

Project Scale Stream Restoration Monitoring: A Regional Review of Habitat Data in the Mid-Columbia

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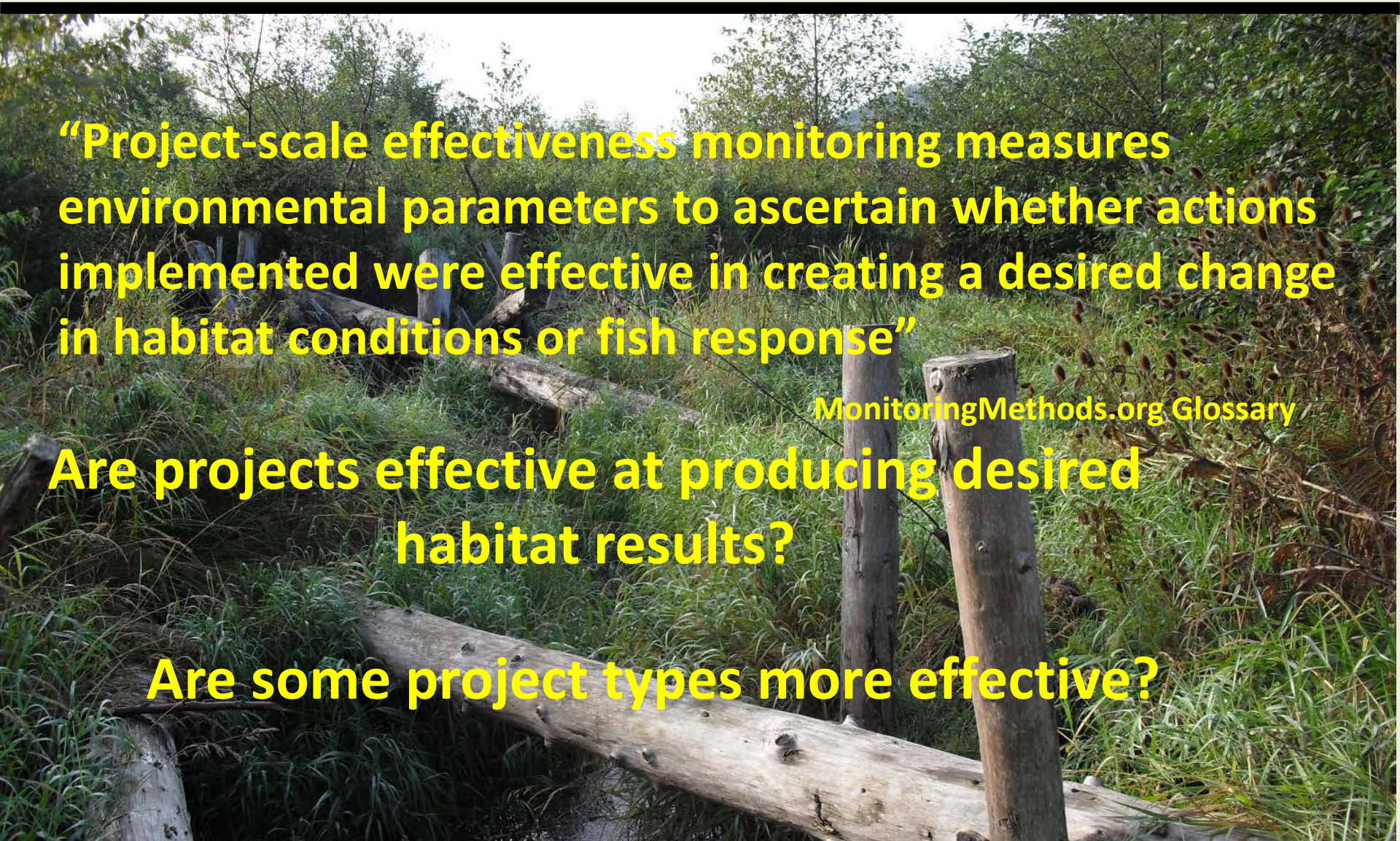
TETRA TECH

Agenda

- What is effectiveness monitoring?
- Overview of monitoring efforts in Mid-Columbia region
- SRFB Reach-Scale Effectiveness Monitoring Program
- GSRO Coordinated Monitoring Program
- Summary

Effectiveness Monitoring



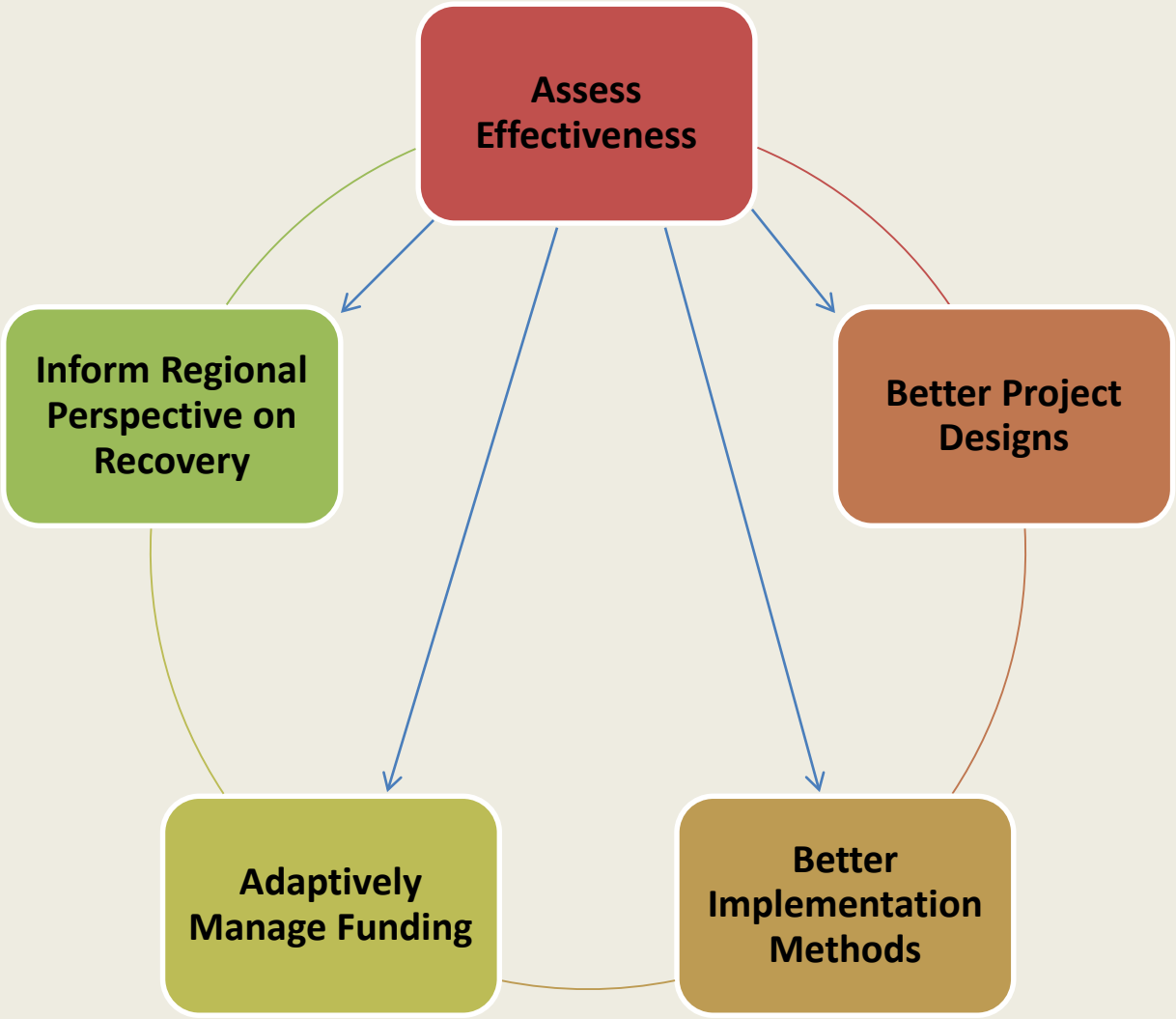
"Project-scale effectiveness monitoring measures environmental parameters to ascertain whether actions implemented were effective in creating a desired change in habitat conditions or fish response"

MonitoringMethods.org Glossary

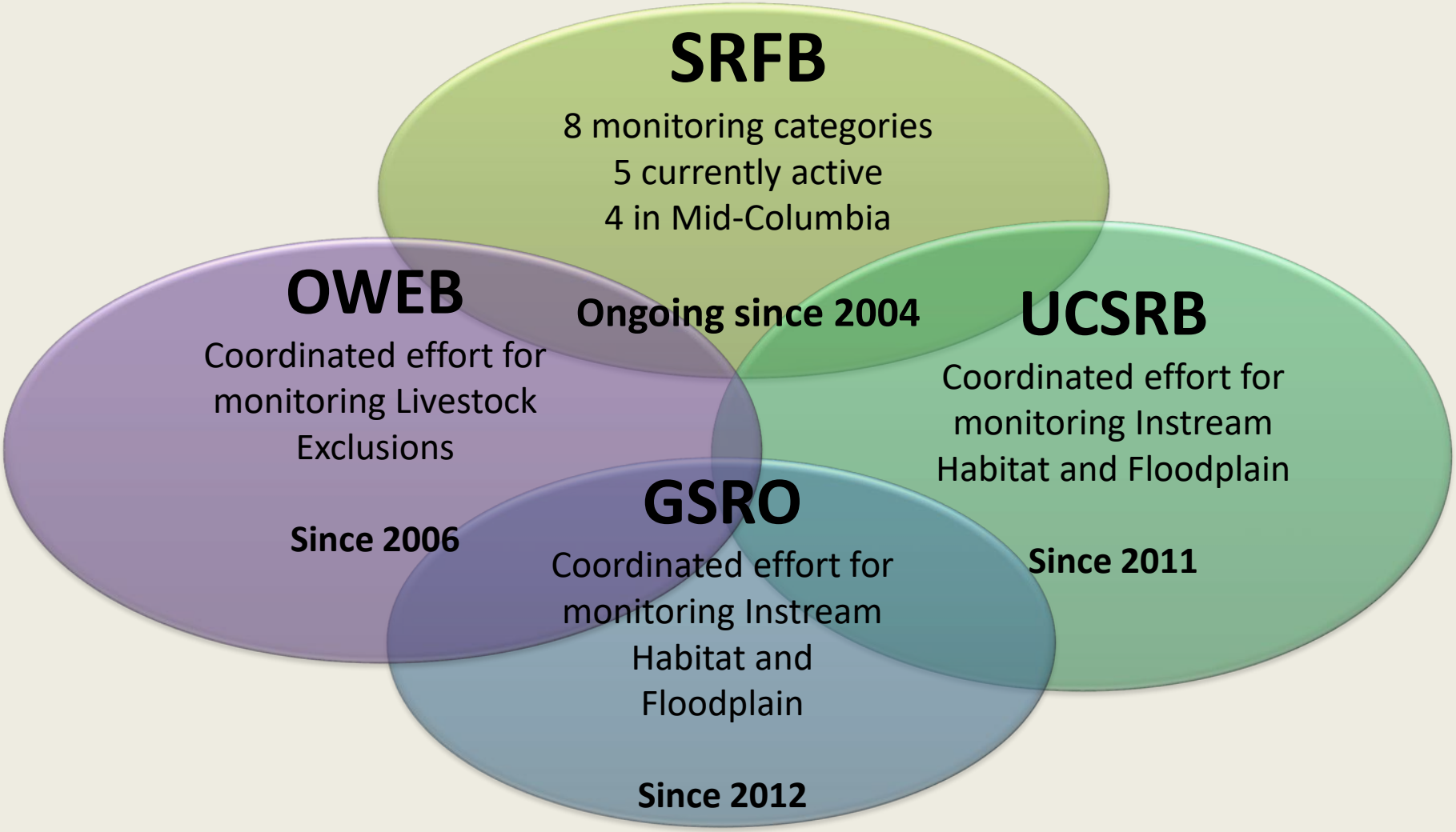
Are projects effective at producing desired habitat results?

Are some project types more effective?

Effectiveness Monitoring Functions

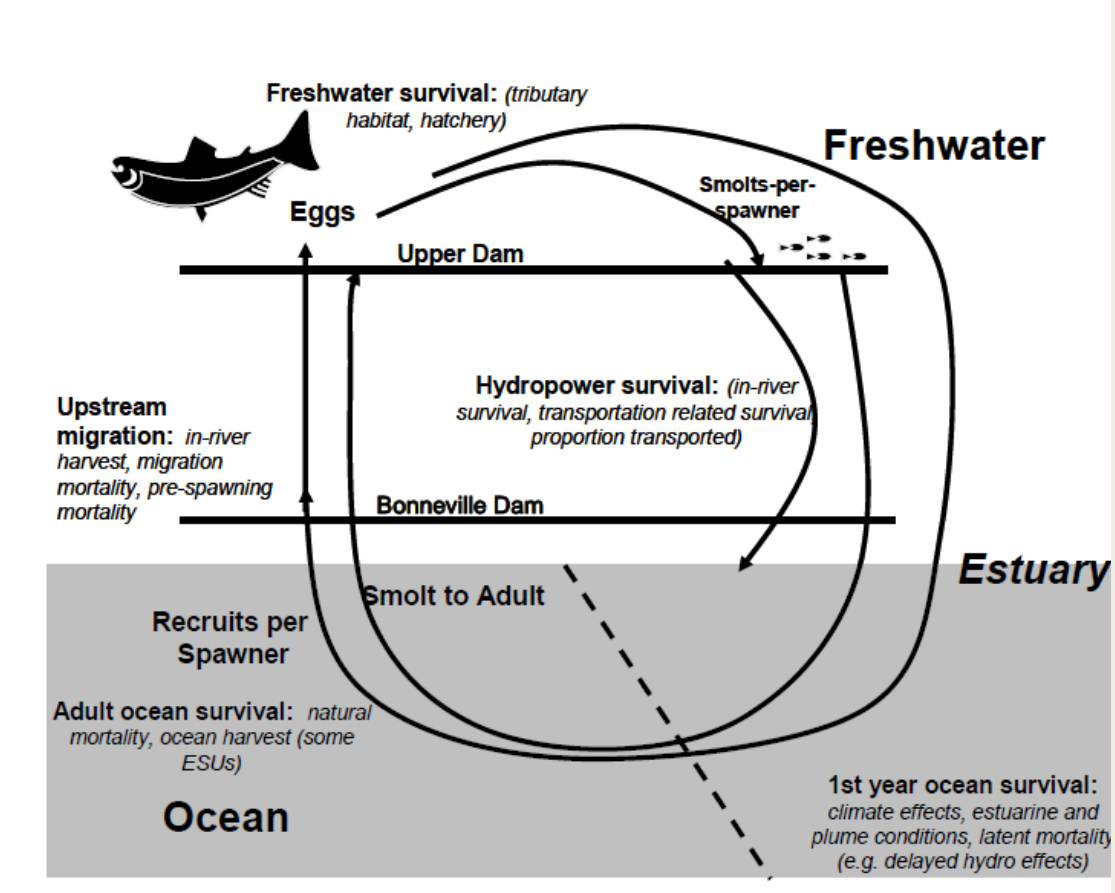


Project-Scale Effectiveness Monitoring Programmatic Approach



Mid-Col Regional Recovery Planning

Key Recovery Efforts
Tributary Habitat
Fish Passage
Improve Flow Conditions
Improve Channel and Floodplain Conditions
Hatchery Reforms
Restore Riparian Condition
Restore Beaver Populations
Nutrients and Sediment Management



Source NMFS 2009

Mid-Col Regional Monitoring Entities

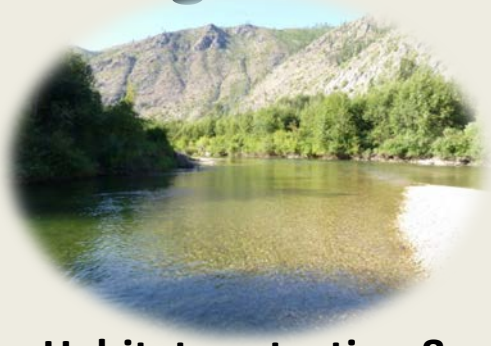
- Mid-Columbia RFEG
- Yakima Fisheries
- Bureau of Reclamation
- Klickitat Conservation Trust
- SRFB
- GSRO Coordinated Monitoring Program
- Others

Mid-Col Regional Monitoring Categories

Project types being monitored in the region:

In-stream habitat

Barrier removal & passage improvements



Habitat protection & acquisition

Water Quality/Flow/Temperature

Riparian planting

Diversion screening

Floodplain Enhancement

Some of the projects being monitored

Project	Monitoring Entity	Project Category	Status
Cle Elum River Instream Habitat Project (06-2141)	Klickitat Conservation Trust	In-stream Habitat	Pre Project – 2009 Post – 2010 & 2011
Taneum Creek	Yakama Nation	In-stream Habitat	Monitored in 2012
Toppenish Creek	Yakama Nation Fisheries	Fish Passage; Div. Screening; Flow	Fish Passage; Div. Screening; Flow
Satus Creek	Yakama Nation Fisheries	Fish Passage; Floodplain; Livestock Exclusion	Monitoring is ongoing
Tepee Creek Phase II Meadows Restoration	Yakama Nation/YKFP	Floodplain/Channel Connectivity	Monitoring is ongoing
Schaake Property Habitat Improvement Project	Bureau of Reclamation	Floodplain/ Constrained Channel	Post-project monitoring proposed for 2012
Yakima Delta Restoration Assessment	Mid-Columbia RFEG	Water Quality	Final document scheduled for Nov 2012

Some of the Protocols Used

Project	Monitoring Entity	Protocols
Cle Elum River Instream Habitat Project (06-2141)	Klickitat Conservation Trust	Stream Survey (Scholz 1998, Rustay et al. 2008); Pebble Counts (Wolman 1954)
Toppenish Creek	Yakama Nation Fisheries	Riparian Habitat Survey (Romero et al. 2005, Knight 1994); Stream Discharge (McMahon et al. 1996); Fish Diet (Meehan and Miller 1978); Invertebrate Identification (Wipfli 1997)

Sources: Cardno Entrix 2012, YKFP 2009

Instream Habitat

Cle Elum River Instream Habitat Project-Klickitat Conservation Trust

- Successful at diverting flow into side channel
- Decreased temperatures in the side channel (esp. lower reaches)
- Increase in the number of habitat units
- Increase in LWD in the side channel
- Decreases in percent fines and embeddedness

Source: Cardno Entrix 2012

SRFB Diversion Screening

Dry/Cabin Creek Fish Screening Project

YTAHP Lower Reecer Creek

- A standard protocol was used for all sites
- Effective if 80% or more of NOAA indicators measured were in compliance
- **In all years monitored, both of these projects met the success criteria**
- **This category of projects was also shown to be performing as designed across the state**
- *Monitoring completed for this category*

SRFB Floodplain Enhancement

Upper Klickitat River Enhancement, Phase 2

In Year 3:

- Construction disturbance led to decrease in riparian vegetation structure and canopy density
- In-stream morphology and pool characteristics increased
- Steelhead observed in new channel
- Year 5 monitoring in 2015

Reecer Creek Floodplain Restoration Project

In Year 1:

- Pool habitat was developed as a result of the channel being constructed
- Fish observed juvenile fish utilizing areas near placed wood structures
- Year 3 monitoring in 2013

SRFB Riparian Planting

Lower Klickitat Riparian Re-Vegetation, Phase 1

YTAHP Wilson Creek Riparian Restoration

Riparian vegetation structure
Canopy cover
Percent woody vegetation cover

ALL INCREASING

Bank erosion: decreasing at Lower Klickitat

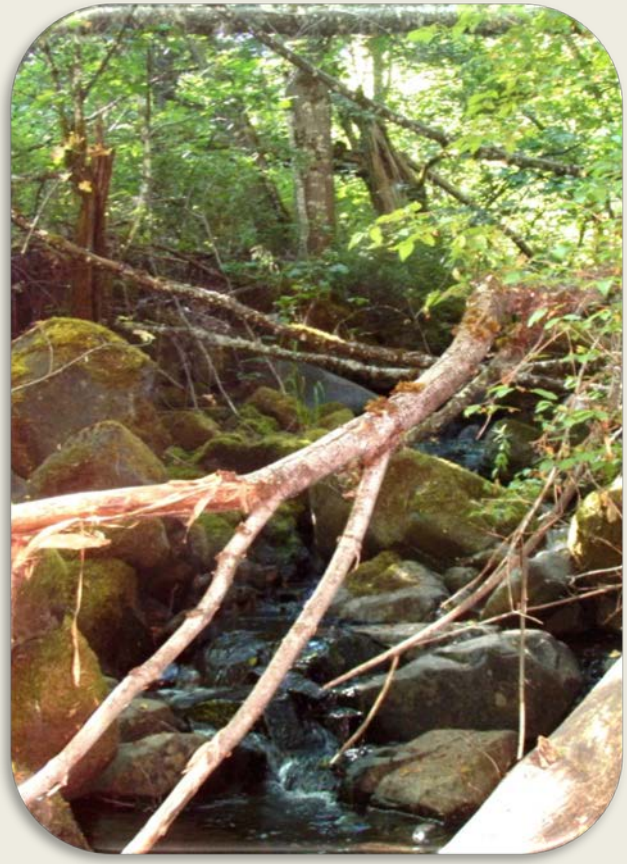
slight increases noted at Wilson Creek

★ **Maintenance of non-native invasive plants was recommended to ensure long-term success of projects** ★

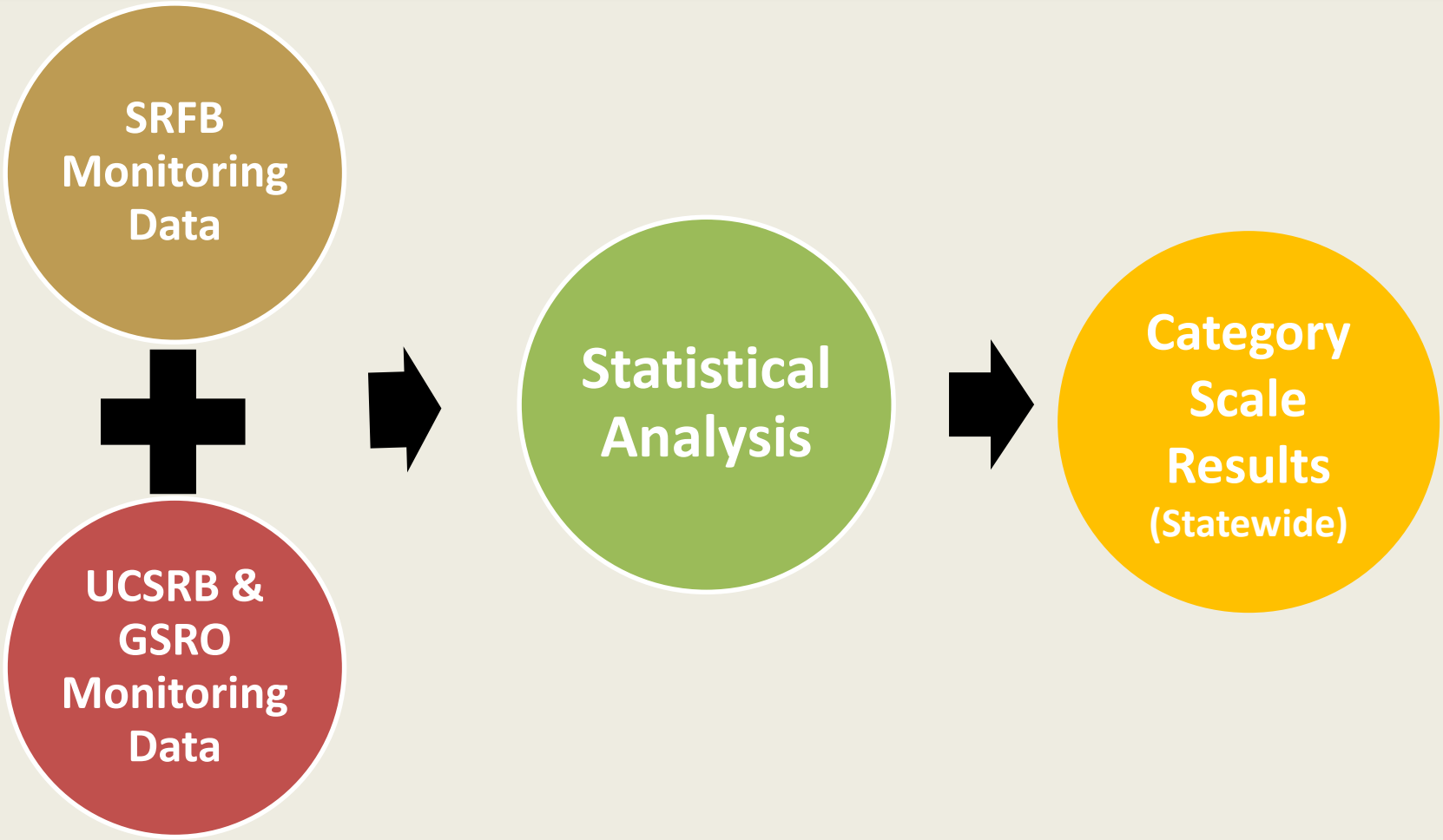
SRFB Habitat Protection

Logging Camp Canyon:

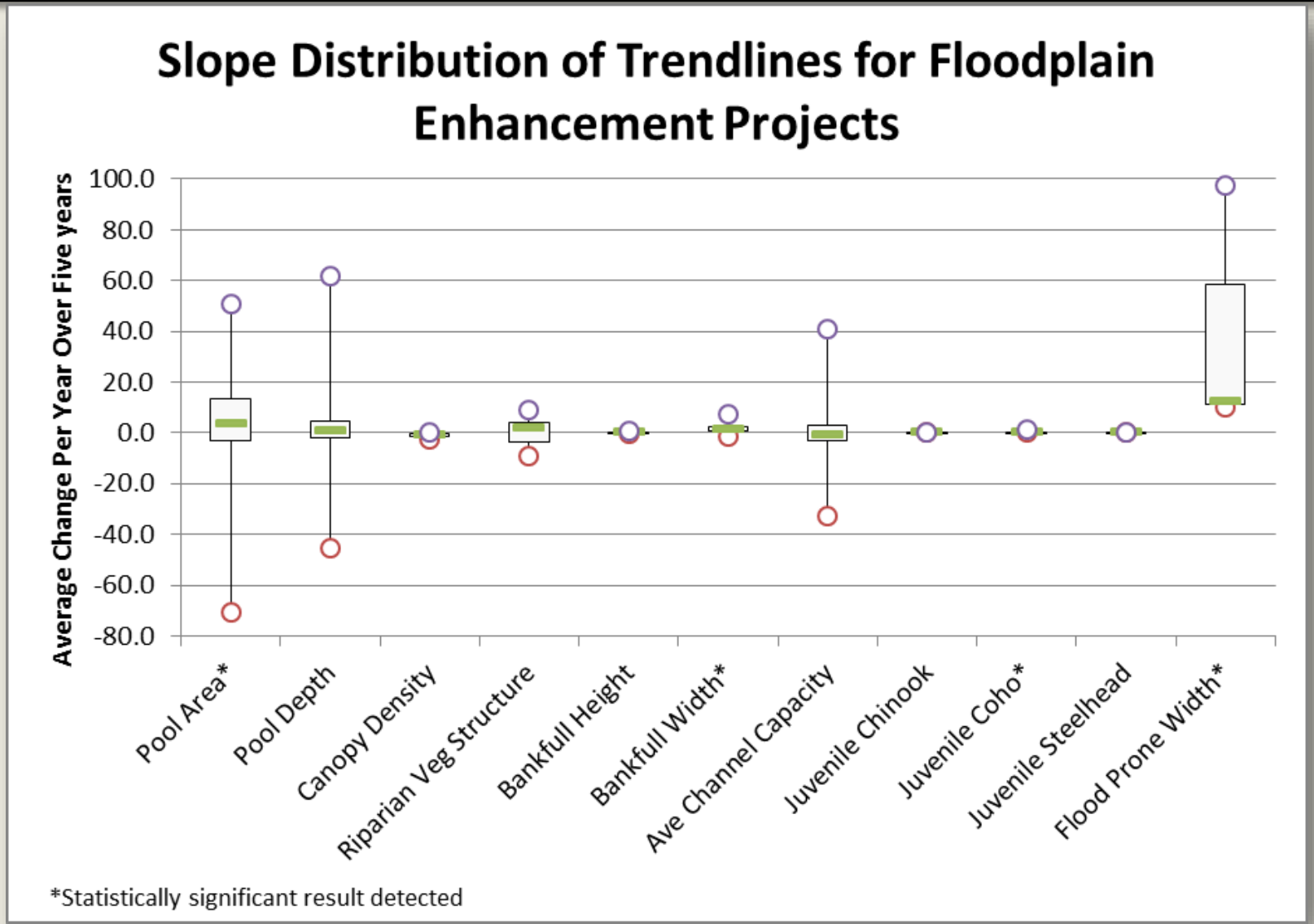
- Purchase of 293 acres of land
- Critical to the long-term protection of steelhead spawning habitat within Logging Camp Creek
- Stable site conditions and indices for demersal fish and macroinvertebrates
- Maintenance of in-stream ecological health and habitat over time



Results by Category

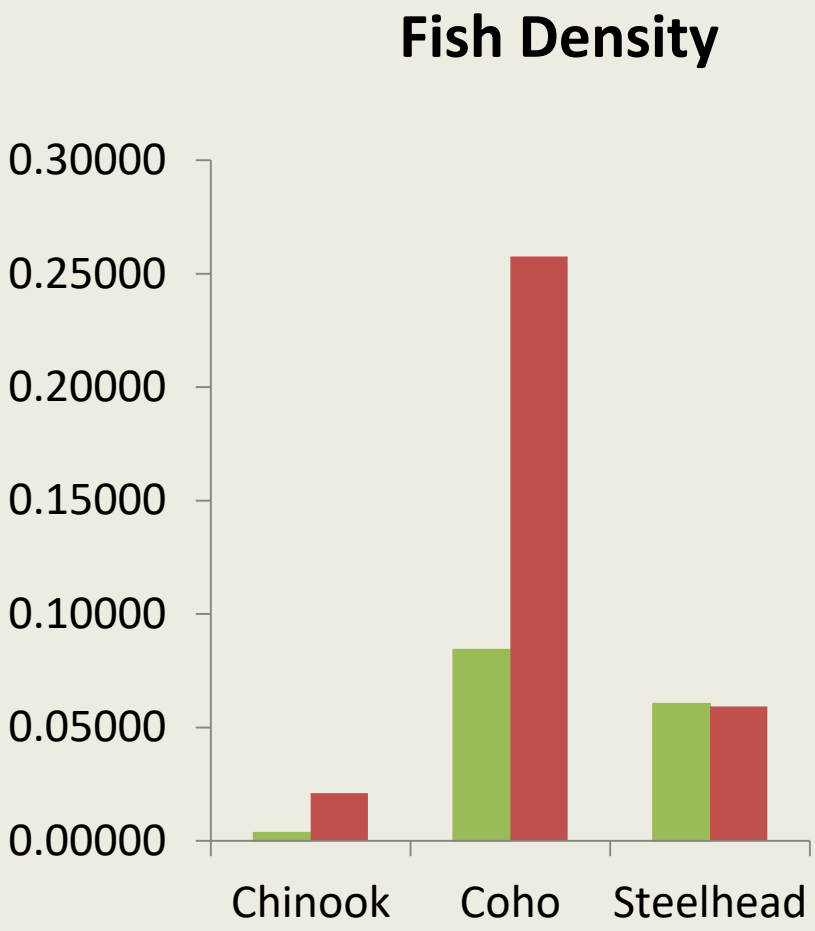


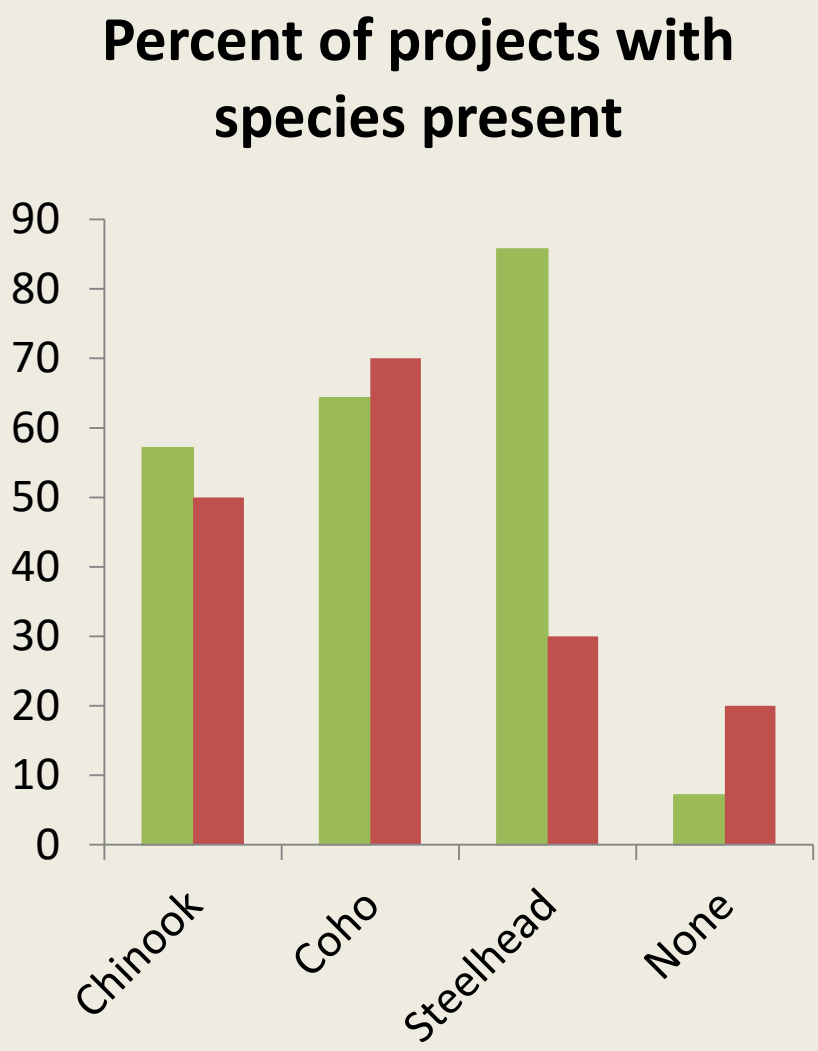
Floodplain Enhancement Projects



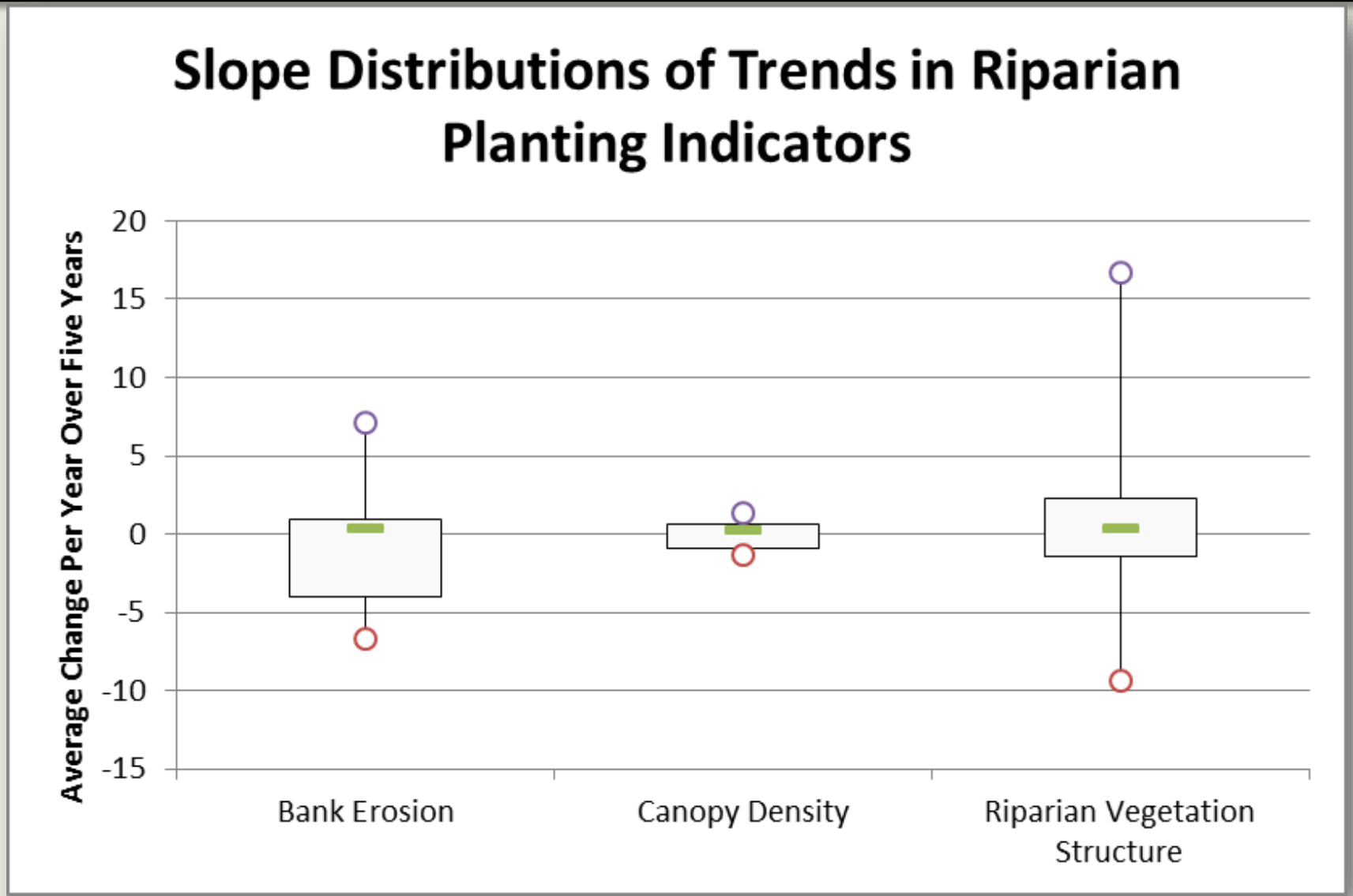
= In-stream Habitat Projects

= Floodplain Enhancement Projects





Riparian Planting Projects



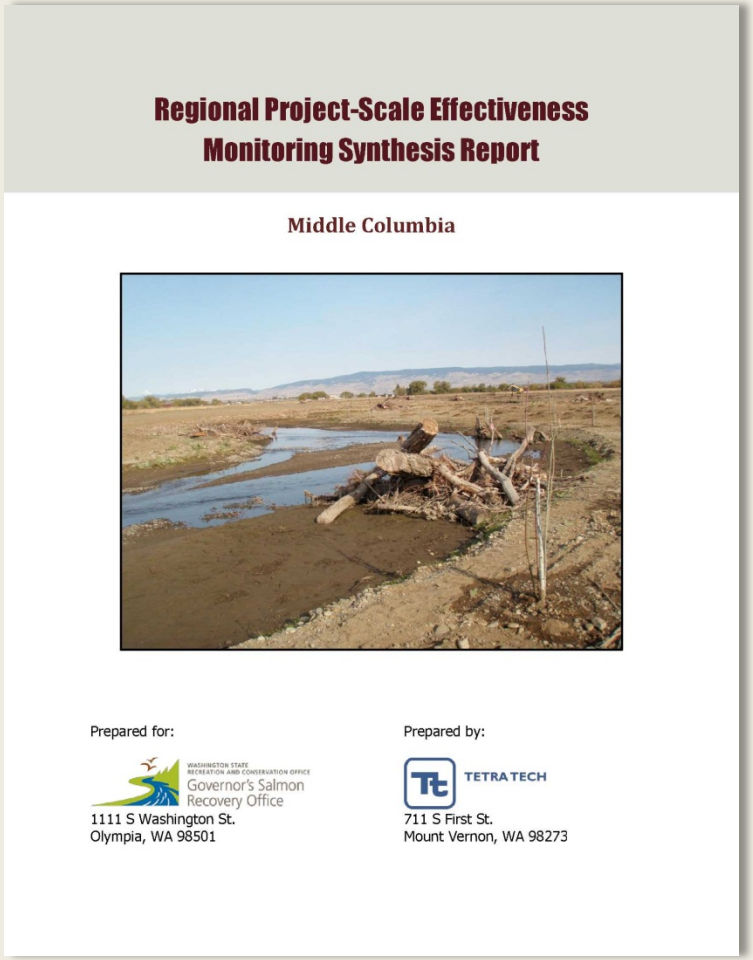
Habitat Protection Projects

21 freshwater indicators monitored

14 are showing *positive* average trends over time:

- Pool Depth
- Coniferous Basal Area
- Deciduous Density
- Percent Fines
- Percent Embedded
- Bank Erosion
- Riparian Vegetation Structure
- Non-native Herbaceous Absolute Cover
- Non-native Herbaceous Relative Cover
- Non-native Shrub Absolute Cover
- Non-native Shrub Relative Cover
- Chinook Juveniles
- Coho Juveniles
- Steelhead Parr

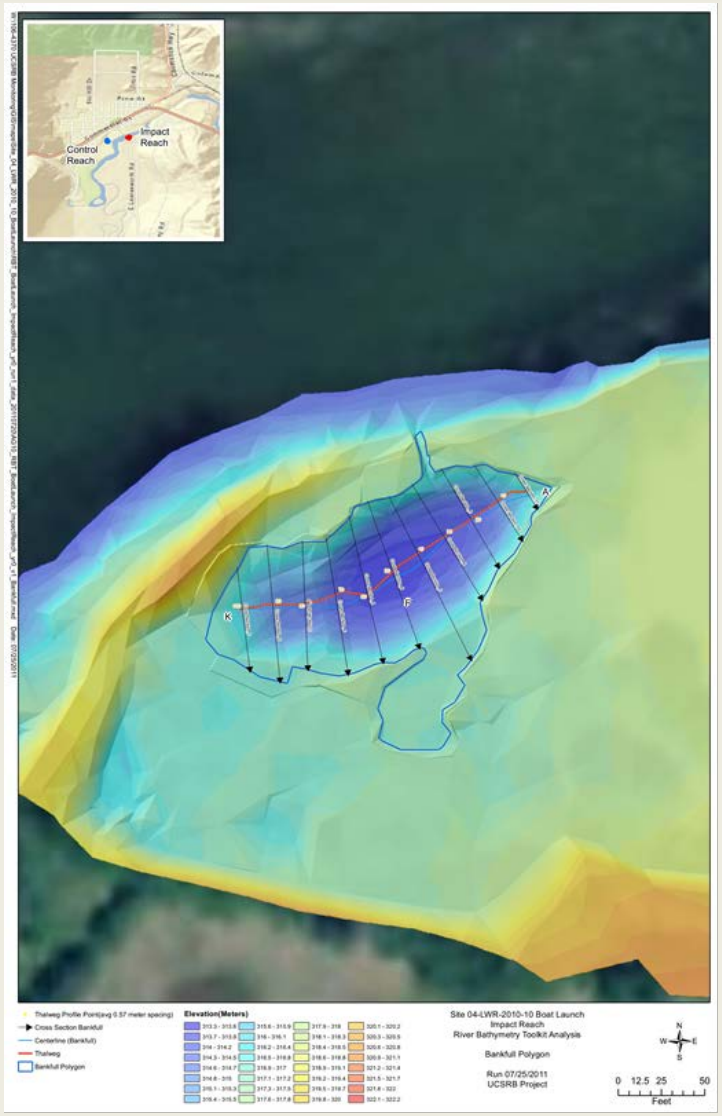
Coordinated Monitoring Program

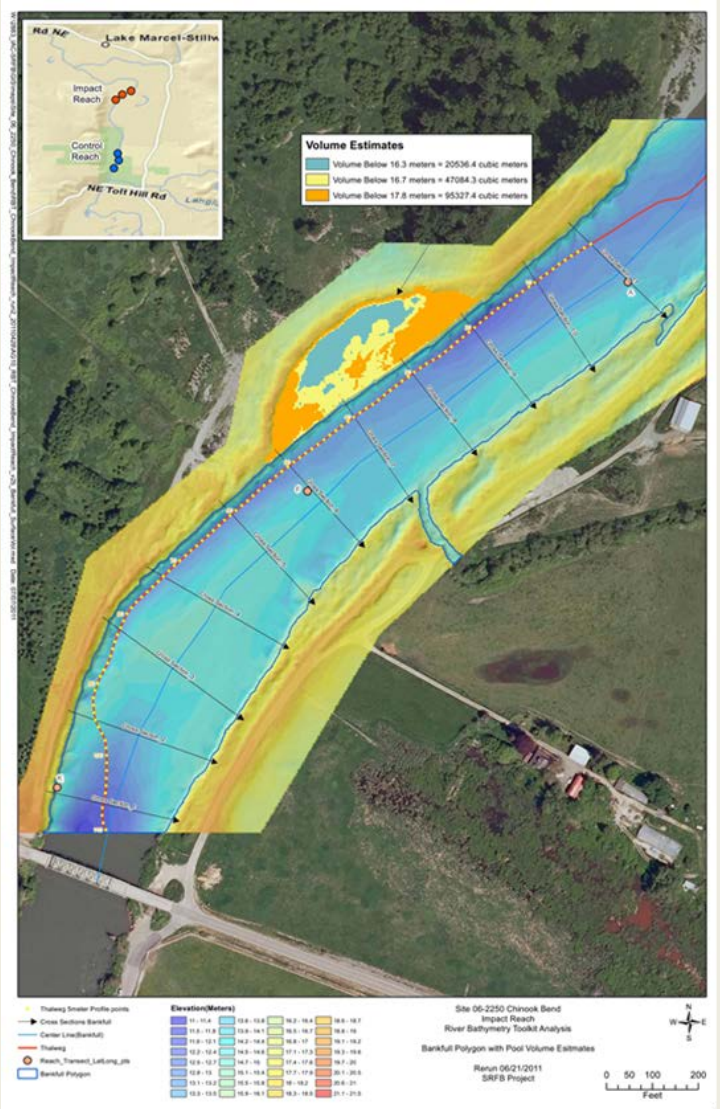


Projects in Mid Columbia

- **Eschbach Park** –Yakima County (Joel Freudenthal and Karen Hodges)
- **City of Yakima Floodplain Restoration Phase II** – City of Yakima (Ryan Anderson)

Floodplain Enhancement Monitoring
Topographic Survey/LiDAR





Additional Monitoring Needs

- Floodplain habitat – along mainstem rivers and off-channel habitat
- Beaver reintroduction
- Nutrient improvement projects
- Flow management issues
- Hatchery/wild interactions

Source: joewheaton.org

Summary

- Project Scale Monitoring in the Mid Columbia Region is targeted at the key recovery efforts
- Work is implemented by a variety of entities using various protocols
- Success of a subset of projects in the region is being documented
- Programmatic approach provides both project and category scale results
- Additional needs for monitoring…

Thank you!

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