

Juvenile Salmon Ecology in the Lower Columbia River and Estuary: Tidal Freshwater Research

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Project Collaborators

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- ▶ Oregon Department of Fish & Wildlife
 - Christine Mallette, Tucker Jones, Adam Storch, Ruth Farr
- ▶ National Marine Fisheries Service
 - David Teel, Paul Moran
- ▶ University of Washington
 - John Skalski
- ▶ Fisheries Consultant
 - Earl Dawley



Overview

- ▶ Study area
- ▶ Project goals and objectives
- ▶ Sandy River delta & vicinity
 - Key findings: Fish community
 - Salmon: genetics, size classes, diets
 - Habitat characteristics
- ▶ Expanded sampling effort
 - Background
 - Preliminary data
- ▶ Direction for the future



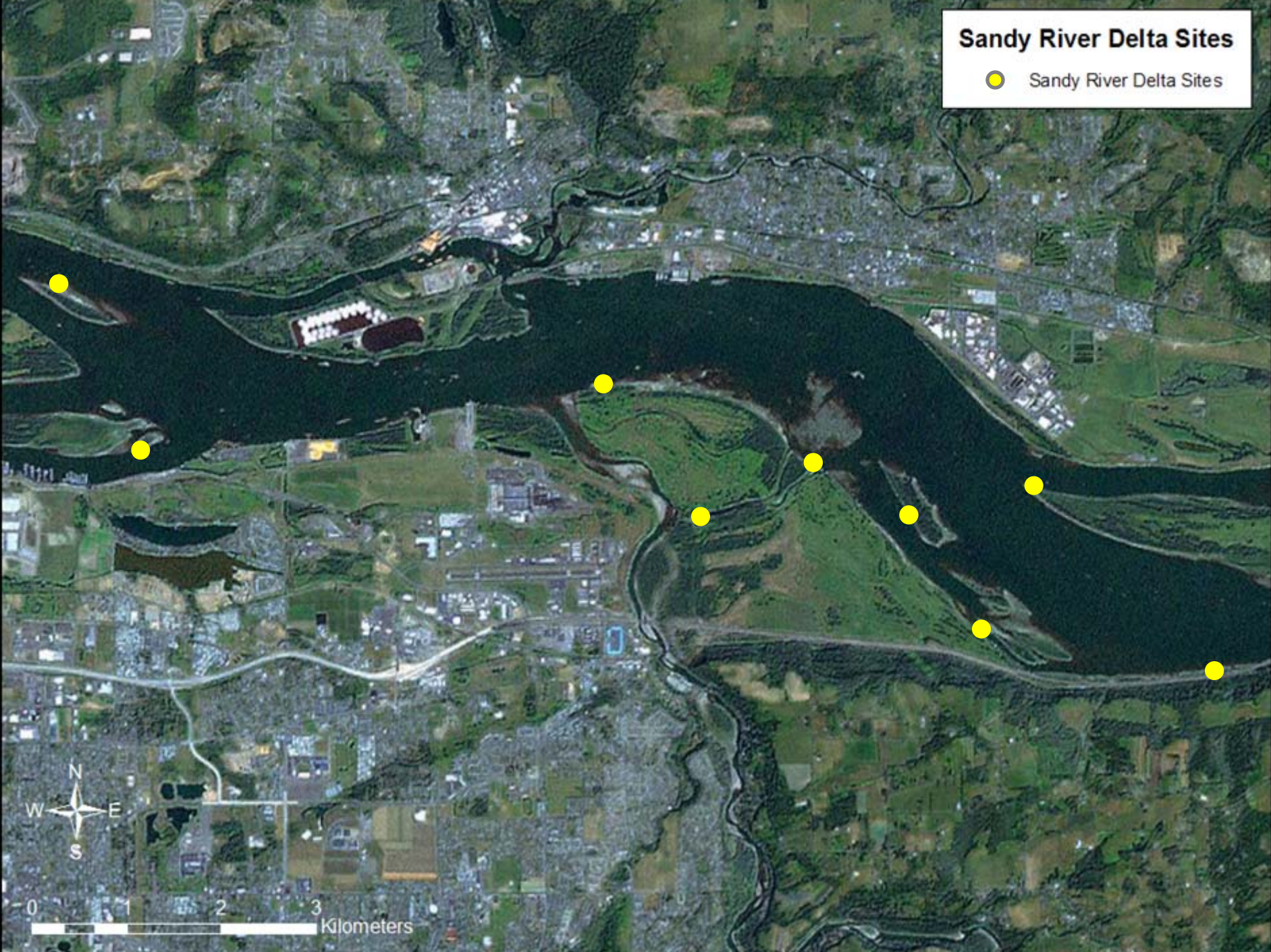
Goal: Address critical uncertainties regarding tidal freshwater habitats and the early life history of salmon



0 7.5 15 22.5 30
Kilometers

Sandy River Delta Sites

● Sandy River Delta Sites



0 1 2 3 Kilometers

Key Findings

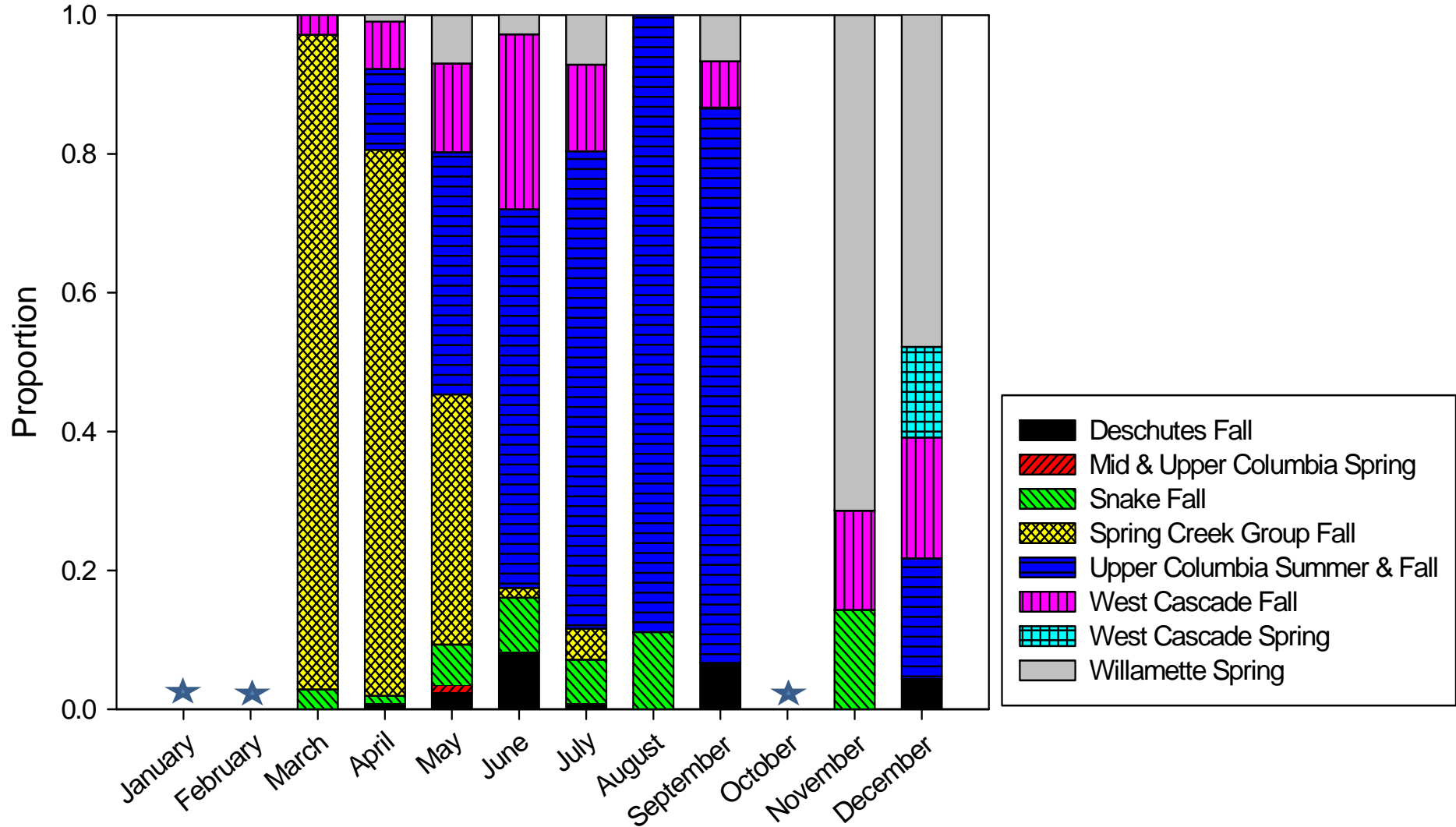
Salmon

- ▶ Salmon occur in all habitats sampled
- ▶ Salmon are encountered throughout the year during all seasons
- ▶ Chinook Salmon are the most predominant salmon

Non-Salmon

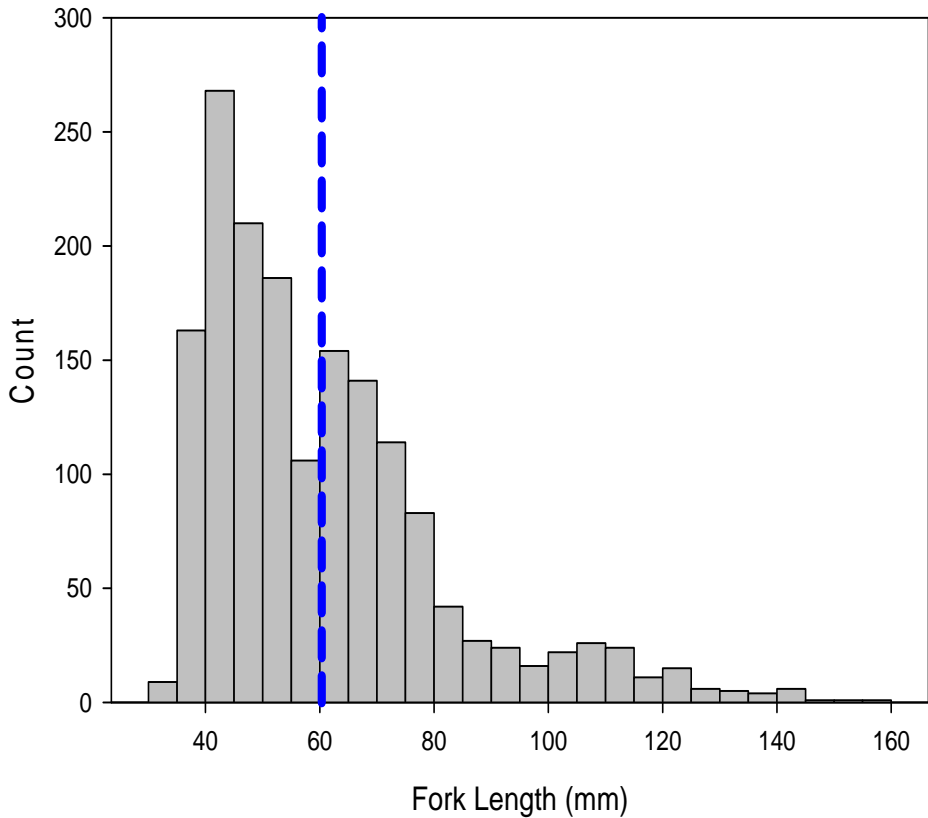
- ▶ Common species:
 - Threespine Stickleback
 - Peamouth
 - Northern Pikeminnow
 - Sucker species
 - Banded Killifish*
 - Bluegill*
- ▶ Non-native Species

Genetic Stock Groups: Chinook Salmon

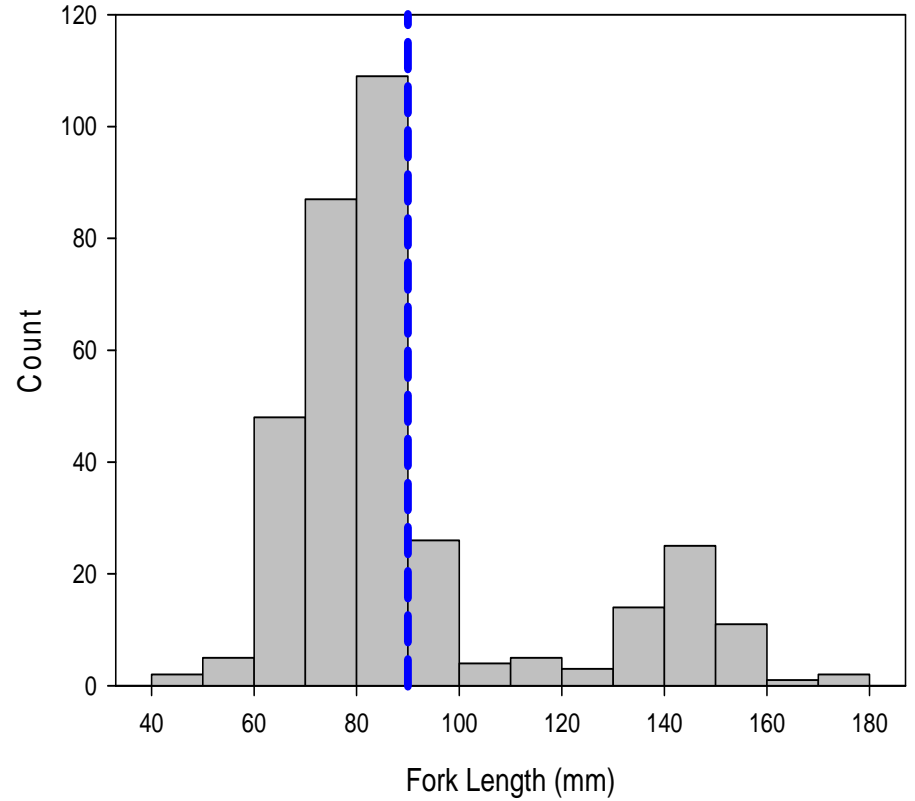


Size Distribution

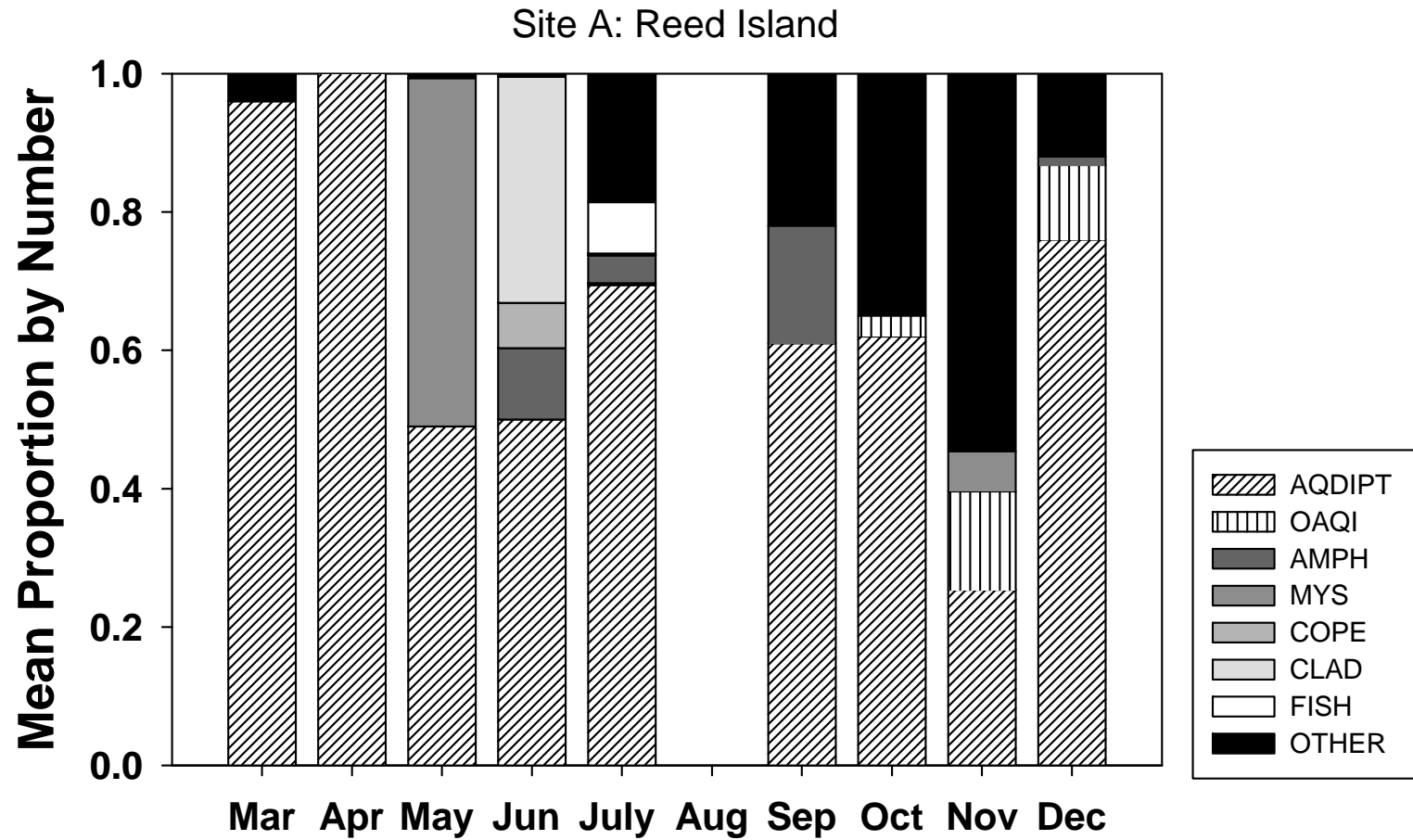
Unmarked



Marked Chinook



Salmon Diet Composition



Habitat Conditions



- ▶ Plant community structure
- ▶ Substrate
- ▶ Elevation
- ▶ Hydrology



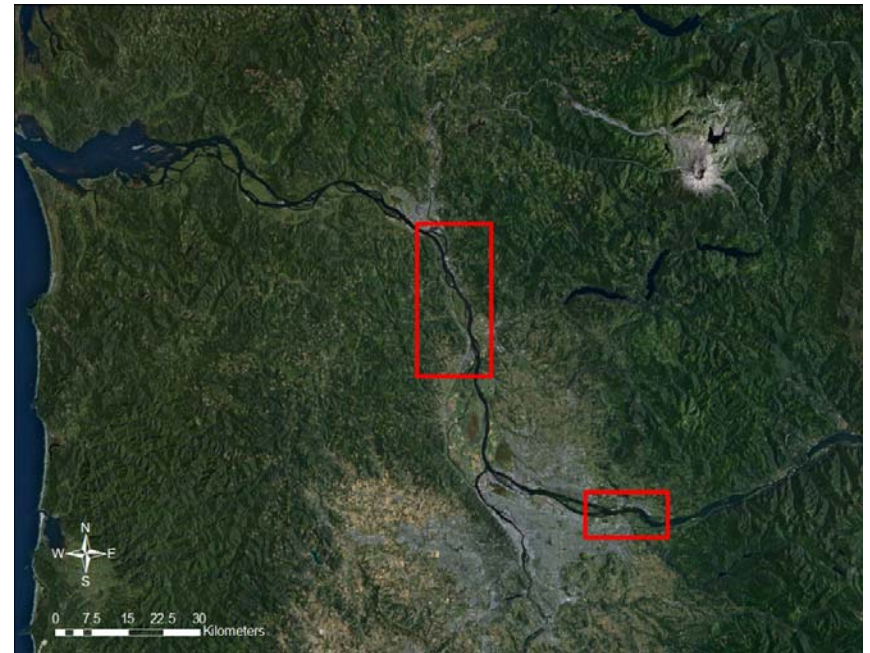


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Validation

- ▶ Is the SRD & vicinity representative of other tidal freshwater habitats?
- ▶ Is the expression of early life history strategies similar between various reaches within the tidal freshwater area of the LCRE?

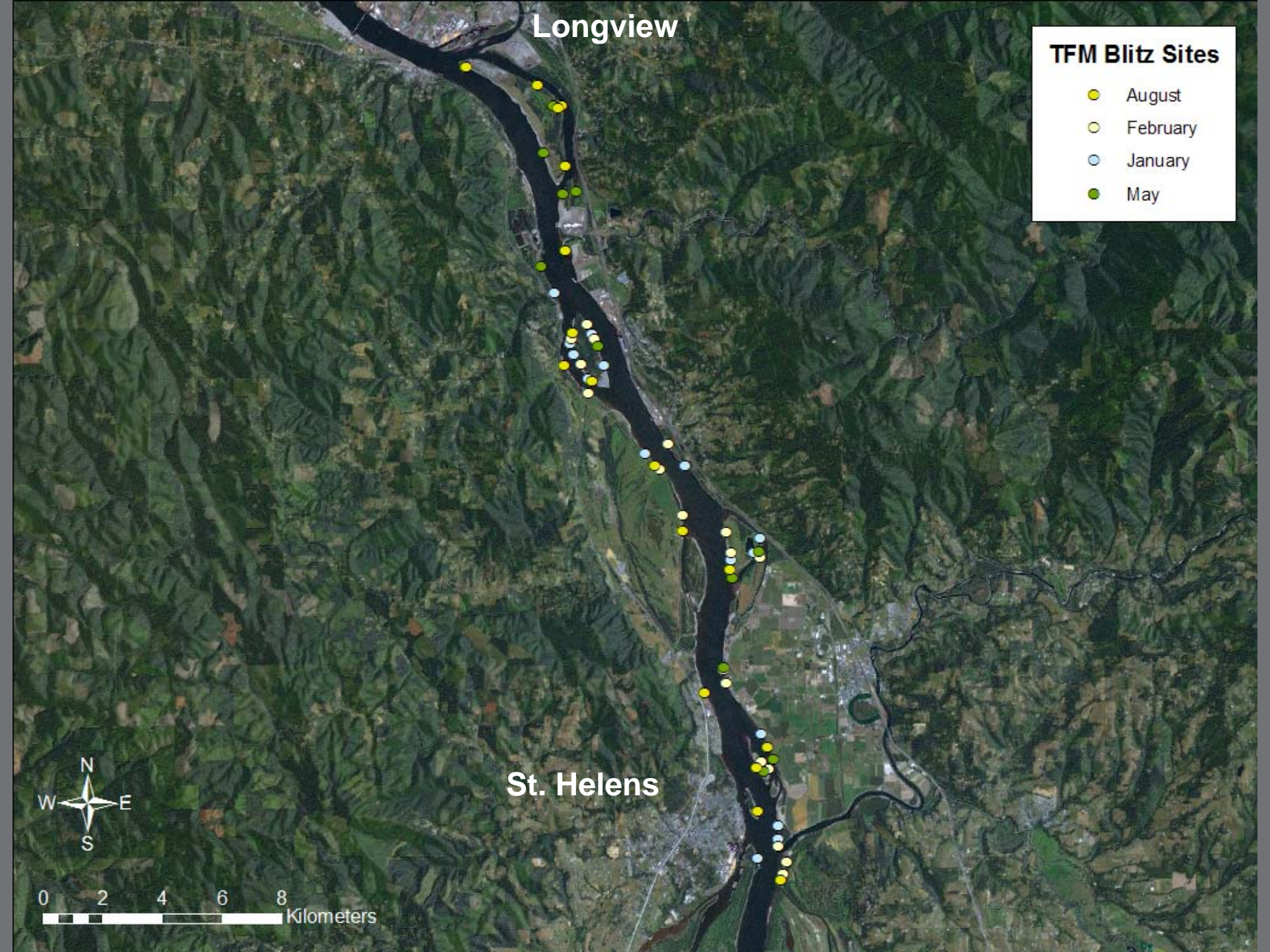


Longview

TFM Blitz Sites

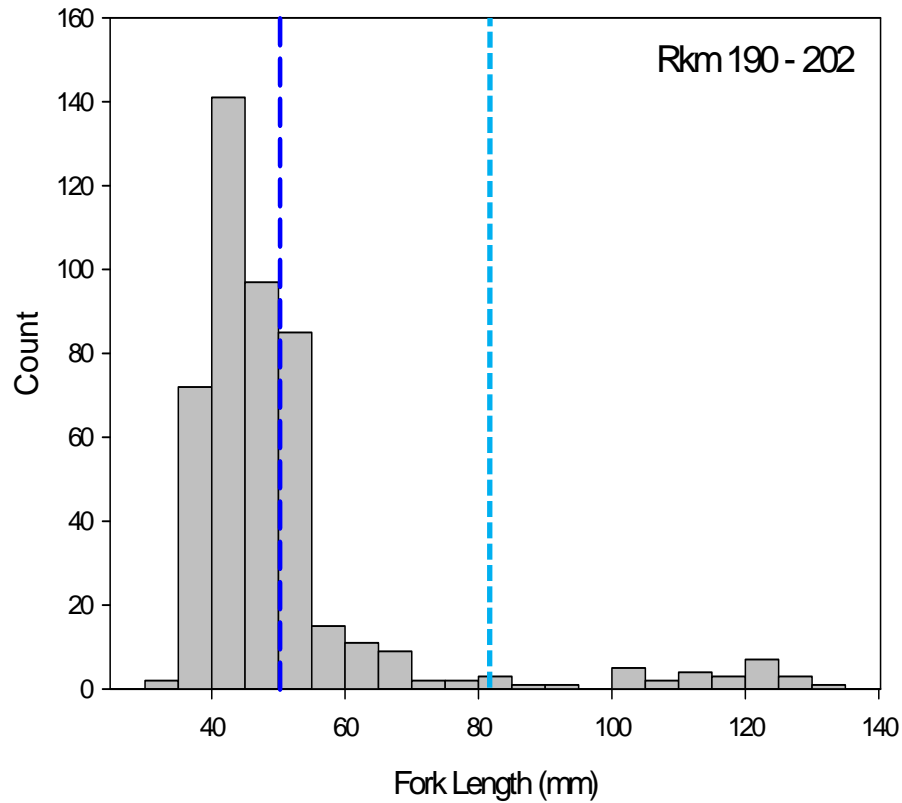
- August
- February
- January
- May

St. Helens

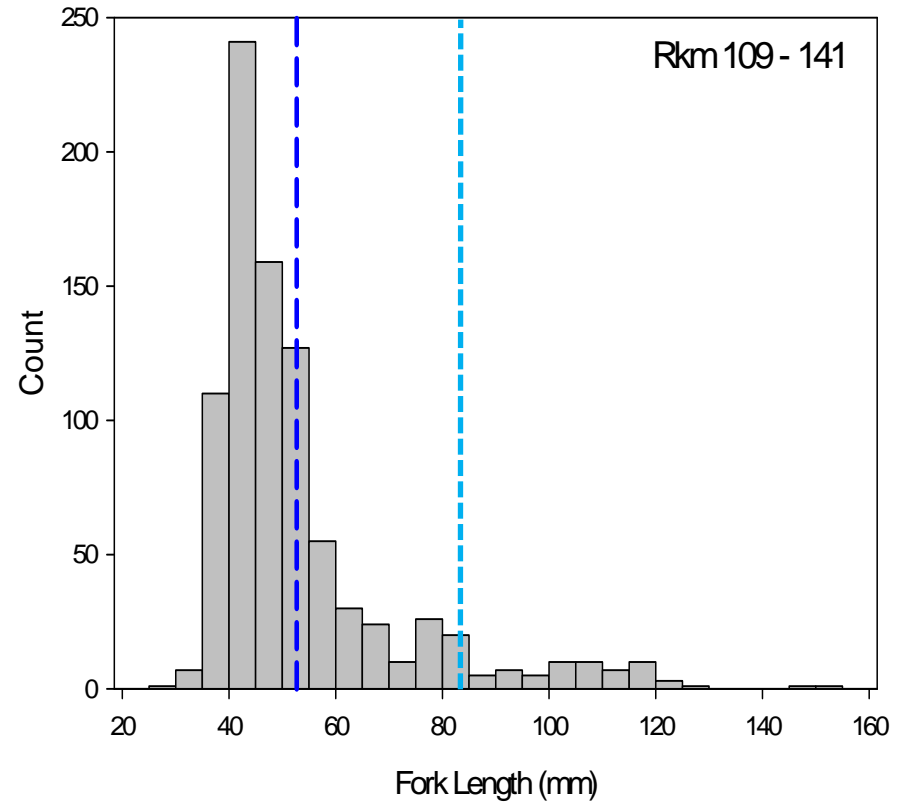


Length Frequency Distribution Chinook Salmon

Base Sites



Blitz Sites



Ongoing Work & Analyses

- ▶ Determining representativeness of sampling sites
- ▶ Linking salmon density and fish community structure to habitat attributes
- ▶ Genetic comparisons between sampling regions
- ▶ Pilot study for residence time of Chinook salmon during winter
- ▶ Associating salmon diet to prey availability
- ▶ Diet comparisons among salmon species
- ▶ Bioenergetics modeling: assess energetic constraints on fish growth



Summary

- ▶ Addressing critical uncertainties in tidal freshwater encompasses multiple abiotic and biotic attributes.
- ▶ As we build our knowledge of salmon ecology in tidal freshwater, the data will be applied to ecosystem restoration prioritization and decision-making to identify actions and strategies to recover ESA listed stocks.



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