

Lewis River Fish Passage Subcommittee Meeting

Agenda

Thursday January 11, 2024

2:30 to 4:30 pm

Teams

Introductions, Review Agenda and Meeting Notes	All
<ul style="list-style-type: none">Meeting notes (November, December)	
2023 Yale Lake Fish Behavior Evaluation - Presentation	Four Peaks Environmental
2024 Study Needs	All
60% Design Review – Questions/Comments/Updates	All
Fish Transport Plan/Marking Strategies	
<ul style="list-style-type: none">Distribute 2009 Fish Transport Plan for background/reviewElements document sections 10-12 and 14	
Next Steps	All
<ul style="list-style-type: none">Continue 60% design reviewFish Transport Plan/Marking Strategies – Alternatives development	
Next FPS meeting – February 8th Teams Agenda	All
Adjourn	

Microsoft Teams meeting

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Phone Conference ID: 970 831 390#

FINAL Meeting Notes
Lewis River License Implementation
Fish Passage Subcommittee Meeting
January 11, 2024
2:30 PM – 4:30 PM
MS Teams Meeting

Attendees

Christina Donehower – Cowlitz Indian Tribe	Jeffrey Garnett – USFWS
Steve West - LCFRB	Dan Didricksen – WDFW
Melissa Jundt – NOAA	Bryce Glaser – WDFW
Beth Bendickson – PacifiCorp	Josua Holowatz – WDFW
Jeremiah Doyle – PacifiCorp	Peggy Miller – WDFW
Nathan Higa – PacifiCorp	Aaron Roberts – WDFW
Chris Karchesky – PacifiCorp	Doug Robison – WDFW
Erik Lesko – PacifiCorp	Keely Murdoch – Yakama Nation Fisheries
Todd Olson – PacifiCorp	Bill Sharp - Yakama Nation Fisheries
Enrique Ochoa - PacifiCorp	
Jonathan Stumpf – Trout Unlimited	Samuel Haffey- Four Peaks Environmental
Katie Buchan – USDA-FS	Mark Weiland – Four Peaks Environmental

Introductions, Review Agenda and Meeting Notes

Bryce Glaser, WDFW, reviewed the meeting agenda.

2023 Yale Lake Fish Behavior Evaluation Presentation

Sam Haffey, Four Peaks Environmental, walked the group through the 2023 Yale Lake Fish Behavior Study Report. Chris Karchesky, PacifiCorp, noted he had addressed all comments provided by Fish Passage Subcommittee (FPS) reviewers prior to issuing the final report, and the responses were provided in the 60% Design Comment Matrix.

Comments

Glaser asked about the decrease in the number of tagged fish reaching the Yale forebay and if it was known why it was less than observed in the 2022 study. Haffey said it was due to differences in hydrologic conditions. There was less water passing through the project in spring 2023 compared to spring 2022. Similar to reservoir passage of tagged fish during the Swift Collection Efficiency Studies, there is a lot of natural variability among years in the number of fish that transition through the reservoir during the study period. Glaser said if there are certain conditions that could increase fish collection, we should keep them in mind. Karchesky added that the reservoir passage information from the last two years is interesting, however, one of the primary goals of the study was to determine that fish are going through the reservoir. There were four spill events in the 2022 study and the generation was high at that time too. In 2023, there was a small

spill and it was a low flow year. However, in both years the fish successfully passed through the reservoir. Todd Olson, PacifiCorp, asked if any fish released at Beaver Bay first went upstream. Mark Weiland, Four Peaks Environmental, said they mostly moved downstream, but late in the study period a large number came back up by the Swift 2 Powerhouse given cooler water temperatures by Beaver Bay and Swift Powerhouse.

Doug Robison, WDFW, asked about the detection array and how fish approached and behaved in the forebay. Haffey said they are orienting to the flow but moving back around (forebay slide). Weiland add they are coming in across Saddle Dam and Boom 4, and cueing more at the powerhouse. It's shallower on the east Side 1 (15 feet deep; fairly shallow). This may be pushing them over to the west side. The speculation is they are moving over to west and then coming back over to the east side due to thermal influences and flows at the powerhouse.

Josua Holowatz, WDFW, asked if fish get detected on West 1 and Saddle Dam? Haffey said once they are released they move down the shoreline and some use the east side to Boom 4.

Robison asked if the receivers were at one depth, and how they capture information on fish depth. Weiland replied that the tags admit a pressure signal that is received by the receiver. It is from this pressure signal that determines the depth of the fish. Robison then asked if it would be worth it to show the depths of each fish? Weiland said it was done that way across the forebay and such details are in the report. Data shows where fish were sounding with most in front of the powerhouse likely clueing in on powerhouse intake flow. With the barrier net in that location, fish are not going into the powerhouse intake.

2024 Study Needs

Karchesky gave a slide presentation providing a summary of the information collected thus far as well as current data gaps the design team is hoping to have additional information on (Attachment A). He identified that the previous studies were really focused on confirming passage through the reservoir and looking at movement and behavior of fish as they approached and once they entered the forebay region of Yale Dam. He went onto provide examples of how this information was used to refine the design of the downstream facility from the 30% to 60% designs. Karchesky indicated that data gaps to the existing design still exist and are focused on design aspects associated with the fish collection channel. In particular, the design team would like additional information to 1) confirm the need to have "higher" water velocities at the entrance of the fish collection channel; 2) confirm that constantly increasing water velocity across the fish collection channel reduces fish rejection; and 3) confirm that capture velocity within the collection channel needs to be increased. Karchesky indicated that he was open to suggestions but was recommending that resources (e.g., acoustic telemetry equipment, etc.) be allocated in spring 2024 to evaluate the modifications that were completed at the Swift Floating Surface Collector that have changed the hydraulics of the fish collection channel and eliminated areas of deceleration. Results of this study would directly be used to inform the design of the Yale Downstream Facility.

Comments

Melissa Jundt, NOAA, thanked Four Peaks for their presentation. She asked if we are going to complete another year of fish behavior study on Yale Reservoir and wonder if there was anything else to gain. Karchesky said that he couldn't think of anything else at this time and felt the design team was comfortable with the changes that were made from the results of the previous studies. The real challenge we are facing is the time and getting all the information the design team needs to complete the design. The main focus now is on the fish collection channel. Jundt agreed and said while additional studies would be nice, she also recognizes we're getting down to timelines.

While not an engineer, Glaser said that he's a little nervous with only one year of data for a few species. He's curious about the thoughts others may have. No additional comments were provided. Karchesky reiterated we are on an accelerated design/construct schedule. One of the things he looked at across the studies is even though we had just one year for Chinook and steelhead, both study years were consistent for coho and the other species seem to follow suit. Juveniles of all species transitioned the reservoir, and when approaching the forebay, the vast majority approached from the west shoreline. Once in the forebay, juveniles of all species displayed search behavior and were attracted to and oriented towards surface flows, either from spill or the powerhouse. That was really helpful in reconfiguring the guide/barrier net as well as confirming a surface-style collector was the right direction to go.

Glaser indicated that he was just making sure there was adequate data to inform design and siting of the facility. Jundt said part of her says we have no time in the schedule, and we do this. In an ideal world we would look at more flow years. We still don't have any kind of an "on the books agreement" that says PacifiCorp is going to replace the Yale spillway barrier net and when. She feels fairly confident that fish will find the proposed Yale FSC location based on the results of the study and likes the changes to the barrier net configuration to allow fish to follow the west shoreline longer. Karchesky said he hears that perhaps an agenda item need would be a discussion on Yale spill data and net replacement.

Karchesky also noted once the facility is in place, it will change the hydraulics and structural cues within the forebay, which will likely change fish behavior. It's challenging to design these structures when fish are acting this way but if we put in a guide net it's going to change their search behavior. How are they going to act? The results of the study make Peter Christenson and team comfortable to move on.

Glaser said new studies starting from here forward would go through ACC for approval. We need to capture the 2024 work and get it teed up for the ACC. Karchesky asked him what he needed (scope of work, etc.) and his thoughts on it. Glaser replied at least a study write-up with background information presented to the ACC was generally what he was thinking about. Jundt said she thought there would be a 2024 Yale study. Memorializing it if PacifiCorp is comfortable taking the risk about design elements. The 2024 Swift study should be reviewed and approved. Karchesky added the 2024 Swift study will help address one of the challenges we've had with the FSC efficiency and inform the Yale FSC design. We've done acoustic noise work at the Swift FSC and in the 2022 study, we looked at the difference in the control weir at the FSC. We've put together a scope of work for the 2024 Swift study and can make that available quickly for review. Glaser, in looking at the Settlement Agreement and Elements Document, said the Utilities would develop study plans for the FPS and ATS to review and would then bring to ACC for final review/approval.

They are expecting to see study designs or plans for review and approval. It affects the design process from here on out. Glaser is just trying to figure out how to get a more detailed plan in front of the FPS and ATS.

Olson agreed with Glaser that in the Elements Document there was a strong interest to be able to review and approve study plans. What are we looking to inform for the Yale design? We need to make sure it's a value to the design. We can try to get something out quickly so we can move forward. Jundt appreciated that and said you have a lot of new folks in fish passage that have never seen the "cookbook." We might have other ideas. Karchesky said our goal today was to present where the design team wants to go and to seek subcommittee input. If folks are amenable to the study, meaning it makes sense to move forward with, then he would distribute a scope of work.

Glaser added if we need to work on moving this quickly he agreed with Olson's assessment of getting started on study implementation, then we need to see details of the study plan and then get it moving. Karchesky said he could work with Haffey and Weiland to get something out for review soon. Glaser said if there were more technical items in the study, we could key it up to the ATS, but if it's general we could present it at the next FPS meeting. He asked if there was a more aggressive timeline. Karchesky said we want to have results for consideration by the design team, so we should try and get the 2024 plan reviewed and approved quickly. He also thinks we could have something out early next week to the group. If anyone has comments, please send them to Chris for discussion. We can then have a check in at the February Subcommittee meeting. He appreciated everyone's input today.

60% Design Review – Questions/Comments/Updates

Olson said the Utilities are interested to get any comments/responses back but he just wants to touch base on a few things. We're on an aggressive track to build three fish passage facilities in the mid-2026 timeframe. We're full speed ahead. When we were working on the 60% design, we used 3D models. Constructing things in electronic 3D phase helps us understand how things fit together. The Design Team felt it was a good way to share information so it can be presented to the group in an understandable format. In going this way, there are probably gaps where the FPS would like to see more information. We can work to provide it in a timely manner. It's more important that the FPS understand and agree on key design elements, then the 45-day review period. We want to hear if folks are ok with "this and this, and not that." The 45 days can be extended as things come up. We are interested if information is being developed and shared and folks are understanding on how it will fit together and move forward. Jundt said she has a short list of items that need more information. As the NOAA FERC coordinator, she noted that we need to have a record of the "why." She does not think the December 2023 PowerPoint does that. You have engineers but you also have fish passage and licensing folks in this group. She wants the dimensions in a clear way for FERC. It also gives her something to approve going forward. It will protect us both. Olson appreciated her feedback in wanting things for the record, documenting what has changed. What we need to provide -- here's what changed and some detail. For example how wide is the entrance (for Yale upstream entrance) etc. Jundt said that for the 90% designs she expects to see the entire set of plans. In her vision PacifiCorp should provide a plan view of the Yale FSC, with a note block on the side that explains things so that we're all on the same page. These are the things that she personally likes. She thought it was extremely helpful to see the changes via the December presentation. She also indicated that having a note section on certain drawing would be good identifying any unresolved questions for instance.

Olson said aside from those things, what is the subcommittee’s thought on the general changes on the upstream (no ladder to pools, and lifts). Do they seem to be acceptable? Jundt said they discussed the location as well as pool sizes. Glaser added that they are not ready to make decisions yet. They are getting together to go through the 60% design presentation information and to help move things along to get to the level of information that Jundt codified, maybe the Services and WDFW (as called out in the Settlement Agreement) could get together to come up with a list of what we need so we can be clear. He thought it would help with communication with the design team and project record. From there, Glaser said his other comment is the intent about the FPS function providing comments within a 45-day review. He likes how we’re functioning but there may be a legal parameter with the 45 days. Let’s keep communicating and let’s get the items where more information is needed, then the 45 days can start. Olson added that as the Services and others come up with the list, to feel free to send it to PacifiCorp and say, “here are the first three things; next week we’re going to talk about the next few things and provide those then.” This way he can feed things to the design team to keep them going. Jeff Garnett, USFWS, said that works for him, to start identifying things. Glaser agreed with Olson in being supporting and moving things along but also for keeping an eye on the legal part of the process. Jundt liked that idea too. She appreciates that we can have live discussions and add to our Comment Matrix a “column” of when our comments were submitted.

Karchesky said he added two columns to the Comment Matrix (Column G - Further Comments/Proposed Resolution) and Resolved (Y/N). He also added the 30% design comments. He wonders what’s the best way to keep everything organized. Jundt said she sees the benefits to Column G. Glaser liked it too. It would help prioritize things with everyone’s workloads.

Fish Transport

Glaser noted the FPS has an objective to work on updating the Fish Transport Plan including marking strategies. In preparation, the last Plan he could find was from 2009. They may be on PacifiCorp website; perhaps PacifiCorp could send the FPS a link to the document or the document itself. Folks should also look at Sections 10-12, and 14 of the Elements Document.

Is there a specific date to finalize the new Fish Transport Plan? Olson replied that this plan needs to be approved before the new fish passage facilities begin operations.

FPS Next Steps

- Continue reviewing the 60% design
- Study Plan 2024 (Discuss any issues on it)
- Yale Spillway Net

Next FPS Meeting: February 8, 2024

Action Items from January 11, 2024	Status
The Services and WDFW will work to develop a list of additional design information needs.	Ongoing
Group review of the December 2023 PowerPoint presentation.	Ongoing

Beth Bendickson will send out a link to or a copy of the last version of the Fish Transport Plan.	Complete
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Action Items from December 14, 2023	Status
Review and provide comments into the Comment Matrix and send to Chris Karchesky and Beth Bendickson by February 19, 2024.	Ongoing

Action Items from November 9, 2023	Status
Bryce Glaser will take a harder look through the Elements Document and pull out items to work on going forward.	Ongoing

The meeting adjourned at 4:33 PM.

Meeting Handouts and Attachments

- Agenda
- **Attachment A** - Yale Reservoir 2023 Fish Behavior Evaluation presentation

Attachment A

Yale Reservoir 2023 Fish Behavior Evaluation Presentation



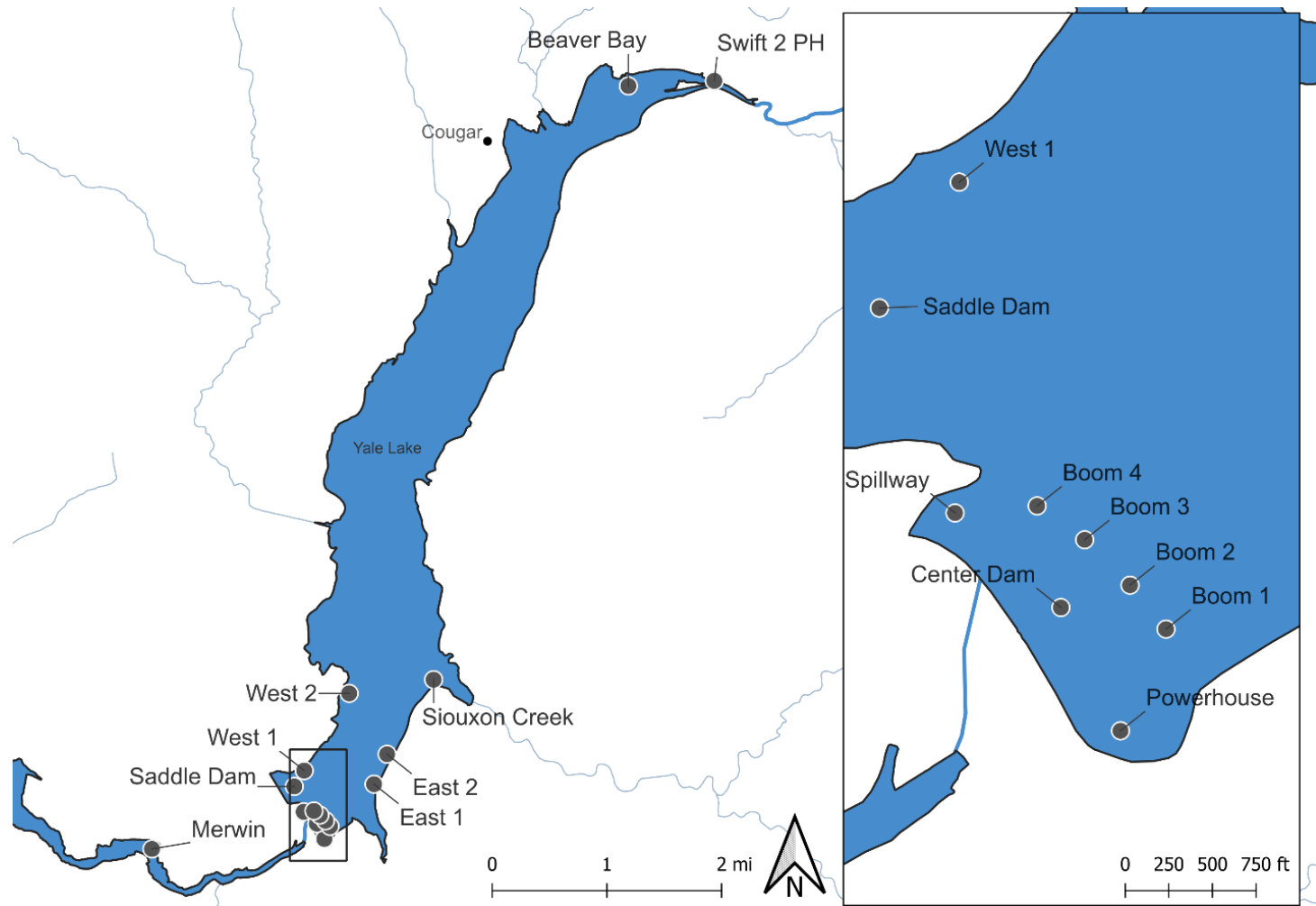
Yale Reservoir 2023 Fish Behavior Evaluation

Lewis River Fish Passage Subgroup Meeting
January 11, 2024

Yale 2023 Study Objectives

- Inform design decisions regarding the location and orientation of a downstream passage facility at Yale Reservoir
 - Estimate the proportion of fish released at the upstream end of Yale Reservoir that arrive in the forebay of Yale Dam (P_{PASS})
 - Describe the behavior of fish as they approach and once they enter the forebay
 - Monitor the depth of fish in the forebay
- Where appropriate, compare results to the 2022 study

Acoustic Telemetry Receiver Array



Fish Tagging and Release

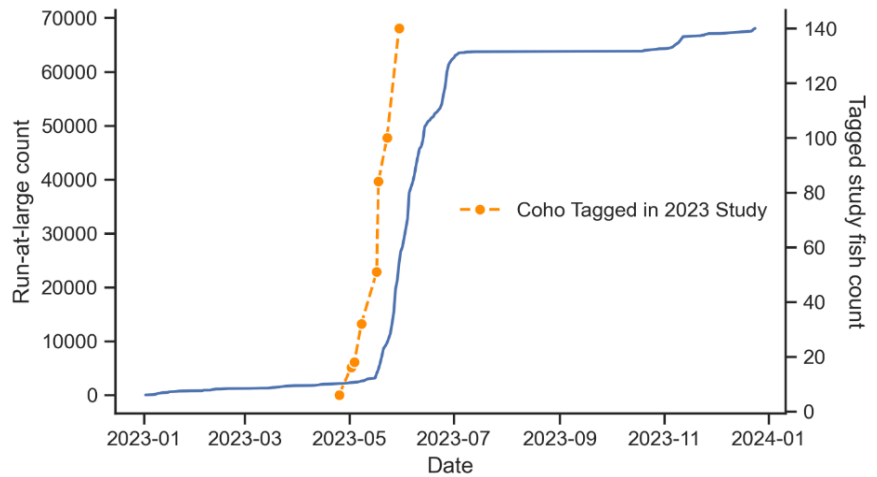
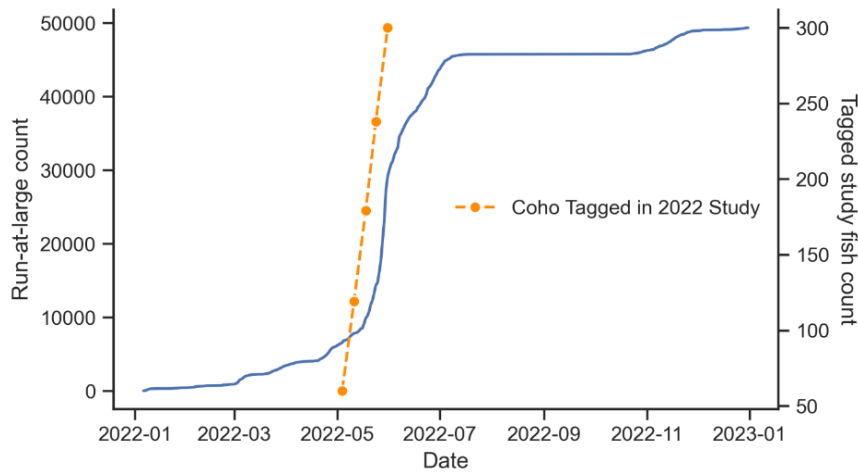
Species	Count	Mean (SD) Fish Mass (g)	Mean (SD) Fork Length (mm)
Chinook	133	64.3 (17.6)	185 (18.0)
Coho	140	43.2 (18.6)	161 (26.6)
Steelhead	130	60.7 (18.3)	191 (18.6)

- Two acoustic tag types were used, divided equally among the study fish
 - SS300P (pressure tag)
 - SS400
- All fish were dual tagged with passive integrated transponder (PIT) tags



Coho Tagging and Release 2022 vs 2023

Study Year	Count	Mean (SD) Fish Mass (g)	Mean (SD) Fork Length (mm)
2022	300	33 (18)	145 (29)
2023	140	43 (19)	161 (27)

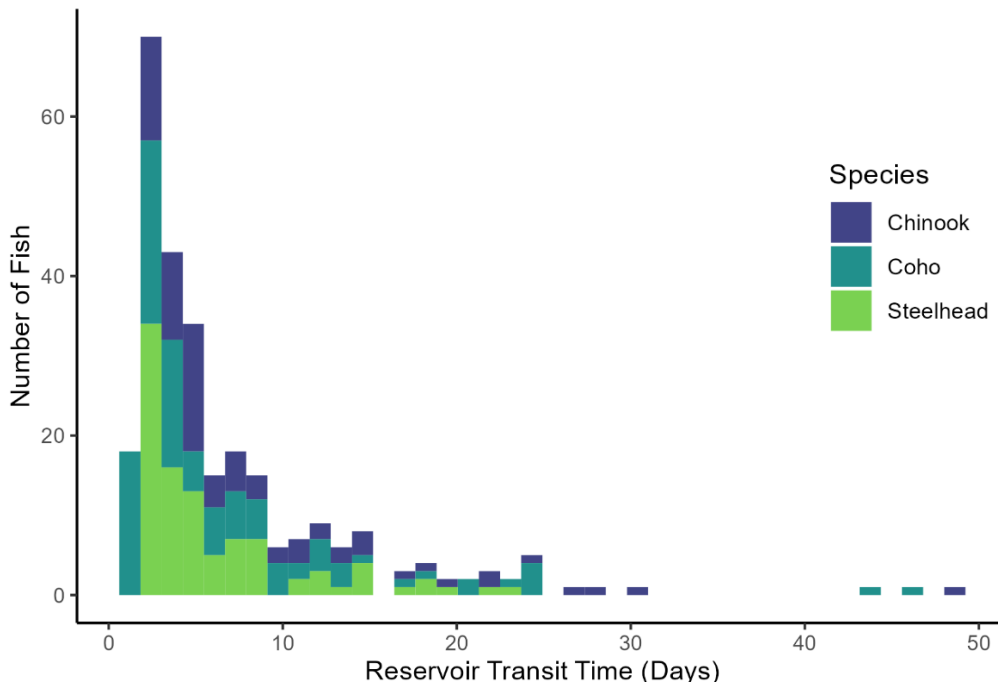


Detected in Forebay Region (P_{PASS})

Species	2023 P_{PASS} Upper Res	2022 P_{PASS} Upper Res	2022 P_{PASS} Mid Res
Chinook	56% (49% - 63%)	-	-
Coho	75% (69% - 81%)	88% (83% - 91%)	90% (85% - 94%)
Steelhead	75% (69% - 81%)	-	-

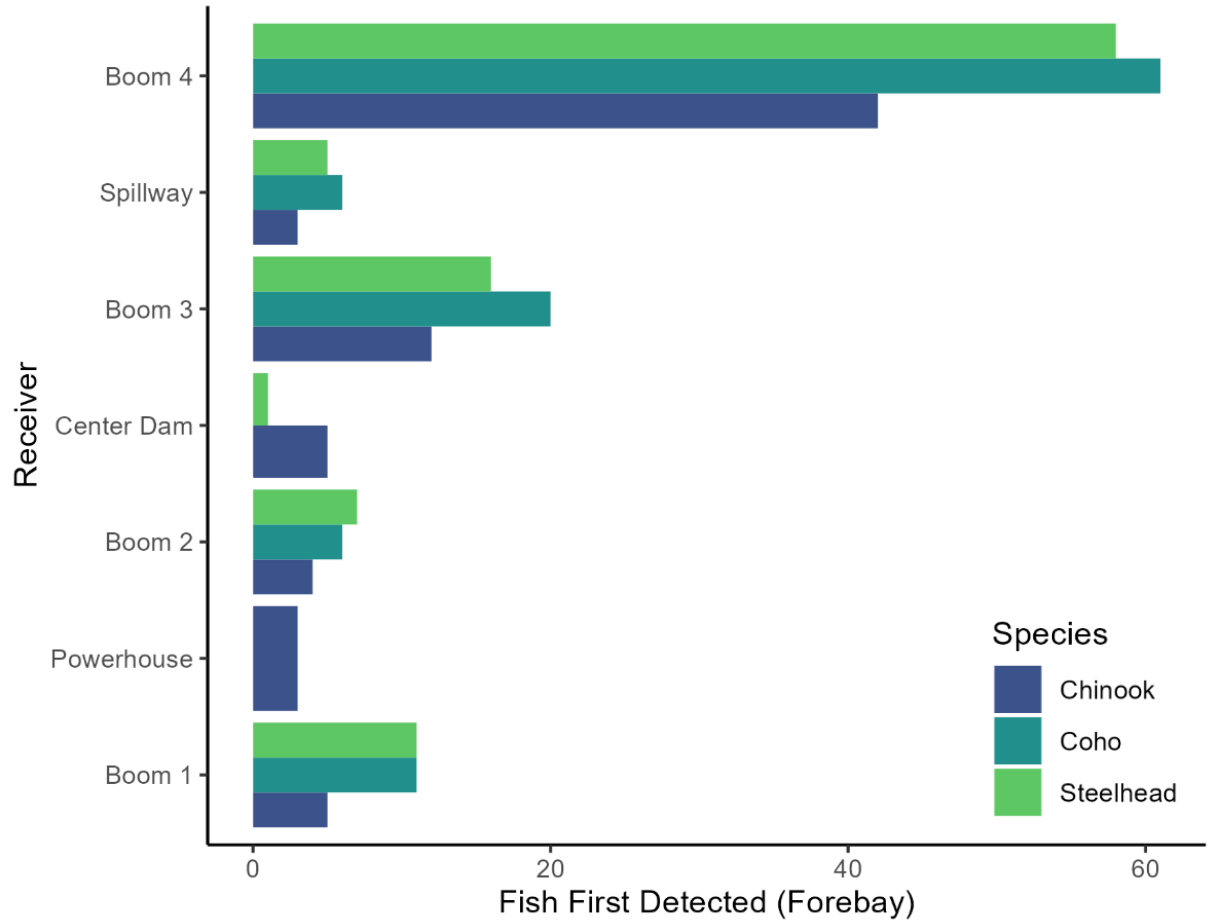
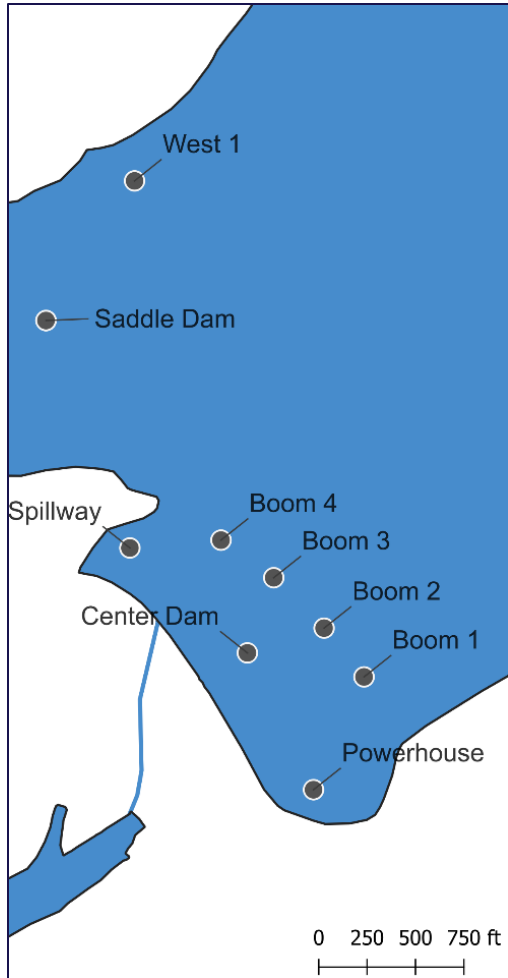
Transit Time

Species	Transit Time (days)		
	Minimum	Median	Maximum
Chinook	2.2	5.1	48.1
Coho	1.0	3.8	46.0
Steelhead	2.2	4.2	23.3

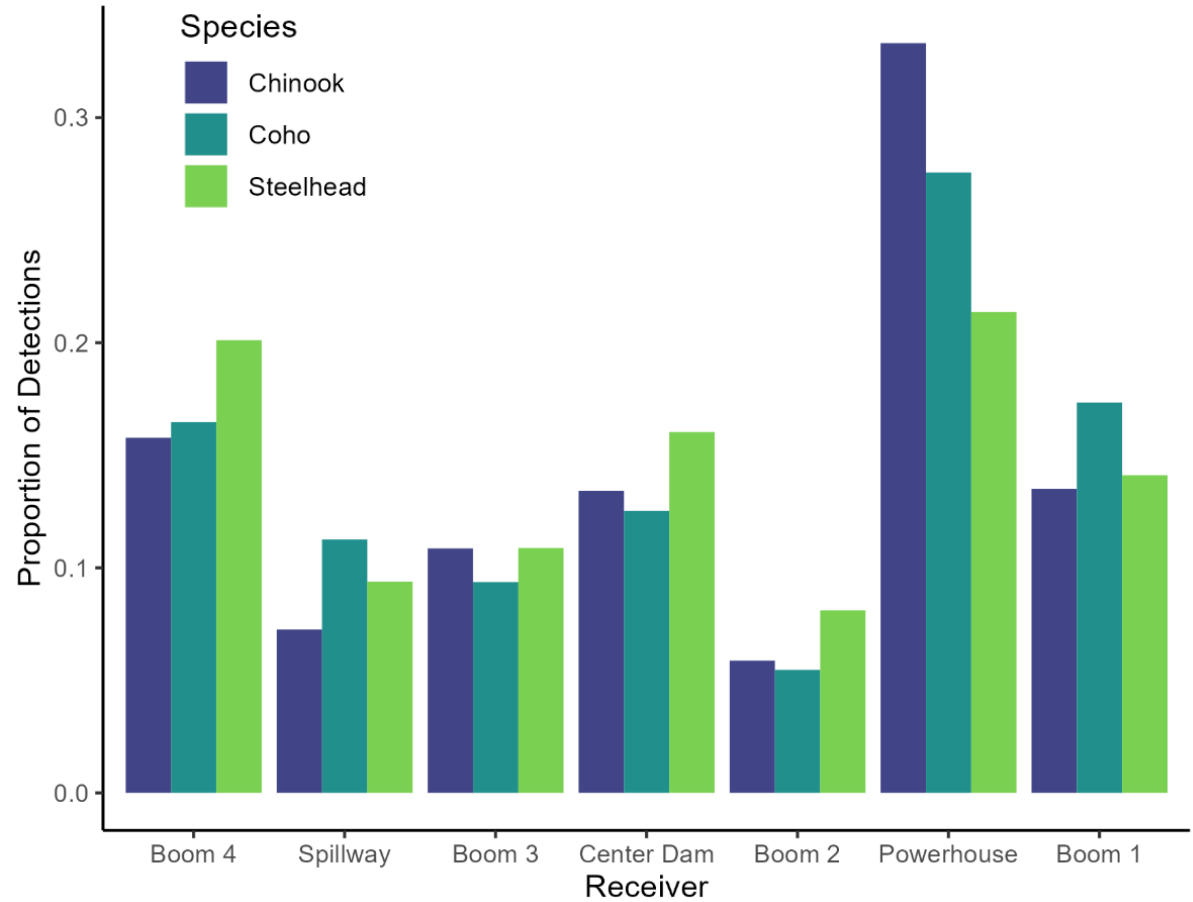
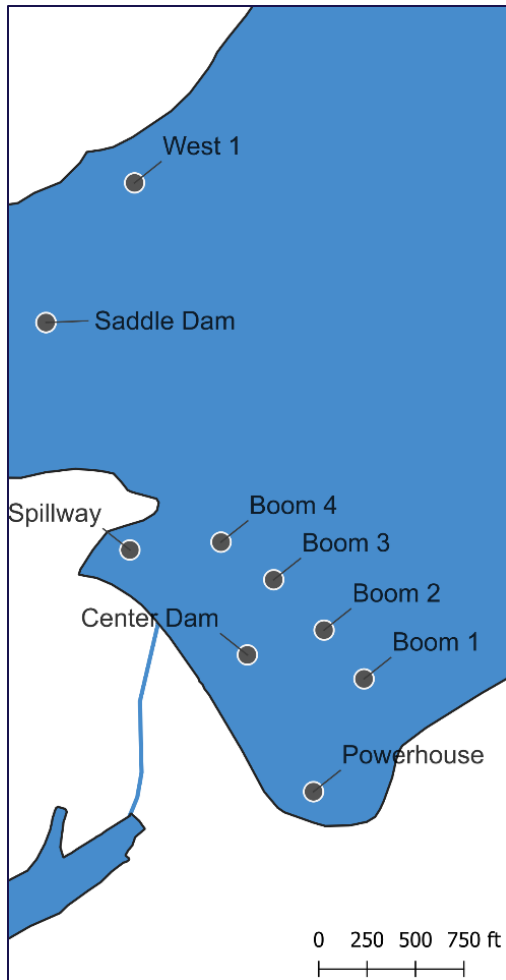


*2022 fish were slightly slower, but transit times were comparable

Where Fish Enter the Forebay



Where Fish Spend Time in the Forebay



Forebay Depth Distribution

Species	Depth (feet)				
	5 th Percentile	25 th Percentile	50 th Percentile (Median)	75 th Percentile	95 th Percentile
Chinook	2.0	3.6	6.1	9.5	17.8
Coho	1.5	3.2	4.7	7.7	17.0
Steelhead	1.0	2.1	3.4	6.2	15.9

- Over 95% of time in the forebay is spent in the upper 18 feet of the water.

Summary

- Results of the 2023 study are consistent with observations made in 2022
 - Fish are making it through the reservoir to the forebay
 - Fish use the shorelines and approach the forebay from the West
 - Once in the forebay, fish display search behavior and orient to surface flow queues
- Fish are surface oriented

Studies to Inform Design of the Yale Downstream Collector

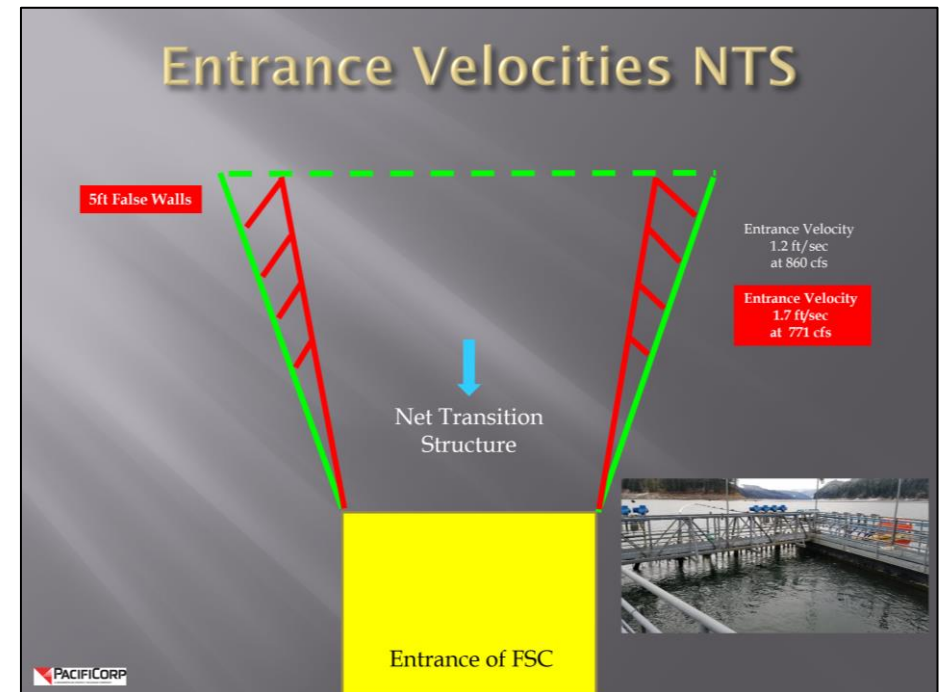
- Primary goal of previous evaluations (2022-2023) were to inform design decisions regarding the location and orientation of the downstream passage facility in Yale Reservoir.
- Key findings:
 - Juvenile salmonids of all transport species do transition the entire length of the reservoir and enter the forebay region of Yale Dam.
 - Juvenile salmonids of all transport species predominately migrate downstream along the shoreline and enter the forebay region of Yale Dam from the west side.
 - Once in the forebay of Yale Dam, juvenile salmonids of all transport species display search behavior and orient towards and seek near surface flow cues created either from the powerhouse or spillway.
 - In the 2023 Study, juvenile salmonids of all transport species were confirmed to be surface oriented and migrate almost exclusively (>95% of detections) in the top 20-ft of the water column.
- These details have been used to refine the location and orientation of the surface-style downstream fish collector being designed at Yale Dam as well as the orientation of the associated guide/barrier nets

Studies to Inform Design of the Yale Downstream Collector

- Information gaps still exist regarding the configuration and hydraulics of the fish collection channel being designed for the Yale Downstream Collection Facility.
- Key design elements of interest:
 - Confirming the need to have “higher” water velocities at the entrance of the fish collection channel.
 - Confirming that constantly increasing water velocity across the fish collection channel reduces fish rejection.
 - Confirming that capture velocity within the collection channel need to be increased.
- Have a unique opportunity to address these data gaps using the modifications recently completed on the Swift FSC that increased entrance velocity and eliminated areas of deceleration within the fish collection channel.
- Testing of the modifications are tentatively scheduled to begin in spring 2024 following methodologies outlined in Objective 2 of the LR Monitoring and Evaluation Plan (2022). Recommend allocating resources to this effort to help inform questions regarding the fish collection channel currently being designed for the Yale Downstream Collection Facility.

Swift Floating Surface Collector

- Adjustments to the Swift FSC Net Transition Structure (NTS) to increase entrance velocity and eliminate areas of hydraulic deceleration within the fish channel were completed in summer 2023.
- Adjustments designed to allow for evaluation of passage success through the collection channel with smooth, consistently increasing velocity. Do these conditions reduce rejection and improve capture success?
- No acoustic telemetry study conducted in spring 2023 to focus resources and equipment on fish behavior evaluation in Yale Reservoir.
- End goal is to use information as we consider more permanent modifications to the entrance of the Swift FSC to improve collection efficiency as well as inform data gaps regarding design elements the Yale Downstream Fish Collector.





Before



After

Swift Floating Surface Collector

- Spring 2024 – Collection Efficiency Evaluation (Obj. 2 M&E Plan) with increase resolution within the fish collection channel
- 3D Acoustic Telemetry similar to previous years:
 - Focused on changes in fish behavior at the entrance and during passage through the fish collection channel.
 - Key passage metrics will be assessed.
- All three transport species included:
 - Coho
 - Steelhead
 - Chinook**
- Schedule:
 - Installation to begin in late-February
 - Field Season/Data Collection – March-July
 - Data Processing/Report – August-October
 - FPS Presentation – December/January?

