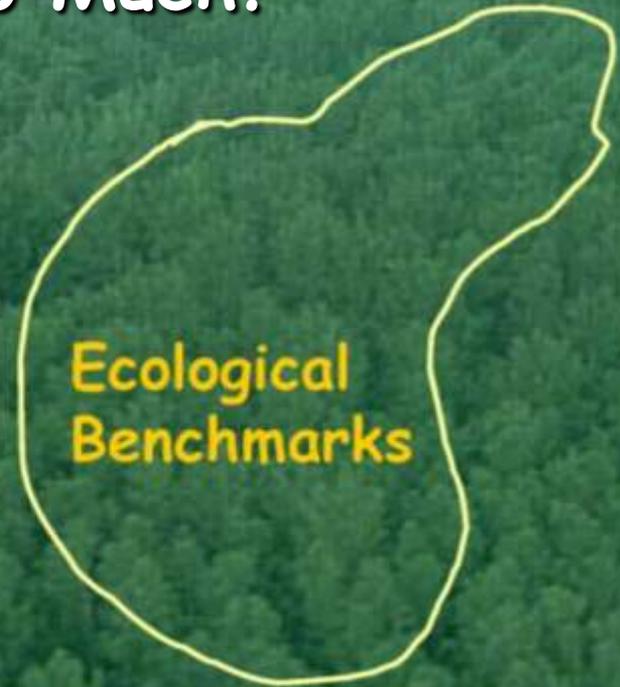
Treat management as experiments to increase knowledge, reduce uncertainty, and minimize risk

Management as Experiment / Conservation by Design – the Foundation

How Much is Too Much?



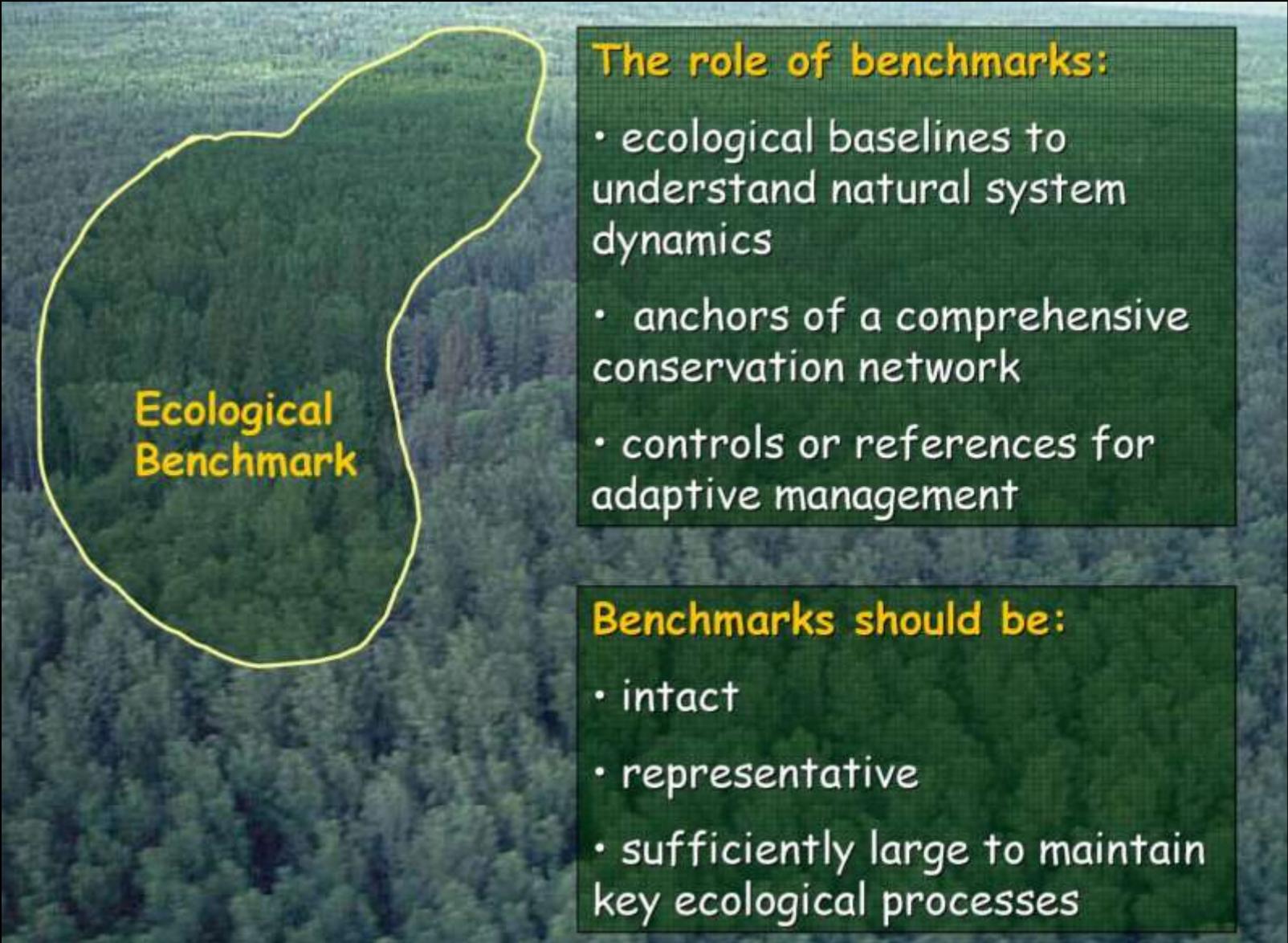
Management
experiments
require controls



Ecological
Benchmarks

How Much is Enough?

Roles and Properties of Benchmarks



**Ecological
Benchmark**

The role of benchmarks:

- ecological baselines to understand natural system dynamics
- anchors of a comprehensive conservation network
- controls or references for adaptive management

Benchmarks should be:

- intact
- representative
- sufficiently large to maintain key ecological processes

Science-based Planning for Broad-scale Conservation of Boreal Systems



Boreal Ecosystems Analysis
for Conservation Networks

Benchmarks Across the Boreal

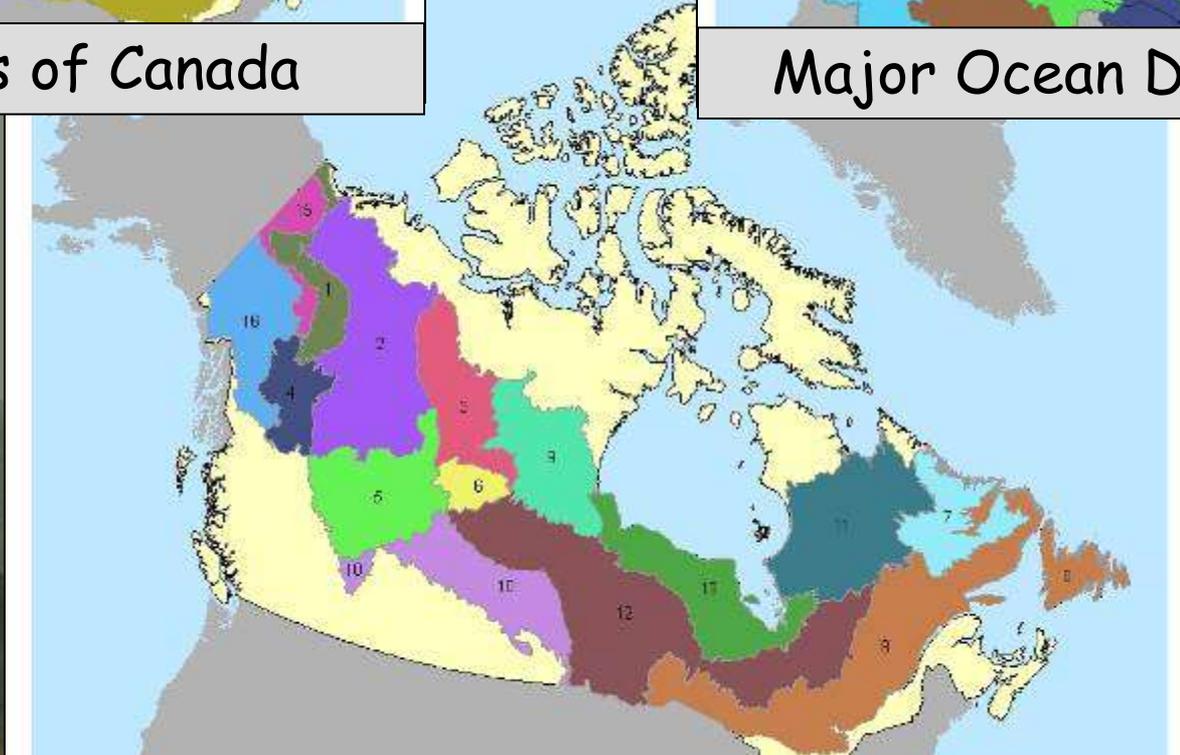




Ecozones of Canada



Major Ocean Drainages



Integrated Regional Planning Units

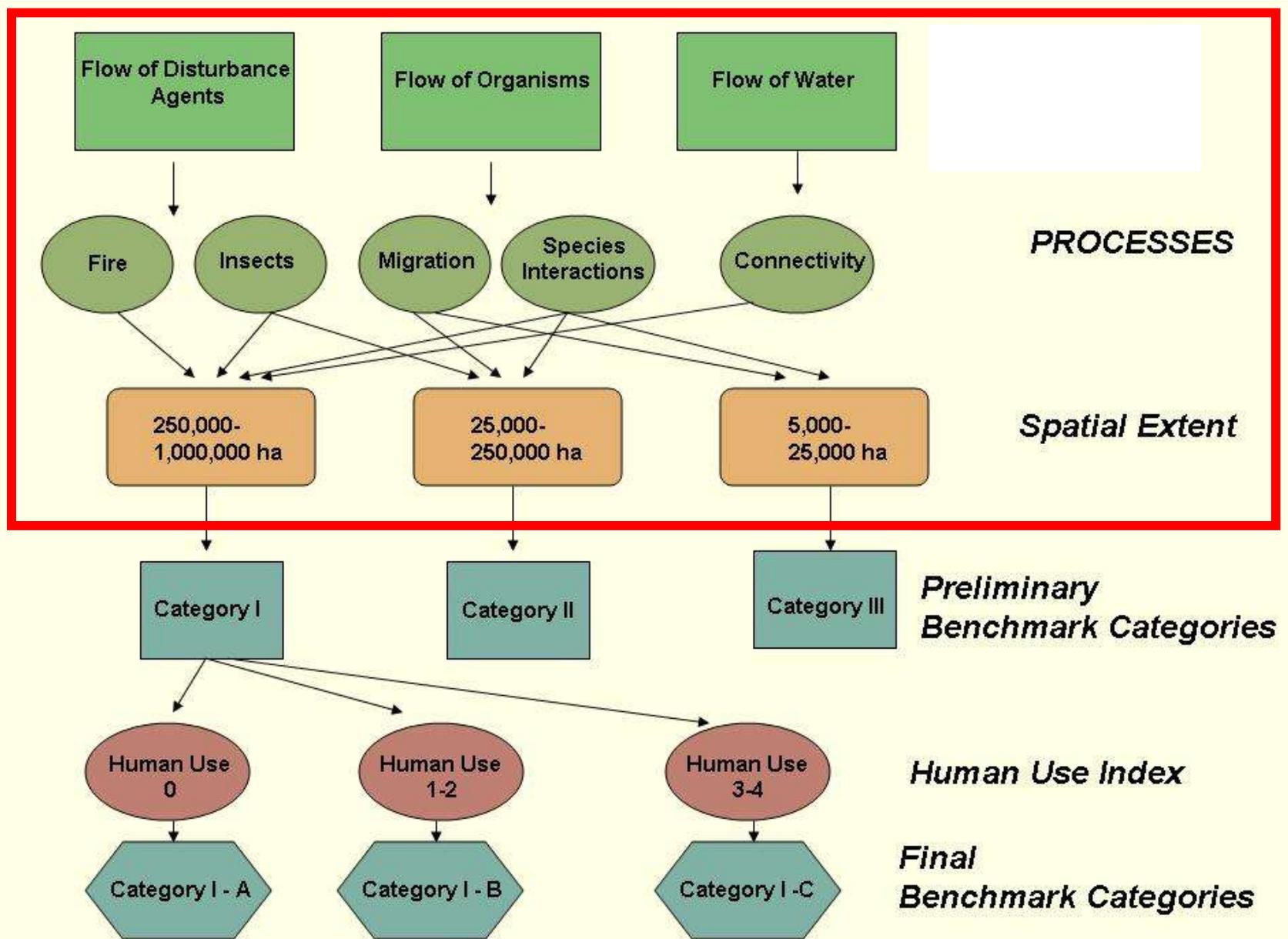
Water – flows that define landscapes



Natural Disturbance – processes that drive natural landscape change



Benchmarks – The Approach





Jared Hobbs



Jared Hobbs



Jared Hobbs



Gerry Kuzyk



Jared Hobbs

Addressing Species Needs

A focal species is simply the species that one focuses on after choosing from the suite of species of potential interest.

(Armstrong 2002)



Jared Hobbs



Jared Hobbs

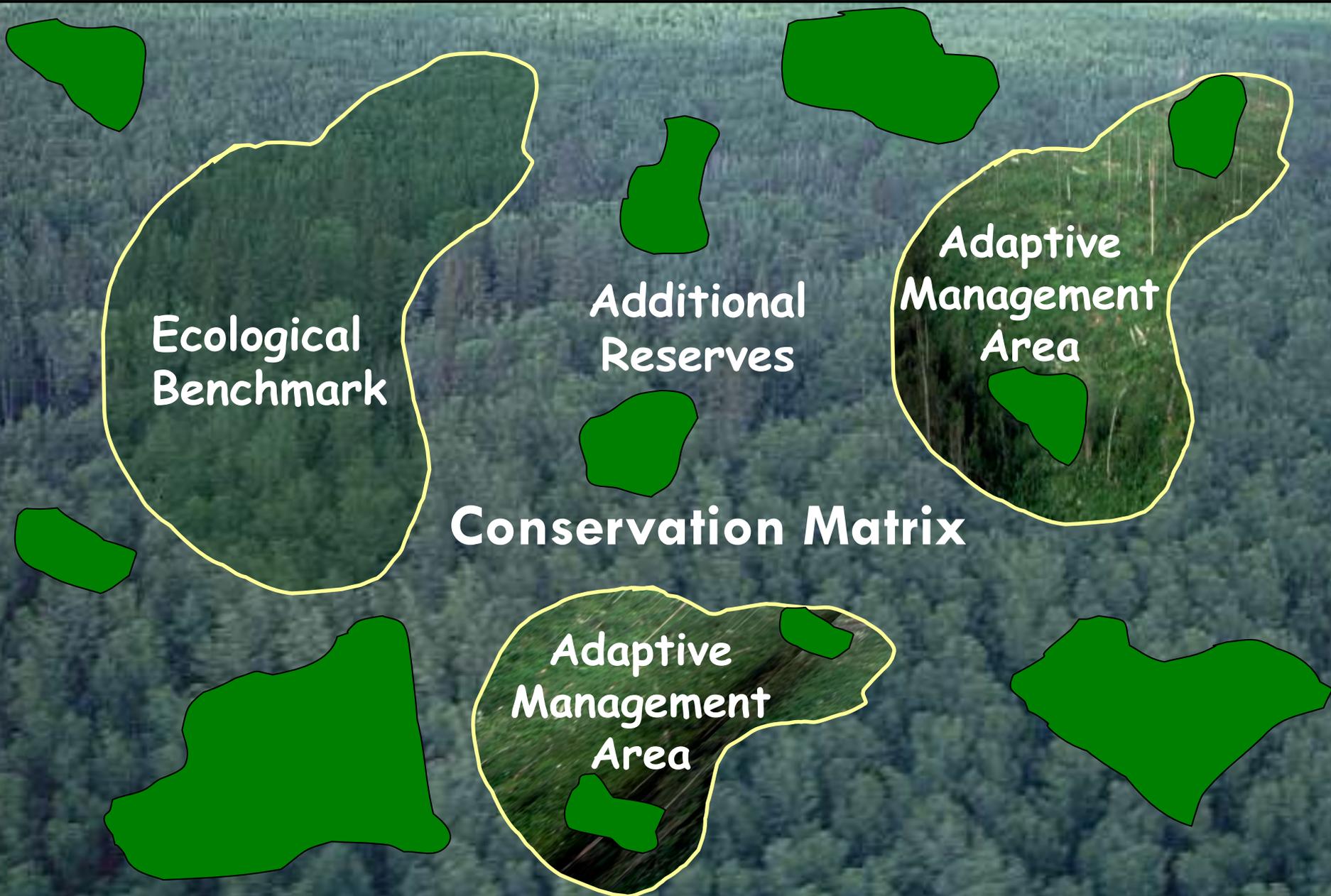


Jared Hobbs

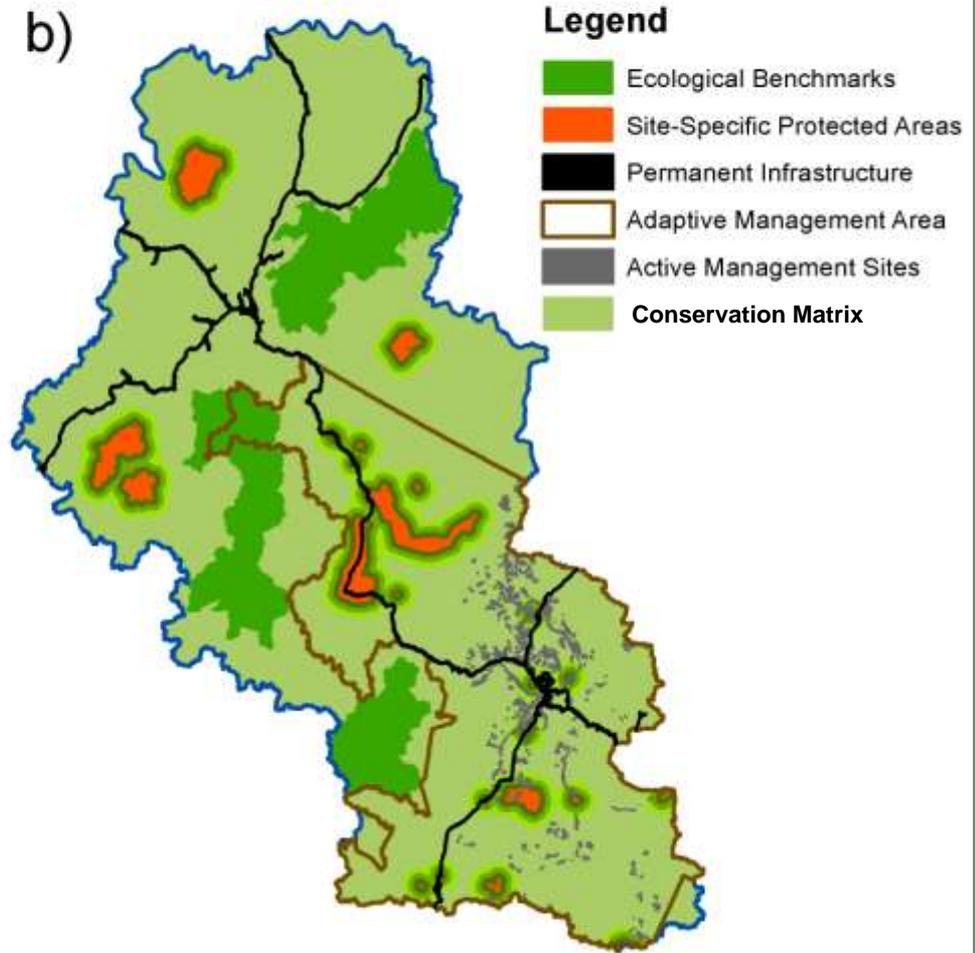
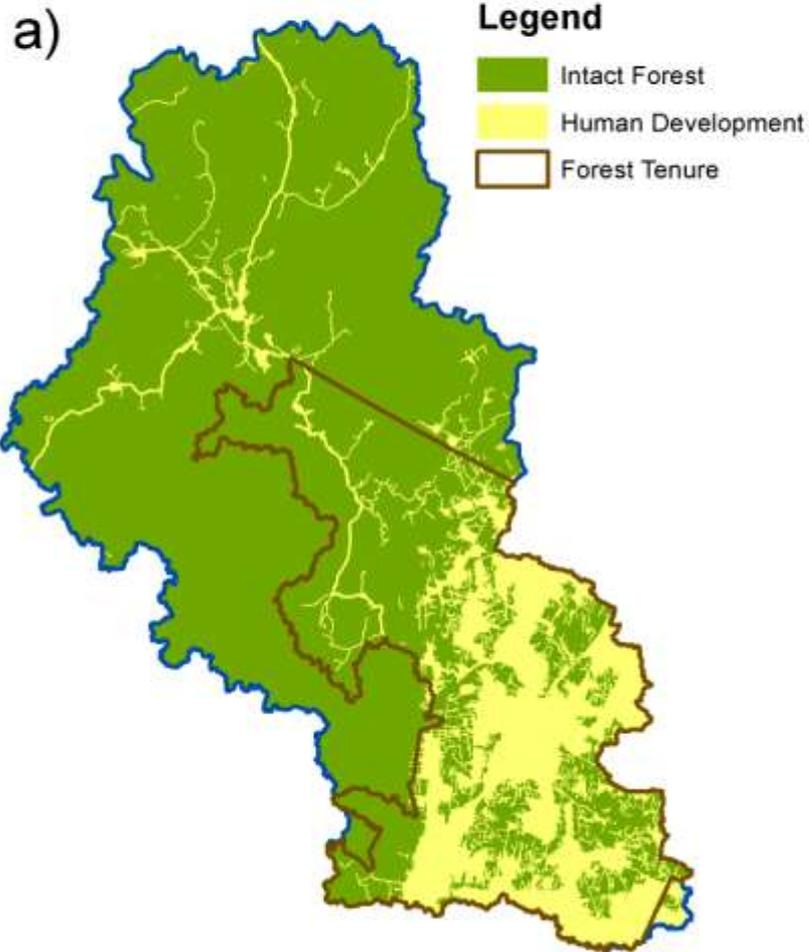


C. Rohner

The Conservation Matrix Model



Conservation Matrix Model) – An example from Northern BC



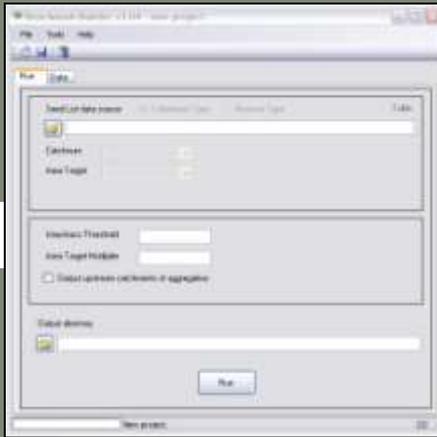
Critical Roles of the Matrix ...

- Supporting populations of species
- Facilitating the movement of organisms
- Buffering sensitive areas and reserves
- Maintaining the integrity of aquatic systems

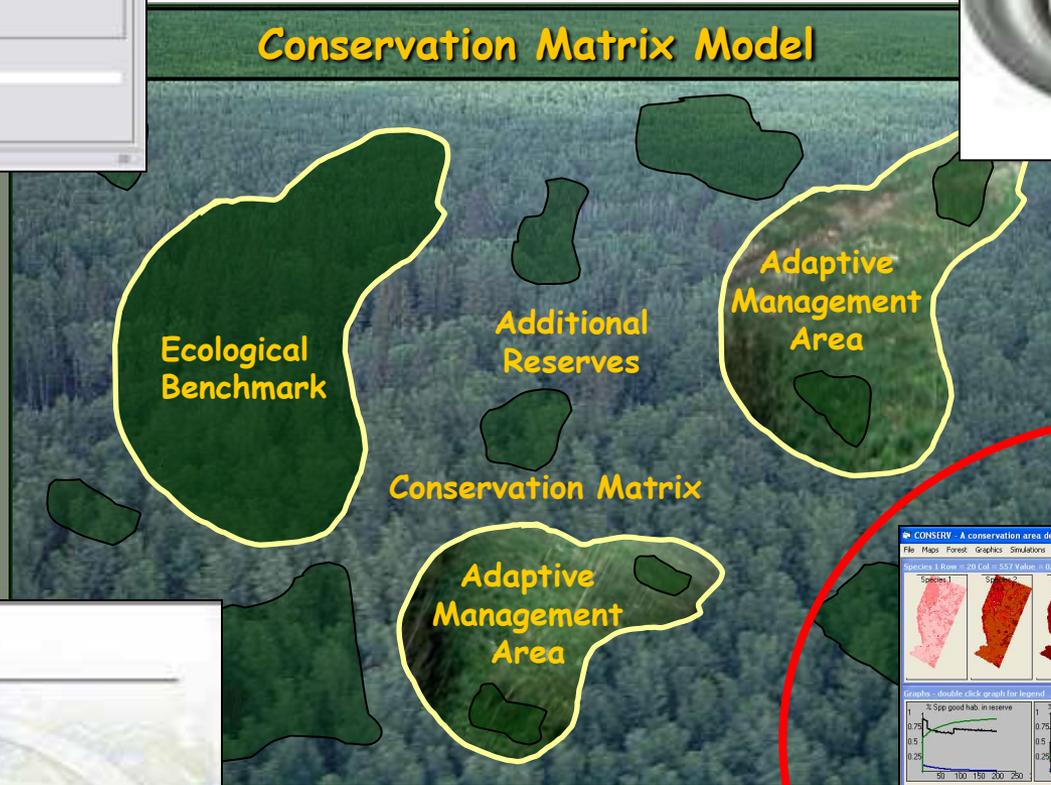


Suite of BEACONs Tools

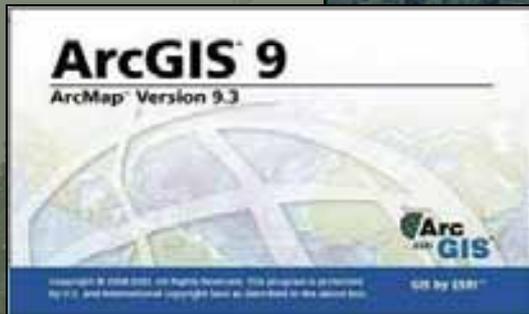
Benchmark Builder



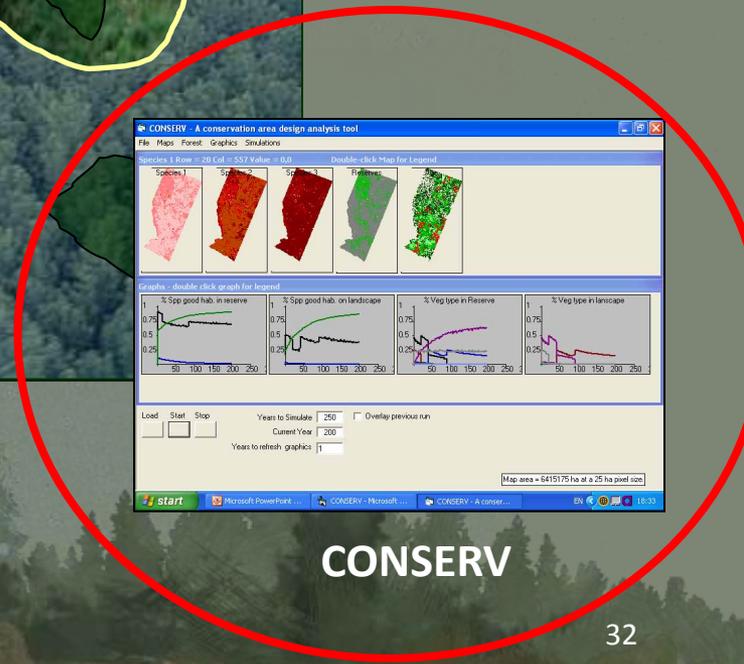
Conservation Matrix Model



Ranker



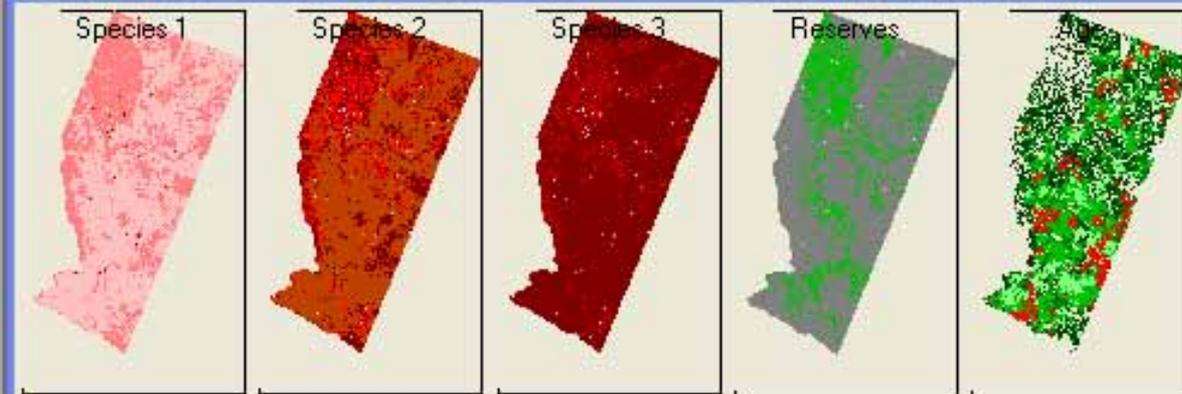
BEACONs Toolbox



CONSERV

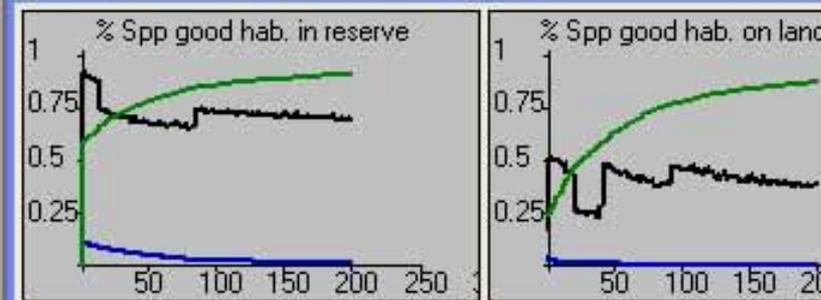
Species 1 Row = 20 Col = 557 Value = 0,0

Double-click Map for Legend



Dynamic Conservation Planning

Graphs - double click graph for legend



How well does an individual protected area, or the network, maintain conservation features given natural disturbances and climate change?

How do different management strategies in the matrix affect conservation values?

Which conservation networks optimize socio-economic considerations?

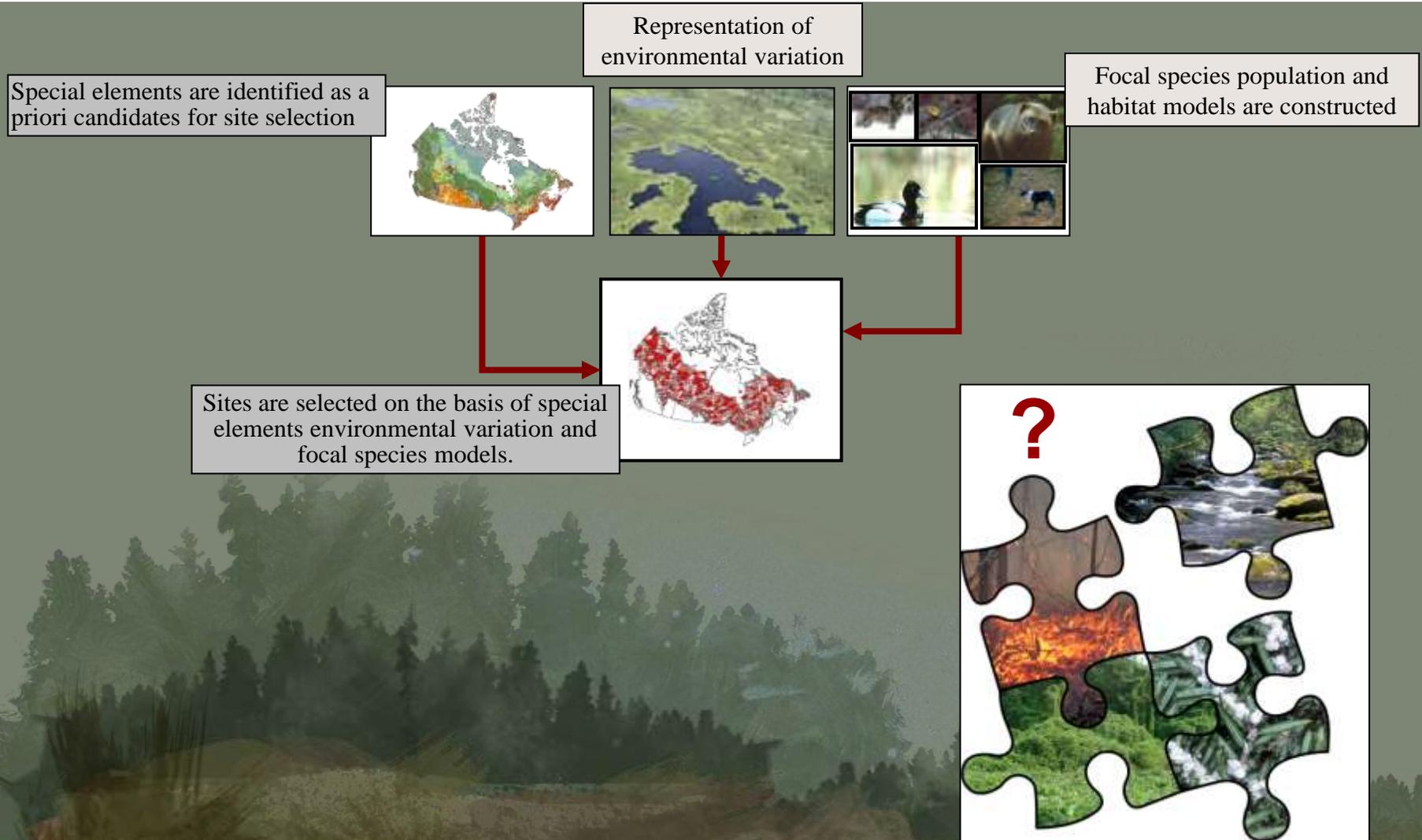
Years to Simulate:

Current Year:

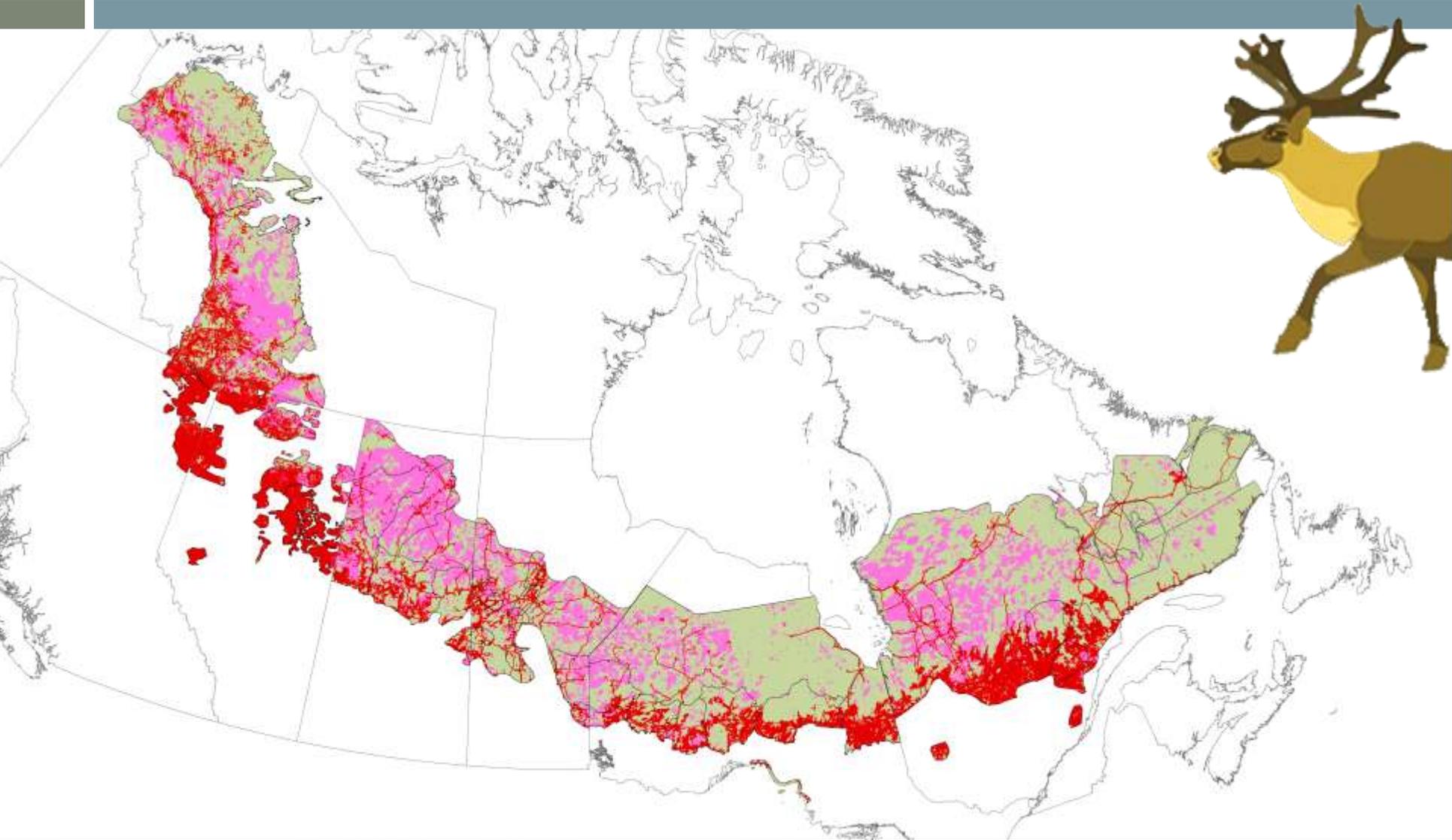
Years to refresh graphics:

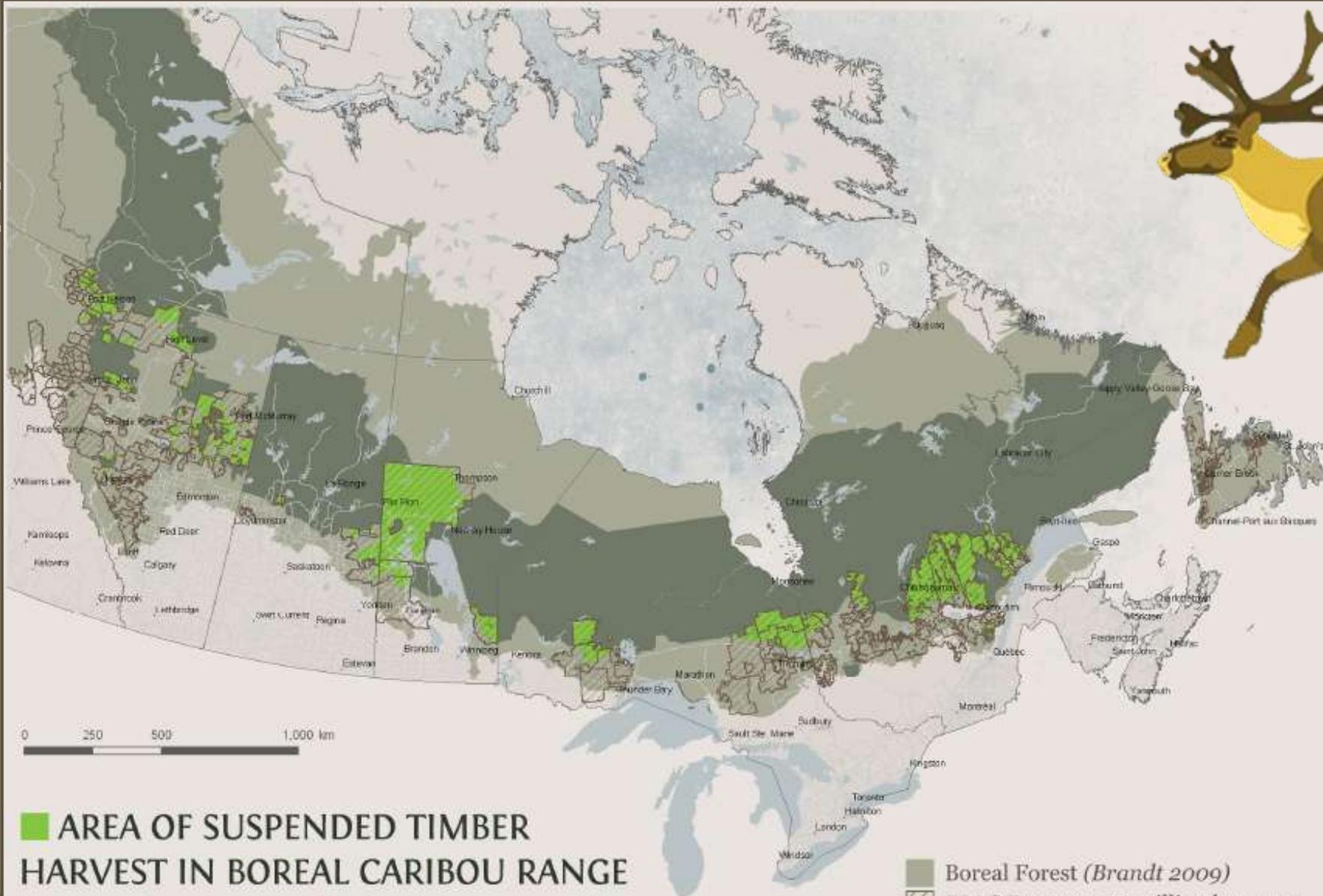
Map area = 6415175 ha at a 25 ha pixel size.

Valued components vs. Functioning Systems



Thresholds – A Cautionary Note





■ AREA OF SUSPENDED TIMBER HARVEST IN BOREAL CARIBOU RANGE

FPAC Members commit to no timber harvesting or road building in these approximately 29 million hectares of Boreal Forest from April 1, 2009 – March 31 2012 for woodland caribou conservation planning.

- Boreal Forest (*Brandt 2009*)
- ▨ FPAC Tenures - 72 million hectares
- Boreal Caribou Range (*Environment Canada 2008*)



Community Meetings – Dawson LUP

Consistent issues emerging from the meetings were:

water quality, quantity and rates of flow;

conservation of habitat (notably salmon, caribou, sheep, moose, grizzly bear, lynx and raptors);

access management;

balance between environmental conservation and economic development;

consideration for the long term, cumulative effects of development; and

adaptive strategies responsive to climate change.

Several unique characteristics of the region were noted, including the unglaciated terrain, high levels of endemism (rare and unique species), considerable mineral potential and historical development and the watershed itself, which supports one of the longest salmon runs in the world.

