

Restoration project effectiveness monitoring

Snoqualmie & Tolt Rivers

Eastman, Latterell, Berge, Timm, Butler



















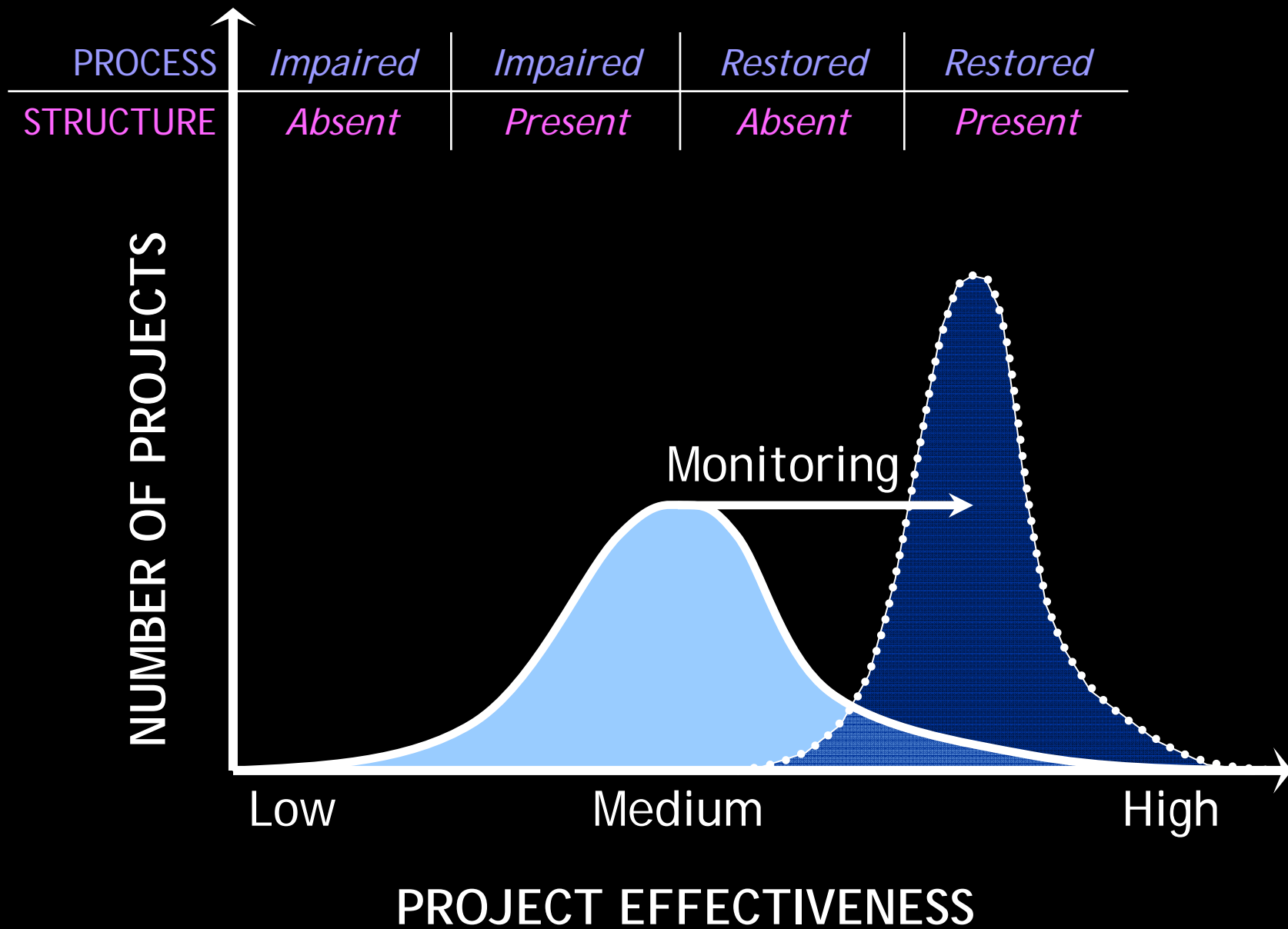
We're doing a pretty good job.

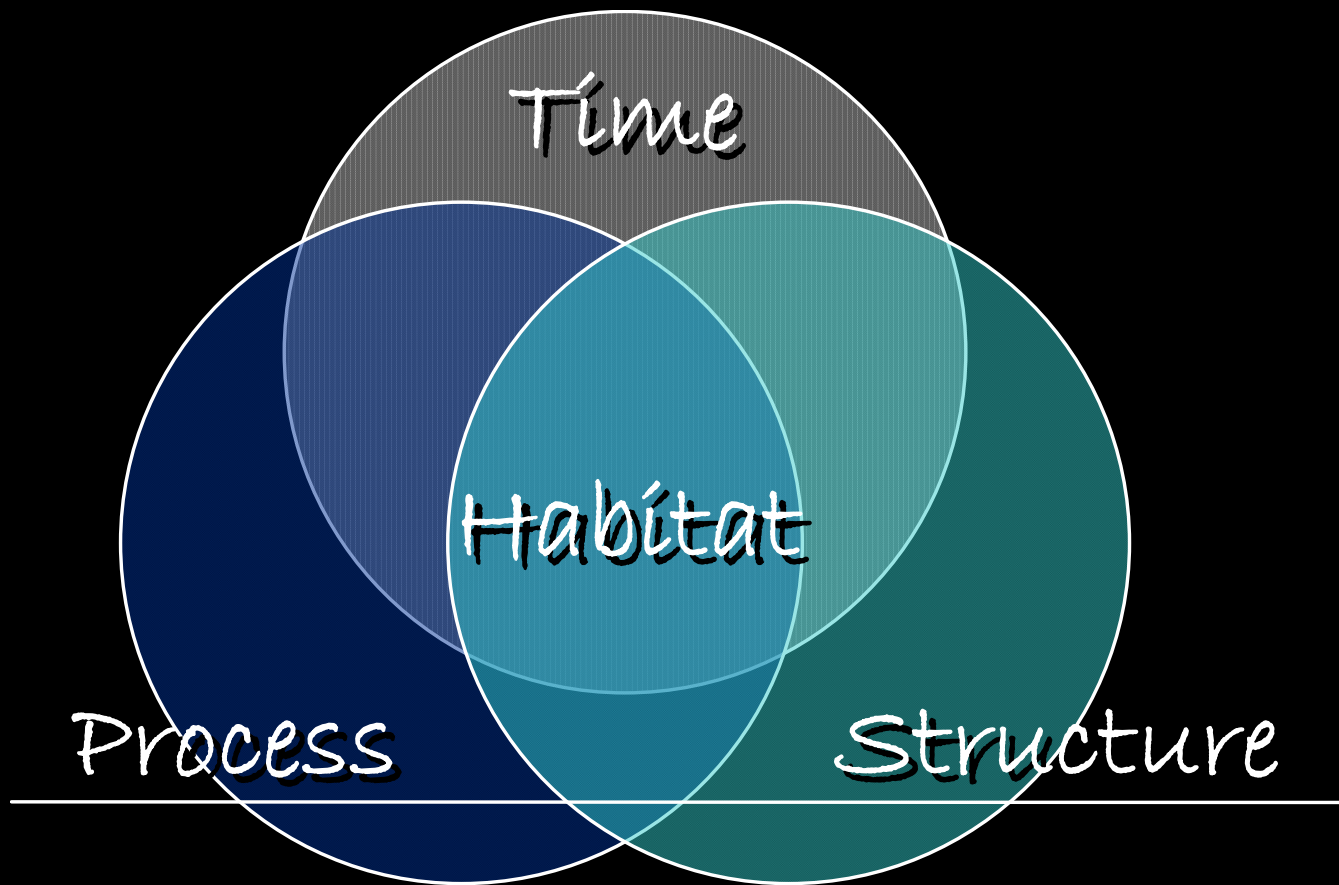


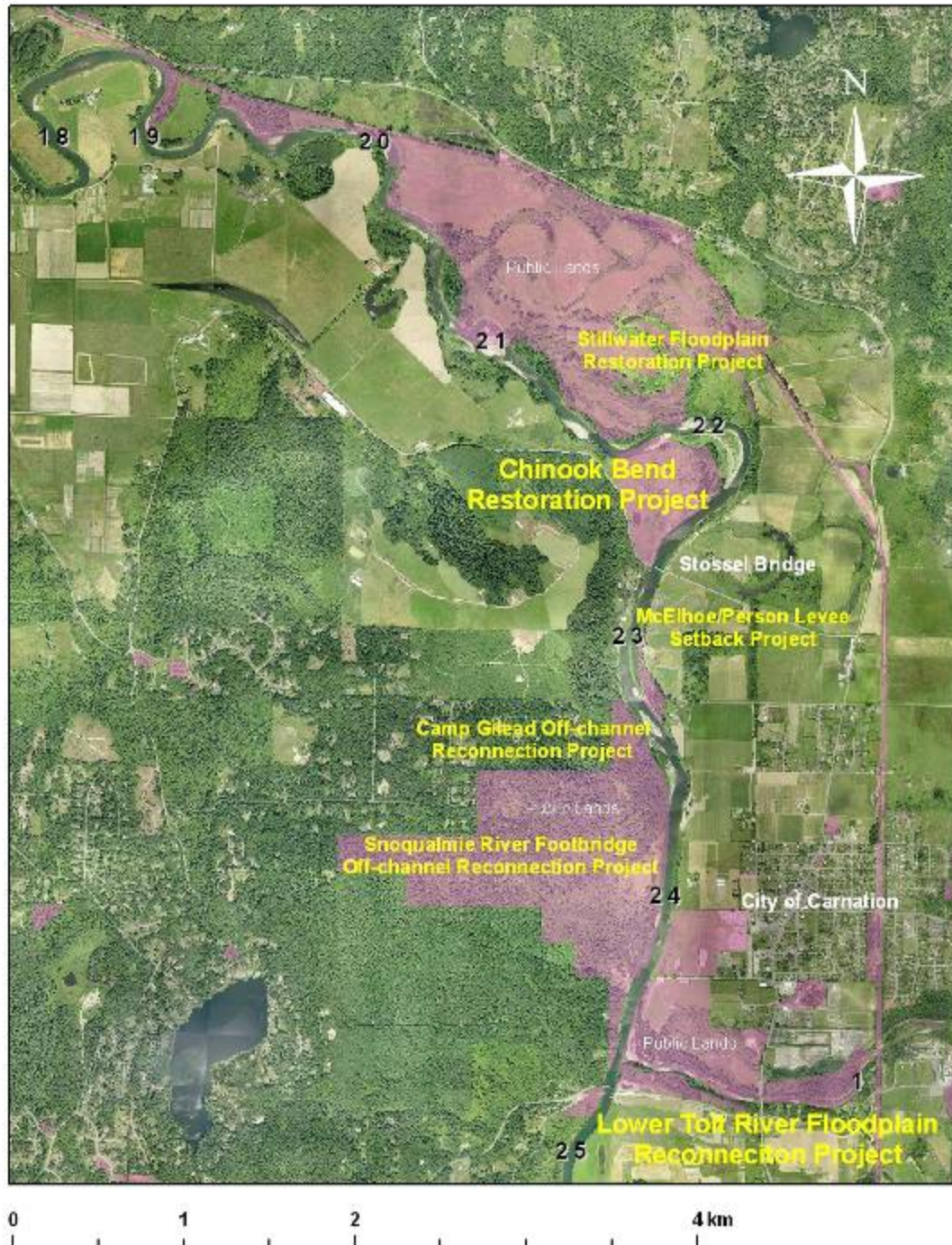


MEDIOCRITY

IT TAKES A LOT LESS TIME
AND MOST PEOPLE WON'T NOTICE THE DIFFERENCE
UNTIL IT'S TOO LATE.





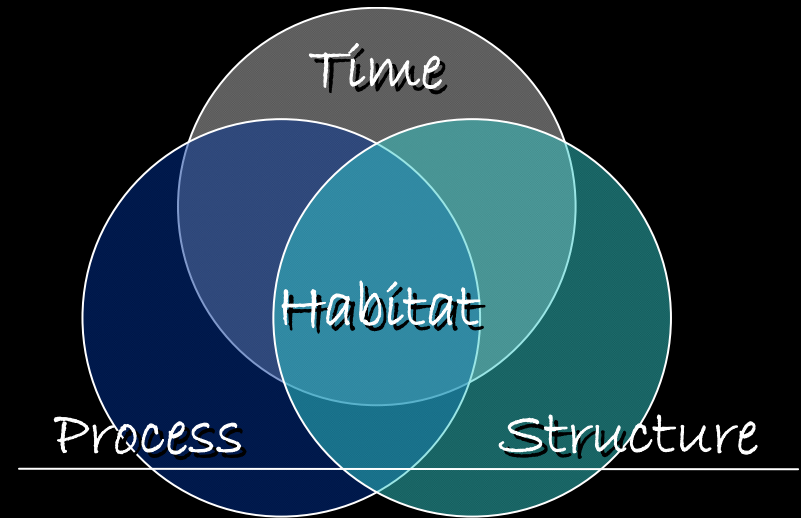


Snoqualmie At Carnation

- Chinook Bend
- Lower Tolt
- McElhoe-Person
- Gilead
- Footbridge
- Stillwater

Hypotheses

- Rearing habitat & fish
 - More, larger, diverse, and used
- Floodplain
 - Available more often
- Channel
 - Dynamic, habitat-forming, complex
- Wood
 - More delivery, more trapped, more effective
- Sediment
 - Patchier, better quality
- Riparian
 - More natural regeneration, faster turnover



Data needs

- LiDAR
- Orthophotos
- Streambed surveys
- Fish sampling
- Edge mapping
- Logjam tracking
- Sediment measurements
- Vegetation plots

Sampling

2008, 2009

Pre-Project

2010 (to 2012)

Post-Project

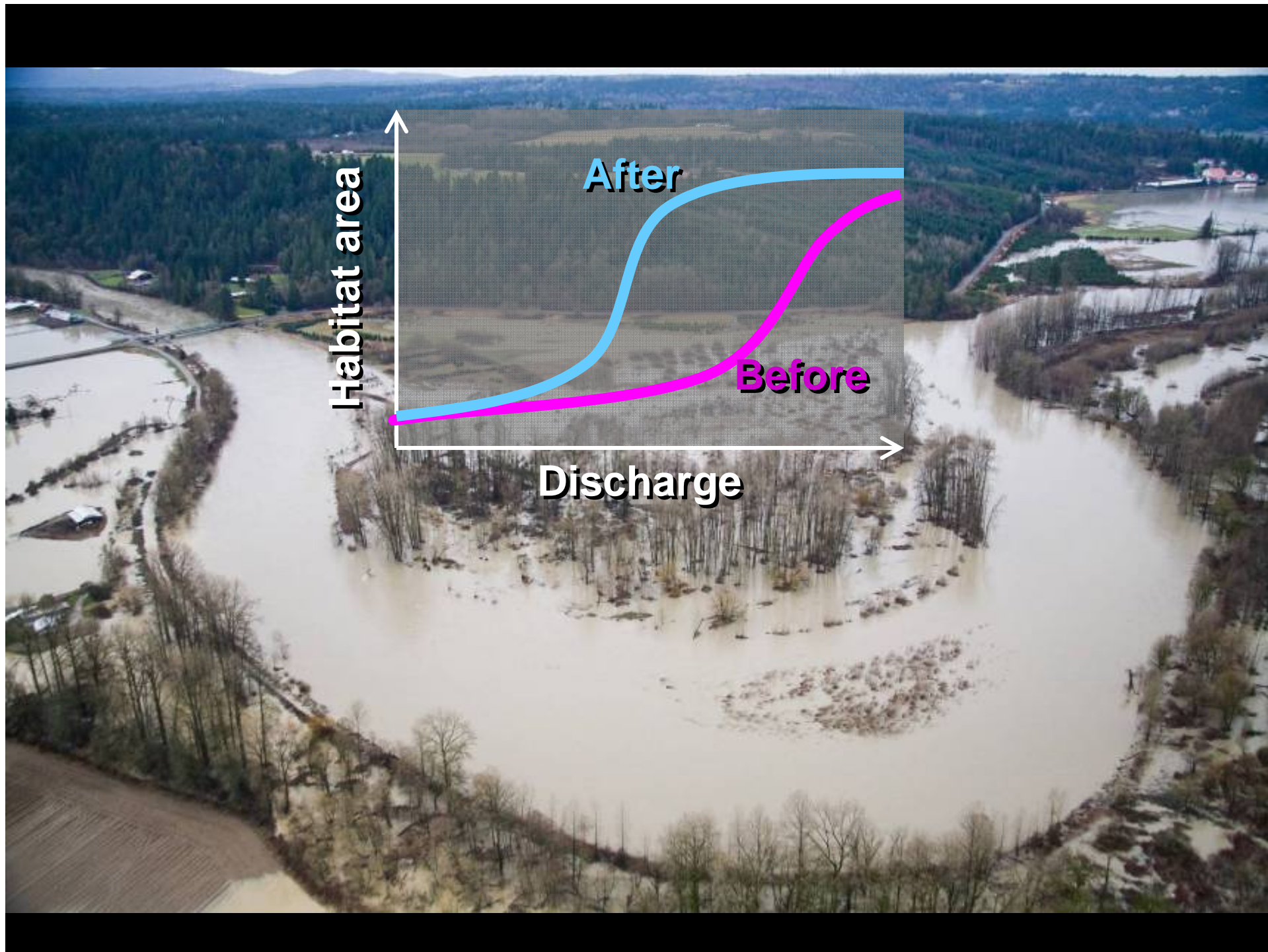
2014/2019

Post-Project

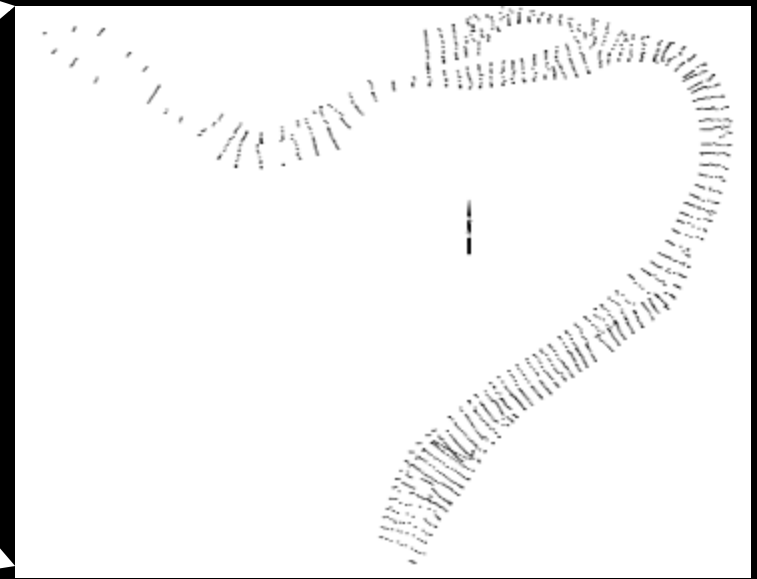


0 125 250 500 Feet

2009 Edge & Fish survey



Streambed surveys

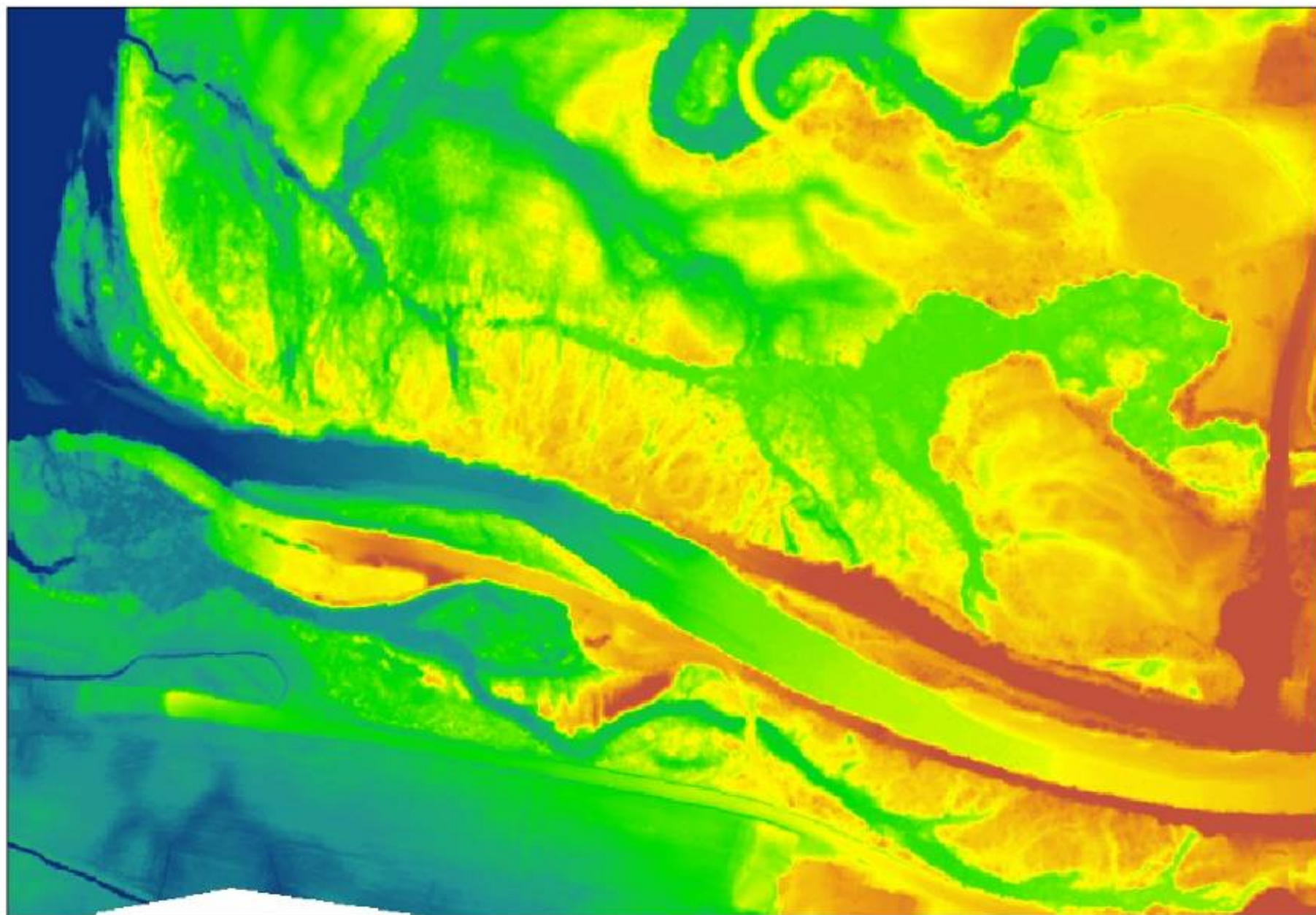


1. Planform
2. Slope
3. Bedform
4. Cross-section



0 250 500 1,000 Feet

2009 Orthophoto



0 250 500 1,000 Feet

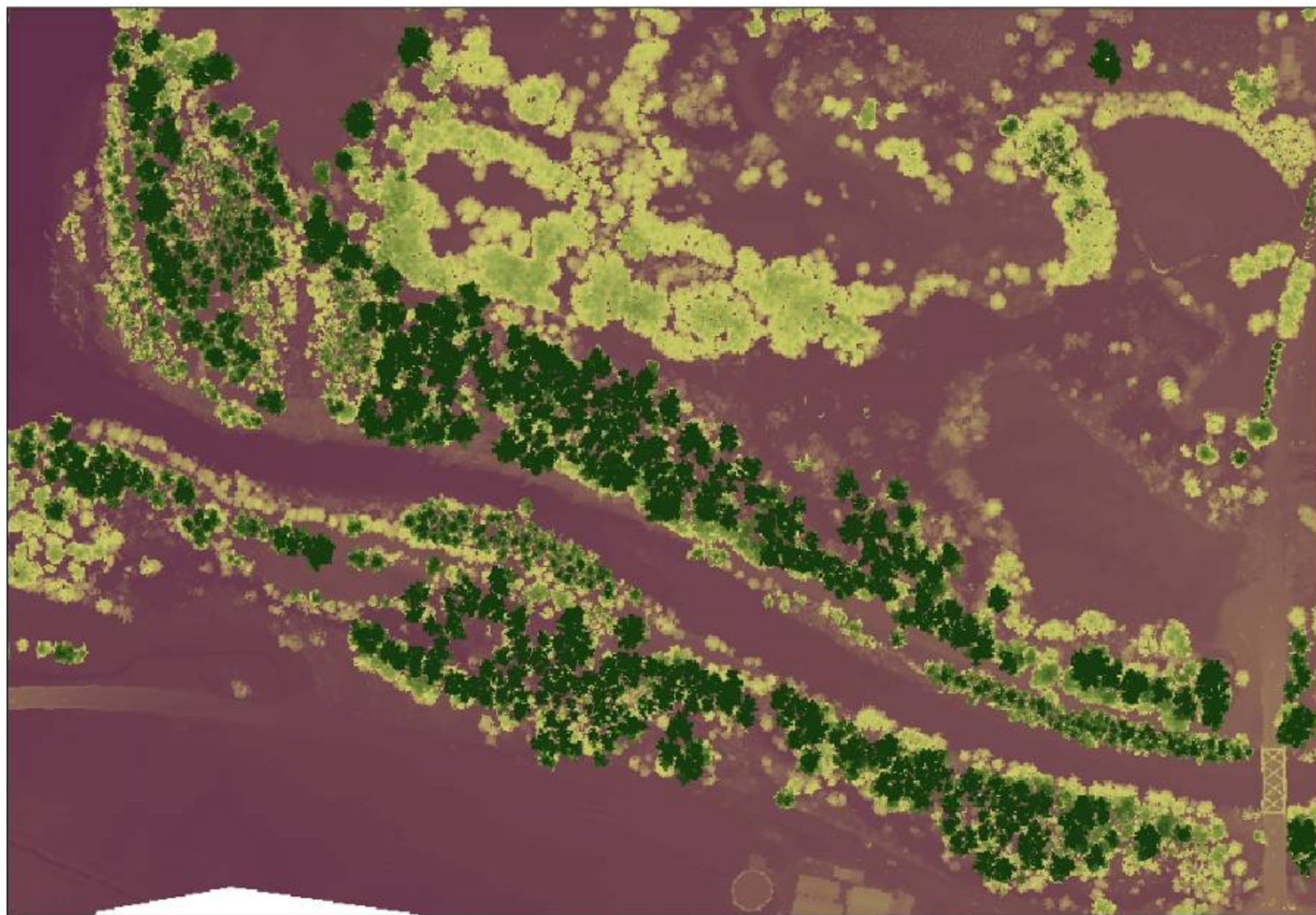


2009 LIDAR



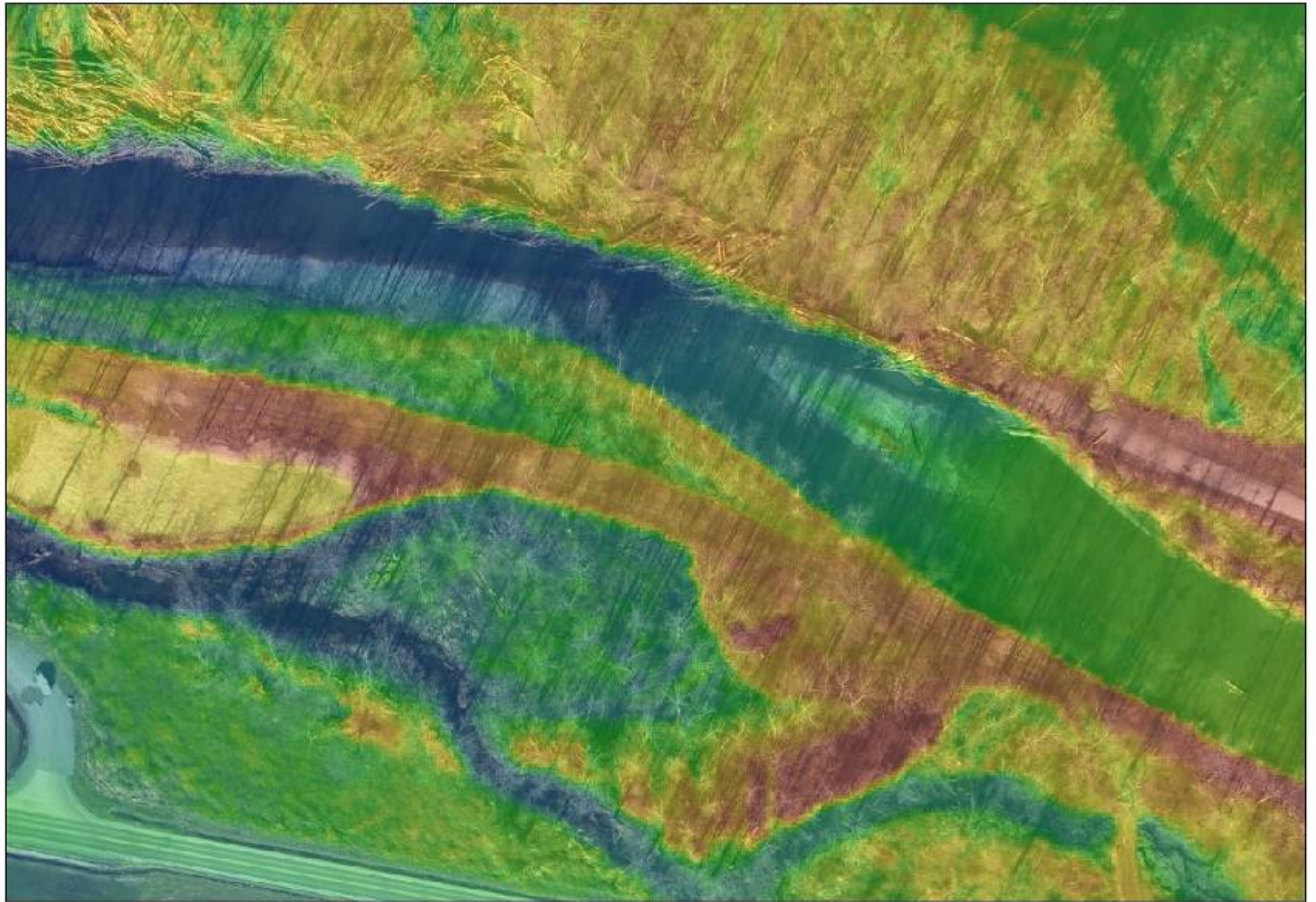
0 250 500 1,000 Feet

2009 Intensity



0 250 500 1,000 Feet

2009 Highest Hit



0 65 130 260 Feet



2009 Habitat Mapping



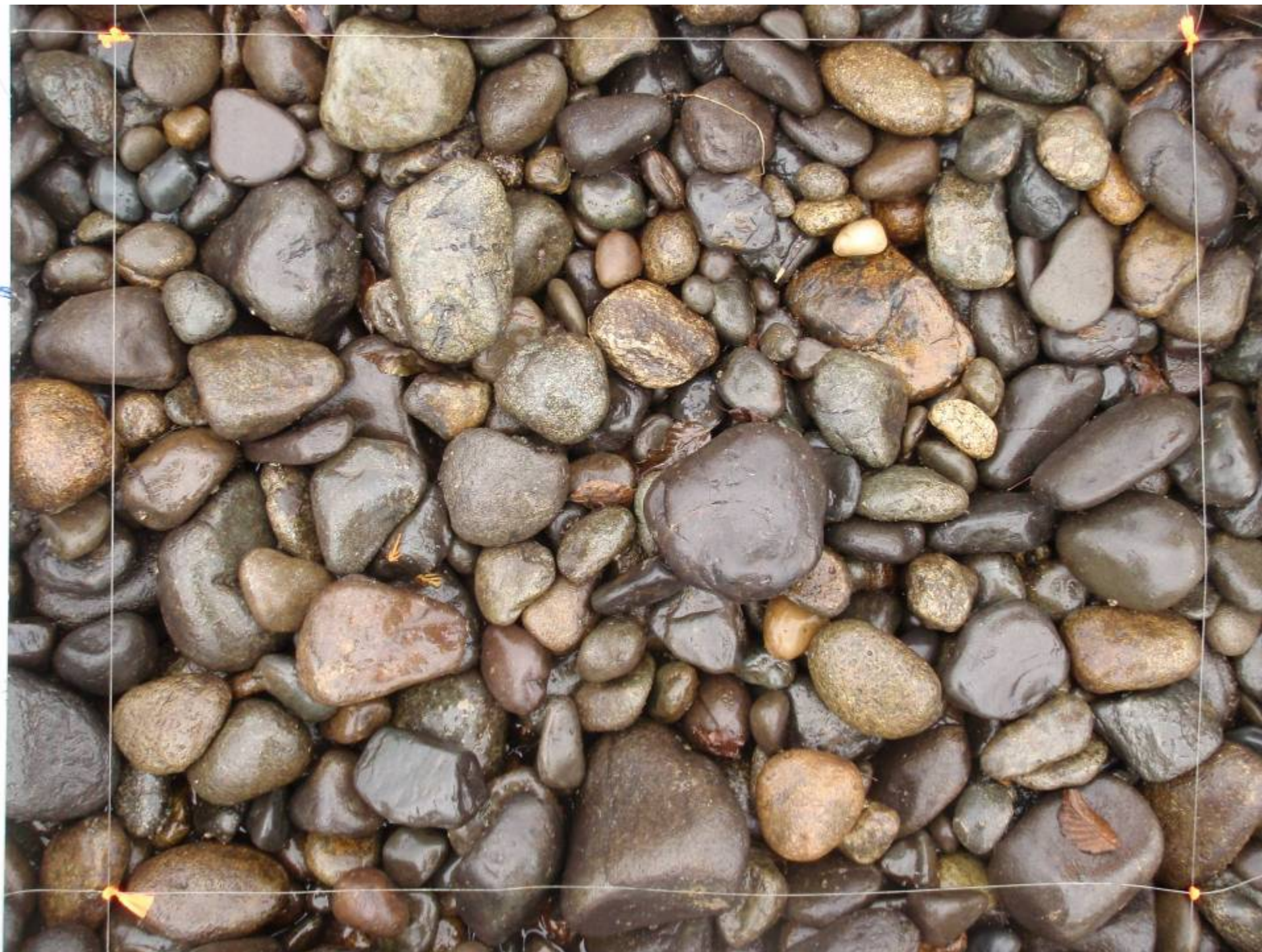
0 25 50 100 Feet

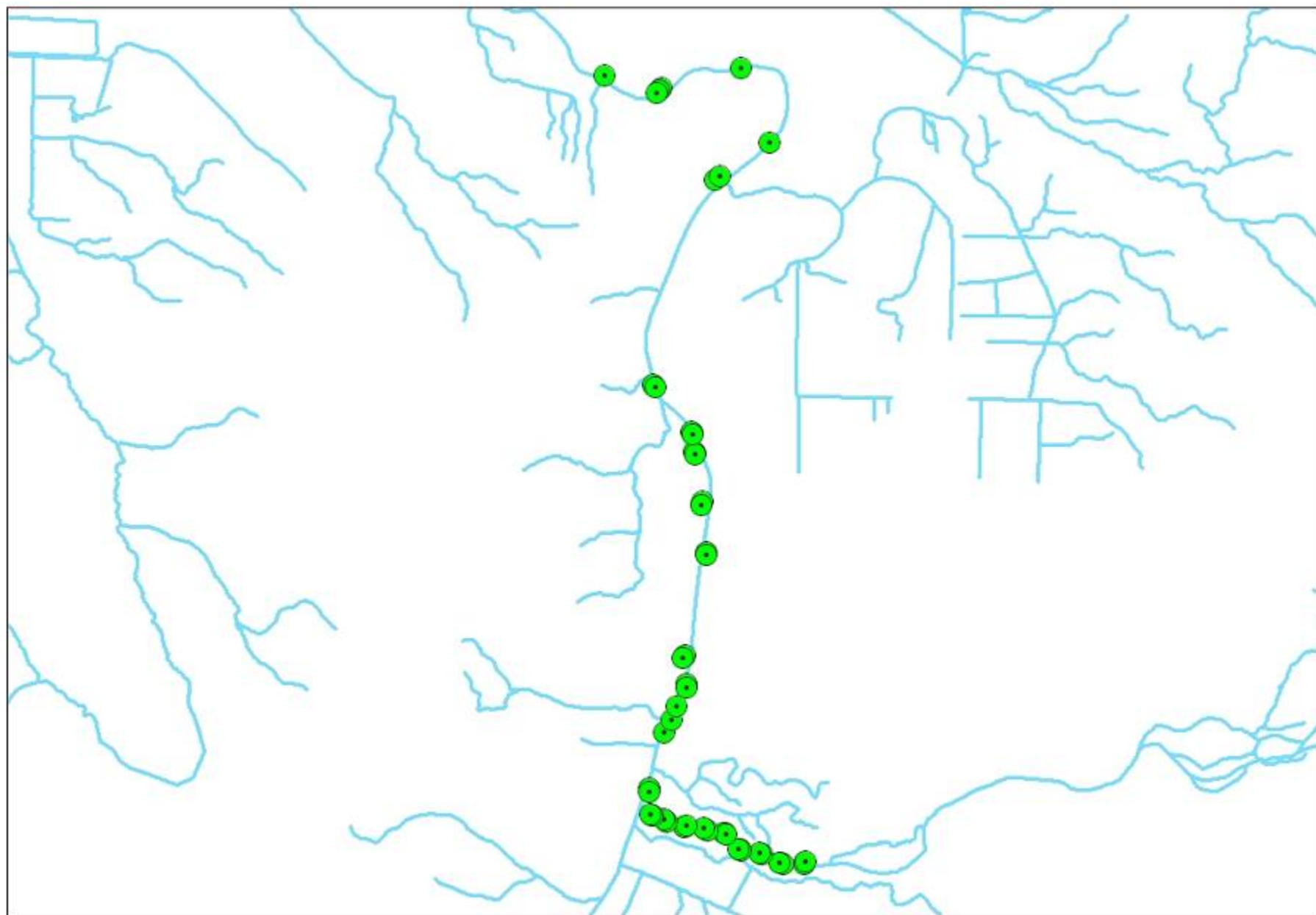
2009 Natural jams



0 25 50 100 Feet

2009 Cottonwood pilings

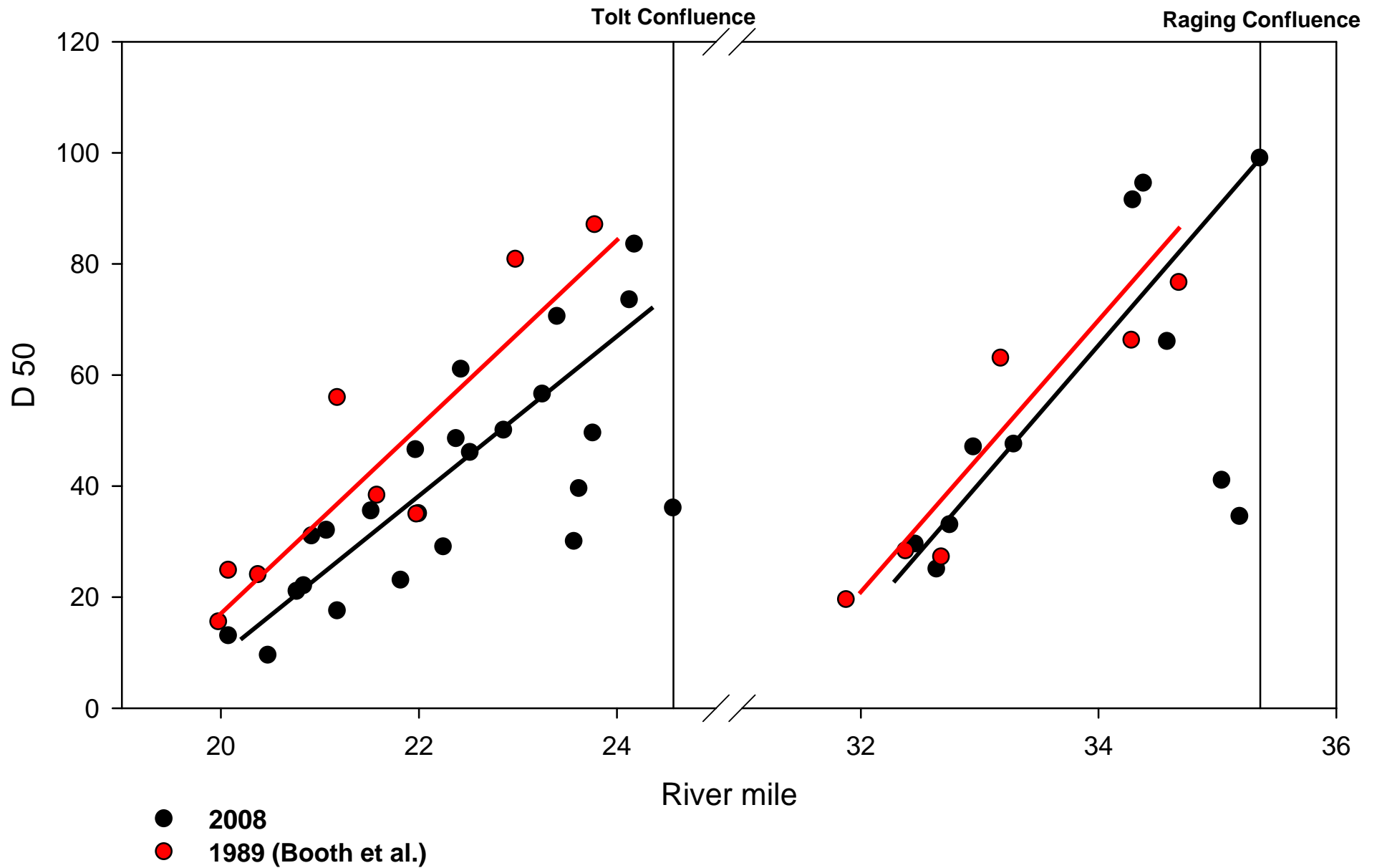


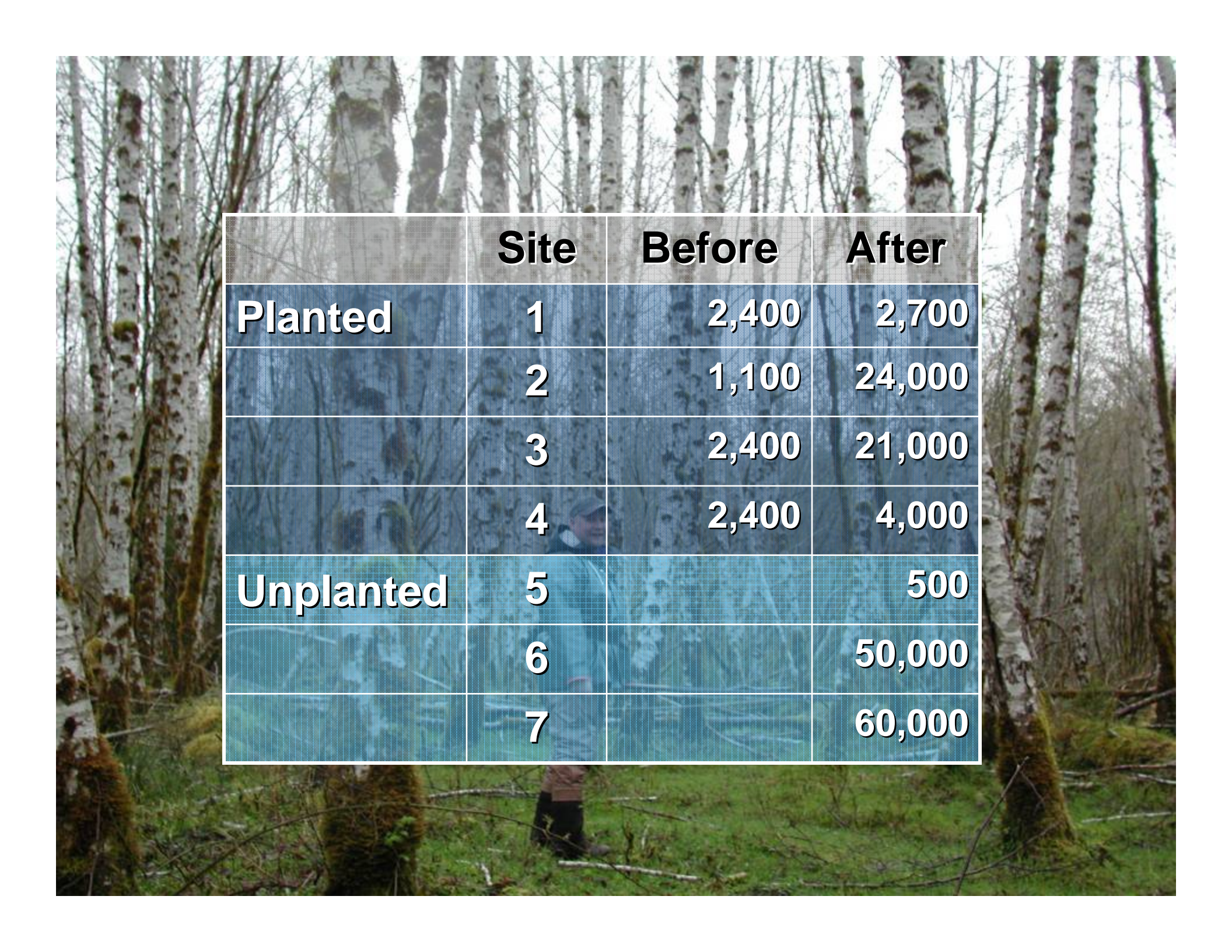


0 1,500 3,000 6,000 Feet

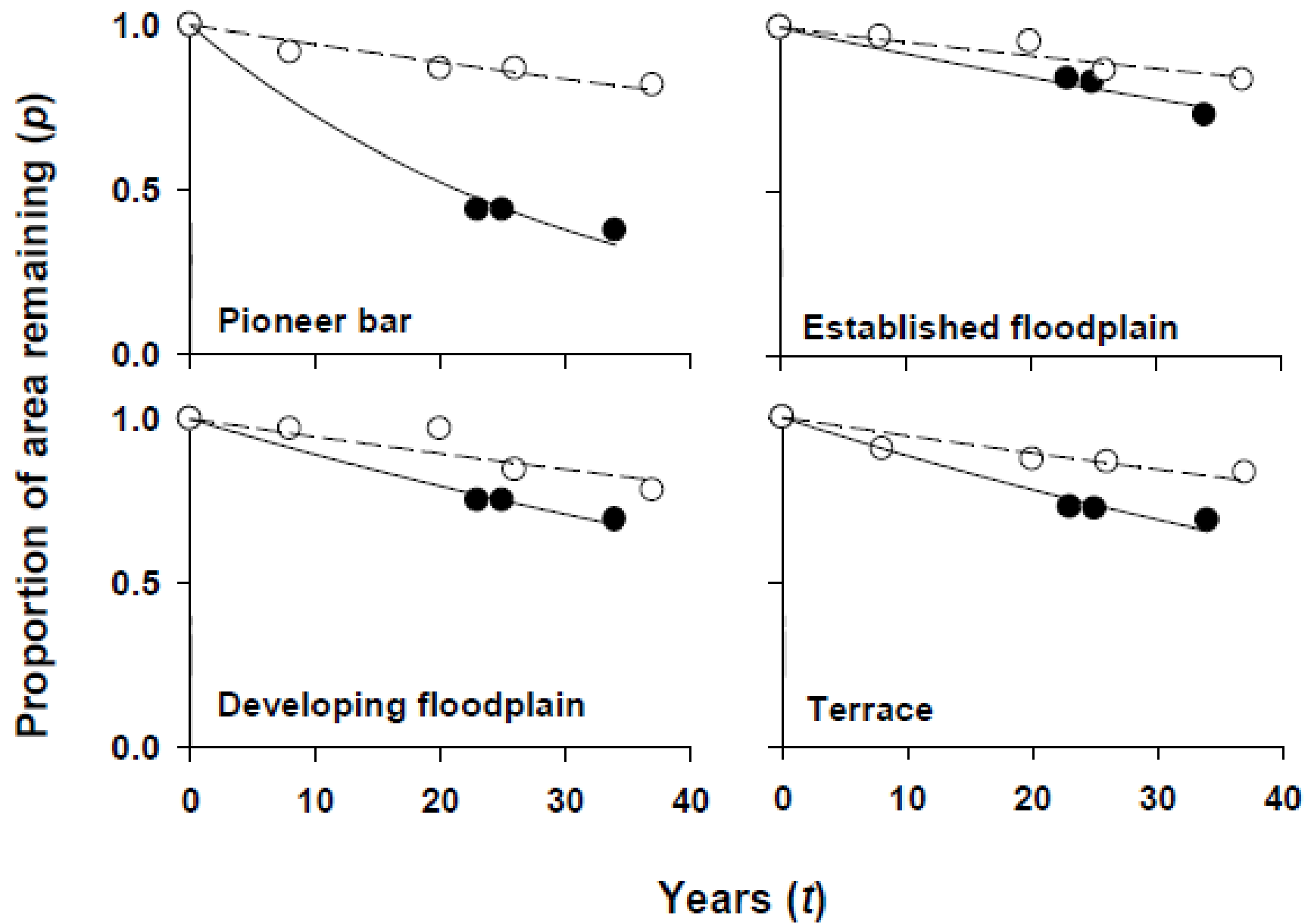
2008 Pebble Counts

Snoqualmie substrate size (1989 vs 2008)



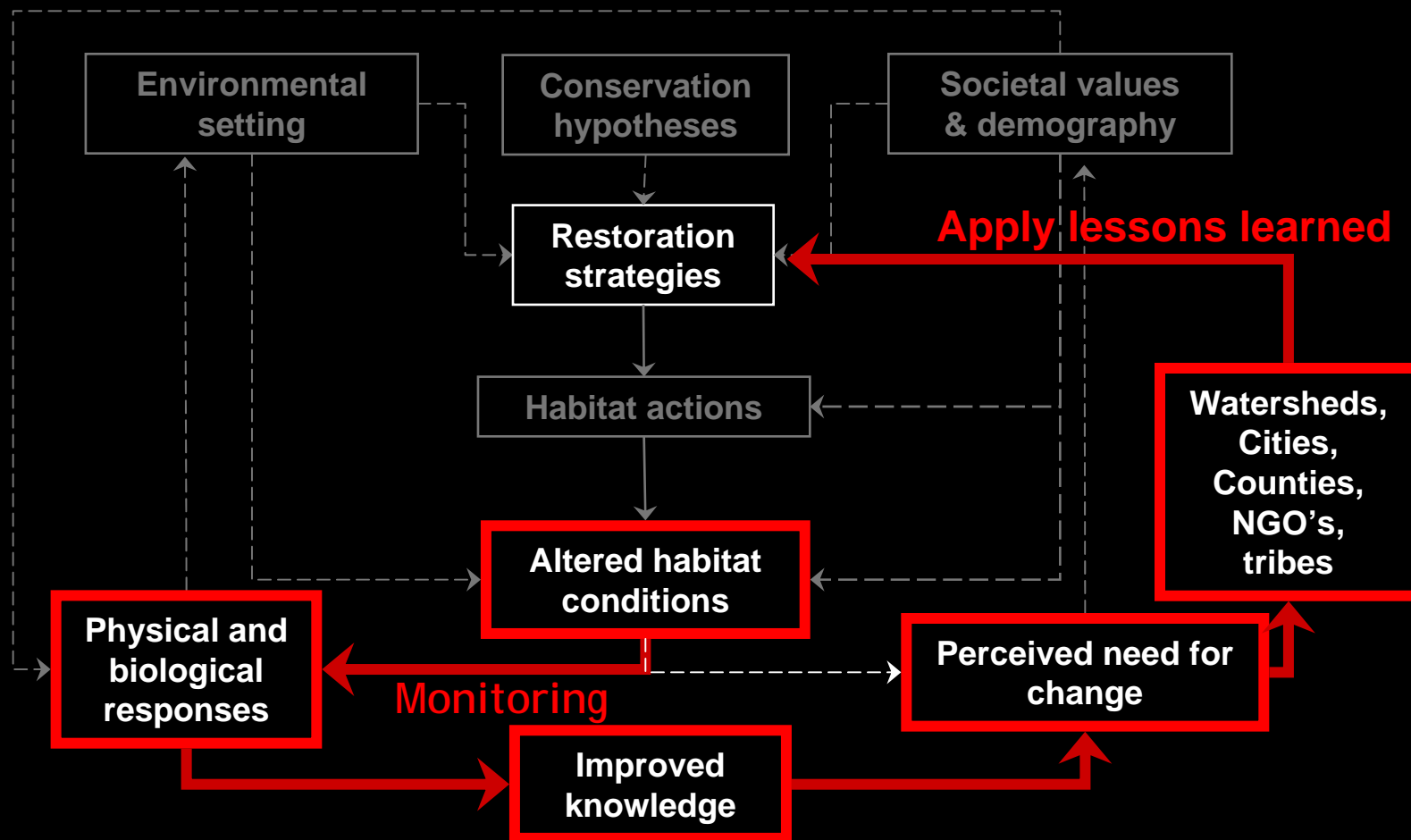


	Site	Before	After
Planted	1	2,400	2,700
	2	1,100	24,000
	3	2,400	21,000
	4	2,400	4,000
Unplanted	5		500
	6		50,000
	7		60,000







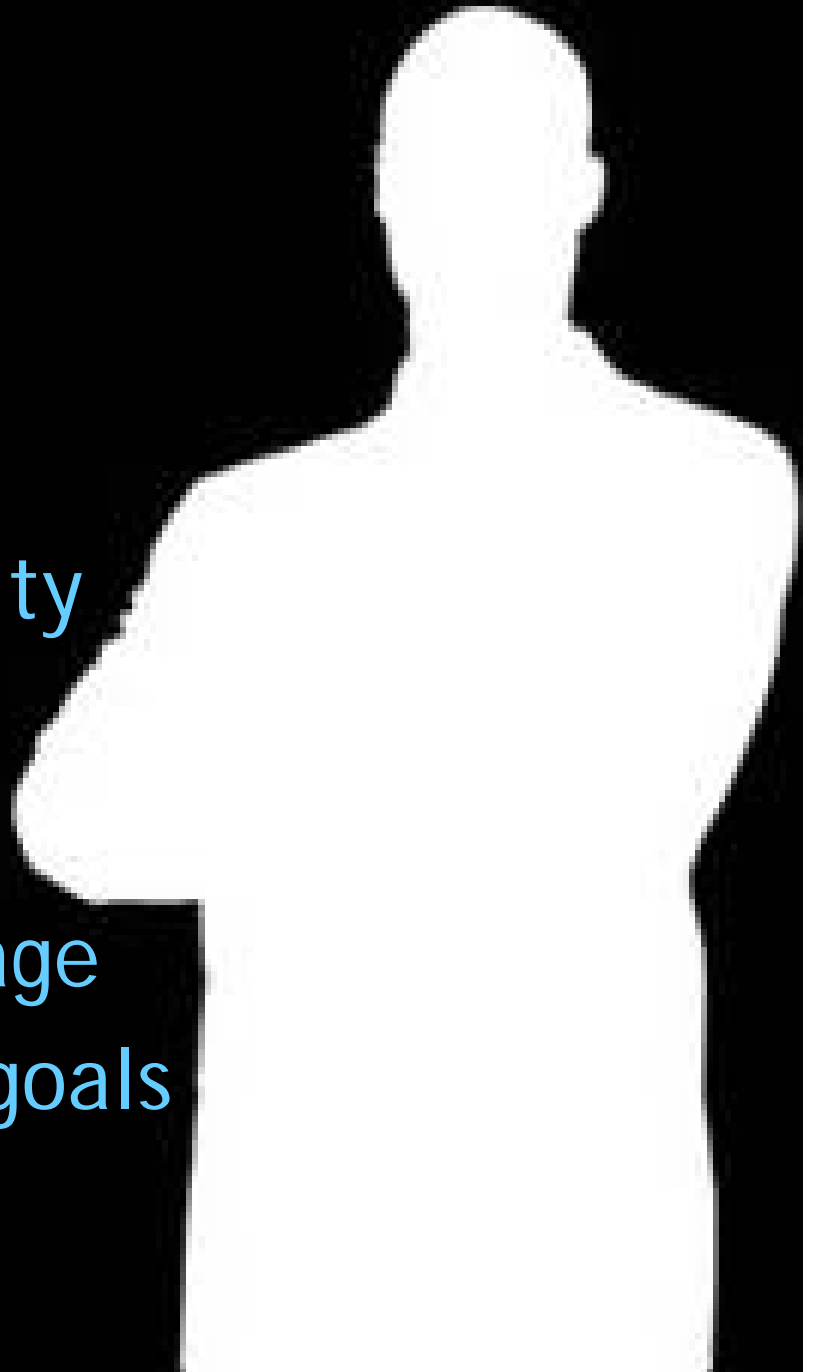


EM is optional.



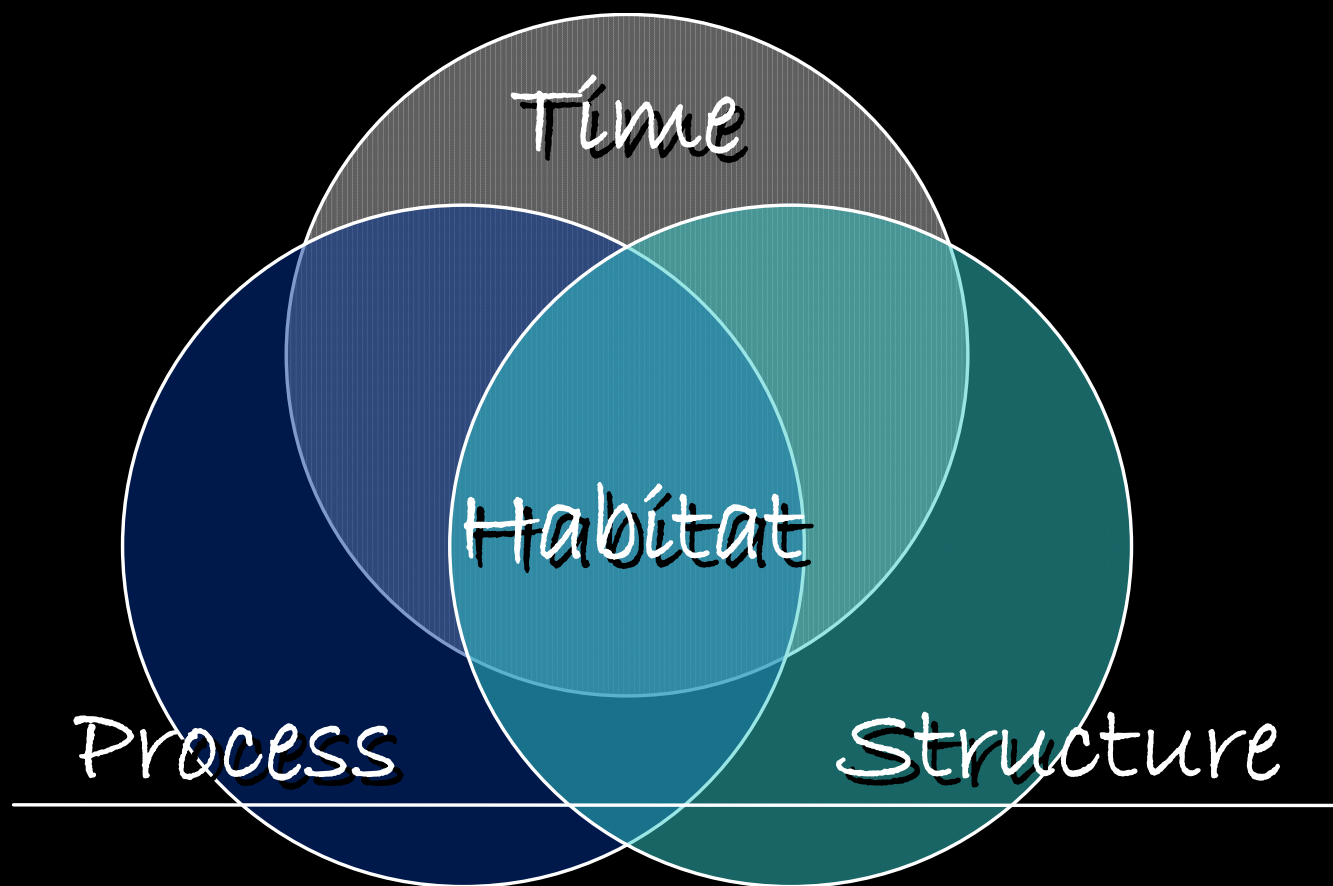
EM is essential.

- Demonstrate accountability
- Establish credibility
- Learn and apply lessons
- Gain competitive advantage
- Support programs, meet goals



Acknowledgements

- King Conservation District
- KC CIP M&M Program
- SRFB –Jen O’Neal
- NOAA Fisheries – Pess, Beechie, Roni
- Colleagues & managers
- Many others





SUCCESS

SOME PEOPLE DREAM OF SUCCESS,
WHILE OTHER PEOPLE LIVE TO CRUSH THOSE DREAMS.