BPA Action Effectiveness Monitoring

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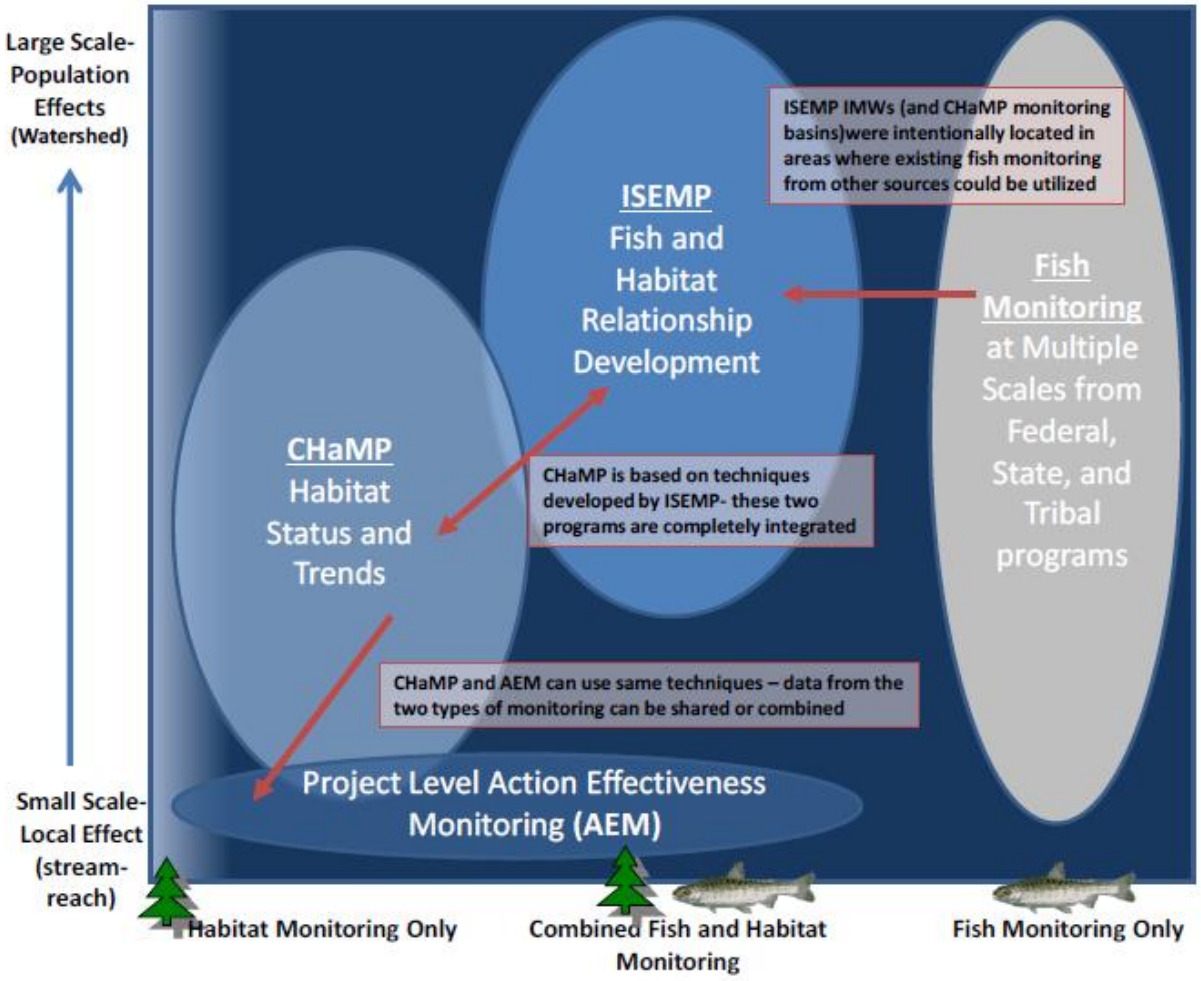
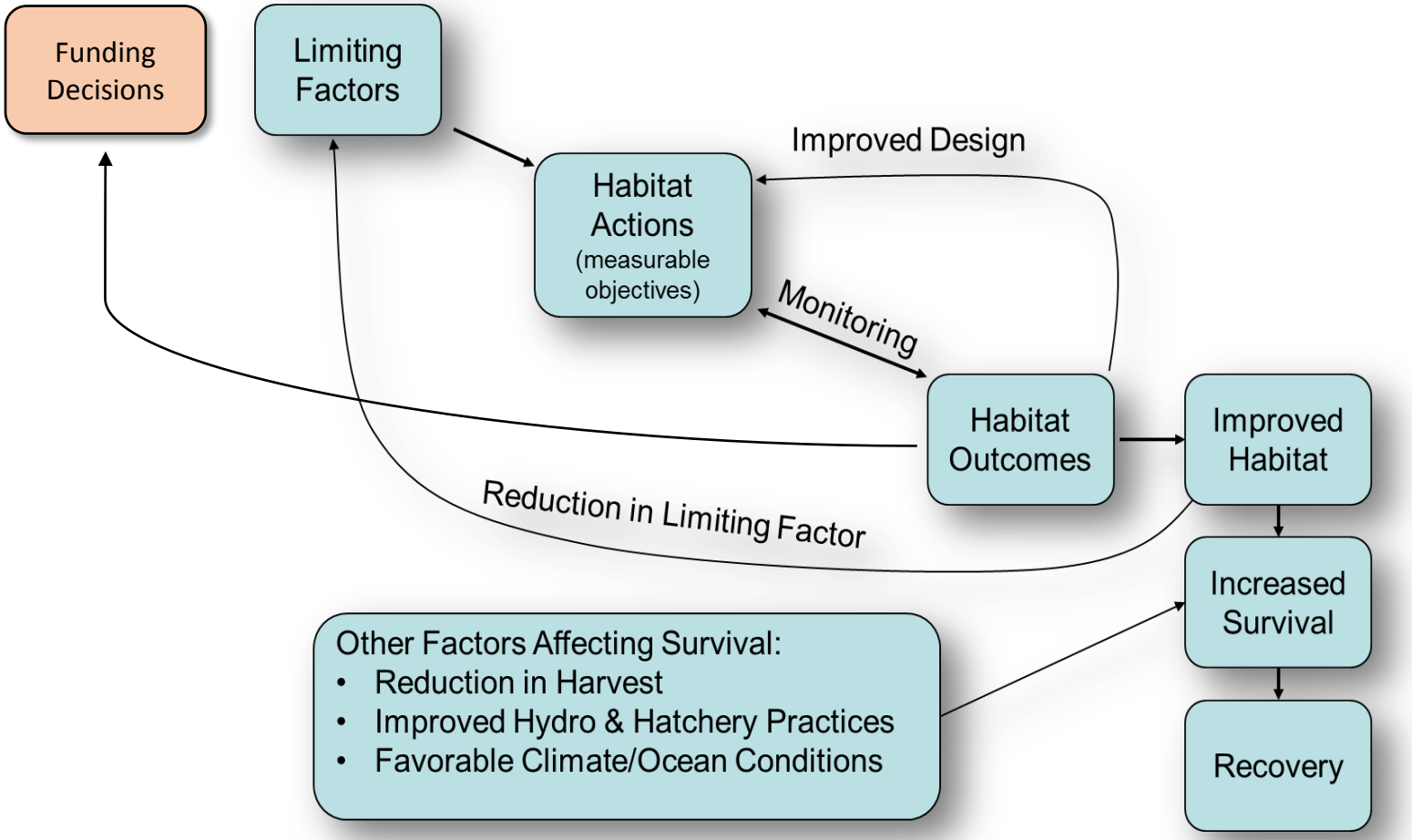
June 1, 2015

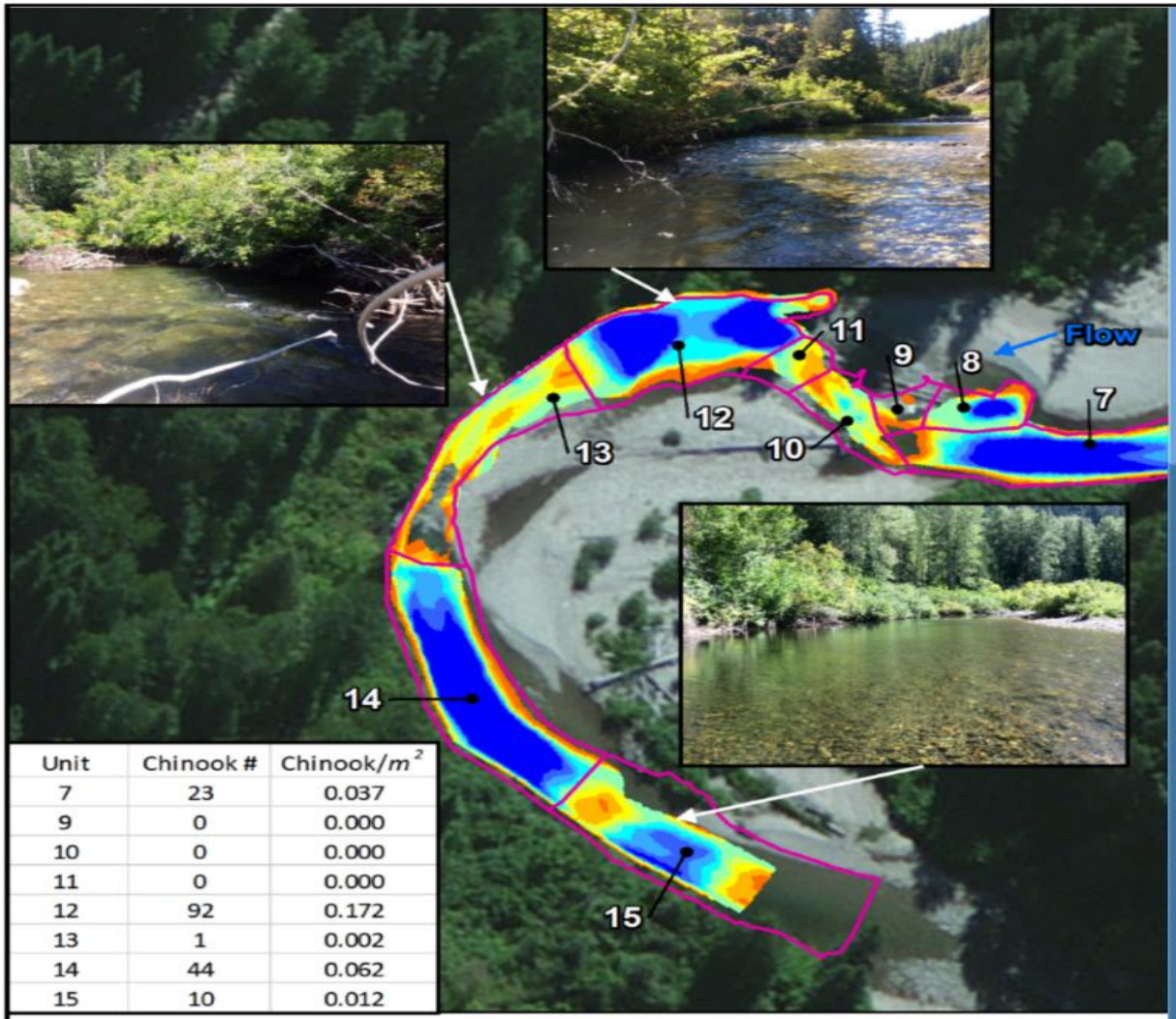

Large Scale-Population Effects (Watershed)
ISEMP IMWs (and CHaMP monitoring basins)were intentionally located in areas where existing fish monitoring from other sources could be utilized
ISEMP
Fish and Habitat Relationship Development
Fish Monitoring at Multiple Scales from Federal, State, and Tribal programs
CHaMP
Habitat Status and Trends
CHaMP is based on techniques developed by ISEMP- these two programs are completely integrated
CHaMP and AEM can use same techniques – data from the two types of monitoring can be shared or combined
Project Level Action Effectiveness Monitoring (AEM)
Small Scale-Local Effect (stream-reach)
Habitat Monitoring Only
Combined Fish and Habitat Monitoring
Fish Monitoring Only

How is Action Effectiveness monitoring information used in salmon recovery?



UPPER WHITE PINE RIVER CONTROL REACH

REARING HABITAT RESULTS COMPARISON



Unit	Chinook #	Chinook/m^2
7	23	0.037
9	0	0.000
10	0	0.000
11	0	0.000
12	92	0.172
13	1	0.002
14	44	0.062
15	10	0.012

Habitat Suitability Index (HSI)

- 0.01 - 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0

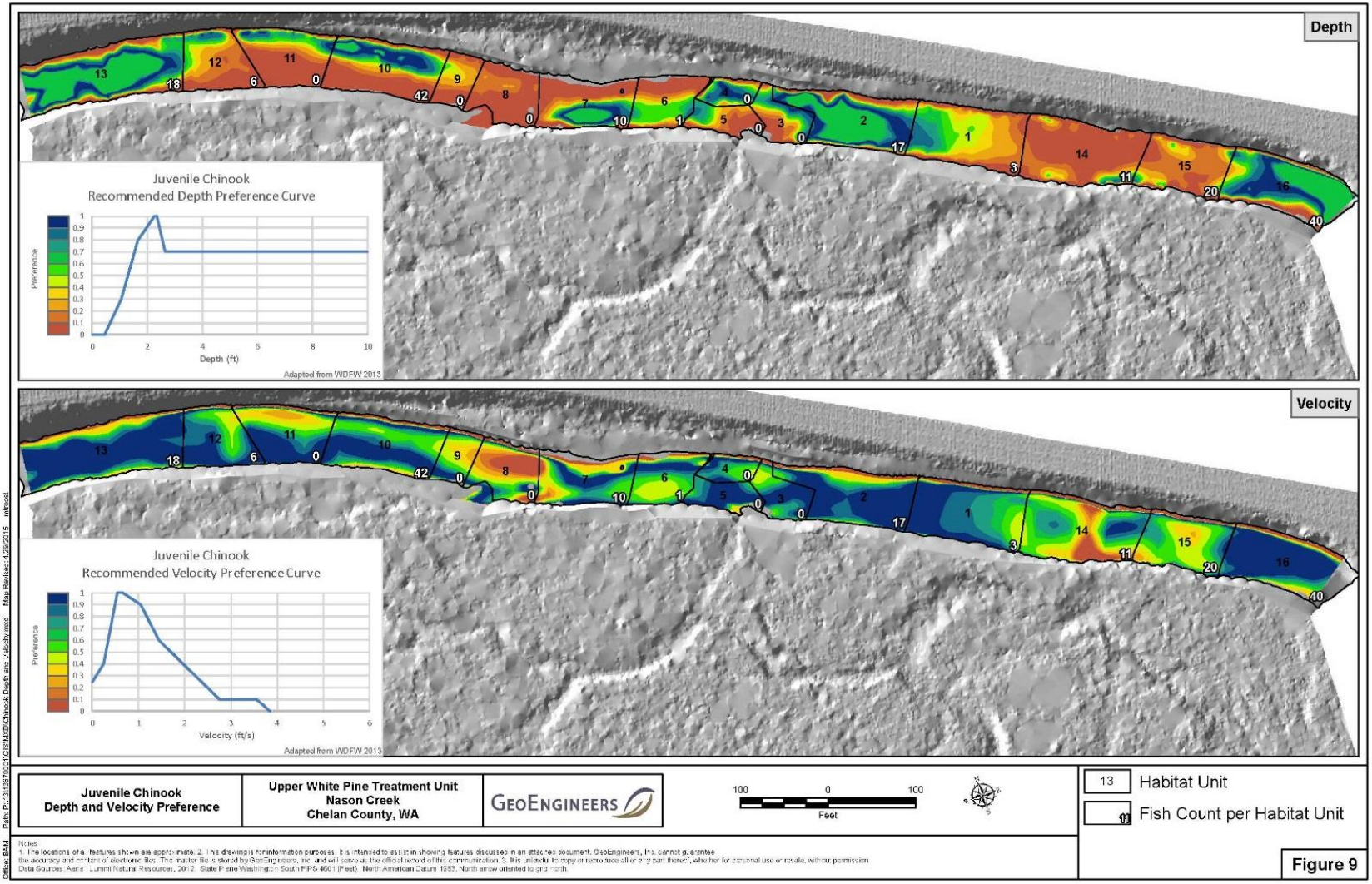
0 25 50
Meters

Snorkel survey data by channel units were used to compare observed Chinook density with the habitat suitability model.

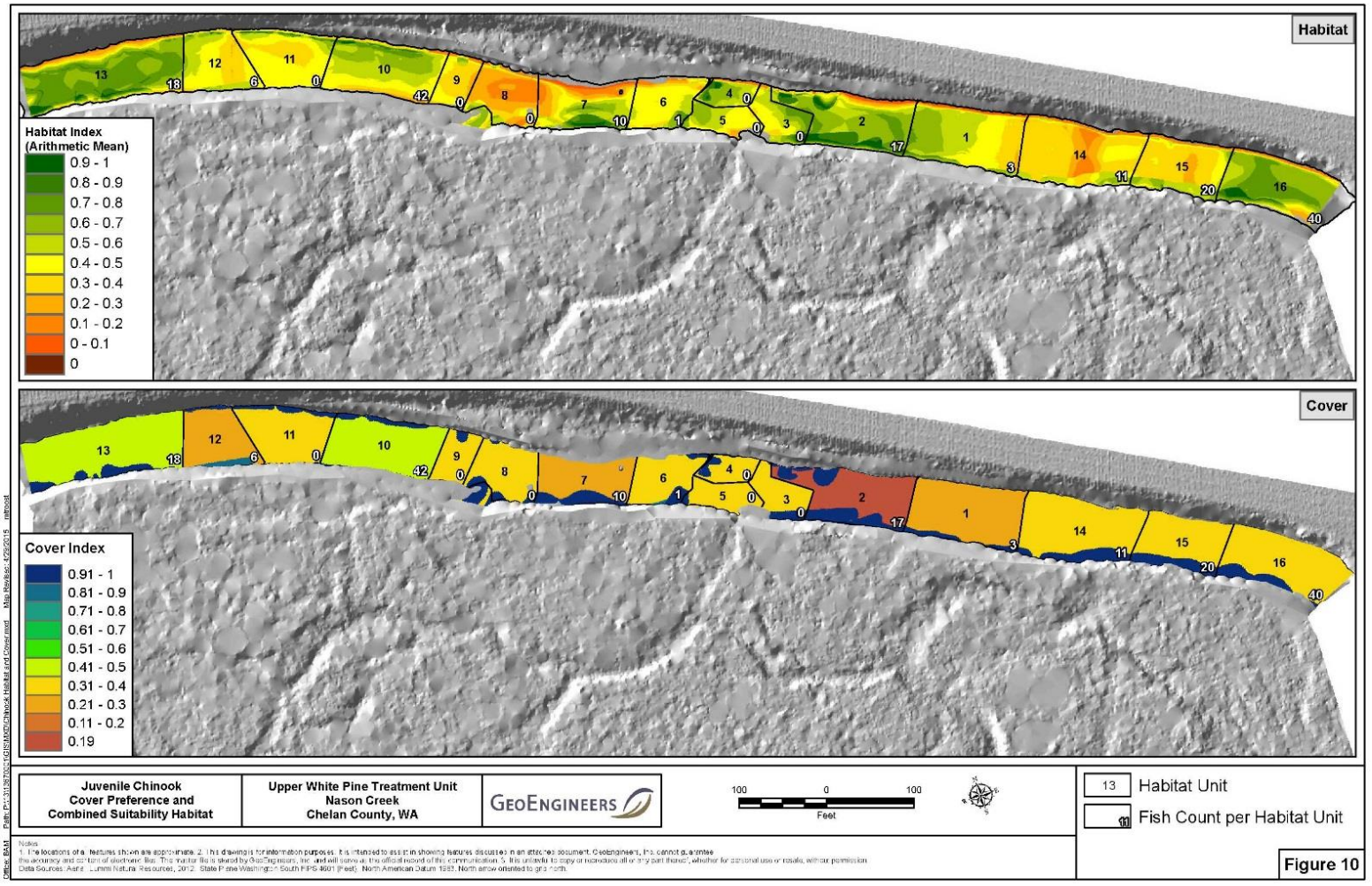
The rearing habitat model results were in general agreement with the snorkel survey data. Channel Units that were dominated by high HSI for rearing habitat also had relatively high observed Chinook juvenile numbers during snorkel surveys.

The inset site photos show habitat conditions in channel units with relatively high (unit 15 and unit 12) and low Chinook density (unit 13).

2-D Output

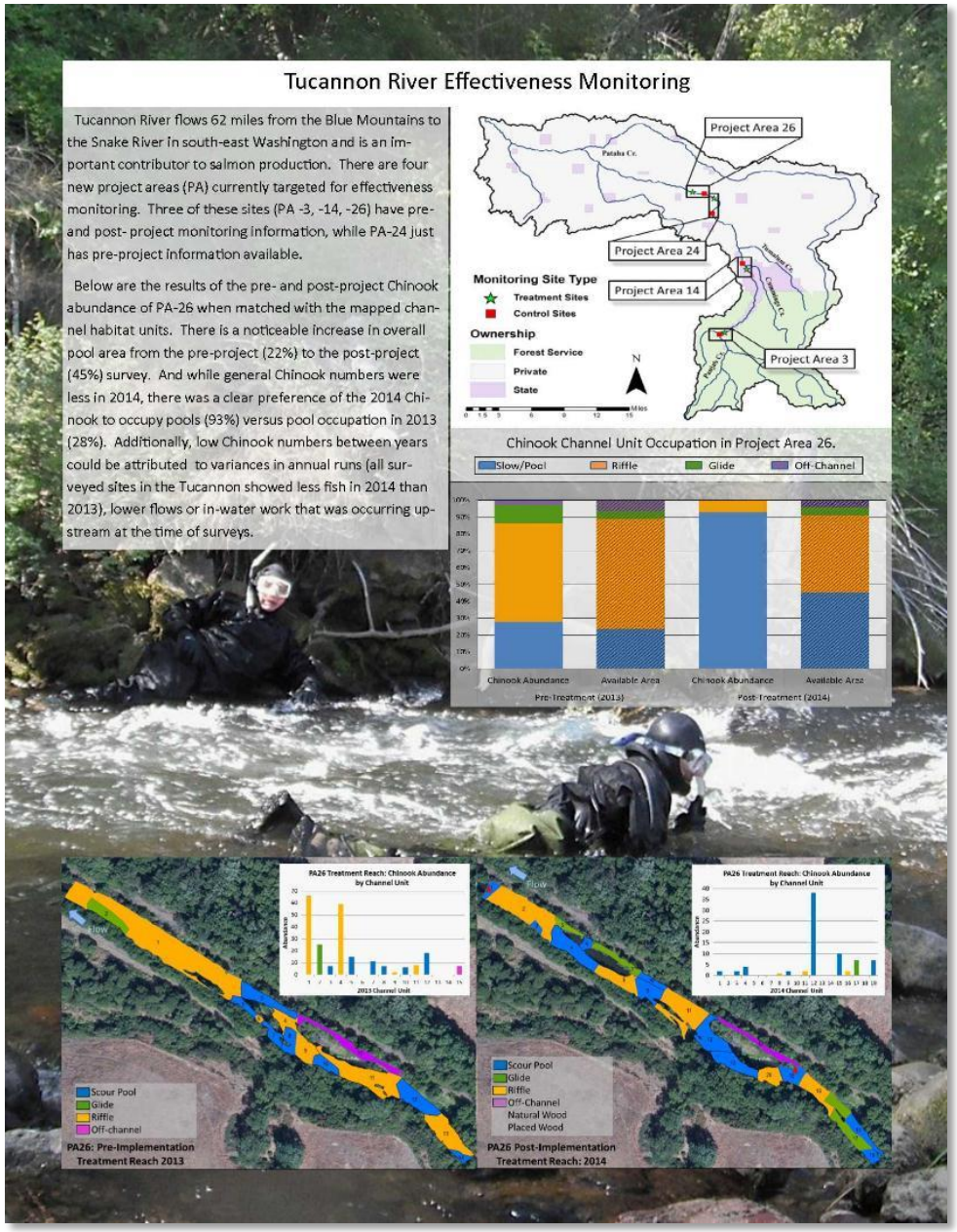

Depth
Juvenile Chinook
Recommended Depth Preference Curve
Preference
Depth (ft)
Adapted from WDFW 2013
Velocity
Juvenile Chinook
Recommended Velocity Preference Curve
Preference
Velocity (ft/s)
Adapted from WDFW 2013
Juvenile Chinook
Depth and Velocity Preference
Upper White Pine Treatment Unit
Nason Creek
Chelan County, WA
GeoEngineers
100 0 100
Feet
13 Habitat Unit
Fish Count per Habitat Unit
Figure 9

2-D Habitat Suitability



Vetting predictive models…

- **Monitoring Partners:**
  - SRFB
  - Umatilla Tribe
  - Snake River Salmon Recovery Board
  - EcoLogical Research
- **Coordinated data collection effort for physical and biological data**
- **Project responses show increase in pool habitat and Chinook use relative to a control**



AEM Program Overview

Goals

- Quantify reach-scale changes in habitat and fish abundance due to restoration
- Guide future restoration efforts to help ensure that BPA is investing in effective techniques

Study Design

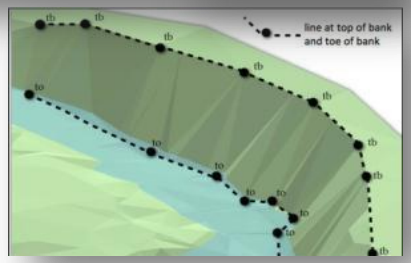
- MBACI – Multiple Before After Control Impact
- EPT – Extensive Post Treatment
- Case Study

Key Questions

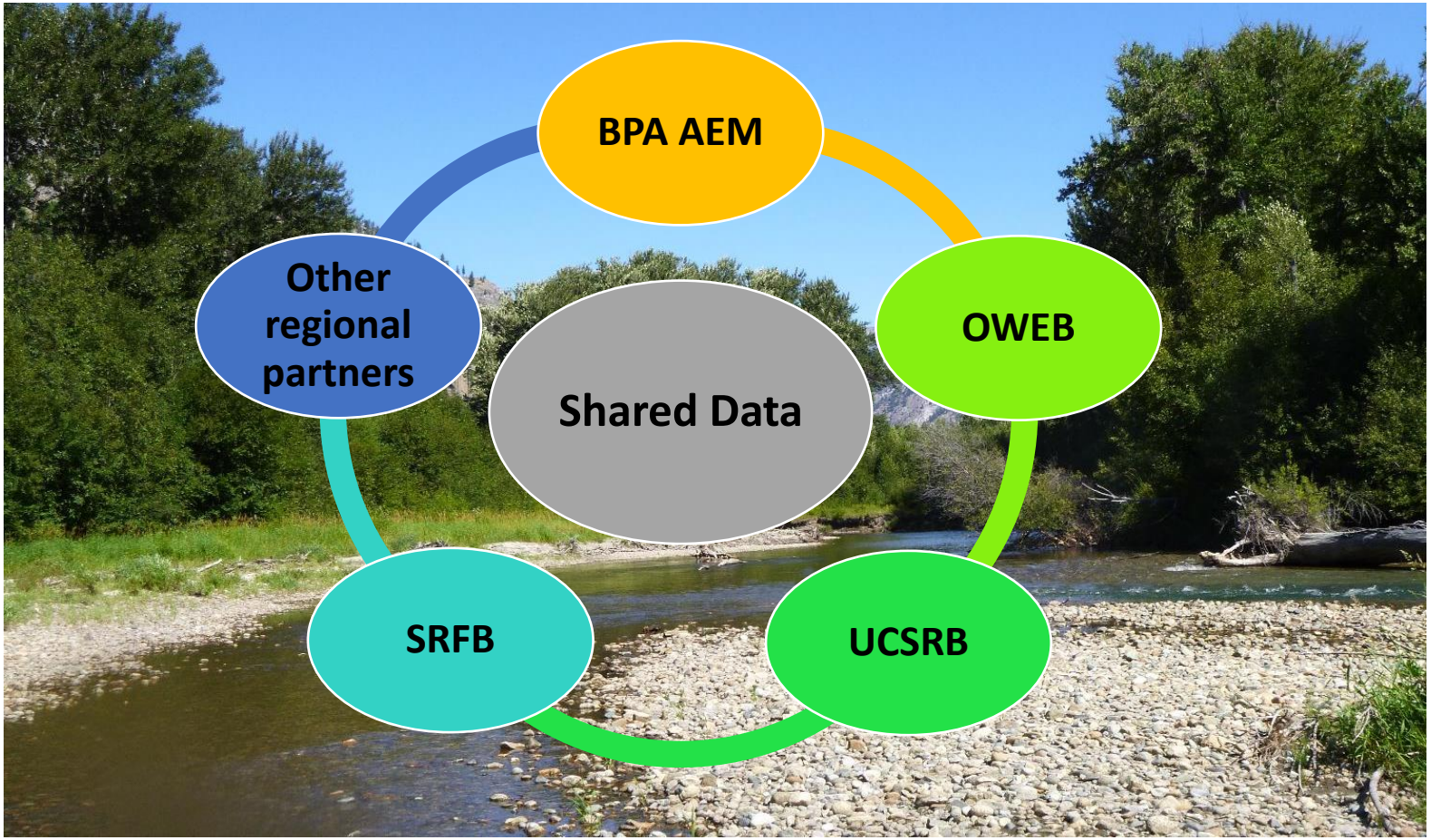
- What is the effect of action types on habitat?
- What is the effect action types on fish/biota?
- Why are some projects more successful than others?
- Are there differences in among ESUs?

AEM Coordination with CHaMP

- MBACI Protocols:
  - Partial Barriers
  - Bank Stabilization
  - Off-Channel/Floodplain Enhancement
  - Riparian Fencing
  - Habitat Protection
- Protocols are tied to project outcomes
- Some methods may apply to various monitoring categories and are in multiple protocols
  - Once a method is learned, it can easily be applied across multiple protocols
    - ➥ Enhances data sharing capabilities
    - ➥ Can compare effectiveness of different project approaches



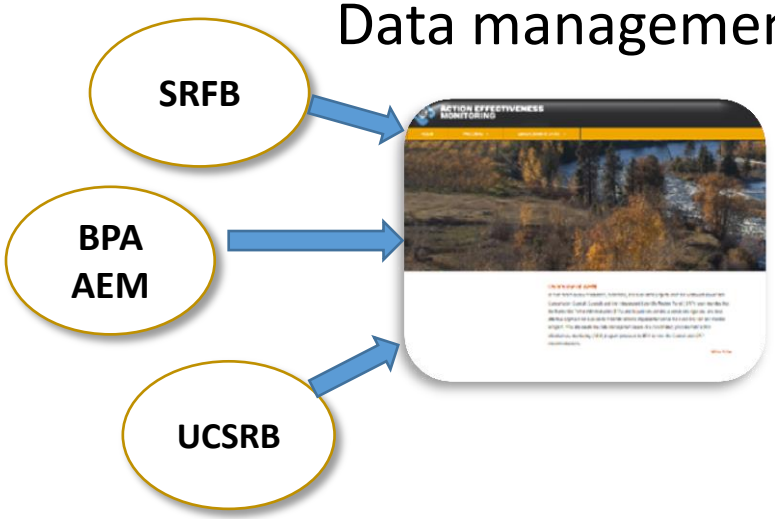
Coordination Across Programs

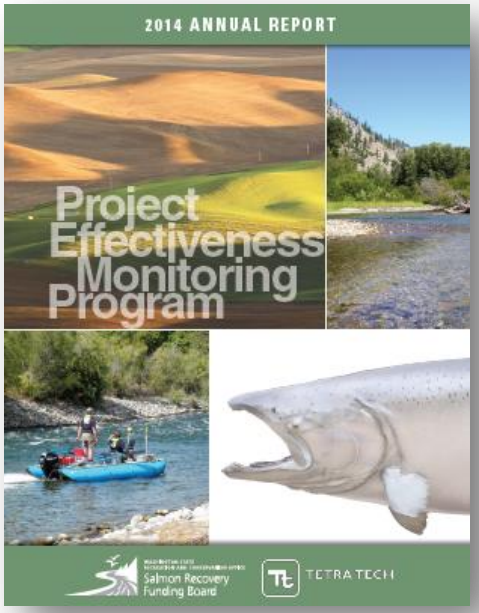


Collaborating with Monitoring Partners

Technical assistance/training

Data management

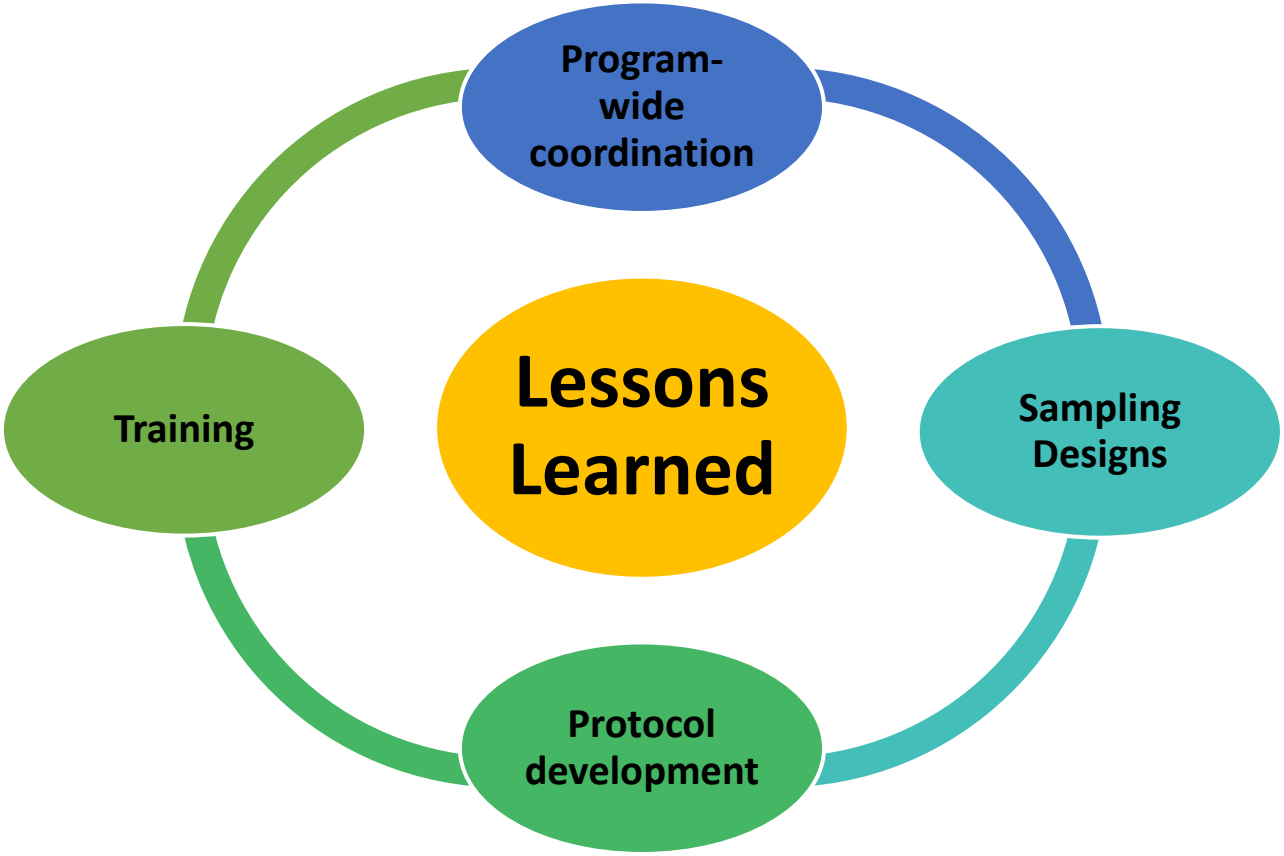




Reporting

Data collection

AEM Lessons Learned



AEM – things you need to know…

- Scope and Scale
  - What, where, and when
  - NOT EASY!
  - Two years pre-project
  - Determines protocol
  - Determines survey extent
  - Nee to talk with design team!
- Suitable Control
  - Geomorphically similar
  - Outside of project influence
  - No tribs or hatcheries that separate it from the treatment reach

AEM – more things you need to know…..

- Additional data elements collected post-project

  (e.g. placed wood locations)

- Fish timing for targeted species and life stage(s)

  May not be the best time for the habitat survey…

AEM Training June 11, 2015