

# Assessing Habitat Availability for Juvenile Chinook Salmon in the Willamette River, Oregon

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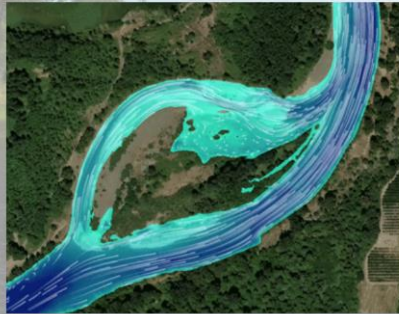
April 28, 2021

# Science for Willamette River Flow Management

## Where, When, and How Much Salmonid Habitat is Available on the Willamette River?

James White, Brandon Overstreet, Laurel Stratton, Rose Wallick, Gabriel Gordon

February 11, 2020



## Developing and modeling the relations between flow management and water temperature in the Willamette River and its major tributaries

Laurel Stratton Garvin, Stewart Rounds, Annett Sullivan  
USGS Oregon Water Science Center

Norman Buccola  
U.S. Army Corps of Engineers, Portland District

Willamette Fisheries Science Review  
February 11, 2020

## Willamette Instream Flow Project: Integrated Tools for the Evaluation of Alternative Flow Management Strategies

James T. Peterson, Jessica E. Pease, Luke Whitman, James White,  
Laurel Stratton Garvin, Stewart Rounds, and Rose Wallick



## Willamette Instream Flow Project: Estimation and modeling of Chinook salmon demographics

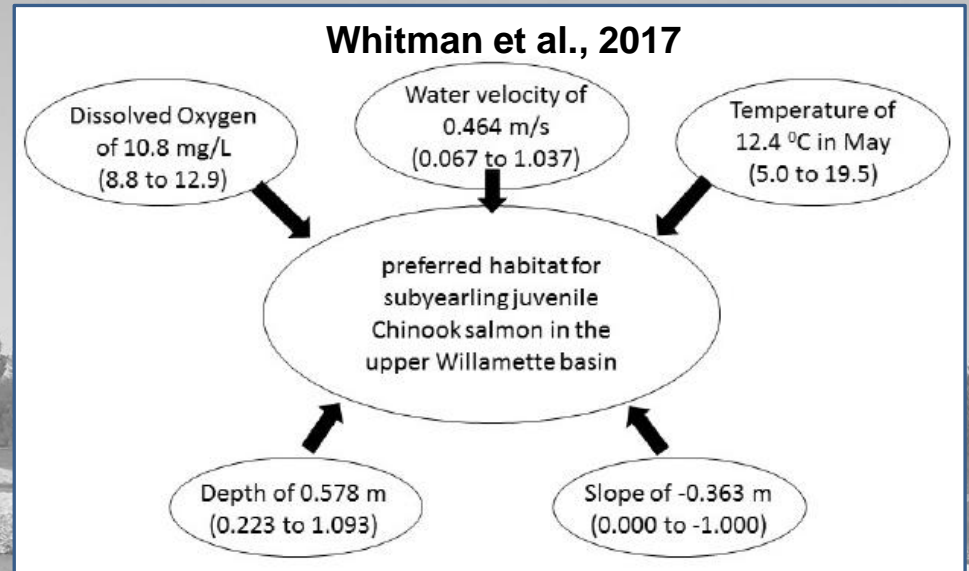
JESSICA PEASE<sup>1</sup>, LUKE WHITMAN<sup>2</sup>, R. KIRK SCHROEDER<sup>2</sup>, AND JAMES T. PETERSON<sup>1</sup>

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# Habitat Metrics for Juvenile Chinook Salmon

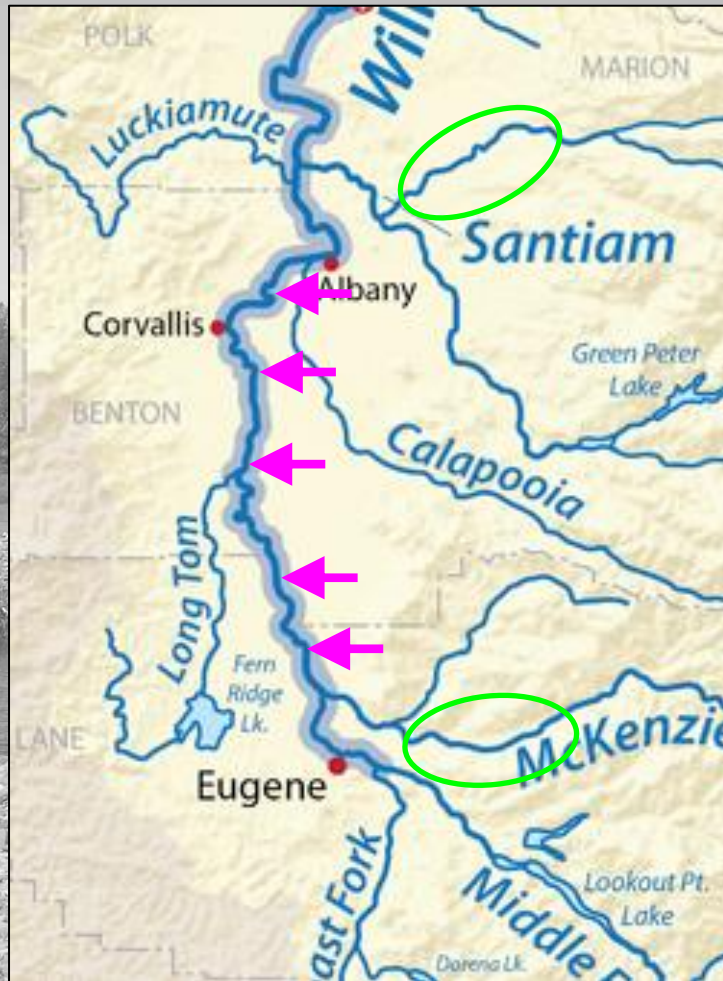
- SWIFT criteria (3 categories)
  - Velocity
    - Broad: 0 – 0.46 m/s
    - Median: 0 – 0.38 m/s
    - Narrow: 0 – 0.15 m/s
  - Depth
    - Broad: 0.05 – 1.52 m
    - Median: 0.05 – 1.07 m
    - Narrow: 0.05 – 0.61 m



We conducted a field study in 2020–21 to collect habitat use data in the mainstem Willamette River.

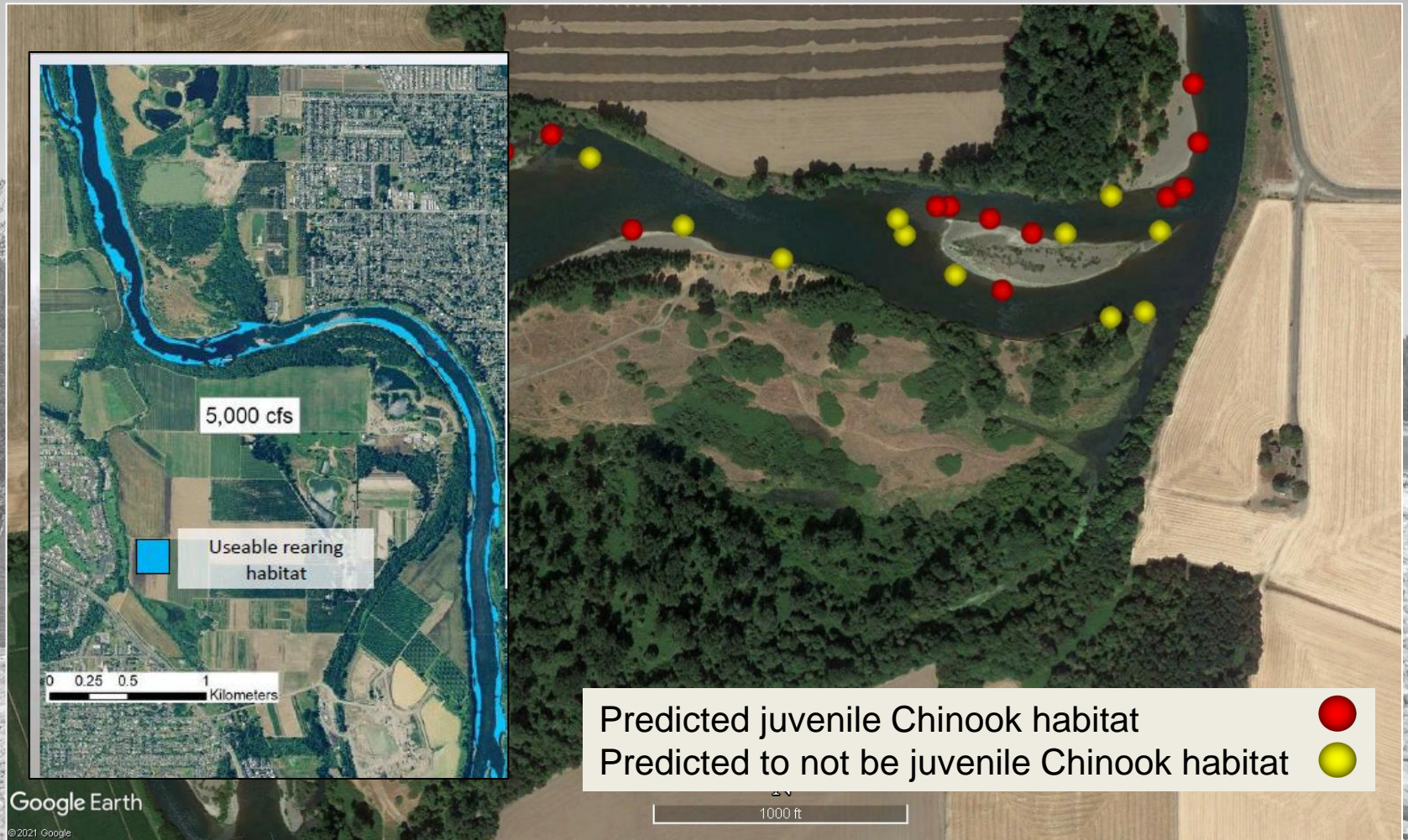
Data also used to validate 2D hydraulic model.

# Sampling Locations



- 5 sites on the mainstem Willamette River
- June 2 – July 23, 2020
- Habitat data collected in ~45 “cells” at each location
- 2021 sampling underway

# Sampling Sites



# Data Collection Methods: Day 1



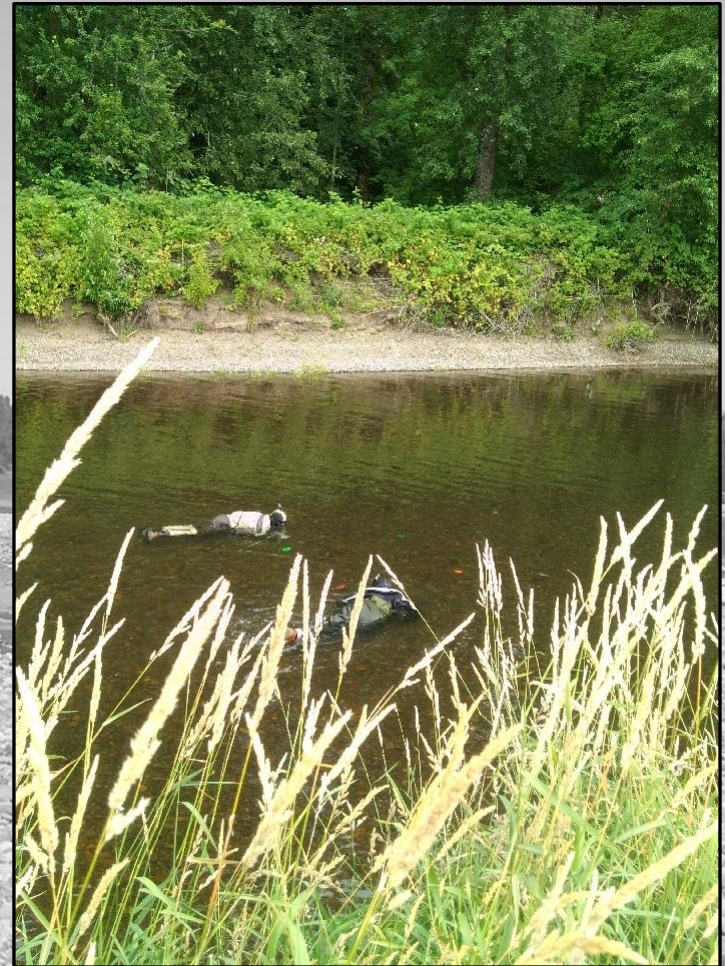
- Mark cell boundaries
- Collect habitat data:
  - Depth
  - Slope
  - Distance to cover
  - Distance to shore
  - Water velocity
  - Substrate size
  - Temperature
  - Horizontal temperature variability
  - Drift samples (invertebrates)
- Leave site and allow fish to re-occupy (overnight)

# Data Collection Methods: Day 2

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- 2 snorkelers observe cells
- “Independent” counts of juvenile Chinook
- Remove cell markers at end of day



# Underwater Video

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# Underwater Video

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# Preliminary Results: Summer 2020

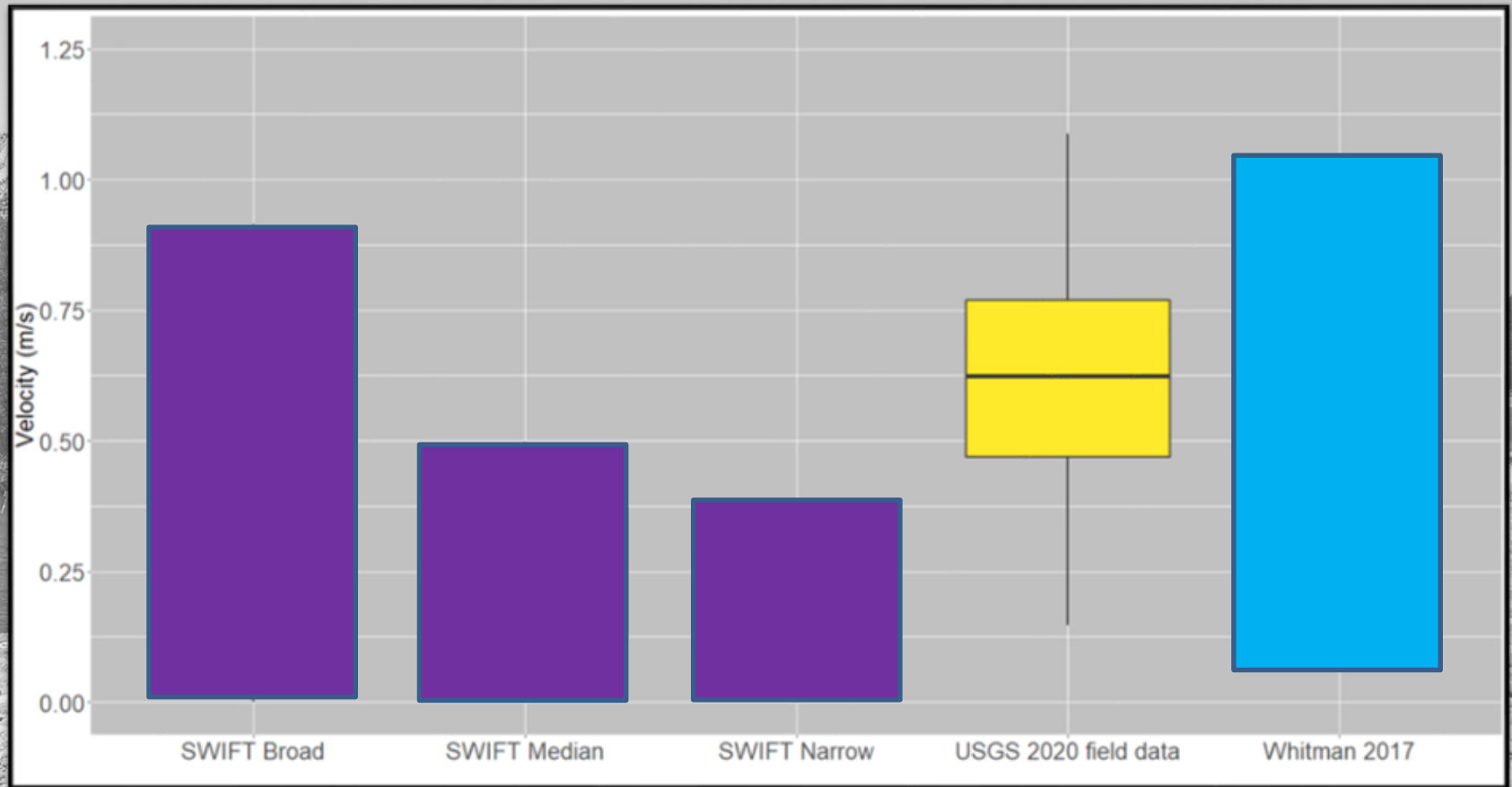
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## Smolt-sized Chinook salmon

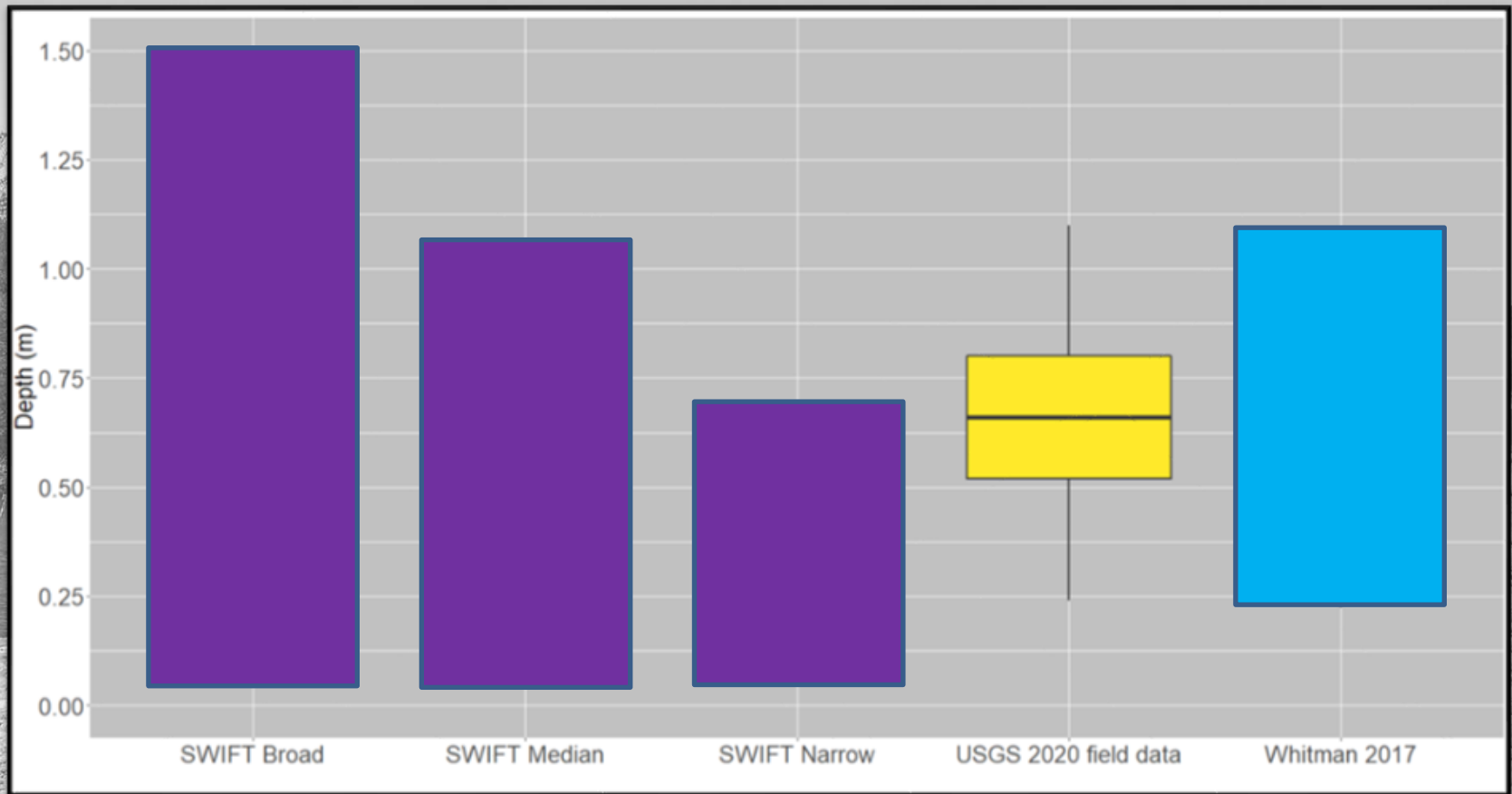
- Habitat data collected in 353 habitat cells
- Juvenile Chinook salmon present in 57 cells
- Water velocity: 0.63 m/s (0.15 – 1.25 m/s)
- Water depth: 0.66 m (0.24 – 1.10 m)



# Water Velocity



# Water Depth



# Preliminary Results: Spring 2021

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## Parr-sized Chinook salmon

- Currently sampling
- Habitat data collected in 112 habitat cells
- Juvenile Chinook salmon present in 62 cells



# Underwater Video 2021

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# Summary

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- Data collection underway, analysis planned for fall 2021
- 2020 sampling
  - Conducted during June and July
  - In-basin habitat use data for smolt-sized Chinook salmon
  - Preliminary data analysis indicate that habitat use data will be useful for future modeling efforts and validation of 2D hydraulic model
- 2021 sampling plans
  - Sampling will occur during April–July
  - Habitat use by fry and parr-sized Chinook salmon

# Water Temperature

