



# **EBM Experiences in Ontario**

Mike Briennesse

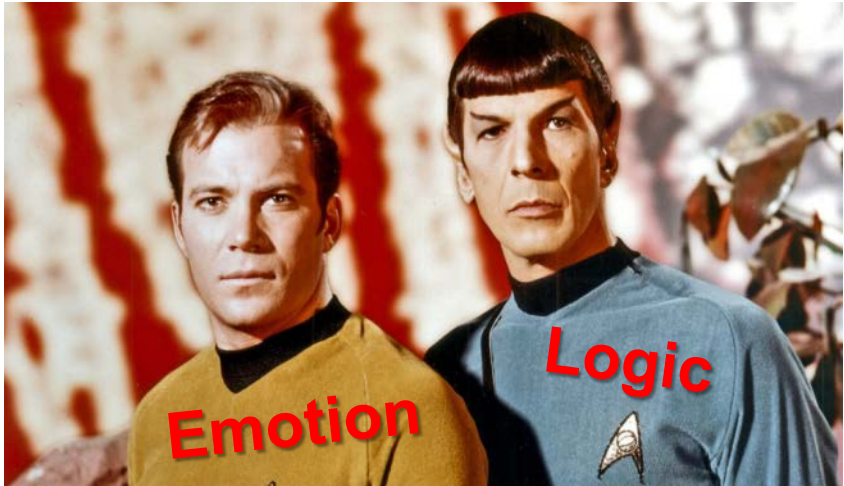
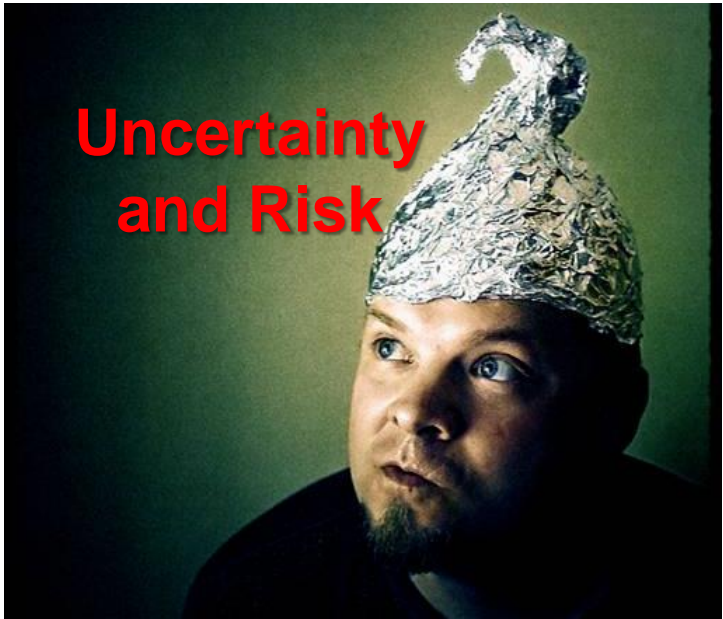
June 19, 2018

# Overview

- Brief background
- Lessons<sup>1</sup> learned<sup>2</sup>

1: learned, learning, yet to learn.....

2: personally, collectively, institutionally.....



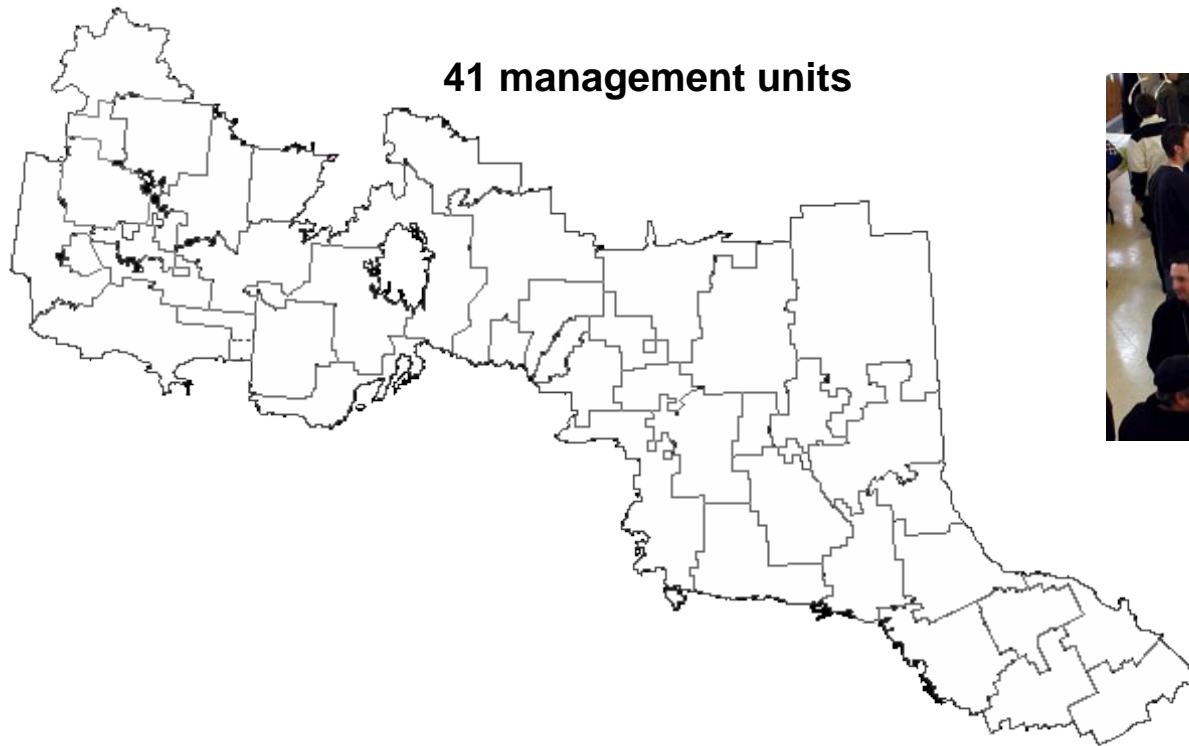
# Ontario's Managed Crown Forest



## Area of the Undertaking (AOU)

- Crown forest available for commercial forestry

# Managed Crown Forest - Area of the Undertaking

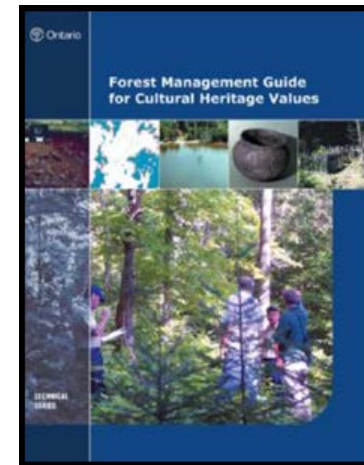
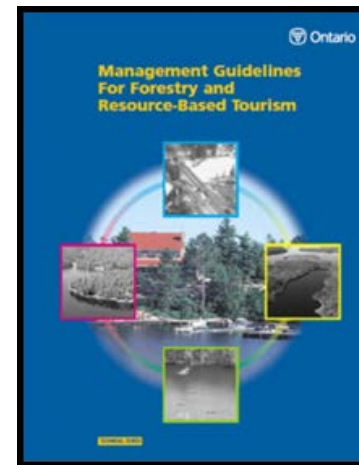
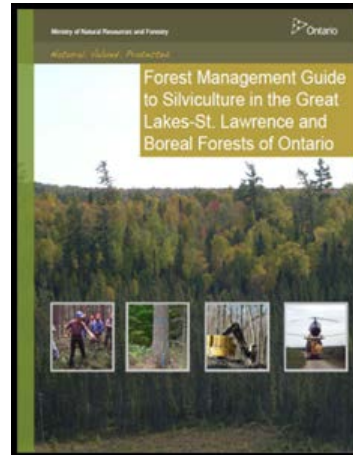
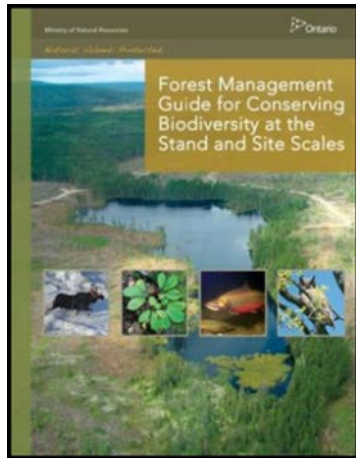
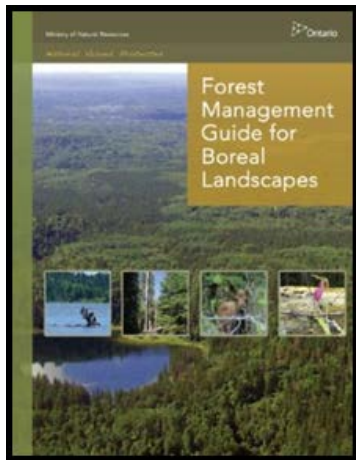


# Crown Forest Sustainability Act

## Principles

1. Large, healthy, diverse and productive Crown forests and their associated ecological processes and biological diversity should be conserved.
2. The long term health and vigour of Crown forests should be provided for by using forest practices that, within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air and social and economic values, including recreational values and heritage values.

# Forest Management Guides



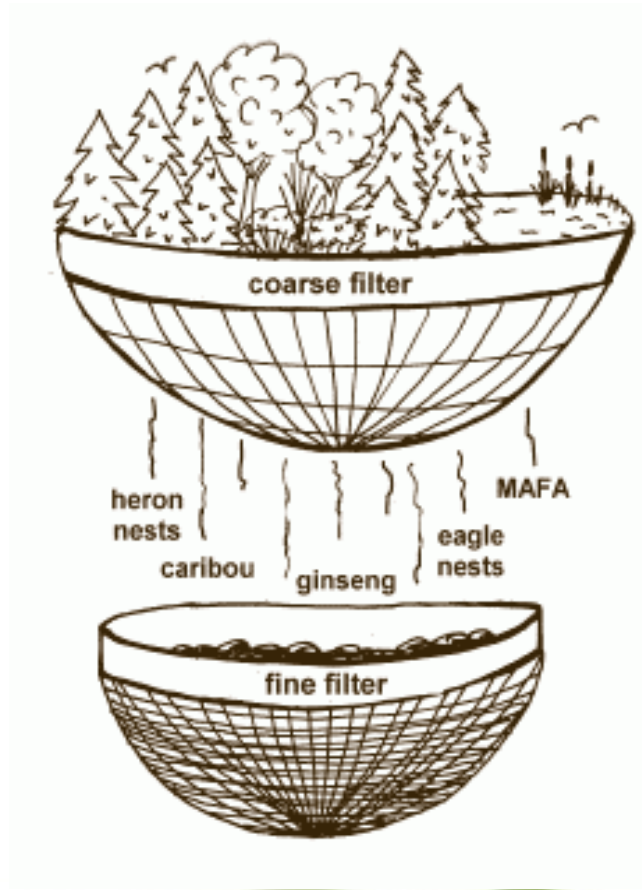
# Forest Management Guides – core concept

## Coarse filter

- Maintain ecosystem health and diversity at multiple scales based on emulating nature

## Fine filter

- When coarse filter not sufficient or societal values differ from coarse





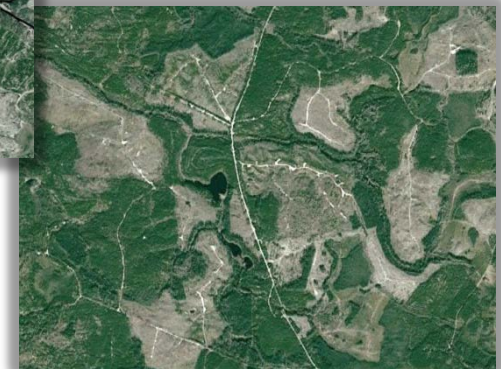
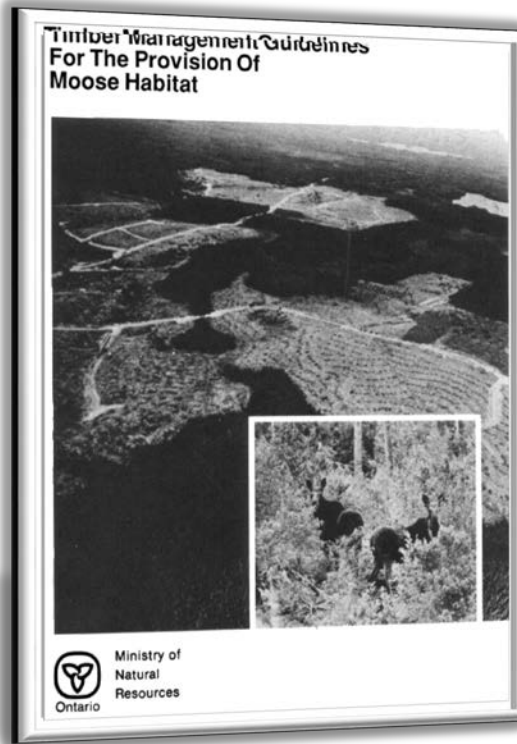
# 1988 “Moose Guides”

## Program Objective:

Increase provincial moose population from 80,000 to 160,000 animals by the year 2000.

## Guide Objective:

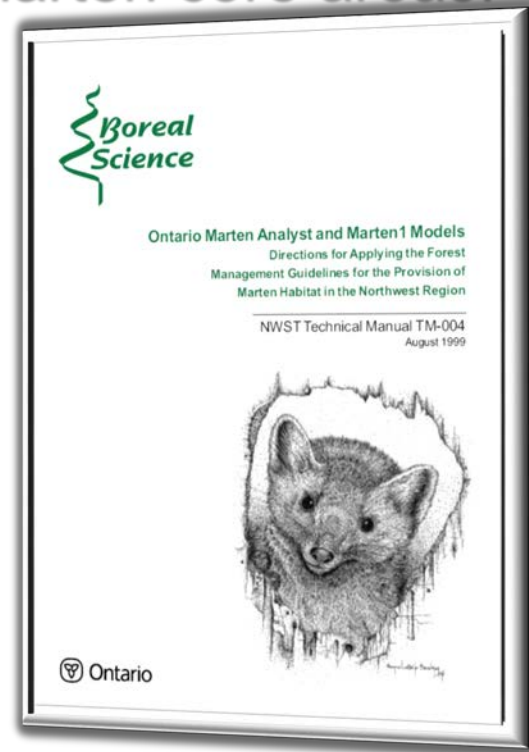
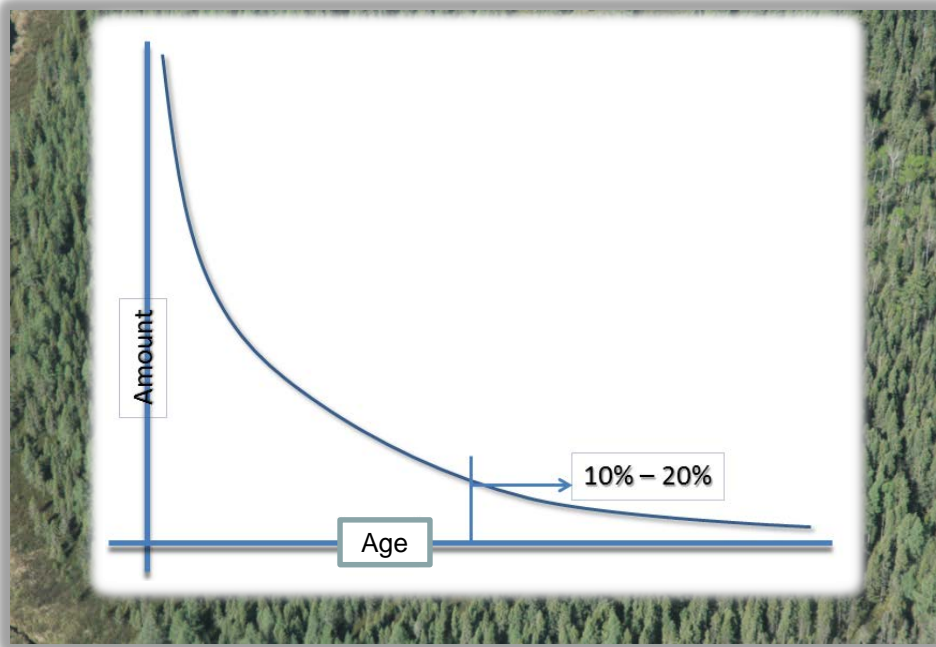
Create good moose habitat.



Openings +/- 120 hectares/  
Young forest interspersed with mature forest = moose habitat.

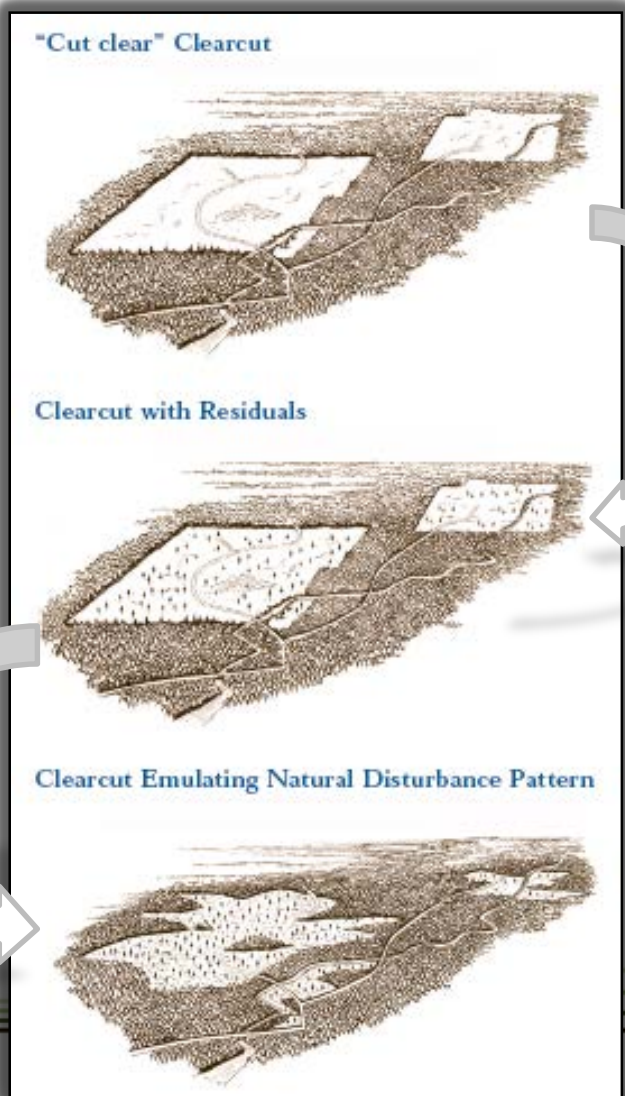
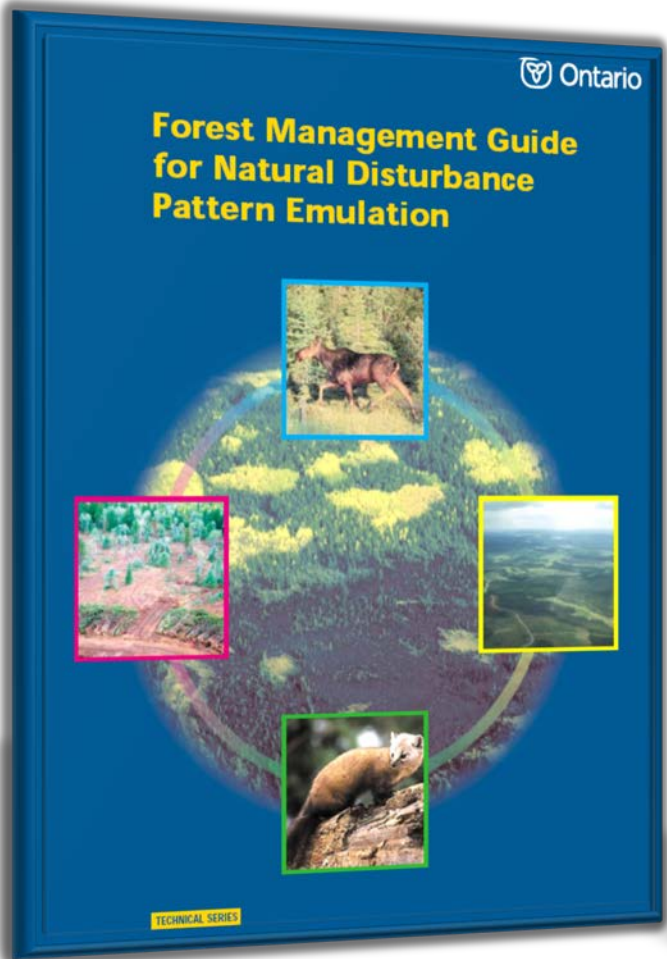
# 1997 “Marten Guides”

Based on the capability of the landscape maintain 10-20% of the landscape in large marten core areas.

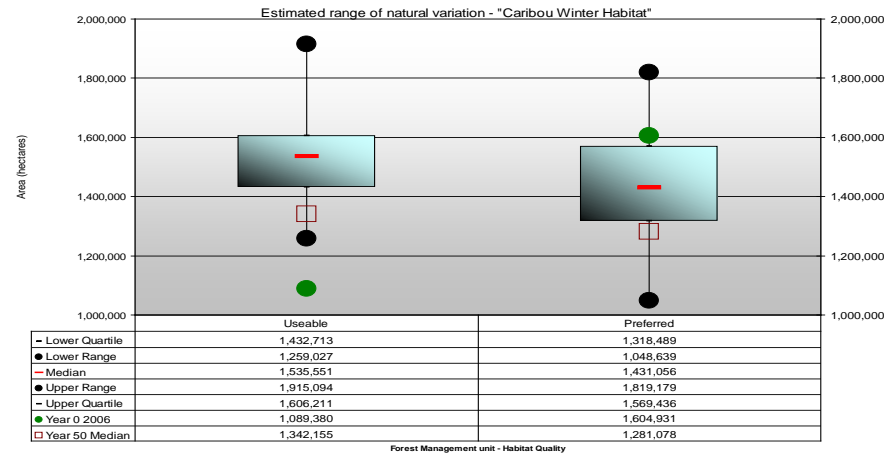
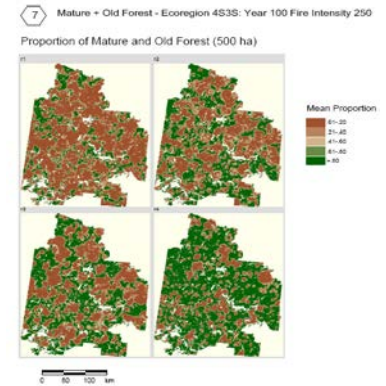
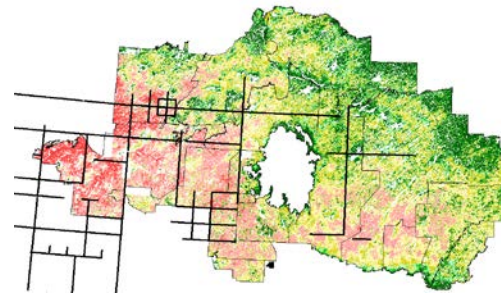
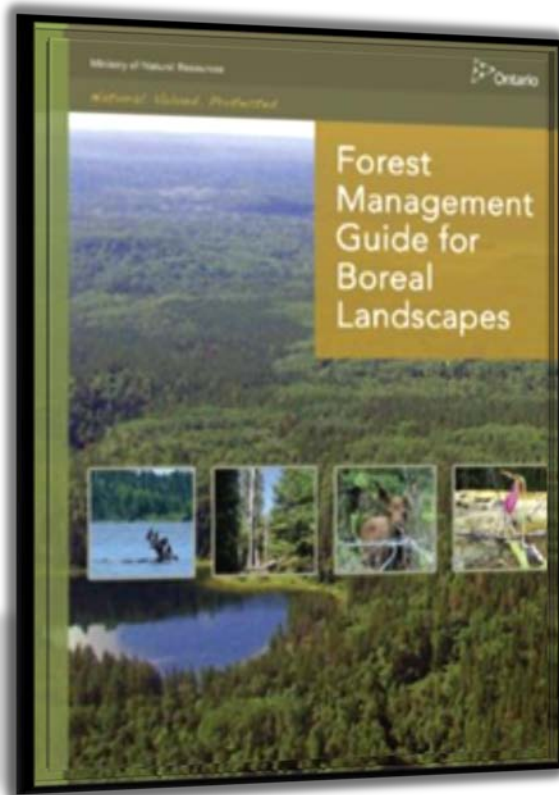


Core areas;  
Large tracts 3,000 ha - 5,000 ha, mature and old conifer dominated. Deferrals up to 100 years.

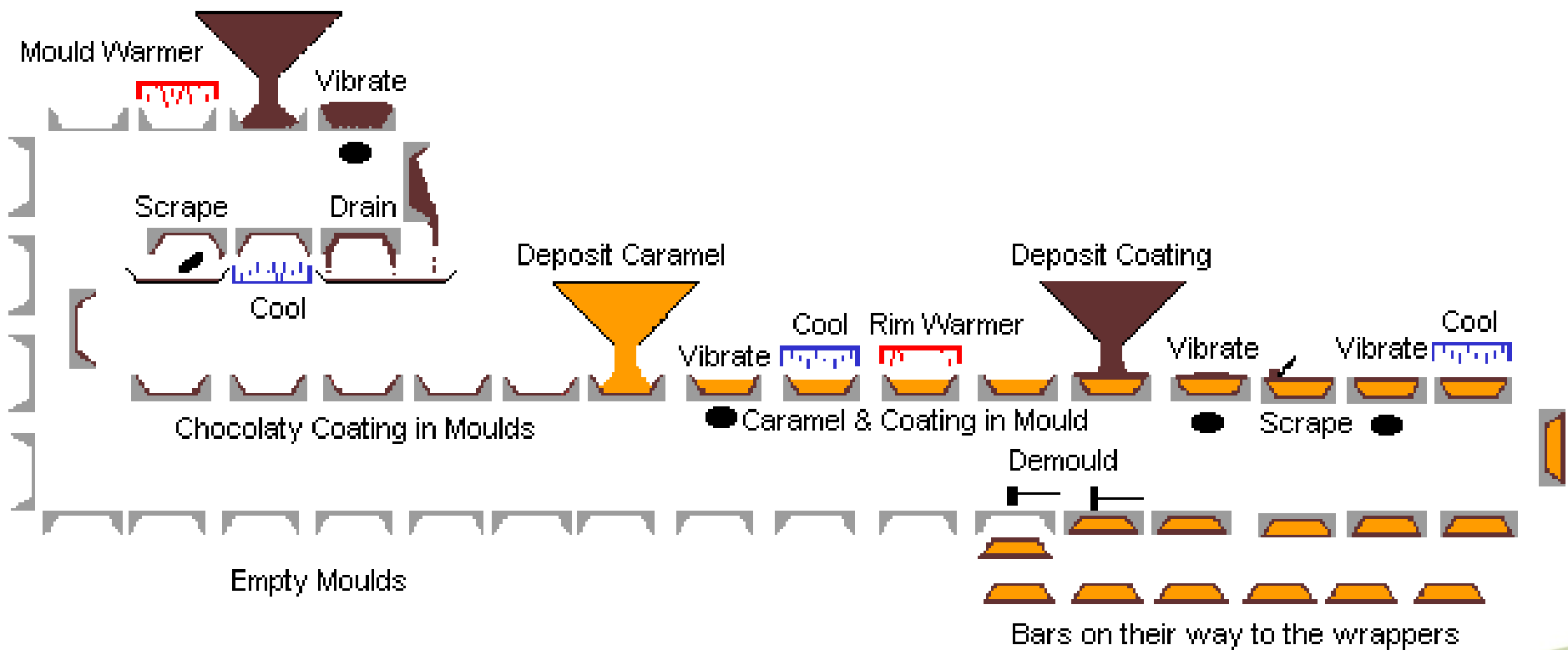
# 2001 "Natural Disturbance Pattern Emulation Guide"



# 2010/14 Landscape Guides



# How science gets into policy



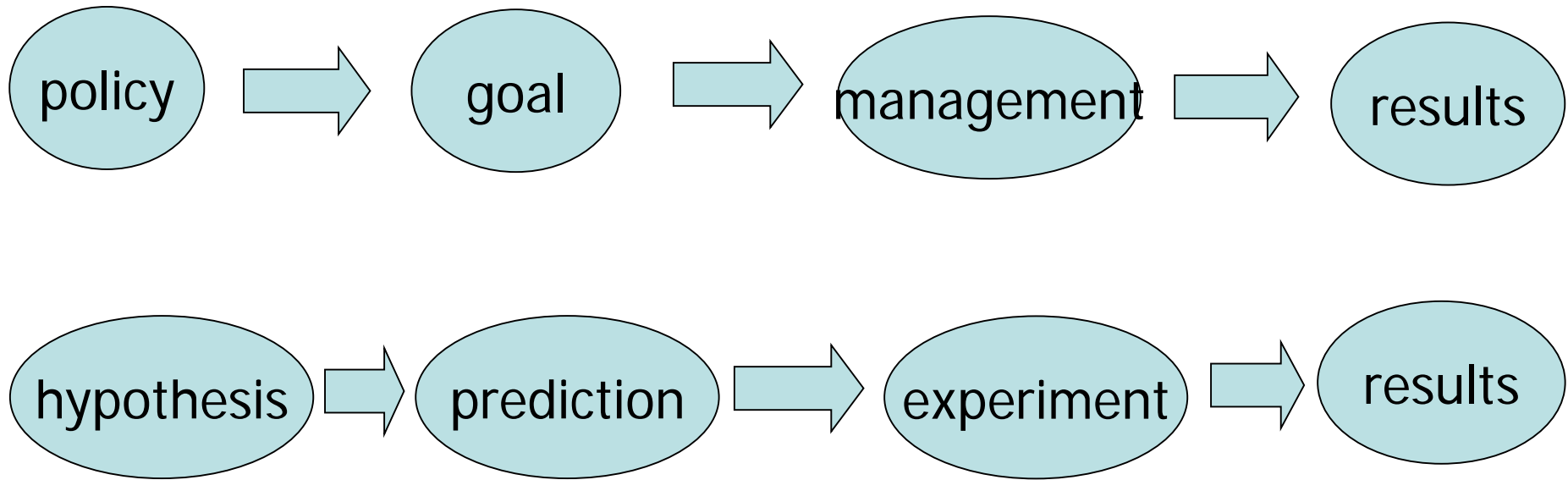
Doubt is not a pleasant condition, but  
certainty is absurd. —Voltaire

# “Uncertainty Monster”

- Hiding
- Exorcism
- Simplification
- Detection
- Assimilation

(Curry and Webster, 2011)

# Policy and Science as Parallel Universes

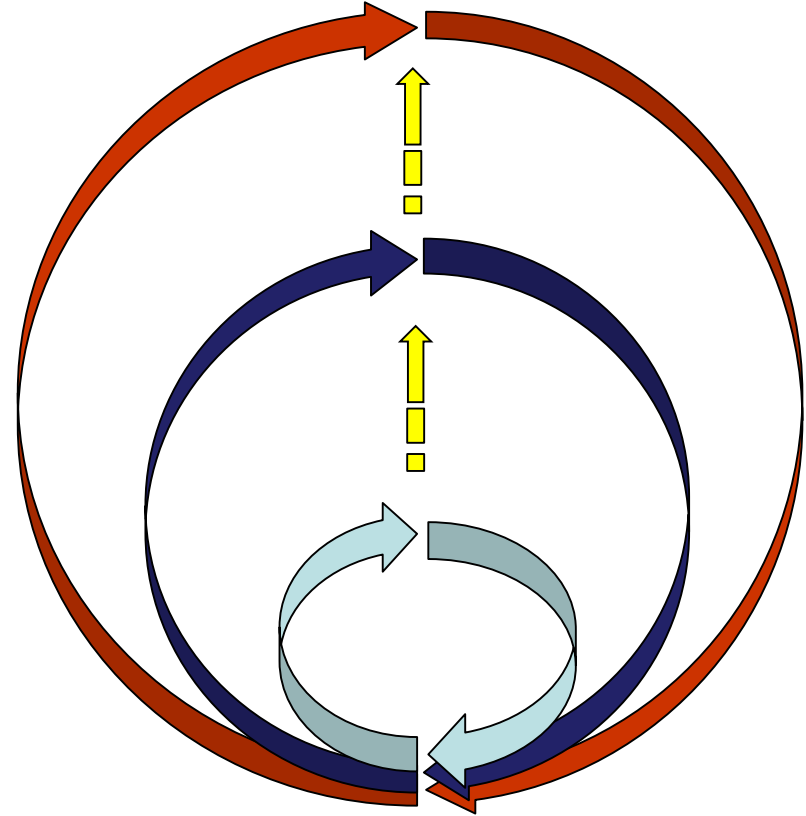


“Policy as Hypothesis; Management by Experiment”

-- R. A. Lancia et al. 1993. *Wild. Soc. Bull.* 24:436



# Forest Policy and Adaptive Management

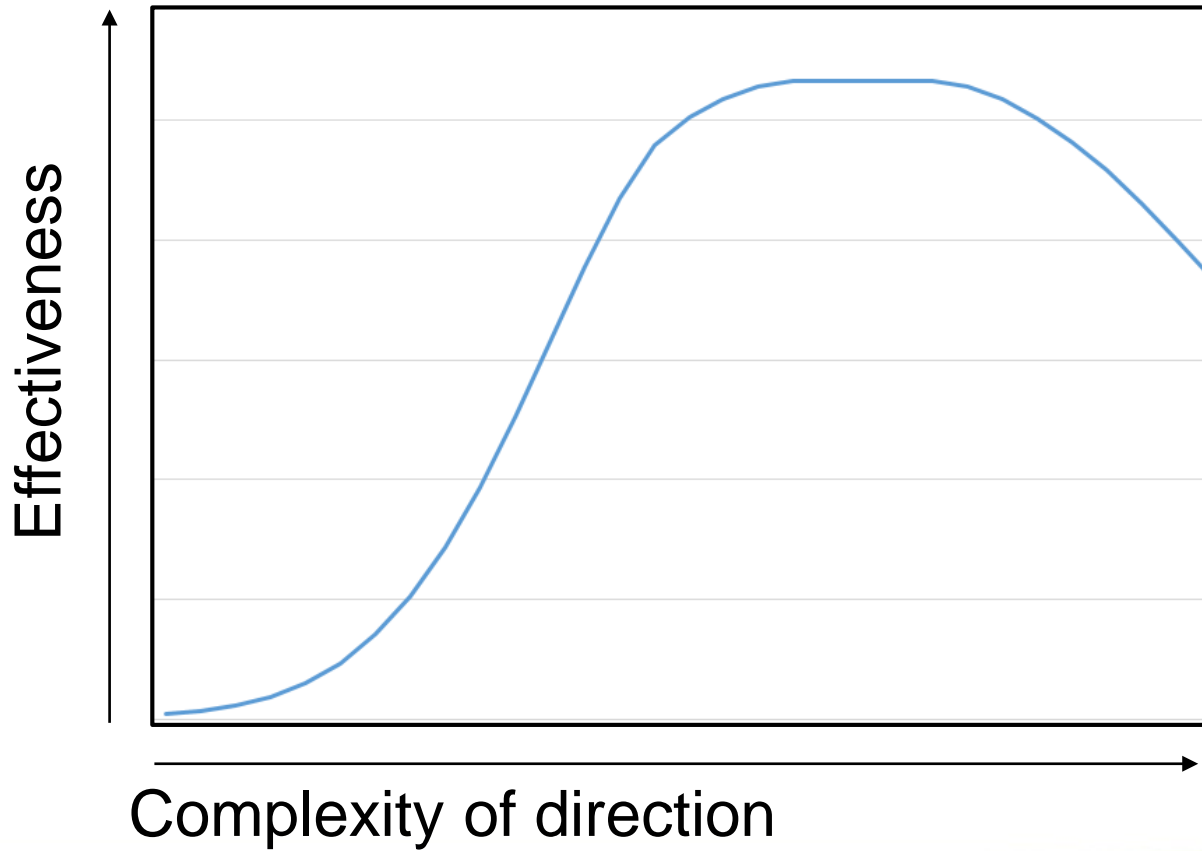


# Precautionary principle



- If an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is not harmful, the burden of proof that it is not harmful falls on those taking an action (Wikipedia - 2017)
- Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (Rio declaration, principle 15 – 1992)

# Complexity and Utility



Supplementary Variable Spacing Chart – Table 2 Separation Distances

Clearcut Area (ha)	Minimum Average Spacing (m)
260	200
360	250
460	300
560	350
660	400
760	450
860	500
960	550
1060	600
1160	650
1260	700
1360	750
1460	800
1560	850
1660	900
1760	950
1860	1000
1960	1050
2060	1100
2160	1150
2260	1200
2360	1250
2460	1300
2560	1350
2660	1400
2760	1450
2860	1500
2960	1550
3060	1600
3160	1650
3260	1700

Clearcut Area (ha)	Minimum Average Spacing (m)
3360	1750
3460	1800
3560	1850
3660	1900
3760	1950
3860	2000
3960	2050
4060	2100
4160	2150
4260	2200
4360	2250
4460	2300
4560	2350
4660	2400
4760	2450
4860	2500
4960	
5060	
5160	
5260	
5360	
5460	
5560	
5660	
5760	
5860	
5960	
6060	
6160	
6260	
6360	

Clearcut Area (ha)	Minimum Average Spacing (m)
6460	3300
6560	3350
6660	3400
6760	3450
6860	3500
6960	3550
7060	3600
7160	3650
7260	3700
7360	3750
7460	3800
7560	3850
7660	3900
7760	3950
7860	4000
7960	4050

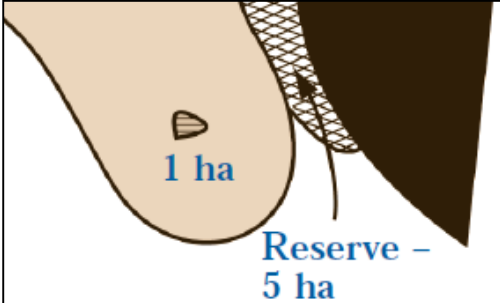
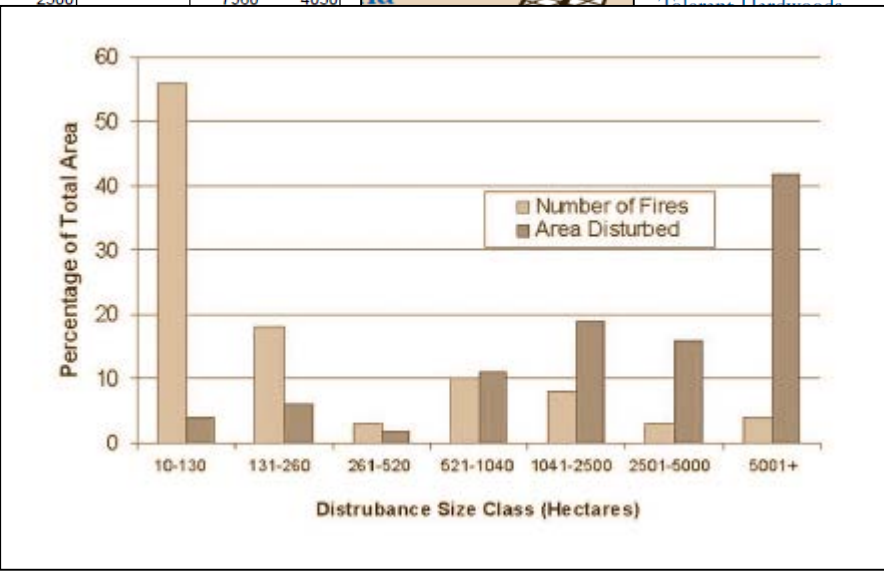
## Forest Disturbances

Reserve - 7 ha  
Disturbances less than 200 m

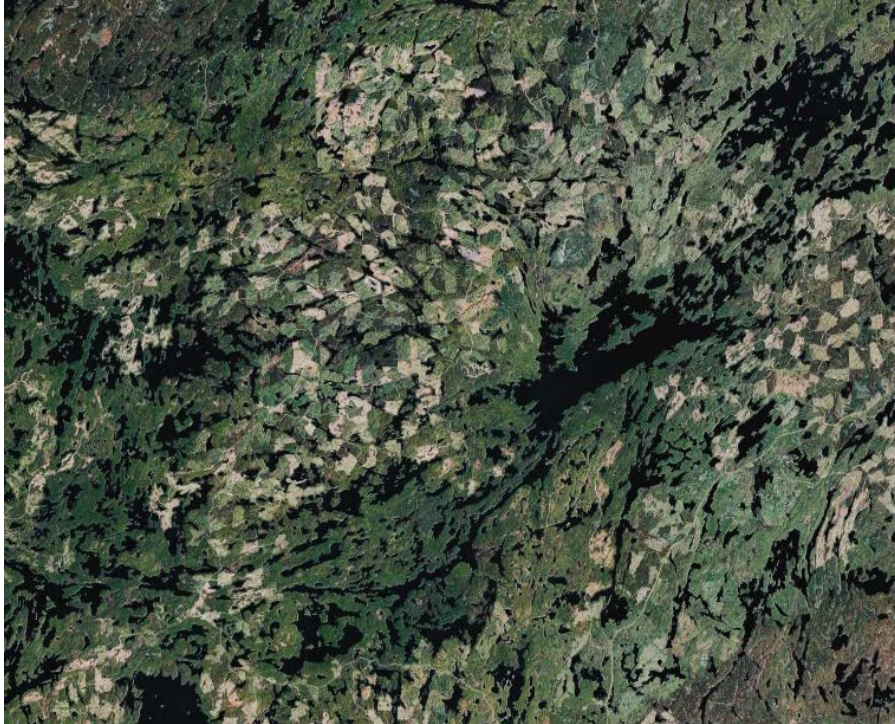


Forest Types	Internal Patches <sup>4</sup> % area (ha)	Peninsular Patches <sup>4</sup> % area (ha)
Conifer Upland <sup>2</sup> (Sp, Pj, Bf)	2%	8%
Conifer Lowland <sup>2</sup> (Sp, Ce, La)	4%	16%
Upland Mixed (Sp, Pj, Bf, Po, Bw)	6%	24%
Intolerant Hardwood (Po, Bw)	7%	27%
Tolerant Hardwood <sup>2</sup>	8%	28%
	2%	8%
	5%	10%

## Forest Disturbance Boundary



# Explicit direction not always needed

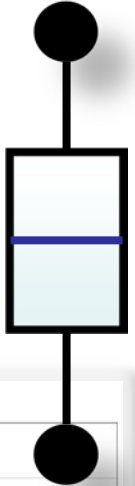
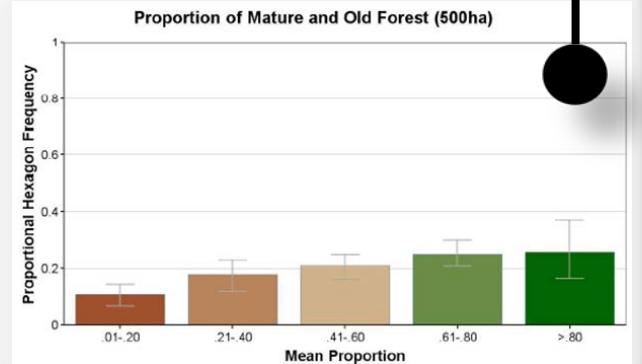


# Denominators matter

3 → Numerator  
4 → Denominator



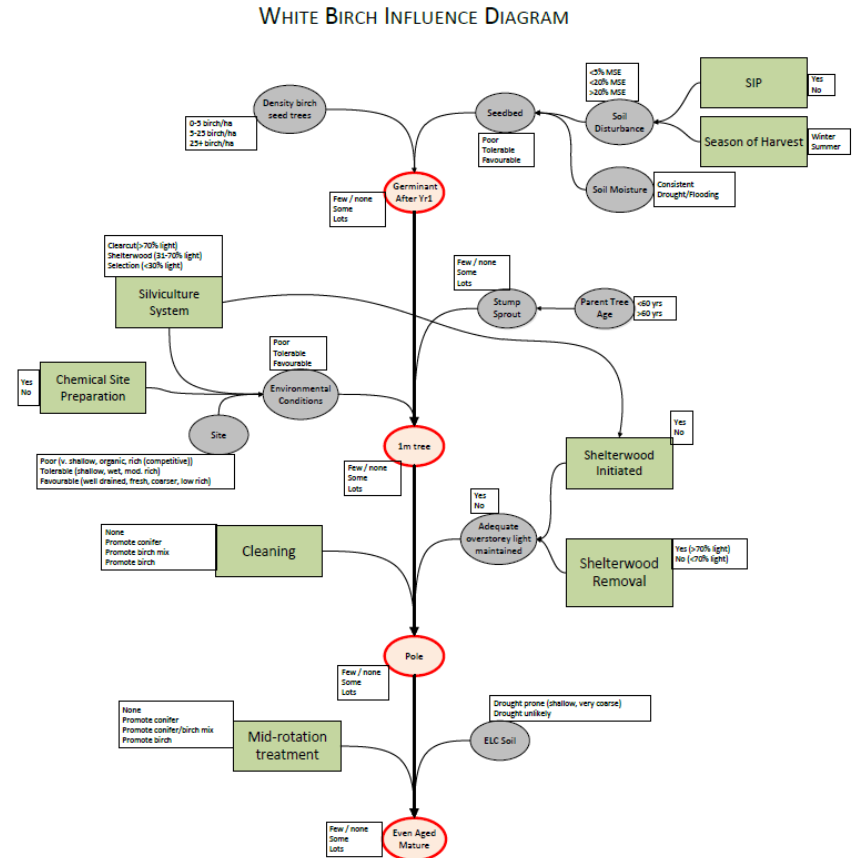
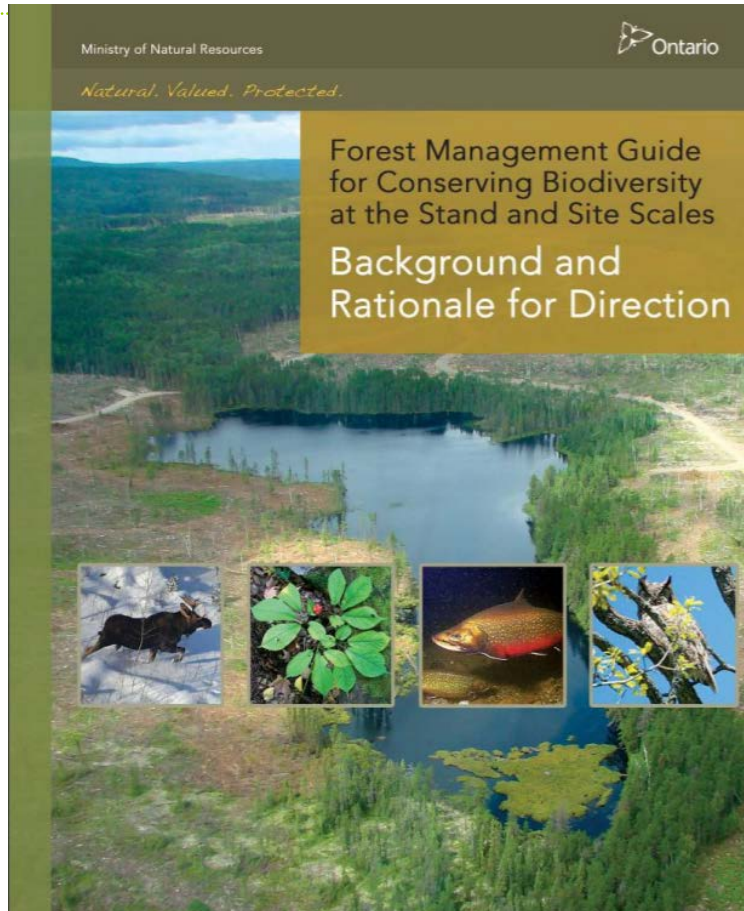
Denominator



# Stories still matter



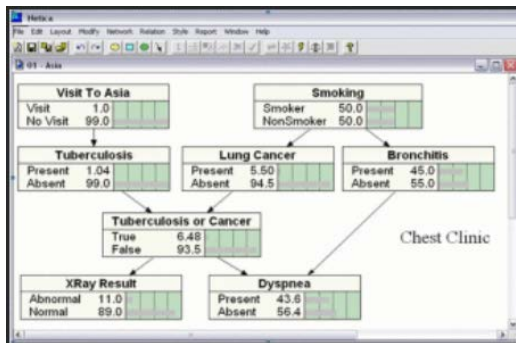
# Transparency and documentation





# Systems thinking, decision analysis, and collaboration

- Bring collaborators in early
- Use process/tools to separate technical from values based disagreements
- Focus on conclusions, not differences



Strategy Theme	Habitat Protection	Predator Control	Population Enhancement	Monitoring
Maintain Existing Population (A)	Status Quo Ban logging in critical habitat Develop linkage corridors	Status Quo Harvest Increase Harvest to reduce predators by 10% Lethal Control to reduce predators by 50%	None Maternity Pens Captive Breeding Translocation	None Basic Monitoring Enhanced Monitoring
Maintain Existing Population (B)	Status Quo Ban logging in critical habitat Develop linkage corridors	Status Quo Harvest Increase Harvest to reduce predators by 10% Lethal Control to reduce predators by 50%	None Maternity Pens Captive Breeding Translocation	None Basic Monitoring Enhanced Monitoring
Increase Population to Carrying Capacity	Status Quo Ban logging in critical habitat Develop linkage corridors	Status Quo Harvest Increase Harvest to reduce predators by 10% Lethal Control to reduce predators by 50%	None Maternity Pens Captive Breeding Translocation	None Basic Monitoring Enhanced Monitoring

# Hold your ground

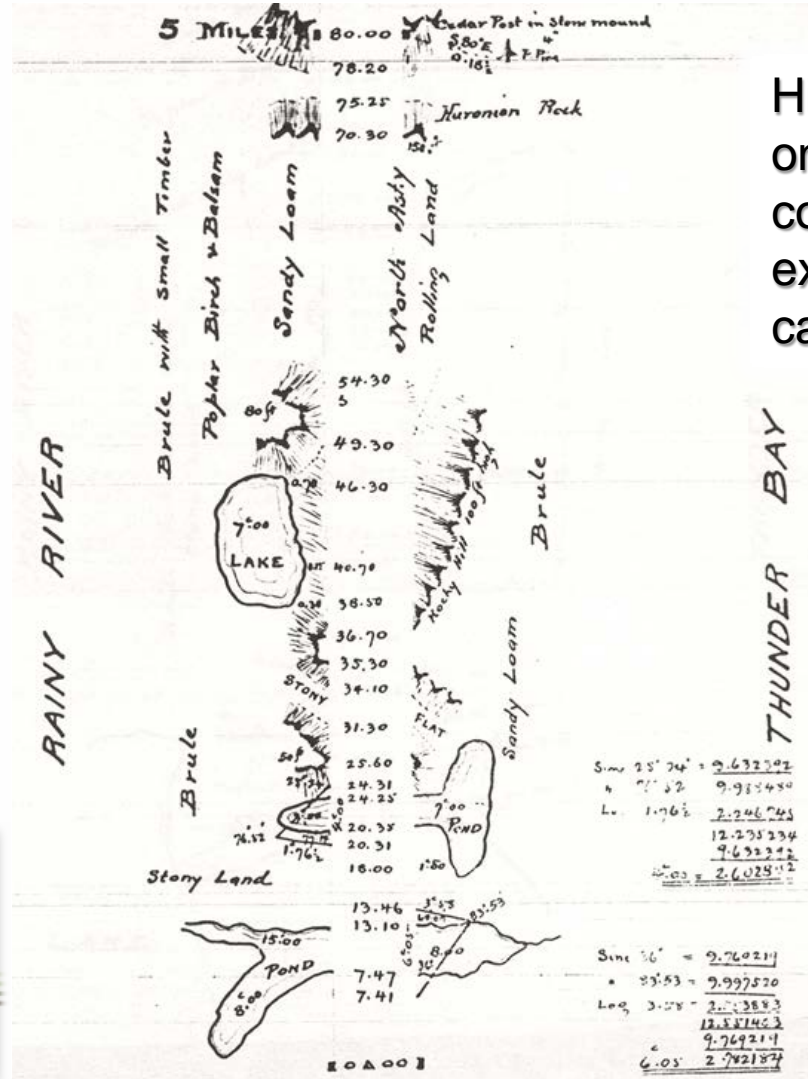


# Questions?

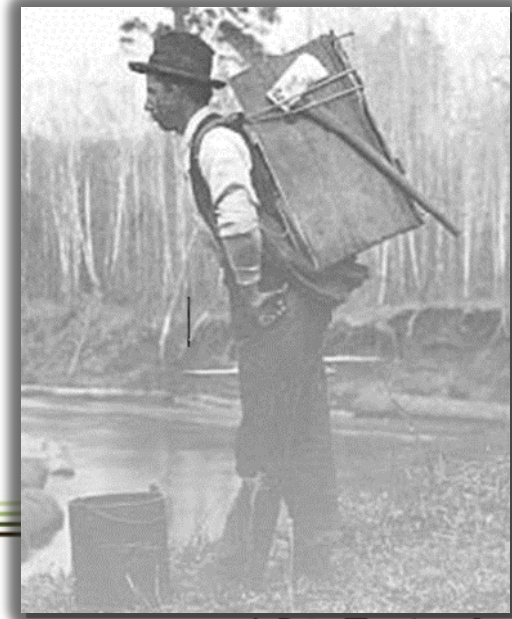


# Landscape Guides Appendix – in case

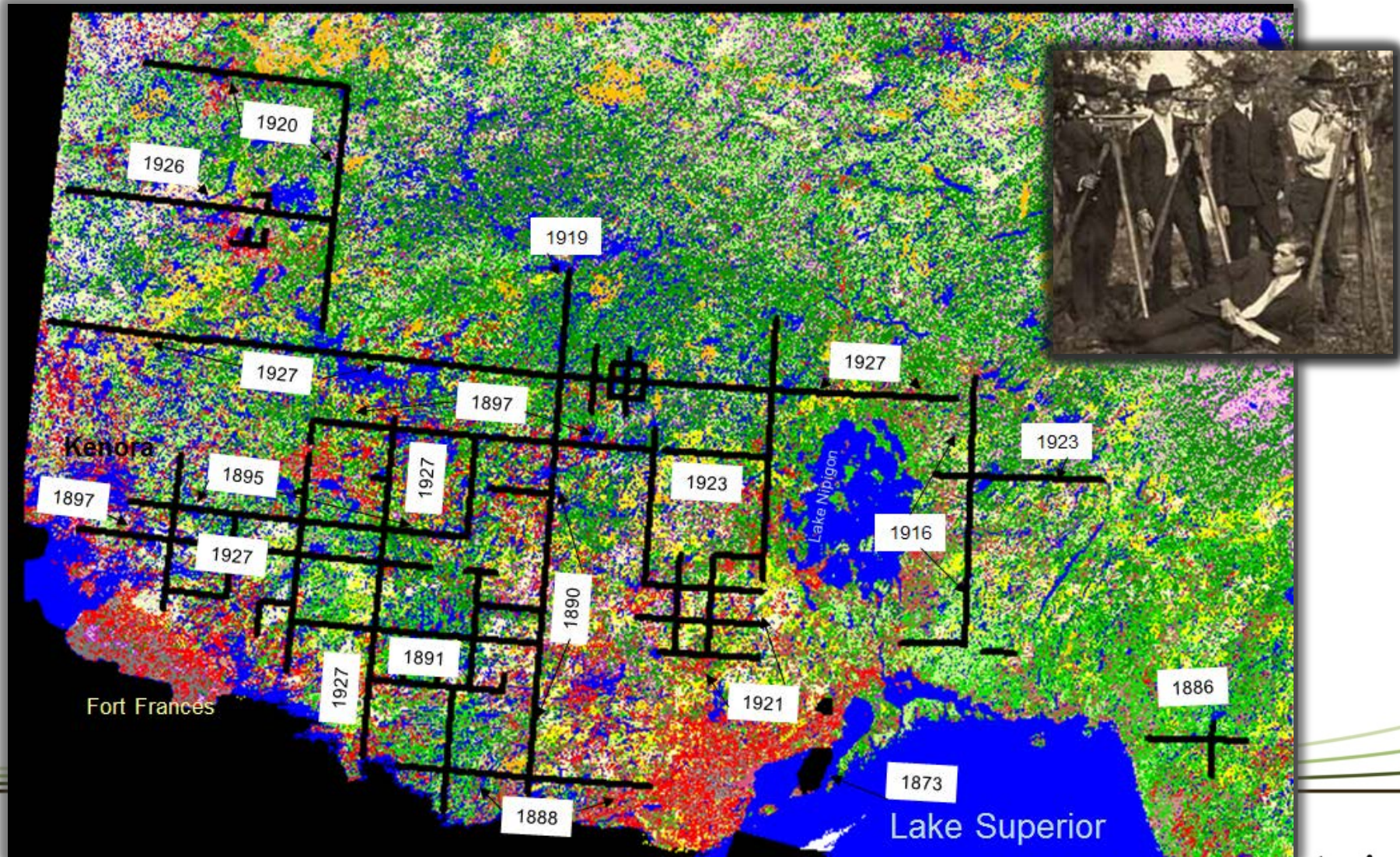
# Historic Survey Notes



History provides at least one estimate of forest condition that we would expect our simulations to capture.



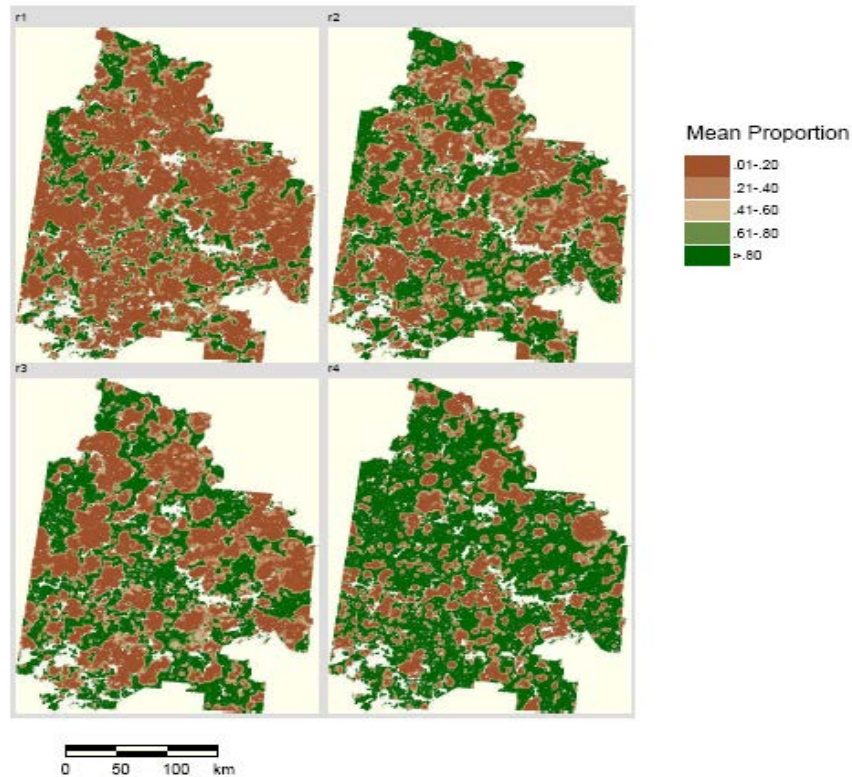
# Historic Survey Notes



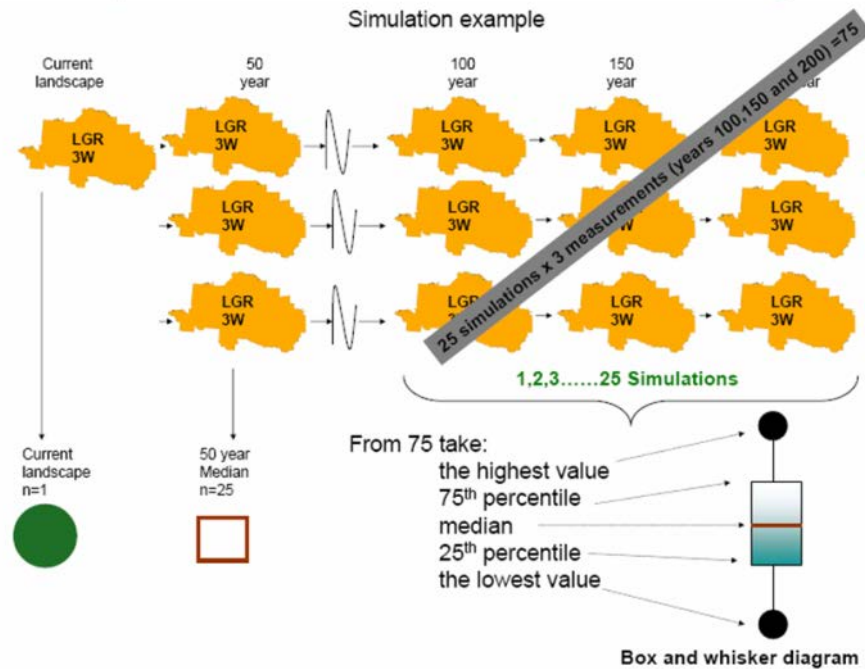
# Determining Simulated Range of Natural Variation

7 Mature + Old Forest - Ecoregion 4S3S: Year 100 Fire Intensity 250

Proportion of Mature and Old Forest (500 ha)

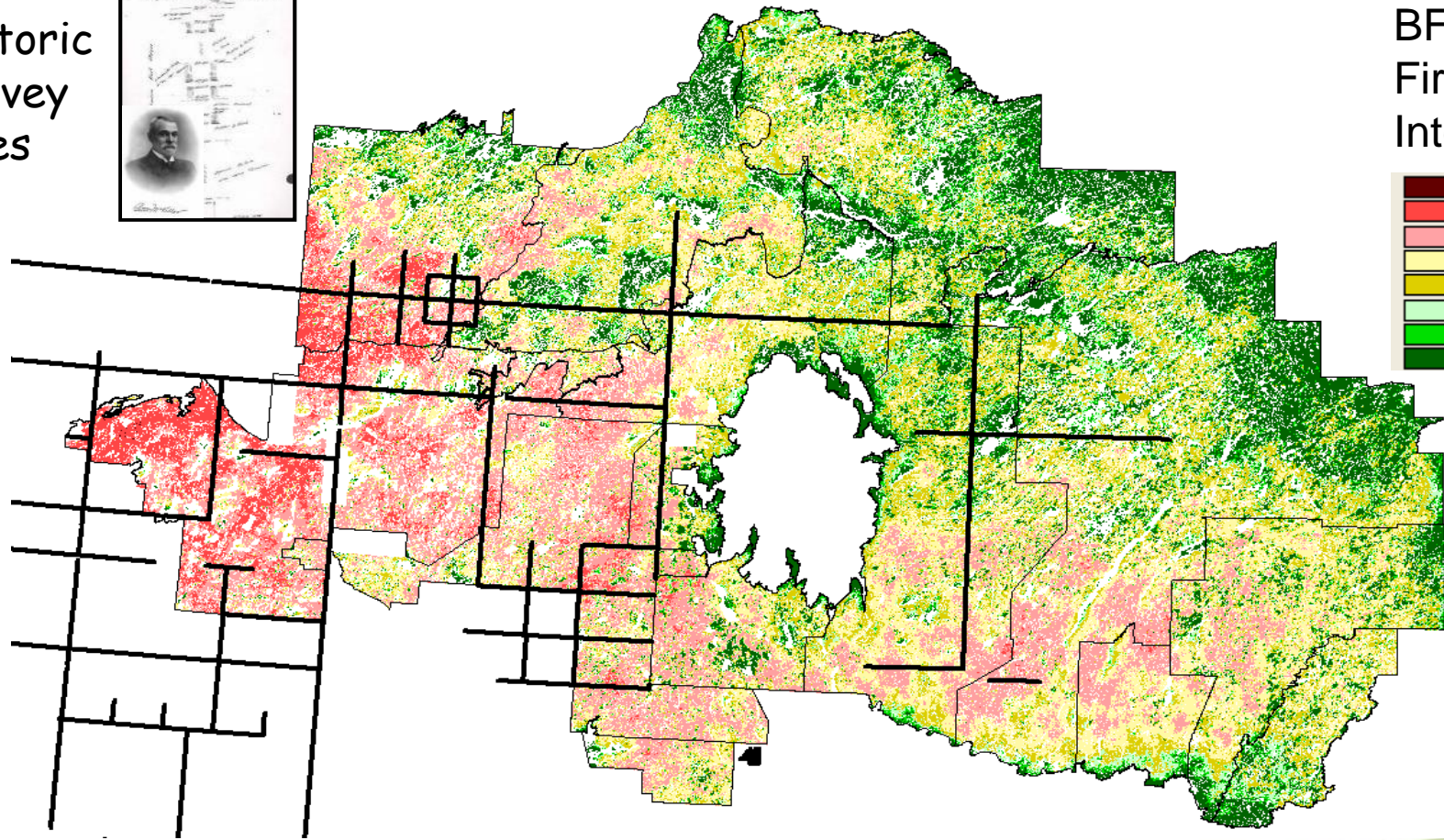
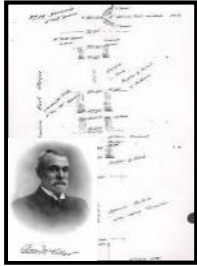


## Example Simulation Run Boreal Forest Region

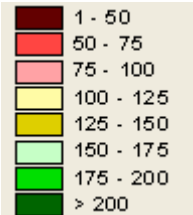


# Natural Disturbances & Landscape Pattern

Historic  
Survey  
Lines

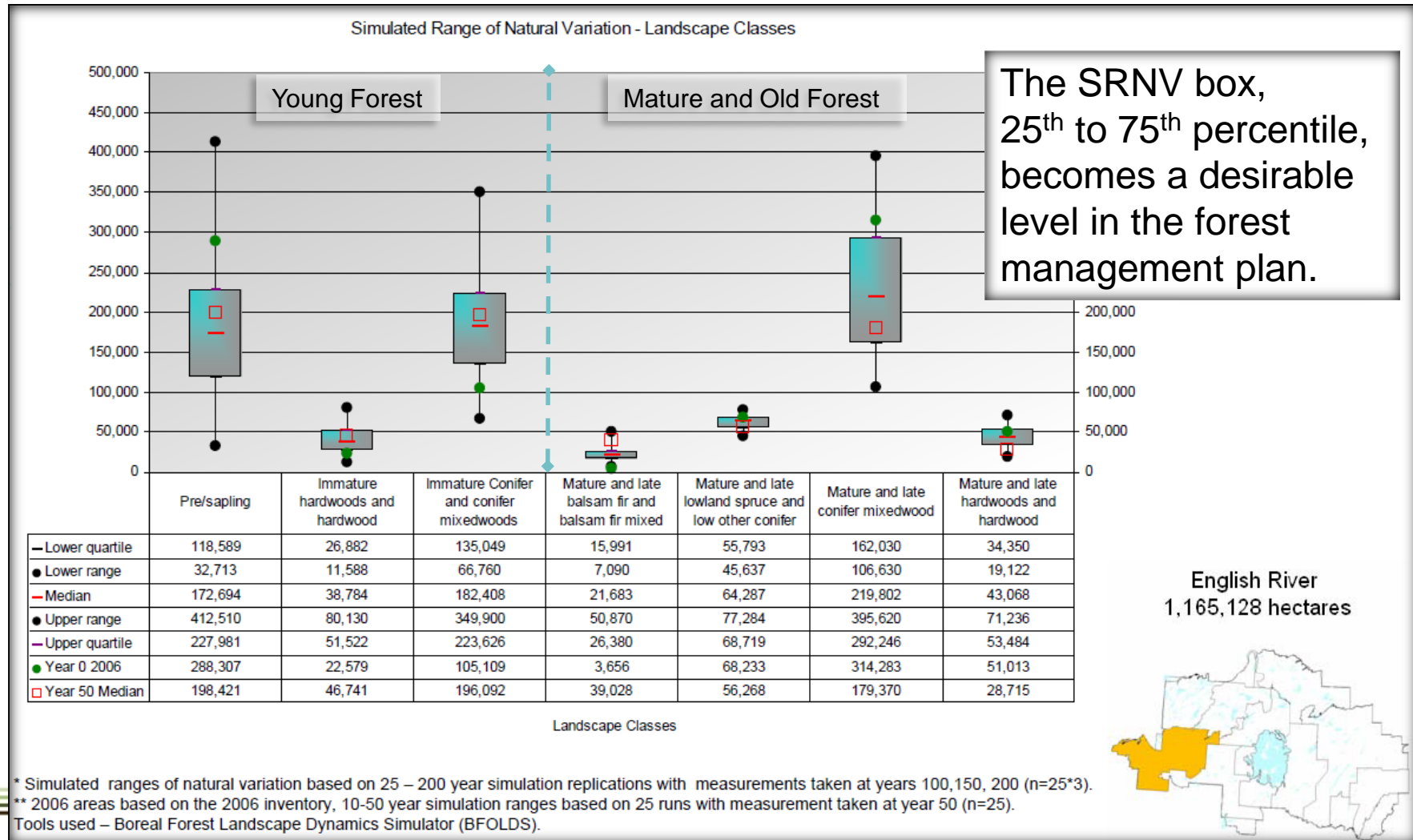


BFOLDS  
Fire Return  
Interval





# Simulated Range of Natural Variation (SRNV)



English River  
1,165,128 hectares



# Desirable Levels and Milestones (amount)

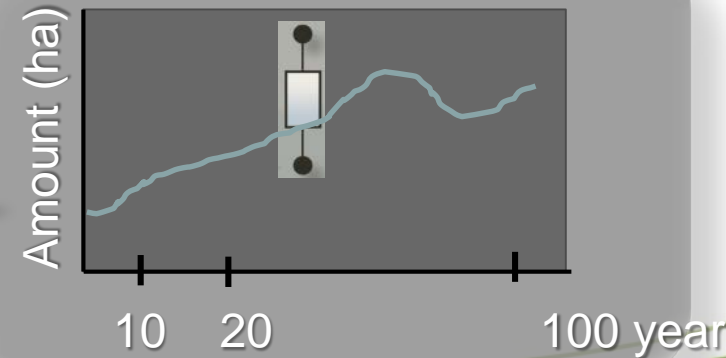


SRNVs of *prescriptive indicators* become desirable levels (targets) for the Forest Management Plan

## Achievable Milestones

Move towards over 10, 20 or 100 years.

Once there – stay there.



# Milestones - example

DRAFT

Table A18. Landscape Guide Region 3W – Milestones for the Kenogami Forest.

CFSA Objective Category	Landscape Guide Indicator Group	Landscape Guide Indicator	Measurement (units)	Milestones			
				Directional Statement	Short (10 years)	Medium (20 years)	Long (100 years)
Structure and Composition	Landscape classes	Mature and late balsam fir mixed	Area (ha)	Maintain within the inter-quartile range (IQR)	Maintain	Maintain	Maintain
		Mature and late lowland spruce and low other conifer	Area (ha)	Maintain within the IQR	Maintain	Maintain	Maintain
		Mature and late conifer and conifer mixedwood	Area (ha)	Maintain within the IQR	Maintain	Maintain	Maintain
		Mature and late hardwood and hardwood mixedwood	Area (ha)	Decrease and maintain within the IQR	Decrease	Decrease	Maintain
	Old growth forest	Old growth by Forest Management Plan forest unit or appropriate grouping	Area (ha)	Maintain within the IQR	Maintain	Maintain	Maintain
	Red and white pine forest	All ages red and white pine forest units	Area (ha)	Increase to pre-industrial condition estimate	Increase	Increase	Increase
	Upland pine and spruce forest	All ages Conifer	Area (ha)	Increase and maintain within the IQR	Increase	Increase	Maintain
Pattern	Texture of mature and old forest	Texture of mature and old forest	500 and 5,000 ha hexagon frequency distribution	Move towards and/or maintain within the SRNV	Move towards mean	Move towards mean	N/A
	Young forest patch size	Young forest patch size	Patch size frequency distribution	Move towards and/or maintain within the SRNV	Move towards mean	Move towards mean	N/A
Habitat	Habitat for forest dwelling woodland caribou within local population range(s)	Refuge habitat	Area (ha)	Increase and maintain within the IQR	Increase	Maintain	Maintain
		Winter used and preferred habitat	Area (ha)	Maintain within the IQR	Maintain	Maintain	Maintain
		Texture/arrangement of winter habitat	6,000 and 30,000 ha hexagon frequency distribution	Move towards and/or maintain within the SRNV	Move towards mean focusing on 60% and greater proportion classes	Move towards mean focusing on 60% and greater proportion classes	Move towards mean focusing on 60% and greater proportion classes

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