Northwest **Power** and **Conservation** Council

May 9, 2023

MEMORANDUM

TO: **Fish and Wildlife Committee Members**

FROM: **Stacy Horton, Washington Policy Analyst/Biologist**

SUBJECT: **Okanogan Basin Monitoring and Evaluation Program (OBMEP): Learning from Monitoring**

BACKGROUND:

Presenter: John Arterburn, Principal Biologist, Brian Miller, Senior Biologist, and Ryan Klett, Senior Biologist for the Confederated Tribes of the Colville Reservation.

Summary: The Okanogan Basin Monitoring and Evaluation Program has developed a status and trend monitoring program that documents summer steelhead abundance and habitat changes at population, sub-watershed and reach scales and provides estimates of habitat performance as Viable Salmonid Population (VSP) criteria. Additionally, synergistic fish and habitat monitoring efforts allow for compelling narratives about the Okanogan River basin, steelhead life-histories and the role of tributary habitat in salmon and steelhead recovery.

Relevance: The Okanogan Basin Monitoring and Evaluation Program (OBMEP) project provides status and trend data for all listed anadromous fish species in the Okanogan River basin. OBMEP monitors key components of juvenile fish production, habitat condition, water quality, and adult enumeration.

The Council tracks the status and trends of focal species to provide an understanding of the benefit of projects funded through the Councils fish

and wildlife program. Information is evaluated to determine if projects are having the intended measurable benefits to fish, wildlife, and their habitats.

Background: The Council first approved the Okanogan Basin Monitoring and Evaluation Program (OBMEP BPA project number 2003-022-00) as part of the Research, Monitoring, and Evaluation Categorical Review in 2003. The project was designed to monitor and evaluate important biological, water quality, and physical habitat indicators for listed anadromous fish throughout the Okanogan River subbasin; to establish a long-term status and trend data set; and determine population scale responses from habitat restoration efforts. The ISRP noted in its most recent review of the project that,

"This long-running, successful, and adaptive project is integral to several other projects (Restore Salmon Creek Anadromous Fish 199604200, Chief Joseph Hatchery Program 2003023, Okanogan Subbasin Habitat Program 200722400, Okanogan Habitat Acquisition and Restoration 200810200, Land and Water Acquisition 200810400, Upper Columbia Programmatic Habitat 201000100, Upper Columbia Spring Chinook and Steelhead Juvenile and Adult Abundance 201003400) in the upper Columbia River basin and most are conducted by the Confederated Tribes of the Colville Reservation. One of the major strengths of the project is its data management system and publicly accessible dashboards for understanding status and trends of listed salmonids and habitat conditions in the subbasins of the Okanogan and Methow basins. The project is a major contributor to monitoring and landscape evaluation in the upper Columbia River basin."

More Info:

https://ecosystems.azurewebsites.net/hstr-okanogan/

This website is the platform for Okanogan subbasin habitat status and trend report cards.

https://ecosystems.azurewebsites.net/hstr-methow/

This website is the platform for Methow subbasin habitat status and trend report cards.

https://www.okanoganmonitoring.org/

Okanogan Basin Monitoring is the primary data sharing website of the Okanogan Basin Monitoring and Evaluation Program (OBMEP). Data from other programs operating in the Okanogan Basin are also available here, such as steelhead-related data on Omak Creek from the Broodstock, Acclimation, and Monitoring (BAM) program of Grant County PUD and habitat restoration information from the Okanogan Subbasin Habitat Implementation Program (OSHIP).

OBMEP, BAM, and OSHIP partner with ESA to develop applications for collecting, processing, and analyzing data. Therefore, this site also functions as a way for biologists and technicians from these programs to upload and edit data to a centralized database, download updates and new applications for collecting data, and view and download data for analysis. Because these programs are publicly funded, the data are made provisionally available to other agencies, Tribes, stakeholders, and the general public.

Okanogan Basin Monitoring and Evaluation Program (OBMEP)

Learning from monitoring

Presentation to the NPCC

May 16, 2023

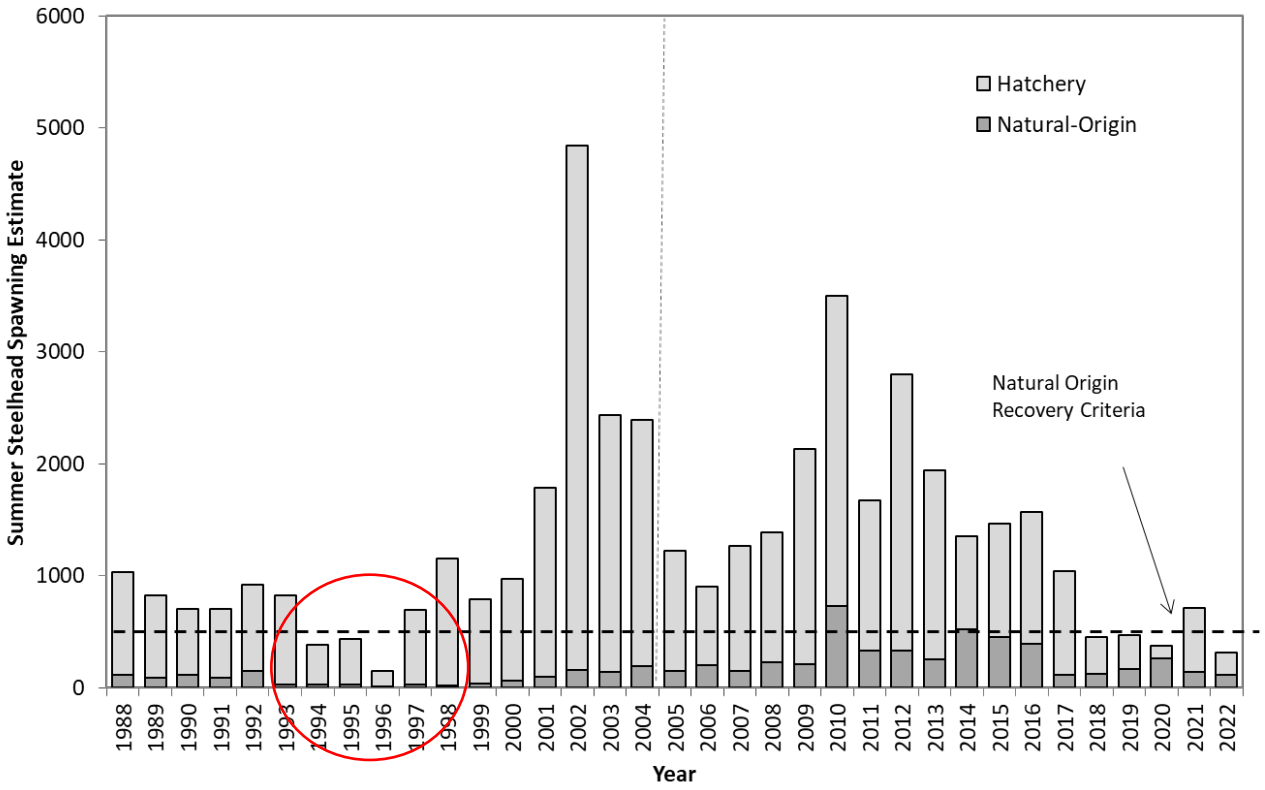
Presented by John Arterburn,
Brian Miller and Ryan Klett

Okanogan/Okanagan Watershed

The Okanogan is:

- A large international subbasin,
- The current northern most extent of anadromous fish in the Columbia River basin,
- Characterized as low gradient and highly productive

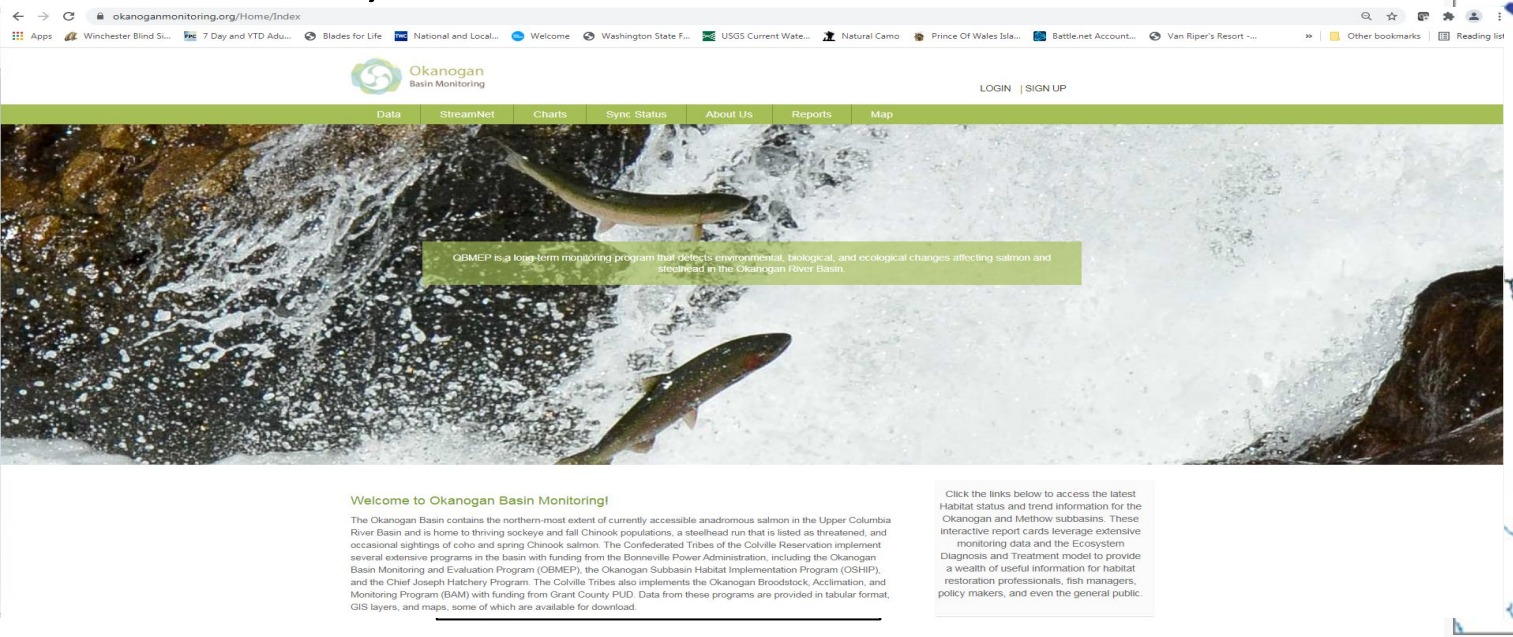
History of Okanogan summer steelhead

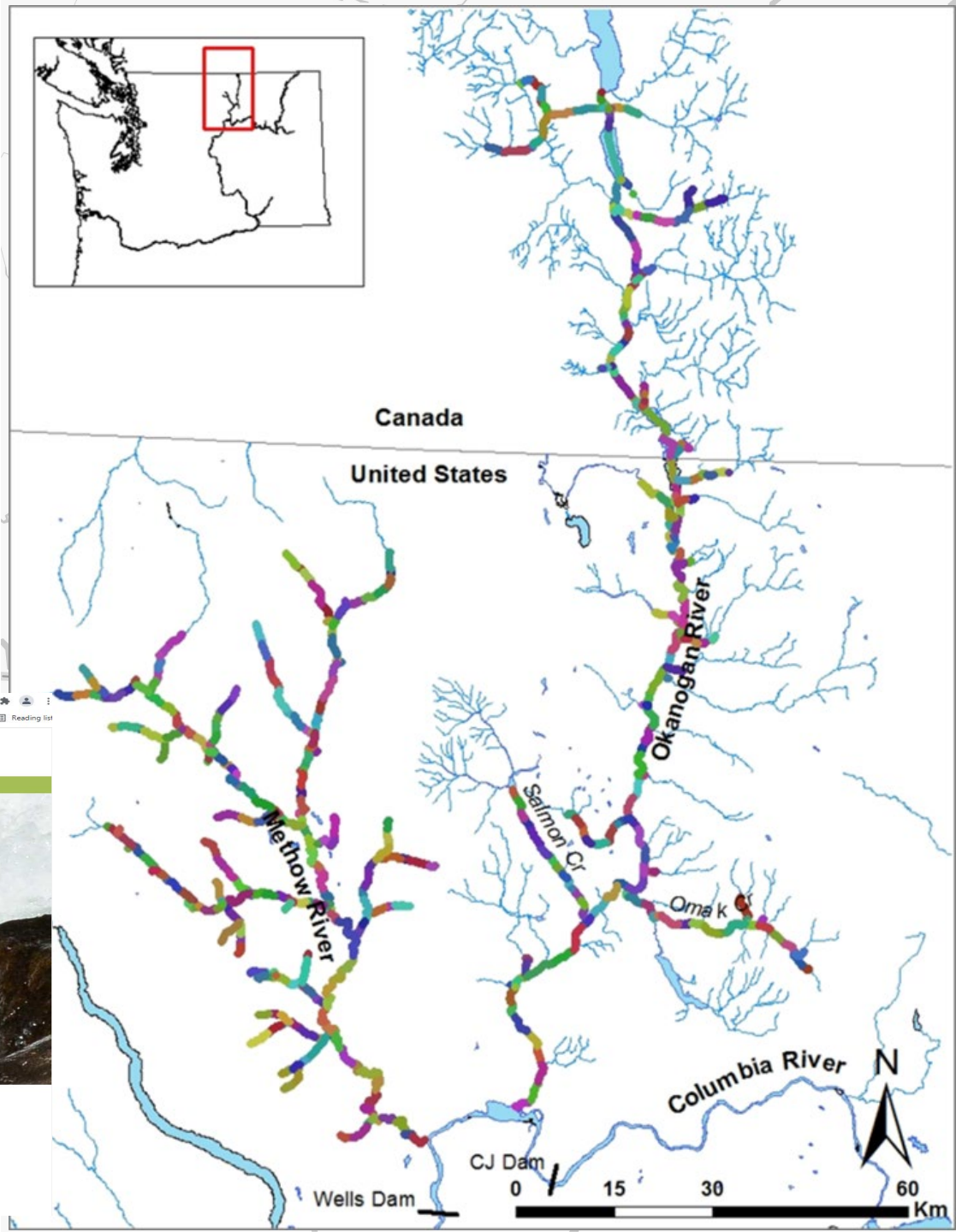


- In the early 1990's wild steelhead returns averaged around 20.
- Upper Columbia steelhead (listed as endangered on August 18, 1997; reclassified as threatened on January 5, 2006; and as a result of a legal challenge, reinstated to endangered status on June 13, 2007)
- Okanogan deemed essential for recovery.

OBMEP Goals

- *To monitor the status and trend of listed salmonids in the Okanogan Subbasin and salmonid habitat in the Okanogan/Methow Subbasins*
  - Document changes in adult/Juvenile VSP
  - Document changes in habitat
  - Secure, summarize and share data





Historic Background

- In 2004, OBMEP proposal was funded.
- In 2008, Placed into Colville Accord portfolio.

Before OBMEP

- Subbasin plan identified a lack of data as primary limiting factor.
- Habitat implementation guided by willing landowners.
- Adult returns determined by Wells dam counts with set percentage to subbasins (Okanogan and Methow)

Today

- Arguably the most data rich subbasin in the Upper Columbia.
- Habitat actions informed and prioritized by OBMEP data.
- Recovery metrics for Okanogan provided to action agencies by OBMEP down to subwatershed scale.

Unique approaches to steelhead monitoring

Standard Approach

- 2003-2013 Fish in/ Fish out monitoring.
  - Primary focus on population monitoring
  - Redd surveys and weir traps
  - Rotary screw traps
- 2013-Present
  - Primary focus on population monitoring
  - PIT-tag escapement estimates
  - Rotary screw traps

OBMEP

- Traditional Fish in/Fish out monitoring had mixed results
  - Redd surveys/weirs/video-low visibility in many years.
  - Rotary screw trap-Poor results
- Changed to juvenile monitoring
  - Rotary screw trapping ended in 2013.
    - Limited catch caused confidence intervals to be greater than the mean.
  - Replaced snorkel surveys with electrofishing MR in subwatersheds
- Adult monitoring
  - PIT-tag escapement estimates at each subwatershed
  - Results summed to produce population estimate.

Unique approaches to habitat monitoring

Standard Approach

- 2004-2010 ISEMP S&T Habitat monitoring
  - Transect based randomized probabilistic sampling
- 2011-2018 CHaMP design
  - Primarily focused on researching how to monitor habitats.
- Today, primarily focused on implementation monitoring of Biop metrics
  - Number of miles of stream impacted
  - Number of widgets placed on landscape
  - No clear relationship to fish recovery

OBMEP

- Design and data collection similar To ISEMP
  - Data management and analysis defined apriori using EDT model
- Continued S&T monitoring
  - Shift to reach based continuous sampling.
- Continues S&T monitoring
  - Increased use of rapid assessment and remote sensing to increase data quality and cost efficiencies.
  - Provides fish VSP metrics related to habitat change over time.

OBMEP – Fish Population Monitoring

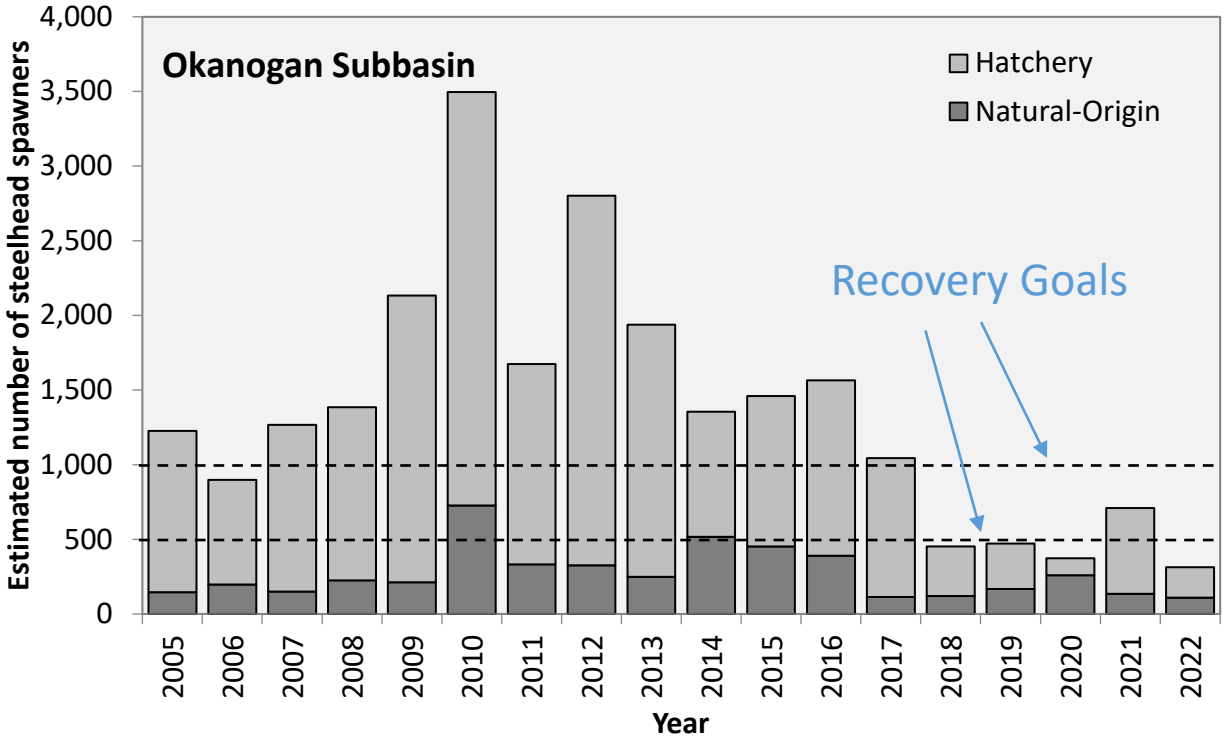
Adult Spawning Estimates

Juvenile Salmonid Monitoring

Steelhead Spawning Estimates

- 2005-Present (19 years)
- Determine spawning estimates at the reach/tributary scale
  - Redd surveys
    - Expand redds by # fish per redd
  - PIT tag expansions
    - 2010-034-00
- Sum all estimates for a subbasin wide

Trend in Steelhead Spawners



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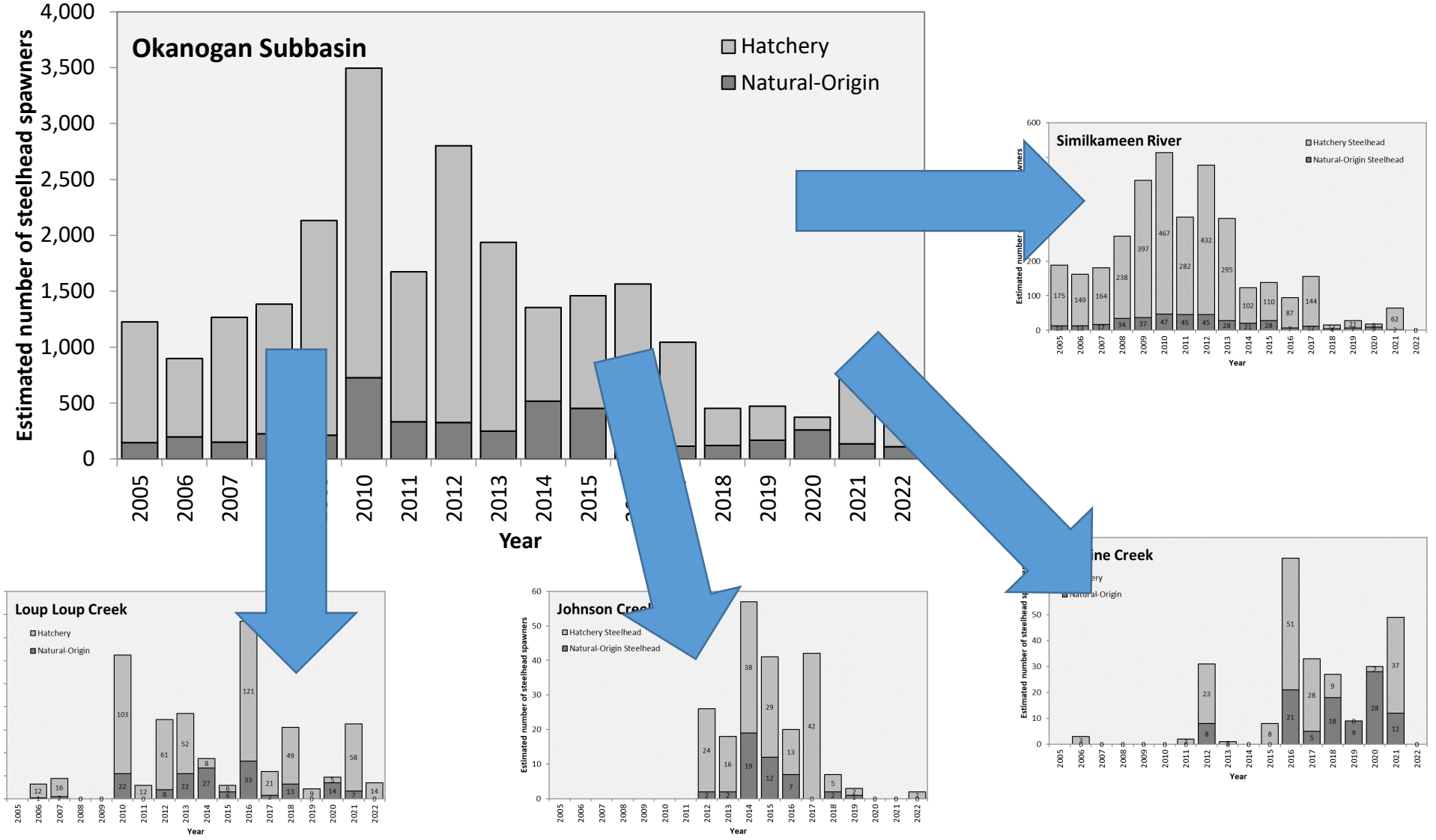

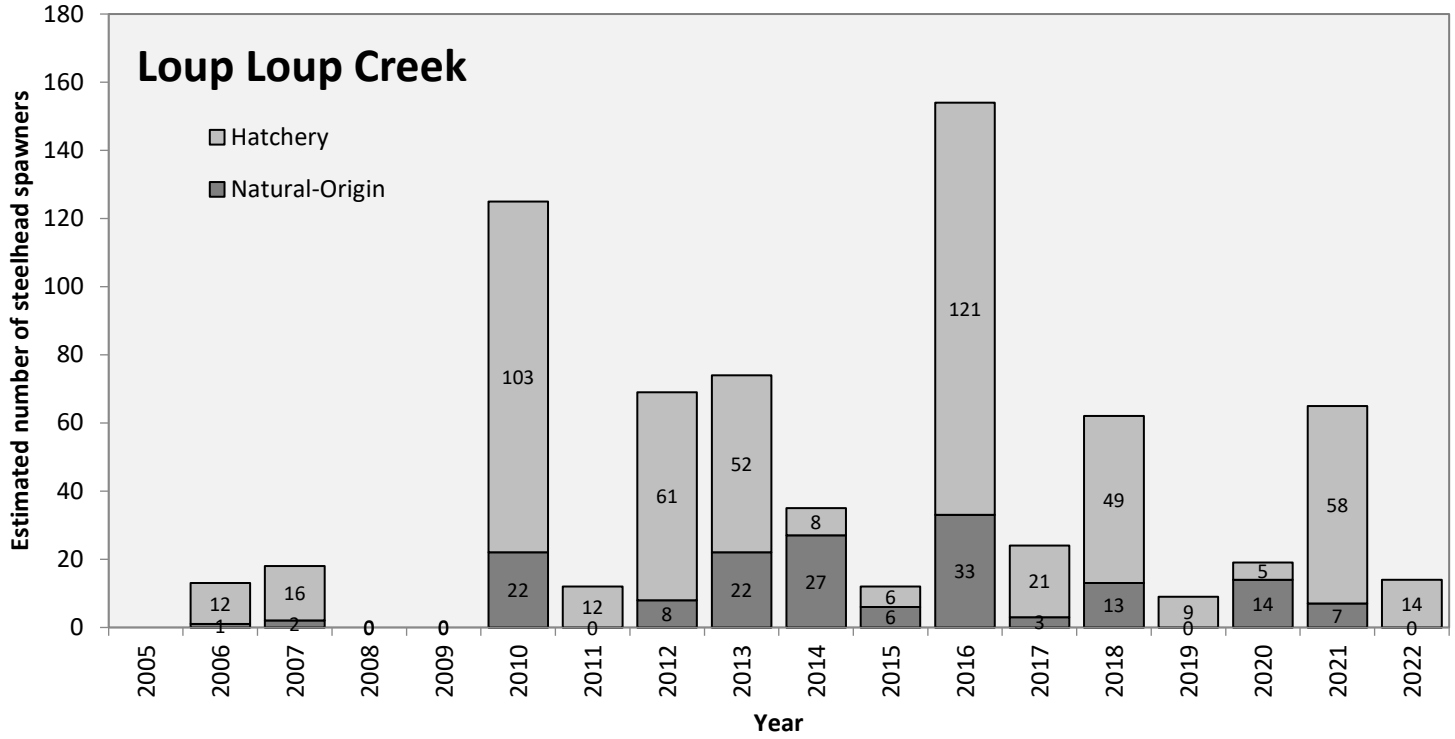
Loup Loup Creek
Hatchery
Natural-Origin
Estimated number of steelhead spawners
Year
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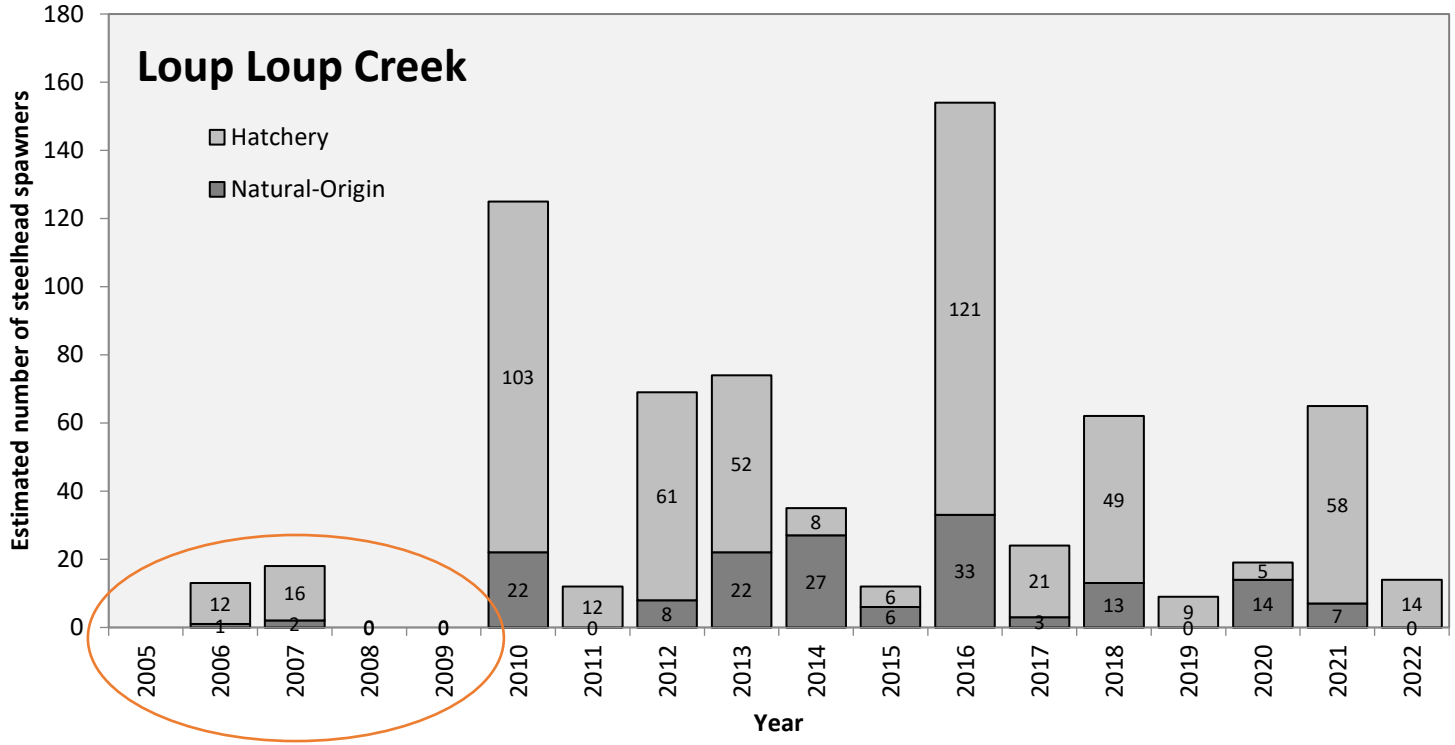
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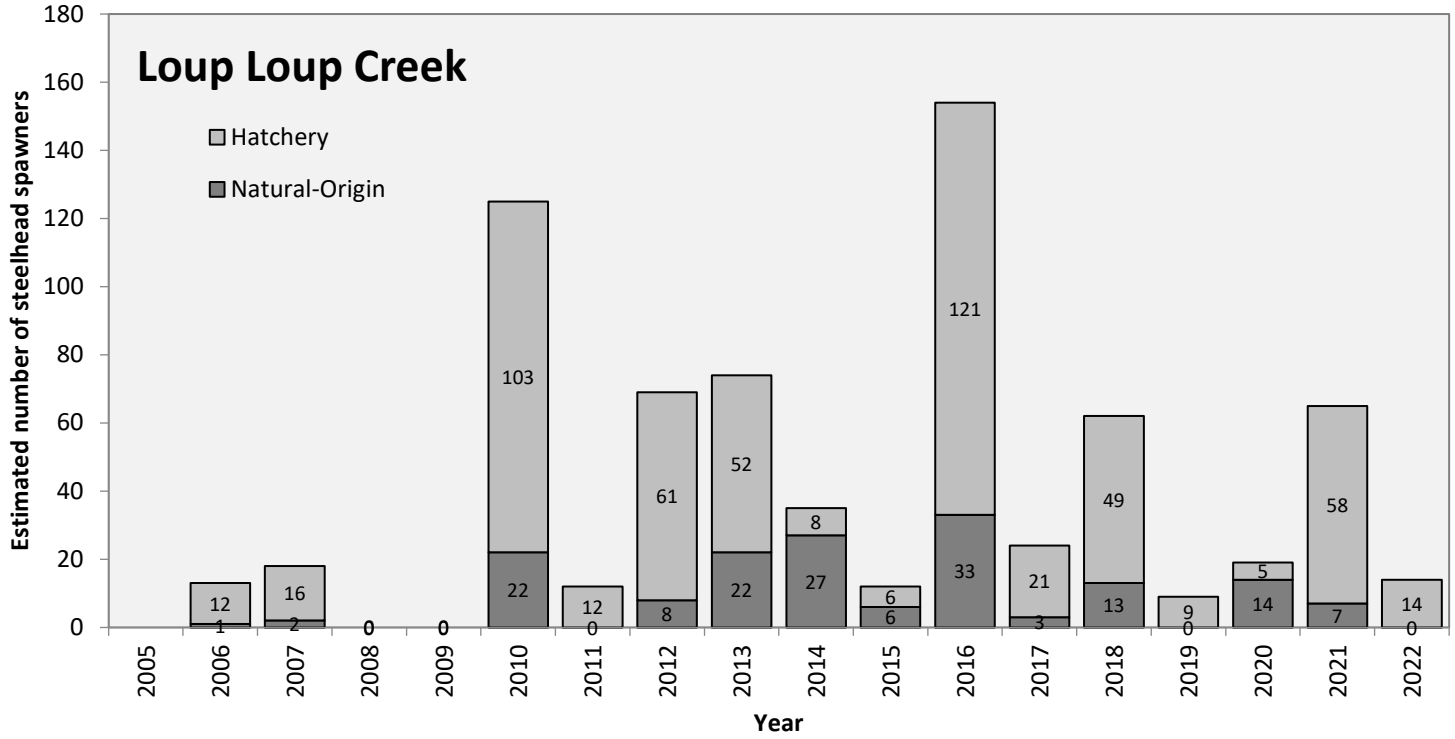
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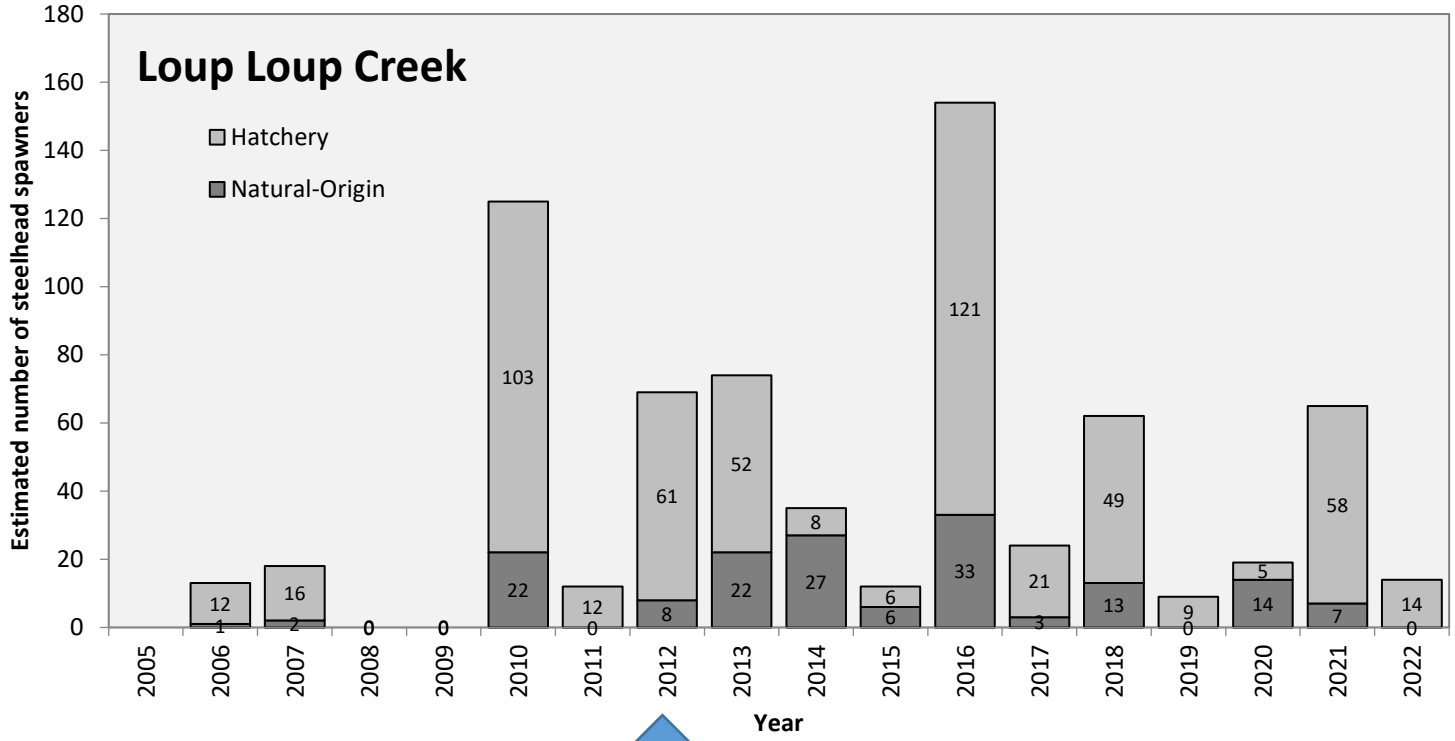
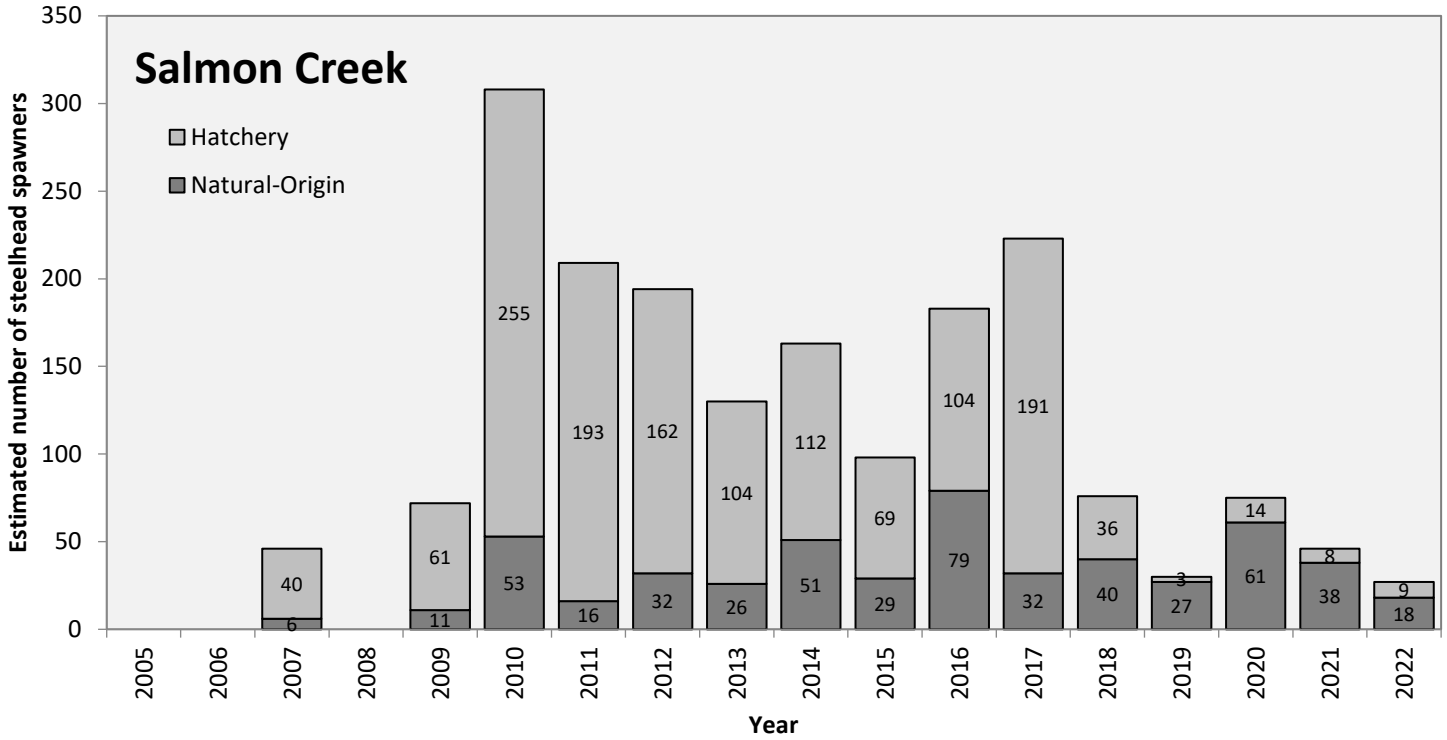


Bridge replacement and instream flow addressed


Salmon Creek
Hatchery
Natural-Origin
Estimated number of steelhead spawners
Year
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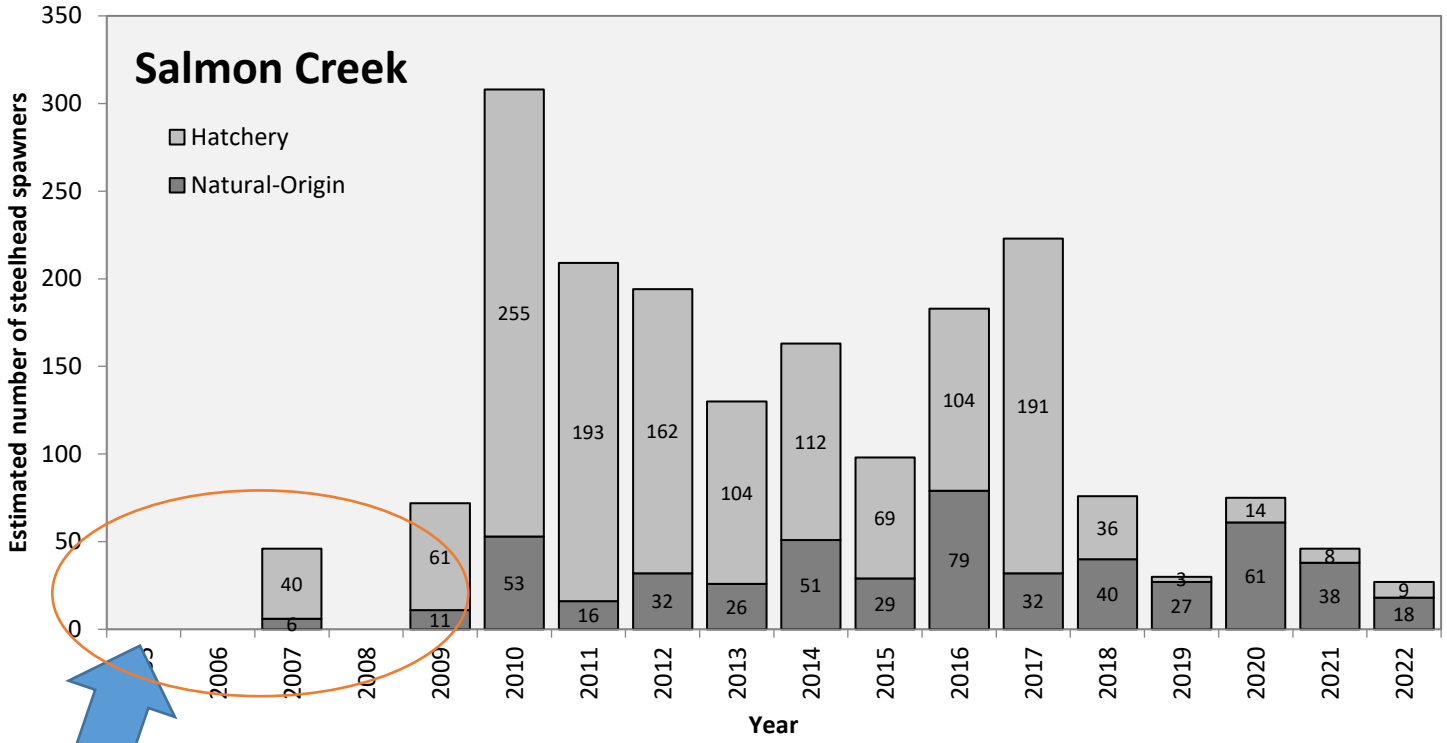
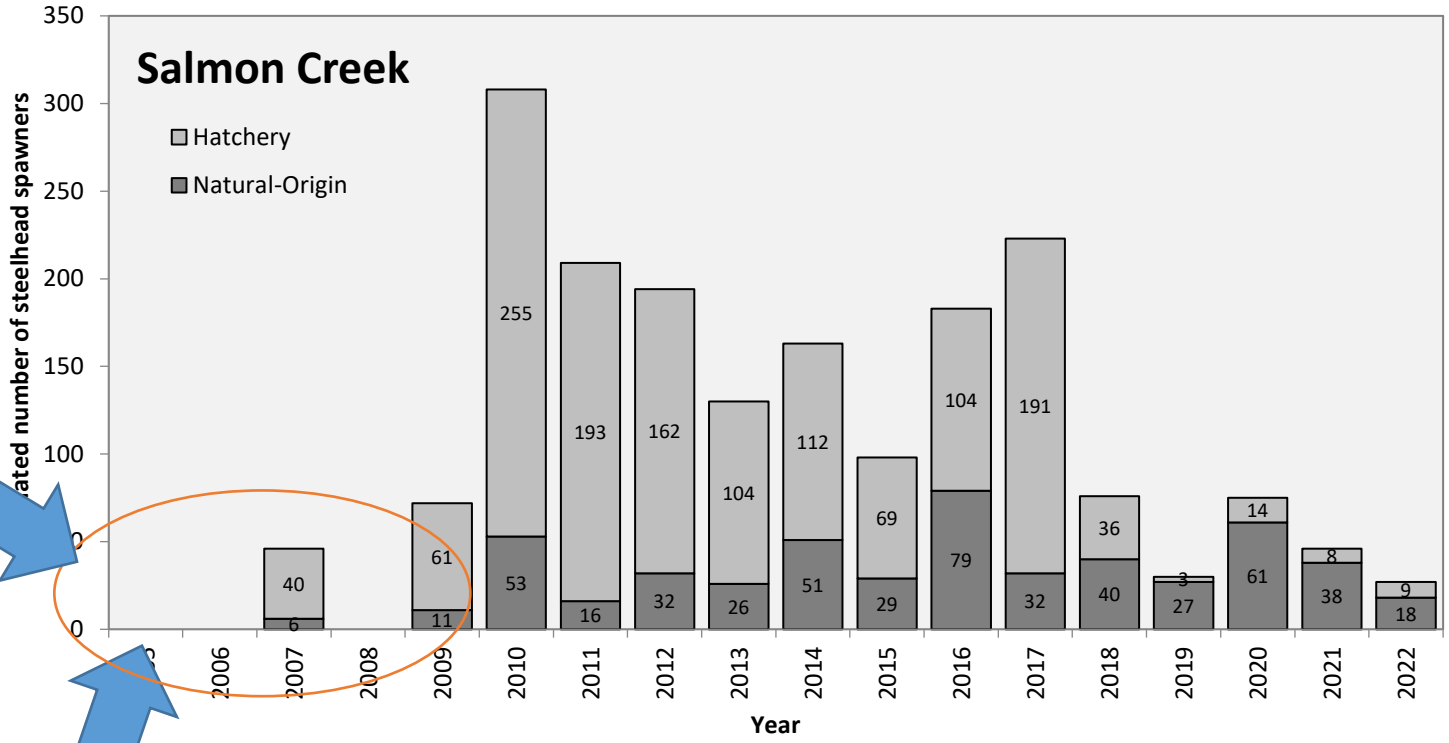


De-watered since 1910

Frequently no adult access

De-watered since 1910



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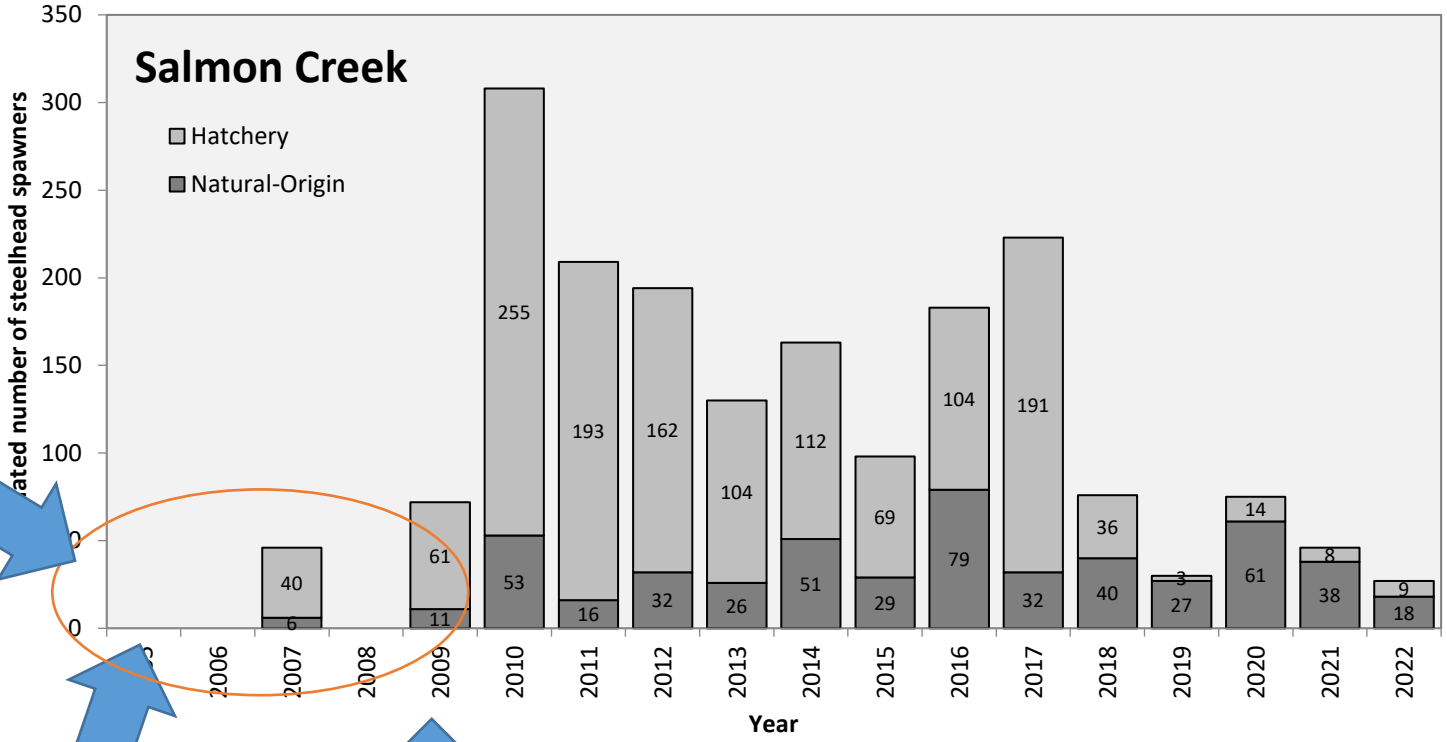
Water releases negotiated



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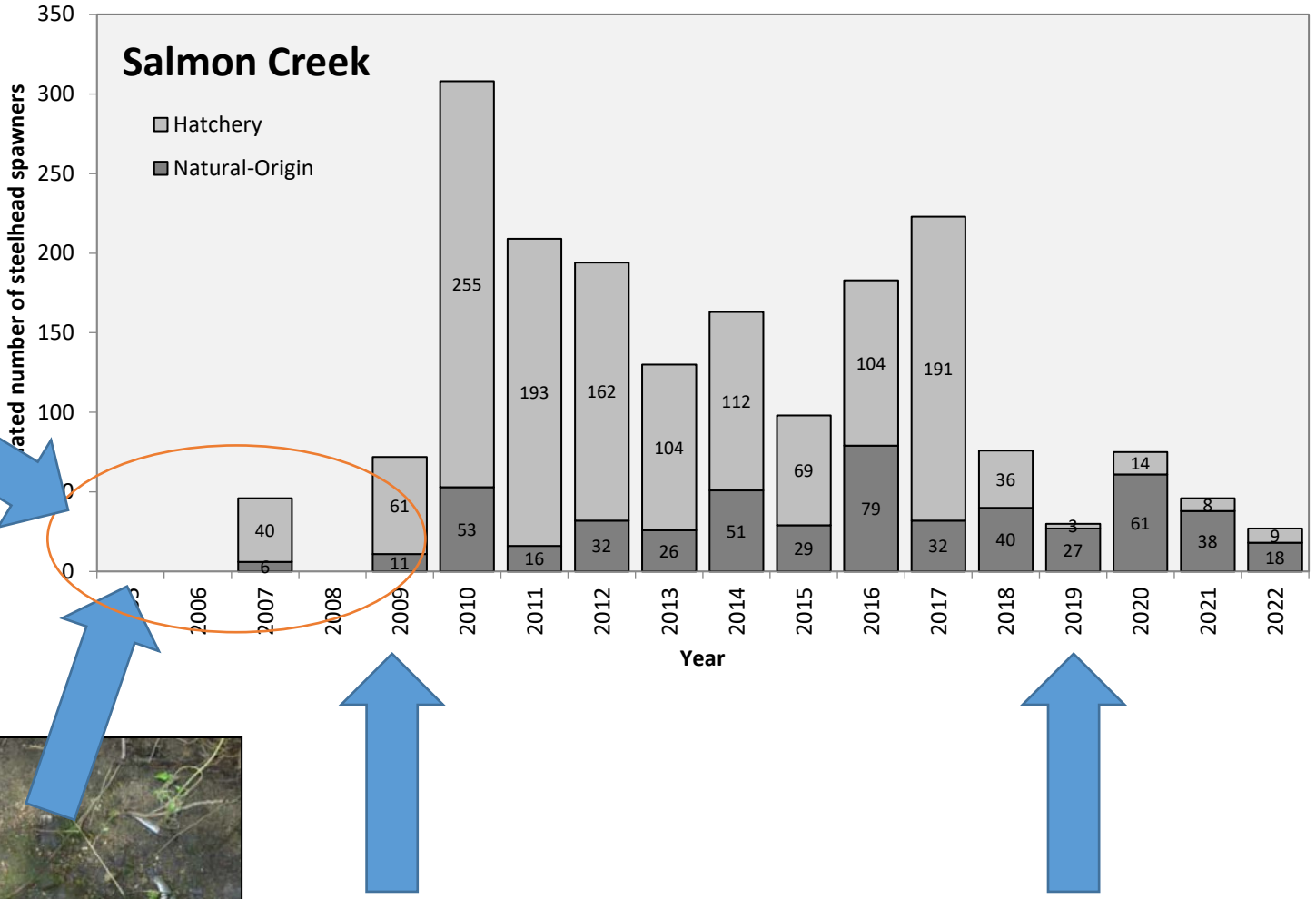
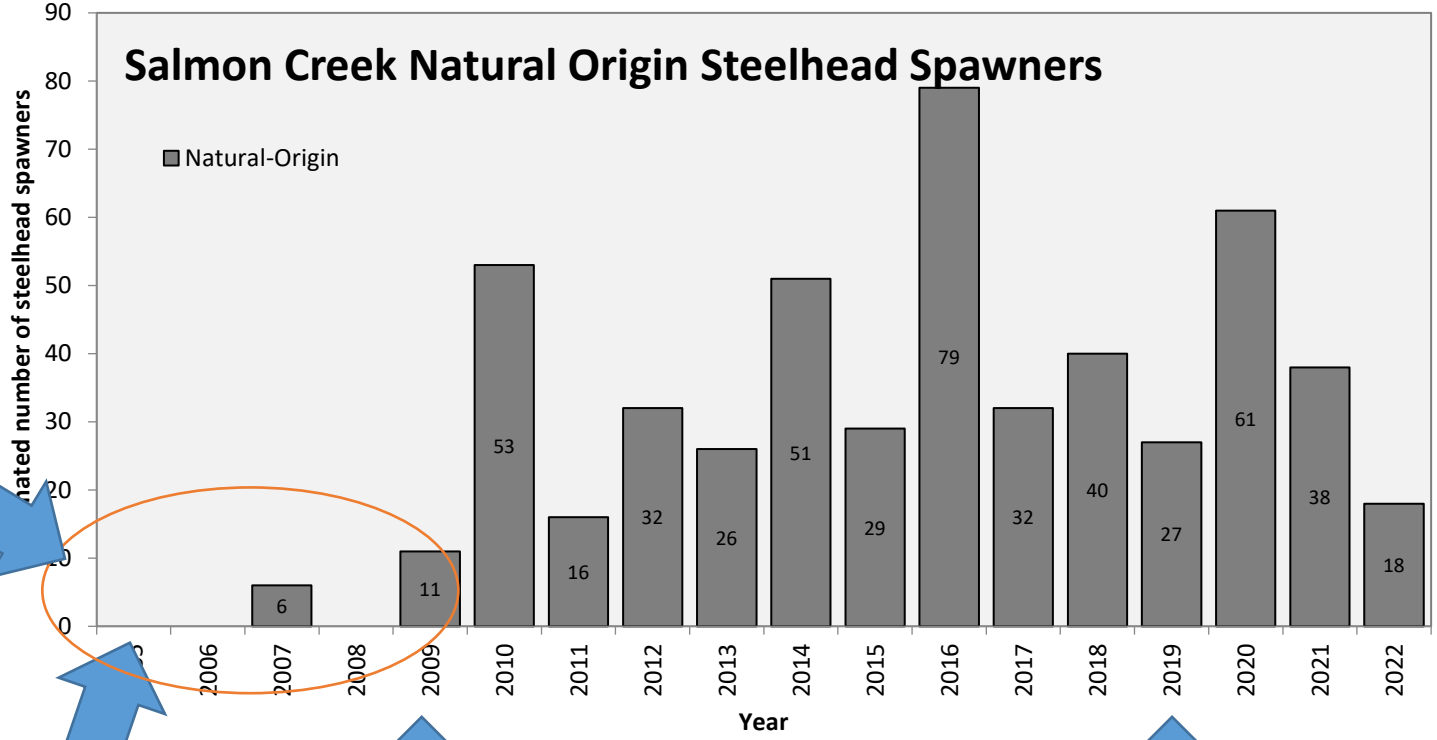


Water releases negotiated

Perennial flow established

Frequently no adult access

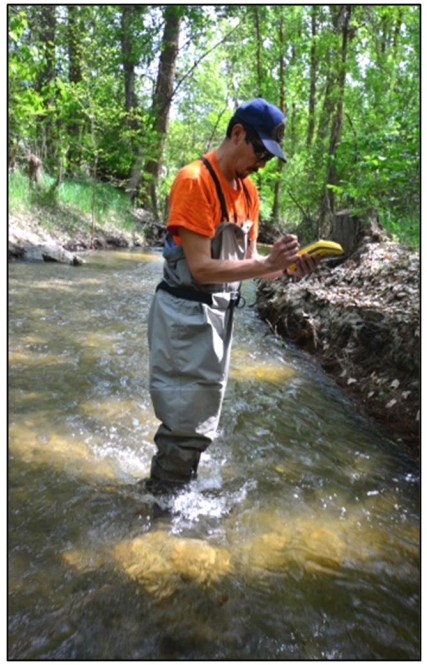
De-watered since 1910

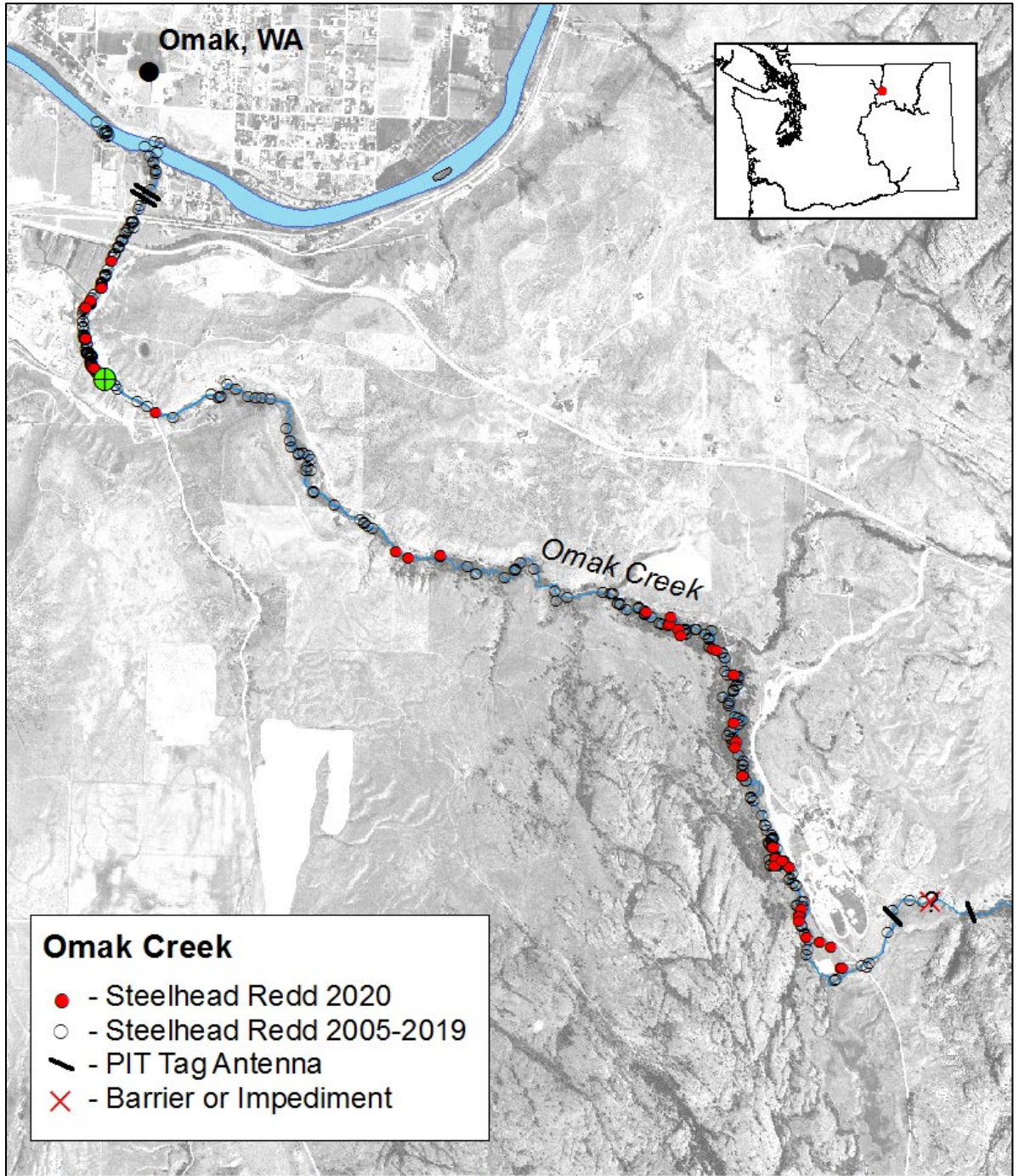


Water releases negotiated

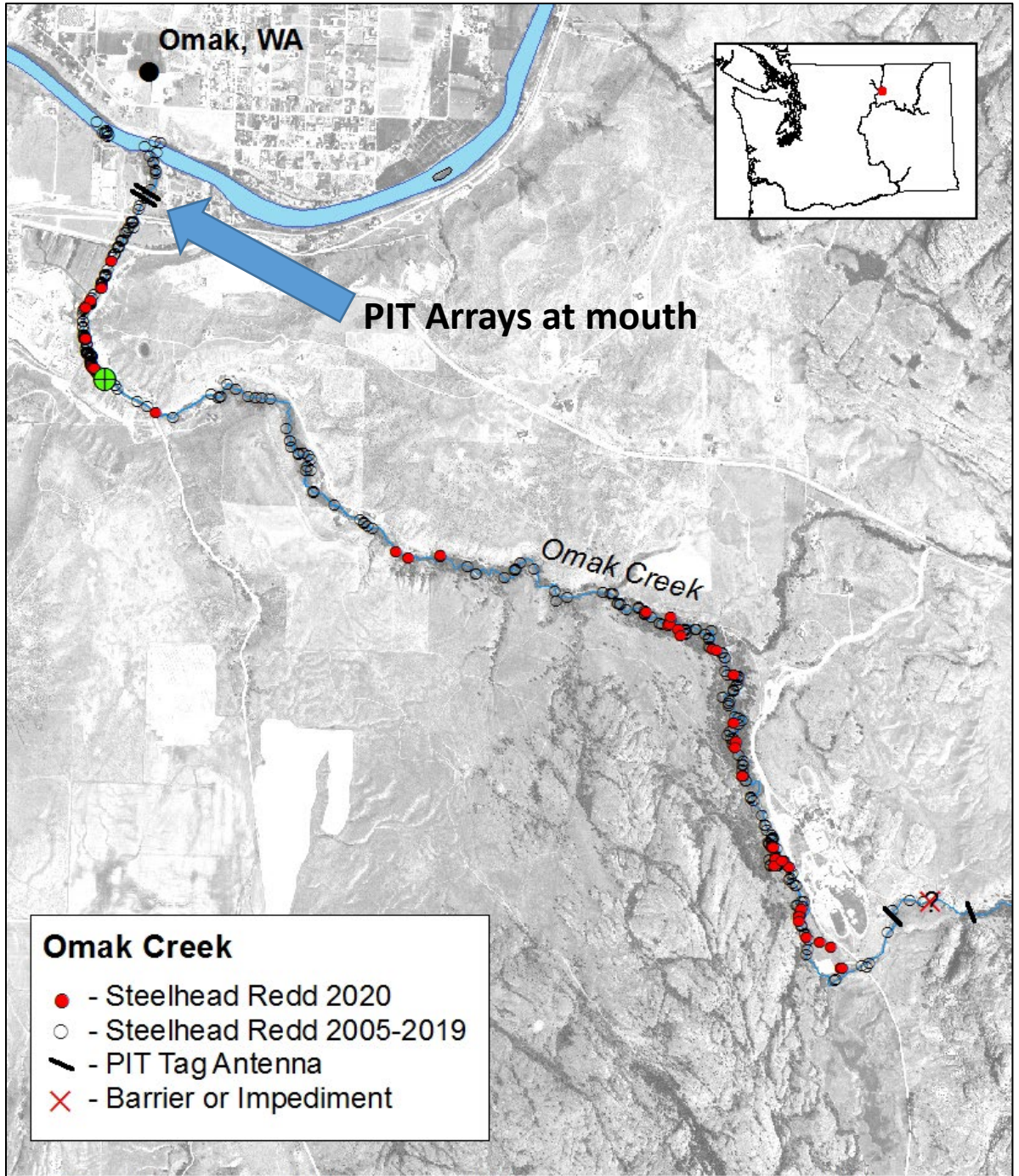
Perennial flow established

Steelhead Spawning, Spatial Distribution





Steelhead Spawning, Spatial Distribution



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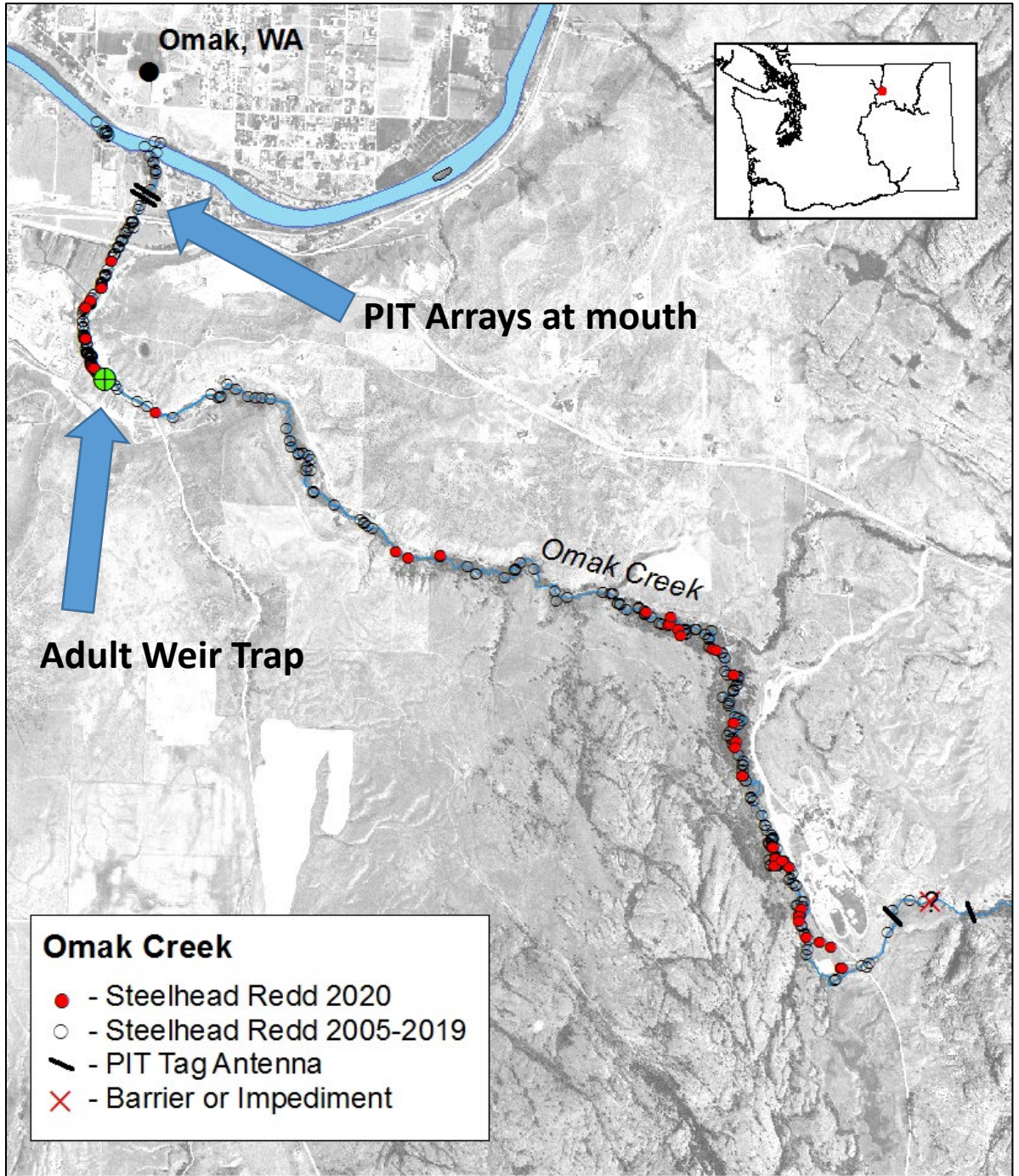

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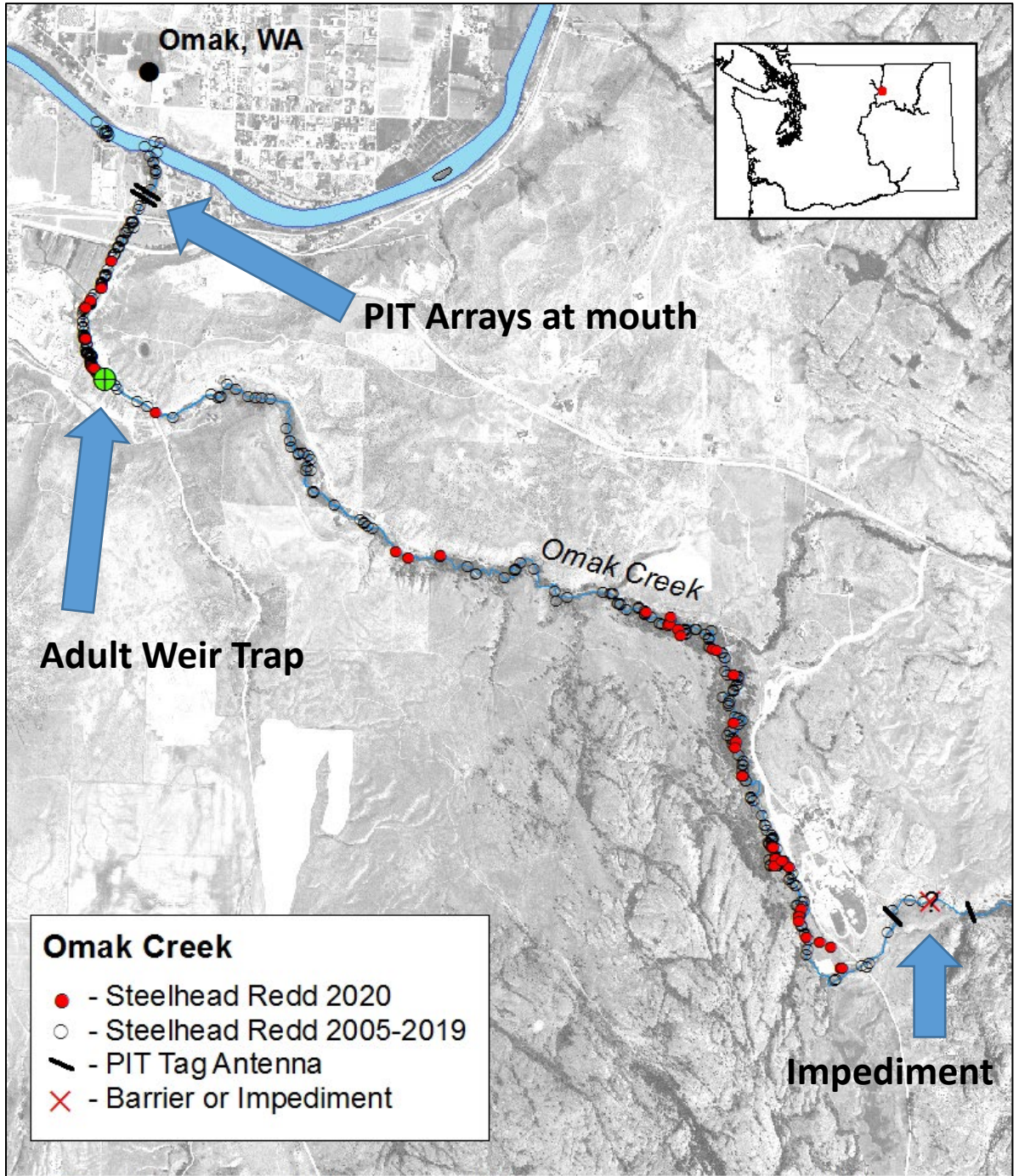

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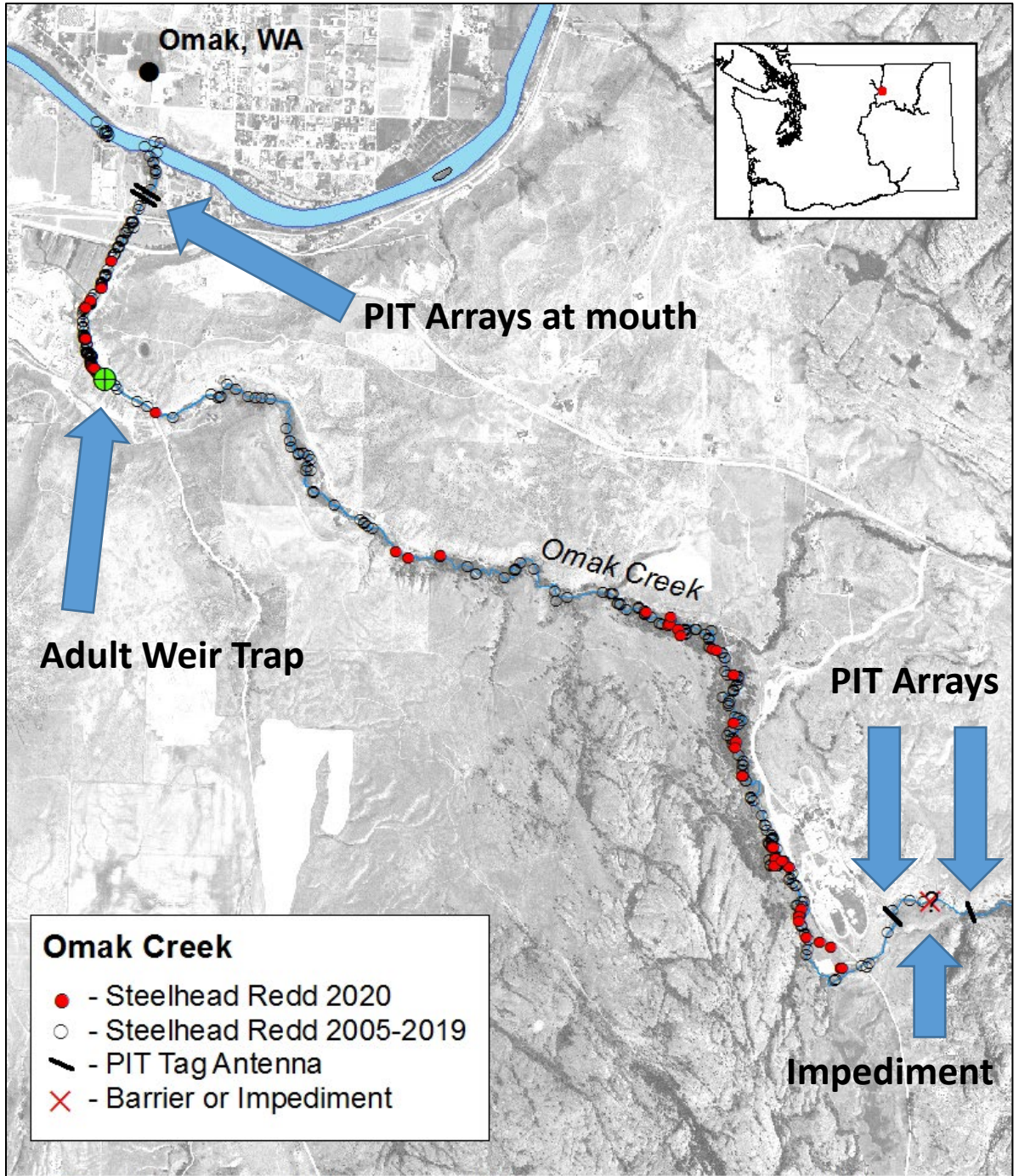
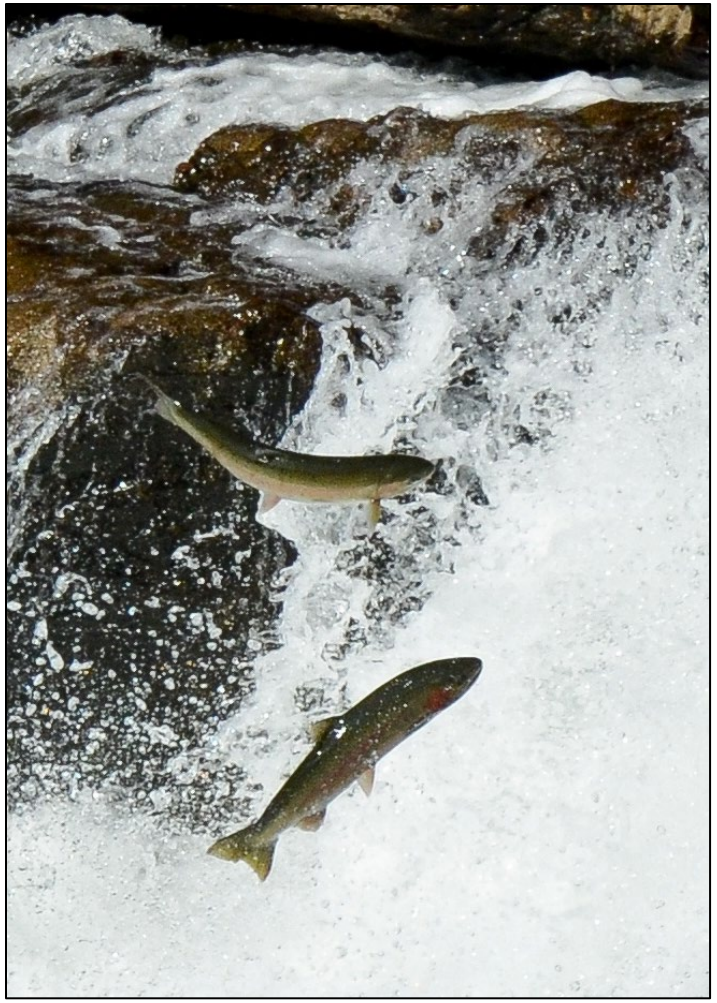


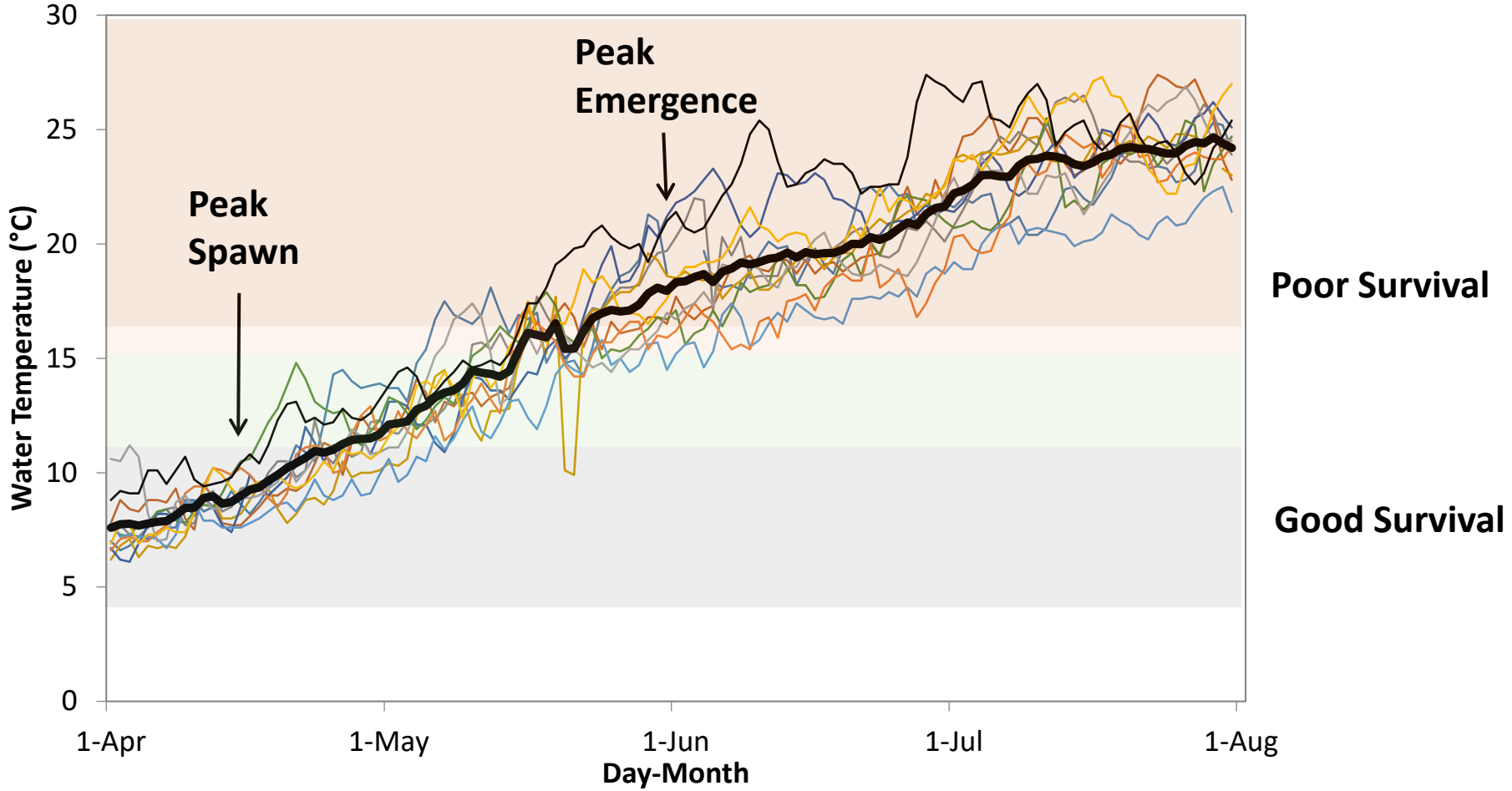
Adult Steelhead Monitoring - Lessons Learned



- Subbasin level estimates are used for large scale region-wide recovery reporting, NOAA efforts

- Tributary and reach-scale data are most used by habitat practitioners
  - Directs local recovery efforts
  - Culvert removal, diversions, habitat protection/improvement, hatchery management, etc., etc.

Understanding Water Temperature Effects on Incubating Steelhead

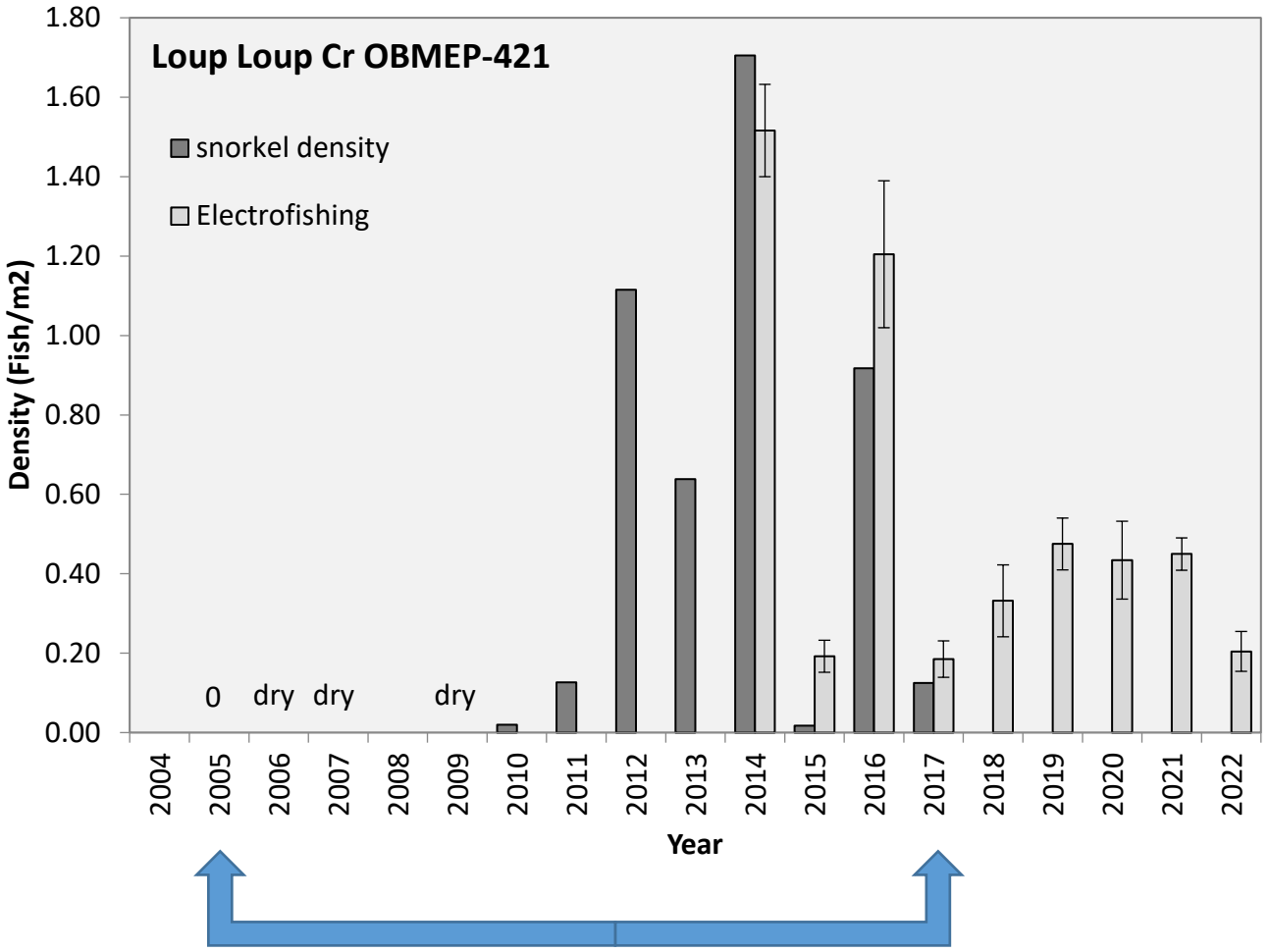


(Velsen 1987, Myrick and Cech 2001)

Juvenile Salmonid Monitoring

Juvenile Monitoring - Tributaries

Snorkel Surveys



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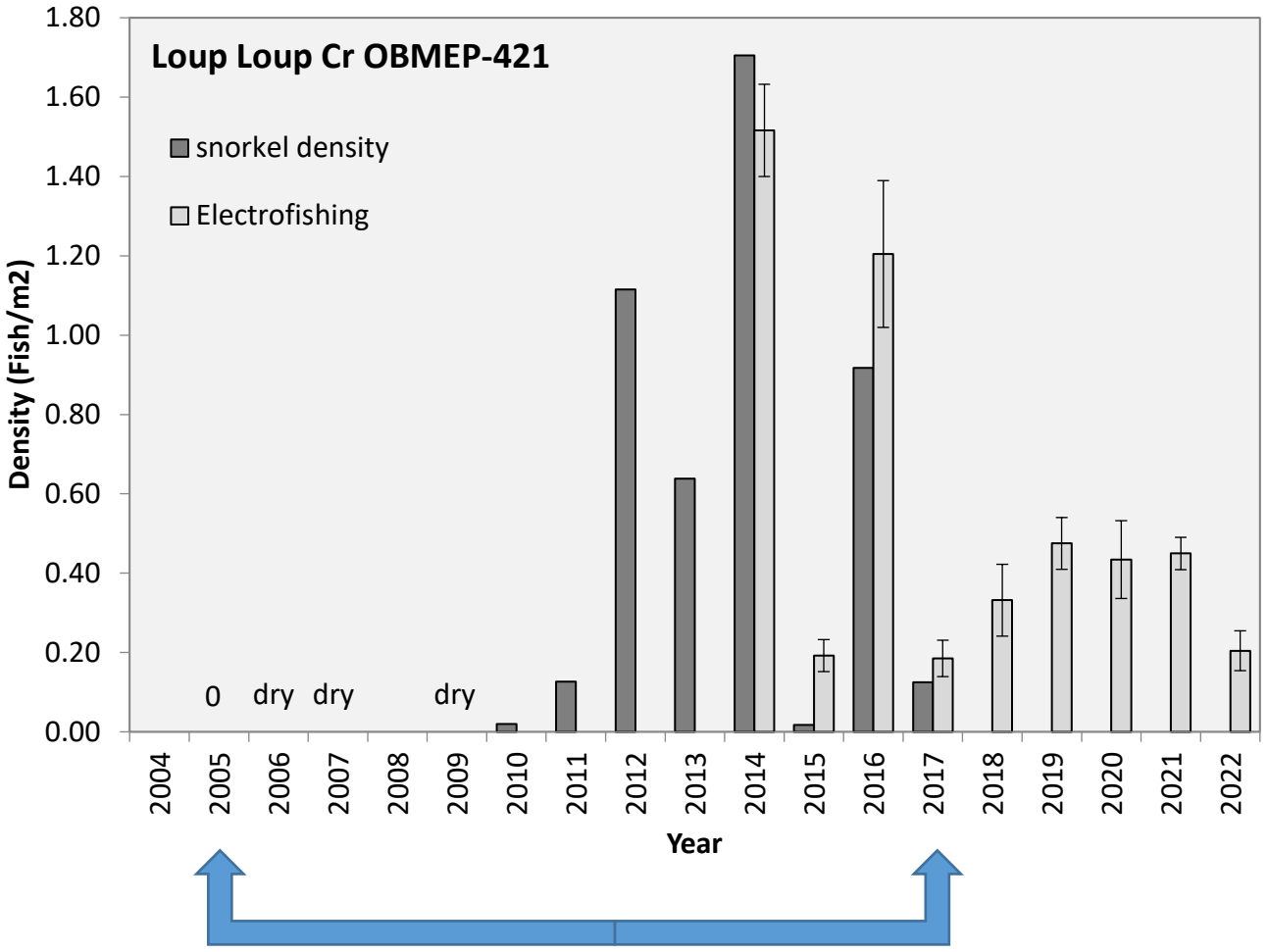

4-yr overlap in methods

Juvenile Monitoring - Tributaries

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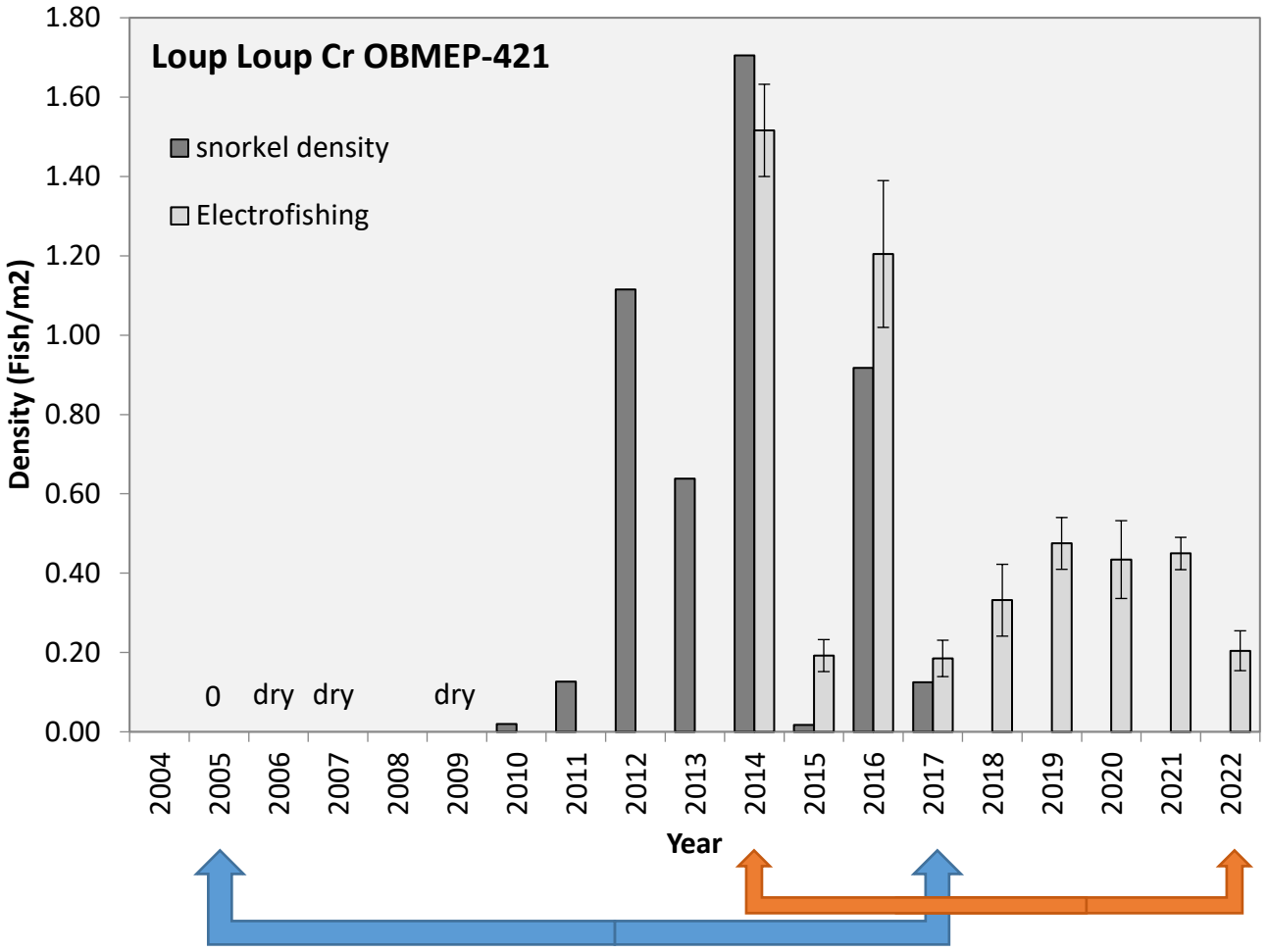

4-yr overlap in methods

Mark-Recapture Electrofishing

Juvenile Monitoring - Tributaries

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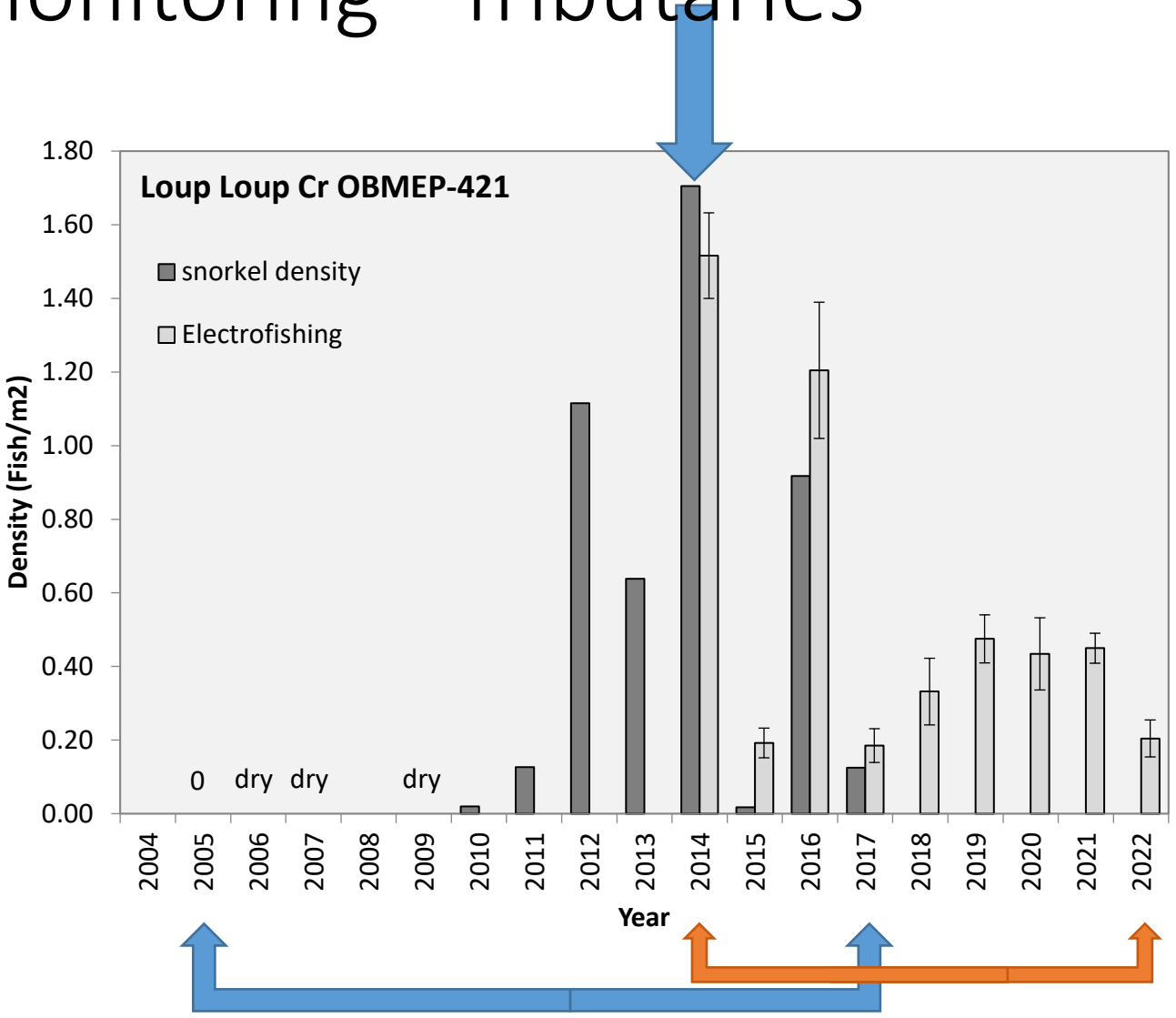

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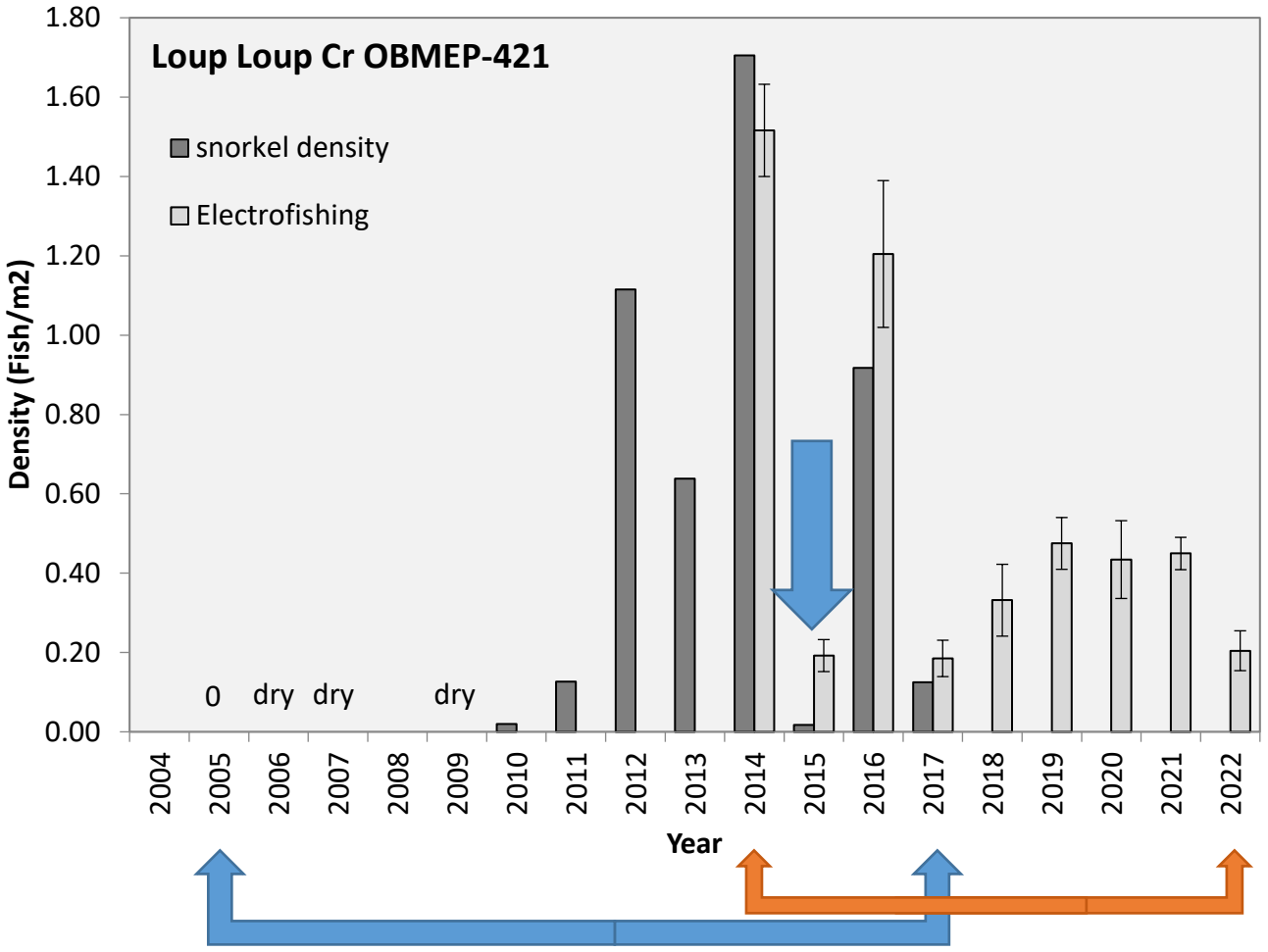

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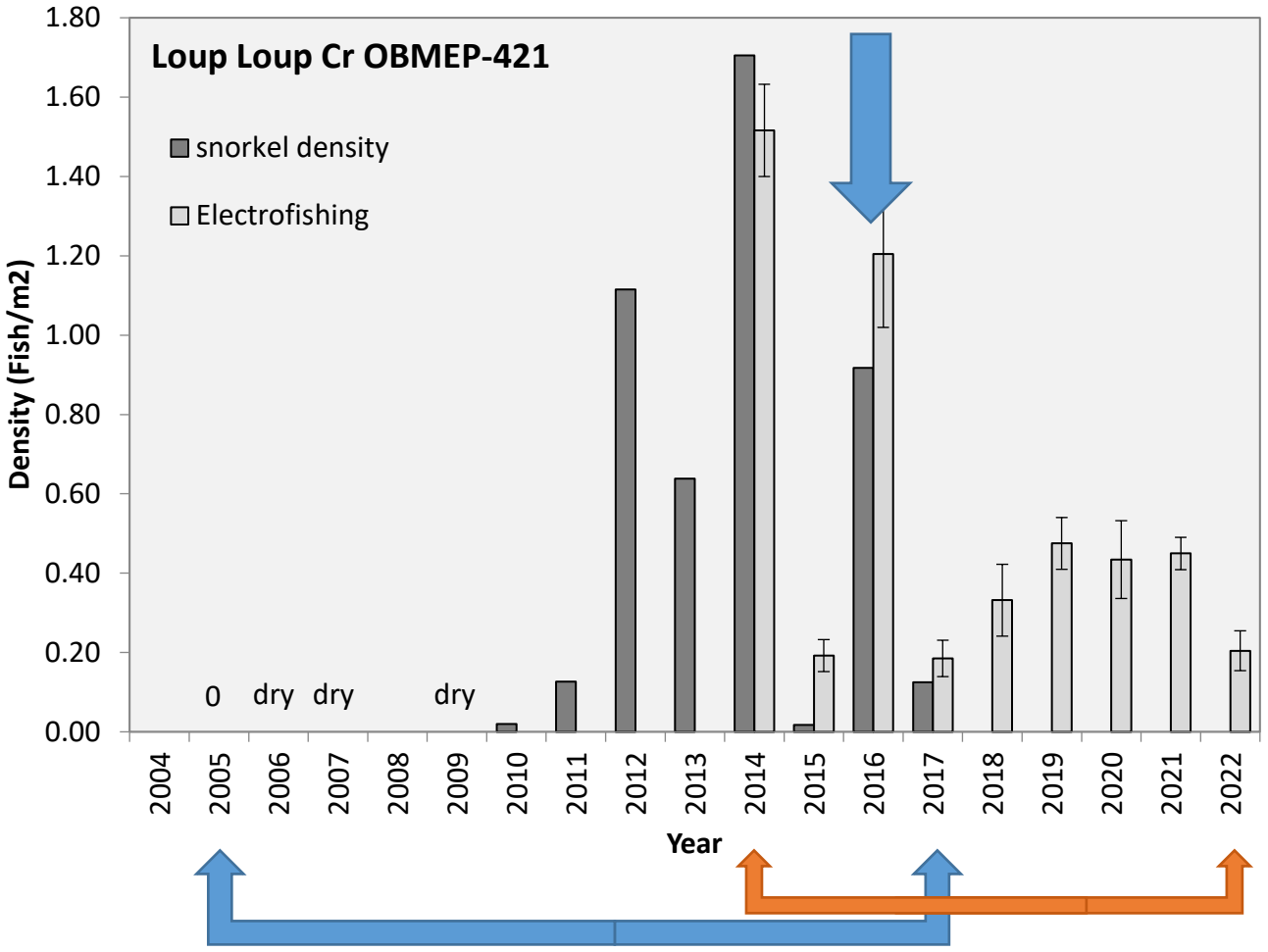

4-yr overlap in methods

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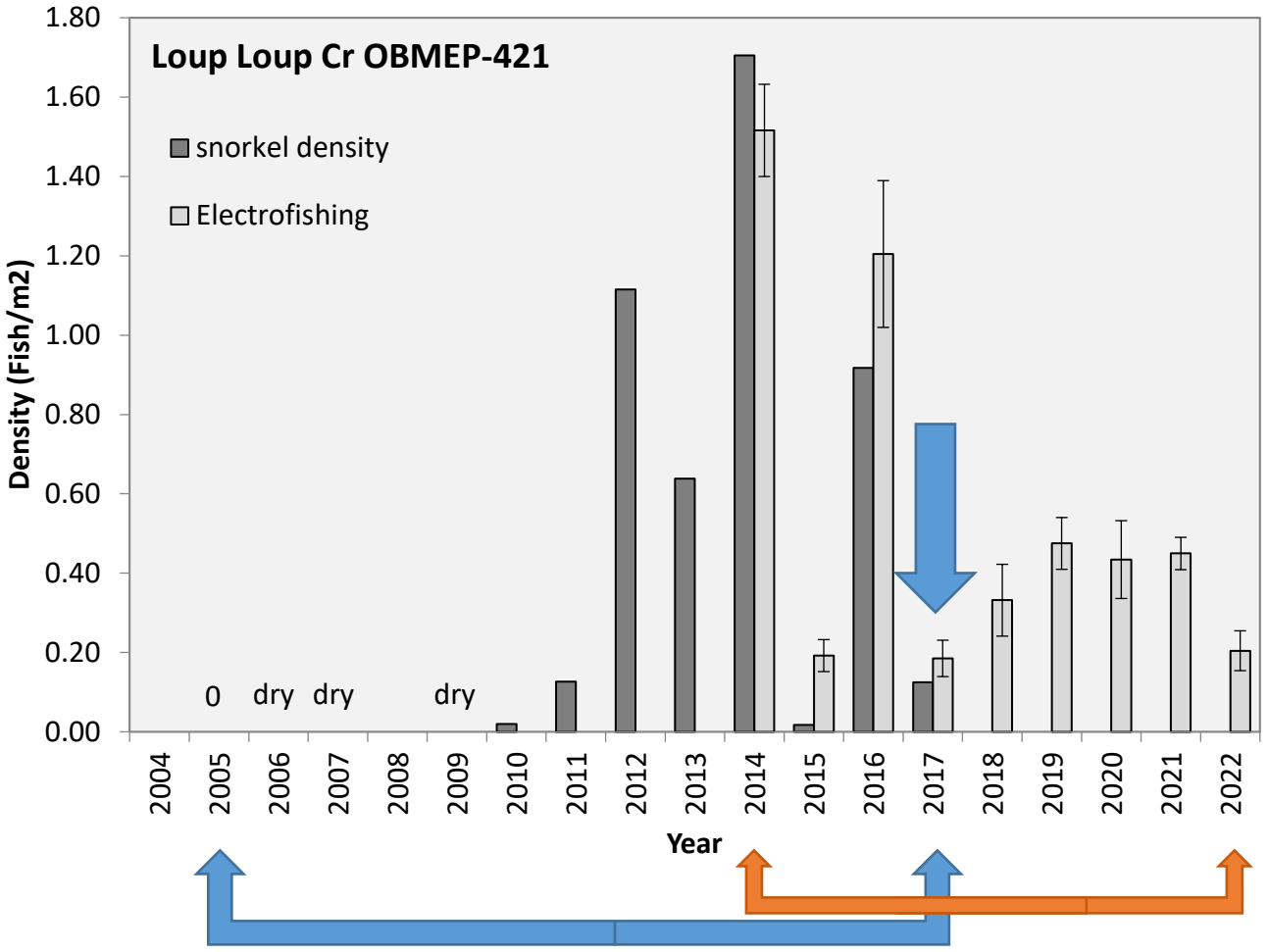
Snorkel Surveys



4-yr overlap in methods

Mark-Recapture Electrofishing

Estimate juvenile salmonid abundance

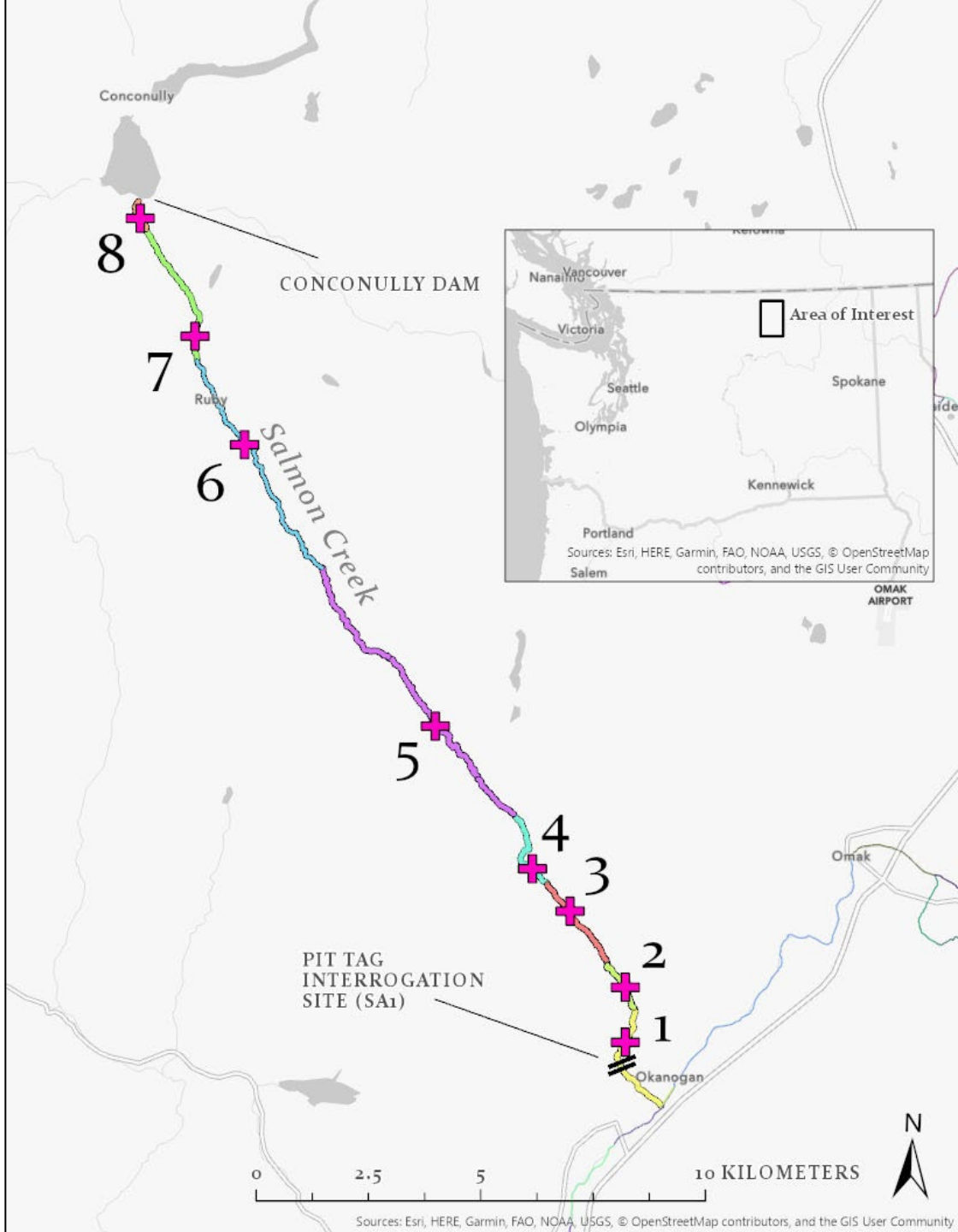
1. Divide tributaries into unique reaches

2. Subsample each reach
    1. Electrofishing, mark-recap
    2. Mark age-1+ with PIT tags

3. Expand site estimates to reach

4. Sum all reaches for tributary estimates

5. Outmigration determined by PIT tagged fish



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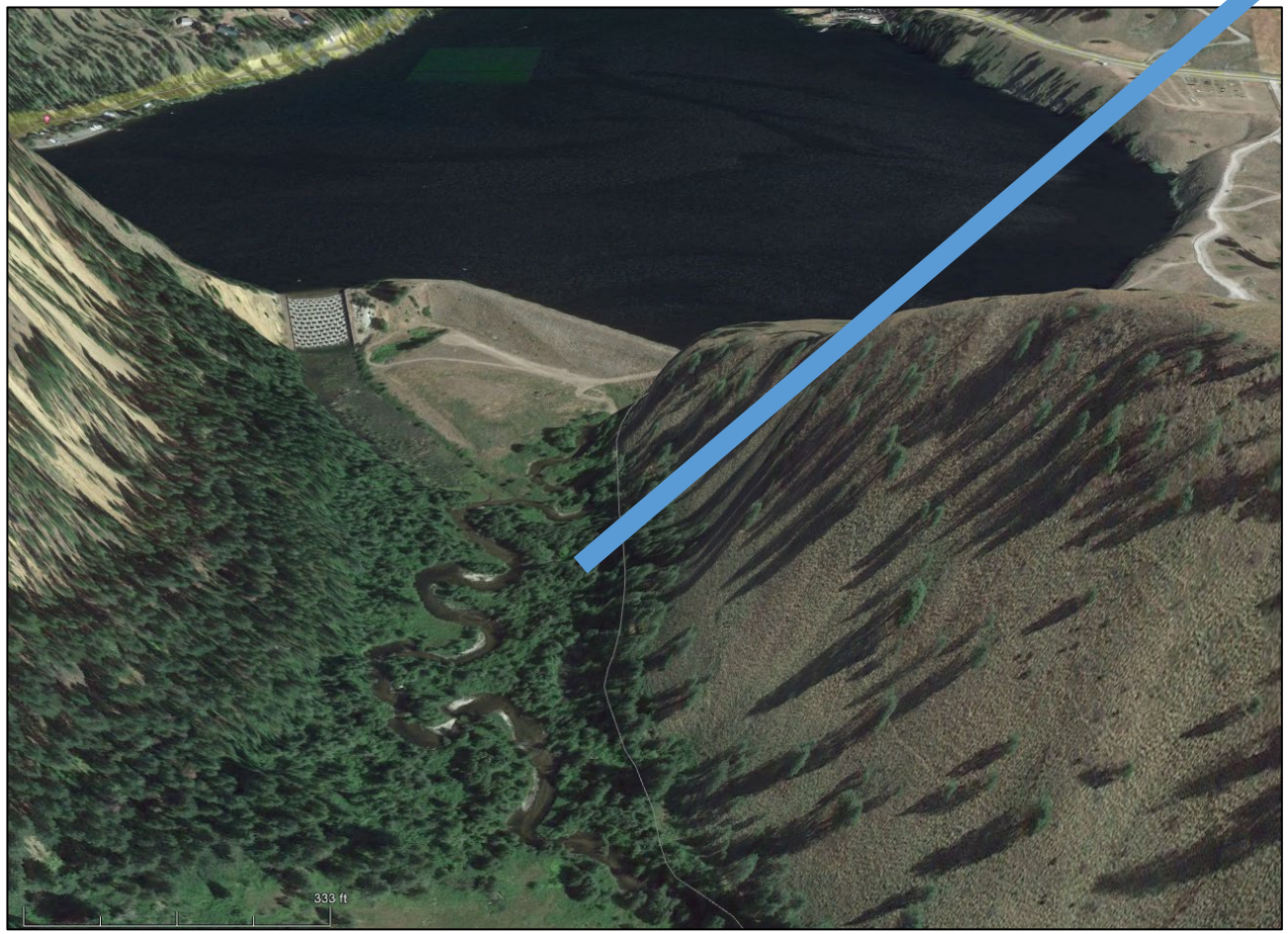

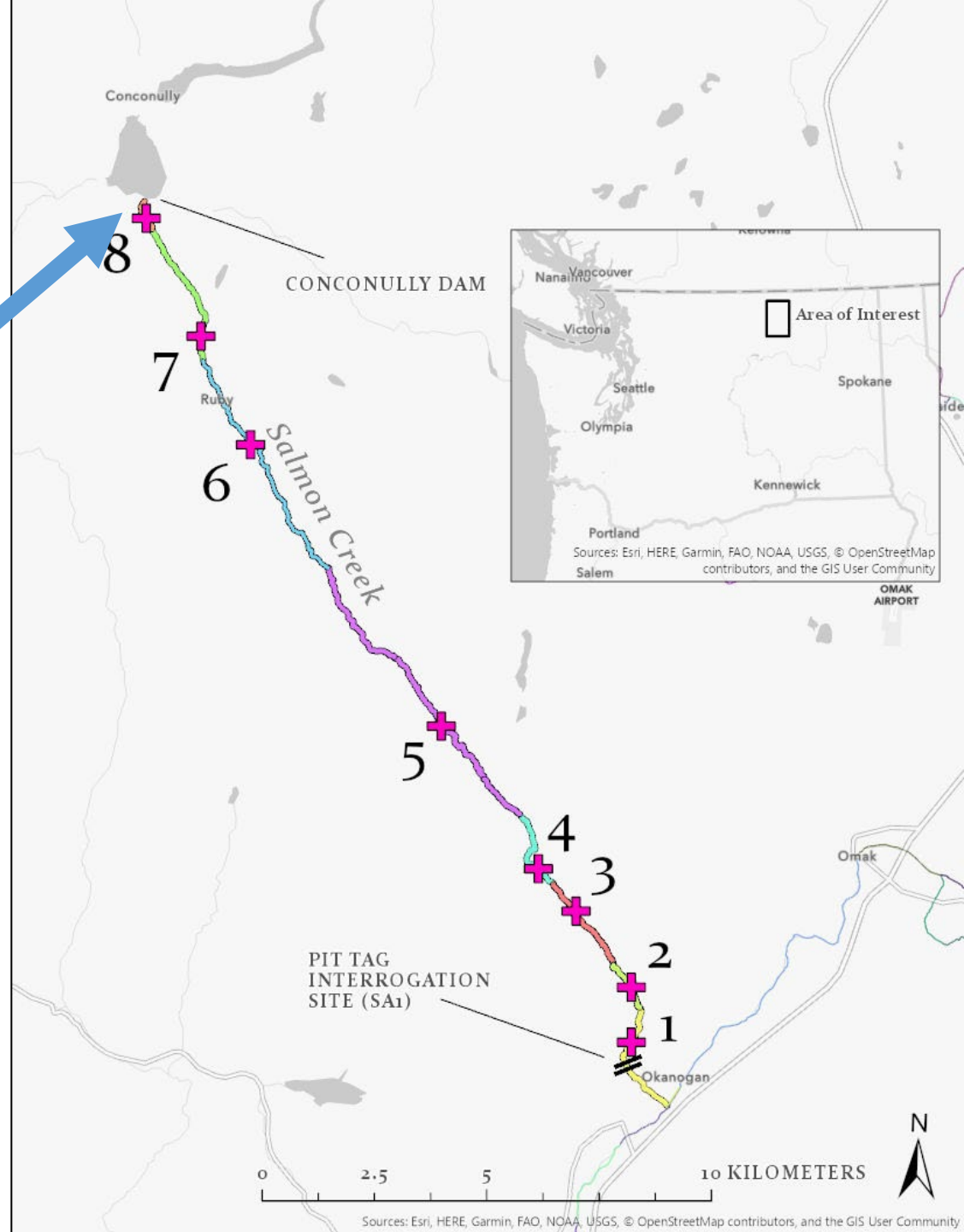

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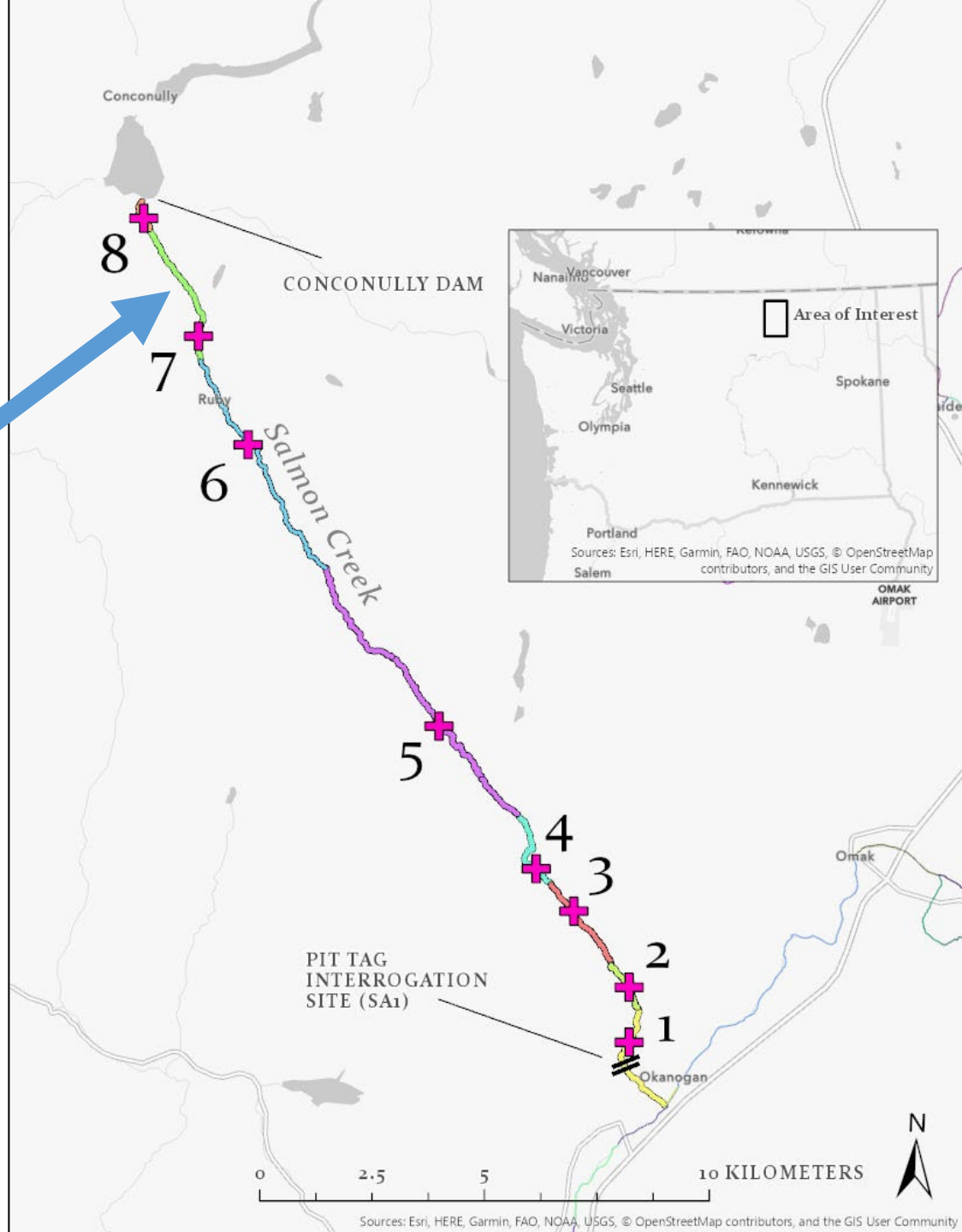

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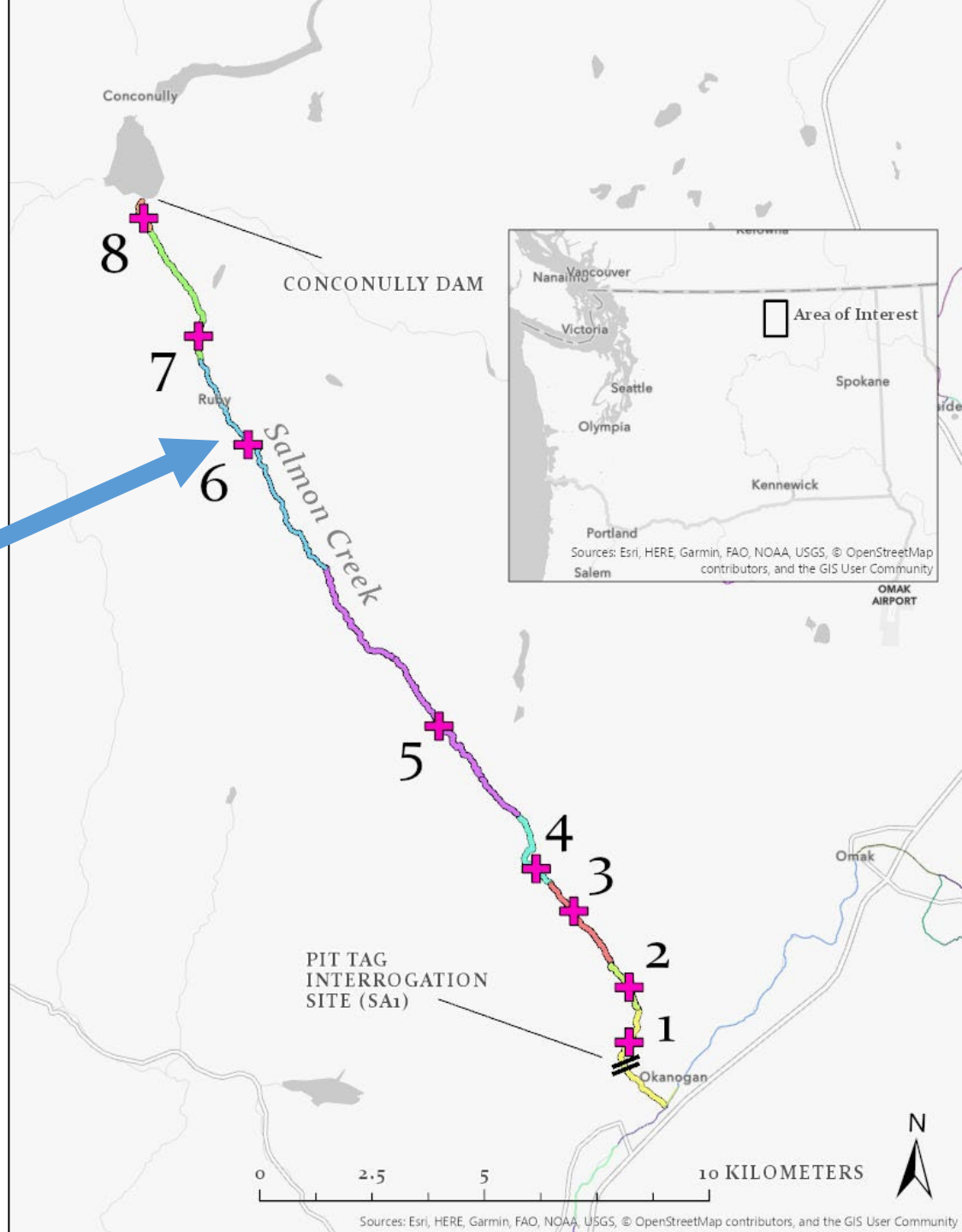

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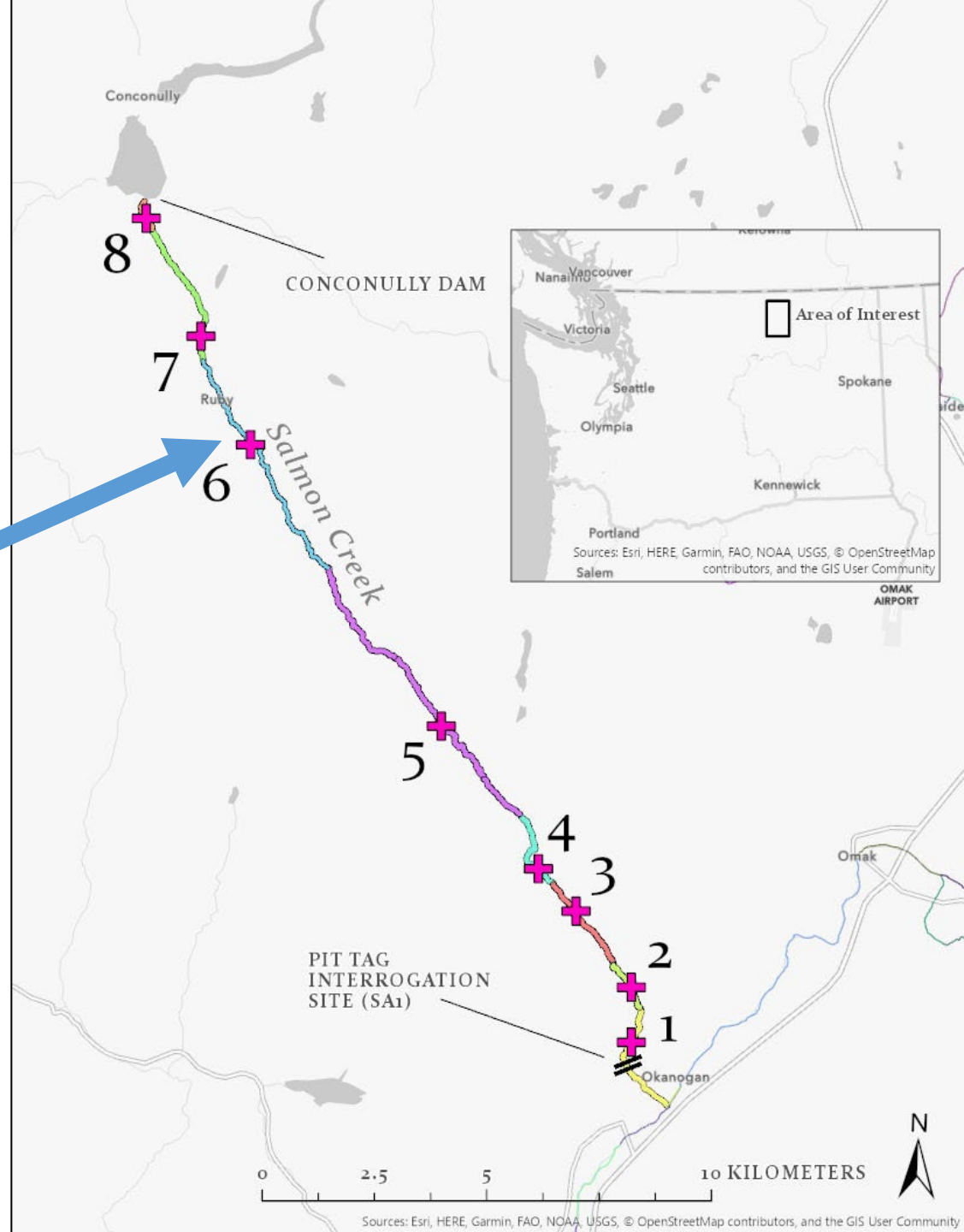
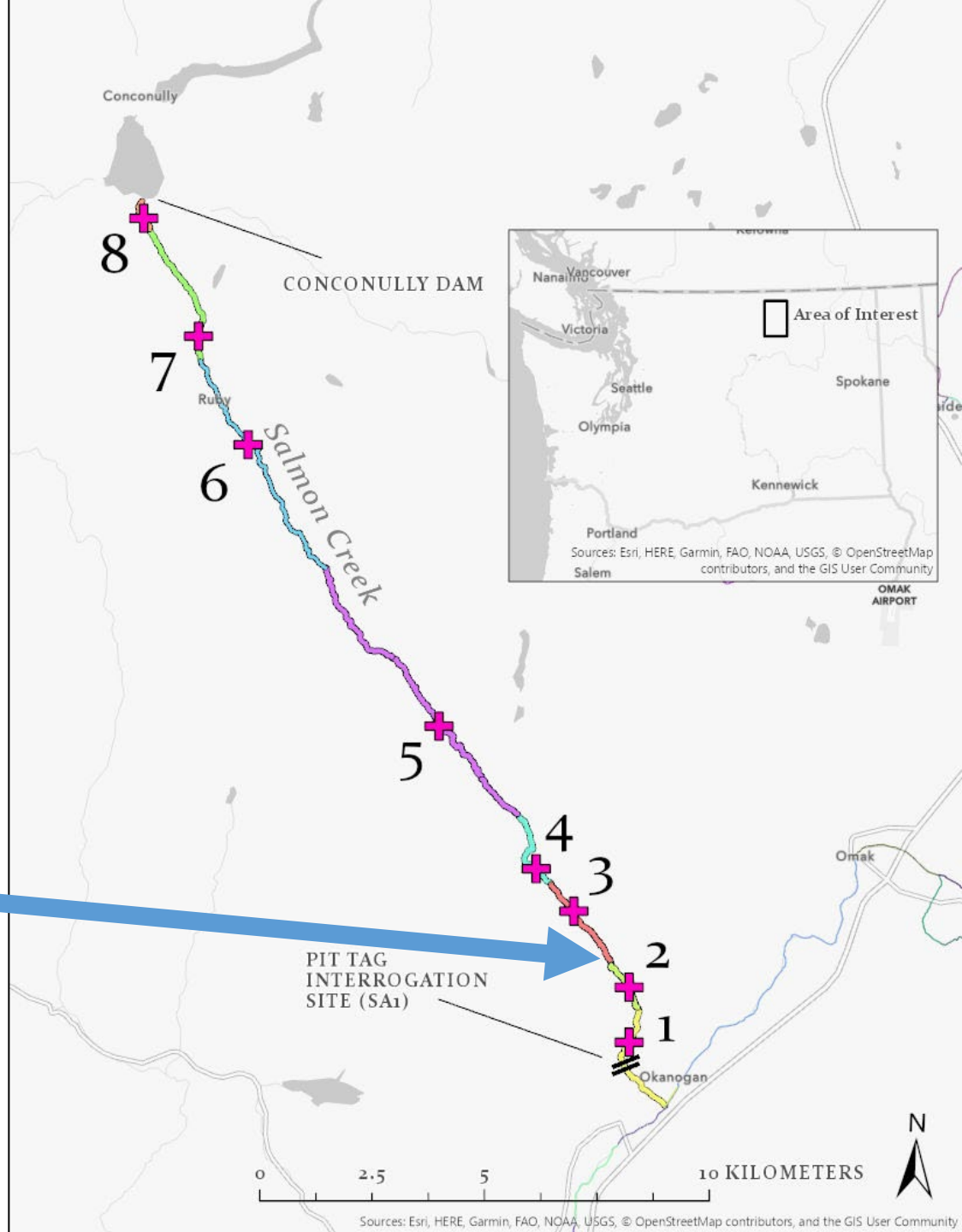


Estimate juvenile salmonid abundance

1. Divide tributaries into unique reaches



Estimate juvenile salmonid abundance

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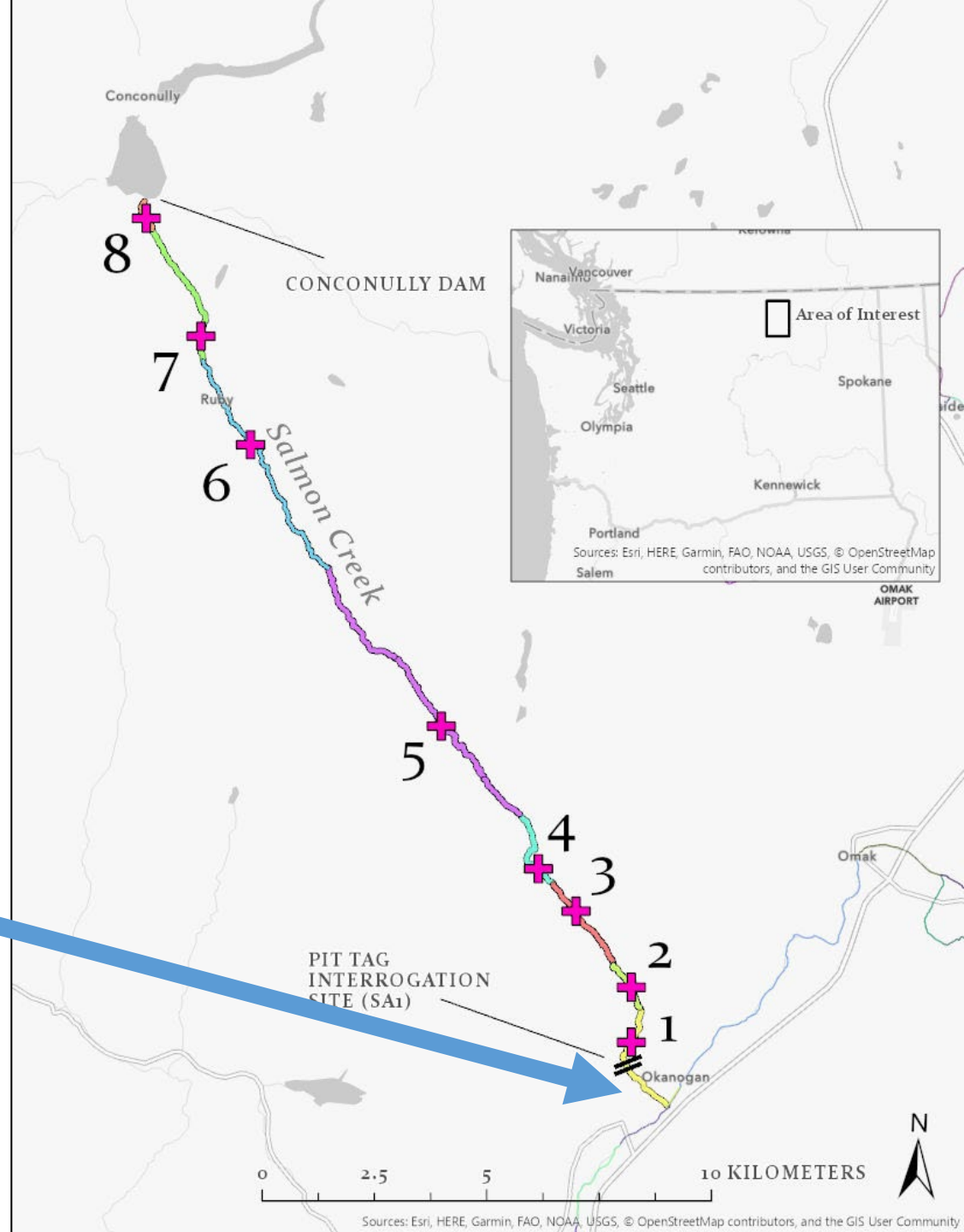

Estimate juvenile salmonid abundance

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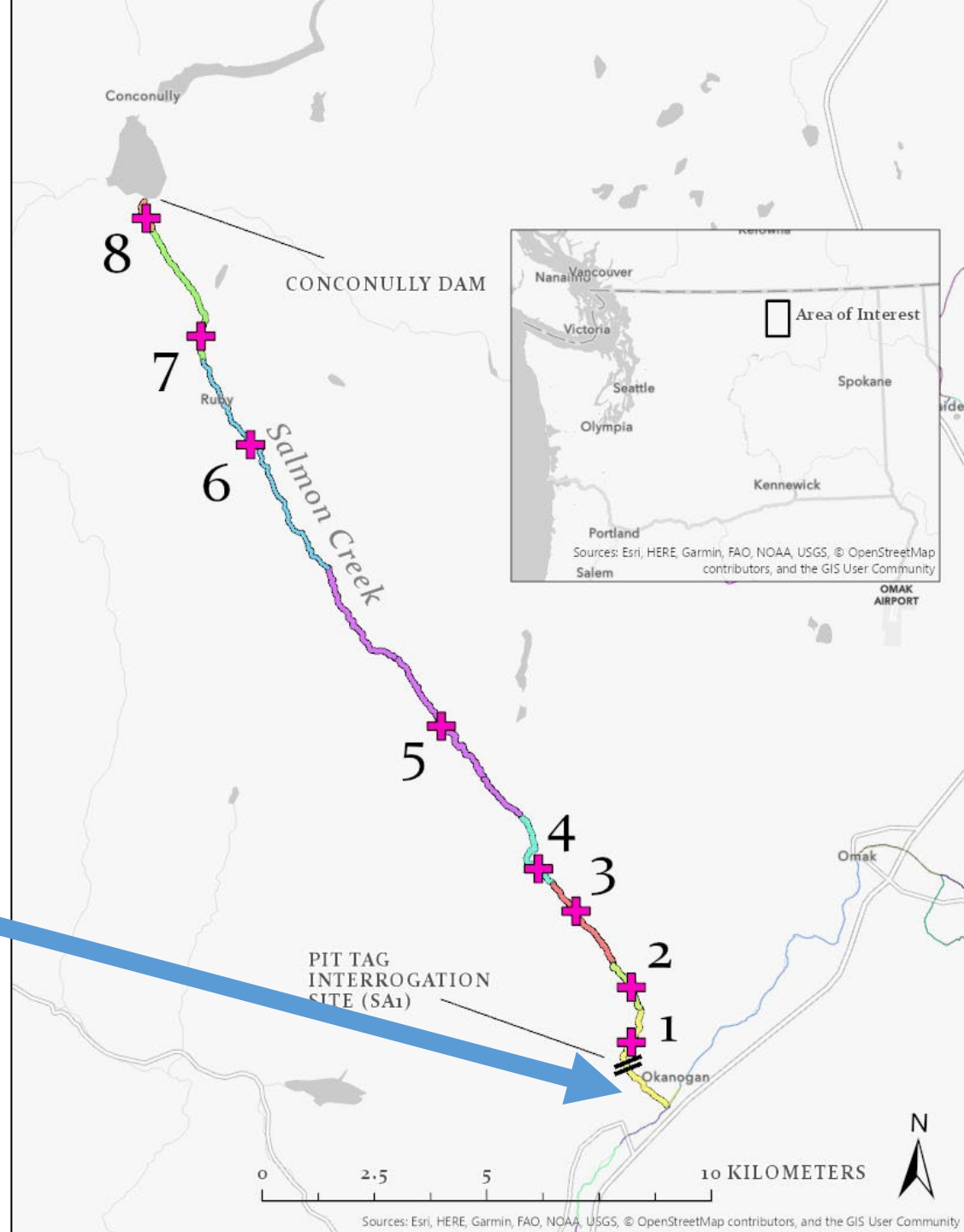


Estimate juvenile salmonid abundance

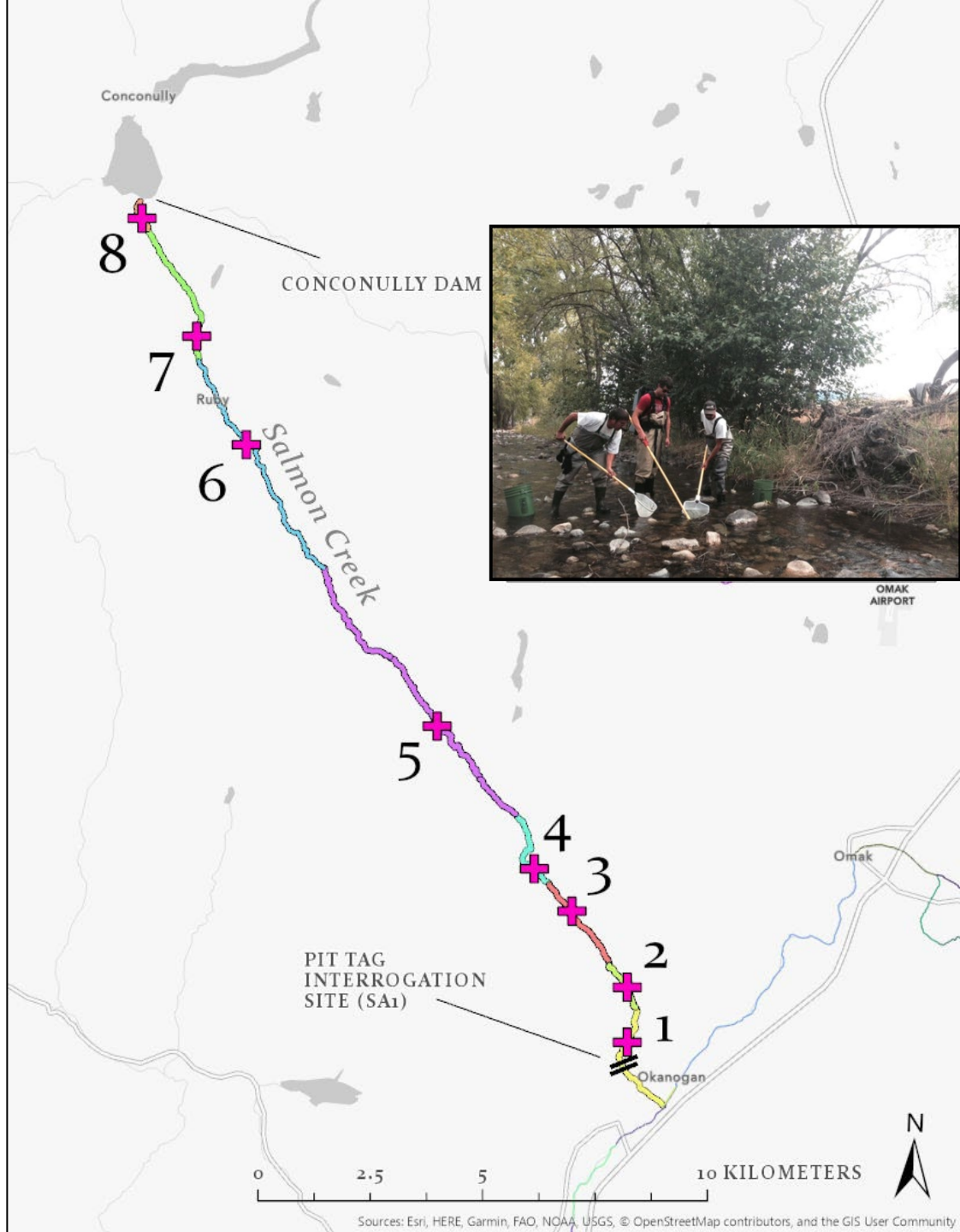
1. Divide tributaries into unique reaches

2. Subsample each reach
    1. Electrofishing, mark-recap
    2. Mark age-1+ with PIT tags

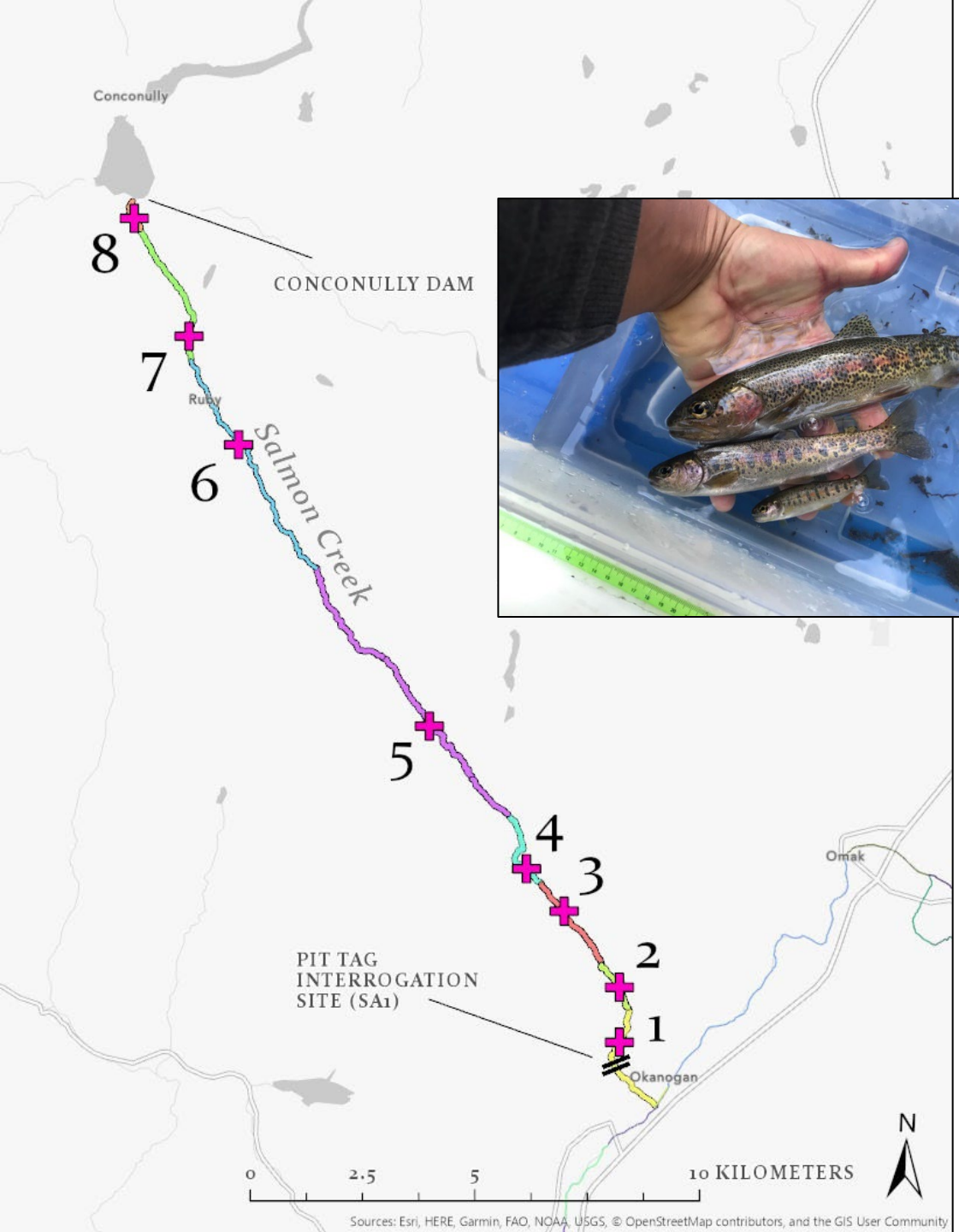
3. Expand site estimates to reach

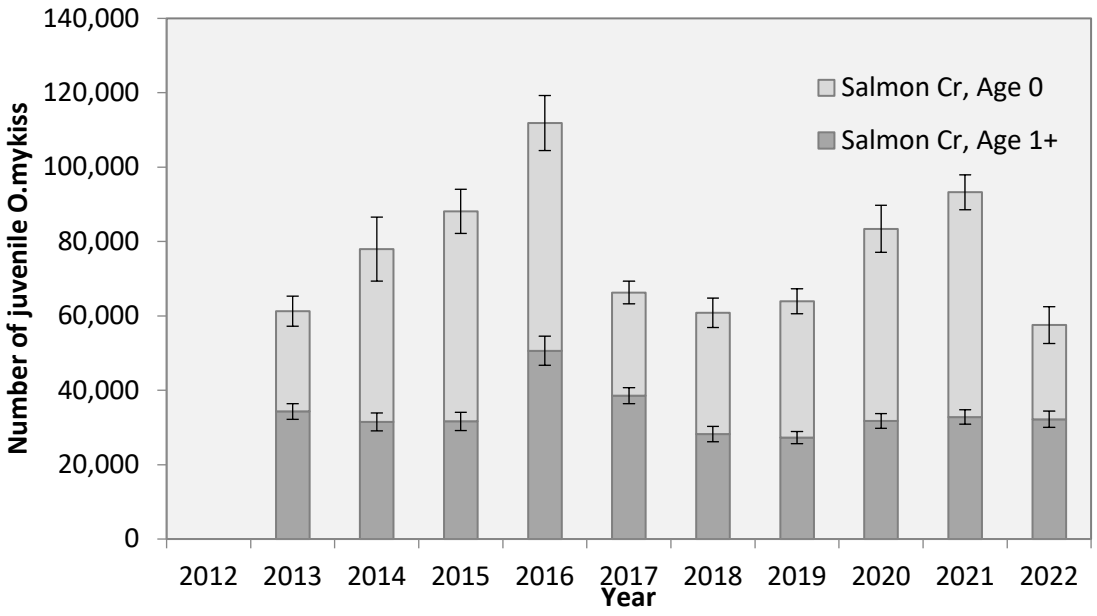
4. Sum all reaches for tributary estimates

5. Outmigration determined by PIT tagged fish

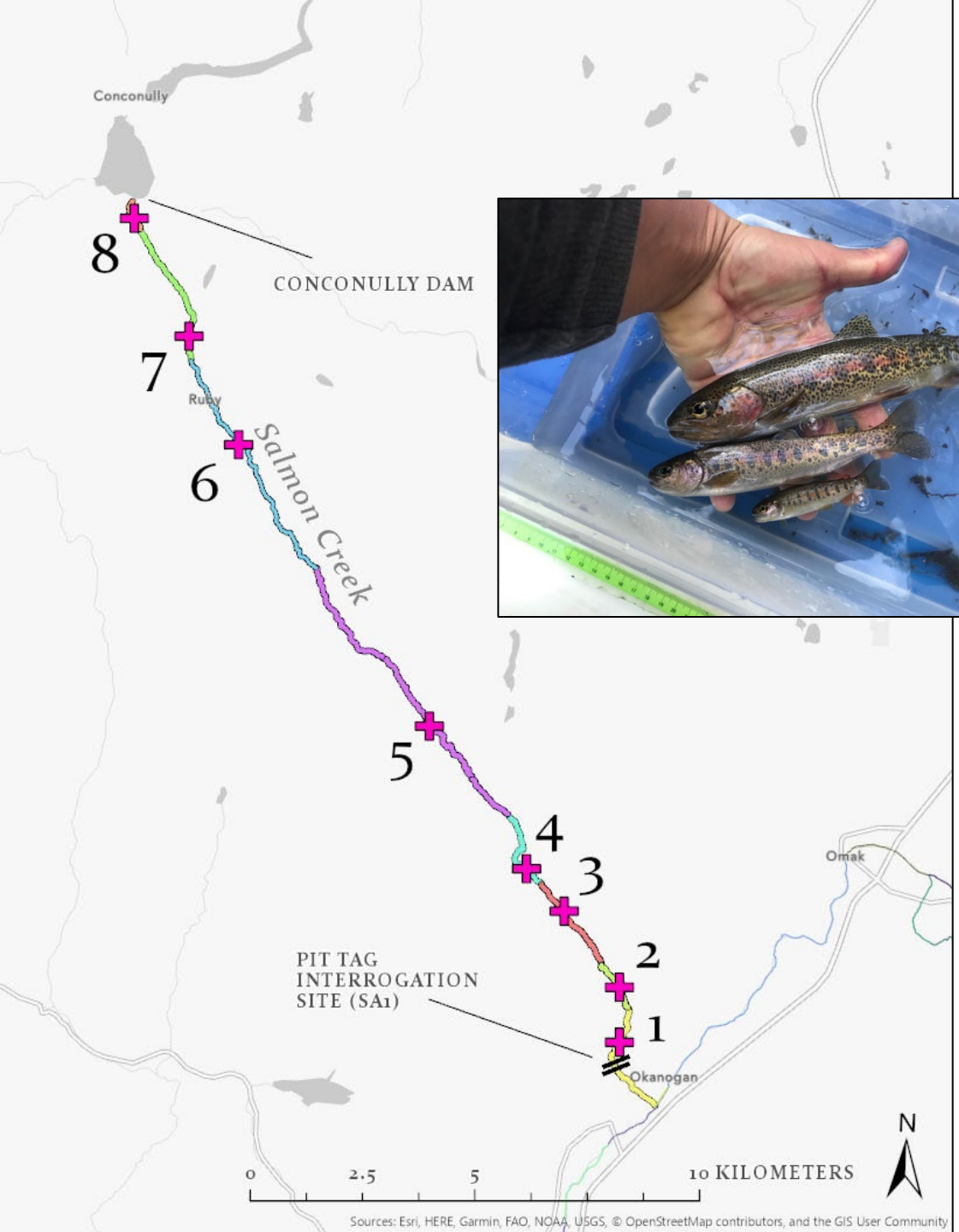


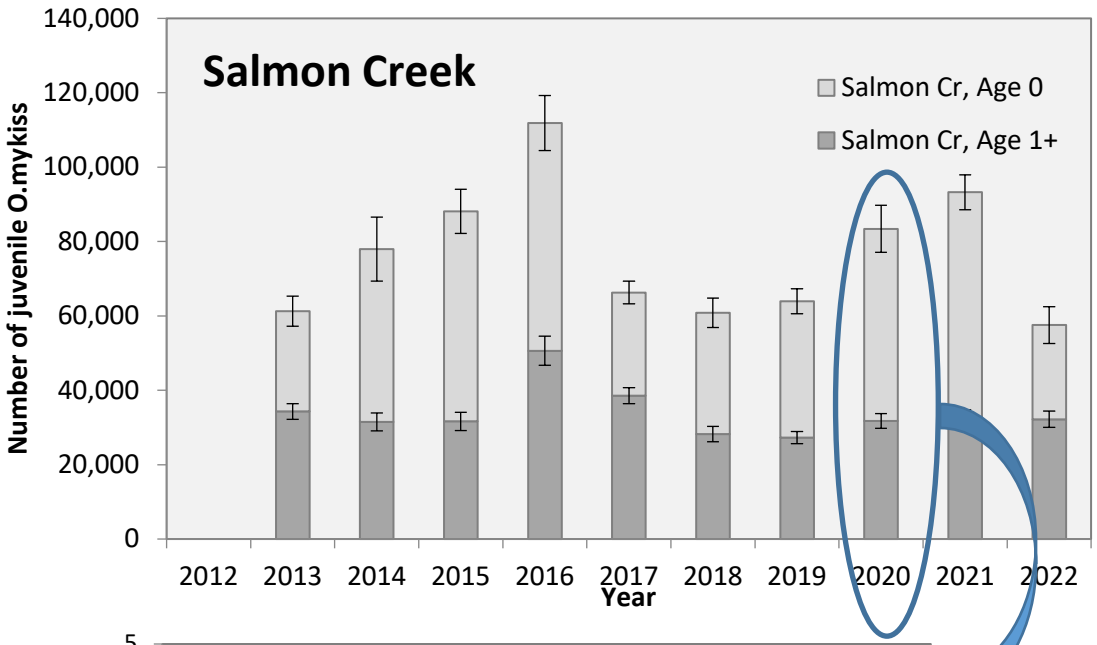
Results: Instream Abundance

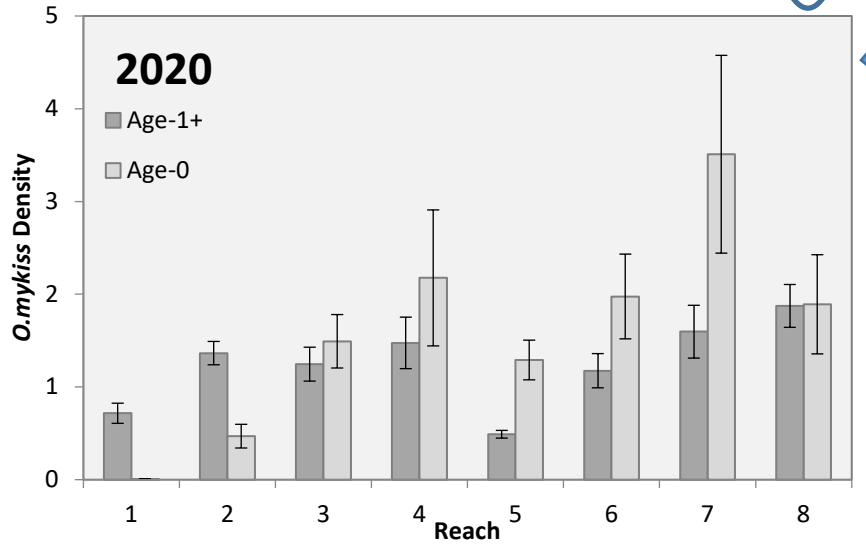




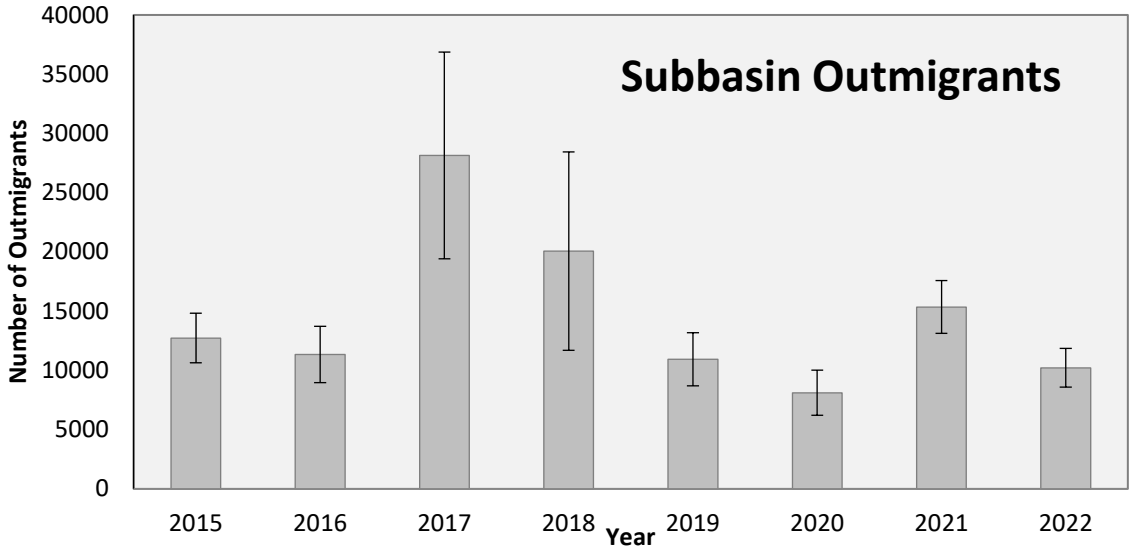
Results: Instream Abundance



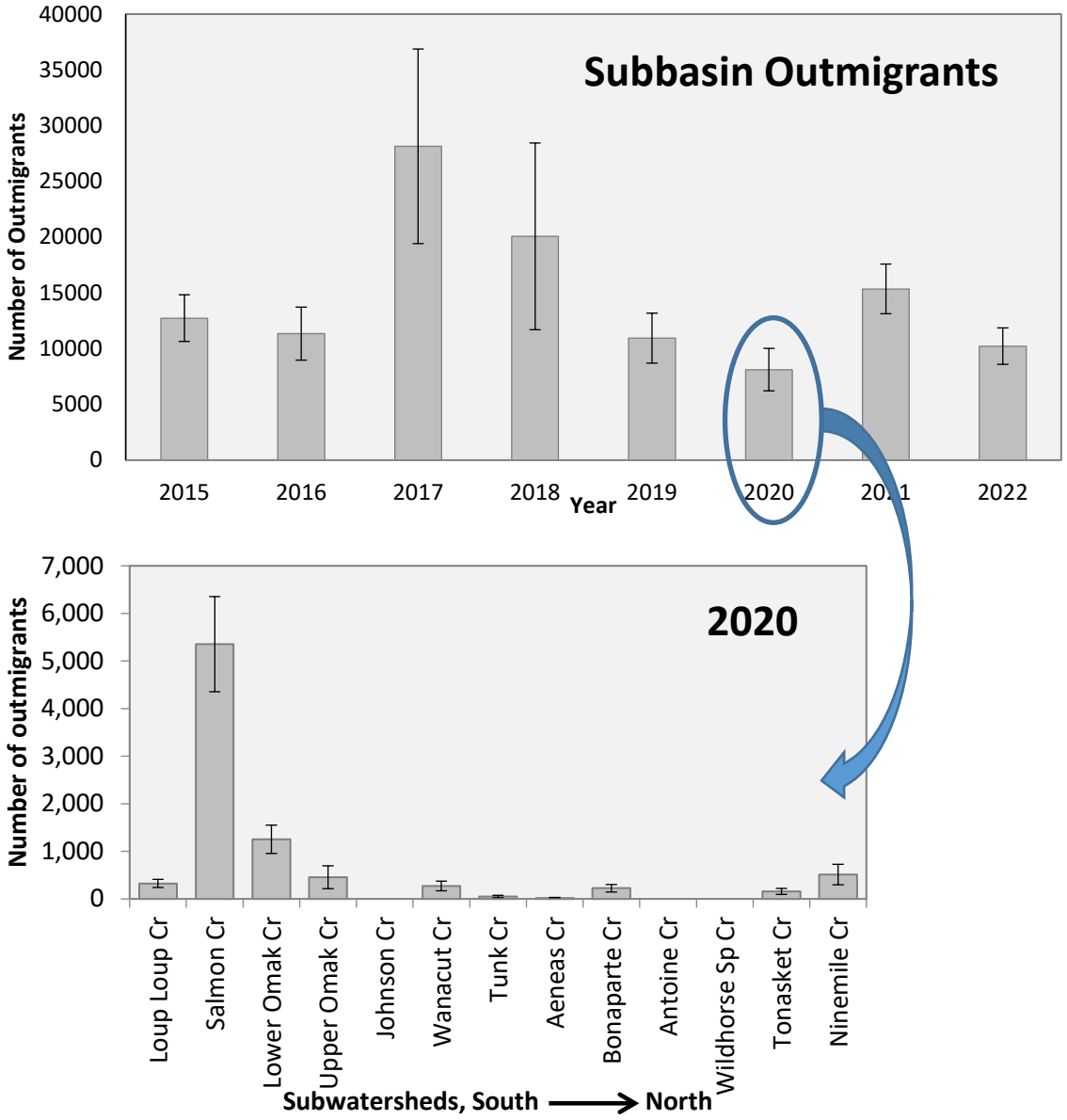




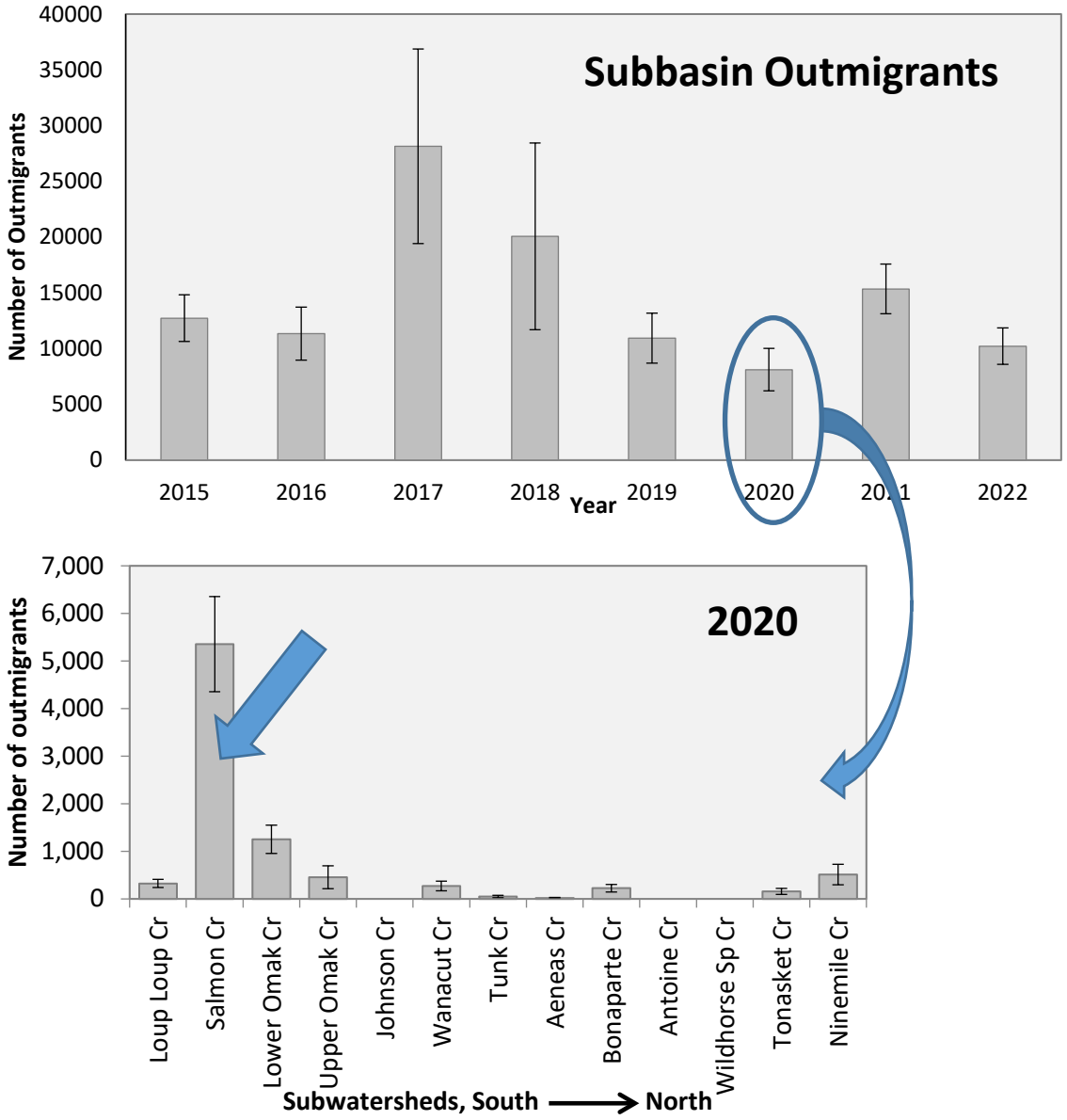
Results: Outmigration



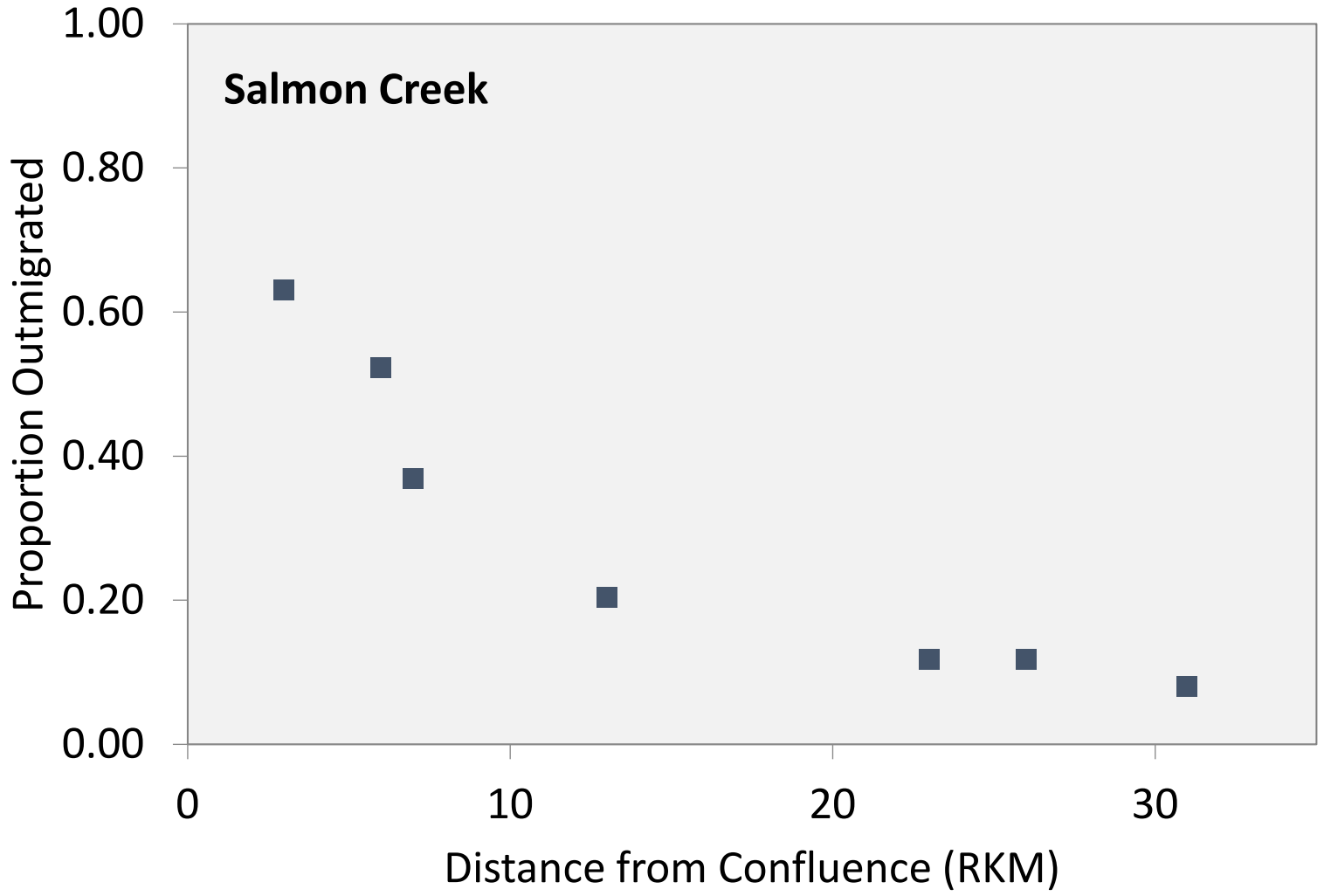
Results: Outmigration



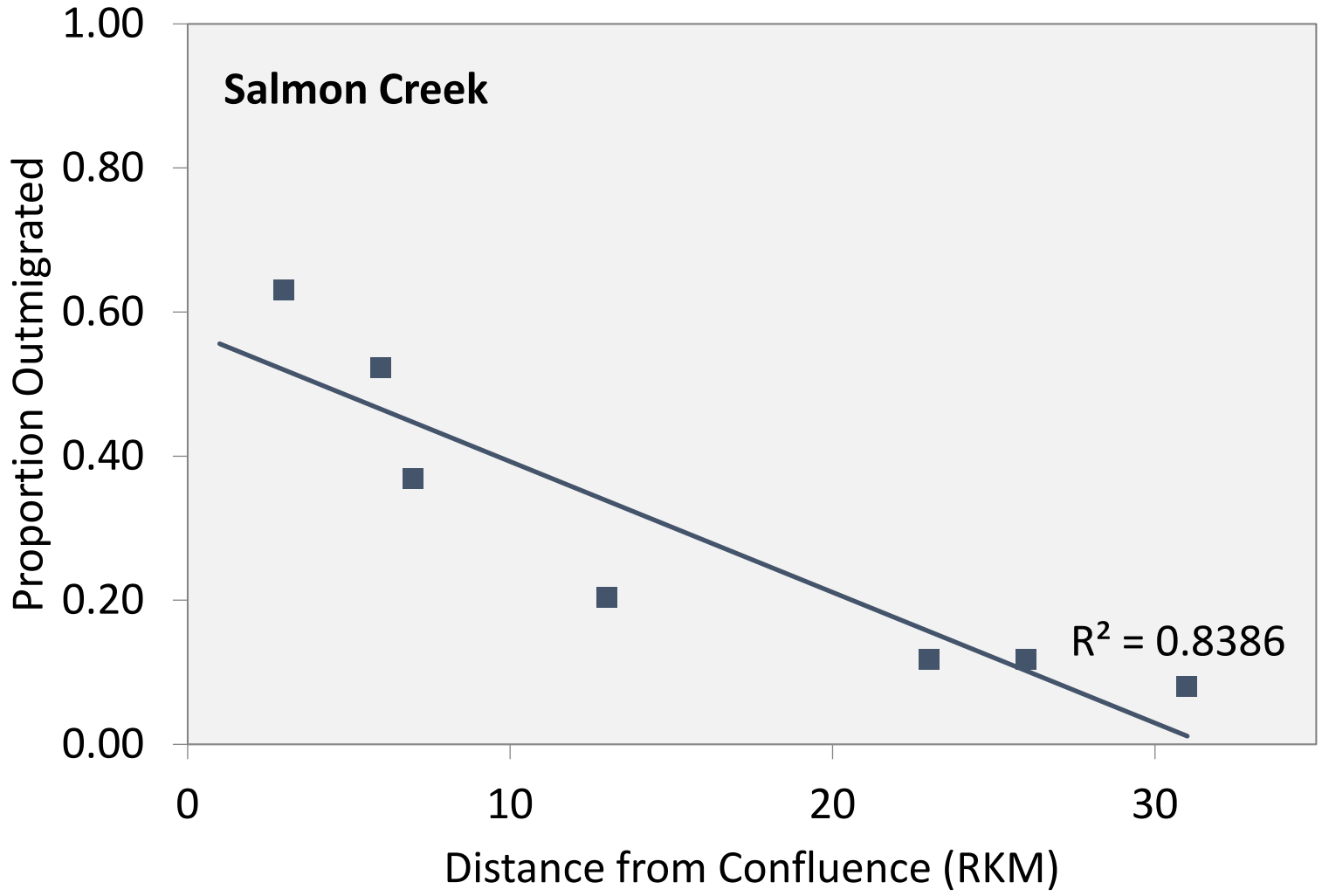
Results: Outmigration



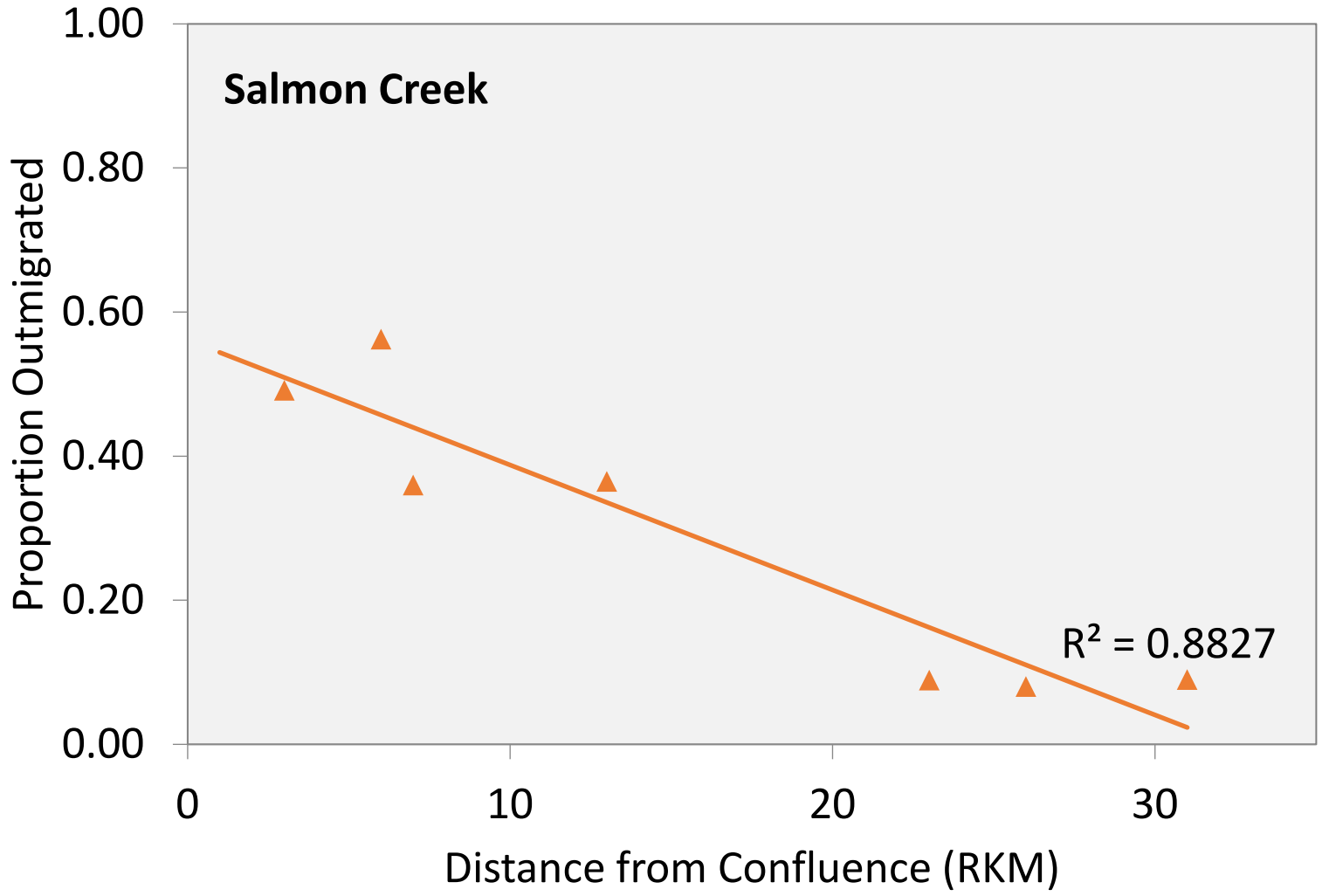
Results: Outmigration varies by RKM within tributaries



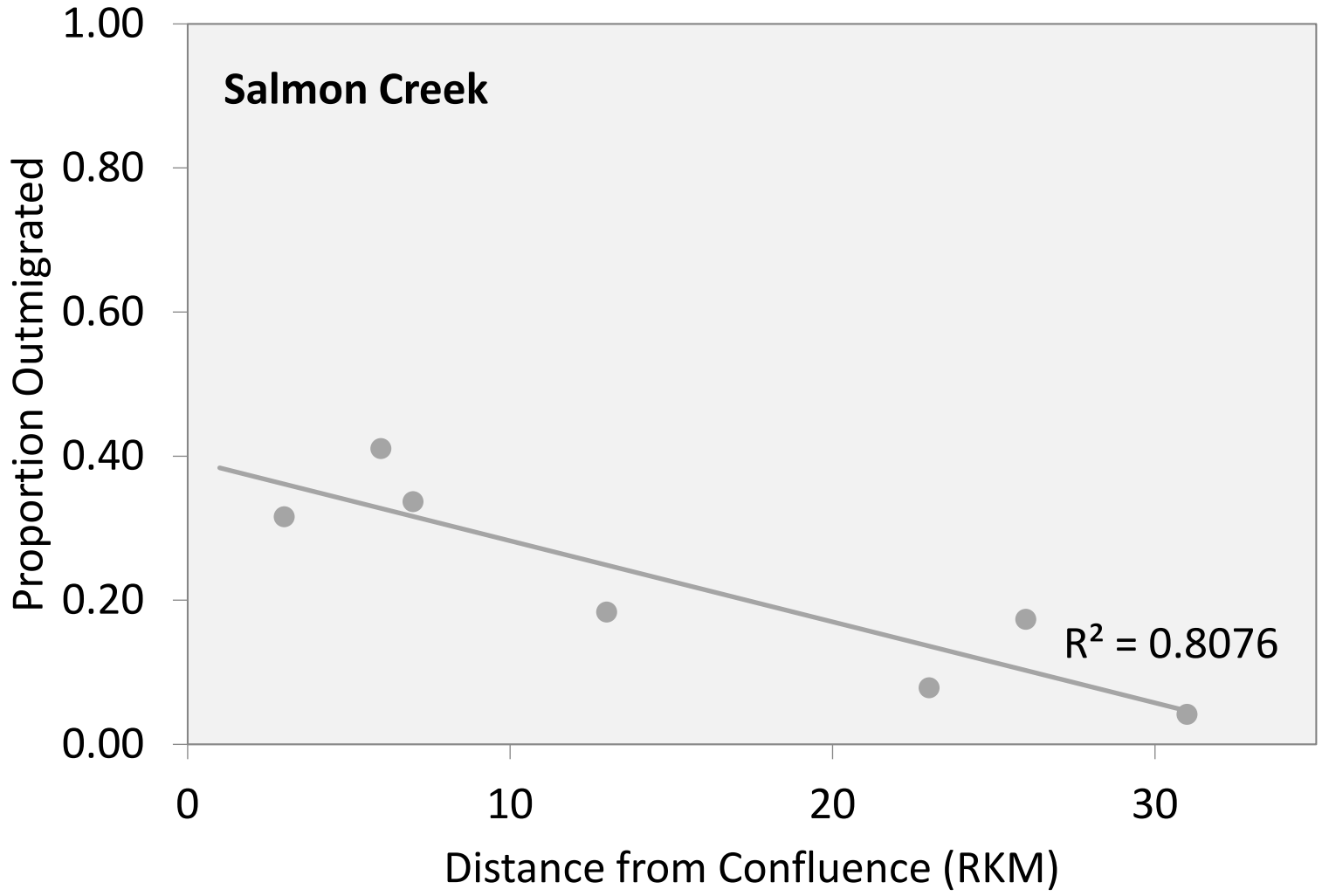
Results: Outmigration varies by RKM within tributaries



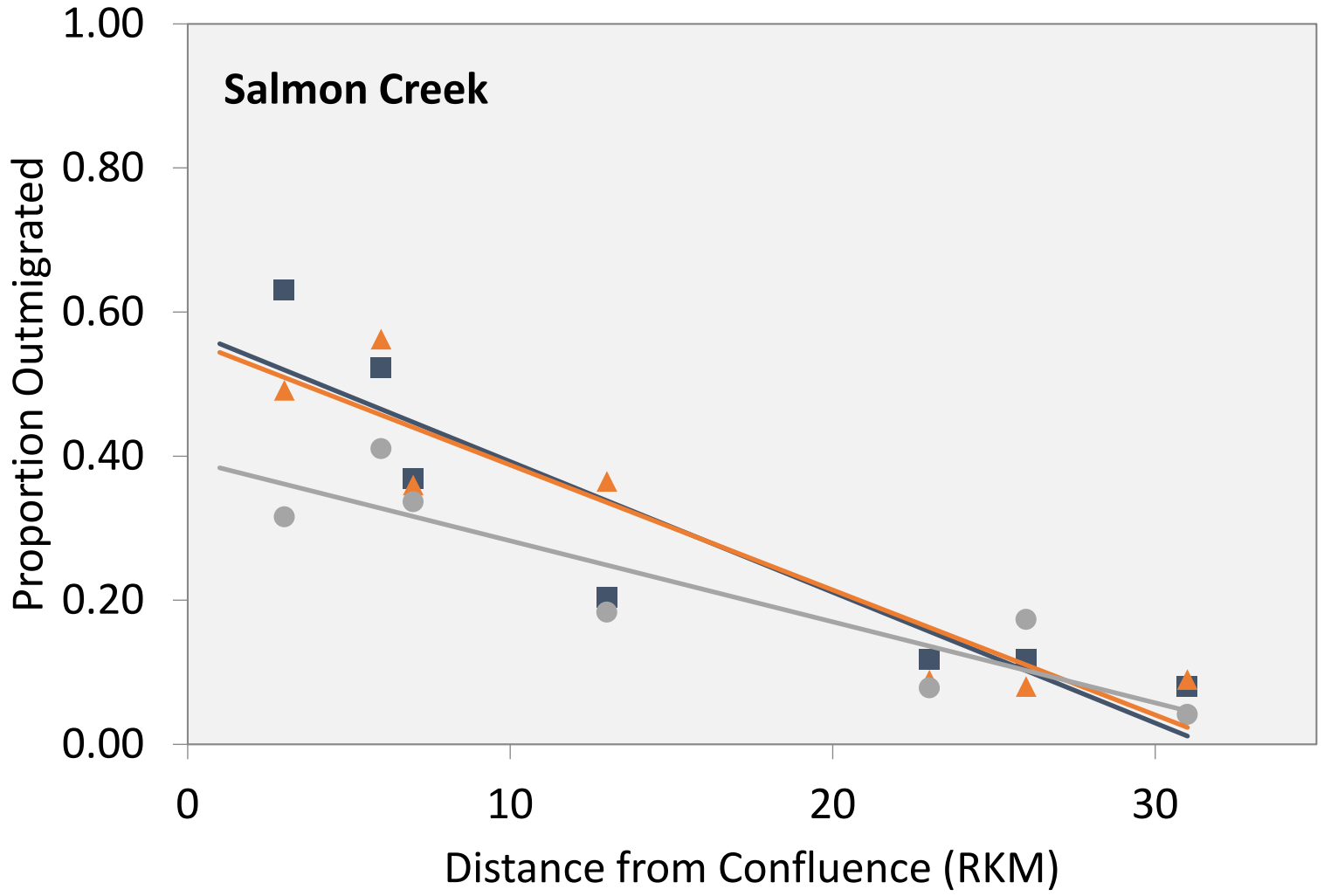
Results: Outmigration varies by RKM within tributaries



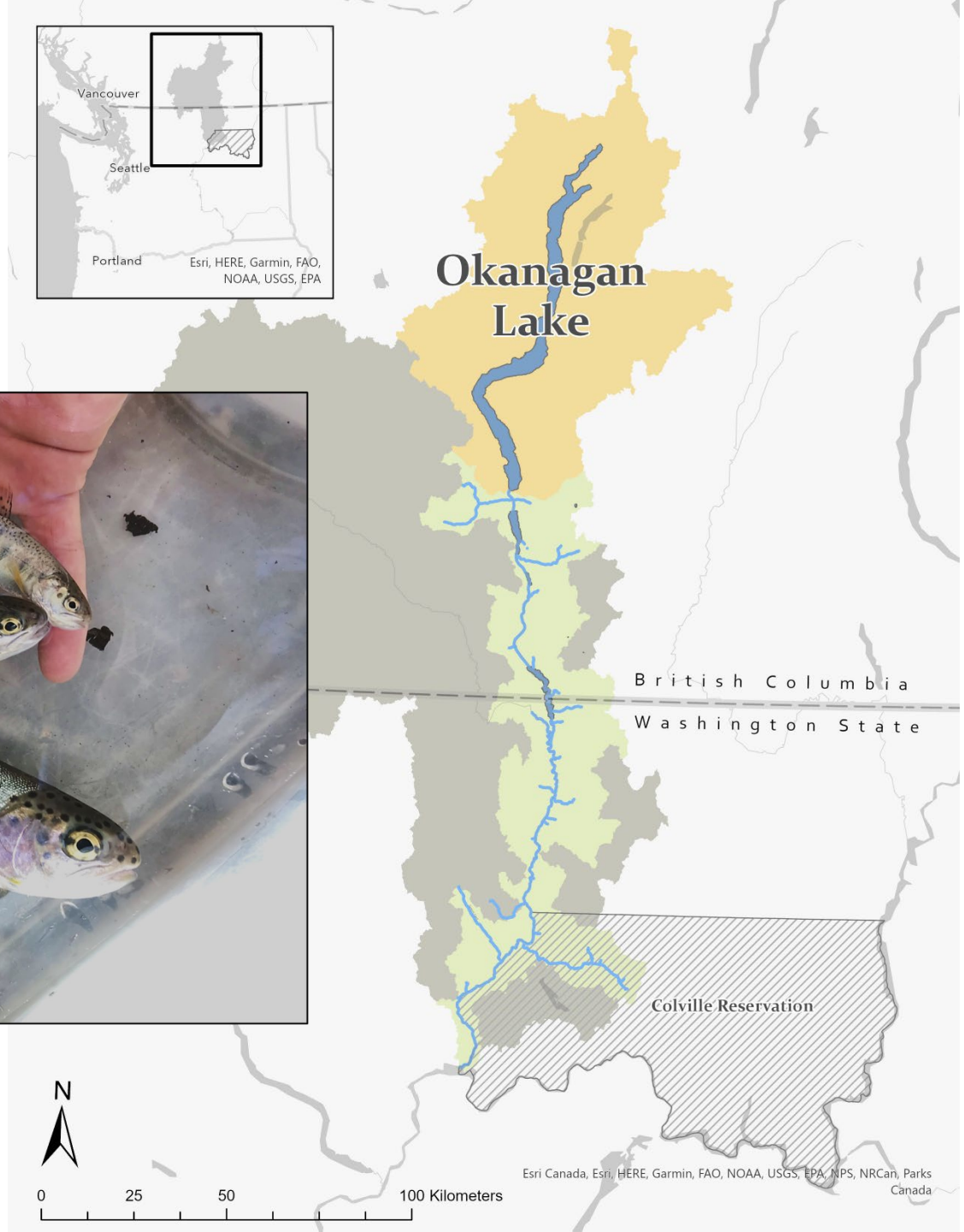
Results: Outmigration varies by RKM within tributaries



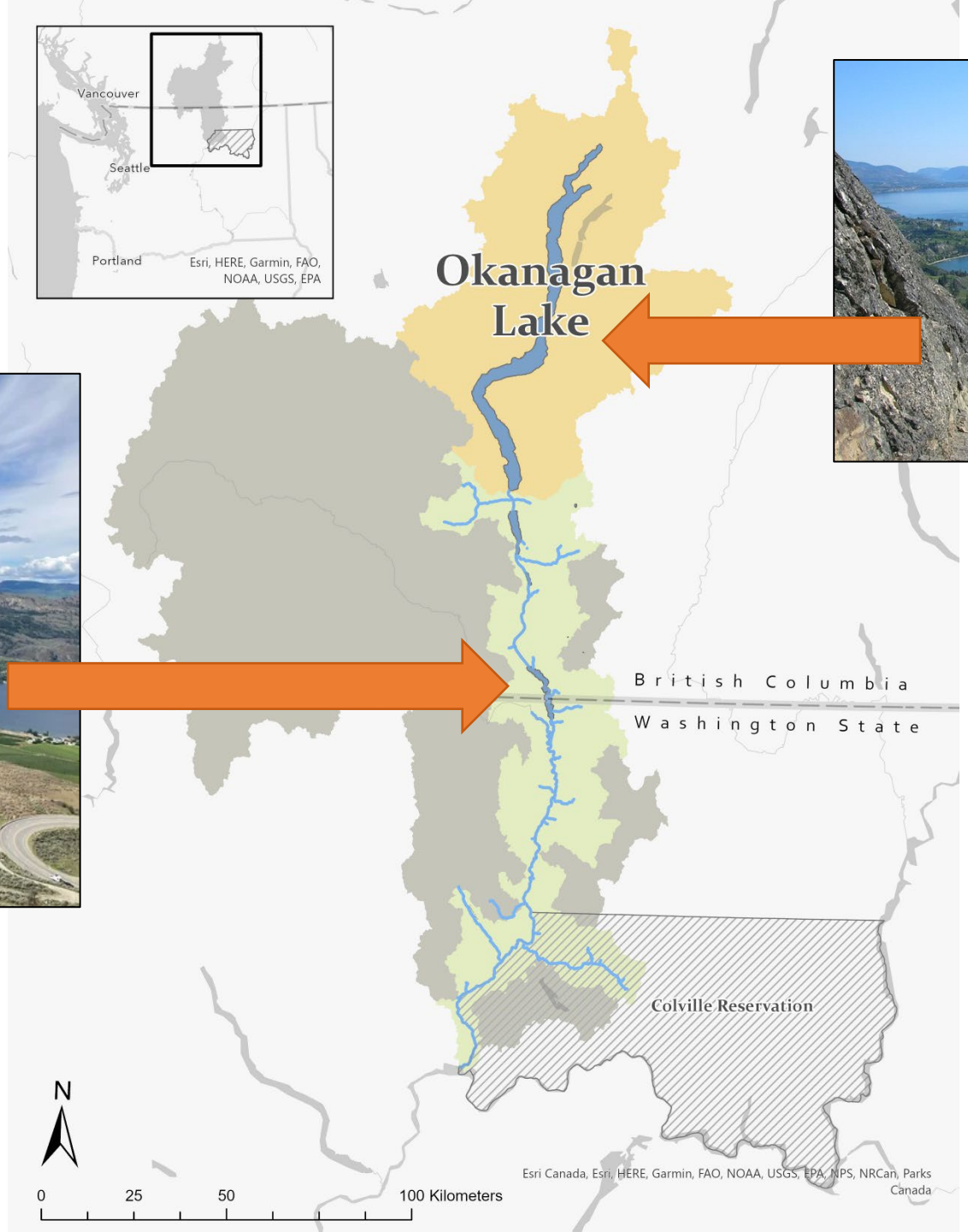
Results: Outmigration varies by RKM within tributaries



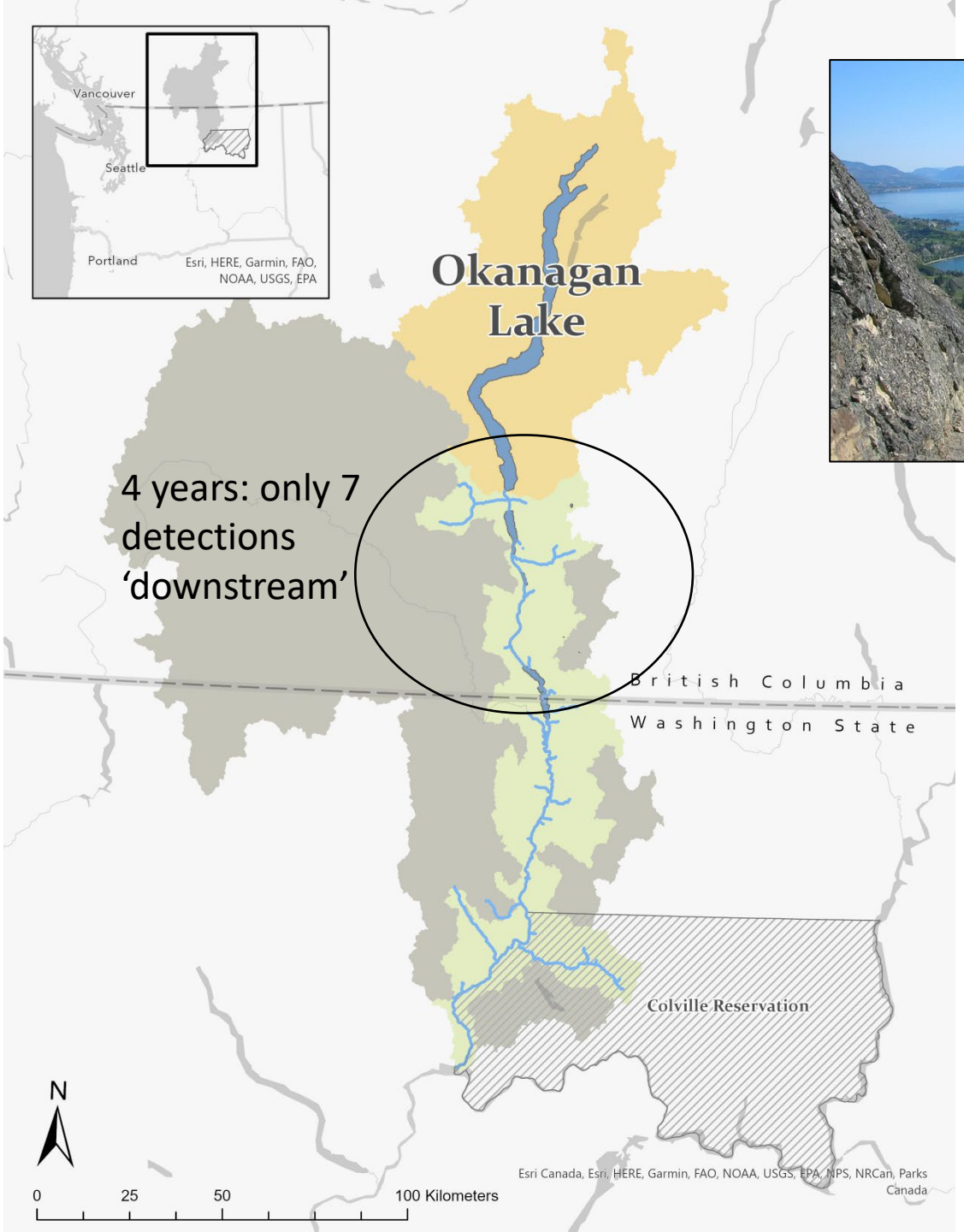
- Unique *O.mykiss* life history strategies
  - Above and below lakes



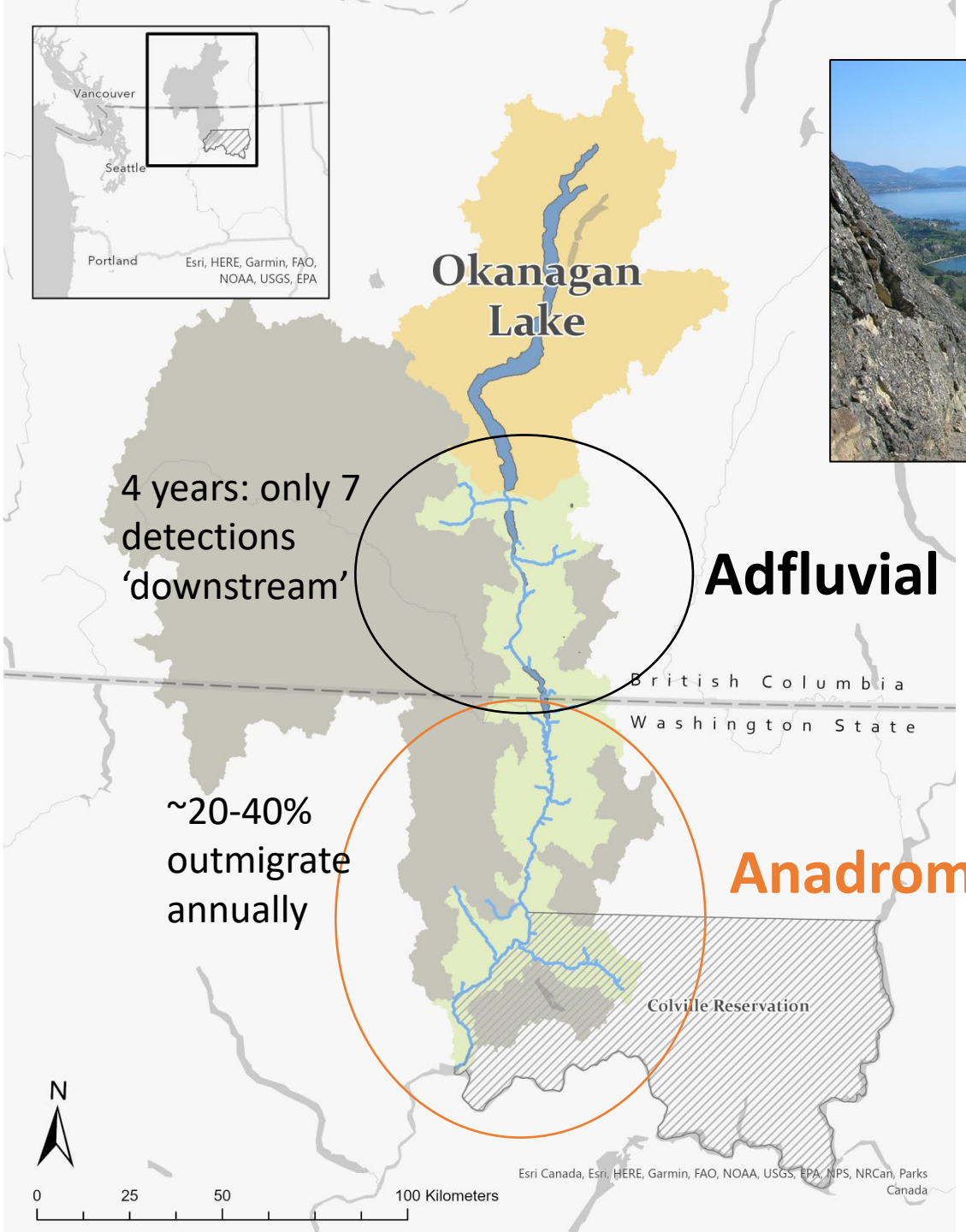
- Unique *O.mykiss* life history strategies
  - Above and below lakes



- Unique *O.mykiss* life history strategies
  - Above and below lakes



- Unique *O.mykiss* life history strategies
  - Above and below lakes



OBMEP Fish Monitoring

- Steelhead/*O.mykiss* can be difficult to monitor
  - Complex life history traits
  - Few spawners over a large subbasin
- Adapt methods
  - Local subbasin
  - Species
- Continue long-term dataset
- Good working relationship, data collection both sides of the WA/BC border
  - Colville Tribes
  - Okanagan Nation Alliance
  - Methods, common database
  - Annual reporting

Habitat Monitoring

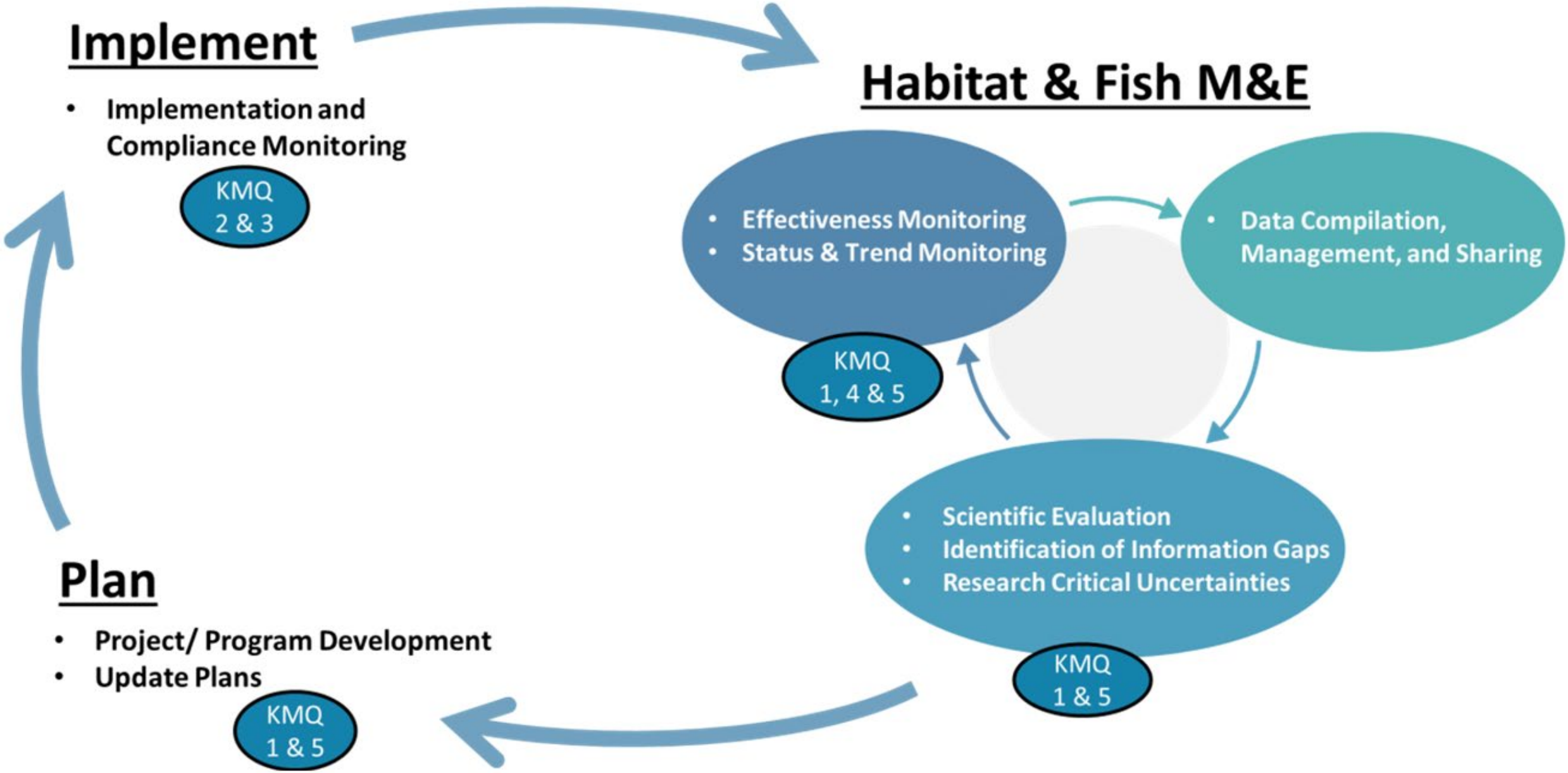
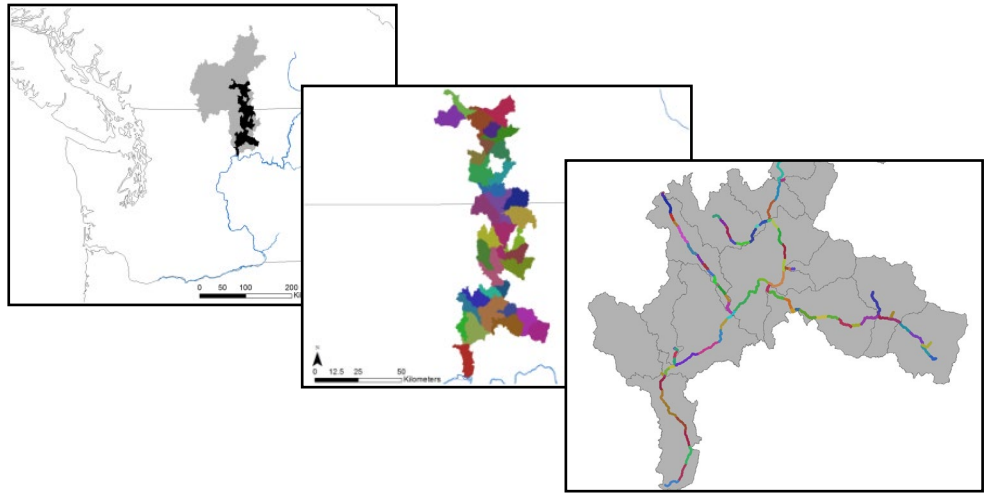
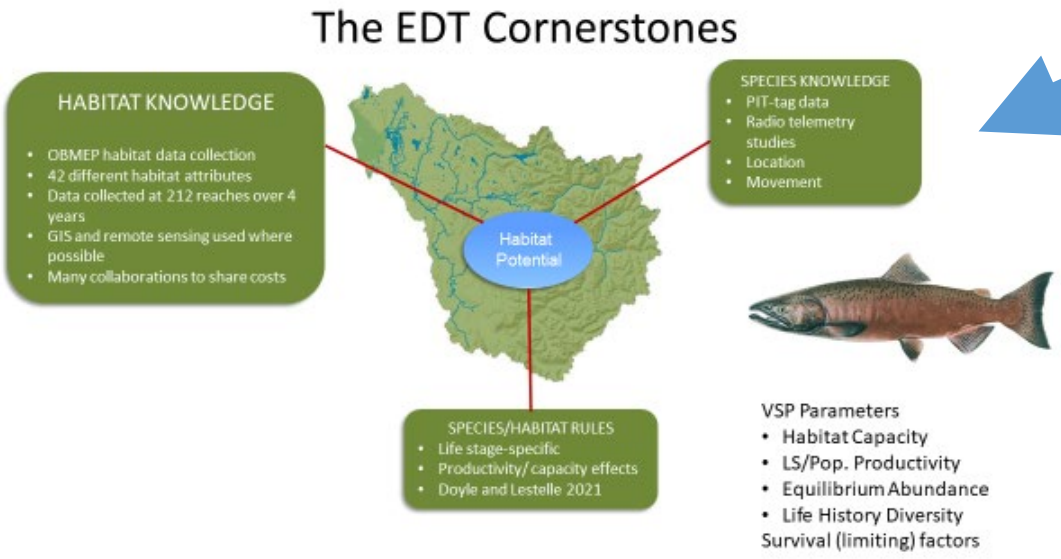


Figure 1 – Conceptual Habitat Monitoring Cycle

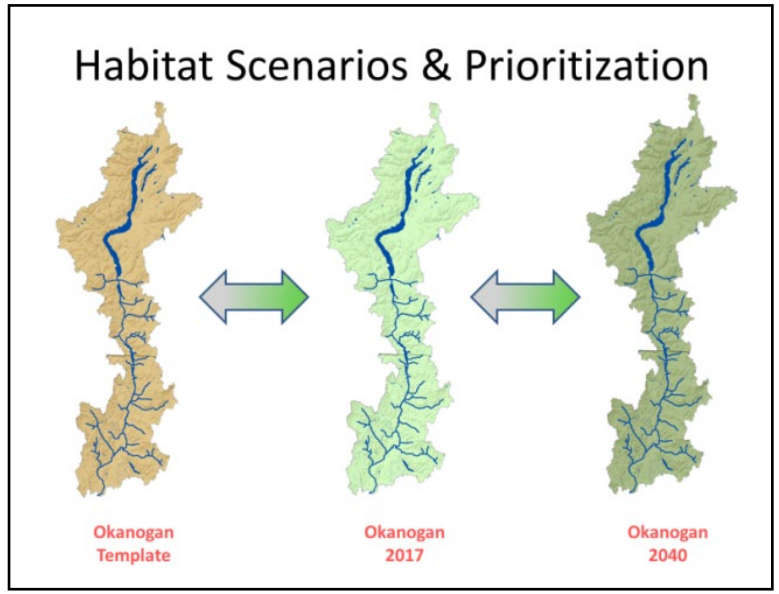


Framework

Data



Habitat Model



Scenarios & Prioritization

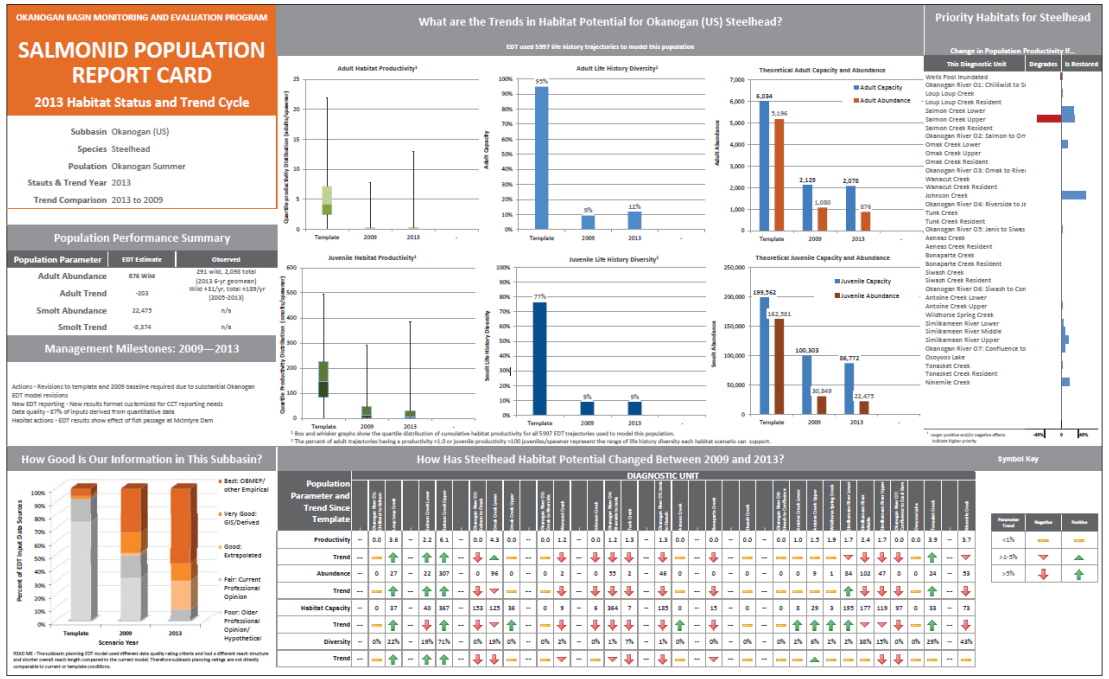


Figure 7. Population Report, U.S. Population of Okanogan River Summer Steelhead

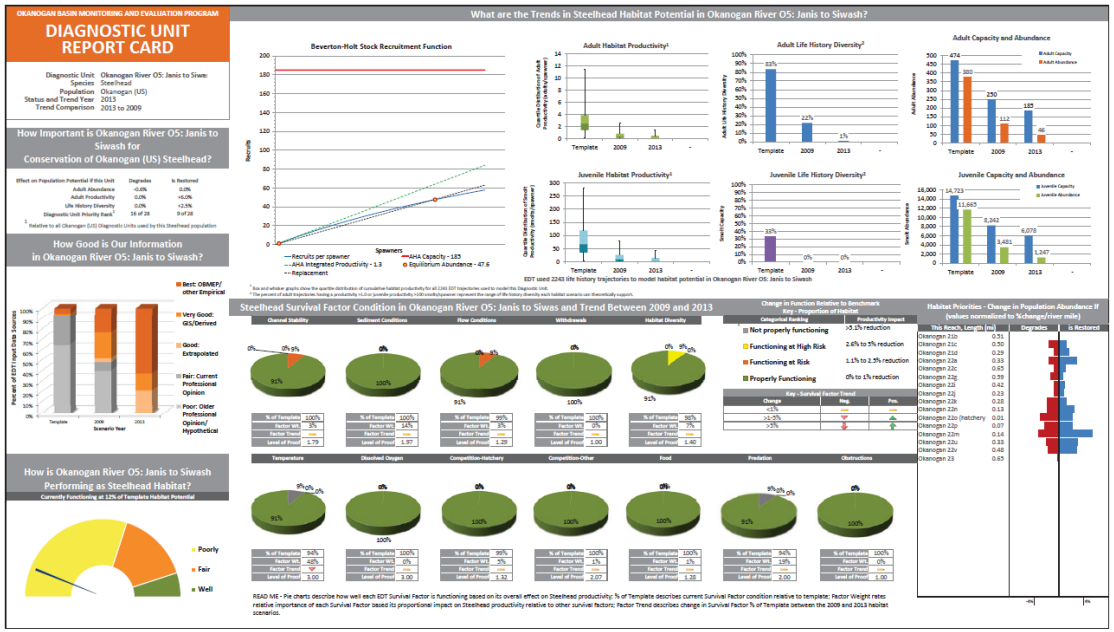
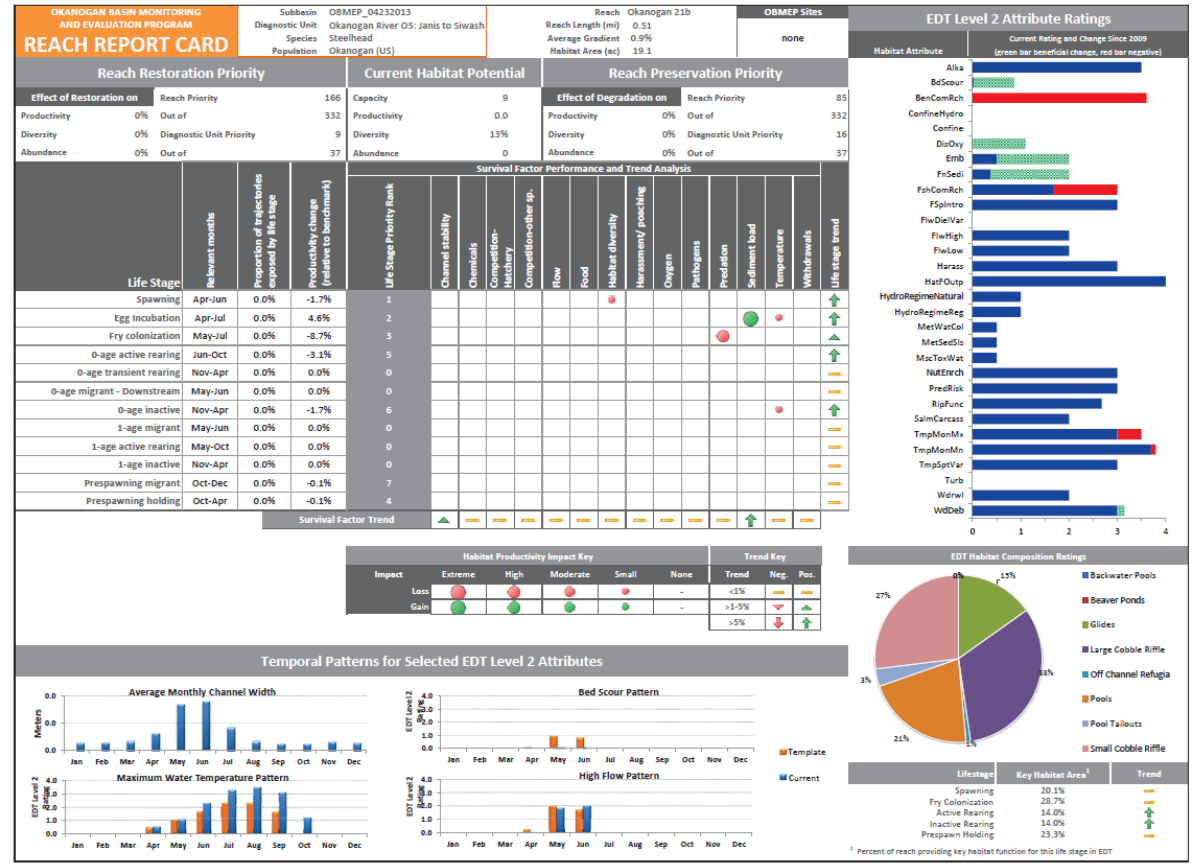


Figure 18. Okanogan River O5 Habitat Diagnosis Report

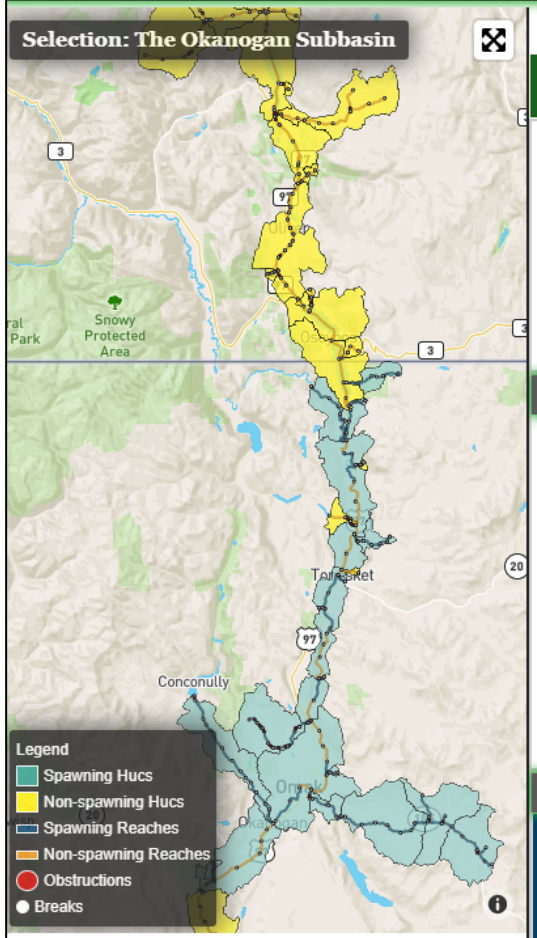


https://ecosystems.azurewebsites.net/hstr-okanogan/

WayPoint

Colville Tribes Okanogan Monitoring and Evaluation Program

The Okanogan Subbasin Report Card: 2021 Habitat Status and Trend Cycle



Use the map above to navigate through the reports by clicking on individual assessment units and reaches. Report tab content will change with the selected scale.

View the Okanogan subbasin in detail

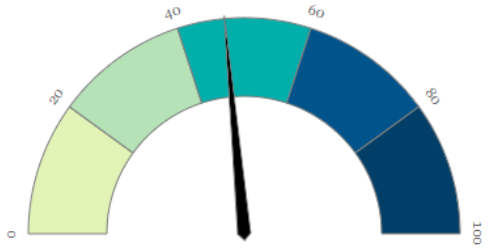
Country: United States | Species: Summer Steelhead | Status and Trend Year: 2021 | Trend Comparison: Template

Performance Summary | VSP Criteria Summary | Habitat Trends | Obstruction Performance | Implementation

Read me first! Welcome to the web-based Habitat Status and Trend Report Cards for the Okanogan Subbasin. The tabs directly above access different reporting metrics (hover on these for more info) and the filters found above the report tabs allow you to select the species, status and trend year, and trend comparison year. Note that the trend comparison filter selection will only affect results that are showing a trend, otherwise there will be no change to the data displayed. Hover over the "?" icons on each page for information about the associated features.

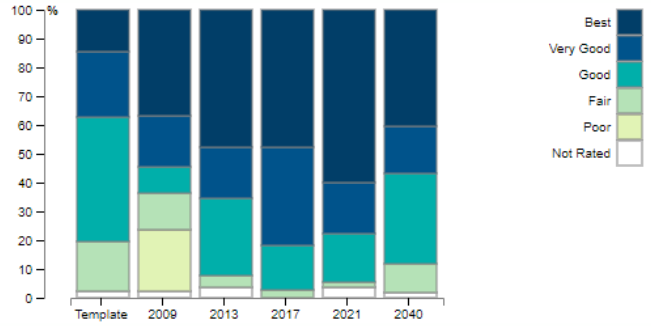
The first time you open the report cards and navigate to a new tab your browser will download all the associated data to your browser cache. Download time will vary depending on your internet connection speed. A progress-spinner will display over each report element until the download is complete. Once all the report card data are downloaded, they will remain available in your browser cache for instantaneous navigation as long as your viewing session remains open.

How is The Okanogan Subbasin Performing as Summer Steelhead Habitat?



In 2021 performed at **47%** of historic habitat potential.

How Good is the Information For The Okanogan Subbasin?



Population Performance Summary

Population Parameter	EDT Estimate	EDT Trend	Natural Origin Abundance ± 90% CI (range), Trend/year	Hatchery Origin Abundance ± 90% CI (range), Trend/year	Total Origin Abundance ± 90% CI (range), Trend/year	Data Source
Adult Abundance	449	−505	155 ± 3 (126-236), -137/4-year interval	286 ± 12 (109-564), -659/4-year interval	478 ± 9 (345-700), -796/4-year interval	OBMEP 2018-2021 from redd surveys, and PIT-tag estimates.
Smolt Abundance	34,481	−25,140	12,377 ± 2,160 (8,617-16,533), -7,902/4-year interval	99,447 ± 238 (92,867-102,489), -5,555/4-year interval	111,824 ± 2,398 (101,484-119,022), -13,457/4-year interval	OBMEP 2019-2022 PIT tag expansion for wild smolts from sampled tributaries only (minimum estimate). GPUD-BAM 2019-2022 hatchery releases.

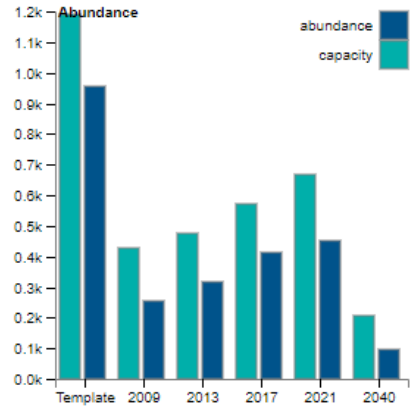
Colville Tribes Okanogan Monitoring and Evaluation Program

The Okanogan Subbasin Report Card: 2021 Habitat Status and Trend Cycle

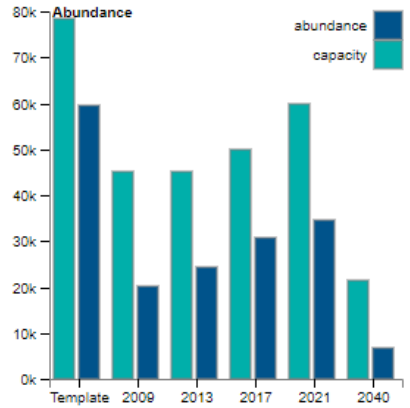
Country: United States | Species: Summer Steelhead | Status and Trend Year: 2021 | Trend Comparison: Template

Performance Summary | **VSP Criteria Summary** | Habitat Trends | Obstruction Performance | Implementation

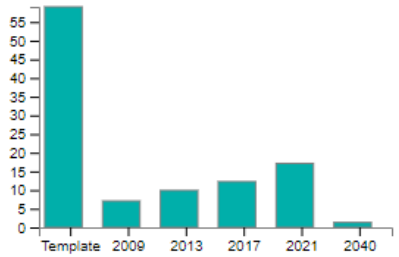
Adult Capacity and Abundance



Juvenile Capacity and Abundance

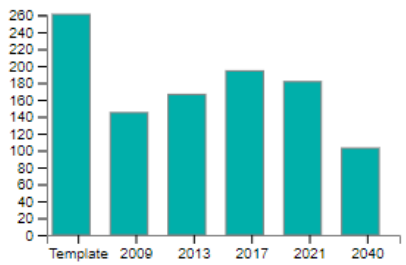


Adult Life History Diversity

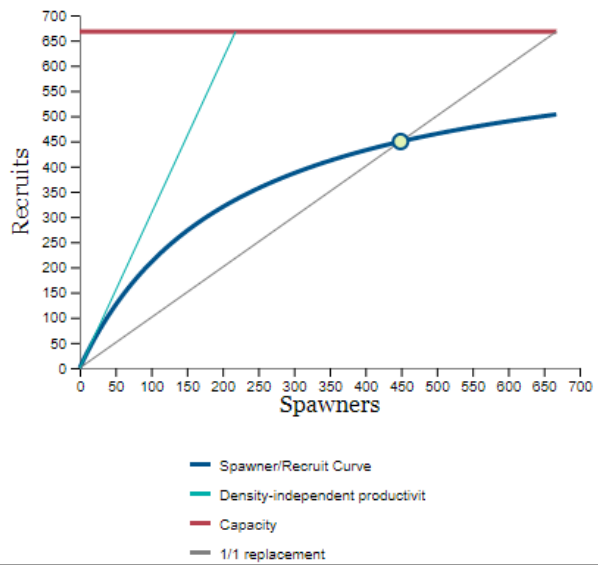


Adult Habitat Productivity

Juvenile Habitat Productivity

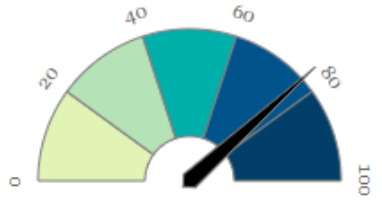


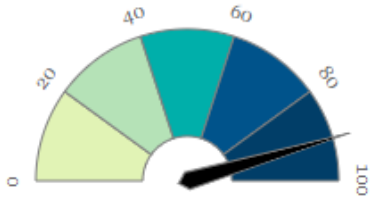
Beverton-Holt Stock Recruitment Function

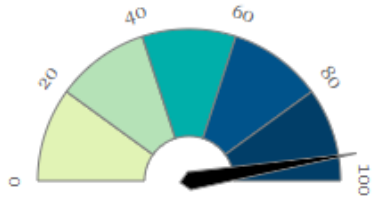


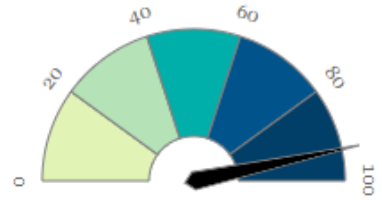
Limiting (Survival) Factors

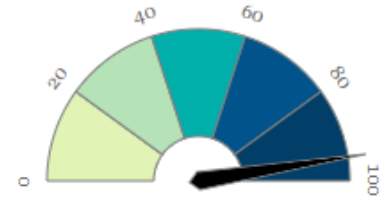
Summer Steelhead Survival Factor Condition In Loup Loup Creek-Lower DS and Trend Between Template Conditions and 2021

Sediment Conditions	
	
% of Template	77%
Factor Trend	▼
Factor Weight	10.0
Level of Proof	2.8

Cover and Complexity	
	
% of Template	91%
Factor Trend	▼
Factor Weight	2.4
Level of Proof	1.1

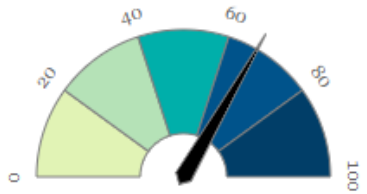
Temperature	
	
% of Template	95%
Factor Trend	▼
Factor Weight	2.1
Level of Proof	2.3

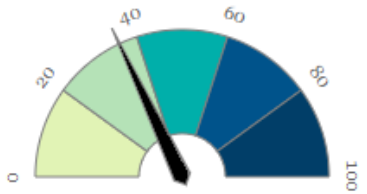
Flow Variability	
	
% of Template	93%
Factor Trend	▼
Factor Weight	1.7
Level of Proof	1.5

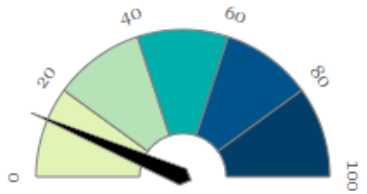
Pathogens	
	
% of Template	95%
Factor Trend	▼
Factor Weight	1.7
Level of Proof	2.4

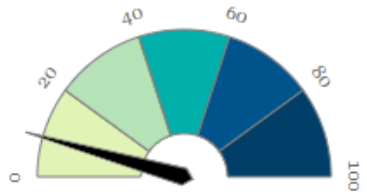
Habitat Attributes

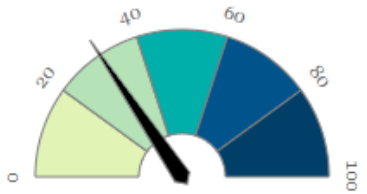
Priority Summer Steelhead Habitat Attributes in Loup Loup Creek-Lower DS and Trend Between Template Conditions and 2021

Fine Sediment	
	
% of Template	67%
Factor Trend	▼
Factor Weight	9.3
Level of Proof	2.3

Temperature: Daily Maximum	
	
% of Template	36%
Factor Trend	▼
Factor Weight	8.9
Level of Proof	1.9

Woody Debris	
	
% of Template	13%
Factor Trend	▼
Factor Weight	4.6
Level of Proof	1.0

Salmon Carcasses	
	
% of Template	9%
Factor Trend	▼
Factor Weight	3.4
Level of Proof	2.0

Confinement: Artificial	
	
% of Template	31%
Factor Trend	▼
Factor Weight	1.4
Level of Proof	1.7

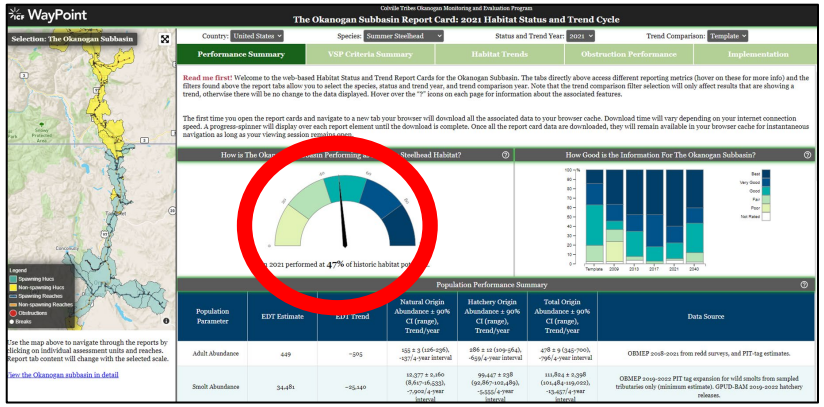
Potentially Suitable Actions for Restoring Summer Steelhead Habitat in Loup Loup Creek-Lower DS

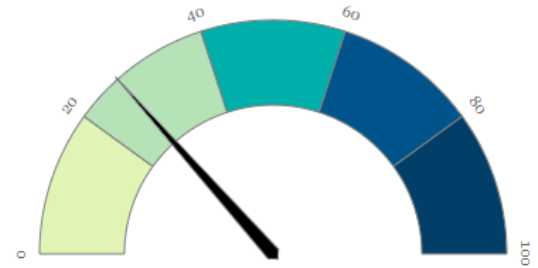
Action	Category	Overall Strength of Effect	Fine Sediment	Temperature: Daily Maximum	Woody Debris	Salmon Carcasses	Confinement: Artificial
Acquire/protect/restore 75.1–100% of historical flows	Instream Flow Acquisition, Protection, Restoration	■	■	■	▪	·	·
Forest practices	Riparian Restoration and Management	■	■	▪	■		▪
Dam removal or breaching	Fish Passage Restoration	■	■	■	▪	·	■
Acquire/protect/restore 50.1–75% of historical flows	Instream Flow Acquisition, Protection, Restoration	■	■	■	·		·
Livestock removal/rotation	Riparian Restoration and Management	■	■	▪	▪		▪
Road decommissioning or abandonment	Fine Sediment Management	■	■	·	·		▪
Riparian buffer planting	Riparian Restoration and Management	■	▪	·	·		·
Beaver reintroduction/beaver dam analogs	Side Channel/Off-channel Habitat Restoration	■	▪	·	·		▪
Restore floodplain connectivity	Floodplain Reconnection and Management	■	■	·	·		■
Riparian fencing	Riparian Restoration and Management	■	▪	·	·		·
Upland vegetation treatment/management	Fine Sediment Management	■	■	·	·		·
Acquire/protect/restore 25.1–50% of historical flows	Instream Flow Acquisition, Protection, Restoration	■	■	■	·		·
Buffer restoration, vegetation management	Floodplain Reconnection and Management	■	■	·	■	·	·
Restore perennial side channel (w/groundwater)	Side Channel/Off-channel Habitat Restoration	■	·	■	▪		▪
Road grading/drainage improvements	Fine Sediment Management	■	■				·
Large woody debris/engineered logjam placement	Instream Structures	■	▪		■	·	▪
Habitat acquisition or conservation easement	Land Protection	■	▪	▪	▪		▪

Categorical Actions

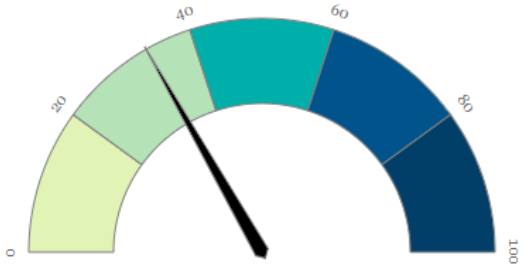
Limiting Factors Habitat Attributes

Habitat Performance

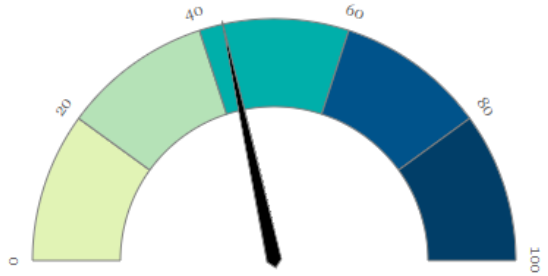




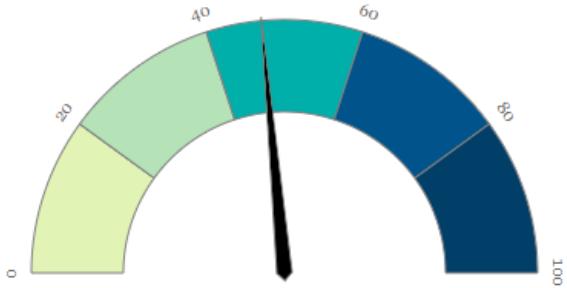
In 2009 performed at **27%** of historic habitat potential.



In 2013 performed at **33%** of historic habitat potential.

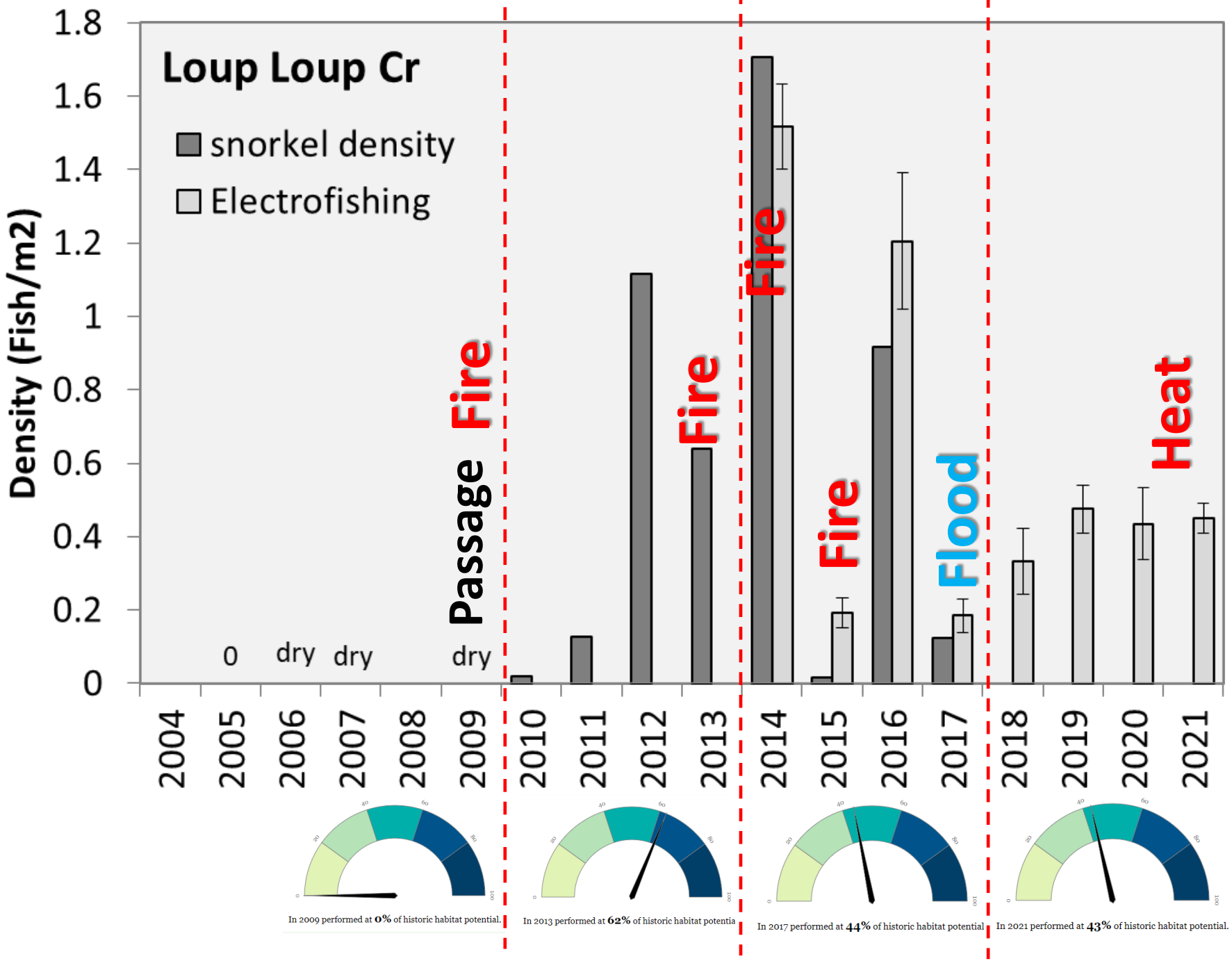


In 2017 performed at **43%** of historic habitat potential.



In 2021 performed at **47%** of historic habitat potential.

Time



2009

Obstructions	
% of Template	0%
Factor Trend	▼
Factor Weight	10.0
Level of Proof	--

Salmon Carcasses	
% of Template	5%
Factor Trend	▼
Factor Weight	0.0
Level of Proof	2.0

2013

Woody Debris	
% of Template	13%
Factor Trend	▼
Factor Weight	6.6
Level of Proof	2.3

Fine Sediment	
% of Template	64%
Factor Trend	▼
Factor Weight	5.0
Level of Proof	1.7

2017

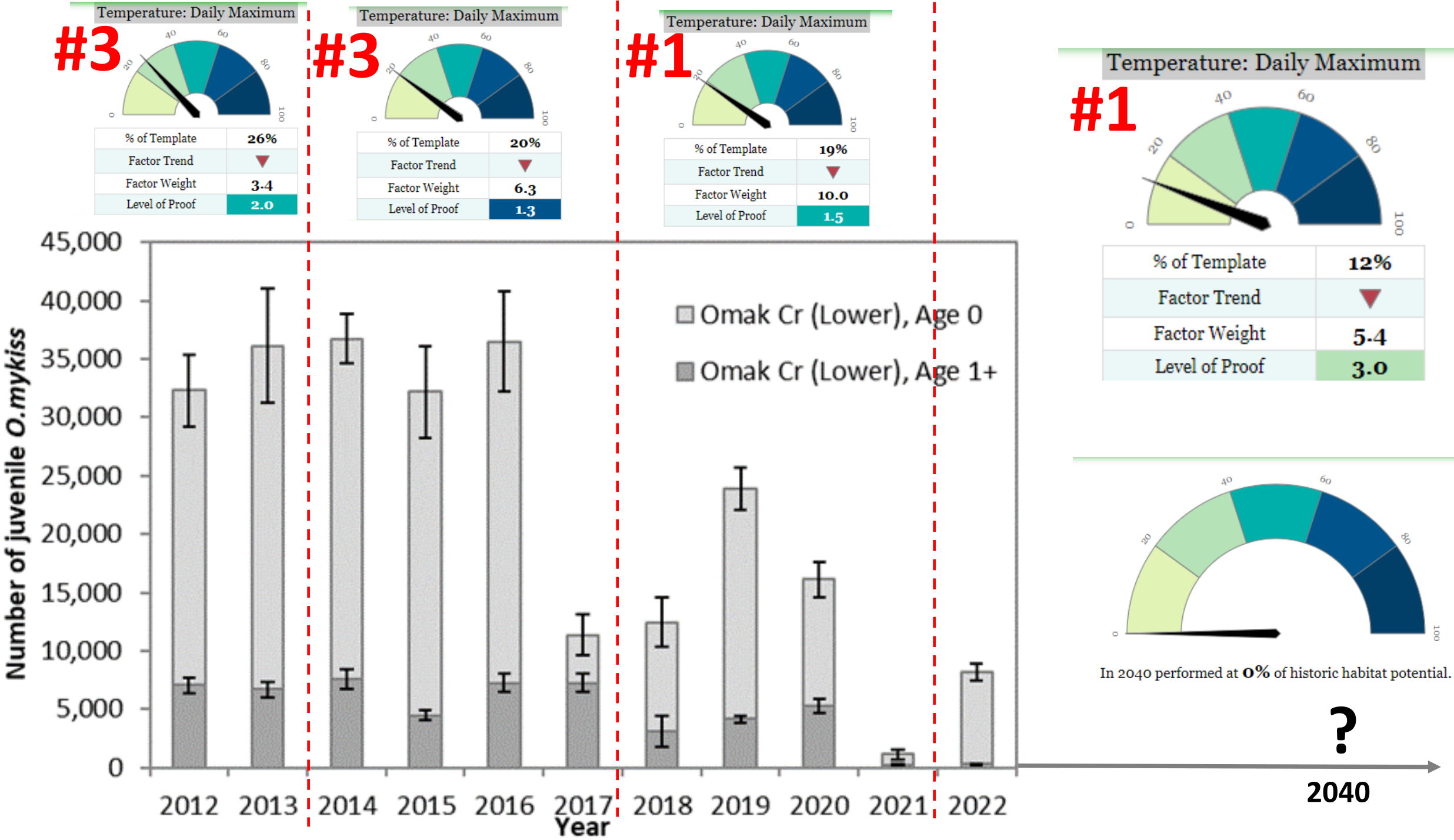
Fine Sediment	
% of Template	66%
Factor Trend	▼
Factor Weight	9.1
Level of Proof	1.7

Woody Debris	
% of Template	4%
Factor Trend	▼
Factor Weight	7.3
Level of Proof	1.7

2021

Fine Sediment	
% of Template	67%
Factor Trend	▼
Factor Weight	9.3
Level of Proof	2.3

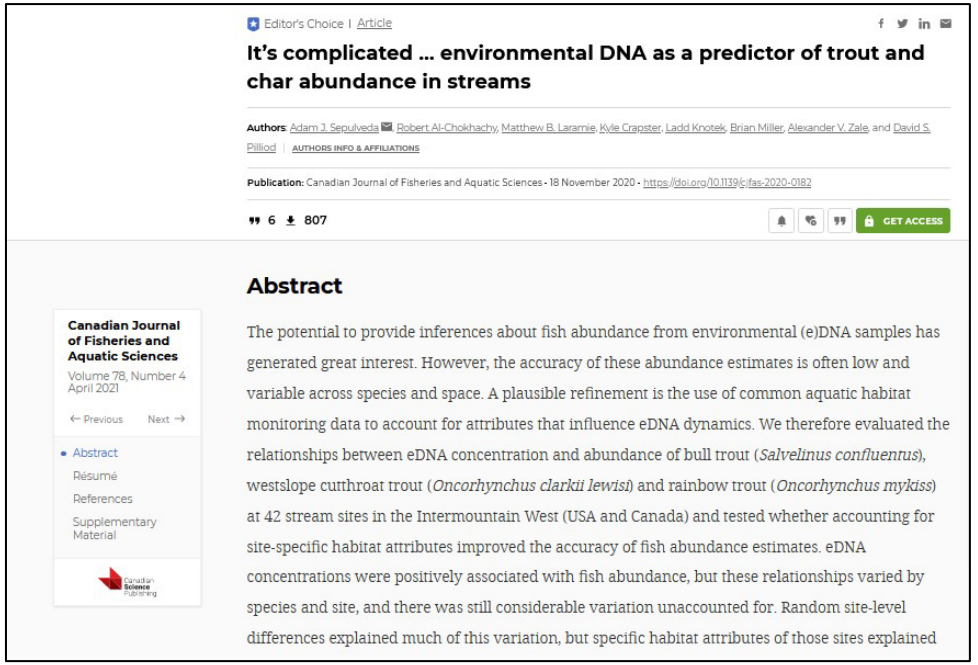
Temperature: Daily Maximum	
% of Template	36%
Factor Trend	▼
Factor Weight	8.9
Level of Proof	1.9


#3
Temperature: Daily Maximum
% of Template 26%
Factor Trend
Factor Weight 3.4
Level of Proof 2.0
#3
Temperature: Daily Maximum
% of Template 20%
Factor Trend
Factor Weight 6.3
Level of Proof 1.3
#1
Temperature: Daily Maximum
% of Template 19%
Factor Trend
Factor Weight 10.0
Level of Proof 1.5
#1
Temperature: Daily Maximum
% of Template 12%
Factor Trend
Factor Weight 5.4
Level of Proof 3.0
Omak Cr (Lower), Age 0
Omak Cr (Lower), Age 1+
Number of juvenile O.mykiss
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Year
In 2040 performed at 0% of historic habitat potential.
?
2040

Awards and peer–reviewed publications

- The first iteration of our OBMEP habitat status and trend reporting platform was acknowledged by the Environmental Business Journal for technical merit in information technology in 2015

- 2021 Journal Article: It’s complicated … environmental DNA as a predictor of trout and char abundance in streams.
  - Canadian Journal of Fisheries and Aquatic Sciences 78:4
- Editor’s Choice Award


Editor's Choice | Article

It’s complicated … environmental DNA as a predictor of trout and char abundance in streams

Authors: Adam J. Sepulveda, Robert Al-Chokhachy, Matthew B. Laramie, Kyle Crapster, Ladd Knotek, Brian Miller, Alexander V. Zale, and David S. Pilliod | AUTHORS INFO & AFFILIATIONS

Publication: Canadian Journal of Fisheries and Aquatic Sciences · 18 November 2020 · https://doi.org/10.1139/cjfas-2020-0182

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Canadian Journal of Fisheries and Aquatic Sciences
Volume 78, Number 4
April 2021
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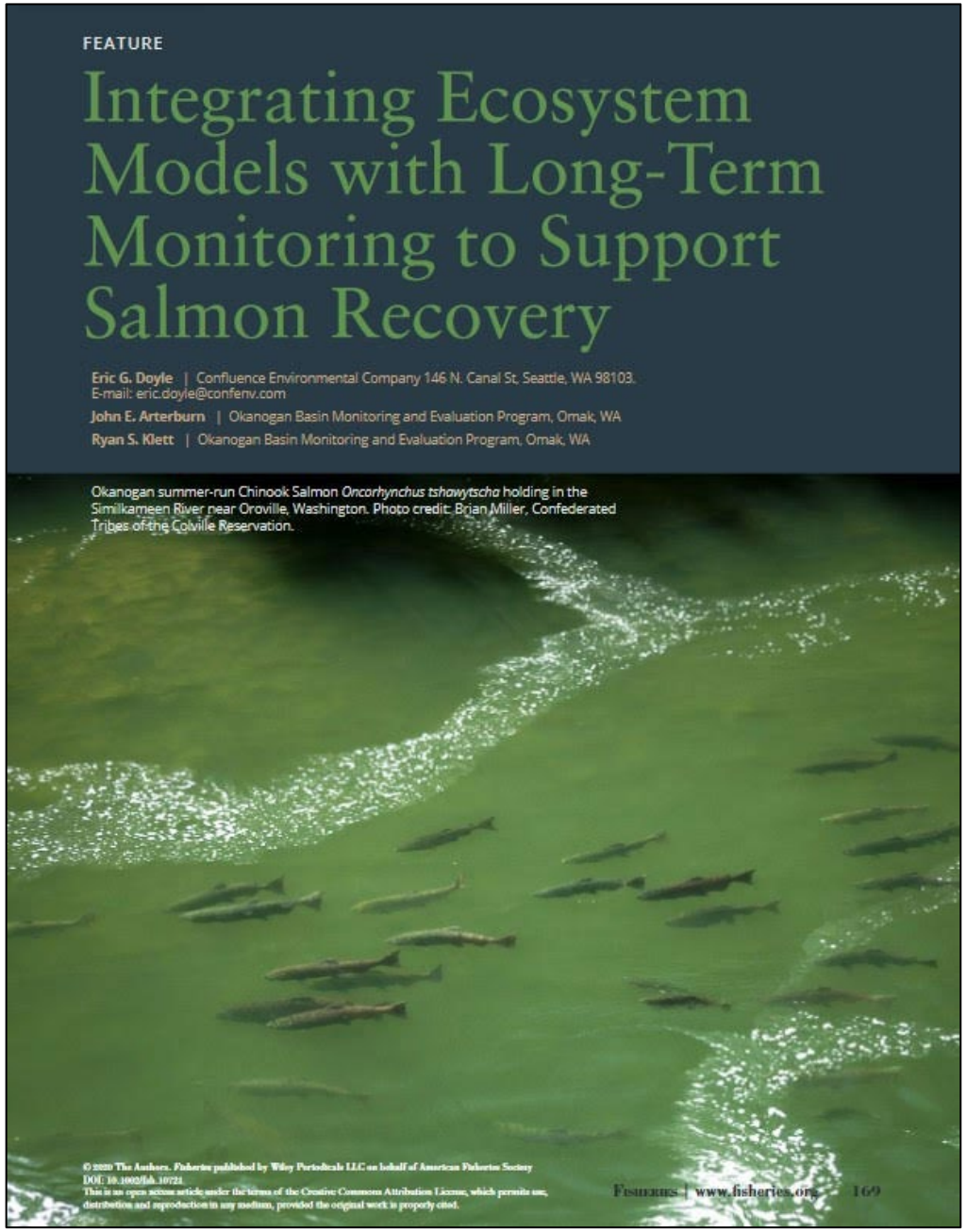
Supplementary Material

Abstract

The potential to provide inferences about fish abundance from environmental (e)DNA samples has generated great interest. However, the accuracy of these abundance estimates is often low and variable across species and space. A plausible refinement is the use of common aquatic habitat monitoring data to account for attributes that influence eDNA dynamics. We therefore evaluated the relationships between eDNA concentration and abundance of bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) and rainbow trout (*Oncorhynchus mykiss*) at 42 stream sites in the Intermountain West (USA and Canada) and tested whether accounting for site-specific habitat attributes improved the accuracy of fish abundance estimates. eDNA concentrations were positively associated with fish abundance, but these relationships varied by species and site, and there was still considerable variation unaccounted for. Random site-level differences explained much of this variation, but specific habitat attributes of those sites explained



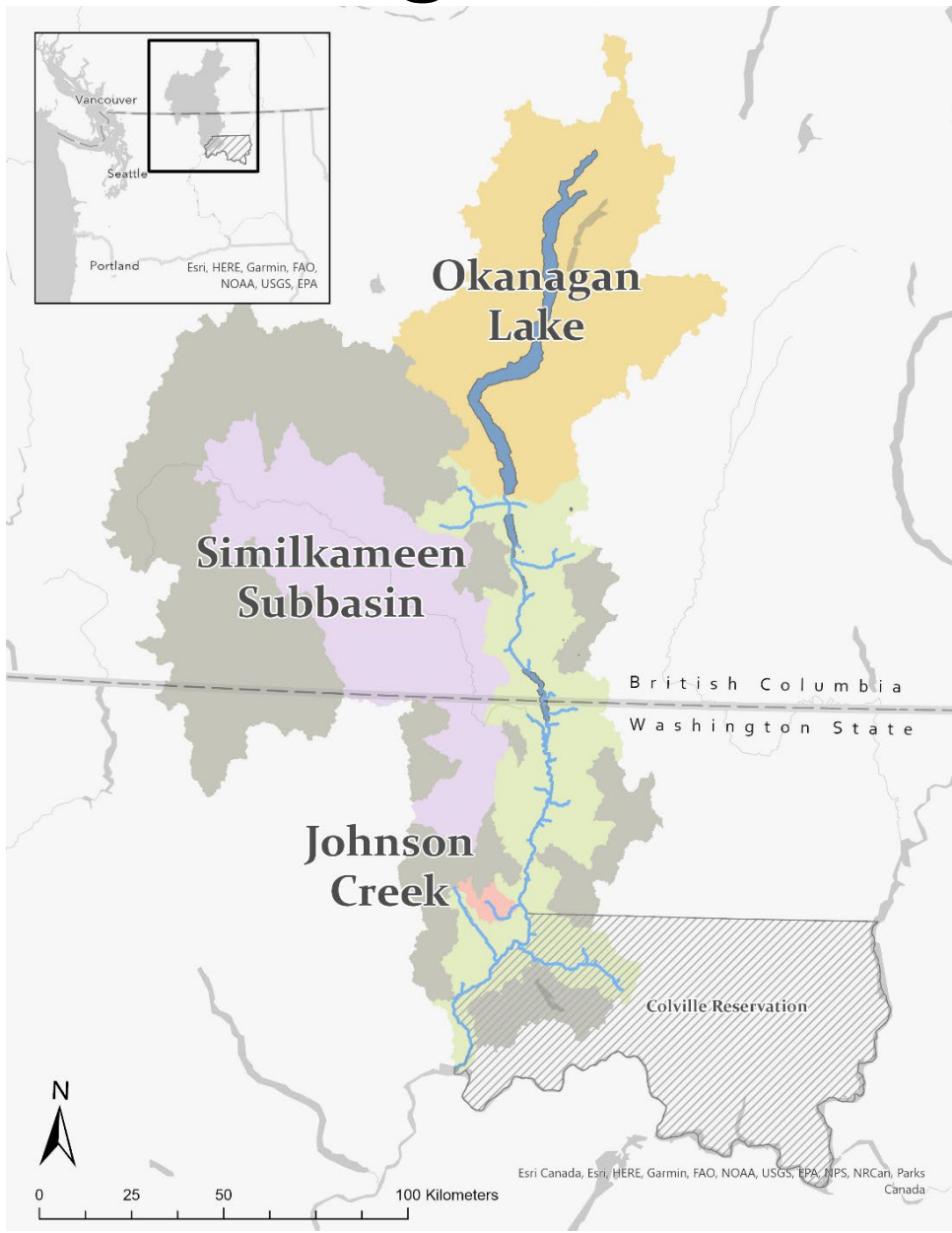
It is with great pleasure that I am writing to inform you we have selected your collaborative work on the Okanogan Ecosystem Diagnosis and Treatment model (EDT) as the recipient of the Society for Ecological Restoration Northwest Chapter's Special Award for 2022. This award is given “To a person, team or project representing a theme or focus of restoration science and practice chosen annually by the Board of Directors.”

The 2022 Special Award was open to any organization or individual that demonstrated their commitment to “Reconnecting to Restoration through the use of innovative tools and techniques in restoration planning or practice in the Cascadia Bioregion.”

SER NORTHWEST SOCIETY FOR ECOLOGICAL RESTORATION

Expanded needs for habitat monitoring

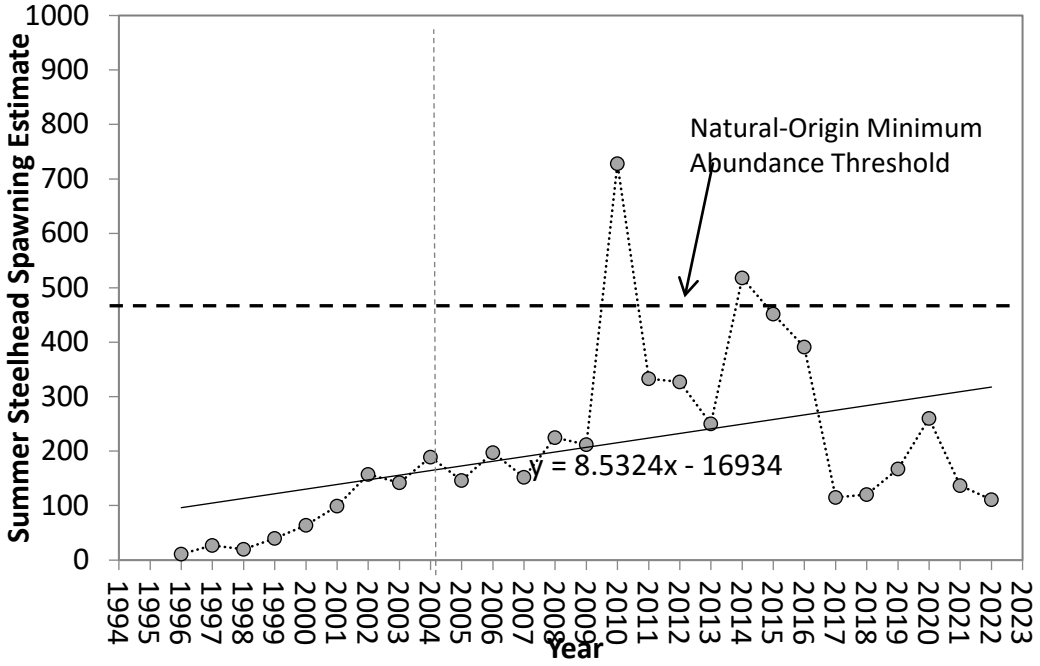
- Since 2014, OBMEP has been supporting EDT modeling in the Methow subbasin using other peoples data (incomplete and dated dataset).
- Upper Columbia lost habitat monitoring when CHaMP was defunded in 2018 and In 2021, the Colville Tribes Habitat implementation program expanded from the Okanogan subbasin to the entire Upper Columbia.
  - OBMEP or at least our approach could be expanded to cover Methow, the Entiat and Wenatchee subbasins but would need substantial additional funding.



Conclusions

- OBMEP has successfully created a subbasin scale S&T monitoring program.
  - Only program that can link changes in habitat to listed stock VSP parameters.
  - Fills all the S&T needs of the new tributary habitat monitoring strategy.
  - Award demonstrate our track record of not only adapting to new technology and methods but leading.
  - Tools and approach is fully transferable to any other subbasin.

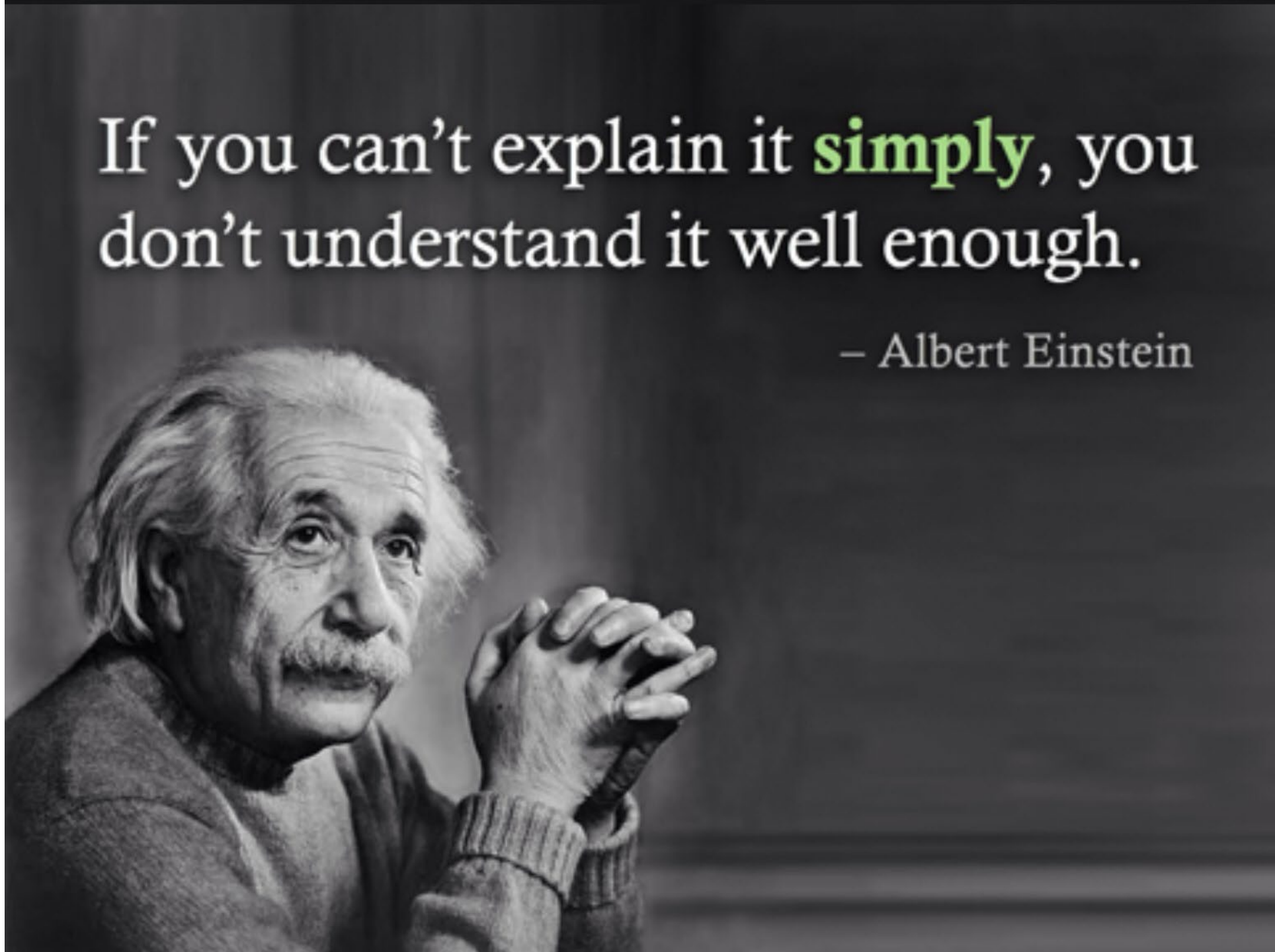
- How do we respond when requested to expand OBMEP S&T monitoring with “No new funds mandate”?



Questions?

Acknowledgements:
Funding provided by Bonneville Power Administration
Excellent field crews: CCT, ONA
Landowners throughout the subbasin

Questions?


If you can't explain it simply, you don't understand it well enough.
– Albert Einstein