Evaluation of Fish Use at Woodland Islands, Lower Columbia River, 2022–23

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U.S. Department of the Interior
U.S. Geological Survey

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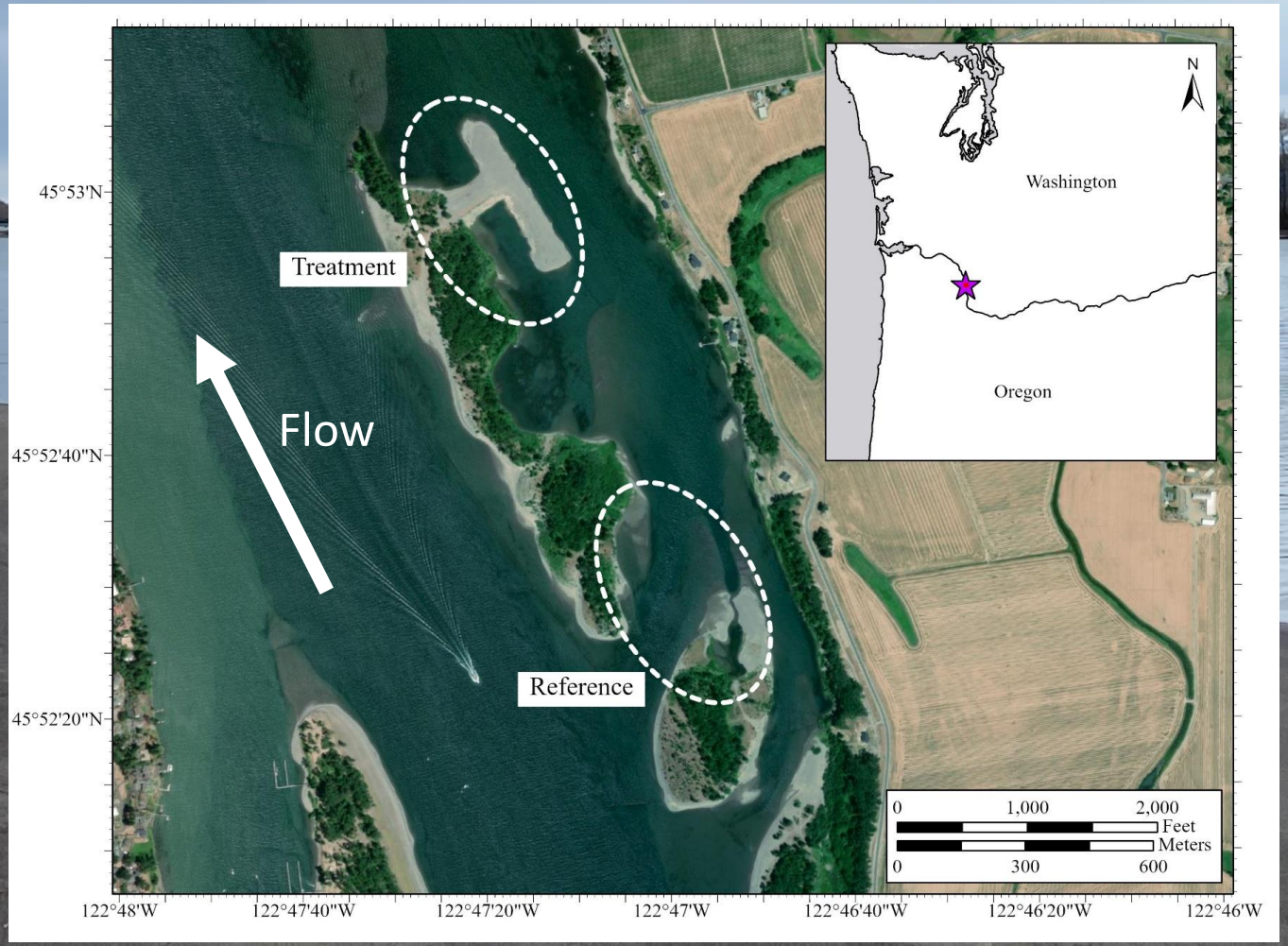
Project Objectives and Study Area

1. Evaluate juvenile salmon use at the placement (treatment) and reference sites

2. Evaluate for predatory fish presence at the treatment and reference sites



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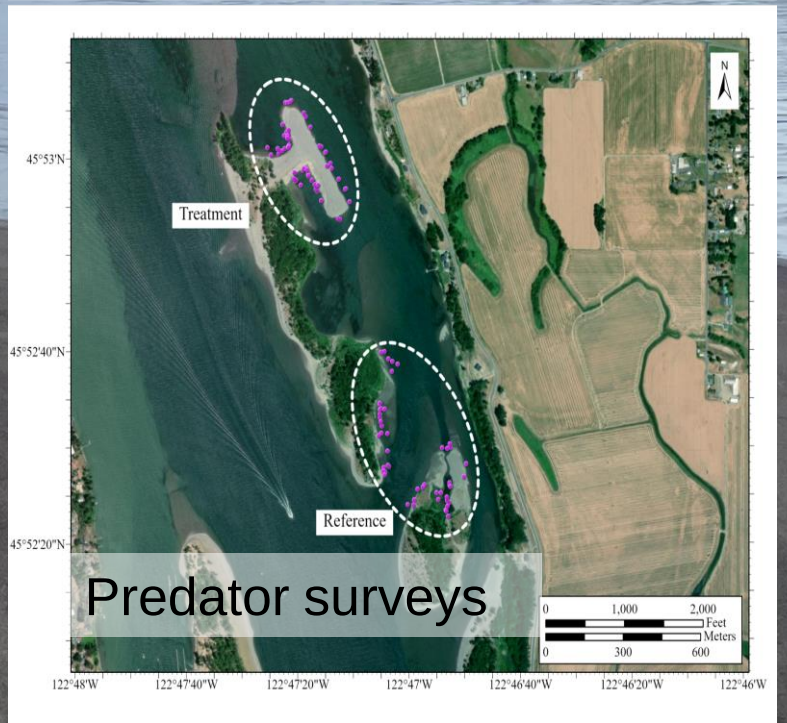
Sampling Plan

Target	Effort	2022	2023
Duration	Weeks	13	8
Juvenile sampling	Beach seines	✓	✓
	Traps	✓	
	Community composition	✓	✓
	Genetic stock identification	✓	
	Diet collection and analysis	✓	
	PIT tagging, growth, residency	✓	✓
Predator sampling	Acoustic camera	✓	✓
	Angling- species verification	✓	✓
	Diet collection and analysis	✓	✓
Covariate collection	Environmental conditions, GPS	✓	✓

✓ Sampling method utilized in that year



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Sampling Dates and Effort

Sampling effort	Reference		Treatment	
	Date range	Locations	Date range	Locations
		2022		
Trap	03-Mar thru 31-Mar	13	01-Mar thru 30-Mar	14
Single-pass seine	03-Mar thru 07-Jun	48	01-Mar thru 06-Jun	50
Predator sampling	02-Mar thru 08-Jun	32	02-Mar thru 08-Jun	36
		2023		
Single-pass seine	27-Mar thru 23-May	18	28-Mar thru 15-May	16
Multi-pass seine	27-Mar thru 23-May	15	28-Mar thru 24-May	15
Predator sampling	29-Mar thru 17-May	21	29-Mar thru 17-May	21

Single-pass seine is a single seine haul in one location
Multi-pass seine is series of six consecutive seine hauls in one location for informing the abundance model

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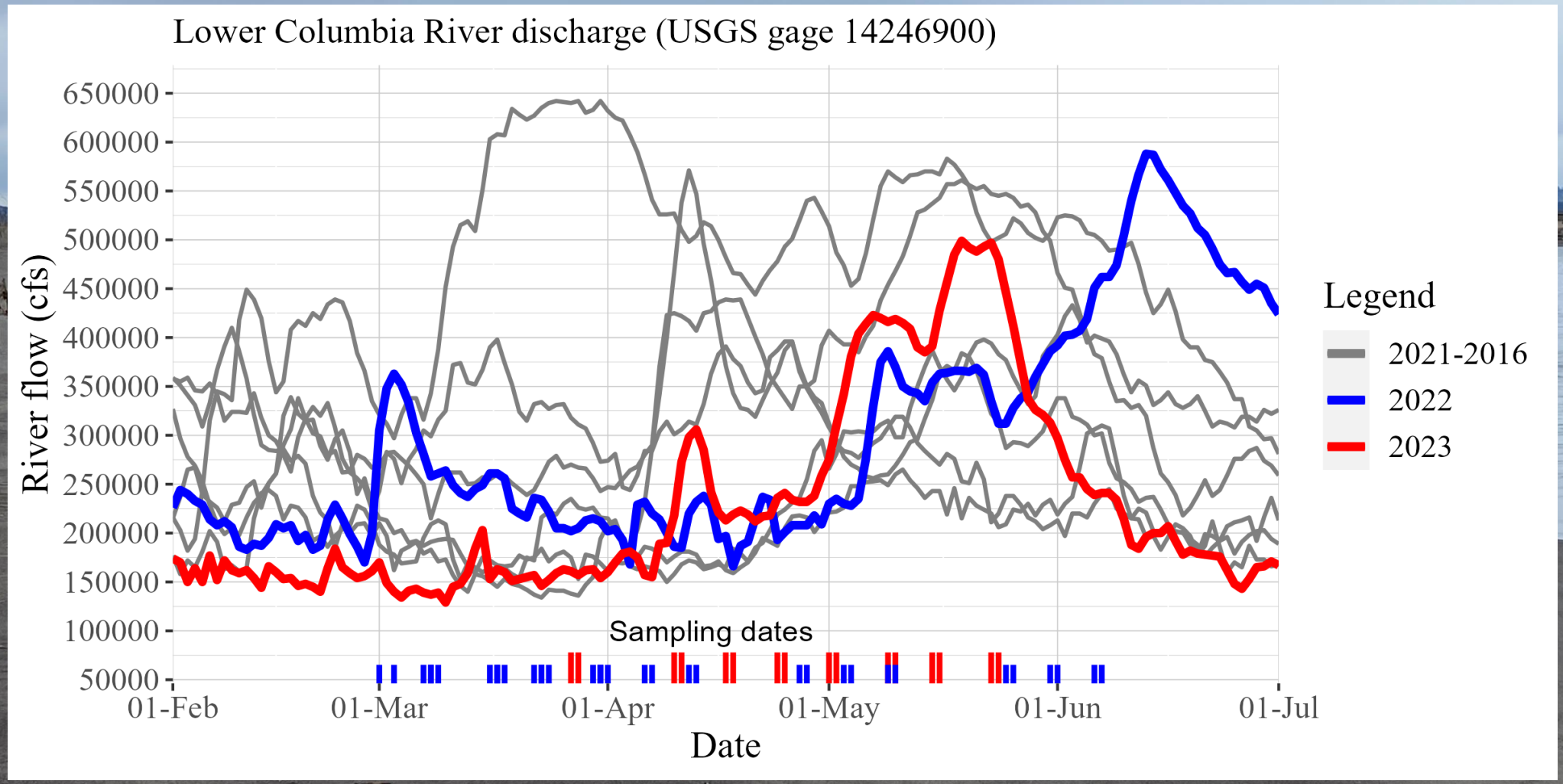
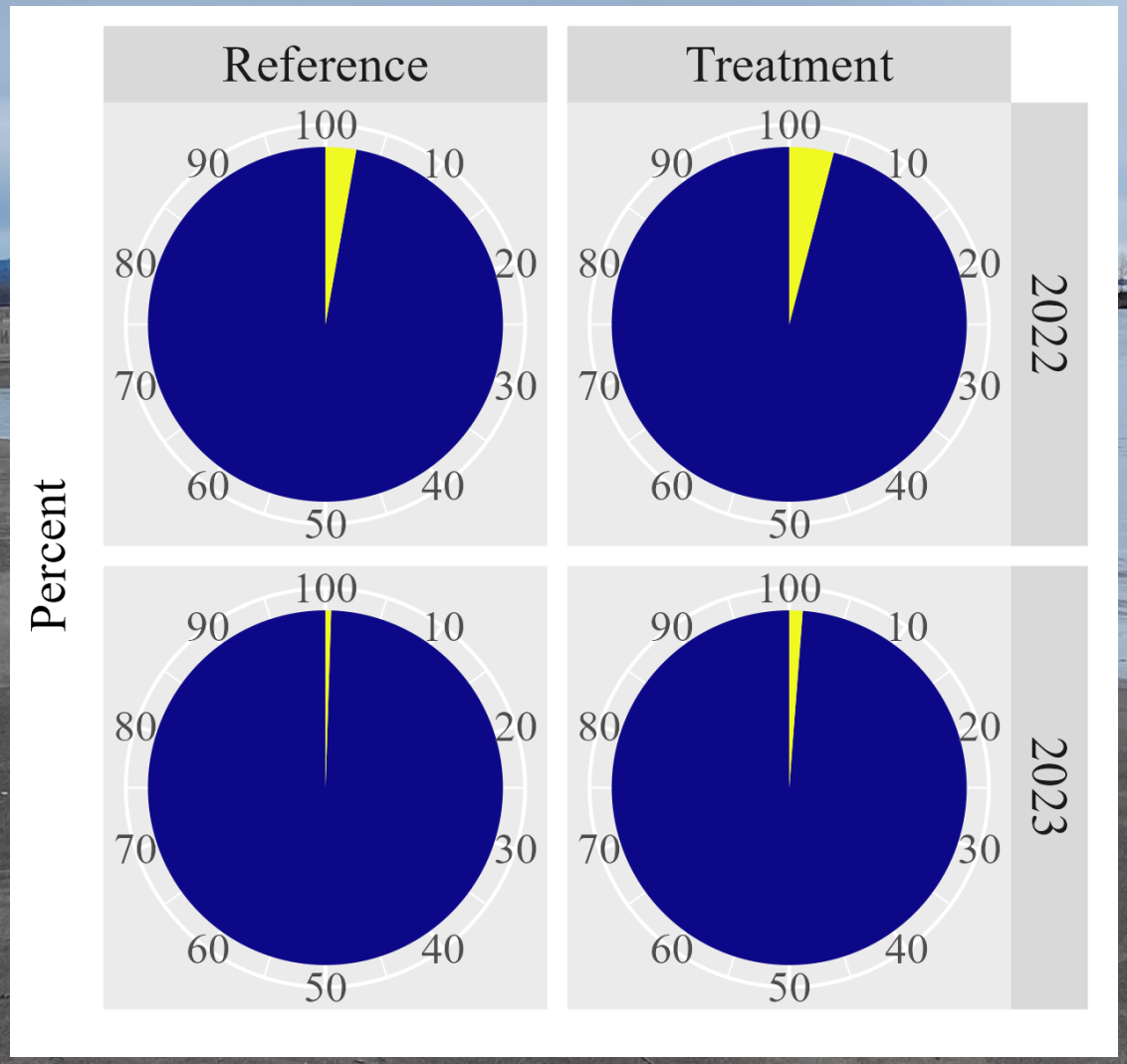
Columbia River Discharge



Native vs Nonnative Species



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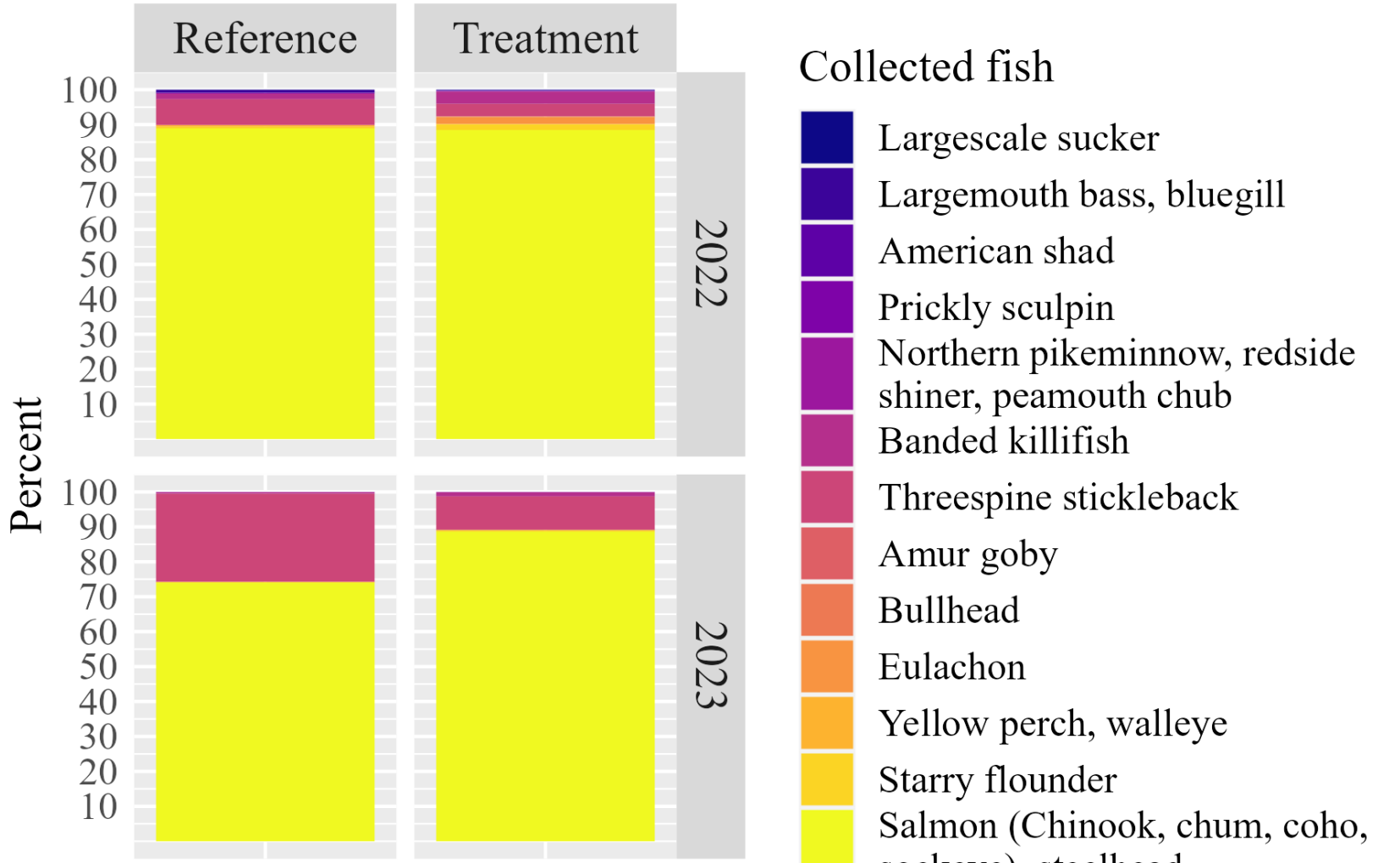
Fish Community Composition



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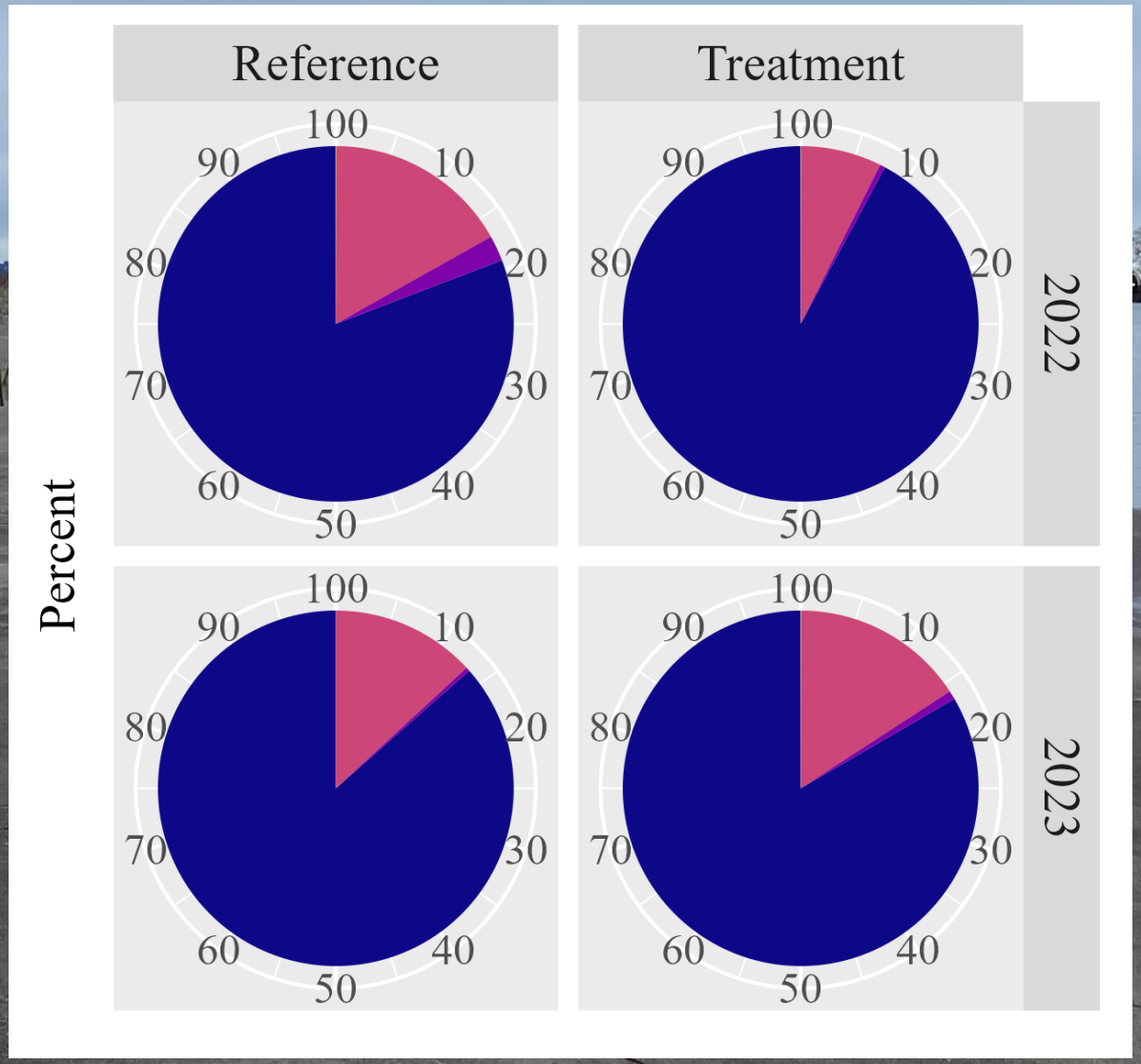
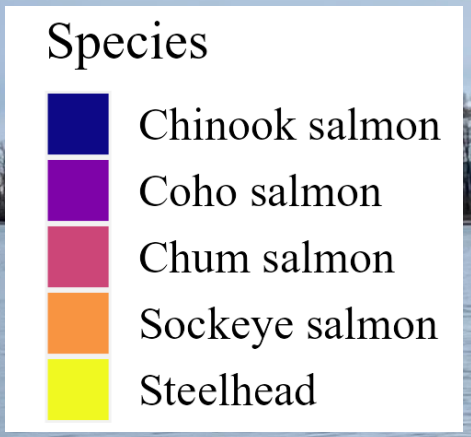
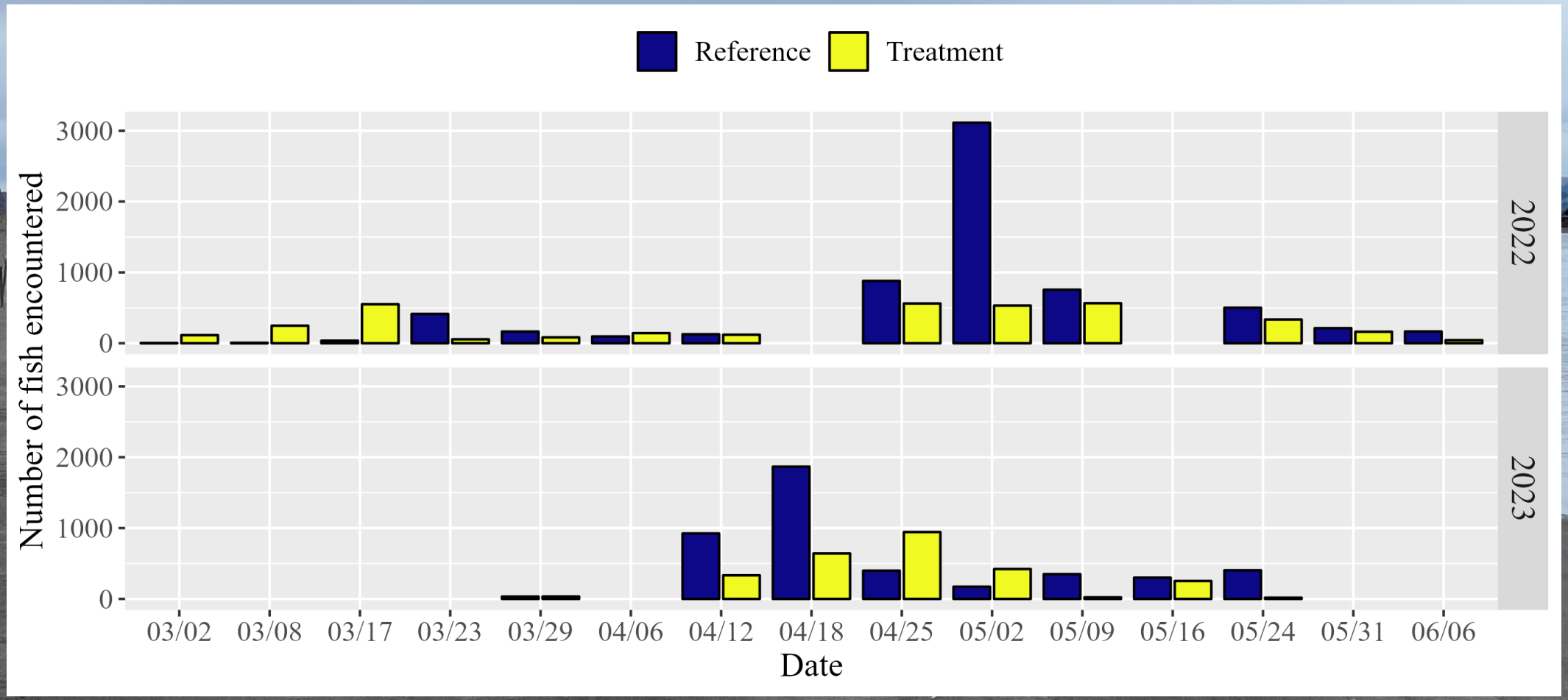
Juvenile Salmon Collected





Chinook Salmon Catch by Week



~36% of Chinook catch was at treatment site in both years
97–99% subyearlings, 96–99% unmarked

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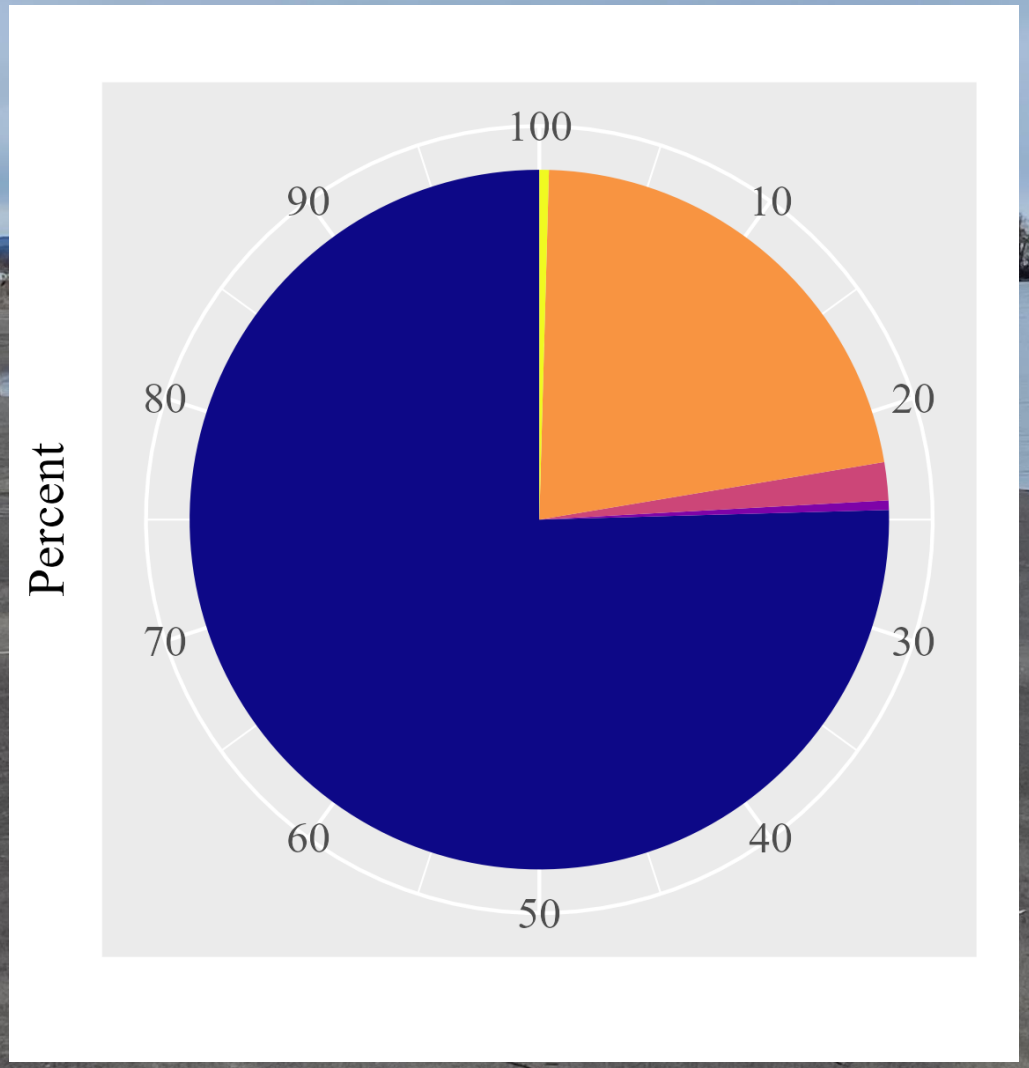
Subyearling Chinook Genetic Stock Identification: 2022



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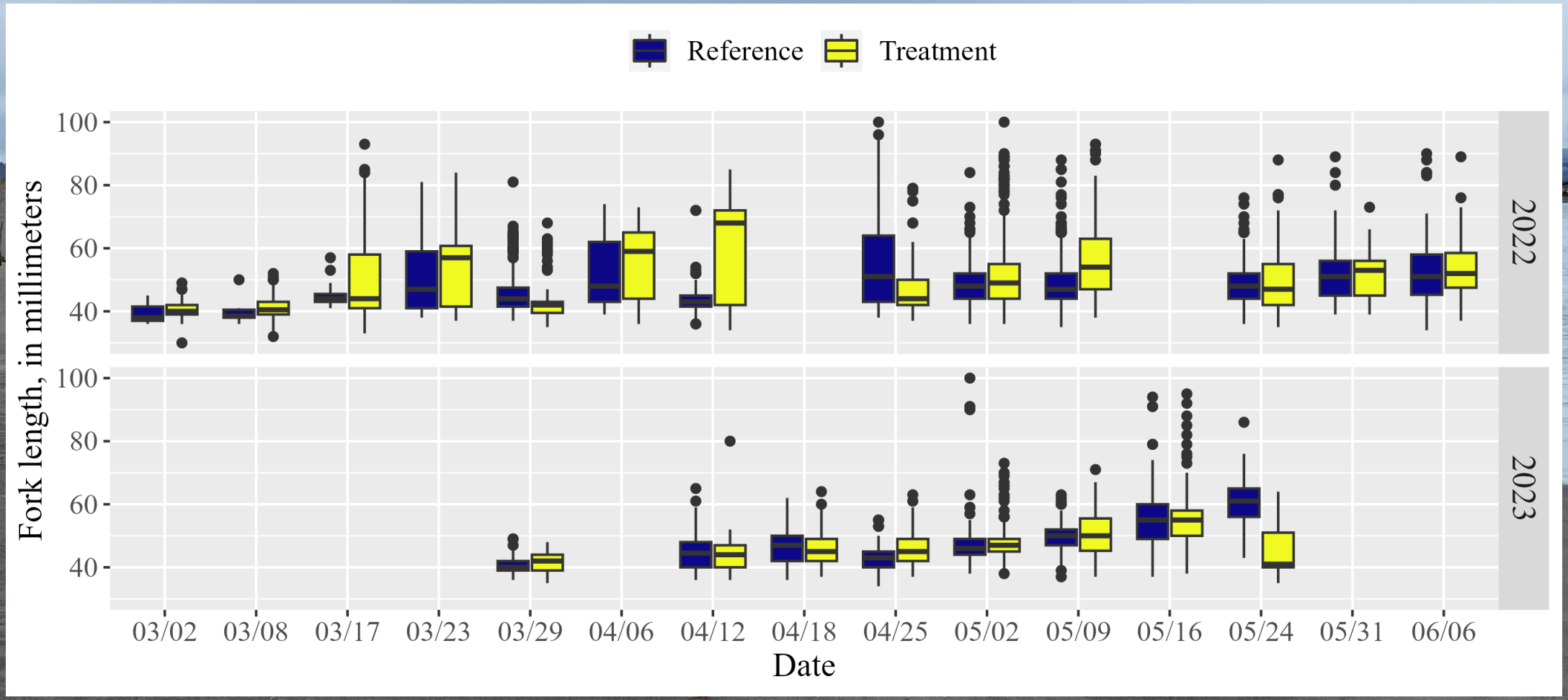
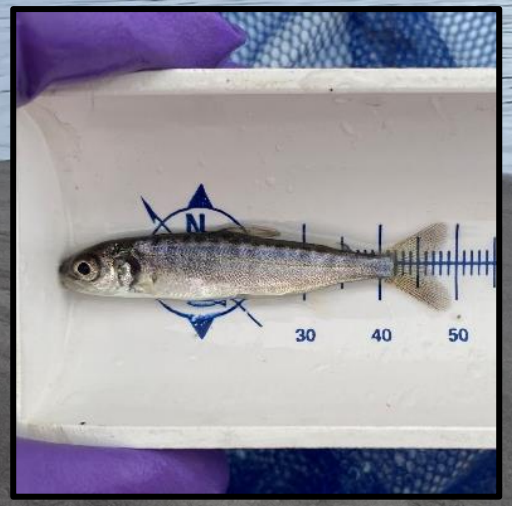
Subyearling Chinook Salmon Size



Subyearling Chinook Residence Time and Growth

Metric	Reference	Treatment
	2022	
PIT tagged (n)	1,167	1,029
PIT recap (n)	29 (2.5%)	31 (3.0%)
Residence time (median, d)	6 (6–34)	6 (6–47)
Growth (mm/d)	0.5 (0.0–0.8)	0.5 (0.0–0.8)
	2023	
PIT tagged (n)	878	630
PIT recap (n)	13 (1.5%)	4 (0.6%)
Residence time (median, d)	8 (7–22)	8 (8–14)
Growth (mm/d)	0.7 (0.4–1.0)	0.5 (0.3–0.8)



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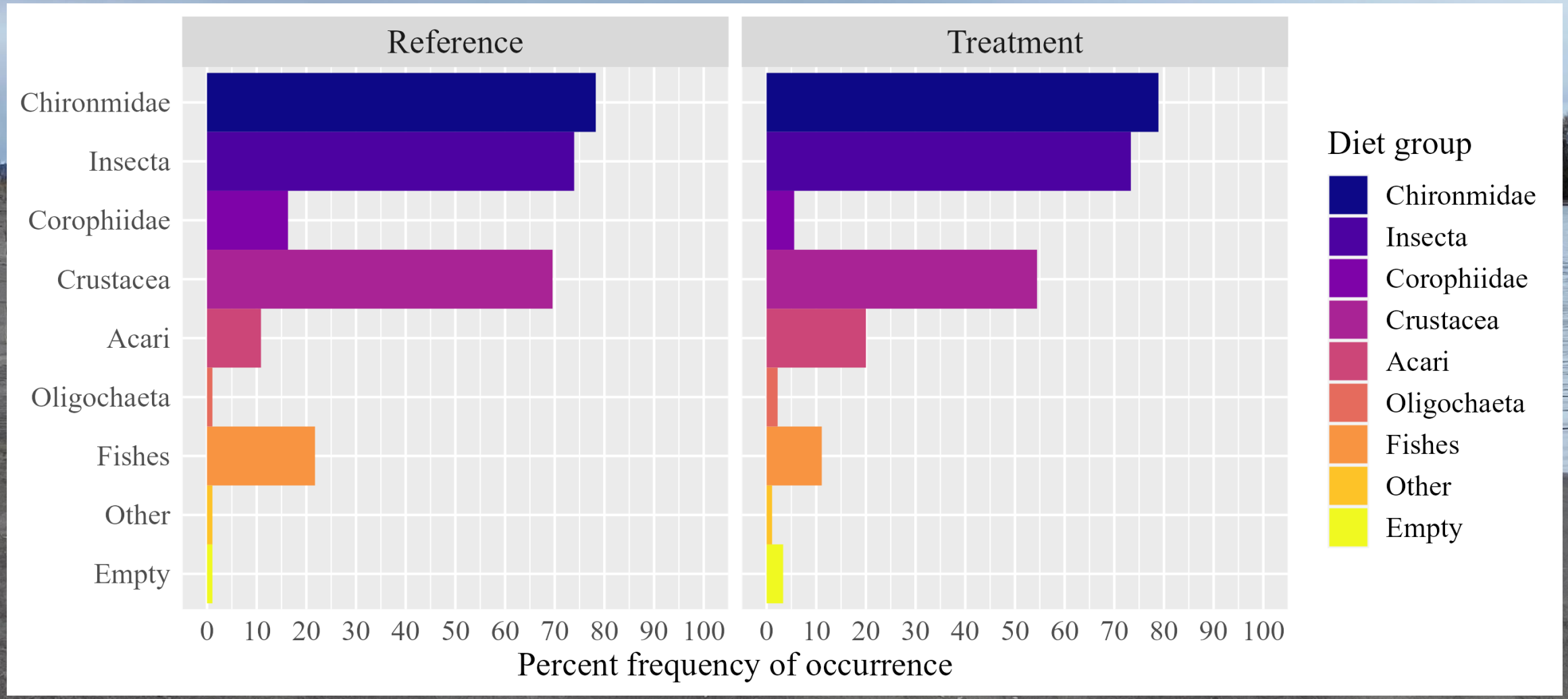
Subyearling Chinook Salmon Diets: 2022



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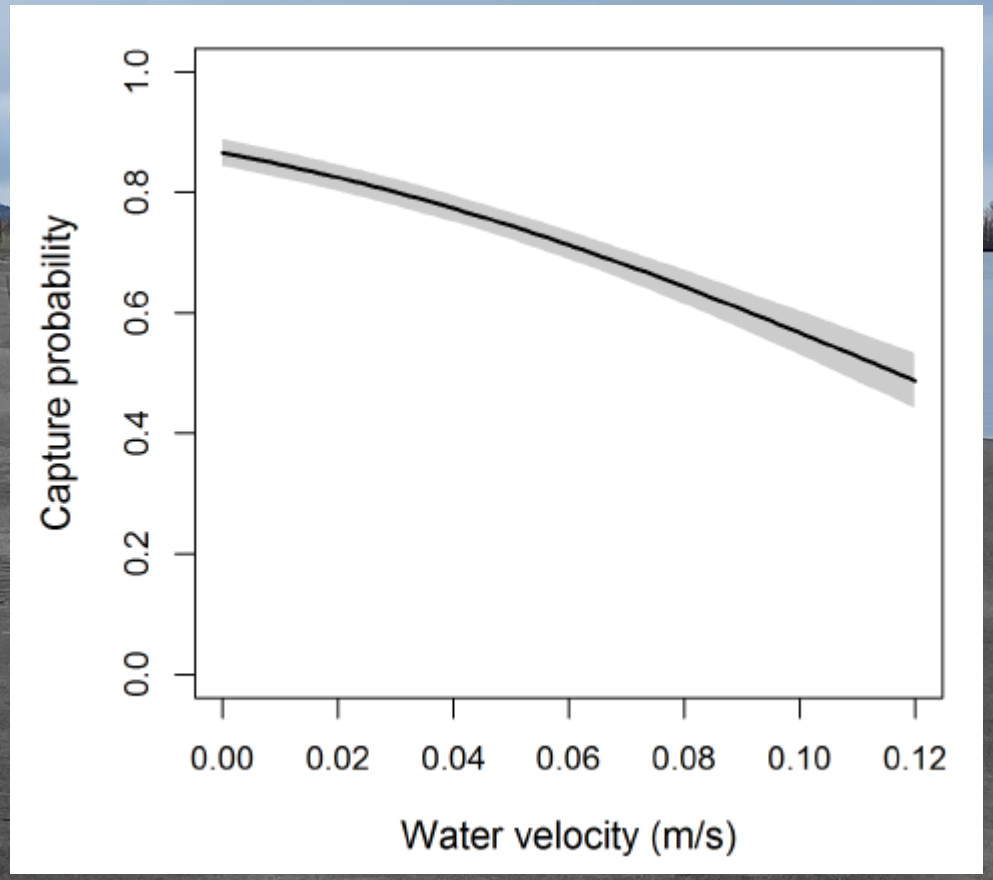
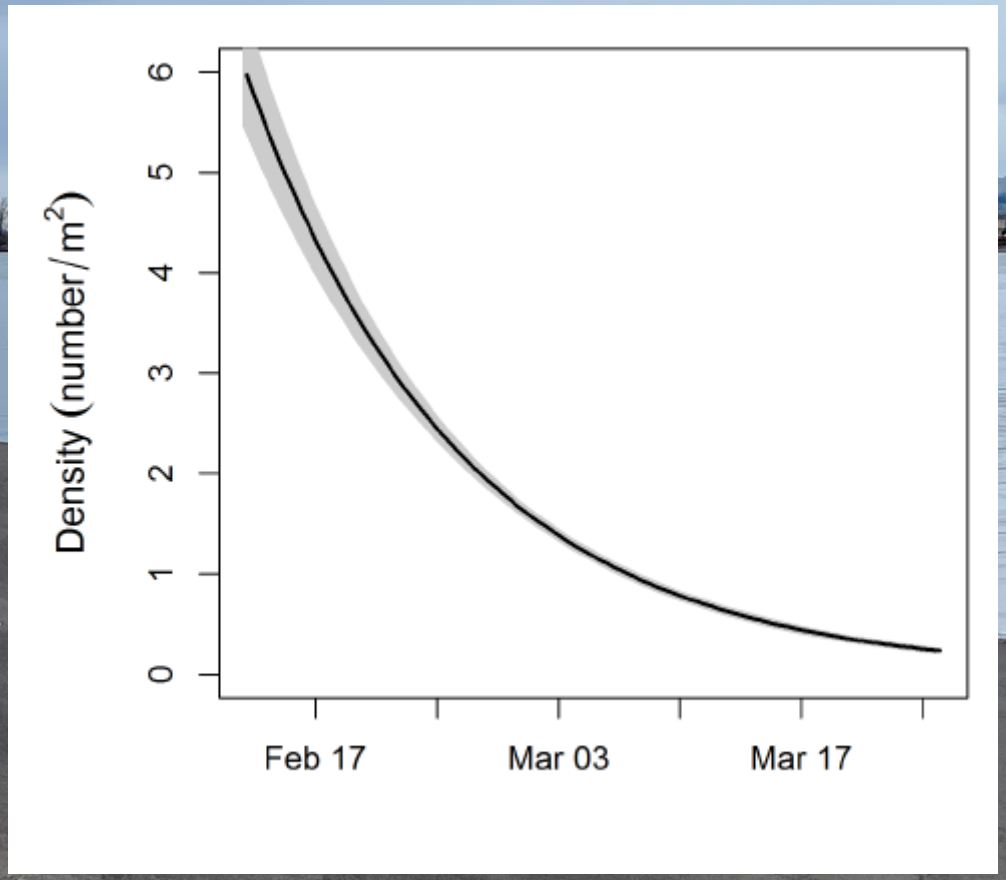
Abundance Sampling





Perry, R.W., Kirsch, J.E., and Hendrix, A.N., 2016, Estimating juvenile Chinook salmon (*Oncorhynchus tshawytscha*) abundance from beach seine data collected in the Sacramento–San Joaquin Delta and San Francisco Bay, California: U.S. Geological Survey Open-File Report 2016–1099, 21 p., http://dx.doi.org/10.3133/ofr20161099.

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Next Steps

1. Estimate abundance at the treatment and reference site using multi-pass and single-pass in 2023 data.
2. Investigate if we can apply abundance model to 2022 data.
3. Evaluate 2023 acoustic camera data for predatory fish presence at the treatment and reference sites.
4. Repeat sampling in spring of 2025.

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Questions?

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