

# Natural Challenges in Riparian Zones of Alberta's Foothills

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Bandaloop Landscape-Ecosystem  
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## **Practical Question:**

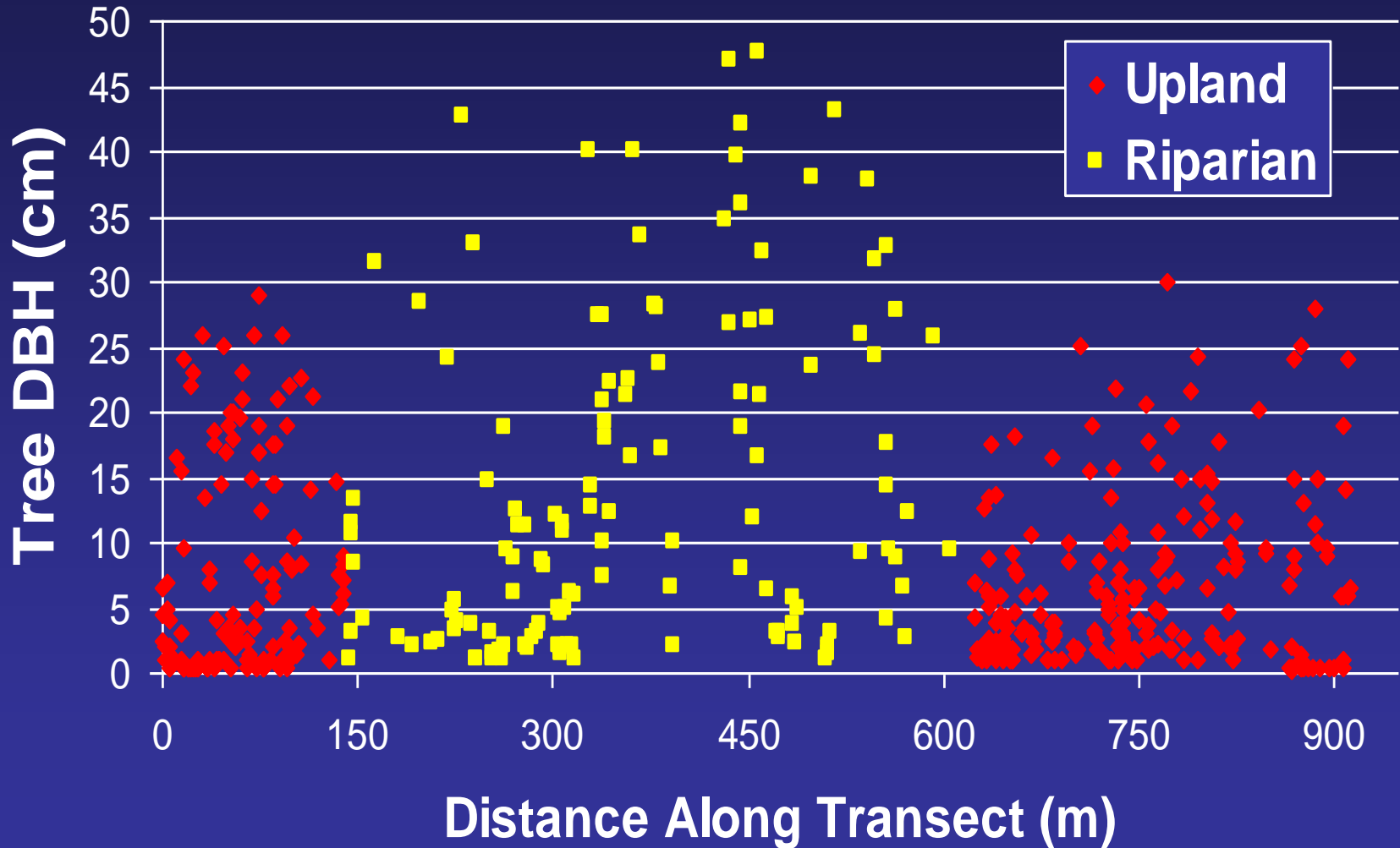
**How could riparian zones be managed to better approximate natural patterns?**

## **Scientific Questions:**

- 1. Do fires differentially affect riparian zones?**
- 2. Do riparian zones pose unique emulation issues?**

# Transect 6, Little Berland River

## Tree DBH Along Transect





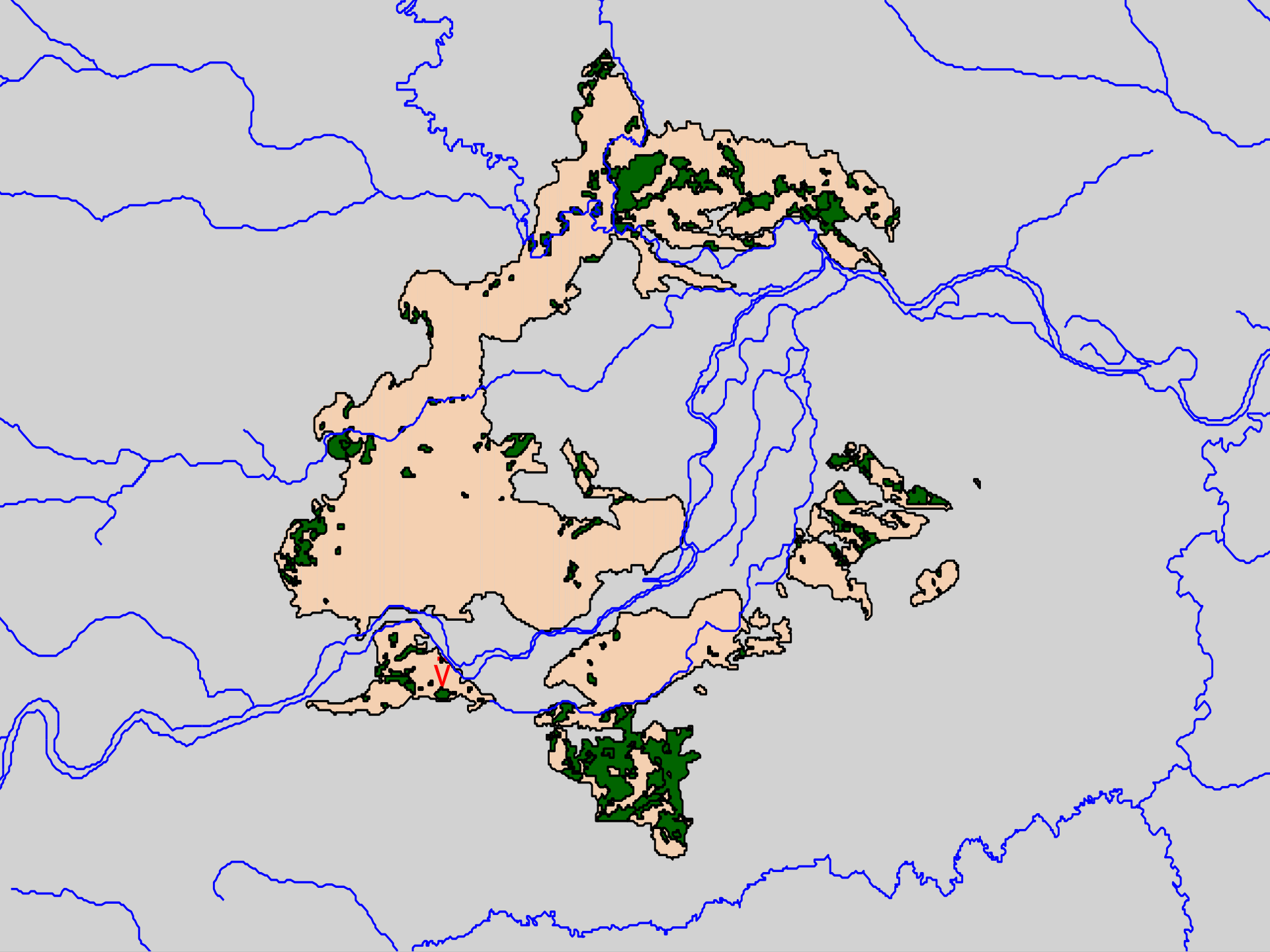






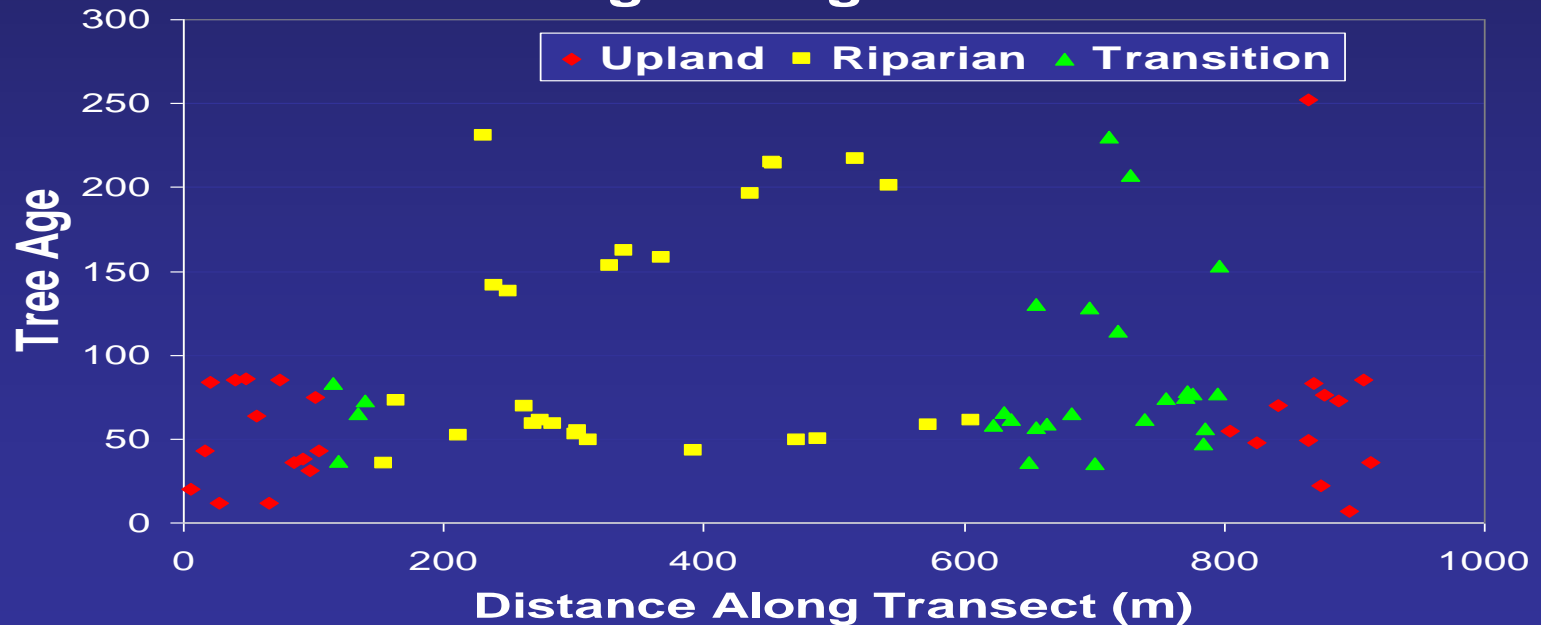






**10% of samples showed obvious evidence that the last fire stopped at the riparian zone.**

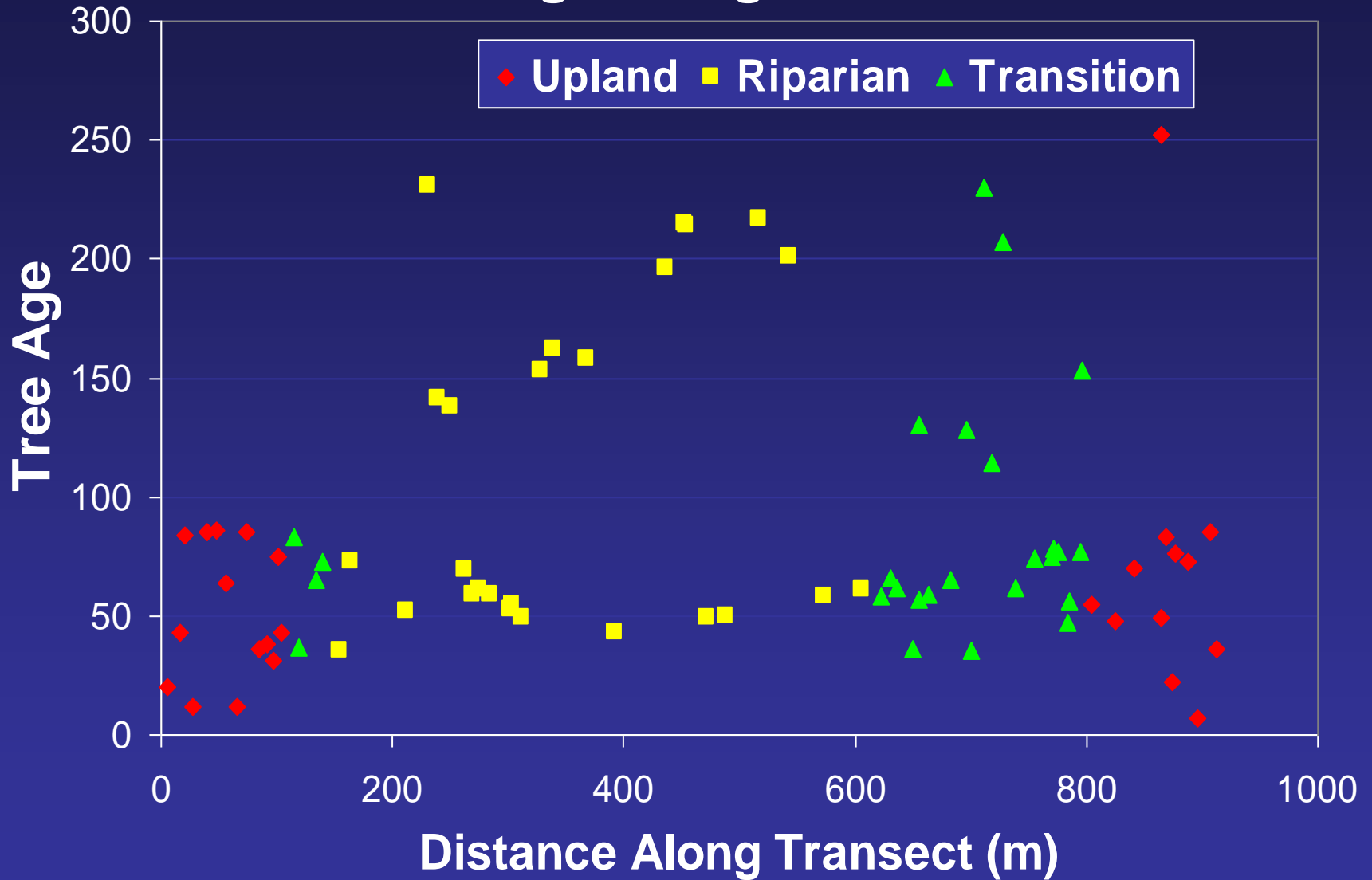
**Transect 6, Little Berland River  
Tree Age Along Transect**





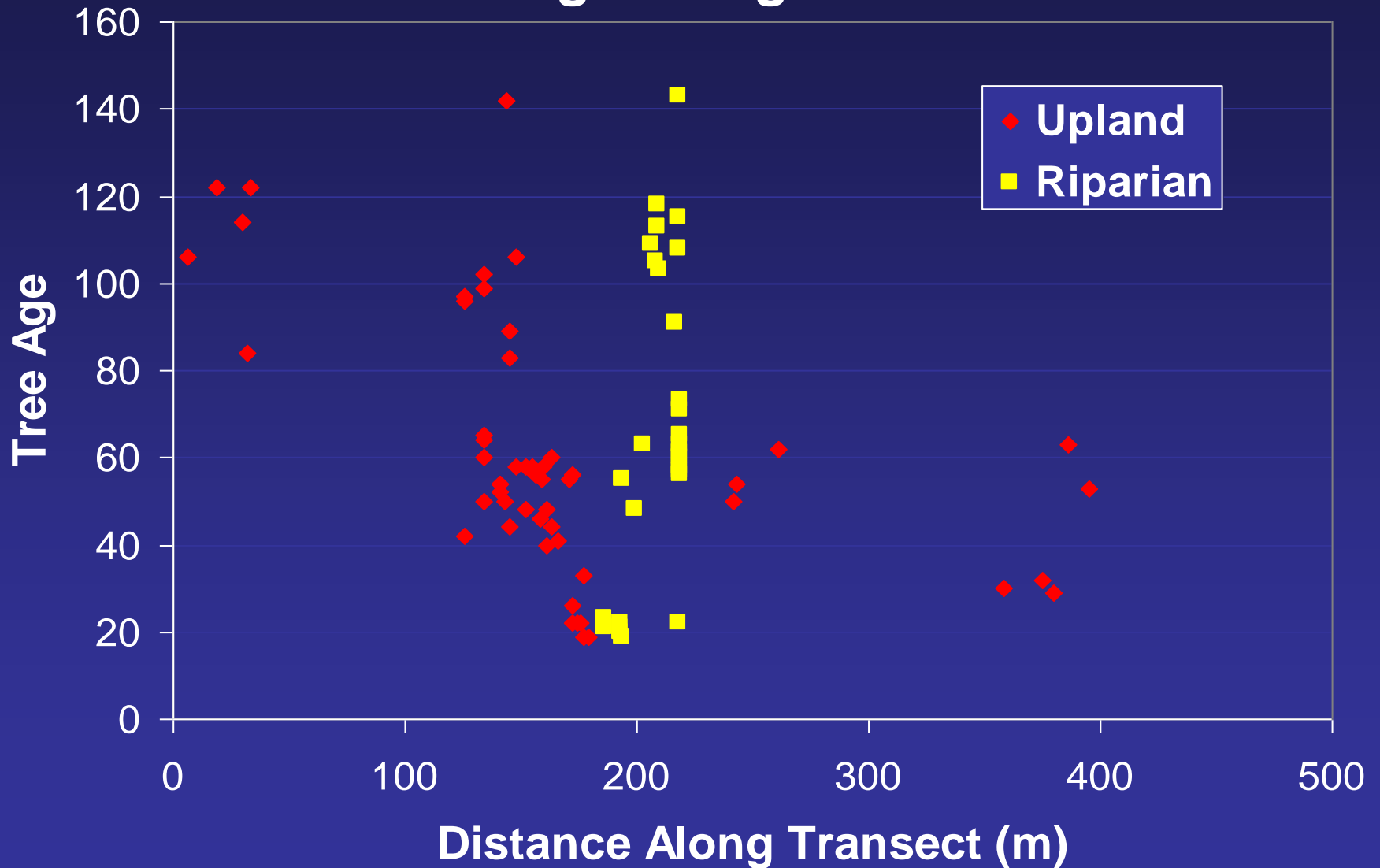
# Transect 6, Little Berland River

## Tree Age Along Transect



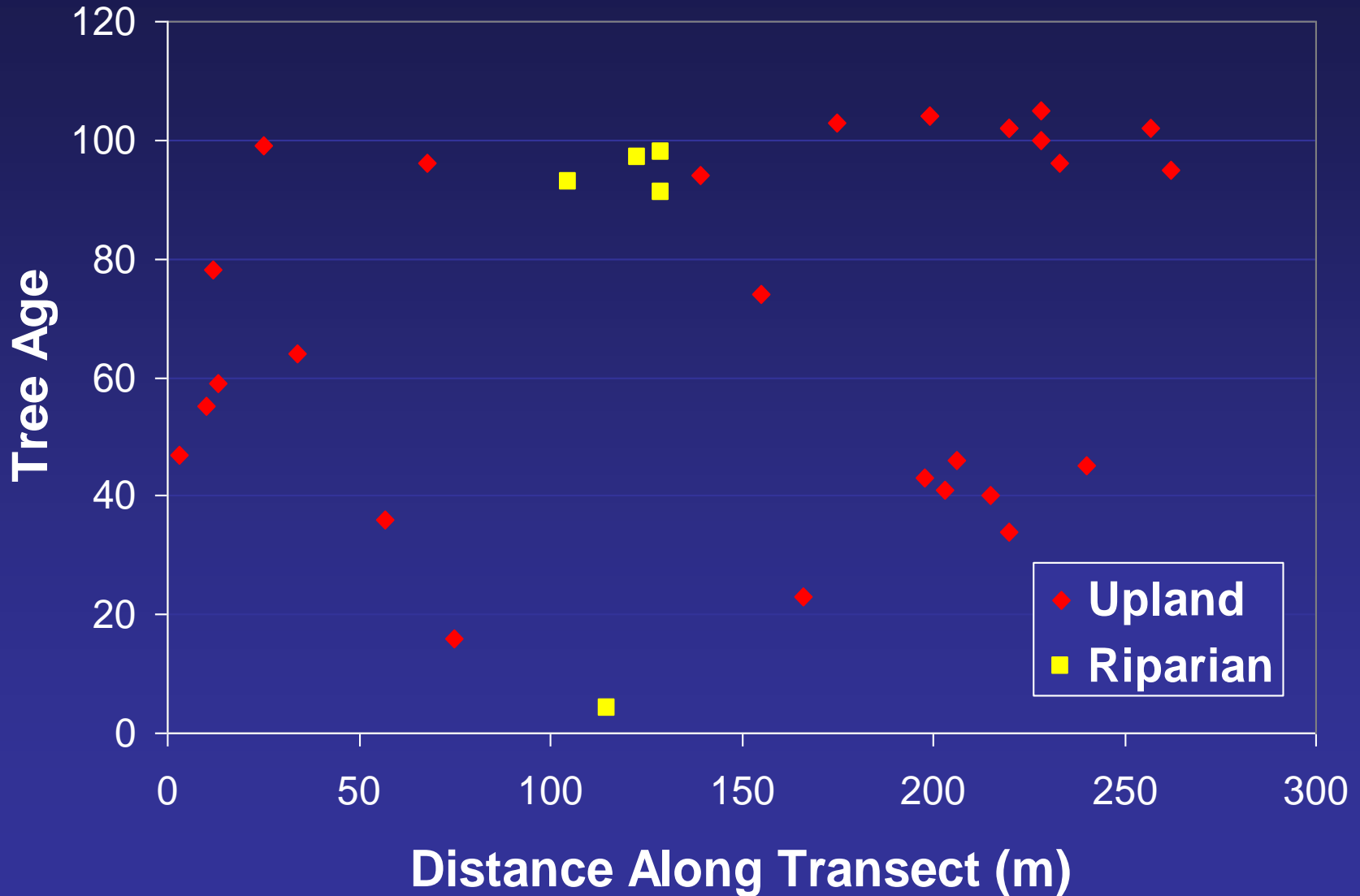
# Transect 1, Emerson Creek

## Tree Age Along Transect



# Transect 23, Tributary of Embarras River

## Tree Age Along Transect





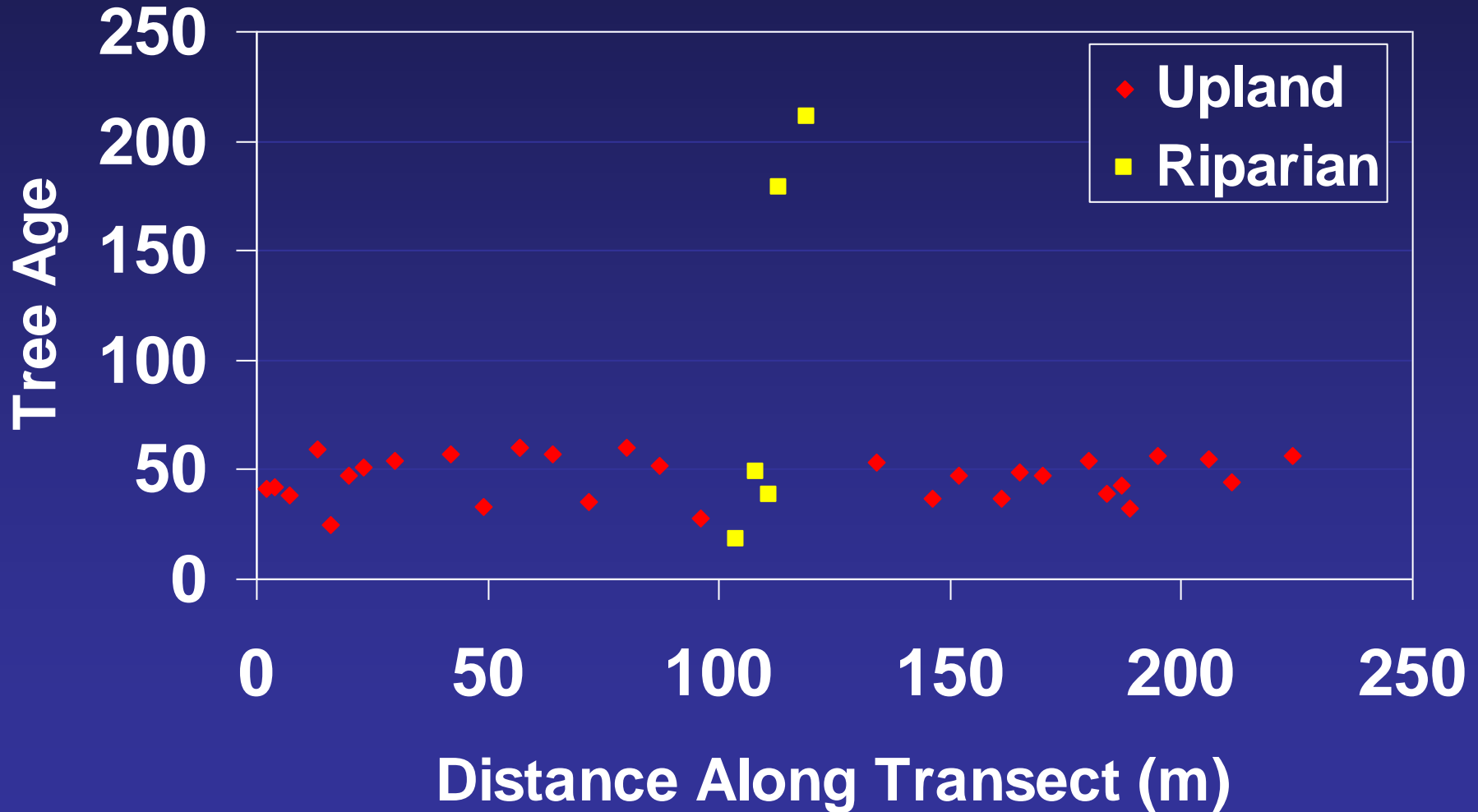
**16% of samples had higher than normal veteran density in riparian zones.**

**Riparian zones with veterans tended to be:**

- Spruce-dominated**
- Across lower-order streams.**
- Within very steep profiles, with wide riparian zones.**

# Transect 20, Antler Creek

## Tree Age Along Transect



**27% of samples had higher than normal levels of ingress within riparian zones.**

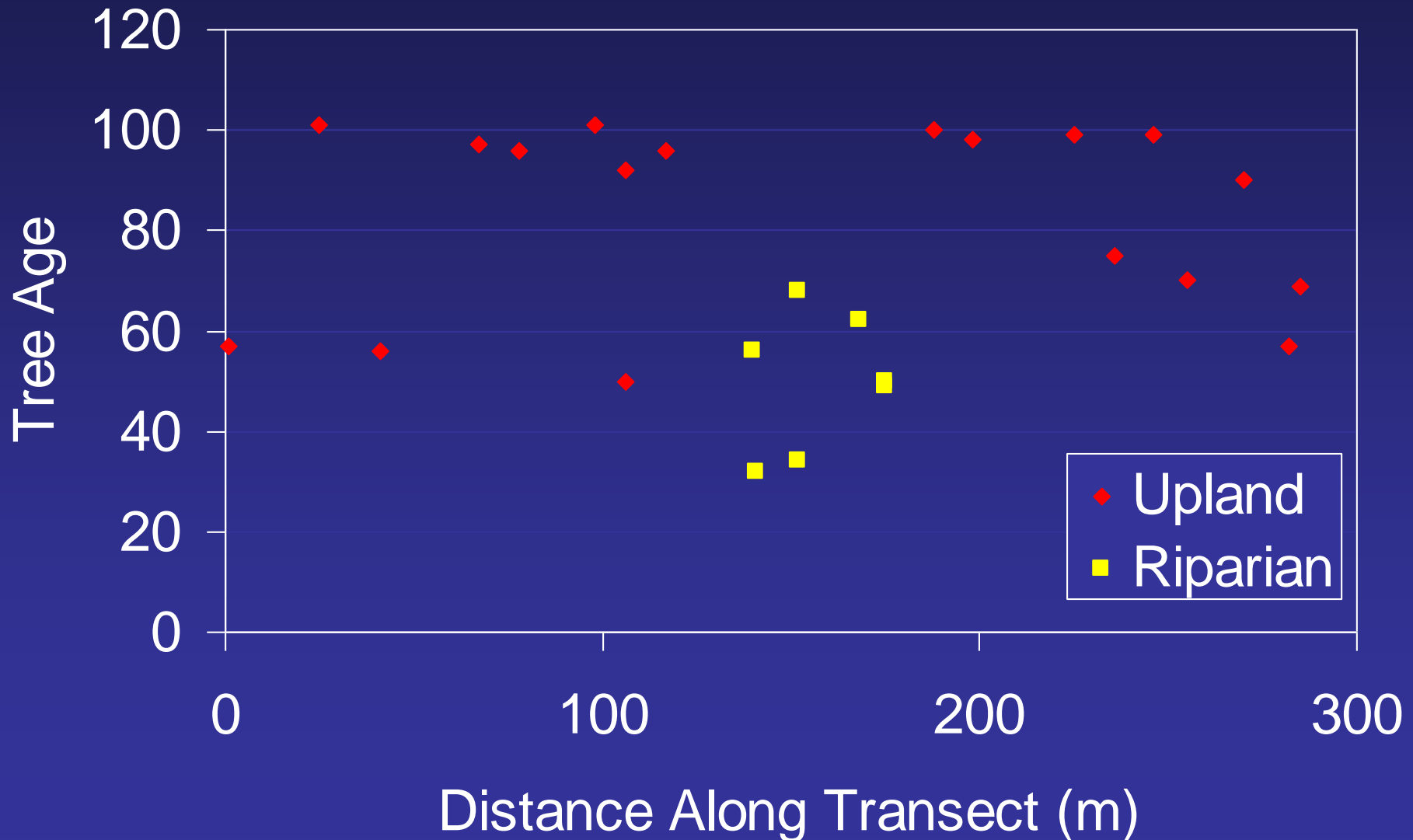
**Riparian zones with ingress tended to be:**

- Pine-dominated.**
- Evenly distributed across all stream orders, all riparian zone widths.**
- Evenly distributed across terrain types.**



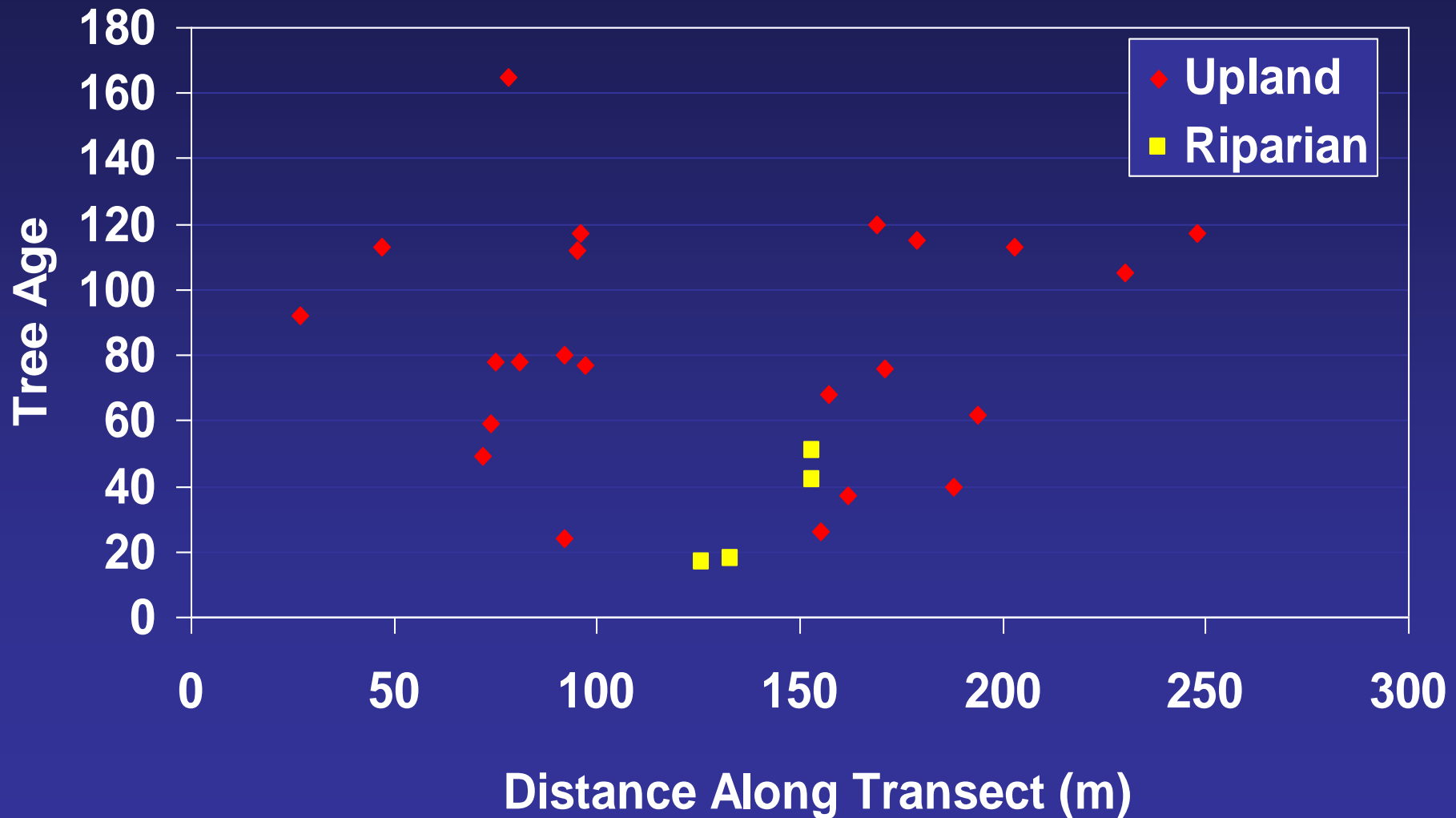
# Transect 31, Tributary of Lovett River

## Tree Age Along Transect



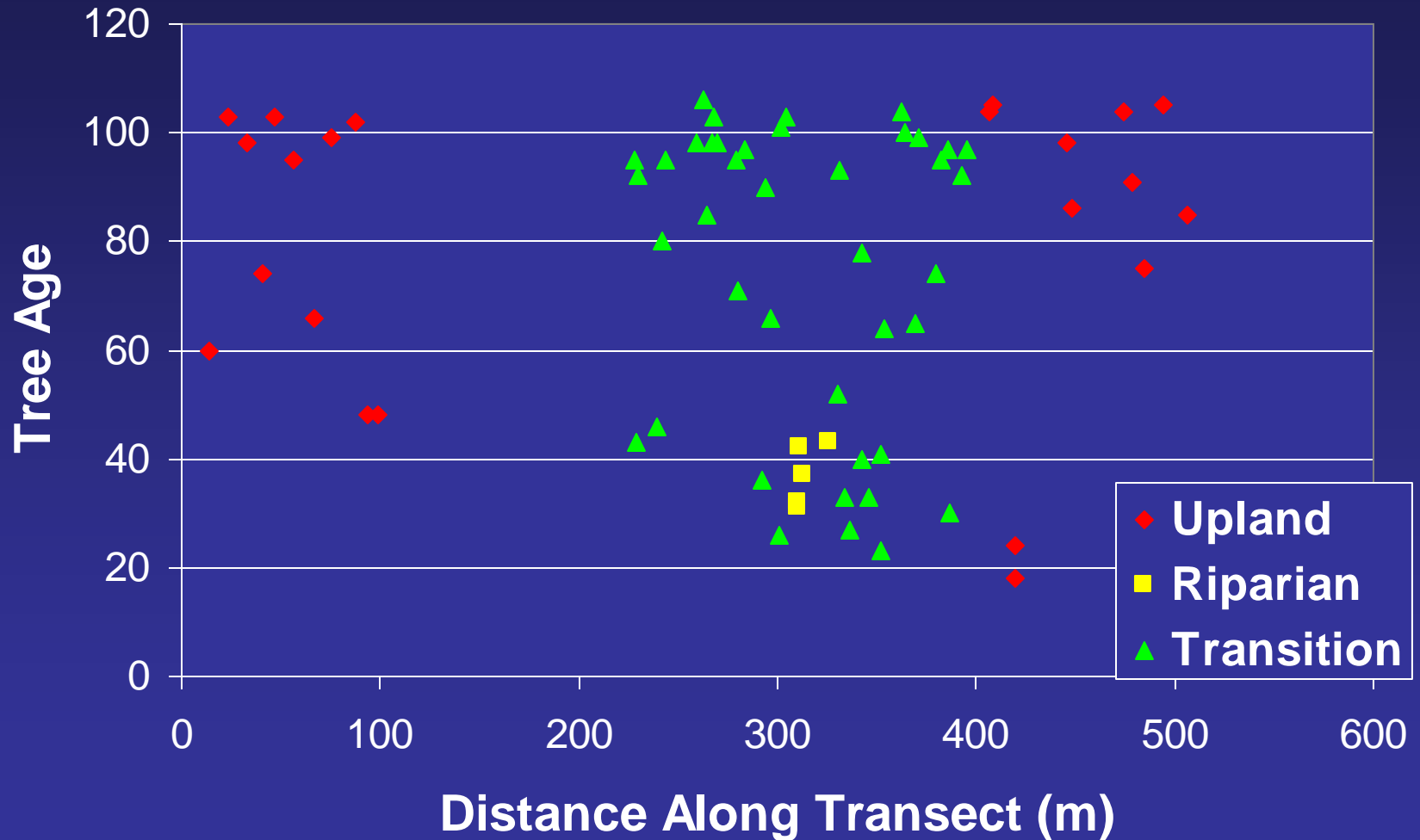
# Transect 19, Tributary to Gregg River

## Tree Age Along Transect



# Transect 3, Tributary of Beaver Creek

## Tree Age Along Transect





## **Scientific Question #1: Do fires differentially affect riparian zones?**

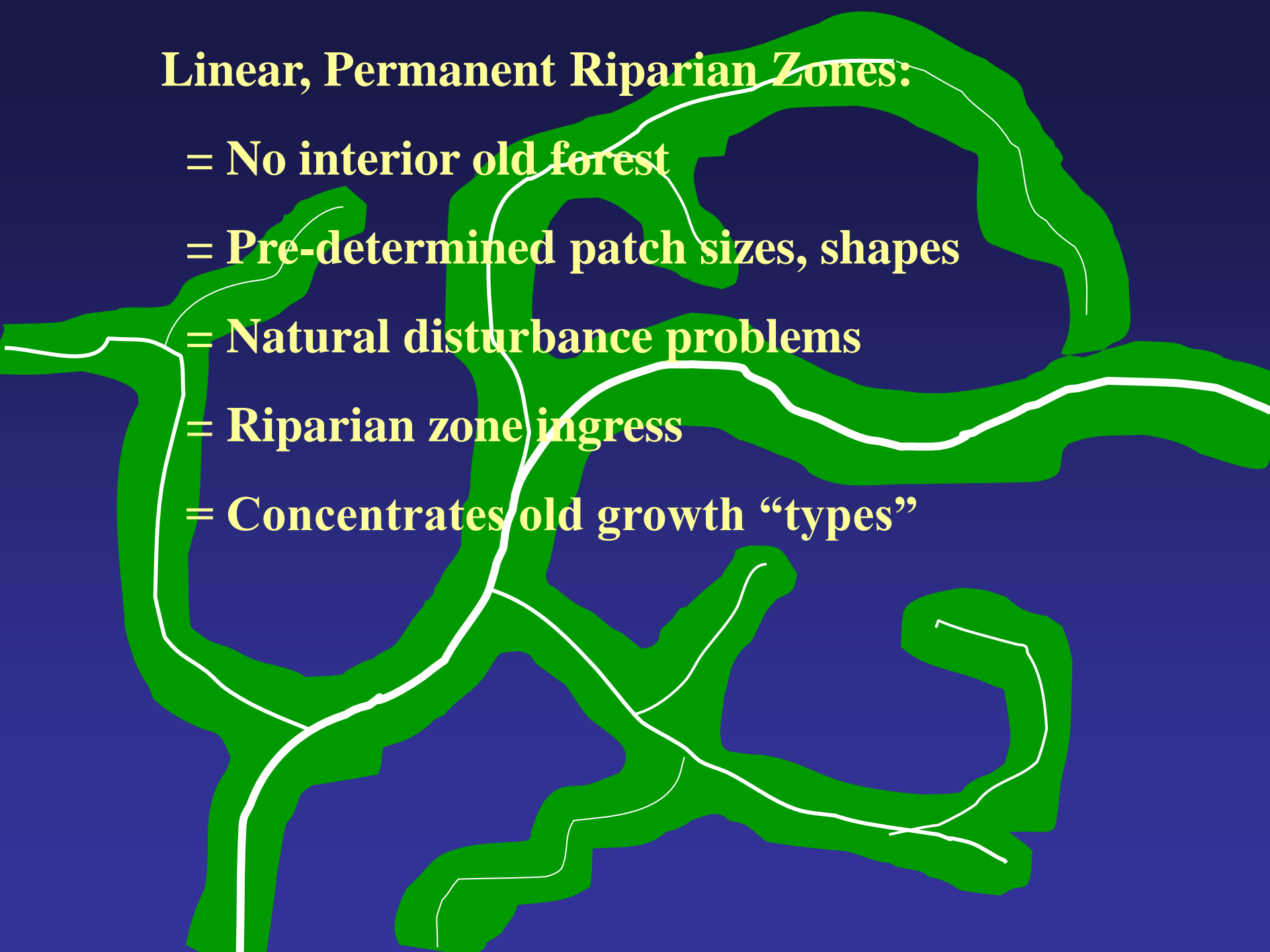
**Not often. There is good evidence to suggest that the presence of fire in riparian zones is almost as widespread as on the upland portion of the landscape.**

**This is consistent with the a landscape-level analysis which demonstrates the larger-scale problems of saving all riparian zones:**

- linear old growth zones with no interior**
- potential fire, disease, insect magnets**
- fragmentation**

## **Linear, Permanent Riparian Zones:**

- = No interior old forest**
- = Pre-determined patch sizes, shapes**
- = Natural disturbance problems**
- = Riparian zone ingress**
- = Concentrates old growth “types”**



# **“Natural” Riparian Zones:**

**= Selective fire “skips”**

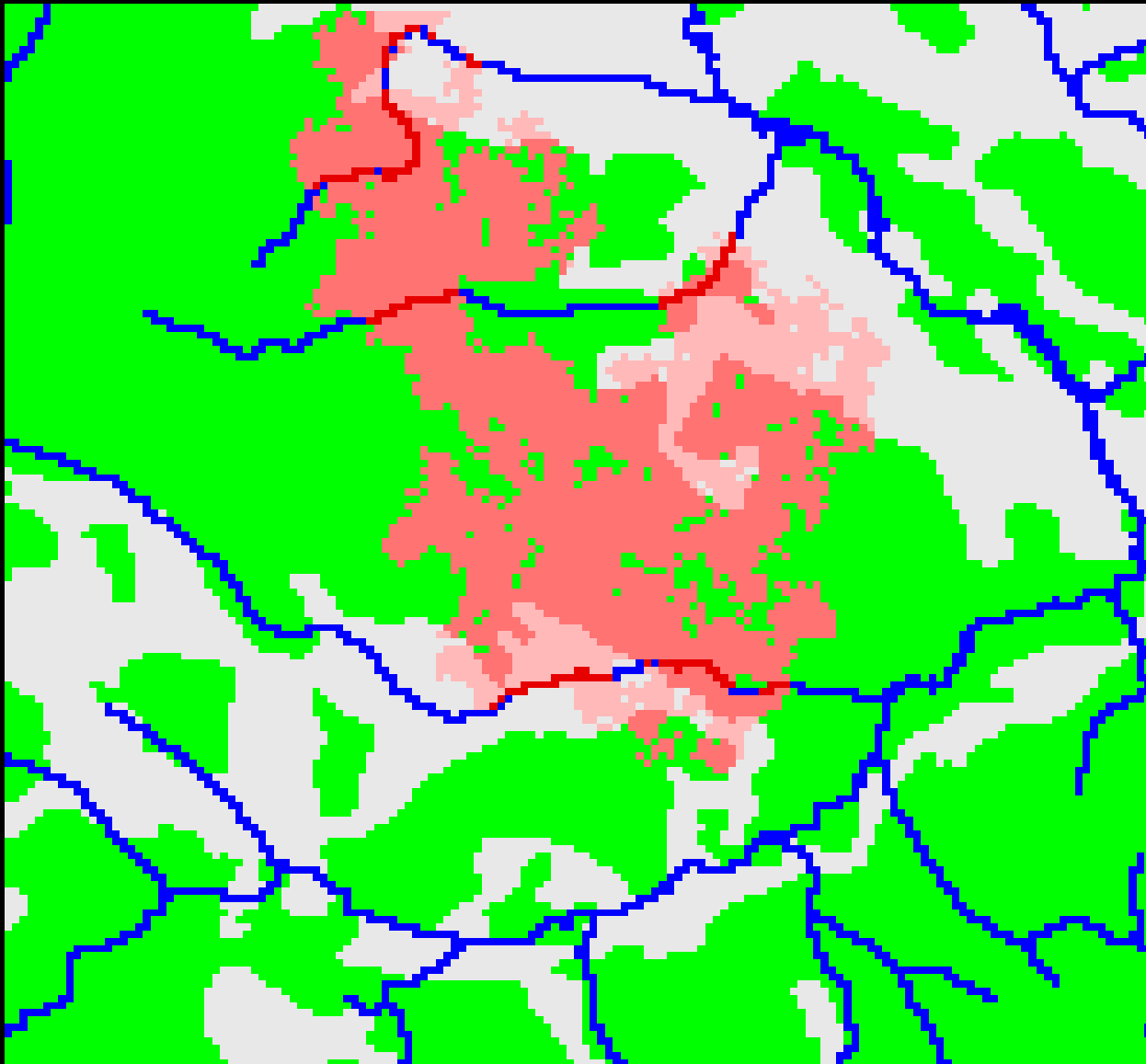
**= Maintains unique vegetation structures**

**= Dynamic old forest patches**

**= Dynamic patch sizes and shapes**



# No Restrictions - Run #1



## Summary of Disturbance

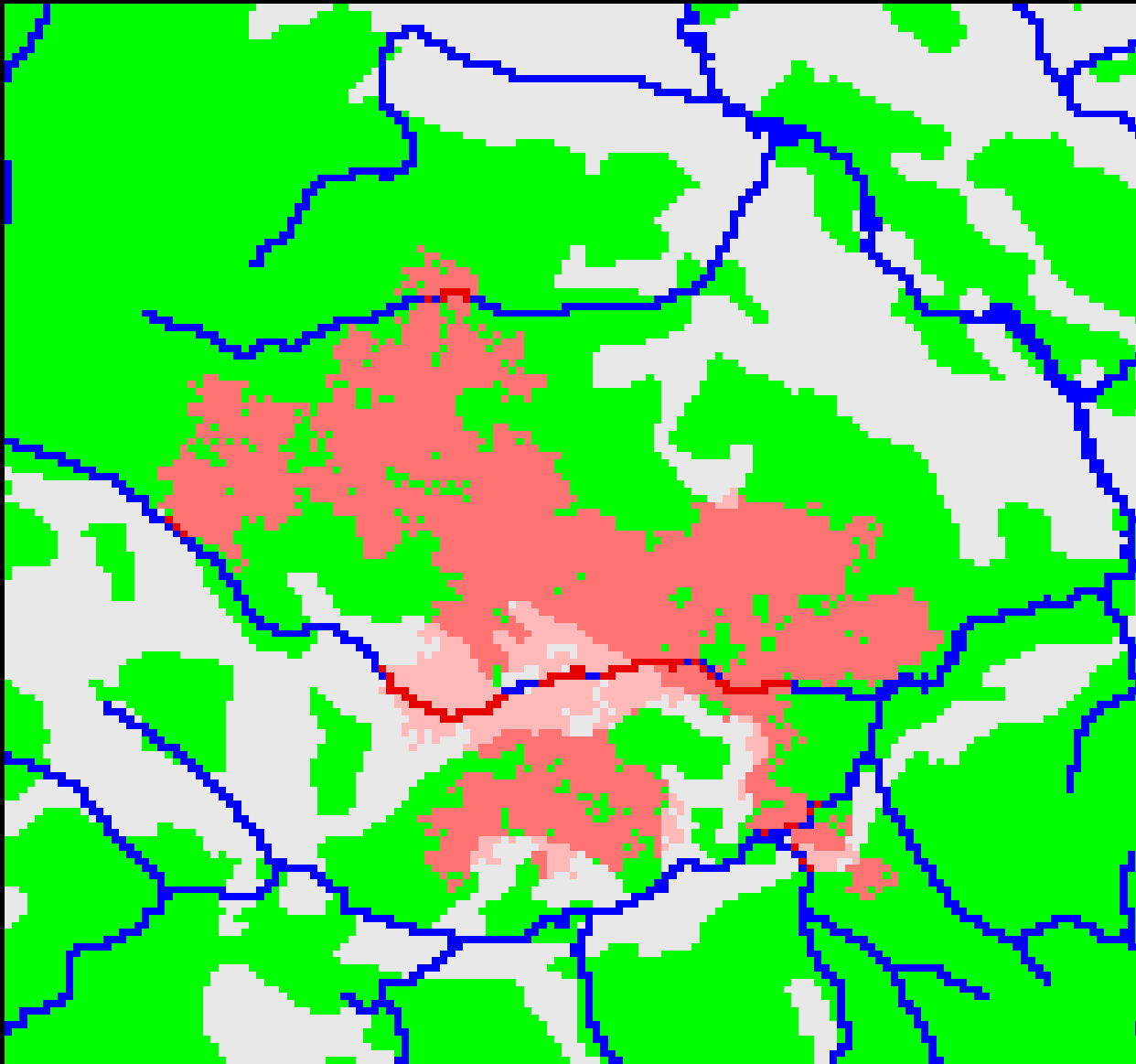
700 ha Forest

187 ha Non-F.

**5.9 km. Ripar.**

113 m/ha Edge

# No Restrictions - Run #4



## Summary of Disturbance

700 ha Forest

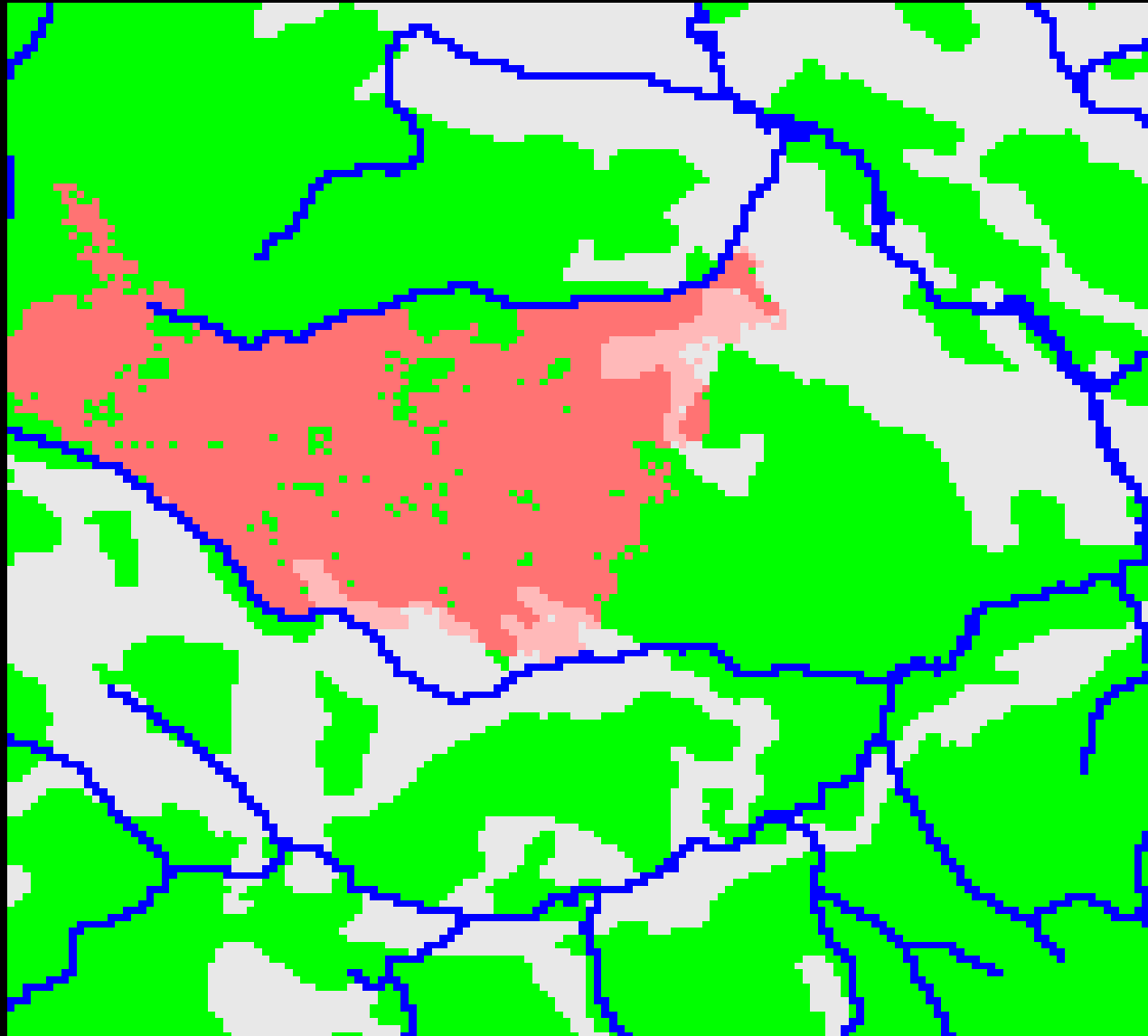
108 ha Non-F.

**4.1 km. Ripar.**

111 m/ha Edge



# No Creek Crossing - Run #2



## Summary of Disturbance

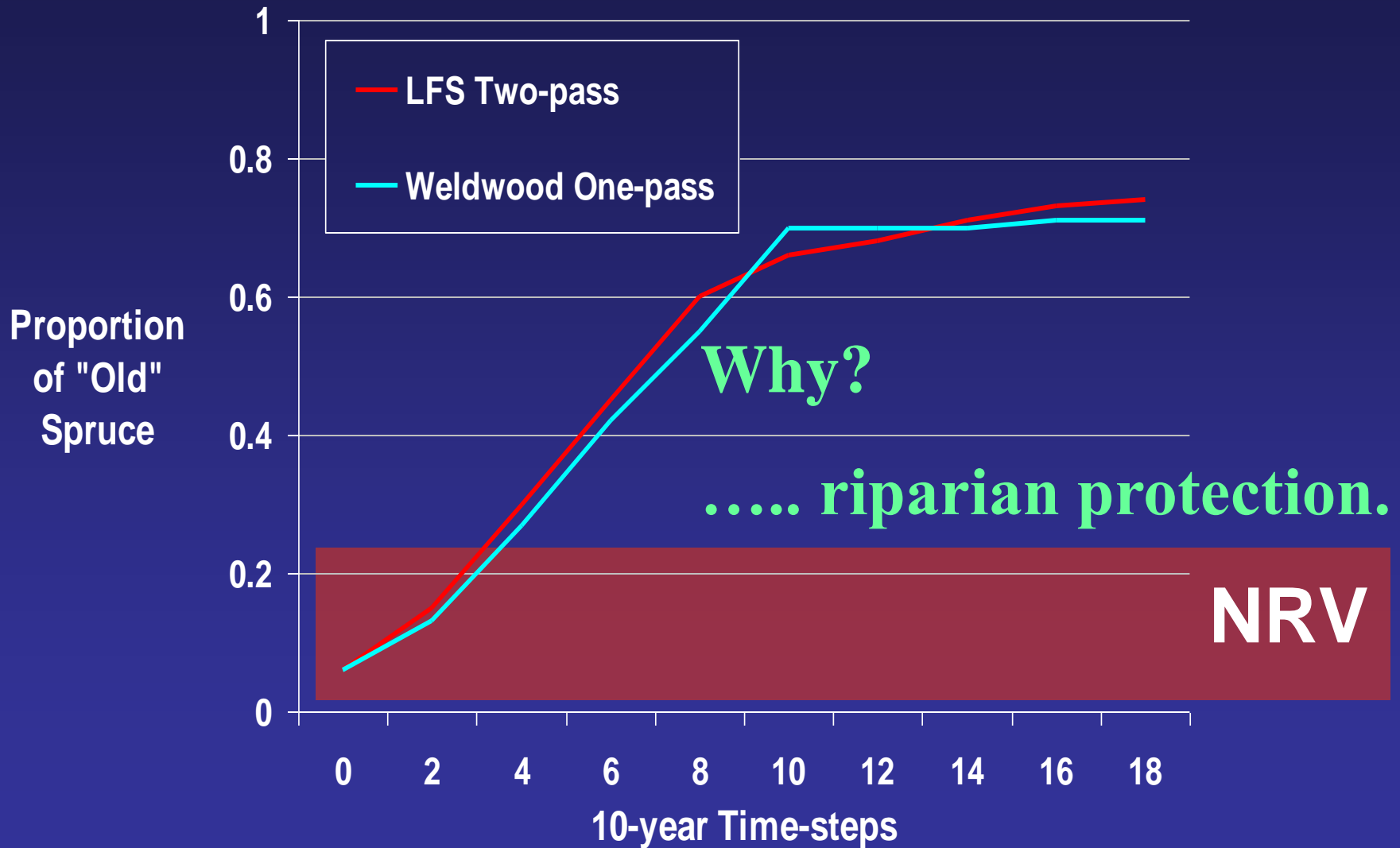
700 ha Forest

74 ha Non-F.

**0 km. Ripar.**

71 m/ha Edge

The proportion of “old” spruce-dominated stands will begin to move well beyond NRV under current guidelines.



**HOWEVER:**

**Scientific Question #2: Do riparian zones pose unique emulation issues?**

**Yes. The NRV model tells us that there is no natural equivalent to machinery PSI, skid trails, and removing / redistributing biomass.**

# Disturbing Riparian Zones: The Dilemma

## Pros

- Veteran control
- Ingress control
- Lower natural disturbance hazard?
- No fragmentation
- Better landscape distribution of old-growth

## Cons

- Compaction
- Erosion
- Overland flow
- Stream sedimentation, temperature...?

# What To Do?

## Seek alternatives

- winter cut
- technological innovation
- burn
- experiment / adapt / push the limits

**Leave the door open – things will surely change.**



# What To Do?

**Admit that we don't have all of the answers yet.**

**Summarize what we know about the science.**

- pros and cons, recognize limits of NRV

**What other factors come into play?**

- aesthetics
- cultural / social values
- economics
- logging risk

**Tackle the key questions that remain**

- risk assessment
- stream / aquatic dynamics