



# Natural Disturbance Program

FRI AGM

June 17, 2009

David Andison



# **The FRI Natural Disturbance Program**

**Understand patterns and process of natural disturbance,  
and help partners integrate them into forest land management & planning.**

# **Organization of The FRI Natural Disturbance Program**

**Program Lead** - David Andison, Bandalooop

**Projects Coordinator:** - Chris Stockdale, FRI

**Activity Team:**

- Rick Bonar, West Fraser Mills
- Tom Archibald, FRI
- Greg Branton, ANC
- Dave Smith, JNP
- Kevin Quintilio, Alberta SRD
- John Stadt, Alberta SRD

# Foothills Research Institute Natural Disturbance Program Long-Term Plan

*Version 1.0 in 1997*

*Version 11.0*

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February, 2009



- Rationale for ND Program
- 56 questions = a shopping list for annual work plans.
- Linkages between projects

## Basic Pattern Research

### FINE-SCALE RESEARCH

- 13 – Riparian area dist. severity
- 17 – Remnant island characteristics
- 18 – Residual heterogeneity patterns
- 19 – Residual het. spatial controls
- 20 – Other residuals patterns
- 21 – Other residual spatial control
- 22 – Edge architecture patterns
- 23 – Edge arch. spatial controls
- 24 – Creating LWD/CWD

### MESO-SCALE RESEARCH

- 10 – Event design
- 11 – Event design controls
- 14 – Remnant island patterns
- 15 – Remnant island types
- 16 – Remnant island spatial controls
- 28 – Browse patterns
- 29 – Wildfire vs. controlled fire patterns

### COARSE-SCALE RESEARCH

- 1 – Landscapes as fire regimes
- 2 – Sub-regime existence
- 3 – Disturbance Frequency
- 4 – Age-class distributions
- 5 – Disturbance event sizes
- 6 – Disturbance patch sizes
- 7 – Other patch sizes
- 8 – Disturbance event / patch shapes
- 9 – Other patch shapes
- 12 – Riparian area dist. Frequency
- 25 – MPB dynamics
- 26 – Land slide pattern dynamics
- 27 – Flooding dynamics

## Related Pattern Research

### POST DISTURBANCE RESEARCH

- 107 – LWD/CWD temporal dynamics
- 108 – Long-term residual dynamics
- 109 – Long-term ingress dynamics
- 105 – Temporal regime changes
- 100 – Site-stand temporal dynamics
- 110 – Disturbance impacts on soils

### AREA-SPECIFIC RESEARCH

- 101 – Montane disturbance regime change
- 102 – Lower foothills regime change
- 103 – Subalpine disturbance dynamics
- 104 – Upper foothills disturbance severity
- 111 – Treeline dynamics
- 112 – East slopes disturbance regime

### ECOLOGICAL IMPACTS RESEARCH

- 106 – Ecological impacts research

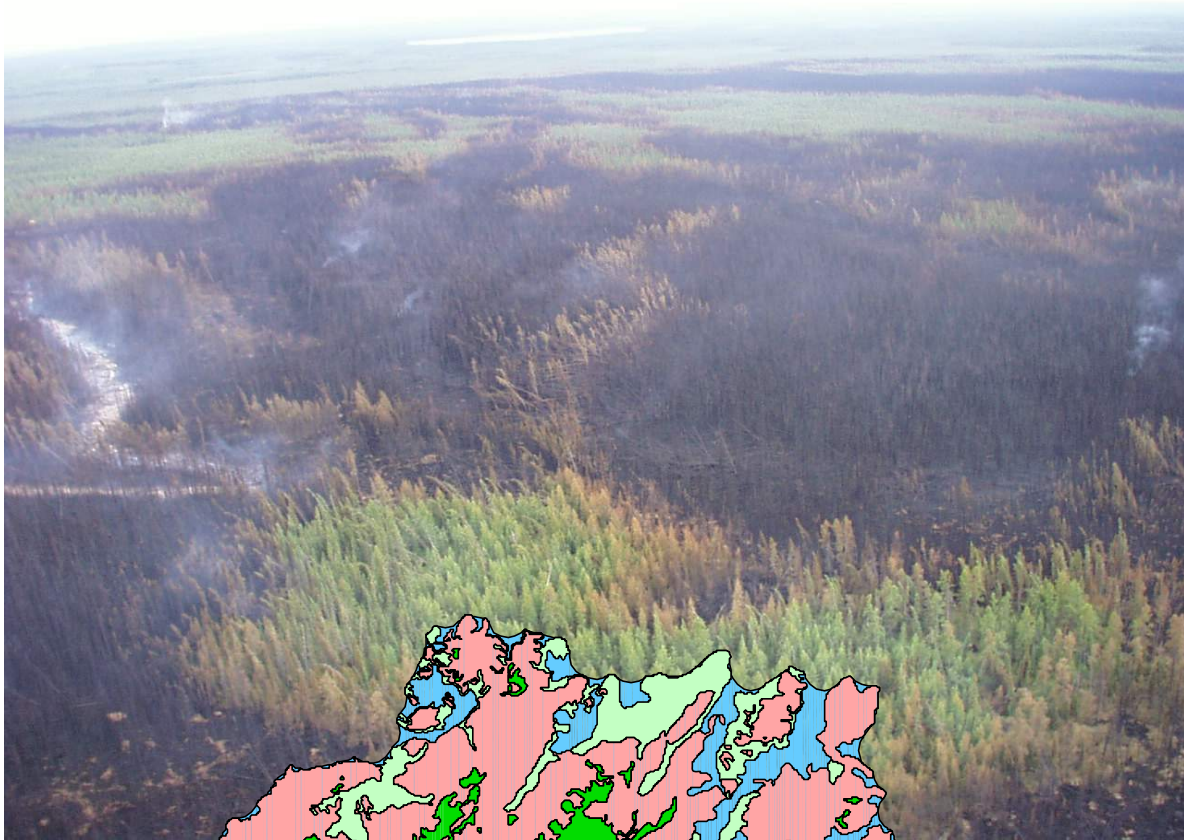
## Communication & Integration

### COMMUNICATIONS

- 300 – Conceptual foundations communication
- 301 – Technical foundations communication
- 302 – Integration potential communication
- 303 – Professional education (short courses)

### INTEGRATION

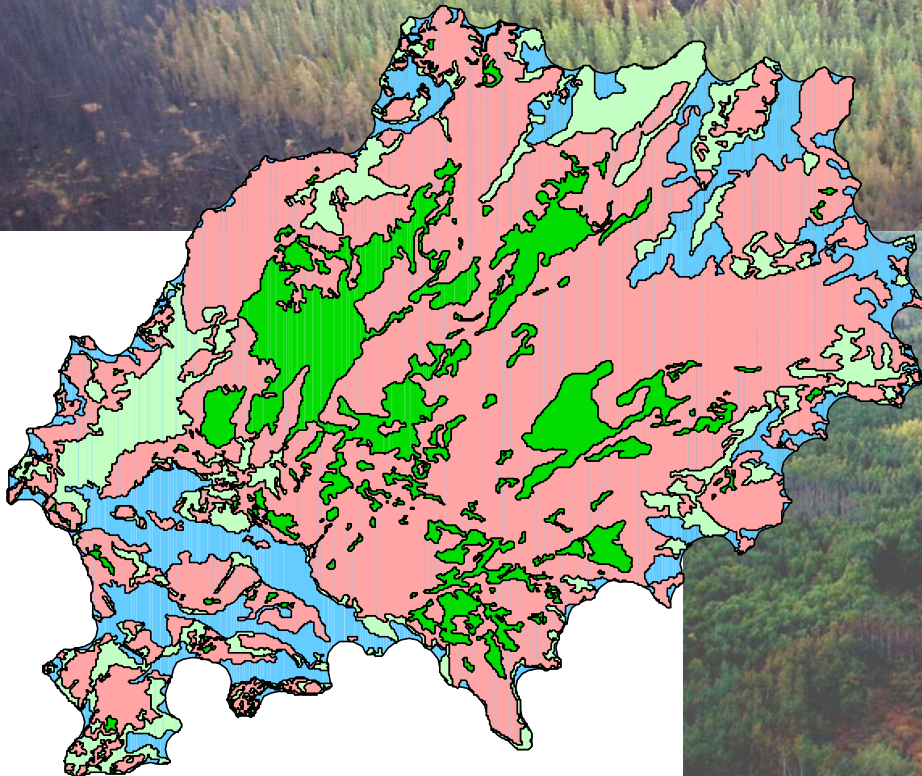
- 200 – Floating reserves
- 201 – Natural and managed disturbance
- 202 – Retaining natural landscapes
- 203 – Restoring landscapes
- 204 – Renovating landscapes
- 205 – Evaluating practical implications
- 206 – Operational Scale NRV DSS
- 207 – Strategic Scale NRV DSS
- 208 – Demonstrating NRV
- 209 – NRV as a land management tool

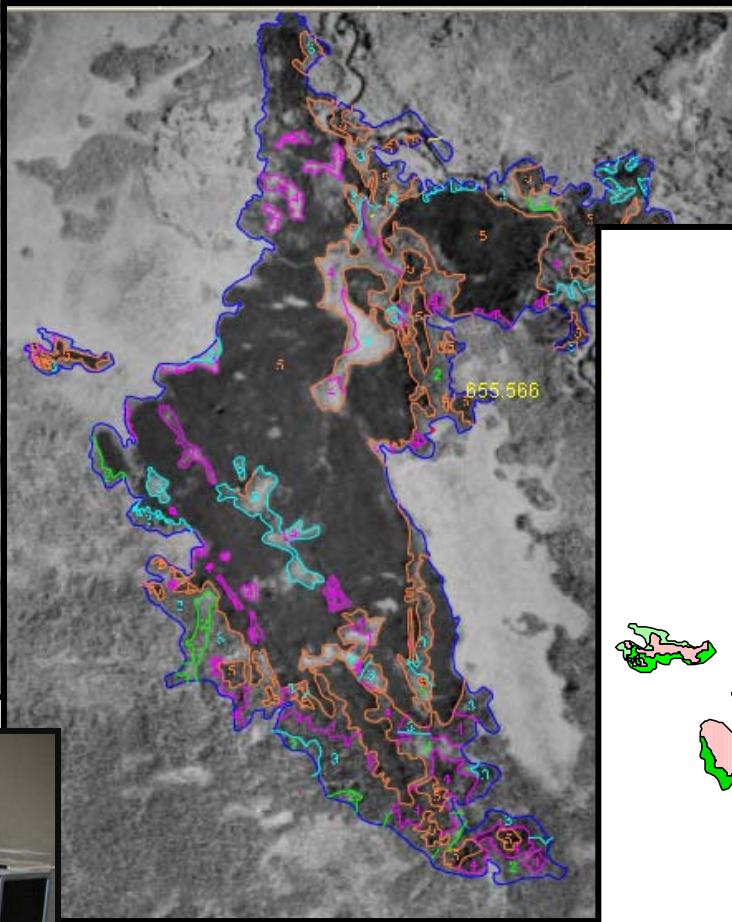
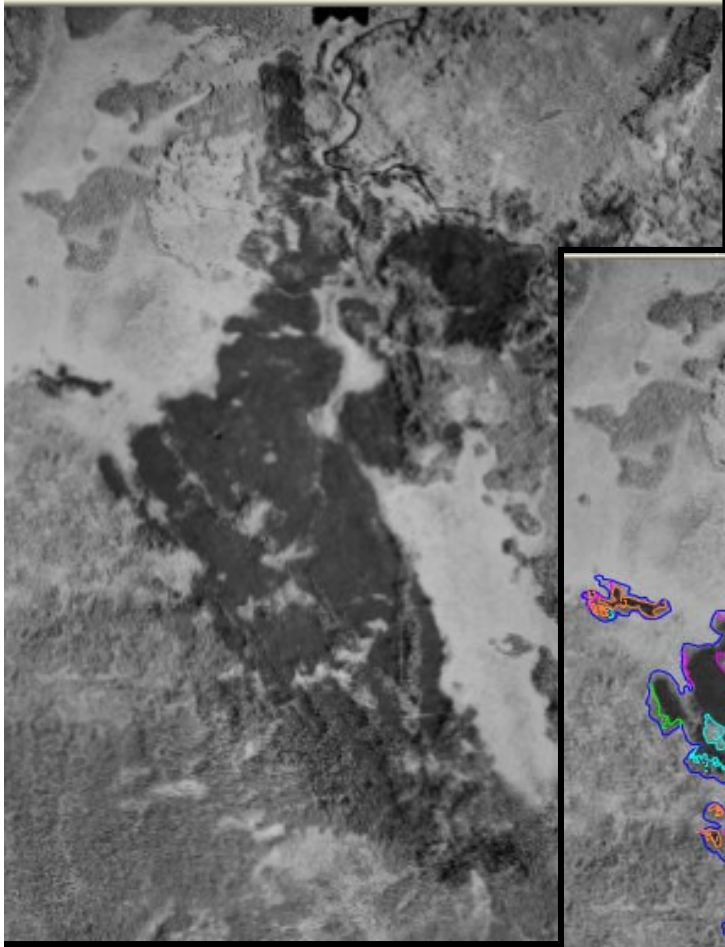


## Our Mantra:

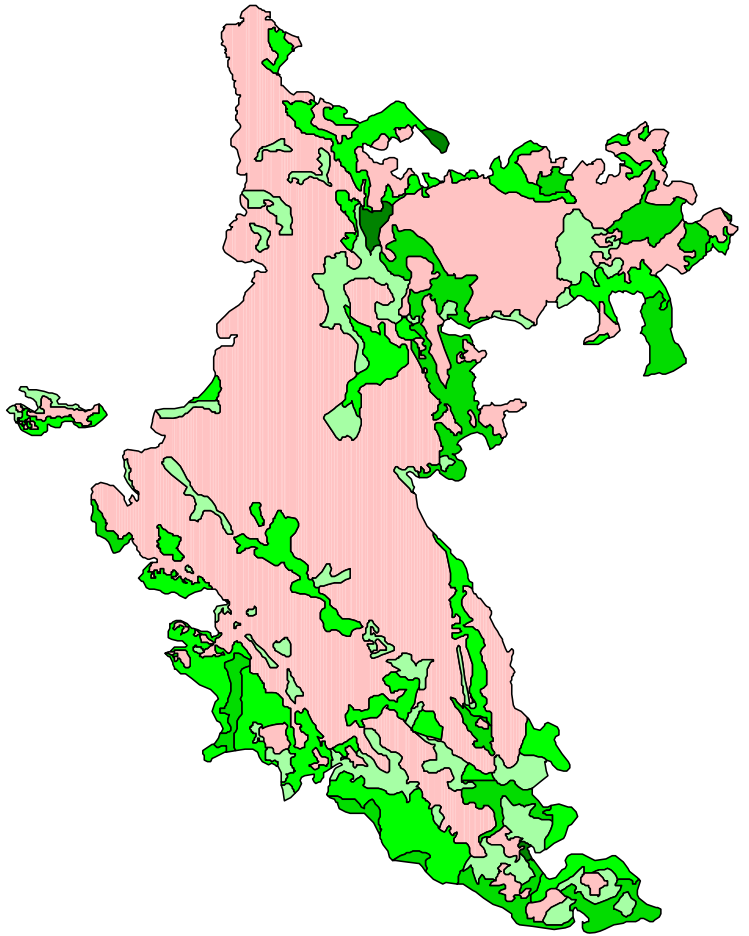
- **Good questions.**
- **Solutions, not just answers.**

***FOR EXAMPLE:***

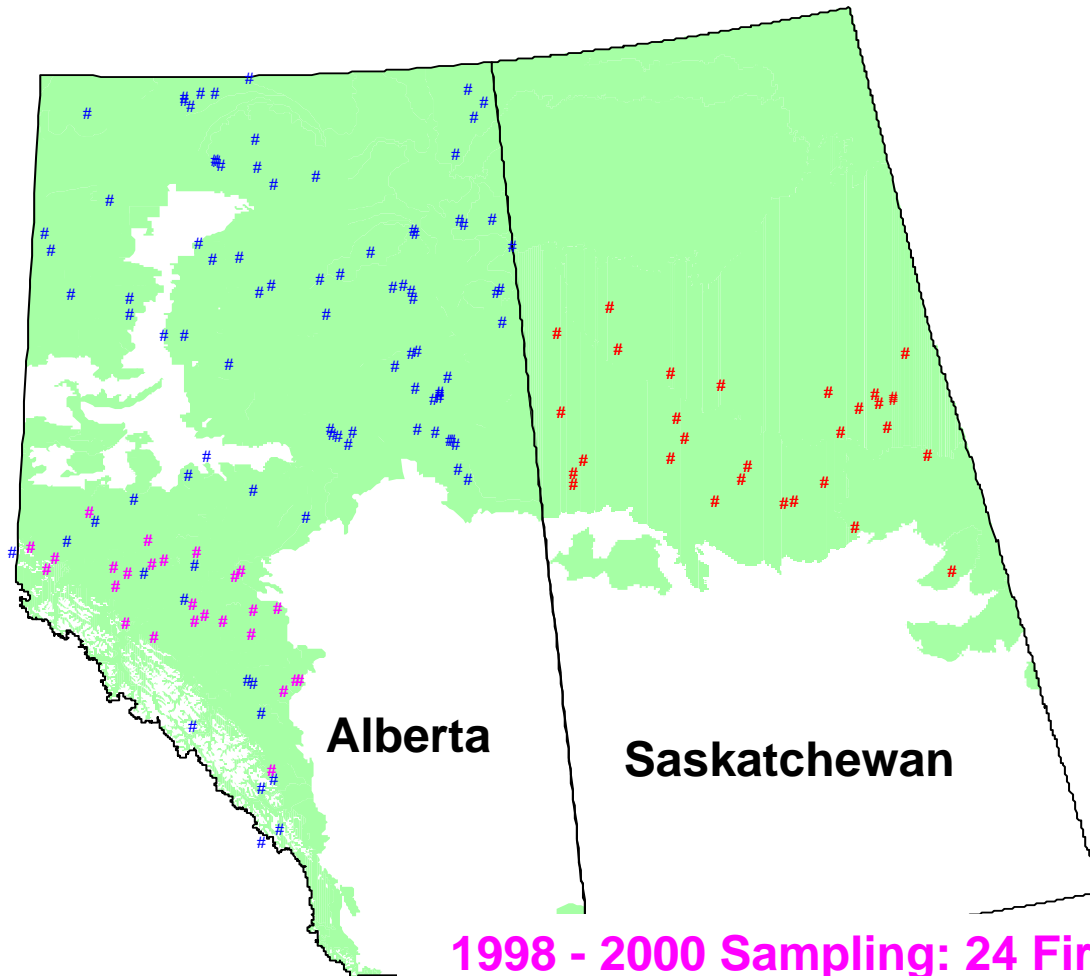




**3-Tree  
Resolution**



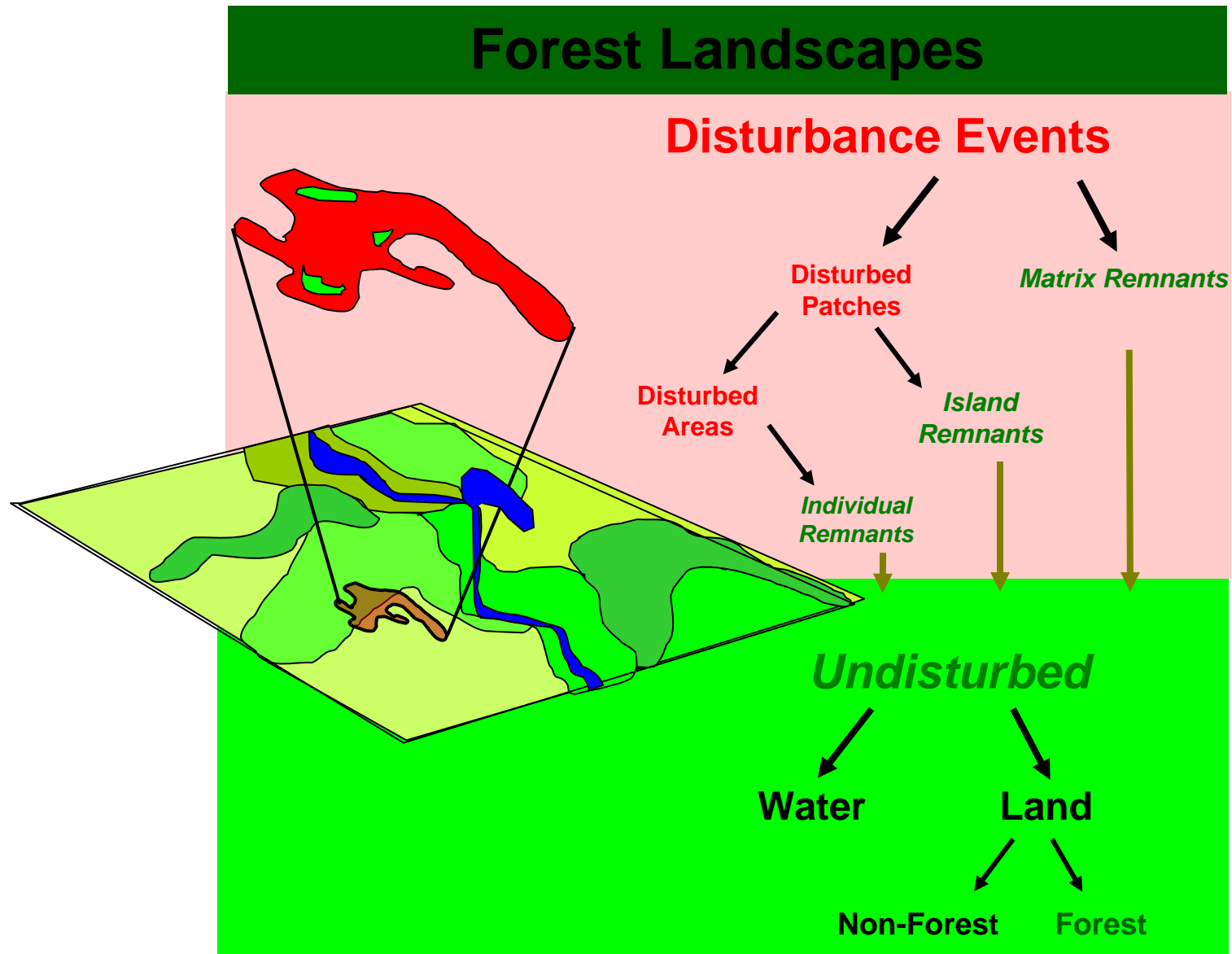
# 11 Years, 3 Provinces, 19 Partners, 130 Wildfires & 258,000 ha.

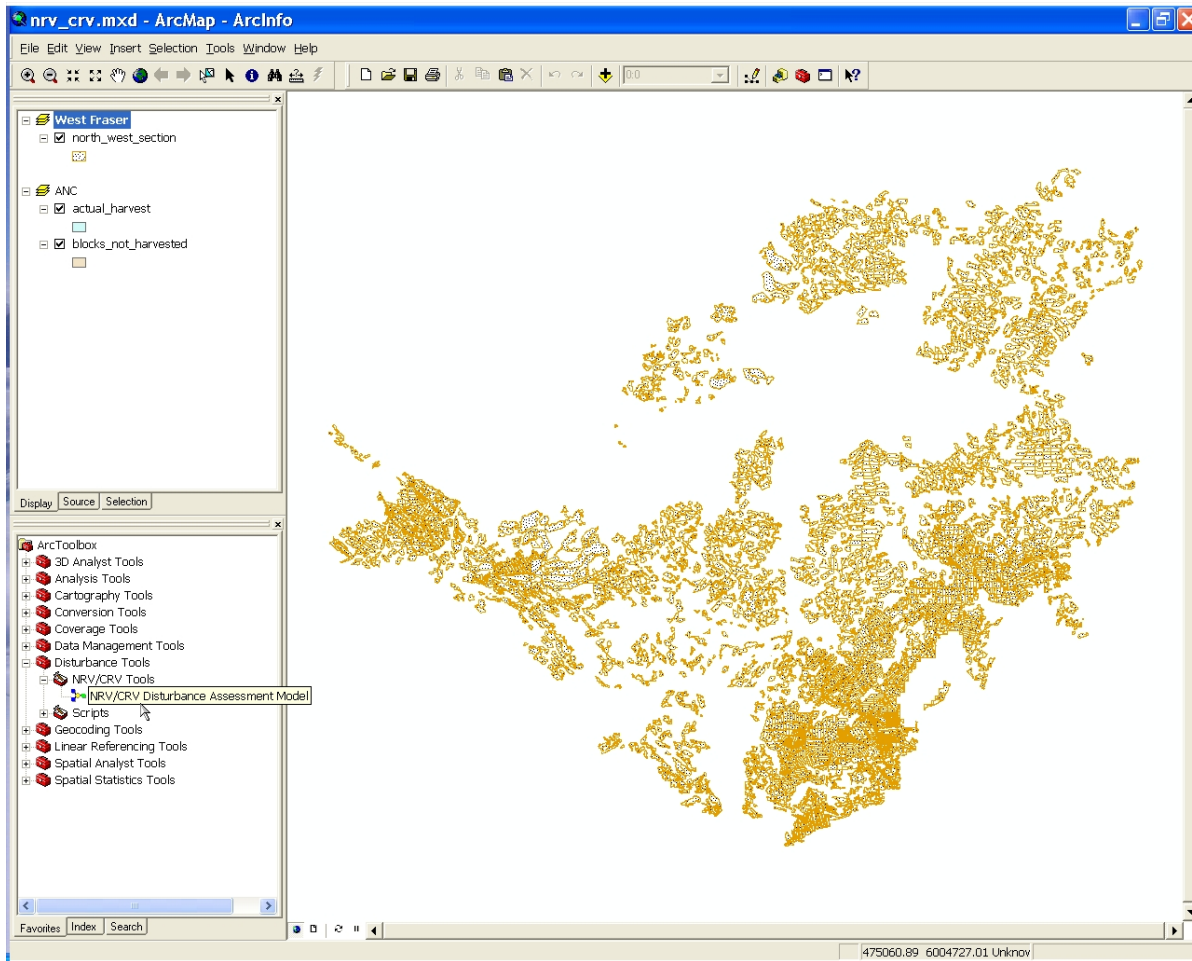


**1998 - 2000 Sampling: 24 Fires,**  
**2003 - 2005 Sampling, 29, Fires,**  
**2006 - 2008 Sampling, 77 Fires,**

Hinton Wood Products (West Fraser)  
Alberta Newsprint Company FMA  
Alberta SRD  
Jasper National Park  
Weyerhaeuser Company, Grande Prairie  
Weyerhaeuser Company – Edson  
Weyerhaeuser Company – Drayton Valley  
Tolko-Footner FMA  
Manning Diversified Forest Products FMA  
Diashowa Marubeni International FMA  
Alberta Pacific Forest Products FMA  
Slave Lake Pulp (West Fraser)  
Sunpine Forest Products (West Fraser)  
Mistik Management (Meadow Lake, Sask).  
Saskatchewan Environment  
Saskatchewan Forest Centre / Forest First  
FRIAA Open Funds  
AFPA  
BC Ministry of Forests

# A New Standardized Spatial Language





***Funded independent of,  
but managed by, FRI.***

# NEPTUNE

- GIS “plug-in” software.
- Converts spatial data into “disturbance events”.
- Compares input with NRV for 10 key pattern metrics.
- Universal spatial language and coarse filter indicators.
- Calibrated now for WC Alberta and Sask.
- Will be calibrated in '09 for all of western boreal Canada.
- Five partners now, likely 8-10 within the year.



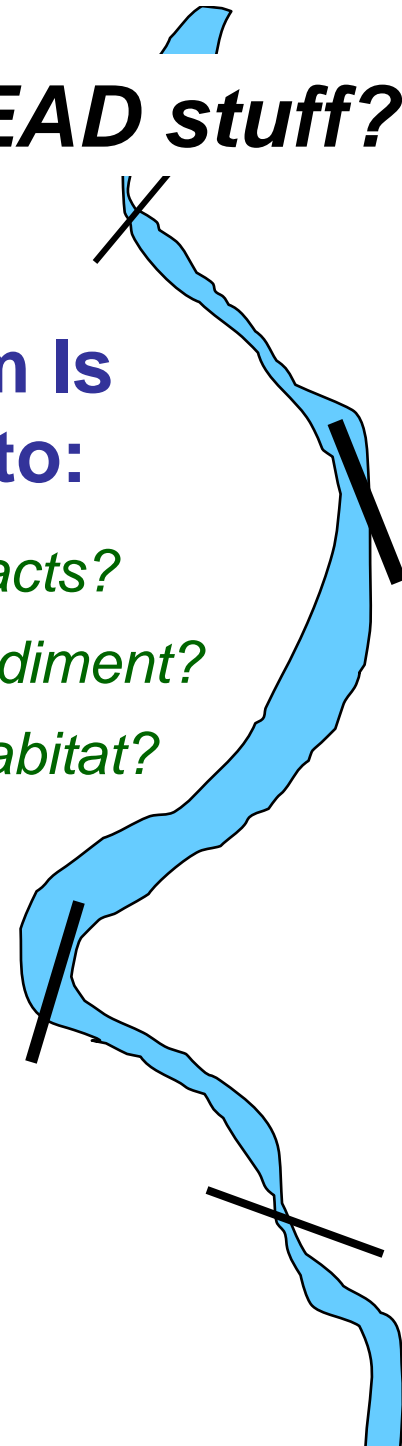
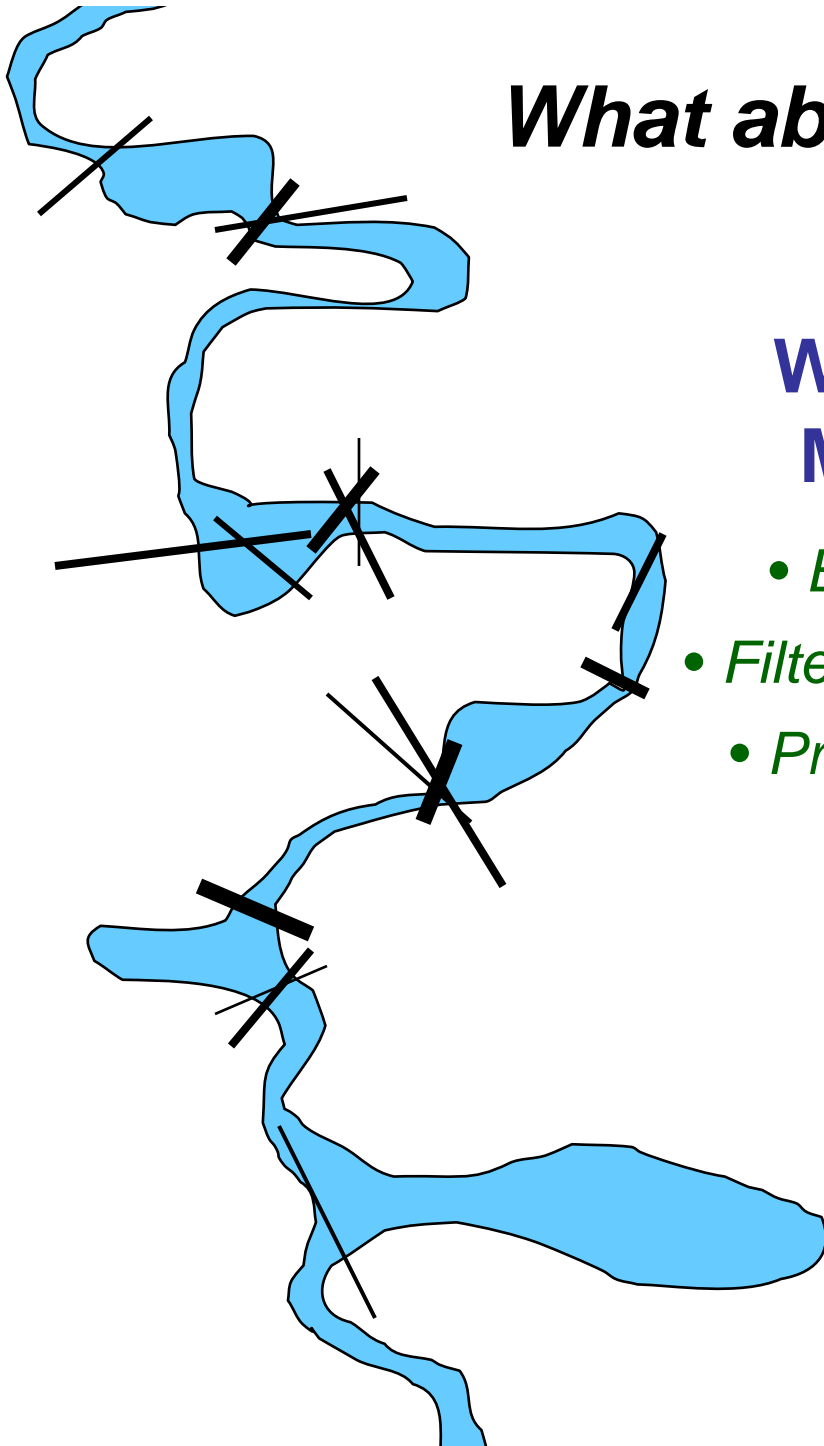
**So much for the  
trees that survive.**



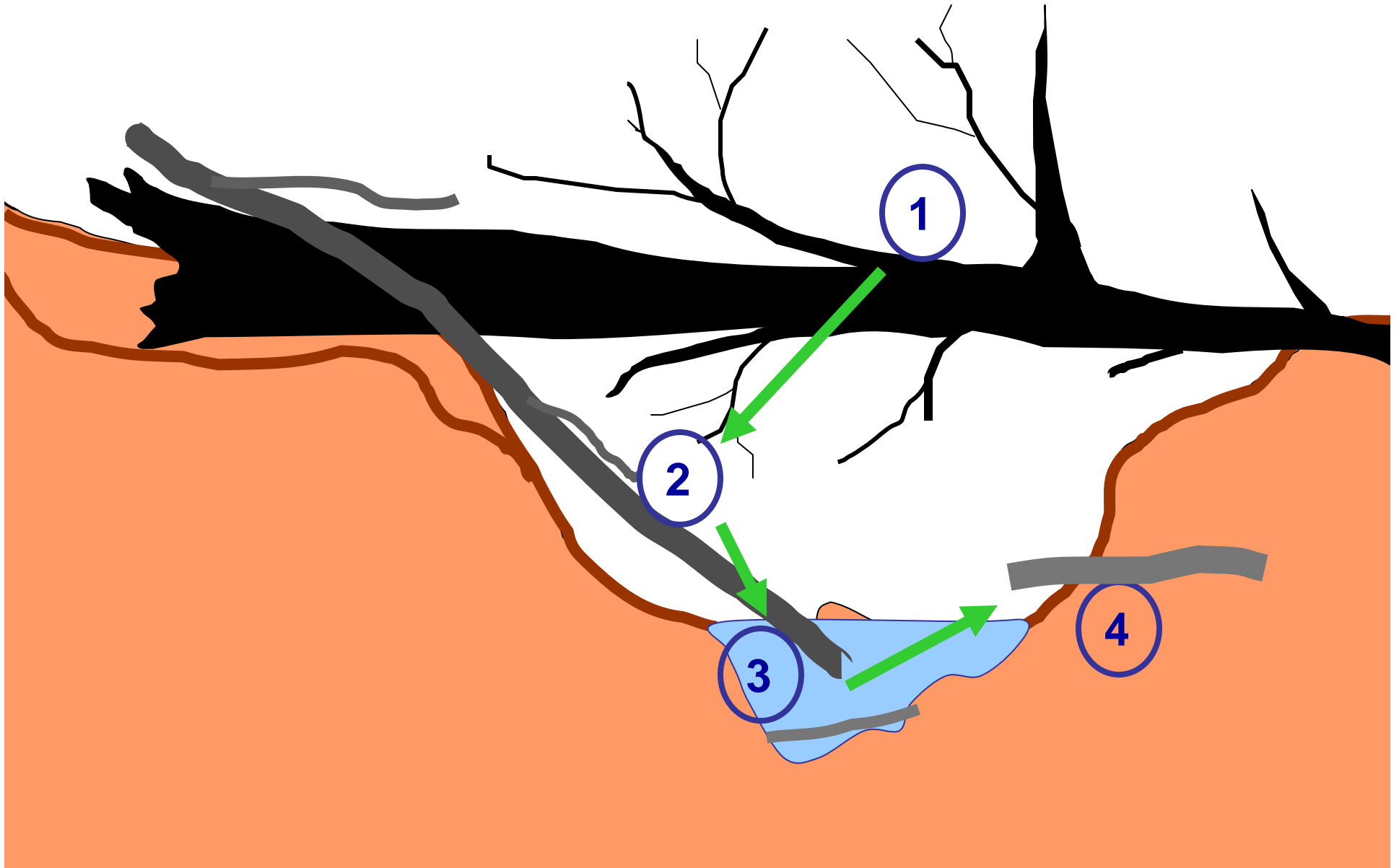
# What about the *DEAD* stuff?

## Which Stream Is More Likely to:

- *Buffer flood impacts?*
- *Filter suspended sediment?*
- *Provide diverse habitat?*



**Let's Start Simple:** What is the “life cycle” of trees once they die? - *in riparian zones.*





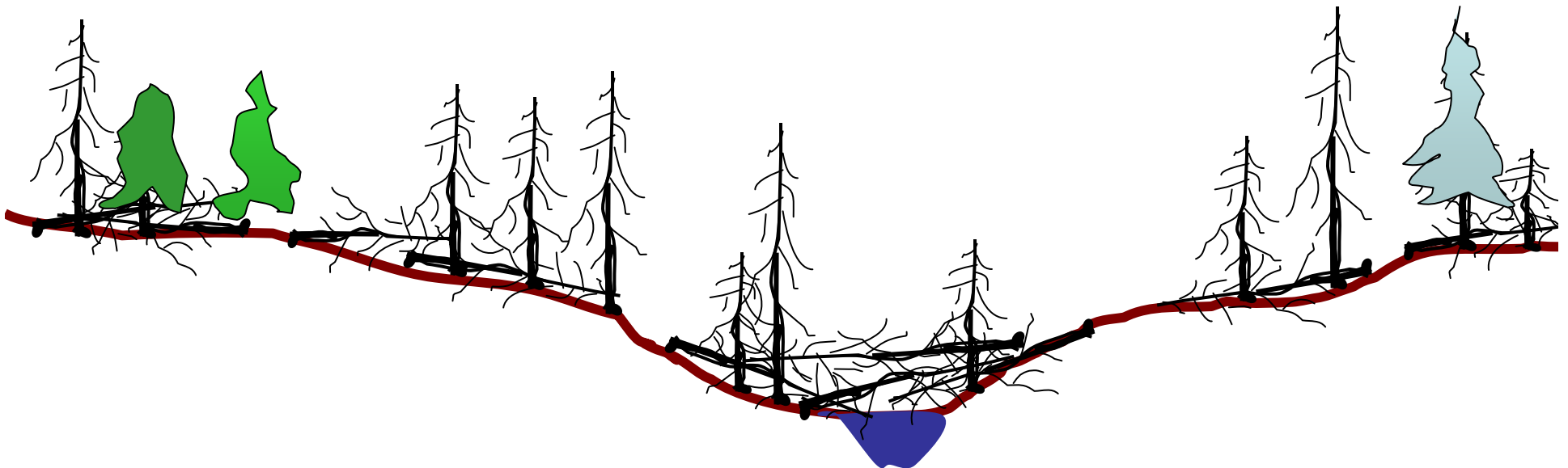
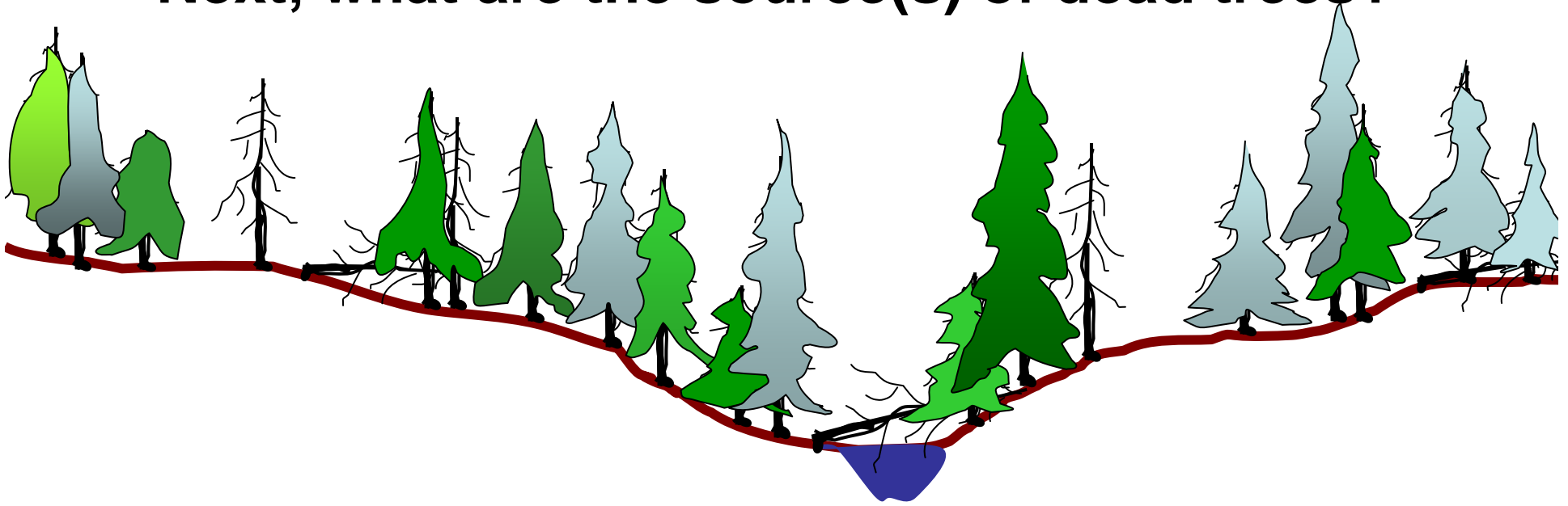
**Bridge  
10-50 yrs**

**Collapse  
Bridge  
20-60 yr**

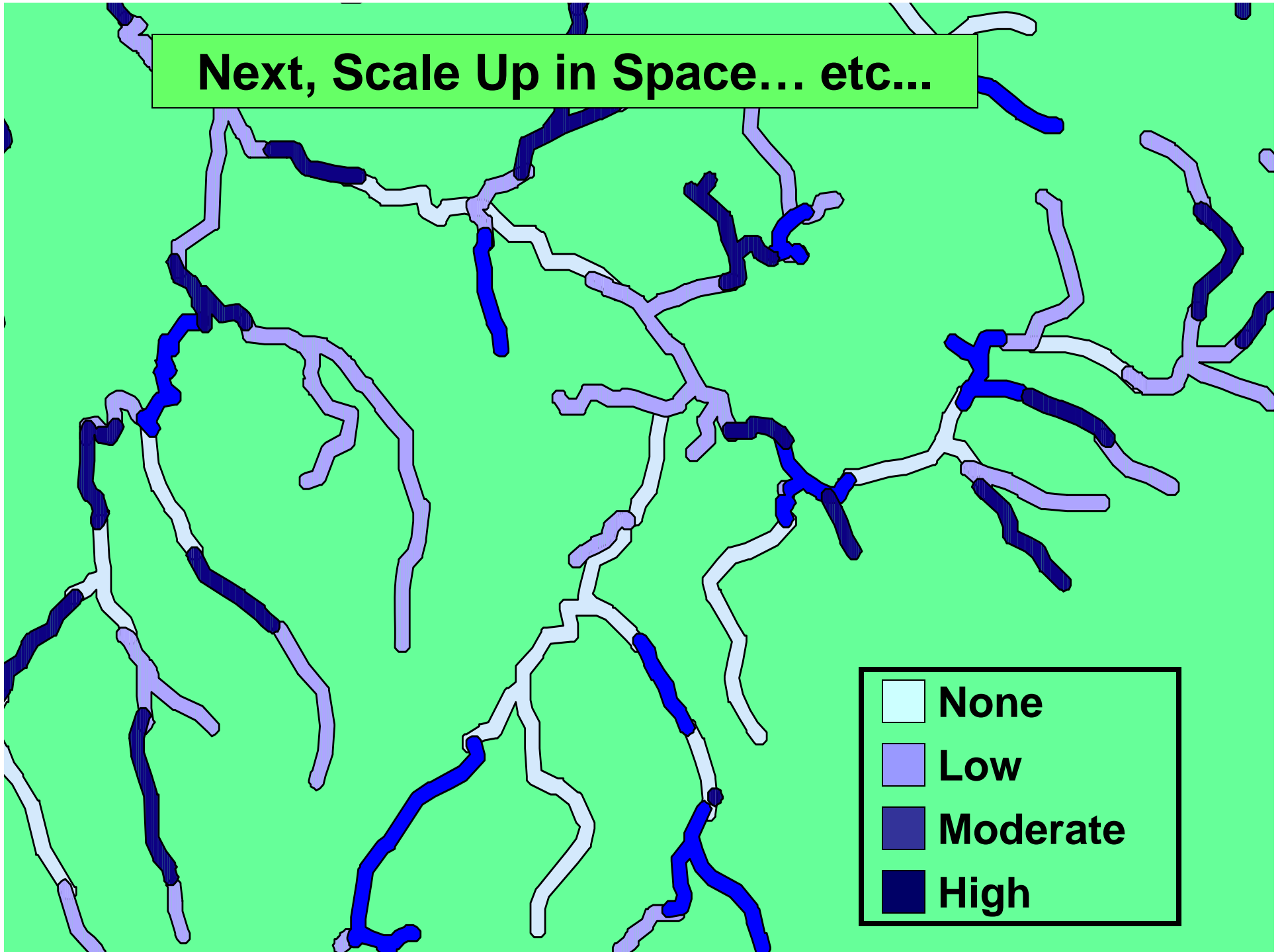
**Embedded  
50-120 yrs**

**Loose  
40-100 yrs**

Next, what are the source(s) of dead trees?



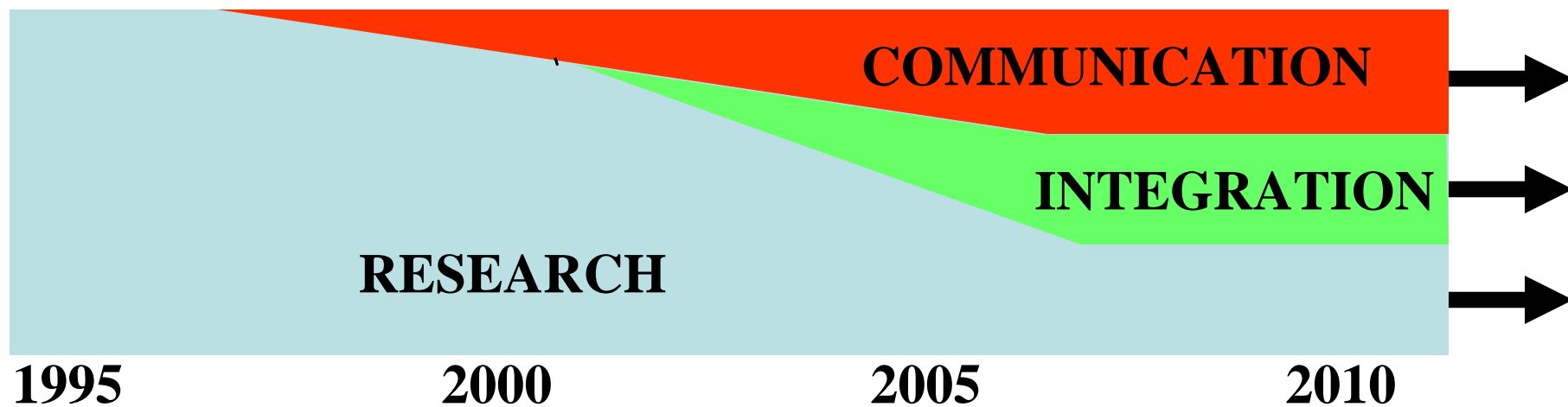
**Next, Scale Up in Space... etc...**



# NRV is a Story

1. How often, and how large do wildfires occur?
2. What is the pattern of residuals within natural wildfires?
3. What is the pattern of dead trees within natural wildfires?
4. When do dead trees fall down and become LWD / CWD?
5. How does LWD function in streams and rivers (and CWD in the upland), and for how long?
6. How do these dead wood dynamics all interact and play out across an entire watershed over time?
7. What is the relationship between quantity and quality of LWD and stream morphology, and sediment loads?
8. What is the relationship between LWD, stream morphology and sediment loads and fish populations, and terrestrial habitat and browse?
9. ...

# The “Plan”





Questions?

