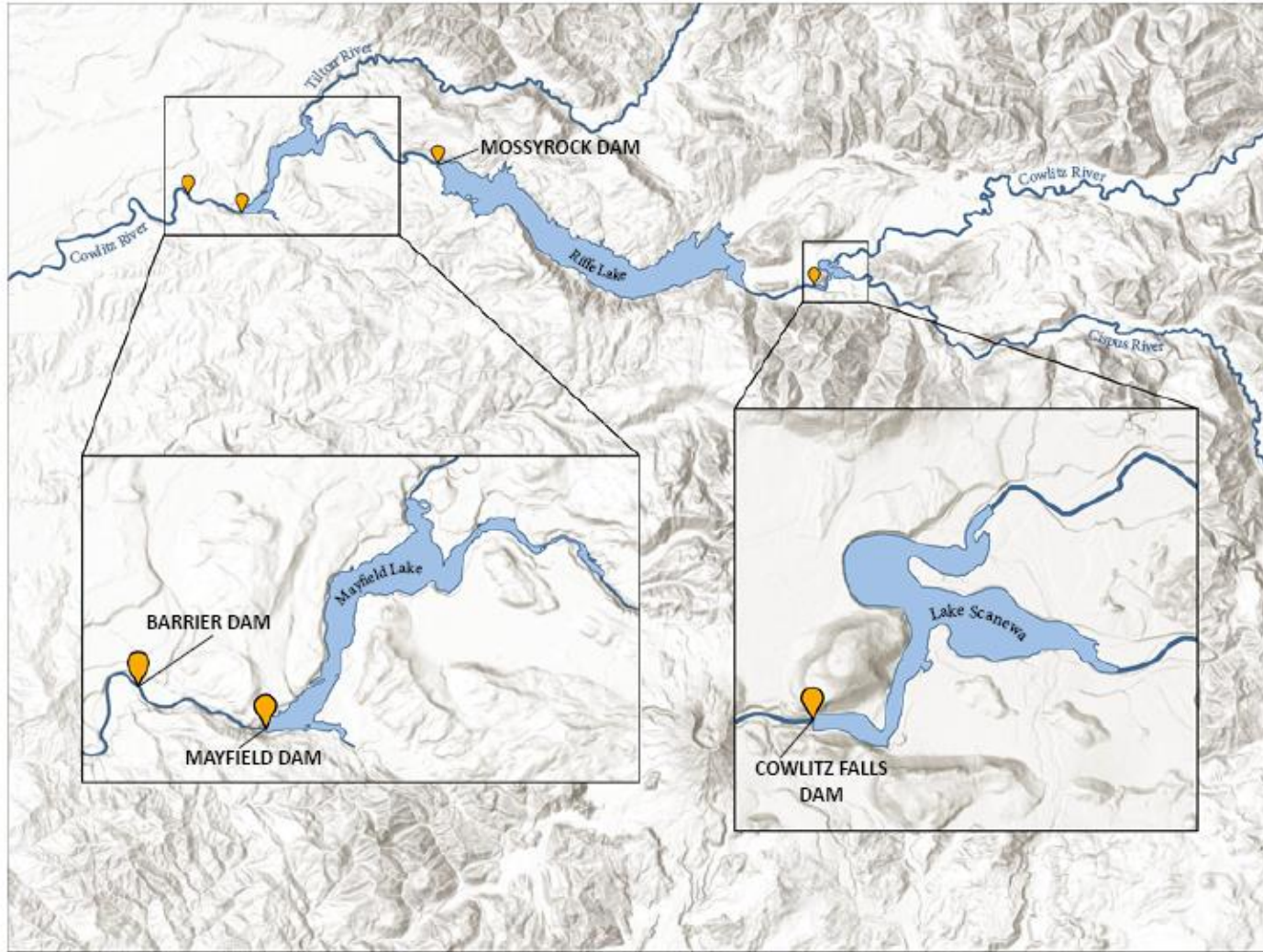


Fish Passage Looking Forward 2025

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Mayfield Secondary Separator



Background

- Passes outmigrating juvenile Coho, Steelhead, and Fall Chinook from the Tilton River
- 2015 study sought to determine which operational strategy yielded the highest FPS
- Residency time and survival

Mayfield Secondary Separator

Background

- Results showed low survival and long residency times for Chinook
- Efficacy varied across different operational strategies

Baseline Operation		
Holding Time (days)		Secondary Separator
Chinook Forebay Releases	Mean	12.466
Chinook Forebay Releases	Minimum	0.929
Chinook Forebay Releases	Maximum	24.785
4 Pump Operation		
Holding Time (days)		Secondary Separator
Chinook Forebay Releases	Mean	13.910
Chinook Forebay Releases	Minimum	0.196
Chinook Forebay Releases	Maximum	25.084
Drawdown Operation		
Holding Time (days)		Secondary Separator
Chinook Forebay Releases	Mean	4.372
Chinook Forebay Releases	Minimum	0.002
Chinook Forebay Releases	Maximum	22.083

Reach	T_1 (4 pumps)		T_2 (Drawdown)		T_3 (Baseline)	
	\bar{s}	$\overline{SE}(\bar{s})$	\bar{s}	$\overline{SE}(\bar{s})$	\bar{s}	$\overline{SE}(\bar{s})$
Louver bay – Secondary separator	1.0	0.0	1.0	0.0	1.0	0.0
Secondary separator – Transport tank	0.6250	0.0699	0.8961 ^a	0.0515	0.6531	0.0680
Transport tank – Tailrace	0.4000	0.0894	0.5238 ^b	0.0771	0.3125	0.0819
Tailrace – Upper Barrier	1.0	0.0	0.8696	0.0702	0.9000	0.0949
Upper Barrier – Barrier Dam	1.0	0.0	0.9500	0.0487	1.0	0.0
a. $P < 0.01, T_2 > T_1, T_3$ b. $P < 0.05, T_2 > T_3$						

Mayfield Secondary Separator

Background

- Results led to adaptive management
- 2025 study will seek further operational refinement/infrastructure alteration

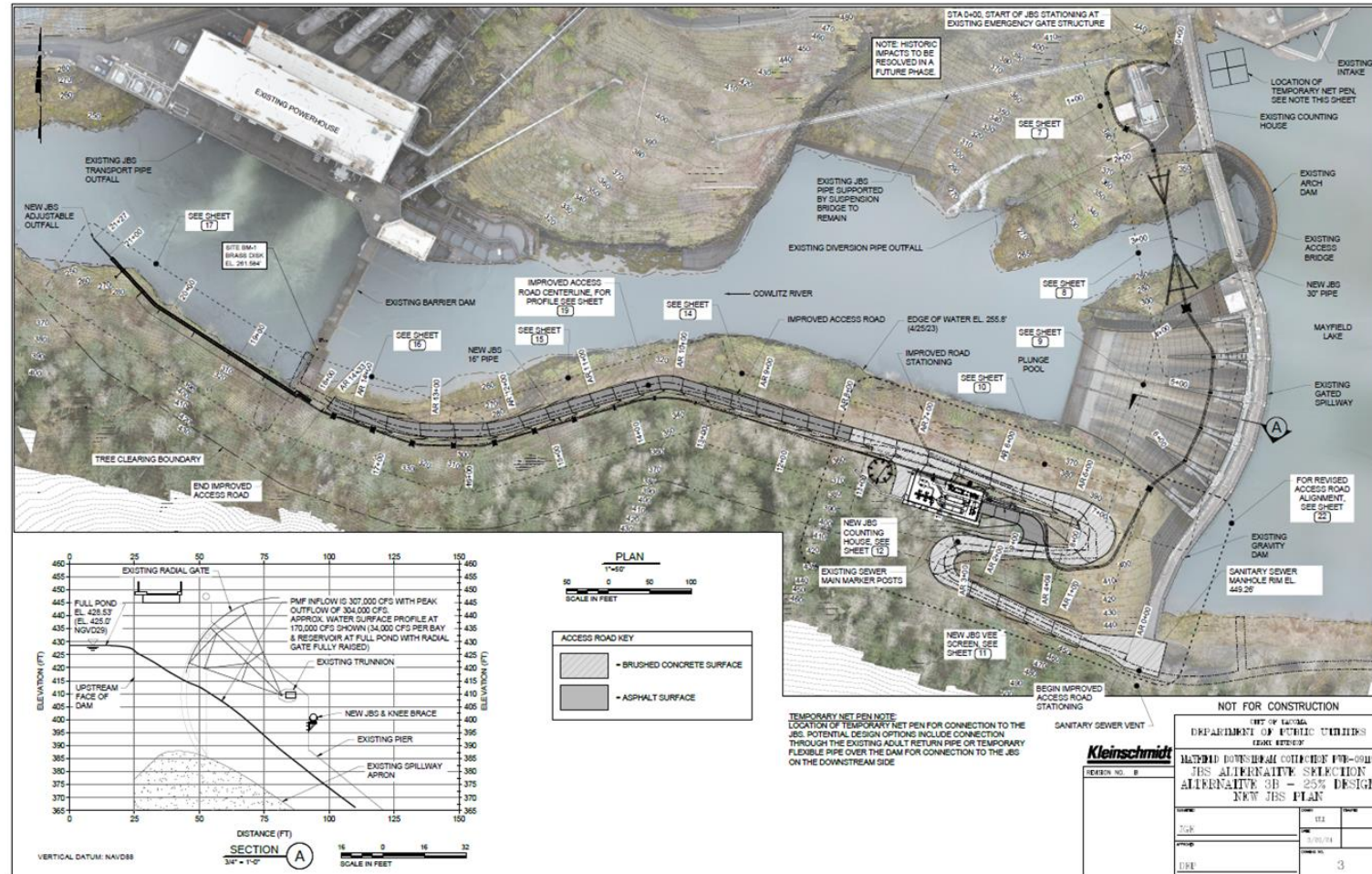


Mayfield Secondary Separator

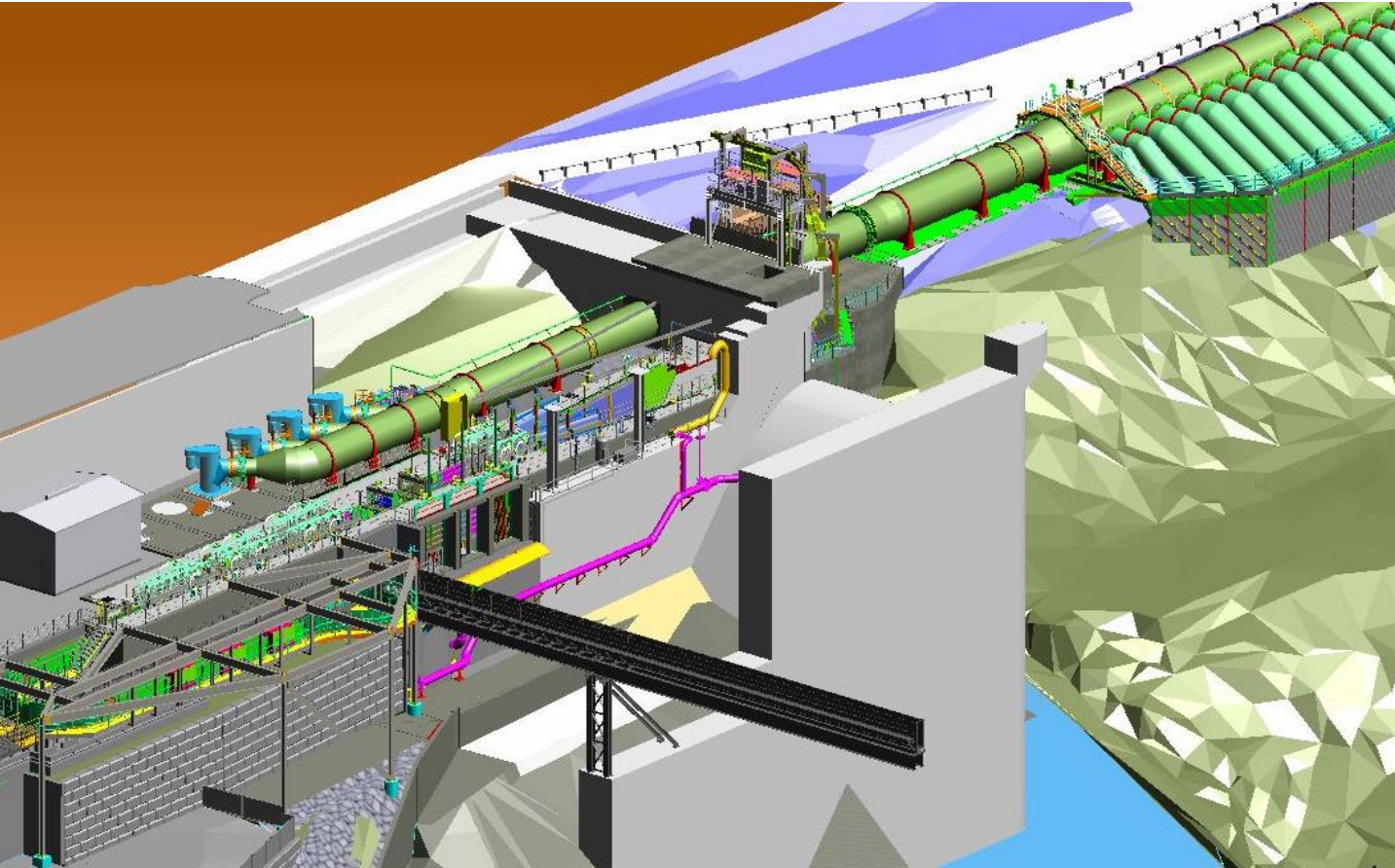
- Morphometrics
 - Condition factor
 - Age/life History Stage
 - Disease/parasite load
- Environmental
 - Discharge
 - Water temp
 - Turbidity
 - Outmigration timing (within season)
- Operational
 - Hydropower Operations
 - Drawdown Operations
 - Density
 - Initial capture
 - Recapture



Preliminary Design for Mayfield



Cowlitz Falls North Shore Collector

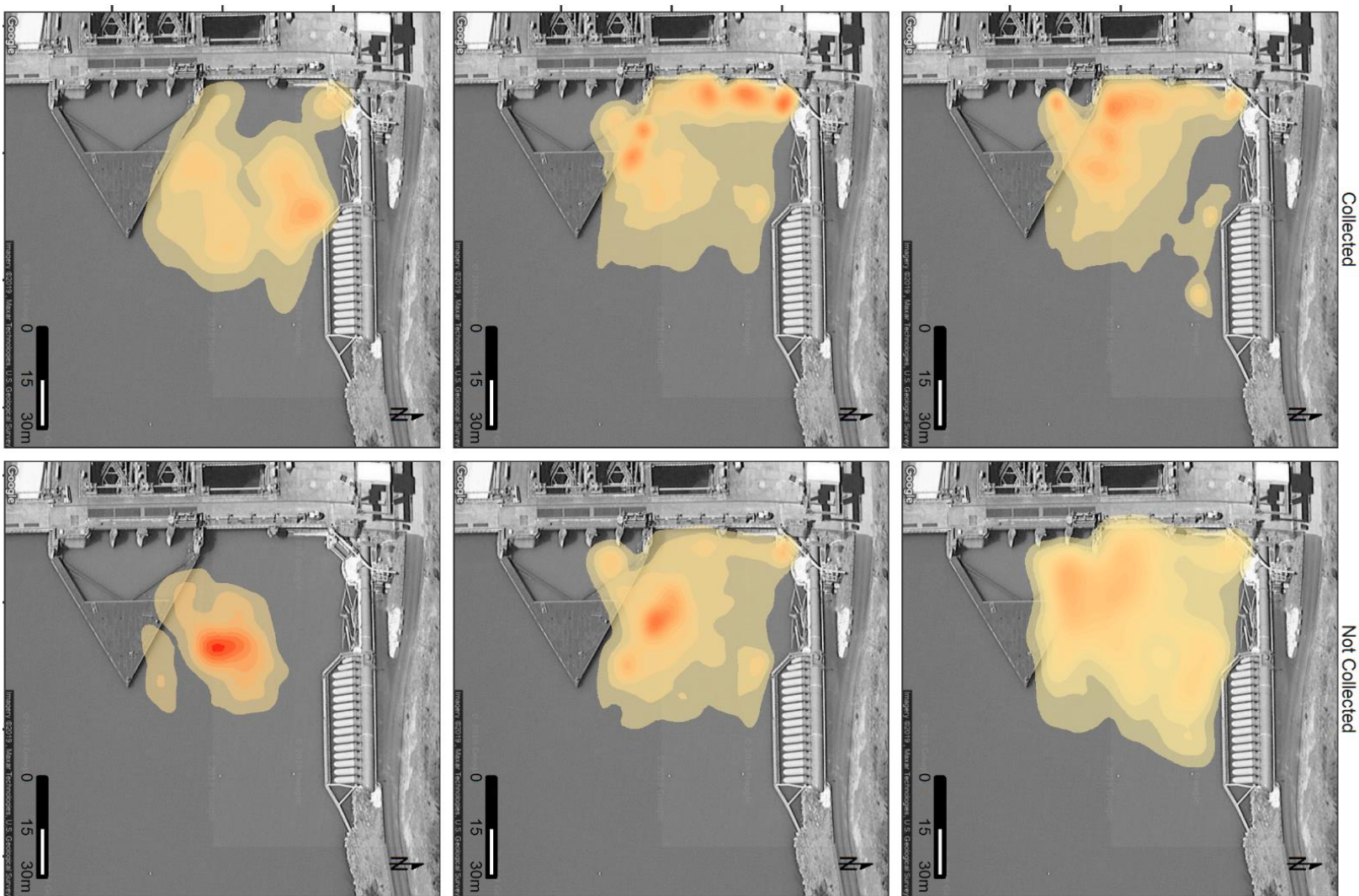


CFNSC - Background

- CFNSC was installed in 2017
 - Designed to be highly adjustable to increase FPS
 - Learning effects of operational changes = adaptive management
- Acoustic telemetry deployed in 2019 in conjunction with routine FCE work.



- Upstream
- Upper Forebay
- Zone of Influence (ZOI)
- CFNSC Entrance
- Capture Velocity Region



August

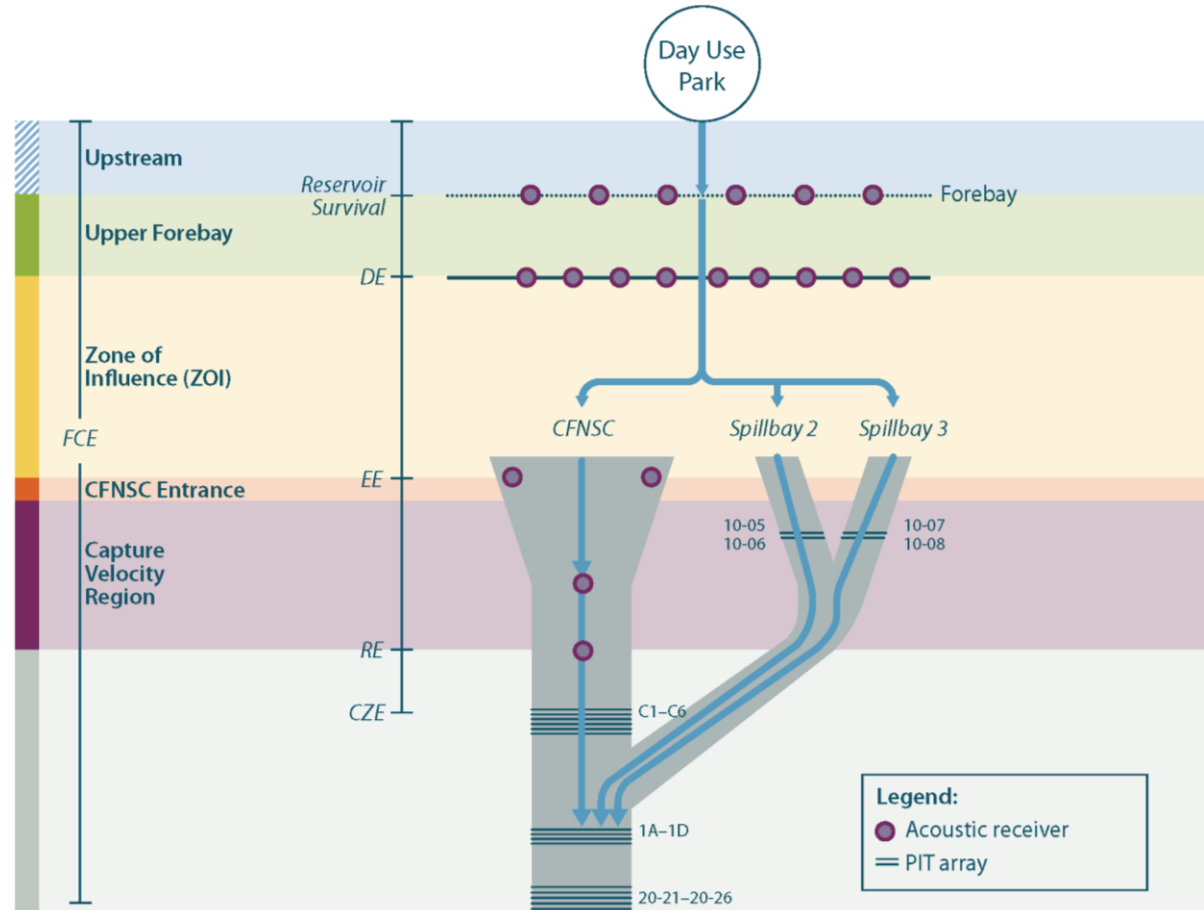
July

June

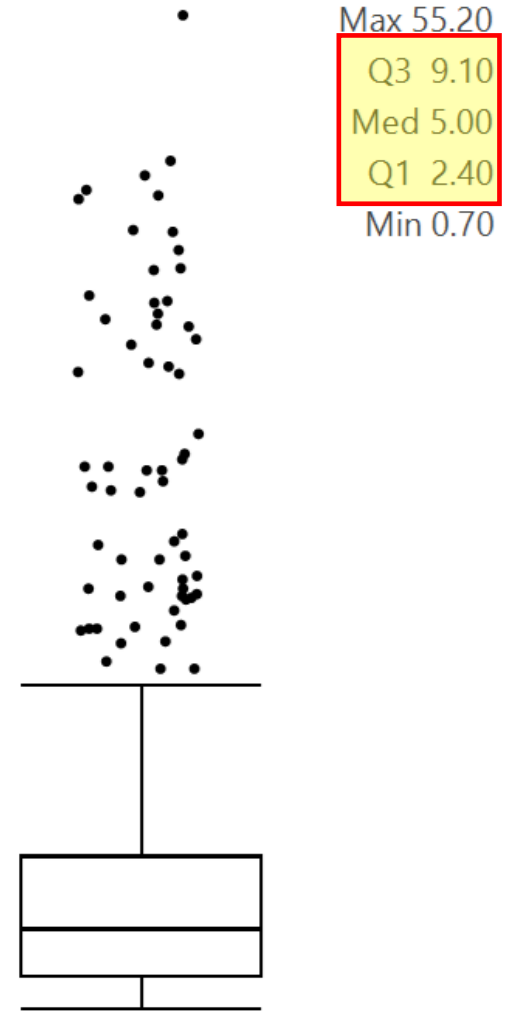
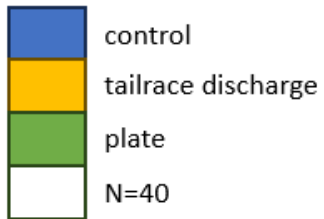
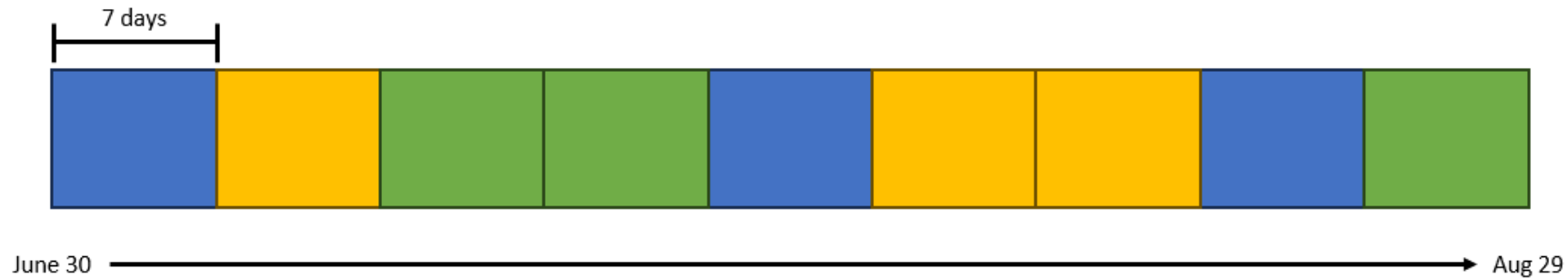
Cowlitz Falls North Shore Collector

Species	Release Date	Fish Capture Efficiency	Fish Released	Fish Recaptured	Fish Recovered
Chinook	June 27, 2024	66.0%	100	66	0
	July 4, 2024	52.0%	100	52	0
	July 9, 2024	30.0%	50	15	0
	July 12, 2024	36.0%	50	18	0
	July 16, 2024	32.0%	50	16	0
	July 19, 2024	34.0%	50	17	0
	July 23, 2024	36.0%	50	18	0
	July 26, 2024	36.0%	50	18	1
	July 30, 2024	20.0%	50	10	0
	August 2, 2024	22.0%	50	11	0
	August 6, 2024	22.0%	50	11	0

Cowlitz Falls North Shore Collector



Cowlitz Falls North Shore Collector



Cowlitz Falls North Shore Collector



CFNSC

- Morphometrics
 - Condition factor
- Environmental
 - Discharge
 - Water temp – surface
 - Water temp – at depth
 - Turbidity
 - Solar radiation
 - Barometric pressure
 - Outmigration timing (within season)
- Operational
 - Proportion unit 1:total Q^*
 - Turbine variation (SD_{turbines}^*)
 - Proportion unit 1:spillbay flume flow
 - Percent spill of discharge
 - Capture zone velocity
 - Differential pressure
 - Block



Questions?

