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June 28, 2013

## MEMORANDUM

**TO:** Council Members

**FROM:** Raquel Crosier, Washington Policy Analyst

**SUBJECT:** Washington's approach to answering critical questions through monitoring.

During our July 10<sup>th</sup> Council Meeting we will have a panel presentation on Washington's approach to habitat and salmonid monitoring. The presentation will be aimed at answering the question; are salmon habitat restoration actions achieving the expected recovery results?

This panel will connect Washington's State-wide monitoring work with monitoring work in the Columbia Basin and will highlight commonalities and opportunities for information sharing across programs. The panel will include presentations from Keith Dublanica of the Washington State Governor's Salmon Recovery Office (GSRO), Amy Windrope, WA Department of Fish and Wildlife and Bill Ehinger, Washington Department of Ecology and Jennifer O'Neal of TetraTech. Keith will discuss the key questions for monitoring in Washington as well as a process that the Washington Salmon Recovery Funding Board is undertaking to evaluate how to get the greatest efficiency out of their monitoring investment. Amy and Bill will provide information on the rationale and results from Westside Intensively Monitored Watersheds. Jennifer will discuss TetraTech's work in Washington State; their monitoring process, partners and results.

# Washington's Approach to answering critical questions through monitoring



A Collaborative Presentation



WASHINGTON STATE  
RECREATION AND CONSERVATION OFFICE

Salmon Recovery  
Funding Board

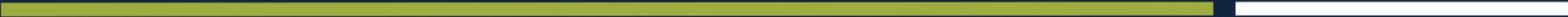
# Collaborative Presentation to the Northwest Power and Conservation Council

Seattle July 10, 2014

- Keith Dublanica      GSRO / RCO
- Bill Ehinger          WDOE
- Jennifer O'Neal      TetraTech
- Amy Windrope        WDFW
- Tim Quinn            WDFW



# Critical *Science* Questions

1. Did the restoration treatments have the intended effects?
  2. Are the fish populations changing over time?
  3. Are fish populations increasing because of our restoration actions?
  4. Can we improve the efficacy of our restoration efforts?
- 

# “Three legged” stool

- Action/Project Effectiveness Monitoring
  - Did this restoration treatment have the intended effect?
  - Can we improve the efficacy of our restoration efforts?
- Fish In / Fish Out
  - Is this fish population changing over time?
- Intensively Monitored Watersheds (IMW)
  - Are fish populations increasing because of our restoration actions?



Are wild salmon increasing  
as a result of our  
investments?

**IMW**

**Fish in/Fish  
Out**

**Action/Project  
Effectiveness**

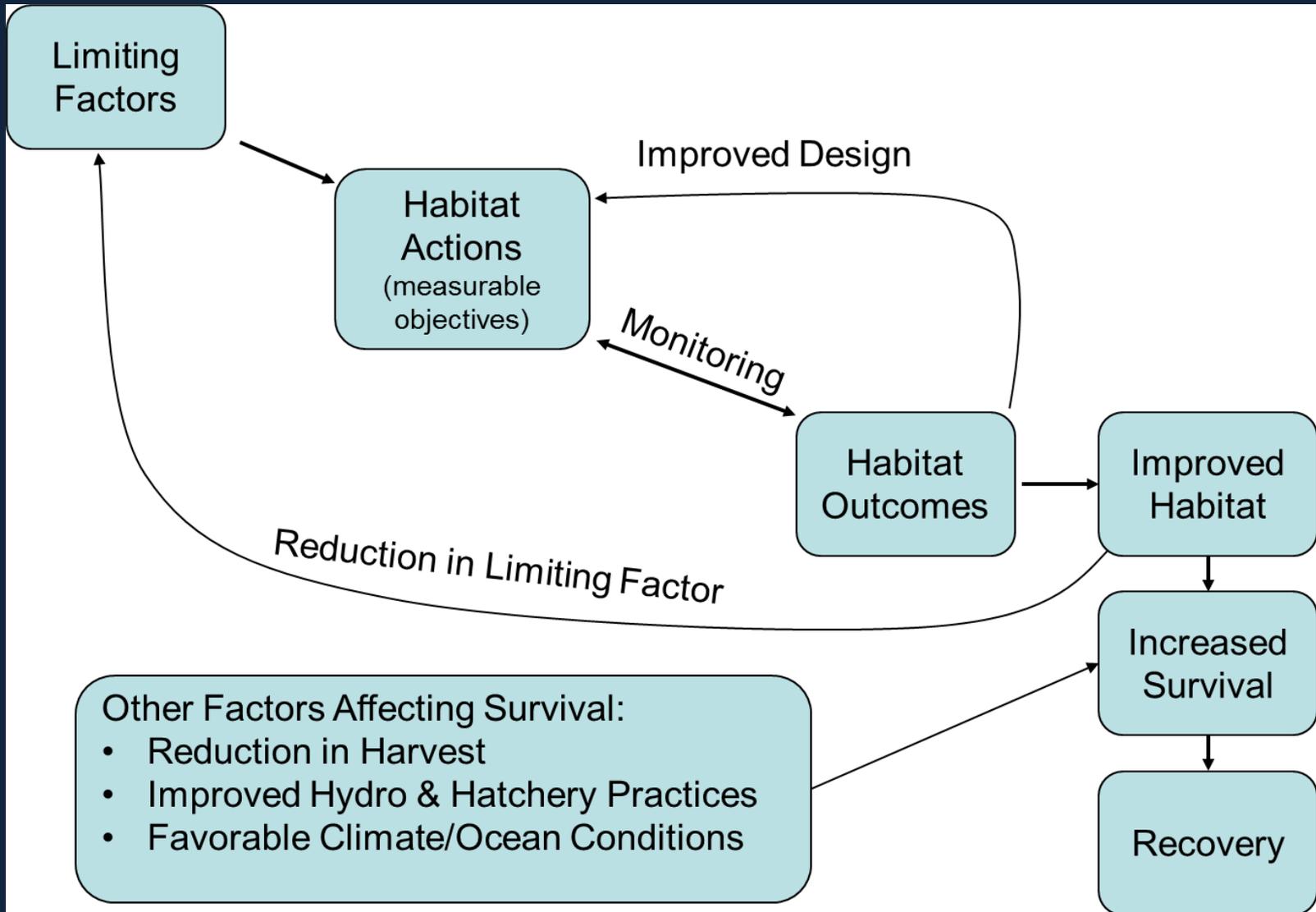
# Project Effectiveness Monitoring Goals

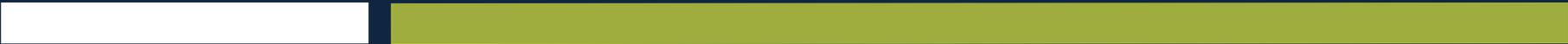
**Goals of project-scale effectiveness monitoring are to determine:**

1. Did the restoration treatments have the intended effects?
2. Can we improve the efficacy of restoration?
  - a. Are some treatment types more effective than others?
  - b. Can project monitoring data be used to improve the design of future projects?

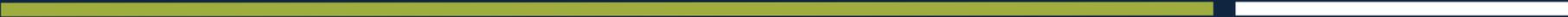
Washington Comprehensive Monitoring Strategy and SRFB personal communication

# Recovery Cycle



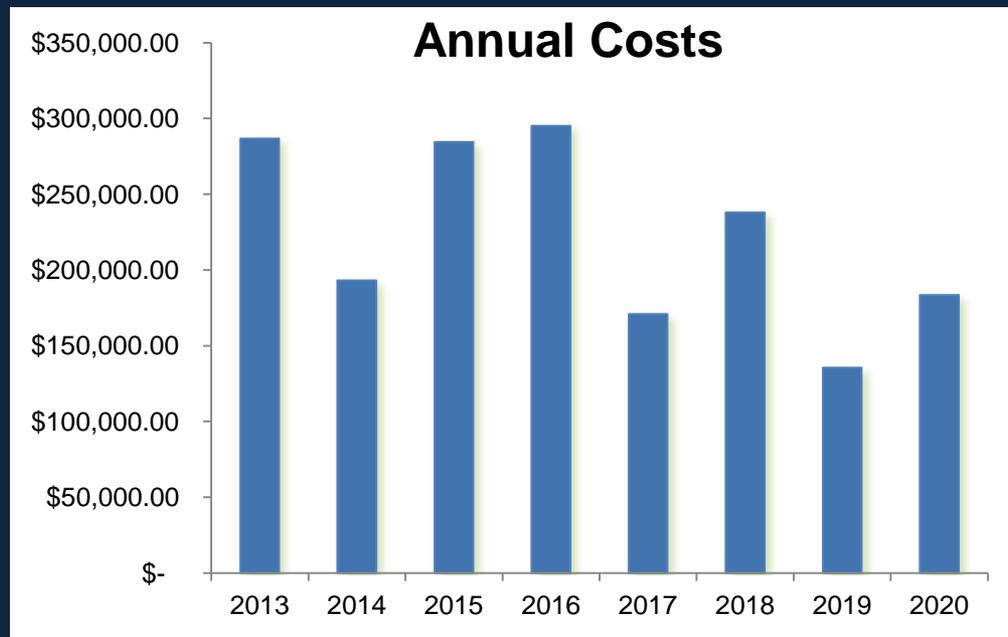


# Program Overview

- SRFB Effectiveness Monitoring Program underway since 2004
  - Coordinated effort with OWEB and UCSRB
  - 8 project categories; monitoring of 3 categories complete
  - Projects monitored using BACI design
  - Data collection complete in 2020 for entire program
- 

# Project Costs

- To date, since 2004 = **\$3.91 million**
- Current Annual Budget through April 2014 = **\$287k** (\$70k awarded, \$217 remaining)
- Cost for Completion of Program (2020) = **\$1.08 million**

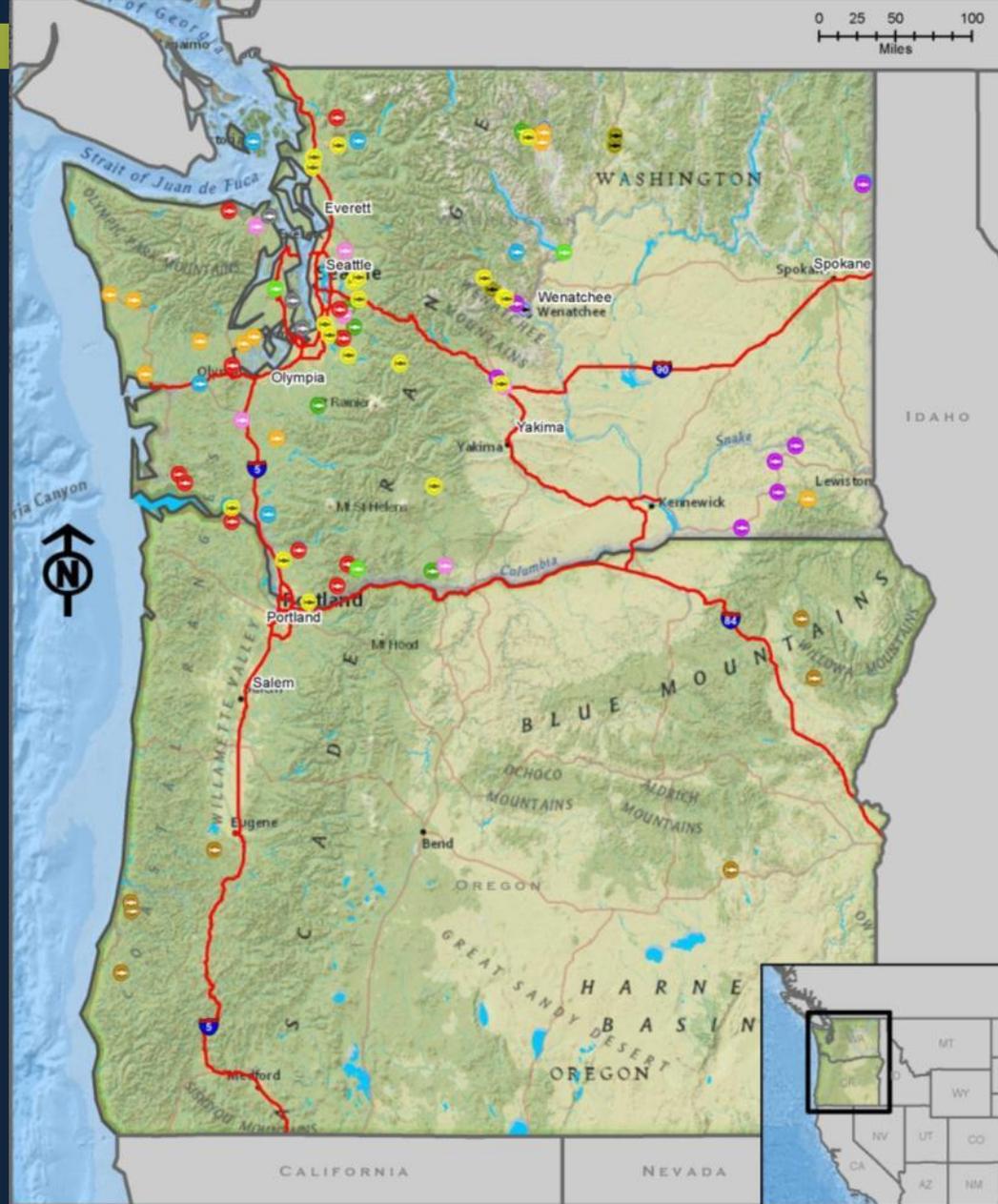


# Project Categories

(sample size)

- Fish Passage (9)
- In-Stream Habitat (13)
- Riparian Planting (9)
- Livestock Exclusion (12)
- Floodplain Enhancement (23)
- Spawning Gravel (2)
- Diversion Screening (9)
- Habitat Protection (10)

**TOTAL 87 Projects**



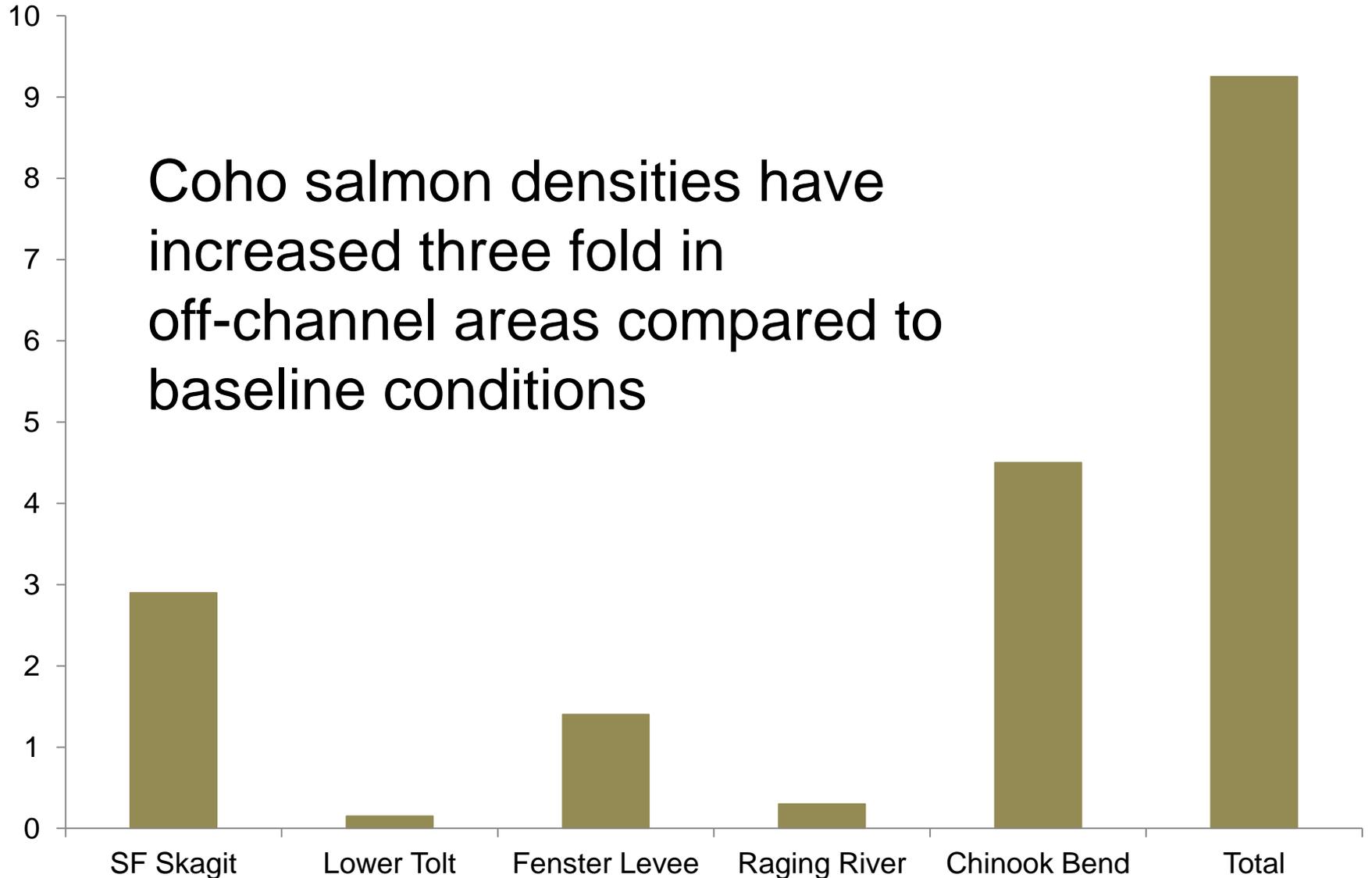
**Projects**

- |                       |                              |                       |                                   |
|-----------------------|------------------------------|-----------------------|-----------------------------------|
| ● Fish Passage        | ● Livestock Exclusion (SRFB) | ● In-Stream Diversion | ● In-Stream Structure (UCSRB)     |
| ● In-Stream Structure | ● Floodplain Reconnection    | ● Acquisition         | ● Floodplain Reconnection (UCSRB) |
| ● Riparian Planting   | ● Spawning Gravel            | ● Forest Plot Base    | ● Livestock Exclusion (OWEB)      |

**Did this restoration treatment have the intended effect?**

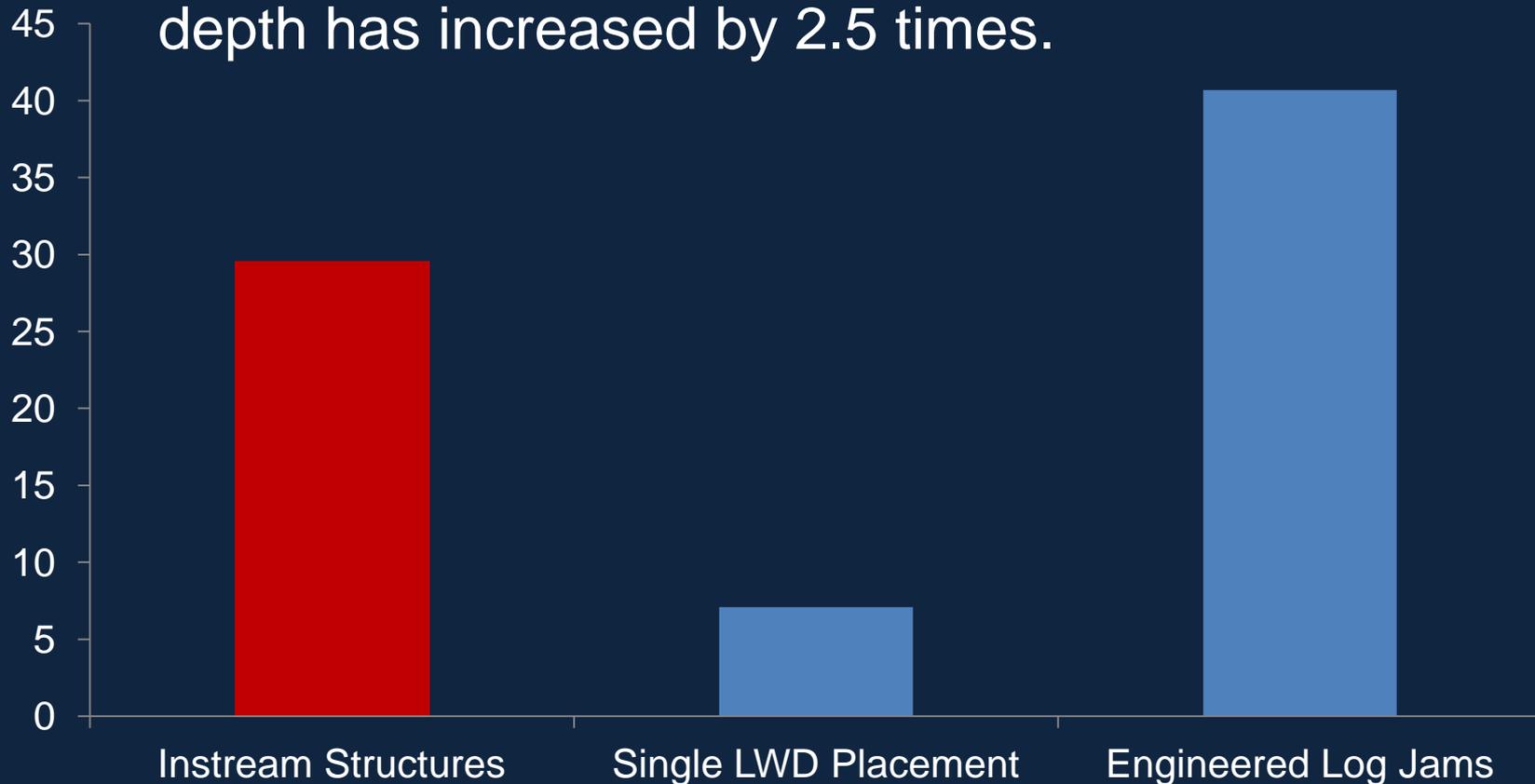


# Backwater Habitat Created



# Pool Area

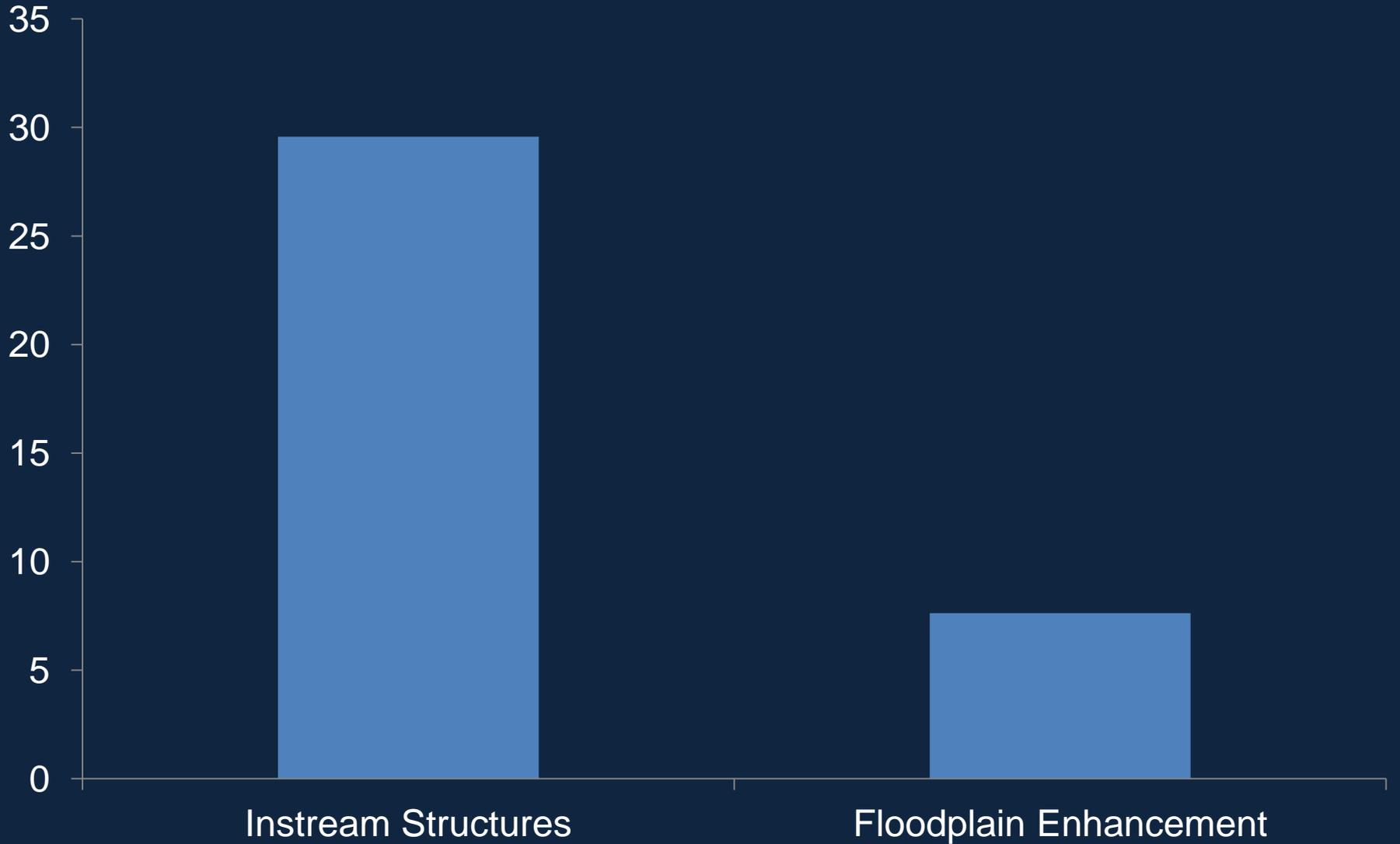
On average, Instream Structure Projects increased pool area by 5 times over baseline conditions. Residual pool depth has increased by 2.5 times.



**Are some project types more effective?**



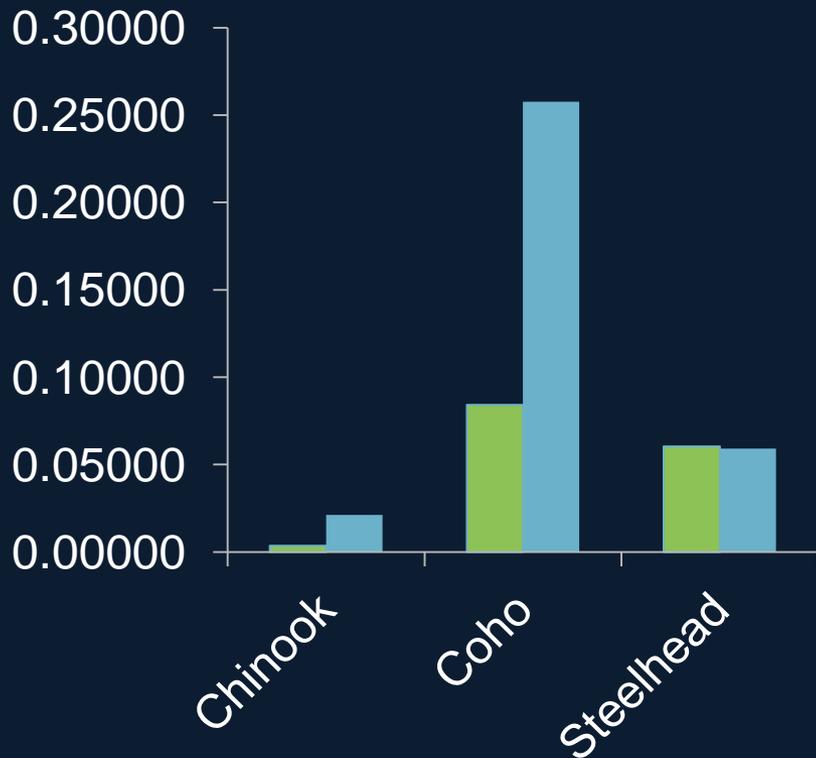
# Pool Area



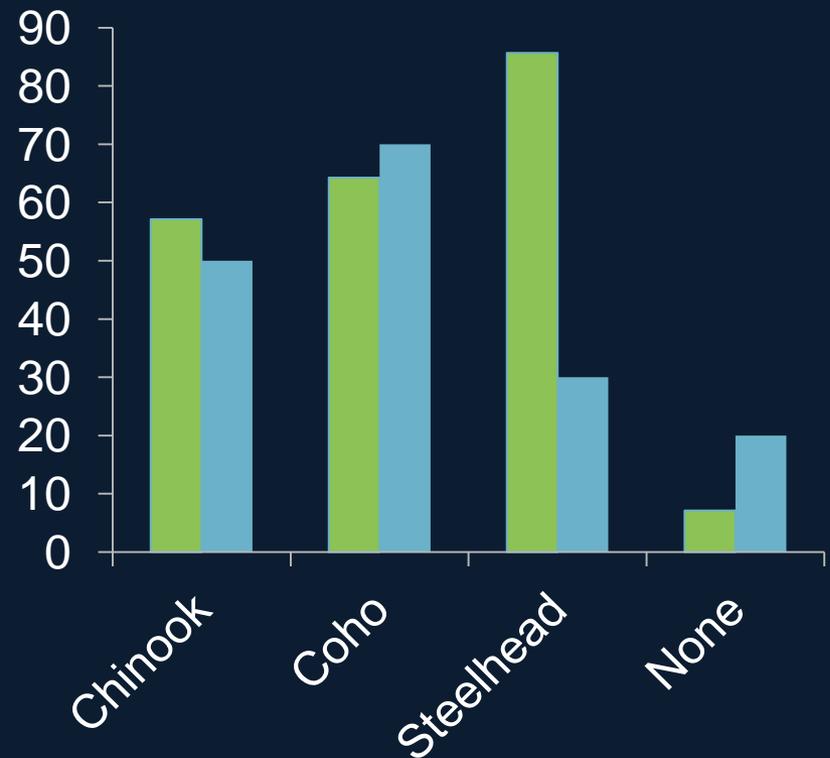
 = In-stream Habitat

 = Floodplain Enhancement

## FISH DENSITY



## PERCENT OF PROJECTS WITH SPECIES PRESENT



# Can project monitoring data be used to improve the design of future projects?

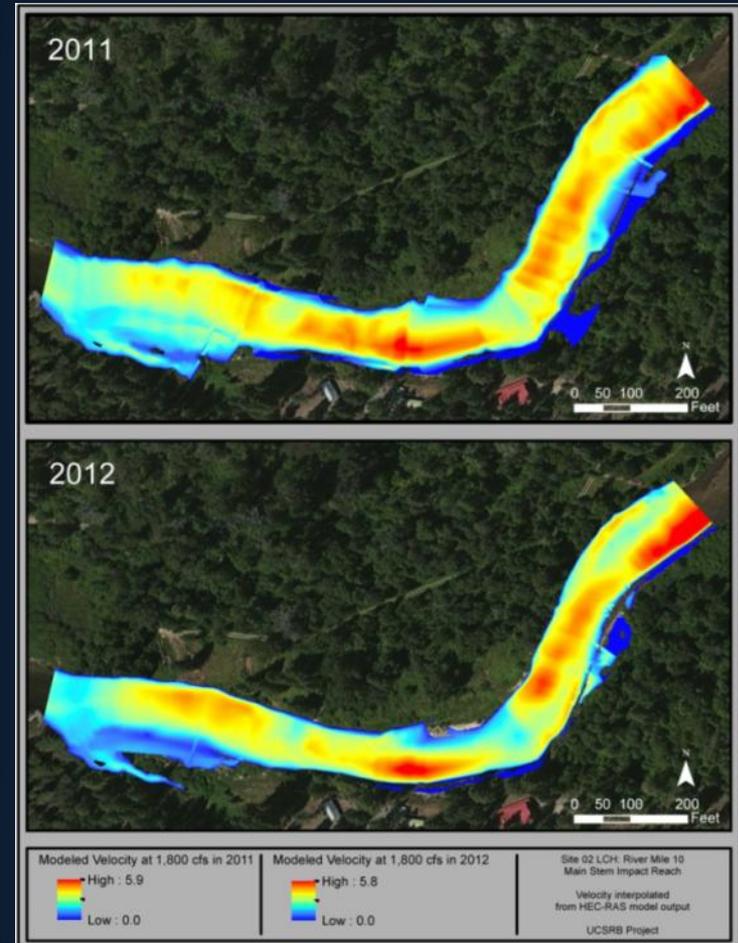
2011



# DIGITAL ELEVATION MODEL

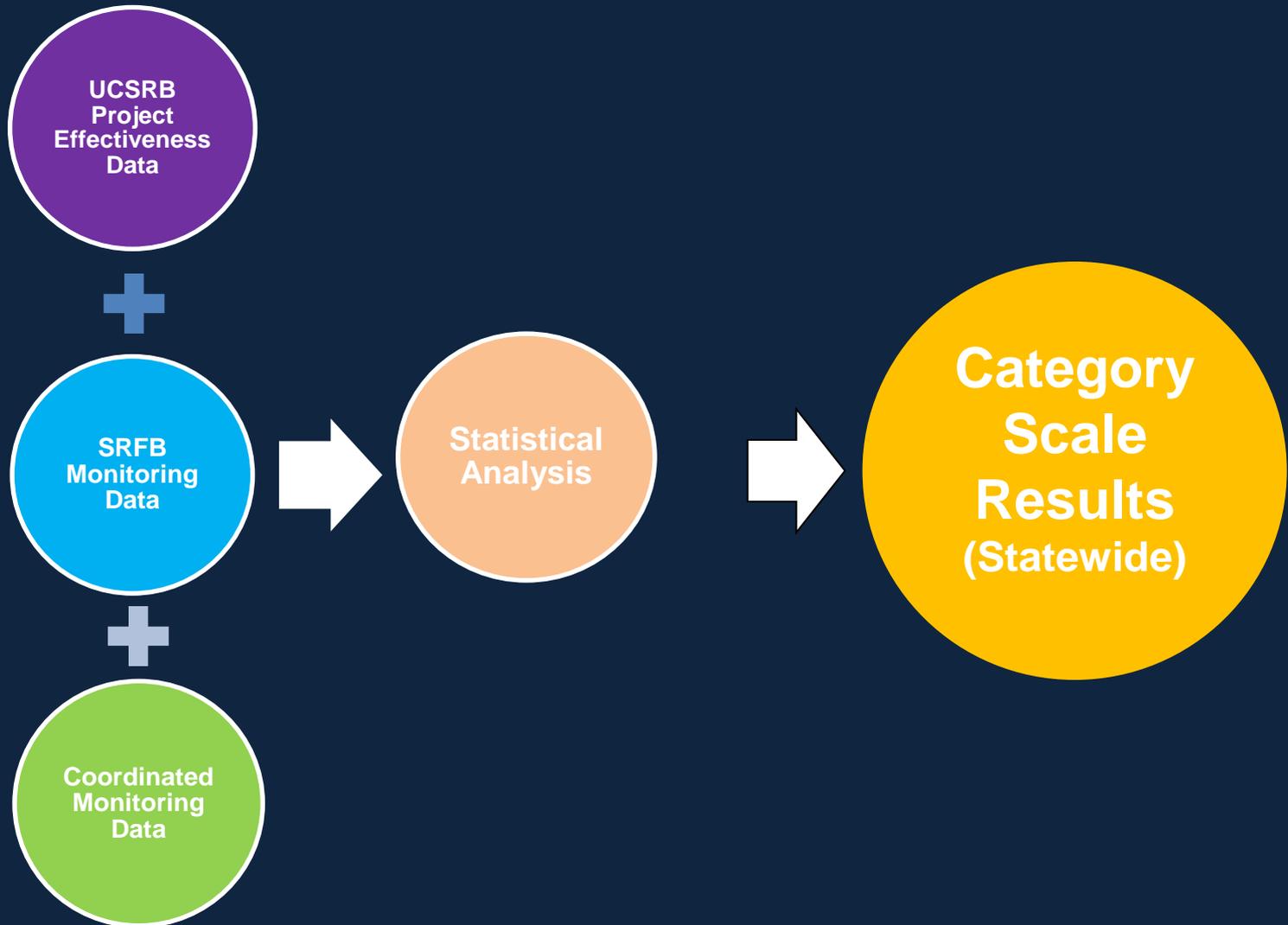


# VELOCITY MODELING



Topo survey approach integrates with CHaMP program to seamlessly share data through data crosswalk (RBT)

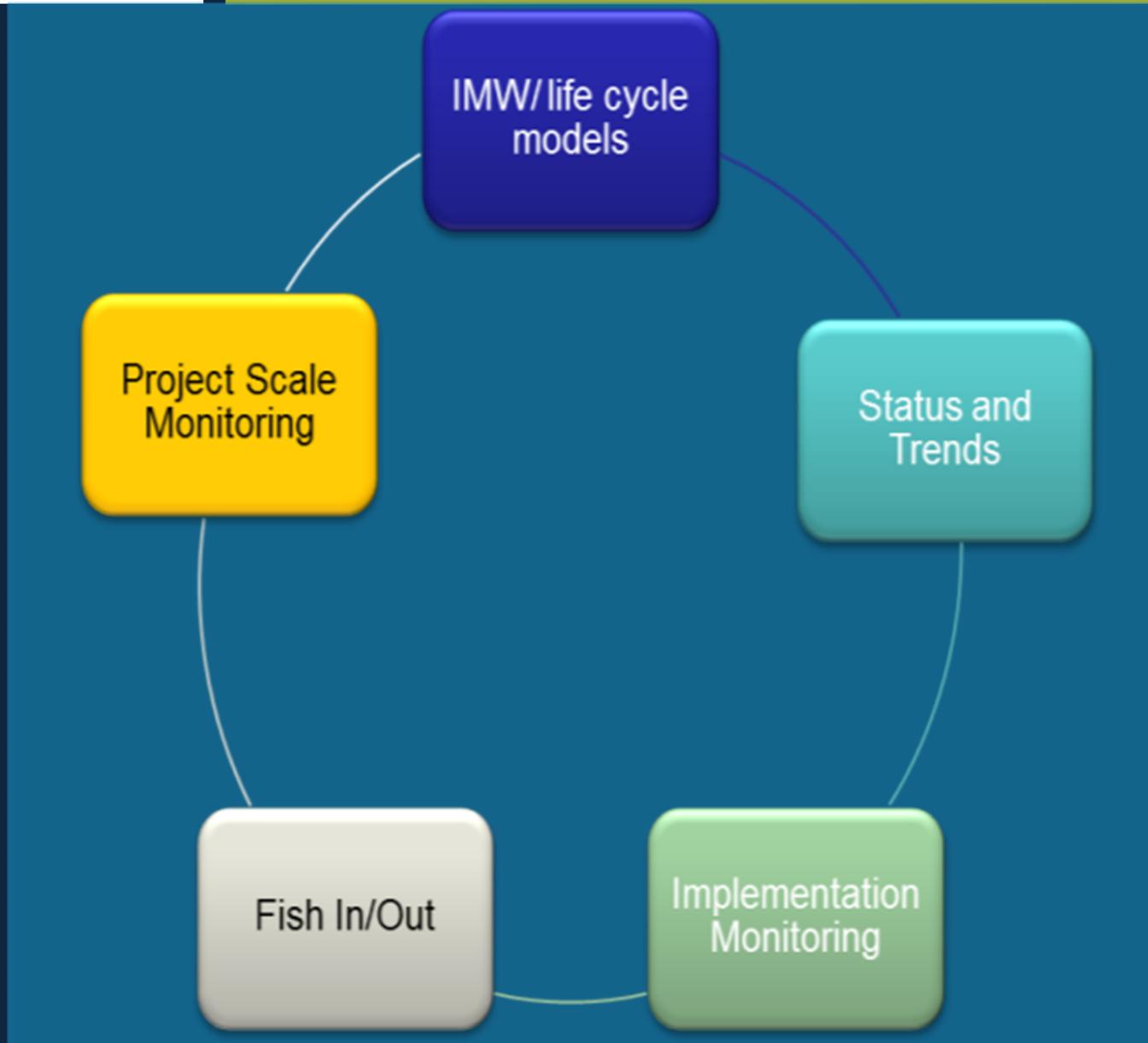
# Data Compatibility



# Summary

- Are projects effective at achieving habitat outcomes?  
**Yes**, habitat is responding (pools and backwater habitat), but further work is needed to document fish response
- Some project types are more effective for specific goals and species
- Coordinate data with project design and improve future implementation
- Partnerships – with local entities and other agencies





# Q 1: Are fish populations increasing because of our restoration actions?

- This is the BIG question as it incorporates action effectiveness monitoring, and fish in/fish out monitoring
- AND monitors habitat and intermediate fish life stages (e.g. egg, fry, parr).

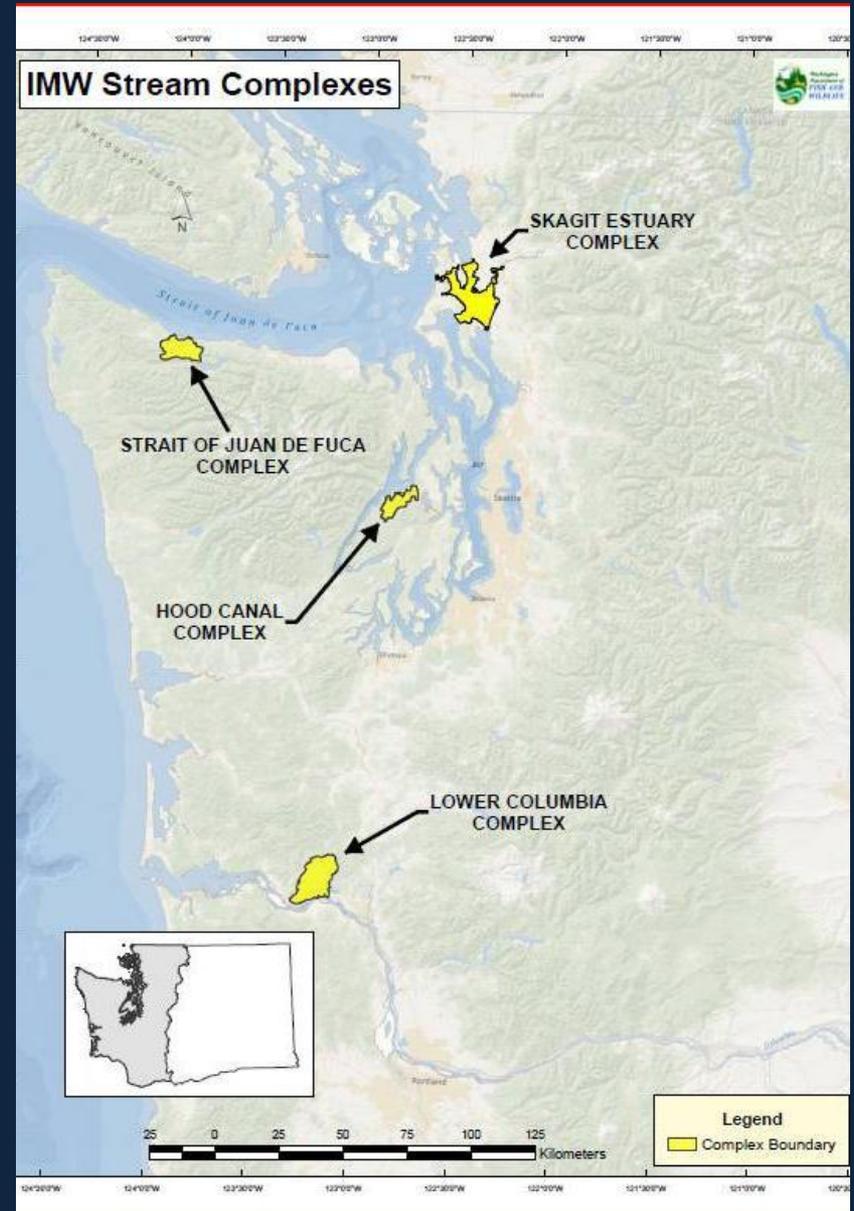
= Intensively Monitored Watersheds

# IMW – What do we do?

1. Find two matching watersheds
2. Work with Lead Entities and restore habitat
3. Monitor and answer questions along the way
  - a) Fish in/Fish out
  - b) Overwinter survival
  - c) Summer parr population
  - d) Project effectiveness (habitat /fish density)
  - e) Fish habitat
  - f) Stream flow and water quality
4. Evaluate change in habitat and fish population metrics relative to the reference stream.

# Where are the IMWs?

- Skagit Estuary
- Strait of Juan de Fuca
- Lower Columbia
- Hood Canal



# Westside IMWs

- Built on existing monitoring efforts to save time and leverage existing resources
- Leveraged existing expertise
- Broad coalition of scientists and organizations



# Lesson 1: Everybody knows that Coho leave the river in spring....

**except they don't**

Clue 1: Fish were leaving in fall at 7 months old

Clue 2: Fish leaving in fall were surviving at low rates

Clue 3: Even though they were surviving at low rate they still made up a large percentage returning spawners

Clue 4: Bigger fish survive better regardless of when they leave.

### Before IMW

- We invested in summer habitat
- We assumed that any fish leaving the stream after June died at sea

### After IMW

- Several life history strategies discovered
- Over winter habitat-More spring migrants=more spawners
- Food resources-bigger fish=more spawners

# Lesson 2 - No room at the Inn? Build more Inns in Skagit Delta.

## Before IMW

- Millions of Chinook fry move downriver in early spring

## After IMW

- When delta habitat is full, fry spill into Skagit Bay
- Low fry survival for those that don't spend time in Delta
- Focus restoration on building Delta habitat

# Lesson 3: Hood Canal

## Evidence that Restoration Works

“Early signals are that we can influence stream productivity with restoration actions”

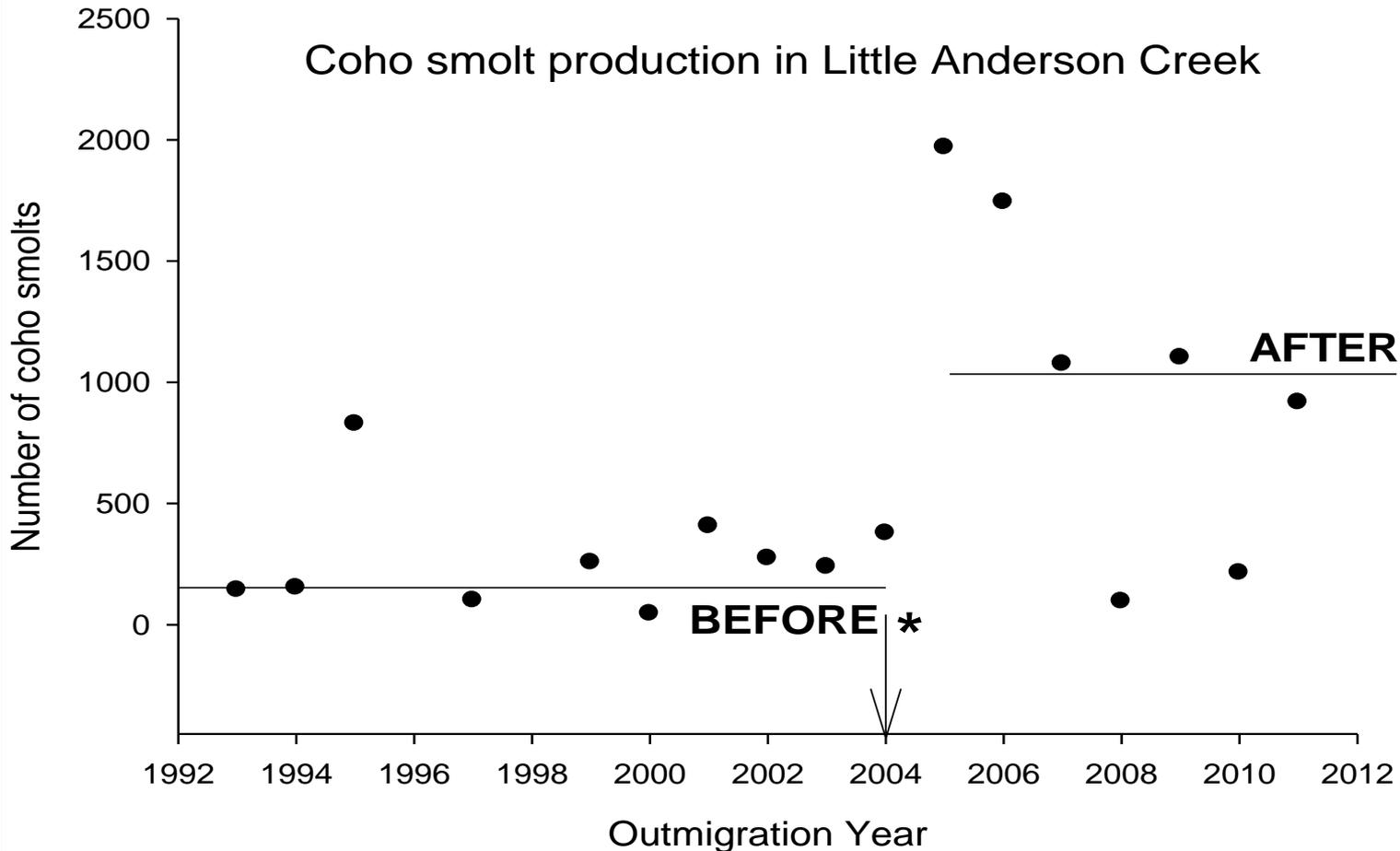
said the scientist

OR

“Our investments are beginning to pay off with more fish”  
said the policy maker

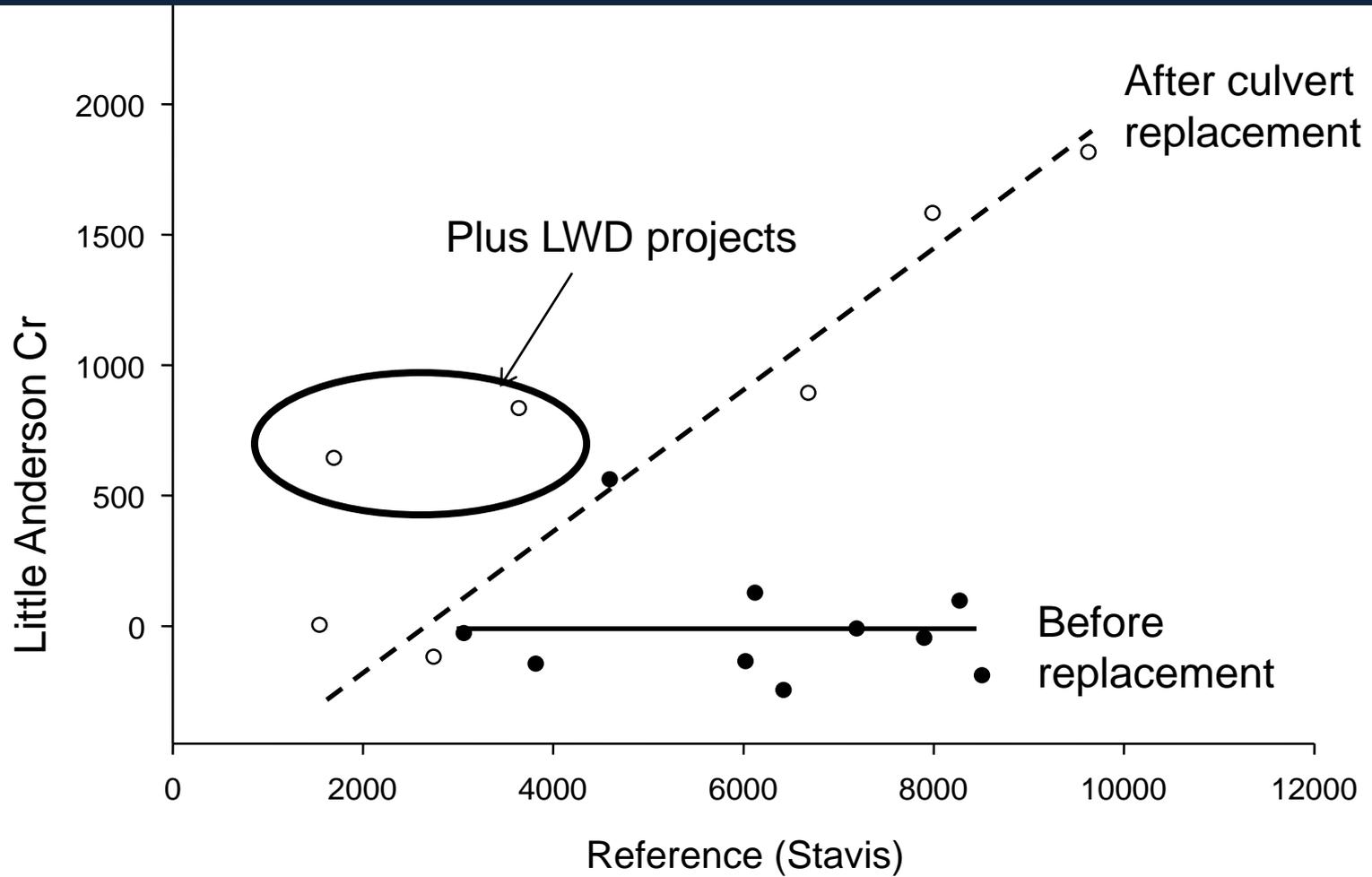
(We are beginning to answer the BIG question!)

# L. Anderson Cr-Coho smolts



\* Arrow depicts first possible smolt year to be influenced by restoration actions. Restoration actions included a culvert replacement in November 2002 and subsequent large woody debris placements in stream.

# Little Anderson-Coho smolts



# IMW – Take Home Messages

- Westside IMWs are strategic investments built on existing monitoring infrastructure using fish in /fish out
  - Allows policy makers and public to know if the investments have paid off
  - Has already allowed restoration to be more strategic
-

# SRFB-funded Monitoring Program



# Background of SRFB-funded Monitoring Program

- Early monitoring was opportunistic or ad hoc
  - (prior to Regional Recovery Plan approvals)
- State creates multi-agency Forum to set monitoring standards and general strategy (3-legged stool)
- SRFB spends 10% of federal PCSRF \$\$ on monitoring.

# Salmon Recovery Funding Board Monitoring Investment Strategy

*The question:*

*Do strategic directions that govern the SRFB investment in monitoring need updating?*

Any changes would still need to be consistent with the statutory framework for salmon recovery and the NOAA guidance for use of PCSRF funds

# COSTS and CALENDAR for SRFB

## Monitoring truncated

- |                                    |                    |
|------------------------------------|--------------------|
| • Effectiveness Monitoring         | current funding    |
| — April - April                    | \$287,000 / year   |
| • Fish In / Fish Out               |                    |
| — January through December         | \$208,000 / year   |
| • Intensively Monitored Watersheds |                    |
| — July- June                       | \$1,470,000 / year |

# Questions for contractor

- Are Project Effectiveness Monitoring, Intensively Monitored Watersheds, and Status and Trends (fish in-fish out) monitoring – the most important for the Salmon Recovery Board to fund?
- Are the funding levels for monitoring at appropriate levels?
- How should SRFB address priorities in the regional salmon recovery plans? How can information exchange from Board-funded monitoring be improved?
- How does the Board monitoring fit into related monitoring being done by federal (and other) agencies?

# Status Monitoring Investment Strategy Status (as of 7/10/13)

- Final Report with recommendations will to be presented to the Salmon Recovery Funding Board, October 16/17 2013, by Stillwater Sciences
- Salmon Recovery Funding Board reviews recommendations in December with planned implementation in 2014.

# Opportunities

SRFB funds other monitoring through workgroup selection for regional concerns (eg.) : WDFW land use analysis; Implementation Assessment; DIDSON device for Makah; Disparate data comparison, estuarine/ nearshore metrics et.al.

Opportunities for economies of scale and leveraging or providing “match” through Partnerships. i.e.:

- Tribes
- PSMFC
- BPA/ NWPCC
- Puget Sound Partnership
- OWEB
- others

# Partnerships

- Getting more out of existing data sets

- Cooperative funding with other agencies



**Bonneville Power Administration**  
**Environment, Fish and Wildlife**

Protocols integrate with other monitoring programs (e.g. Asotin, Tucannon)

- WDFW
- WDOE
- [data.wa.gov](http://data.wa.gov)

# Questions?



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