

# Learning from the Landscape

**Evolution of applied science  
affecting oil and gas operations on  
forest landscapes in Western Canada**

Bob Bott

Petroleum History Society

January 30, 2019



**THE FRI  
RESEARCH  
STORY**

**ROBERT D. BOTT  
ROBERT W. UDELL**

# Learning FROM THE Landscape



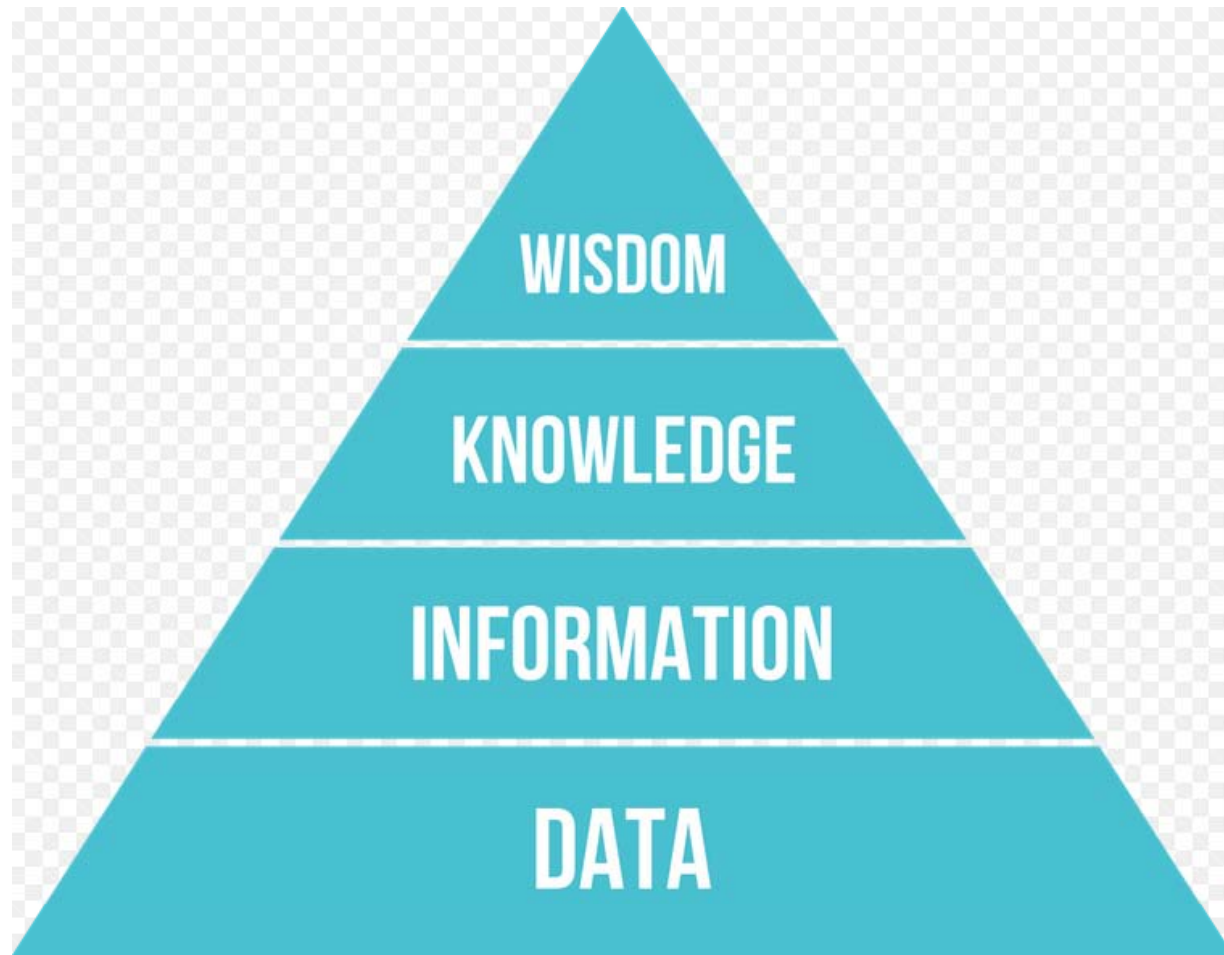
**BUILDING KNOWLEDGE AND TOOLS FOR FOREST  
STEWARDSHIP AND SUSTAINABILITY 1992-2017**



# Contents

- Institutional evolution
- Sustainable management
  - Biodiversity
    - Species and habitats
    - Natural disturbance
    - Monitoring
  - Healthy forests
  - Soil and water
  - Climate
  - Socio-economics
  - Society's responsibility
- Fate of the other model forests
- Conclusions and recommendations

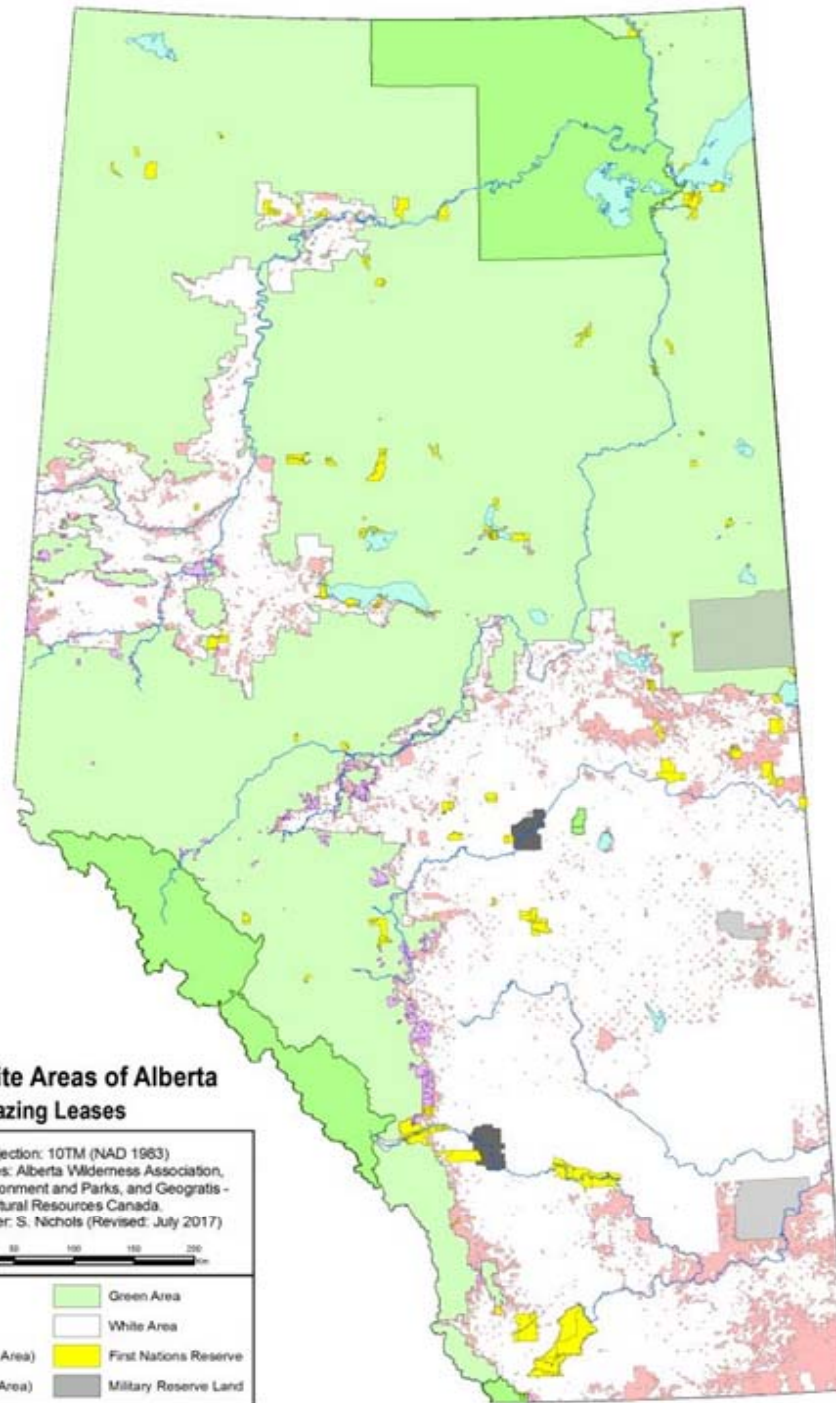
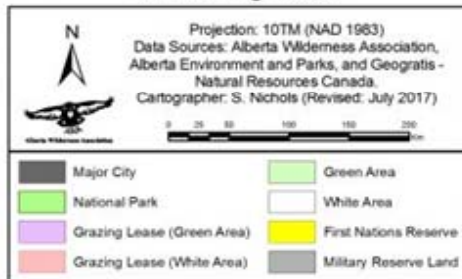
# DIKW Pyramid



# Timeline

- 1869—Canada acquires Rupert's Land
- 1906—Forest Reserves Act
- 1930—Transfer of Resources
- 1948—Alberta Green Area
- 1954—Hinton Forest Management Agreement
- 1977—Eastern Slopes Policy
- 1990—federal Green Plan
- 1992—Foothills Model Forest
- 2007—Foothills Research Institute
- 2015—fRI Research

### Green and White Areas of Alberta with Grazing Leases





# Caterpillar D-8, introduced 1935



# Cumulative Effects

- Forest harvests and reforestation
- Coal mining
- Oil and gas exploration, production, and transmission
- Roads and power lines
- Traditional and recreational use
- Indigenous rights
- Pits and quarries



# 1990: Wild River area between Edson and Hinton northwest of Athabasca River

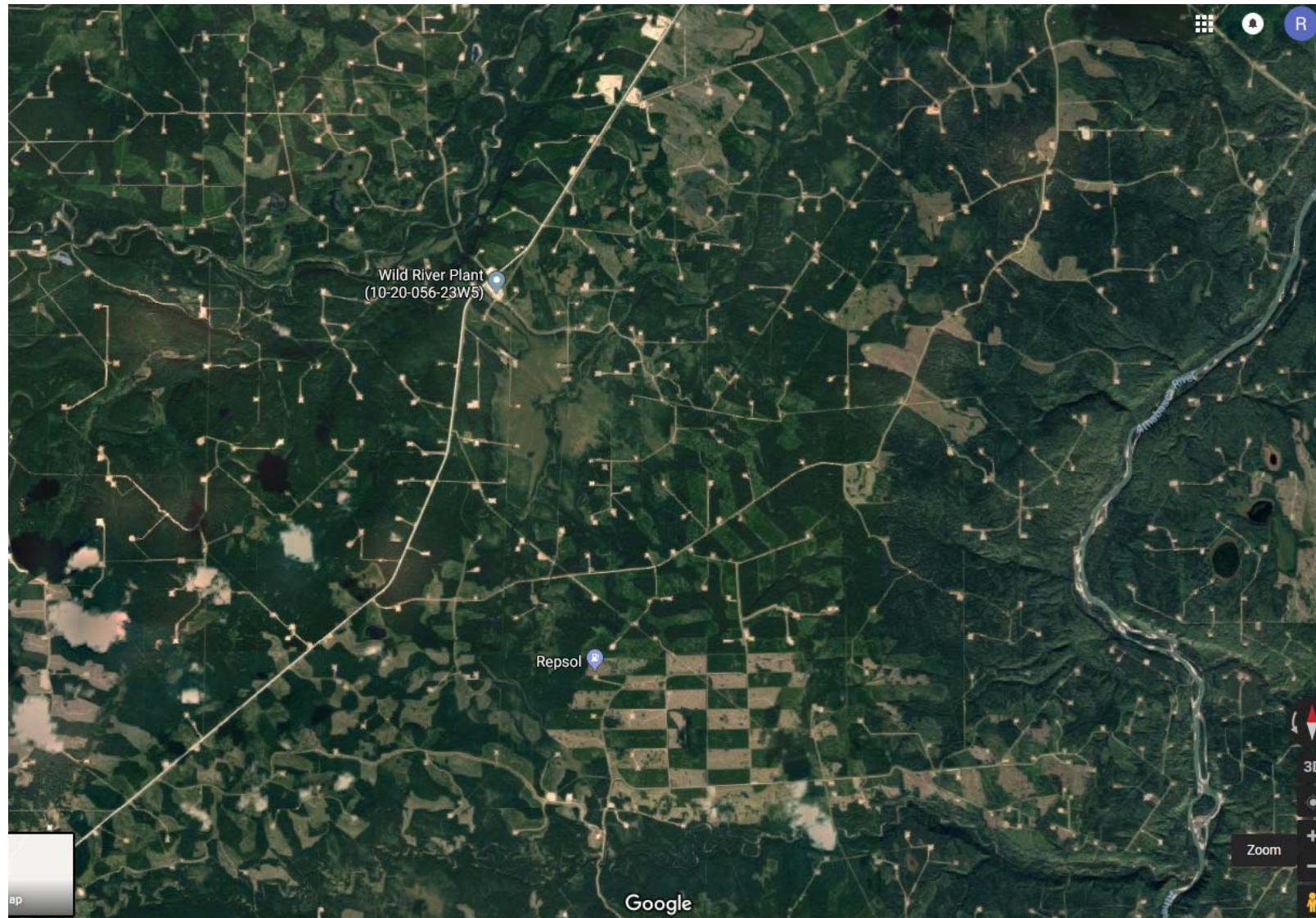


# Same Area 2011





# Current Google Satellite View



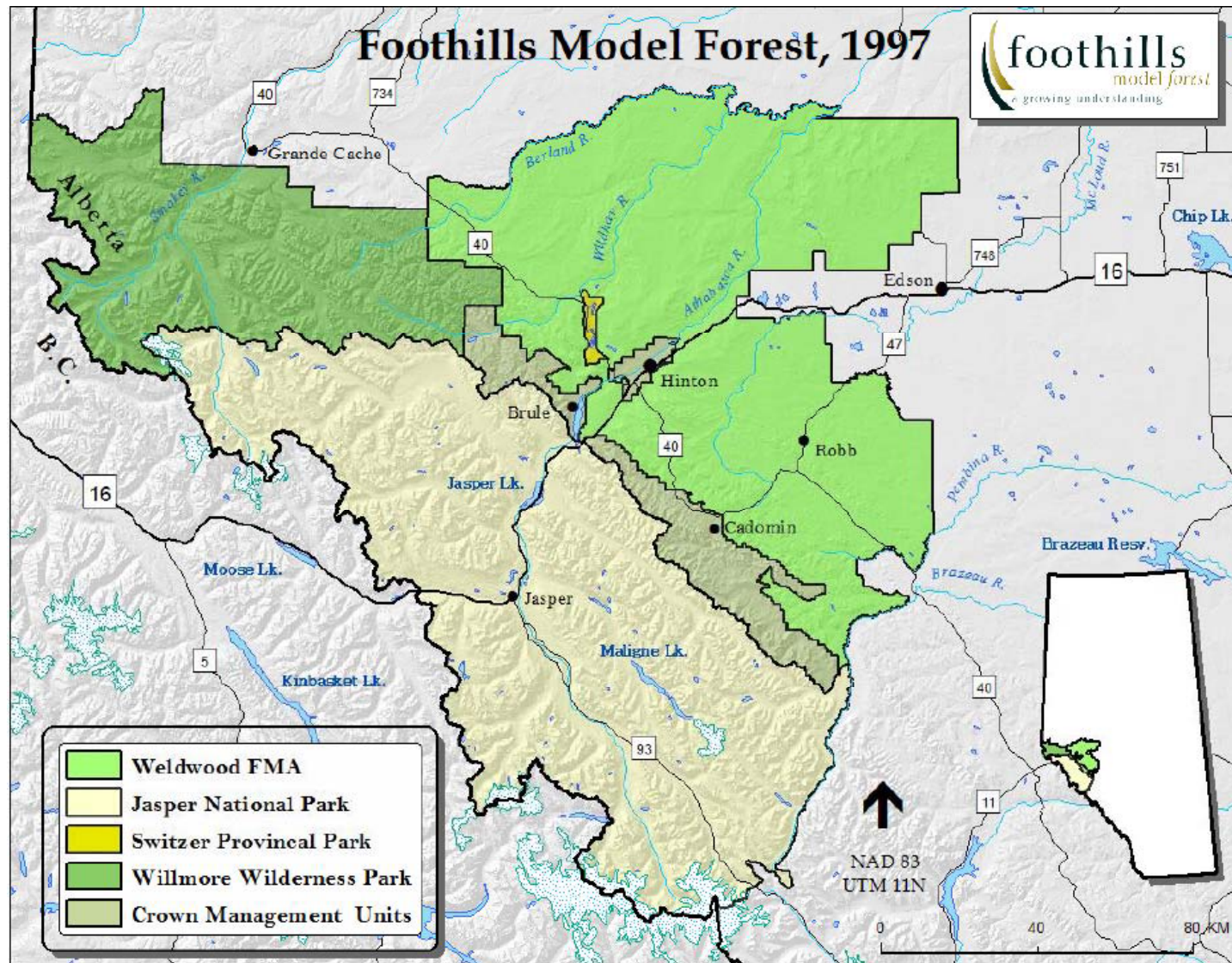




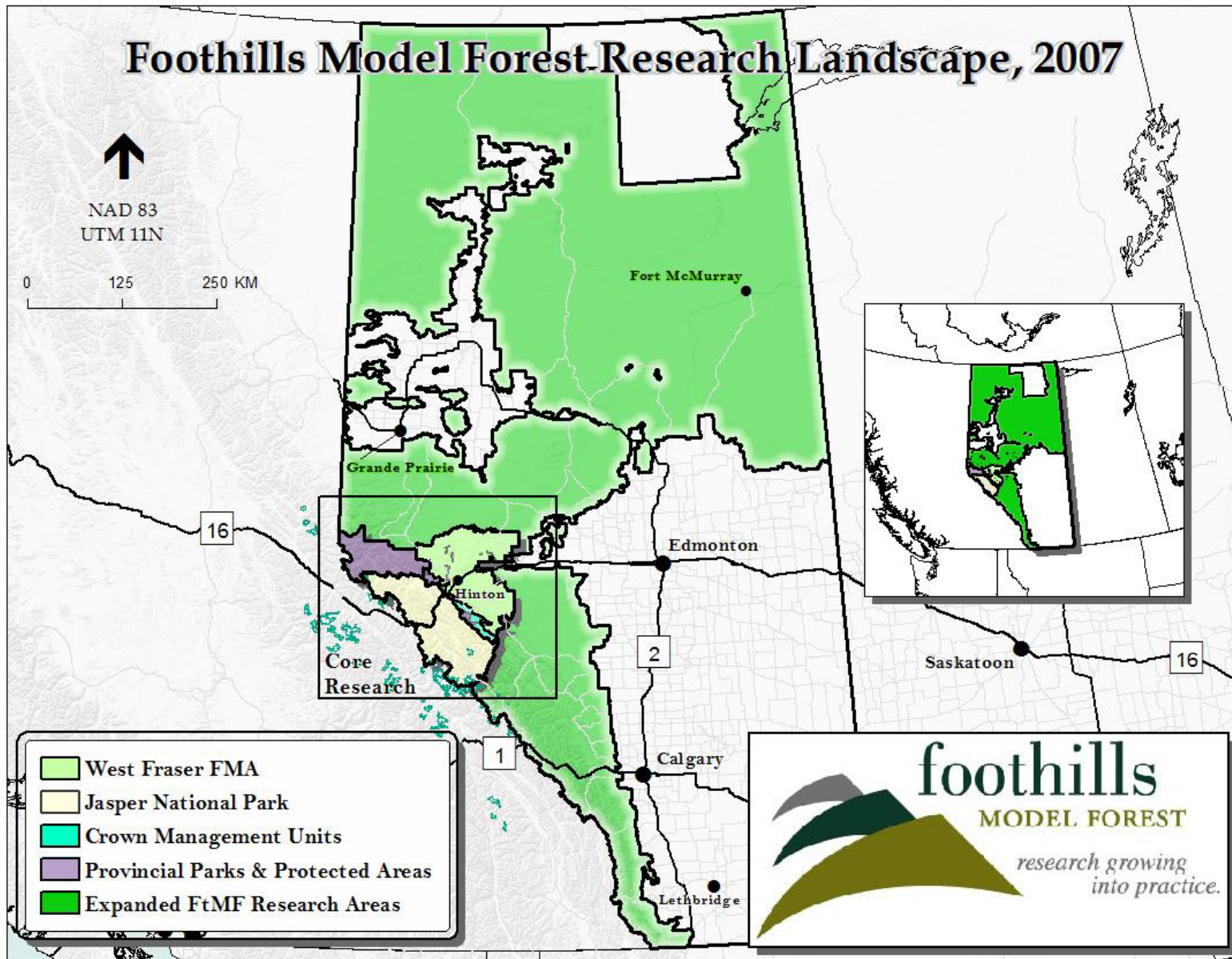




# Core Land Base, 1997



# Research Landscape, 2007





# Pileated Woodpecker



# Woodland Caribou







**Researching Carbon Gains and Losses**  
A study by the University of Minnesota  
has found that thinning forests can  
increase carbon storage in the soil.  
This is because thinning reduces  
the amount of litter on the forest  
floor, which allows more sunlight  
to reach the ground and stimulate  
microbial activity. This activity  
breaks down the litter and releases  
carbon into the soil, where it can  
be stored for a long time.

**Western Wood Products Management Program**  
**Caribou Lichen Study**  
**Commercial Thinning**  
**Research Trial**  
**Berland 18**  
Commercially Thinned 1998





# Caribou Patrol Program

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## **Aseniwuche Winewak Nation (AWN) Caribou Patrol**

Grande Cache Indigenous community, with support of Foothills Landscape Management Forum, works on education initiatives and recovery strategies such as habitat restoration and predator control.

# Laura Finnegan, Caribou Program



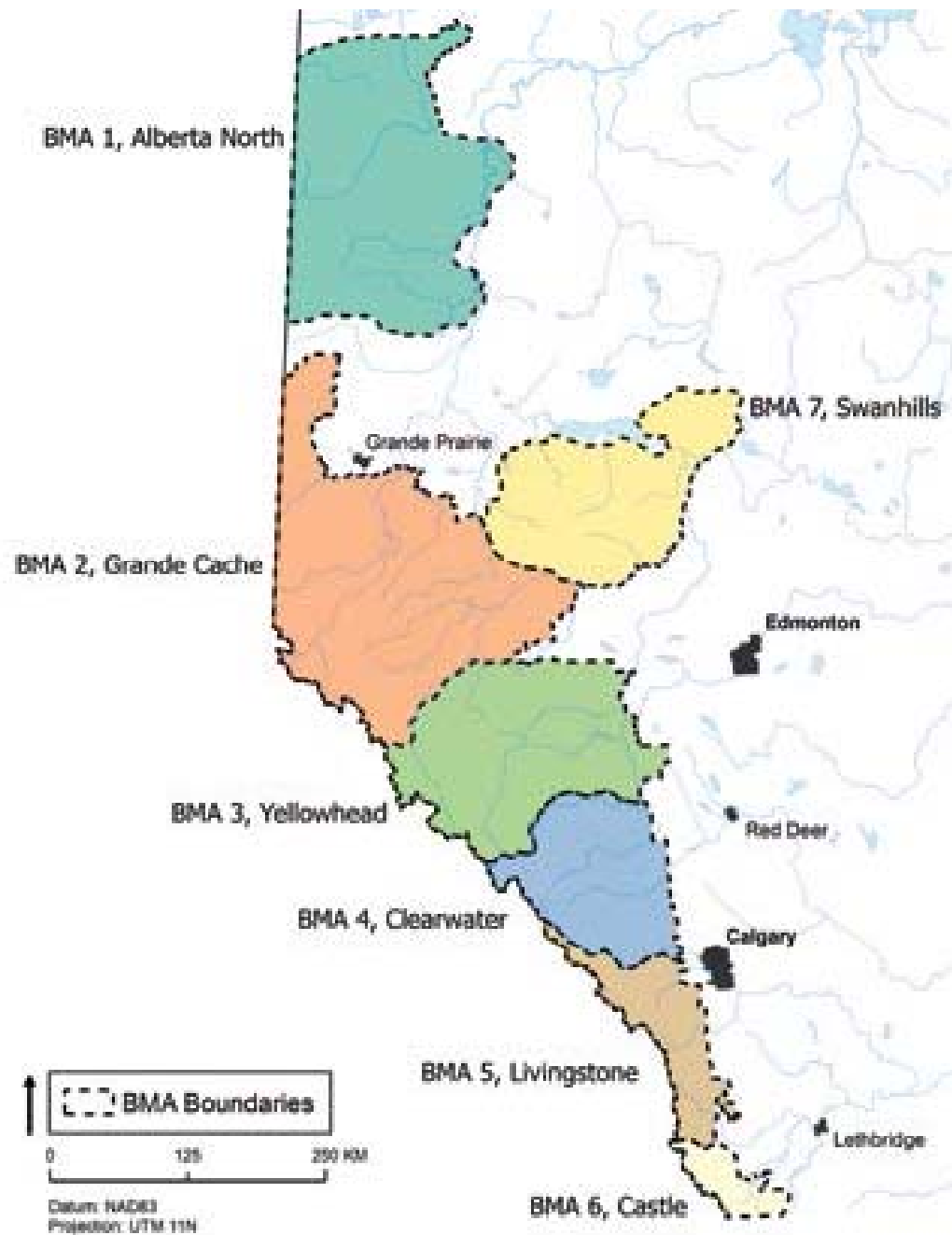




Current and historical grizzly bear range

Grizzly Bear G20, popularly known as Mary, and her cubs were killed by poachers in 2002.







# Grizzly Bear Program (in Sweden)



GORD STENHOUSE &  
OLE GUNNER-STOEN

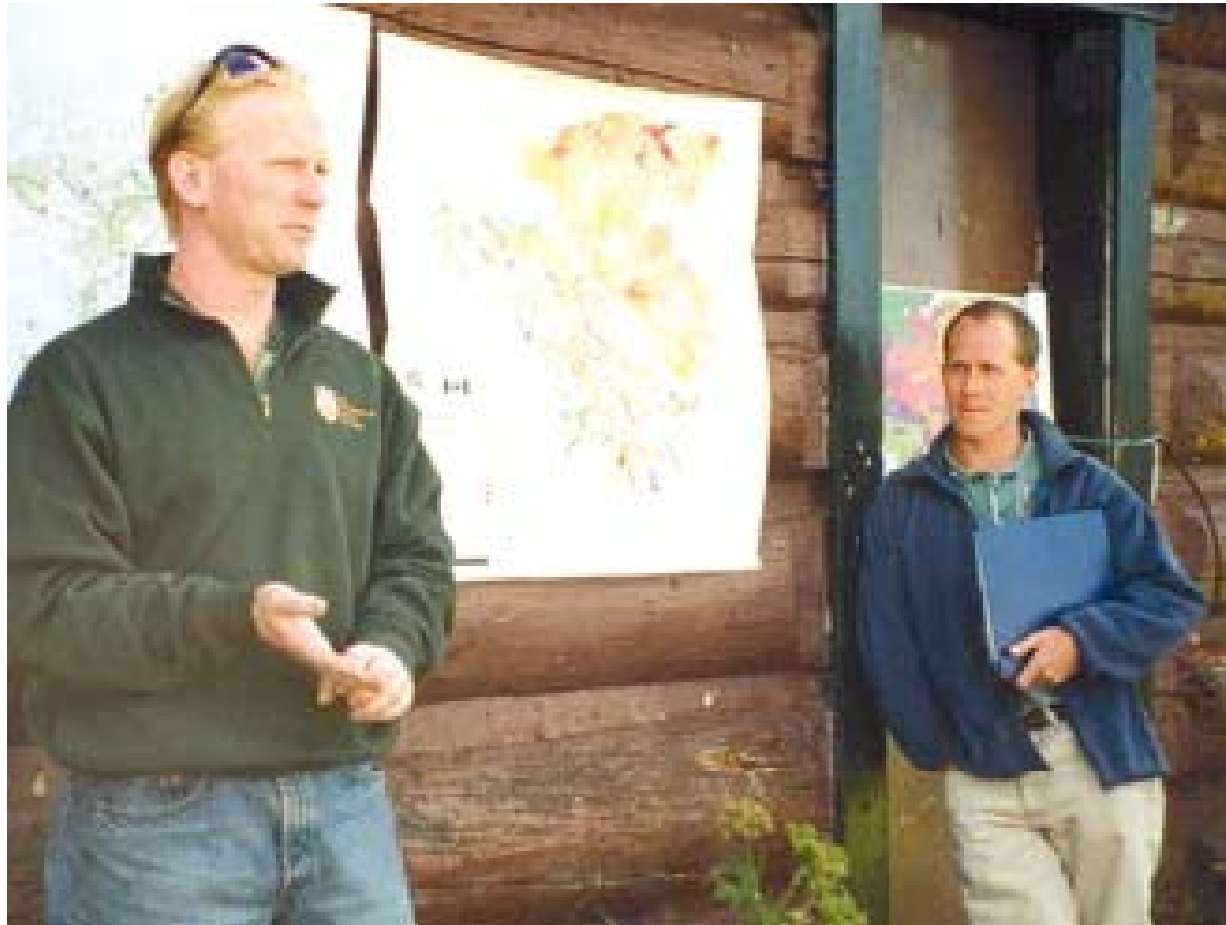
# Gord Stenhouse and Peer-Reviewed Papers







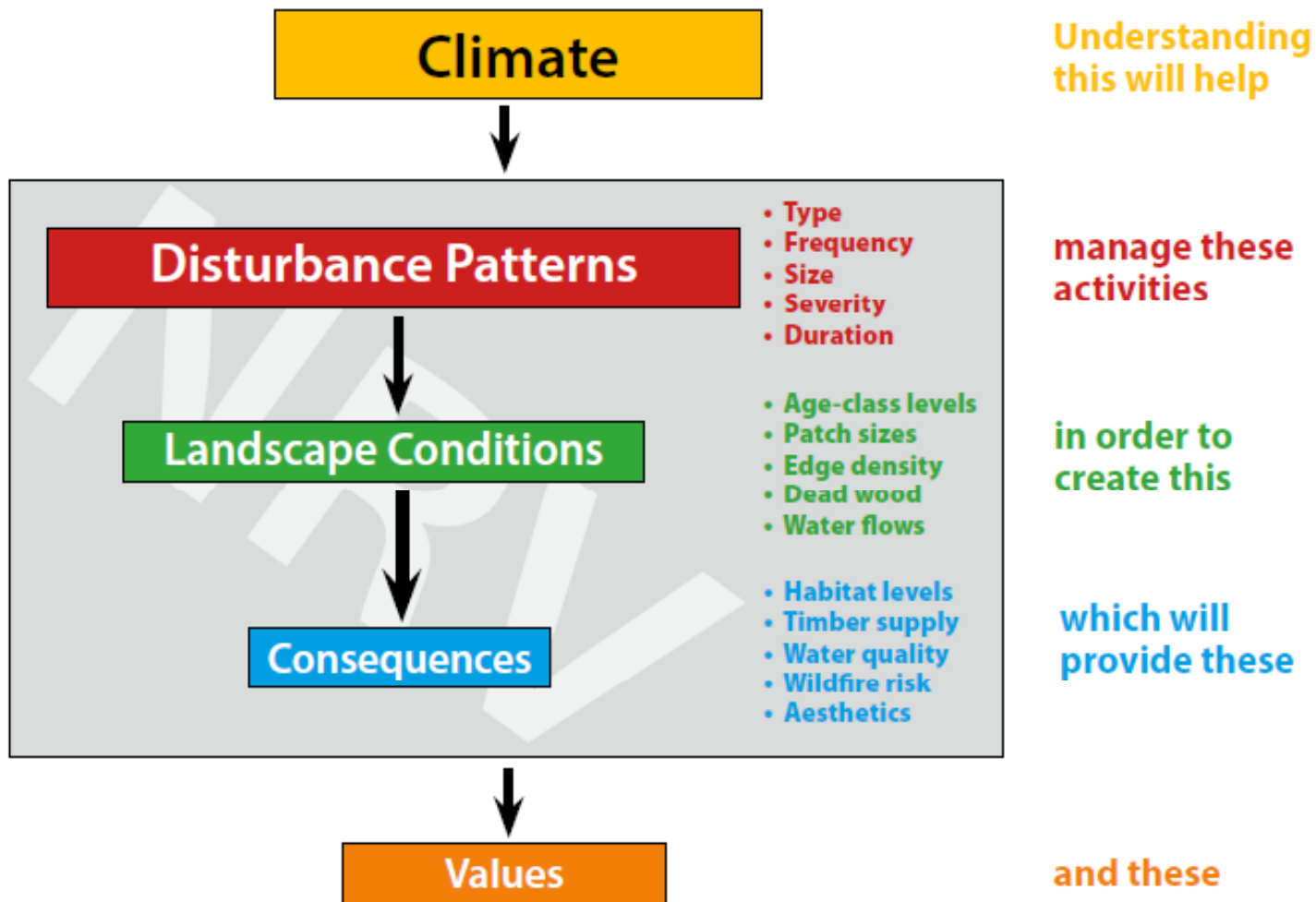
LOST CREEK FIRE 2003



### **Dave Andison and Dan Farr**

Andison's Natural Disturbance Program (now called Healthy Landscapes) led to changes in forest management across Western Canada. Dan Farr's research led to creation of the Alberta Biodiversity Monitoring Program.

# How Forest Landscapes Work







# LandWeb Study Area

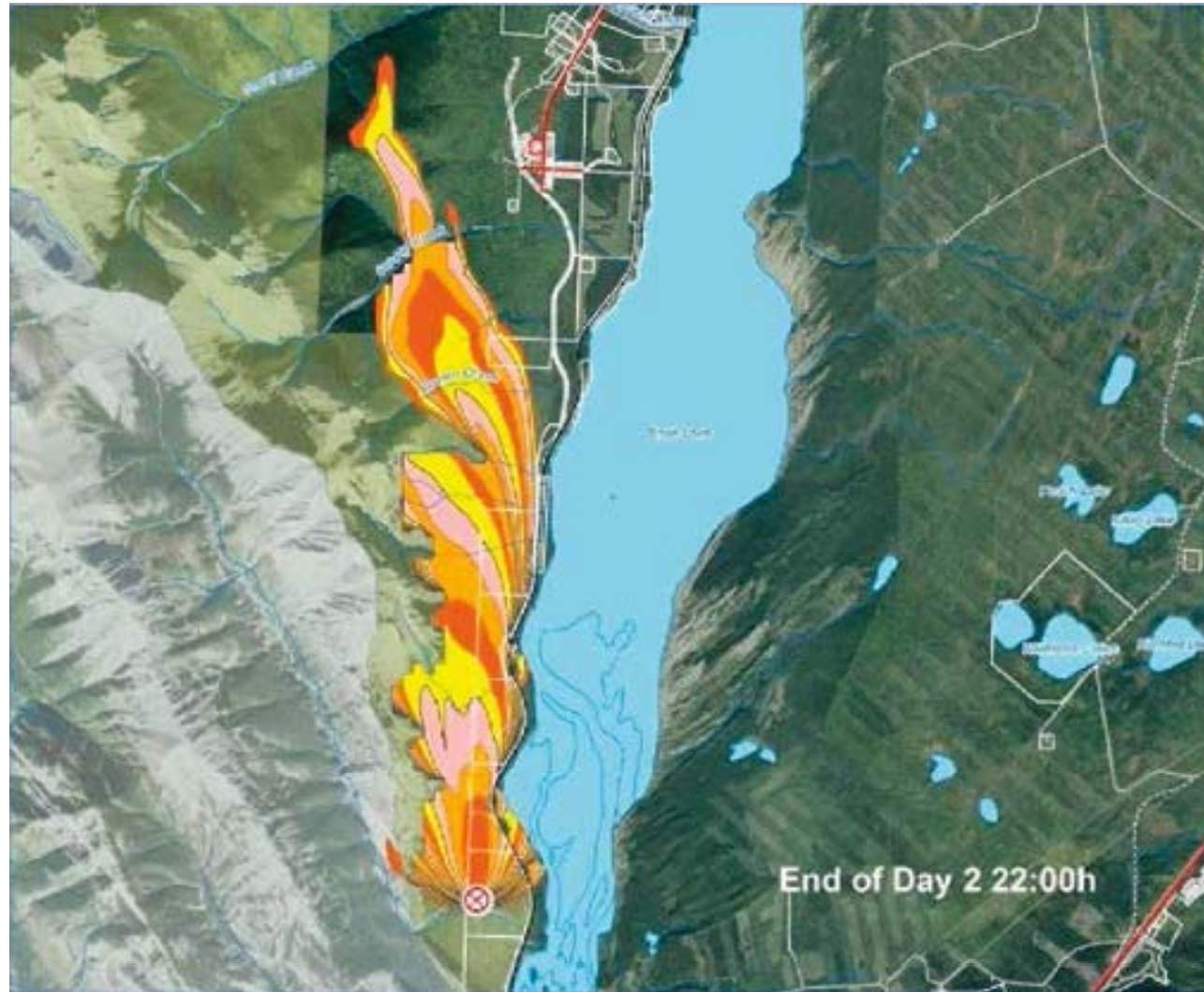


# Mountain Pine Beetle





# Prometheus Wildfire Growth Model





# FireSmart/ForestWise, Jasper 2002





# Soil and Water





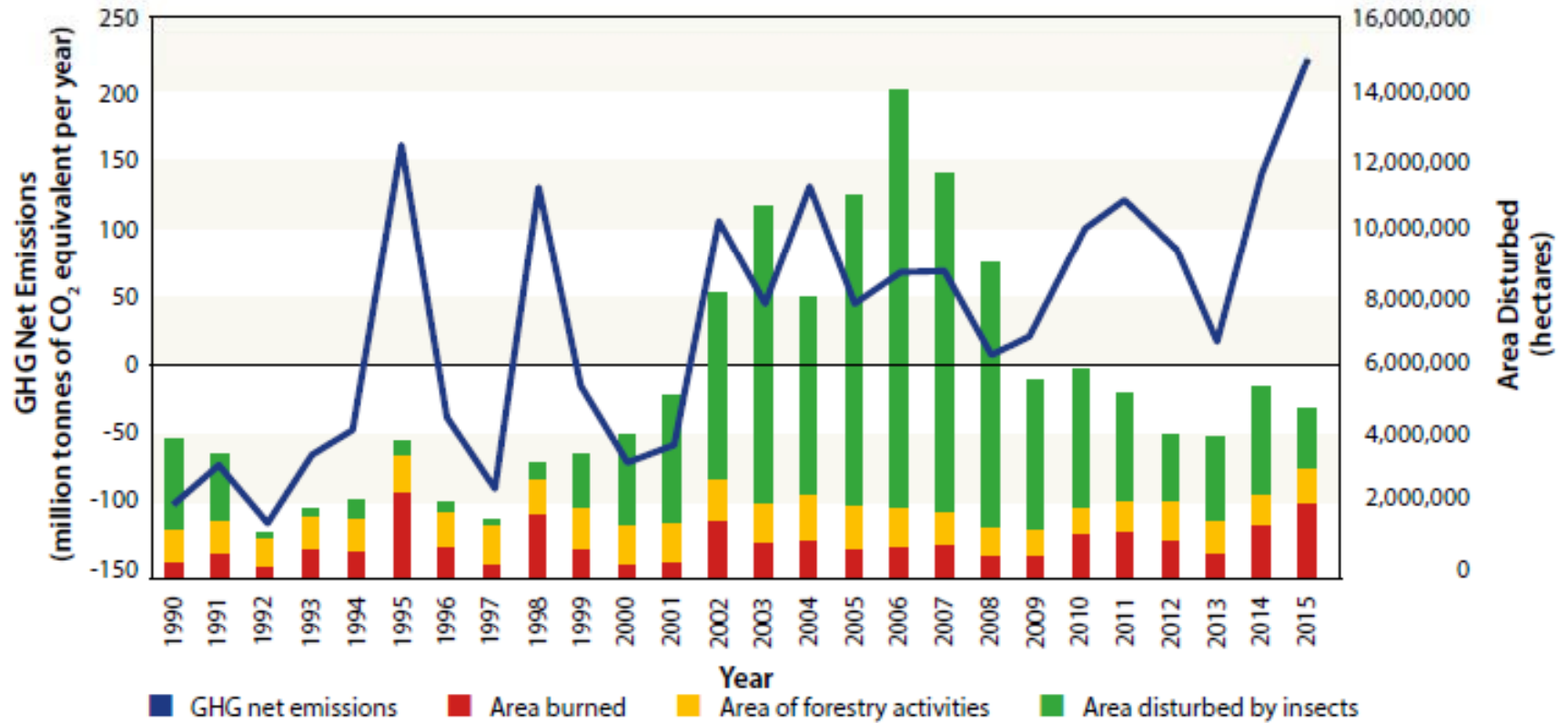
# Foothills Stream Crossing Partnership



# New Bridge Construction Methods



# Carbon Sources and Sinks



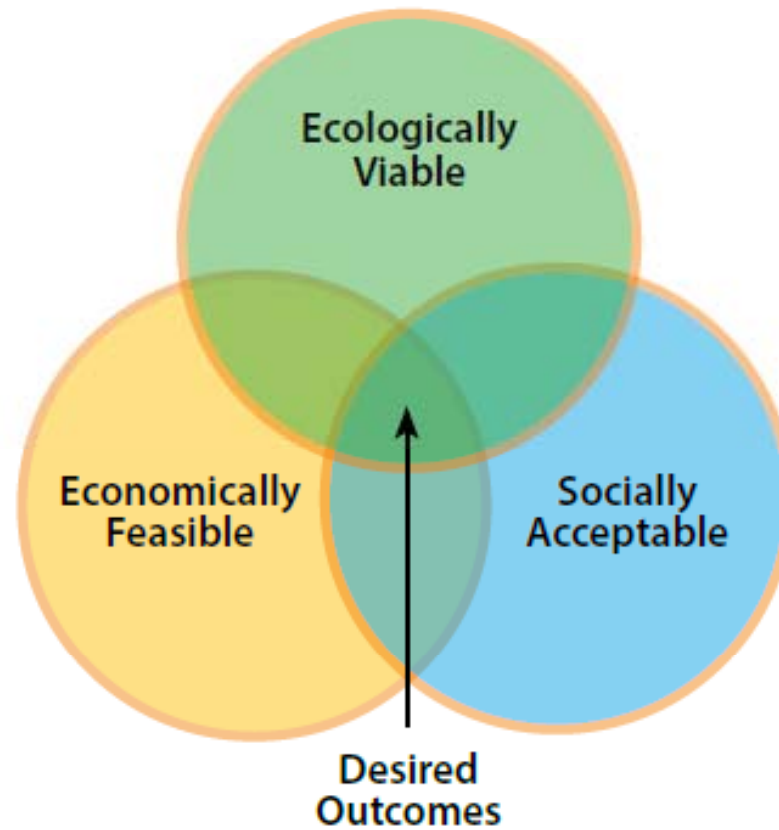


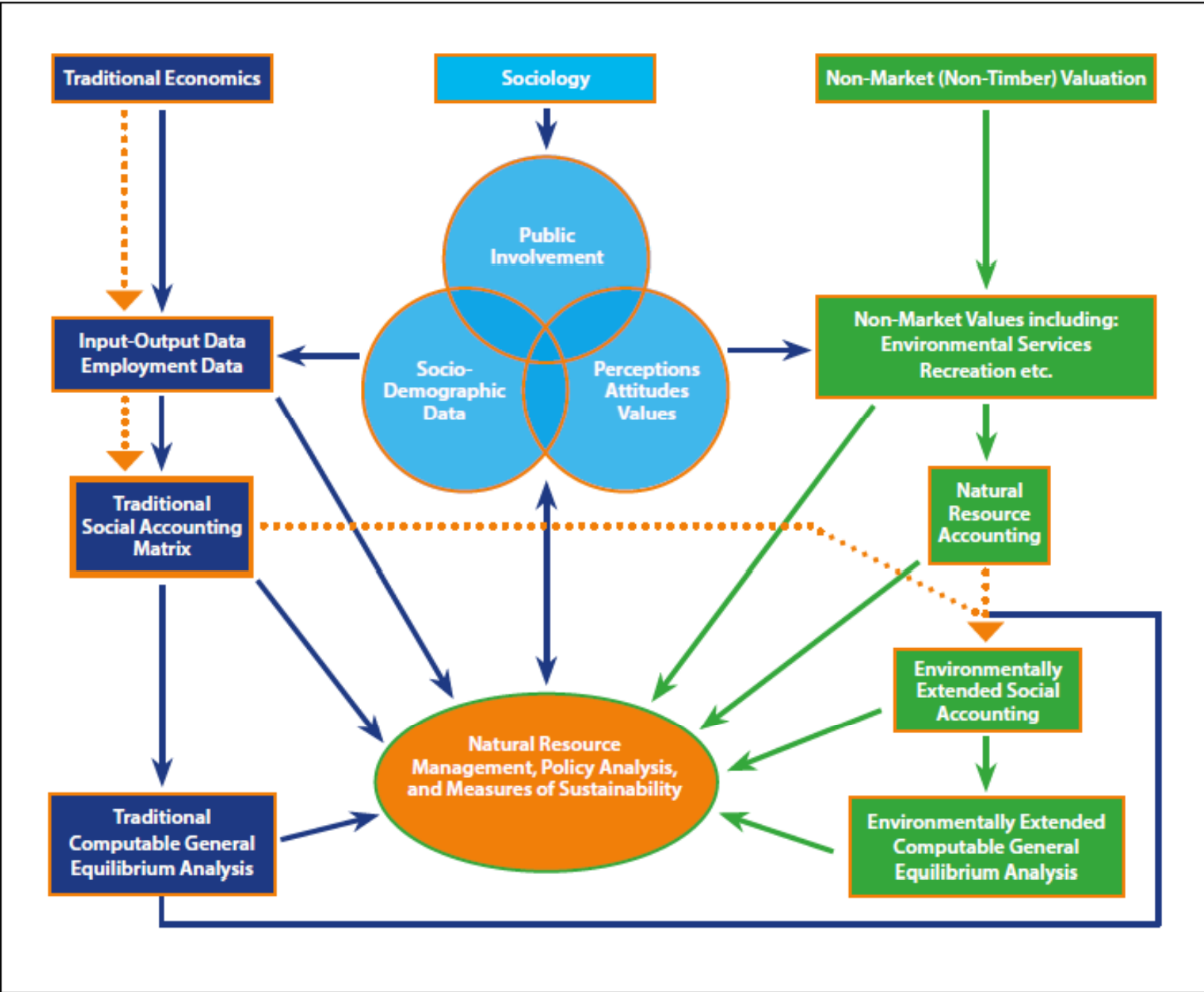
# “Greening” or “Browning”

Opportunities	Risks
Growing season	Drought
Soil temperature	Fire
Nutrient cycling	Flooding
Nitrogen deposition	Extreme weather
Carbon dioxide fertilization	Insects and diseases, including exotics

# Socio-Economics

Goal of Sustainable Forest Management








# Indigenous Involvement



# Communications and Knowledge Transfer



# Land-use Knowledge Network



Growing Insights is an innovative, online community conversation and learning experience about urban agriculture and local food in Alberta.

**Learning begins November 4, 2013**

[Register now >](#) [Learn more >](#)



# Forest History Program

