LEWIS RIVER AQUATIC COORDINATION COMMITTEE

Facilitator: ERIK LESKO
503-412-8401

Location: TEAMS MEETING ONLY

Date: August 11, 2022

Time: 9:30 AM – 12:00 PM

AGENDA ITEMS

9:30 AM	Welcome ➢ Review and Accept 8/11/2022 Agenda ➢ Review and Accept 7/14/2022 Meeting Notes
9:45 AM	Public Comment Opportunity
9:50 AM	Approval of Yale Habitat Preparation Plan 2022 Plan – *Erik Lesko*
10:15 AM	Study/Work Product Updates ➢ Flows/Reservoir Conditions Update ➢ Aquatic Fund Announcement Update ➢ Reservoir Shoreline Development Projects ➢ ADA Access at Haapa – Update ➢ ATS Update ➢ AMEP Update ➢ FPS Update ➢ USFS Restoration Project Field Trip Update ➢ Fish Passage/Operations Update ➢ Swift Reservoir Stranding Survey Schedule ➢ Compensatory Mitigation Discussions Update (tentative)
11:50 AM	Next Meeting's Agenda • USFS Clearwater Creek Design Update Public Comment Opportunity
12:00 PM	Meeting Adjourn

Note: all meeting notes and the meeting schedule can be located at:
https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html

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Or call in (audio only)

+1 563-275-5003,,644857650# United States, Davenport

Phone Conference ID: 644 857 650#

FINAL Meeting Notes
Lewis River License Implementation
Aquatic Coordination Committee (ACC) Meeting
August 11, 2022
TEAMS Meeting Only

ACC Representatives and Affiliates Present (17)
Sarah Montgomery, Anchor QEA
Christina E. Donehower, Cowlitz Indian Tribe
Eli Asher, Cowlitz Indian Tribe
Amanda Froberg, Cowlitz PUD
Anne Baxter, Ecology
Steve West, LCFRB
Chris Karchesky, PacifiCorp
Erik Lesko, PacifiCorp
Todd Olson, PacifiCorp
Jeremiah Doyle, PacifiCorp
Mark Ferraiolo, PacifiCorp
Aaron Roberts, WDFW
Peggy Miller, WDFW
Josua Holowatz, WDFW
Bryce Glaser, WDFW
Kate Day, USFS
Bill Sharp, Yakama Nation

Guests (0)
None

Calendar:

August 11, 2022	ACC Meeting	TEAMS Meeting

Assignments from August 11, 2022	**Status**
Erik Lesko: Schedule the surveys for the Swift Reservoir Stranding Study.	**Ongoing.**
Erik Lesko: connect with PacifiCorp staff regarding the Haapa boat launch ADA accessibility project.	**Compete (August 2022).**
All: Forward the Aquatic Fund announcement to potentially interested parties.	**Complete 8/9/2022.**

Assignments from July 14, 2022	**Status**
Erik Lesko: Update Teams meeting invitation to add and remove staff as needed.	**Ongoing.**

Assignments from June 9, 2022	**Status**

Todd Olson: Provide the draft letter to FERC regarding the ACC's progress, agreements, and outstanding discussion items for ACC review.	**N/A See topic Fish Passage Plan**

Assignments from April 14, 2022	**Status**
Erik Lesko: Coordinate with the TCC regarding the timing for WSDOT's Cougar Creek culvert project.	**Ongoing. (Currently planned for 2023.)**

Opening, Review of Agenda and Meeting Notes
Erik Lesko (PacifiCorp) called the meeting to order at 9:33 a.m. and reviewed the agenda. Bryce Glaser noted that the FPS has an update for the ACC on their approach to a Fish Passage Plan, and it will be helpful to get the ACC's feedback on its purpose and next steps. Olson said this can be added to the agenda.

Lesko reviewed the July 14, 2022, meeting notes. Revisions were reviewed and approved at 9:49 a.m.

Public Comment Opportunity
None.

Approval of Yale Habitat Preparation Plan

Erik Lesko said the ACC previously provided comments on the Yale Habitat Preparation Plan, which he has revised for final approval. Lesko summarized the changes shown in this version of the plan (Attachment A):

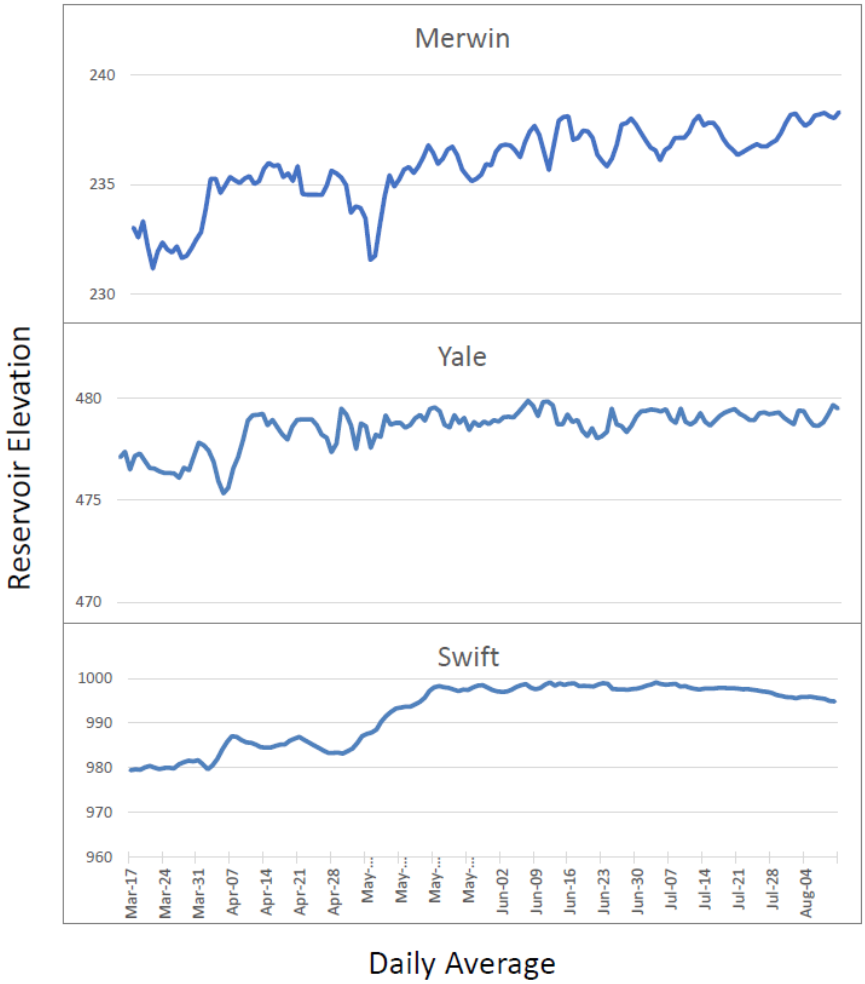
- The chart showing coho return numbers has been updated to represent hatchery-origin coho collected at the trap (both early and late origin coho). He noted there have been a lot of coho returning in the last two years, though some years previously did not have a lot.
- The transport numbers have been updated to reflect capacity, not abundance estimates, and definitions were added to clarify these terms. The associated figure was updated and a table was added to improve readability. Lesko noted that the new transport number based on updated definitions is 1,842, compared to the previous transport number of 1,100. He asked if there are any concerns with this new transport number.
    - Glaser said because the purpose of the Yale HPP is not to maximize production but just to get fish into habitat to provide nutrients and till gravel, he does not have concerns about the transport number. Actually achieving full capacity is a separate goal from the HPP and would be discussed in a different plan.

Lesko said according to the ACC ground rules, a decision document is not needed to approve a plan that is required by the Settlement Agreement. However, a consensus decision should be recorded in the meeting notes. He asked if there is any opposition to this approach or implementing the plan, and there was none.

ACC representatives present agreed that the Yale Habitat Preparation Plan, as revised, should be implemented.

Flows/Reservoir Conditions Update
Erik Lesko shared the flows and reservoir conditions update.

Reservoirs are still quite full, as follows:



-1.16 feet
(-1.97 feet in July)

-10.60 feet
(-11.0 feet in July)

-5.19 feet
(-2.13 feet in July)

Lesko noted that the reservoirs have only lowered approximately one foot from last month, and the current total draft is 16.95 feet. He pointed out that the Swift Reservoir is currently at a stable elevation but starting to decrease. This will be important for him to follow closely over the next few weeks because the Swift Reservoir stranding surveys can start at around 991 feet. At the current rate of decline, it is anticipated that surveys should start at the end of the month or beginning of September. Downstream of Merwin Dam, he noted that reservoir elevations are stepping down in sequence with the FERC minimum flow and available inflows.

Aquatic Fund Announcement

Erik Lesko said Beth Bendickson sent the Aquatic Fund announcement to interested parties on August 9. Though this was later than intended due to a delay in determining the available funds, it still provides applicants approximately two months to develop a draft proposal to submit by October 22. He said there is no intention to shift the previously agreed upon schedule, with presentations in November and proposals due December 30. He said the announcement has been sent to the Terrestrial Coordination Committee and the previous Aquatic Fund announcement distribution list. Bryce Glaser asked Steve West if he could forward to the announcement to additional potentially interested parties using Lower Columbia Fish Recovery Board contacts. West said he will coordinate with Steve Manlow and other LCFRB staff on this. Lesko asked

that any ACC representative please forward the announcement to potentially interested parties to widen the distribution of the announcement.

Study/Work Product Updates

Shoreline Development Update
Lesko provided an update on various shoreline development and other projects:

- He noted there have been no new permit applications.
- PacifiCorp received approval from FERC to replace a culvert downstream of the Merwin Park area.
    - Peggy Miller noted this culvert is on a road that is used to access powerlines. It is not a fish-bearing stream. The Terrestrial Coordination Committee has also been discussing this project, which is called "600C2 Culvert Replacement Project."

Haapa Boat Ramp Update
Erik Lesko said Josua Holowatz requested an update on the Haapa Boat Ramp ADA access project, which is a proposed project to install an ADA-accessible fishing platform near the Haapa Boat Ramp. Lesko received an update from PacifiCorp staff on this project. The status is comments were received from WDFW on the design drawings, suggesting that the platform be moved 25 feet downstream. This is a significant request and would require new design work. Holowatz said he provided these comments because fish are known to spawn in the immediate area where the platform is proposed to be installed, and the overall footprint of installation is quite large for the area. He also had concerns about whether this platform would provide a quality fishing experience for anglers, because he understands there is not much fishing success in that area. He said he understands the project has taken longer than was initially planned to implement but he hopes that these comments and more coordination will ultimately improve the project. Lesko said the next steps are for PacifiCorp and their consultant team to work with WDFW on these comments and update the schedule and design as needed. Holowatz said he looks forward to re-engaging with the group and will share additional ideas. Lesko said he will check in with PacifiCorp staff to make sure they are aware of WDFW's interest in re-engaging on this topic.

Bryce Glaser noted that WDFW has recently revitalized the advisory group that advises WDFW on ADA topics statewide. He said there is a new volunteer representative for Region 5, and he may have interest in being an additional resource. Glaser said he will connect Holowatz with the Region 5 representative.

ATS Update
Erik Lesko said he and Larissa Rohrbach (Anchor QEA) are working on finalizing the 2022 Annual Operating Plan. A draft version should be available for the ATS to review in August or September. The priority for the ATS right now is evaluating the fall monitoring approaches, for which there may or may not be meaningful changes made in 2022. Other ongoing work items include developing the genetics monitoring plan for implementation in 2023; developing a plan and scope to evaluate smolt-to-adult return rates; and implementing the total dissolved gas study at Lewis River Hatchery.

FPS Update
Bryce Glaser said at the last Fish Passage Subgroup (FPS) meeting, the FPS was working through some of the issues were initially lined out in the draft letter to FERC that had been presented. After further discussions with Todd Olson, Glaser said they decided to develop a plan

to capture many of the elements that were discussed in the previous letter. The last FPS meeting was focused on working on the pieces of the plan and identifying areas where there are concerns or alignment. The FPS will continue making progress on this plan during their meeting later today. Olson agreed and thanked the FPS for working on the comments on the plan. He said he has some clarifying questions on the plan that can be reviewed this afternoon with the FPS.

Fish Passage Plan – Purpose

As discussed above, the FPS is developing a plan to capture the approach to future fish passage. Glaser said this is separate from the plans that are required by the Settlement Agreement and is designed to provide initial direction on how to get started on the plans required by the Settlement Agreement. This represents an agreement in principle on how to move forward and will line out some key direction on certain elements. It should not be too prescriptive. Olson agreed and said he sees the purpose of the plan as memorializing agreement on elements that will be included in the fish passage plans and construction schedules. The document should provide guidance to the engineering design team, fish passage team, and monitoring and evaluation teams. So far, finding the right level of detail has been a challenge, but the plan overall should identify what will be implemented or the process for getting to the implementation process. The goal is to keep this plan moving along quickly due to pressure from FERC and a desire to complete the plan as soon as possible. Glaser agreed and noted that the plan will be helpful because it will point out items that should be included in the plans, like "handling plans for bull trout and nonnative species." Given that the Settlement Agreement calls out a specific implementation timeline, it will be important to point to the overall schedule and how deliverables required by the Settlement Agreement fit into the schedule. Olson said any milestones of interest to the FPS and ACC can be added to this schedule. Once the FPS finished the draft plan, it will be provided to the ACC for review and ultimately approved as a decision document.

Swift Reservoir Stranding Survey Schedule

Lesko said he is working to schedule surveys for the Swift Reservoir stranding study based on expected flows in Swift Reservoir. He expects field work will start in late August or the first week of September, and he will update interested staff on the timing of the survey as it gets closer.

Compensatory Mitigation Discussions

Todd Olson said the FPS continues to discuss potential for compensatory mitigation along with the fish passage plans. Eli Asher said it would be appropriate for the Utilities to provide a response to the proposed compensatory mitigation. He said the fish passage plans currently have "to be decided" listed under potential compensatory mitigation, and he asked that the Utilities put more effort into this topic. Olson noted Asher's request.

USFS Site Visit Update

Lesko said the USFS hosted the ACC representatives for a site visit to the Swift Creek culvert replacement project and Rush Creek project. He said it was a great visit and the ACC was able to better understand the scope of the projects. It was interesting to learn that Rush Creek was previously an active logging area, and there were multiple old dams found within the new side channels the project is reestablishing. Josua Holowatz said he appreciates being able to see the confluence of Rush Creek and the Lewis River and observe how the stream has moved. He said he anticipates this project providing great benefits to fish, which will be able to use Rush Creek at a higher variety of flows and access the floodplain habitats. Lesko and Holowatz both noted the drone technology that was being used to monitor project progress and thanked the USFS staff for organizing the site visit.

AMEP Update
Chris Karchesky shared a presentation, Lewis River Fish Passage Program Mid-Season Summary (Attachment B). He said the purpose of the presentation was to highlight some of the monitoring and evaluation work and field activities that have been accomplished so far this year. He noted that the Swift Floating Surface Collector (FSC) was turned off July 18, 2022 when water temperatures reached the threshold and fish numbers had declined to near zero. Currently, the Swift FSC is in summer maintenance mode, and only routine maintenance is scheduled this year. This week, divers are on site doing repairs and inspections of the nets and other underwater structures. The FSC will be returned to service sometime late September or early October when water temperatures fall. The Merwin Trap is still collecting mostly summer steelhead, which are being recycled or surplussed by WDFW.

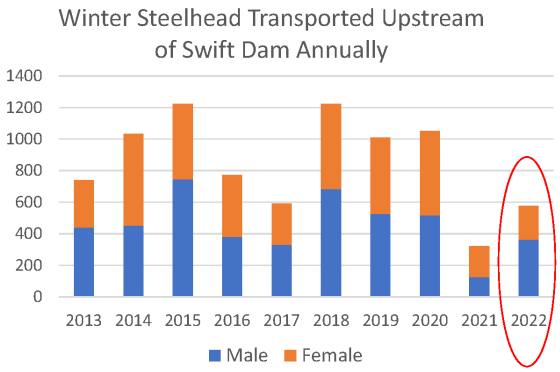
Lewis River Fish Passage Program Mid-Season Summary 2022

Karchesky provided an update of the M&E Plan metrics pertaining to the Fish Passage Program in 2022. He said that the metrics were based on the revised M&E Plan, which focuses on brood year evaluations. He described the previous challenge in reporting Settlement Agreement obligations on the calendar year basis, and was one of the main reason in the new plan to begin reporting brood year data.

Merwin Adult Fish Collection Facility

- Winter Steelhead
  - 641 Collected Overall (2021-2022 run yr)

Gender	Brood	Upstream	Downstream	TOTAL
BWT-Female	1	146	0	147
BWT-Male	7	306	0	313
Female	23	70	1	94
Male	23	63	1	87
TOTAL	**54**	**585**	**2**	**641**

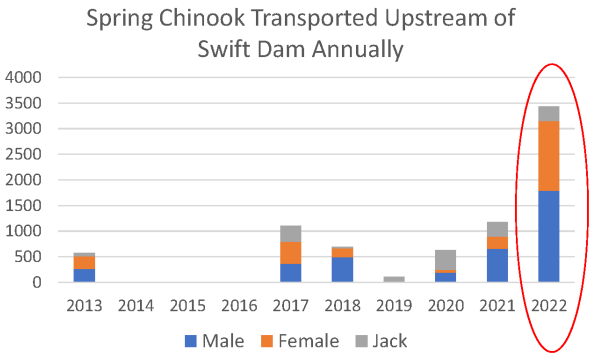


Karchesky said the Merwin Adult Fish Collection Facility saw higher winter steelhead returns than in 2021, but not as high as some of the highest years in the past. He noted that in 2022, about 30-35% of the fish were natural-origin returns (NORs), which is lower than most years. However, recent (2022) observations at the collector suggest that there may be higher percentages of NORs in the future.

Merwin Adult Fish Collection Facility

- Spring Chinook
  - Nearly 4,800 Collected Overall!

Gender	Brood/Surplus	Upstream
Female (HOR)	Brood Goal Met!	1,014
Male (HOR)		1,289
Jack (HOR)		251
Female (NOR)	0	198
Male (NOR)	0	309
Jack (NOR)	0	9
TOTAL	**1,300+**	**3,436**

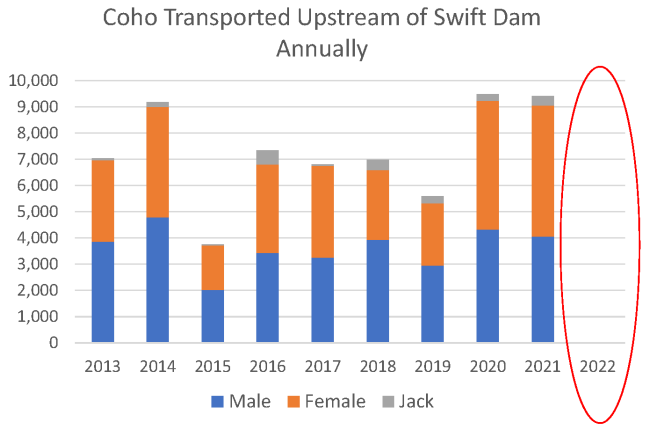


Karchesky said over 4,800 spring Chinook were collected at the Merwin Trap in 2022. This past spring was a great year for meeting broodstock, in-river fishery, and upstream transport goals. He noted that there was a good proportion of males, females, and jacks upstream this year. Approximately 15% of the fish sent upstream were NORs. He said spawning surveys are to

begin in September for spring Chinook, and it will be a good opportunity to see how those fish distribute in the upper basin.

Merwin Adult Fish Collection Facility

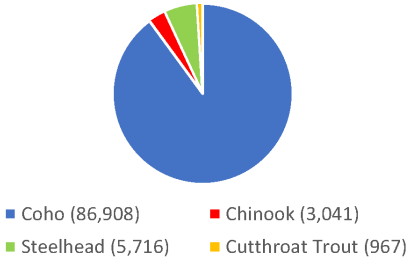
- Coho Salmon
  - 2022 Preseason Forecast:
    - ~53,000 Earlies
    - ~25,000 Lates
  - Targets:
    - Brood - ~1,300 Earlies/~800 Lates
    - Upstream - ~9,000 total - Earlies/Lates
    - Yale HPP - ~1,800 Earlies
    - Swift Nutrient Enhancement - carcasses

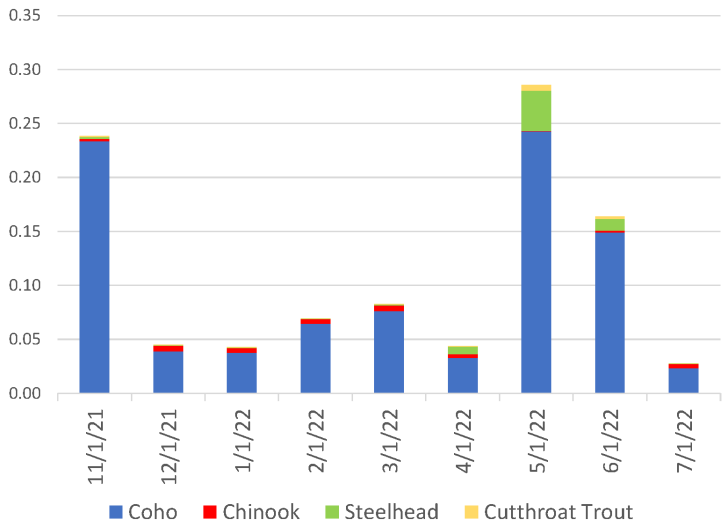


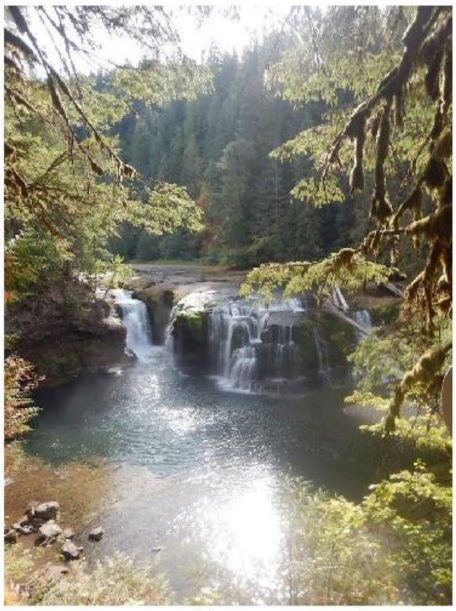
Karchesky shared the forecasted coho numbers this coming year (~78,000) and noted that there was a goal of 9,000 fish to be transported upstream this year similar to the past. He went on to say that there have been no major issues with upstream transport in 2022 to date. The conveyance system has a quarterly outage, and this seems to work well. He noted that they were planning a to maintain the conveyance system the first week in September as part of their routine maintenance.

Swift Floating Surface Collector

- 2021/2022 Season
  - Nov 8, 2021 – July 18, 2022
- ~97,000 out-migrants



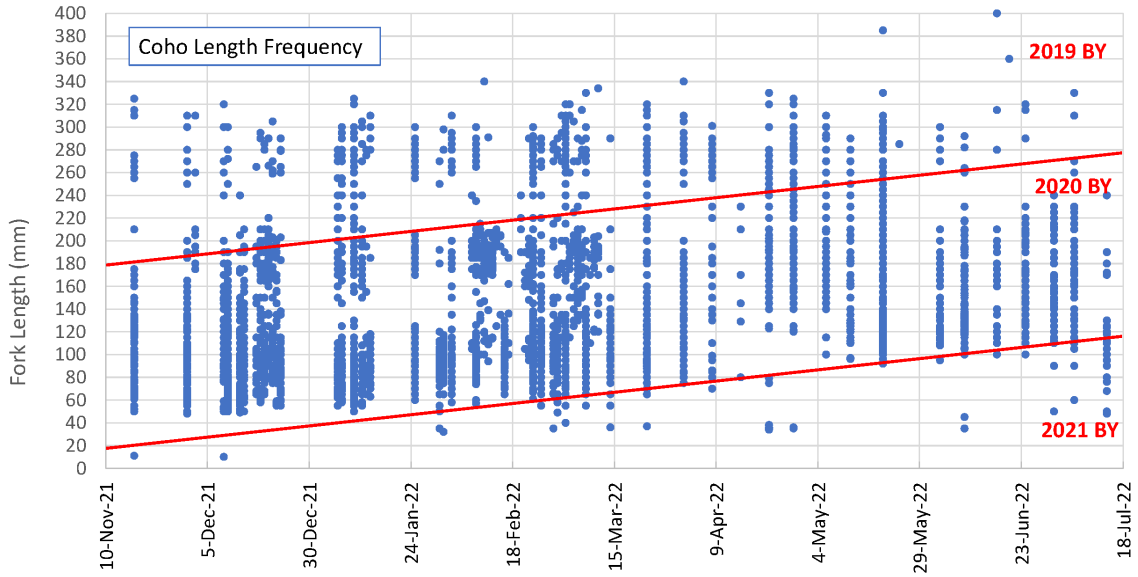




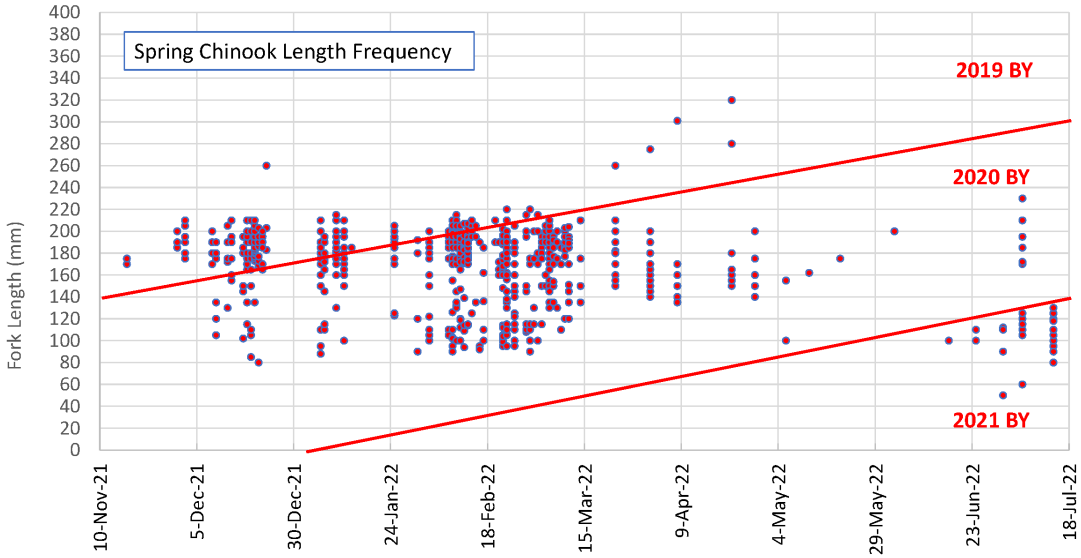
Lower Lewis River Falls *September 9, 2021*

November 12, 2021

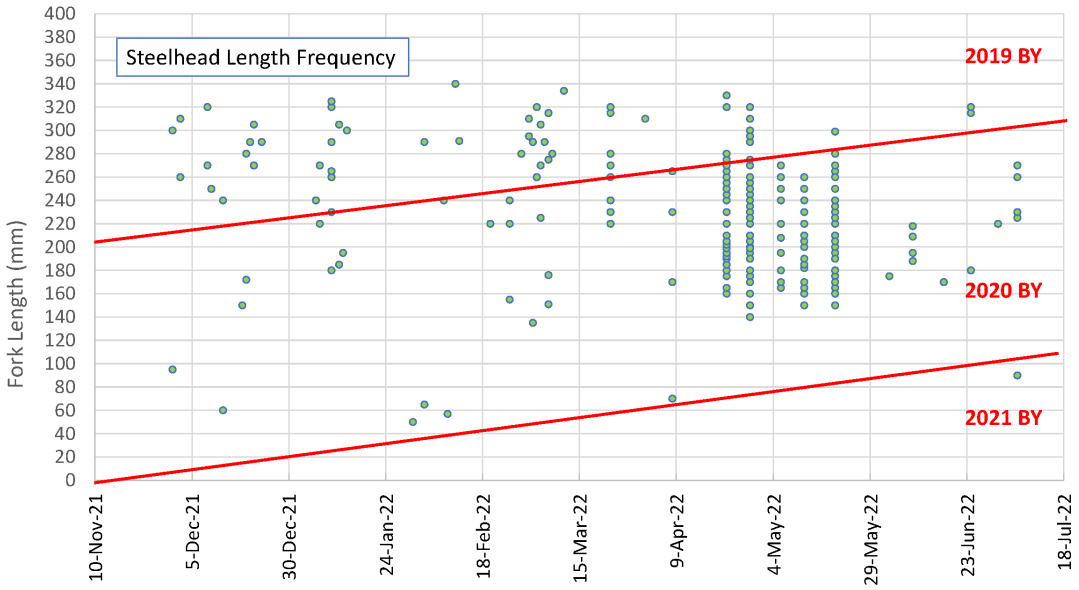
Swift Floating Surface Collector



Swift Floating Surface Collector



Swift Floating Surface Collector



Swift Floating Surface Collector

- Collection Efficiency – Spring 2022 (UPDATE):
- 3D Acoustic Telemetry similar to previous years:
  - Focused on where and why fish turn around in fish channel
- 413 smolts tagged:
  - Coho: 231
  - Steelhead: 182
- Schedule:
  - Field work complete/demob (last week)
  - Data processing and analysis ongoing
  - ACC Presentation – December/January?
  - Report will be included with Annual Report
  - Next steps?

Swift Floating Surface Collector

- Feasibility Study – Year 1 (UPDATE):
- Two-year evaluation to assess whether tagging out-migrants collected at the FSC and transporting them back upstream can be used as a surrogate (or bolster) naïve-fish entering the reservoir to calculate overall downstream survival and abundance parameters.
- PIT Tag similarly sized groups of out-migrants from FSC and Eagle Cliff
- All fish released at head of reservoir to be eventually collected at the FSC.
- Comparing recapture probability between groups by size/age classes
- 2,669 smolts tagged since March 2022:

Species	FSC	Eagle Cliff ST
Coho	1,405	835
Steelhead	200	229

Karchesky noted that PacifiCorp started the Swift FSC a little later than was intended due to the debris management project that was completed last year. Consequently, collection data at the FSC starts in November verses October similar to previous years. He noted the majority of fish collected in the fall were coho that came in early. Collection timing for Chinook and steelhead were similar to prior years. He noted there was strong contribution of coho outmigrants in November, which was odd. This was probably due to a major high water event that occurred in November 2021 that likely pushed fish out of the upper basin and into the reservoir. He noted that most fish collected during this time period were parr. He also noted that there was less of a contribution of coho in the April to June timeframe than expected. He noted the reservoir can be an important rearing area for juvenile fish, and water conditions can drive what life stages and ages appear at the collector.

Karchesky summarized the length frequency results. In coho, there was a wide variety of sizes throughout the year. Staff may analyze these data more closely to investigate the variety of life history strategies. Overall, the M&E Plan has more requirements for monitoring fish and sizes. PacifiCorp is developing an updated approach to calculating metrics to address these needs. Lesko asked if Karchesky thinks the differences in growth rates are related to fish rearing in streams versus the reservoir environment. Karchesky said yes and overlaying these data with environmental factors seems to correlate (in mild winters, smaller fish may stay in the upper basin longer). Overall, taking a closer look at these environmental variables and fish response will help develop integrated population models and improve the monitoring and evaluation program.

Glaser noted that the most important metric is collection efficiency (CE). He asked if there were observable changes in CE with the increased flows. Karchesky said yes, however this would be more reflected in the estimate of overall downstream survival (ODS) rather than the estimate of CE in the M&E Plan – which is intended to assess trap performance and areas for improvement. He suspects that the imbedded collection efficiency component of ODS did improve during the

high water event simply based on the number of fish that were collected during that time frame, but said because not as many fish passed during what would normally be the expected timeframe (April to June) overall ODS for that brood year may be lower.

Karchesky reminded the ACC that another year of evaluation for collection efficiency was conducted at the Swift FSC using acoustic tagged fish. In addition to calculating performance metrics pertaining to fish collection, the main focus of this year's study was to assess fish behavior and identifying points of rejection in the secondary portion of the fish channel. Only coho and steelhead smolts were tagged this year due to low number of spring Chinook out-migrants. The contractor has just demobilized their equipment and is now working on the data summaries. Karchesky reminded the ACC the draft report summarizing the data is usually out by the end of the year along with a presentation.

Karchesky described the one of the major changes in the new M&E Plan was trying to develop a more efficient process for marking additional fish upstream of the Swift FSC in order to make inference on population wide metrics for fish entering the reservoir – like estimating ODS and population abundance. As part of this effort, the M&E Plan describes conducting a two-year feasibility study in which fish from the FSC are marked and released along with fish collected and marked in the upper portion of the reservoir (screw trap). This is being done to determine if fish from the FSC that are release upriver are collected at the same rate as fish coming directly into the reservoir – by age/size class. If so, fish from FSC may eventually be used as a means for adding additional marked fish into the reservoir in order to improve population estimates in the future. Karchesky informed that year-1 of this feasibly study was started in spring of 2022. Results of this study are anticipated to be out sometime in 2023.

Josua Holowatz asked if there has been a difference in the number of Goldendale trout collected at the FSC. He noted that some of the fish planted at the power canal in 2022 were Goldendales, and he is curious about the potential effect of water levels on fish arriving at the FSC. Karchesky said Goldendales were collected at the FSC and may have been in slightly higher numbers than past years. He suggested that the ATS could further discuss how to minimize this occurrence; one option would be to change the regulations to a bigger limit so that fish that have been in the reservoir for more than one year can be targeted. Karchesky said as reporting proceeds, more information will be available about the metrics Holowatz is curious about.

Merwin Fish Passage Update (see also Attachment C)
Karchesky reviewed the Fish Passage Report. Additional discussions about Merwin fish passage occurred under the earlier topic, "AMEP Update."

Swift Floating Surface Collector (see also Attachment D)
Chris Karchesky reported that the Swift Reservoir FSC was currently in operation. Additional discussions about the Swift FSC occurred under the earlier topic, "AMEP Update."

Lewis River Fish Passage
See Attachment E.

Services Update on Fish Stranding Above Swift Dam
No update was available.

Administrative Updates
Eli Asher noted that today is his last ACC meeting, as he is leaving the Cowlitz Tribe for a different opportunity in state government working on salmon recovery. He said Christina Donehower will be the main point of contact in the interim as the tribe works to identify a new representative. Asher thanked the ACC for their work, and everyone wished Asher best of luck at his next position.

Similarly, Kate Day noted that today is her ACC meeting as she is relocating for a new position. She said she will provide an email update on who will be the main point of contact moving forward (Nicholas Grant from the McKenzie River district). She said USFS staff and their consultant team will provide an update on design for the Clearwater Creek project. The ACC wished Day well in her new role.

Public Comment Opportunity
None present.

Agenda Items for September 8, 2022
- Review August 11, 2022, Meeting Notes
- Clearwater Creek design update
- Study/Work Product Updates

Adjourn 11:32 am

Next Scheduled Meeting

September 8, 2022
Teams Call
9:30 a.m. – 12:00 p.m.

Meeting Handouts & Attachments
- Meeting Notes from 7/14/2022
- Agenda from 8/11/2022
- **Attachment A –** Yale Habitat Preparation Plan
- **Attachment B –** M&E Update
- **Attachment C –** Merwin Adult Trap Collection Report (July 2022)
- **Attachment D –** Swift FSC Facility Collection Report (July 2022)
- **Attachment E –** Lewis River Fish Passage Report (July 2022)

Yale Habitat Preparation Plan

Yale Reservoir, North Fork Lewis River

August 4, 2022

I. Introduction

The purpose of this plan is to provide the necessary logistics and methods necessary to collect, transport, and distribute hatchery origin coho beyond those needed for Lewis River hatchery programs and above Swift Reservoir supplementation and reintroduction needs into Yale Reservoir (Figure 1). Coho salmon above hatchery and reintroduction needs are referred to as "excess hatchery coho". This plan proposes to transport and release excess hatchery coho into Yale Reservoir as part of the Habitat Preparation Plan (HPP) specified under Section 7.4 of the Lewis River Settlement Agreement.

7.4 Habitat Preparation Plan. Within six months after the Effective Date, PacifiCorp shall develop a plan (the "Habitat Preparation Plan") in Consultation with the ACC to release live adult hatchery anadromous salmonids into Swift Reservoir, Yale Lake, and Lake Merwin for the purpose of preparing the habitat in those locations for the reintroduction of anadromous salmonids. The objective of the Habitat Preparation Plan will be to make possible (1) nutrient enrichment in the waters through decay of the adult hatchery fish and, (2) tilling of the gravel by the released hatchery adults as they attempt to spawn. The number, sex, and species of hatchery adult salmonids shall be determined as part of the Habitat Preparation Plan. PacifiCorp's performance obligation under the Habitat Preparation Plan shall be limited to placing live adult hatchery anadromous salmonids for a period of five years in each of Swift Reservoir, Yale Lake, and Lake Merwin, commencing in each case five years prior to expected completion of the downstream fish passage facility from that reservoir. PacifiCorp shall implement the Habitat Preparation Plan at Swift Reservoir beginning as soon as practicable after the Habitat Preparation Plan is finalized and at the other reservoirs as provided in the Habitat Preparation Plan. PacifiCorp shall implement this program only to the extent there are excess hatchery fish available beyond those required for the Hatchery and supplementation Plan described in Section 8. PacifiCorp shall not be required to pass or collect the progeny of hatchery adult anadromous salmonids introduced under the Habitat Preparation Plan unless and until collection and transport facilities for such progeny are constructed in accordance with Section 4. For the Merwin and Yale Projects, PacifiCorp's obligations under this Section 7.4 shall cease if the Yale Downstream Facility or Merwin Downstream Facility, respectively, will not be constructed pursuant to Section 4.1.9.

II. Summary of past adult releases into Merwin and Yale reservoirs

Merwin and Yale dams were completed in 1931 and 1953, respectively. Soon after completion of each of the dams, efforts were initiated to move primarily coho salmon upstream of each dam. For Merwin, efforts were intended to increase juvenile production in response to precipitous declines in adult returns. After completion of the Yale Dam, coho were released at preselected locations to gain a better understanding of spawning site selection and distribution upstream of Yale.

Merwin Dam (Smith 1943)

Between 1933 and 1942, over 50,000 adult coho were transported and released upstream of Merwin Dam. In 1939, a total of 18,591 adult coho were released upstream of Merwin Dam. Following this release (prior to completion of Yale and Swift dams), Smith observed adult coho in several tributaries of the upper watershed. An estimated 2,000 coho salmon were observed in a large clear pool at the mouth of Clearwater Creek; 464 coho were observed in the Muddy River about one mile upstream from the confluence of Clear Creek; 48 coho salmon were observed in Siouxon Creek and smaller numbers were observed in Speelyai Creek and the mainstem Lewis River upstream of Merwin reservoir. In 1940, a total of 7,155 adult spring Chinook were released upstream of Merwin Dam; however, no observations were made regarding the distribution of these fish.

Cougar Creek holding ponds

To improve hatchery survival and provide additional support, Milo Bell, an engineer for the Washington Department of Game, designed and constructed hatchery holding ponds using source water from Cougar Creek. The holding ponds were completed in 1938 and were used primarily as a holding facility for adult coho and spring Chinook. In 1939, 256 spring Chinook adults from the holding ponds were released into Cougar Creek. A majority of the released adults successfully spawned in Cougar Creek and it was thought, at the time, that it may be possible to develop a natural spawning population of Cougar Creek spring Chinook (Smith 1942). For unknown reasons, the Cougar Creek holding ponds were abandoned in 1942.

Yale Dam (Chambers 1957)

In 1956 (prior to completion of Swift Dam in 1958), John Chambers of the Washington Department of Fisheries and J. Hamilton of Pacific Power and Light conducted a mark-resight study of adult coho released upstream of the Yale Dam. A total of 1,386 adult coho were released upstream of Yale Dam. Of these, 374 were tagged with numbered Peterson discs for later visual recovery (Chambers 1957). Table 1 shows the dates, release locations and recoveries of coho tags during the recovery surveys. Of all tributaries surveyed, Cougar Creek showed the highest incidence of spawning coho salmon. On November 14, 1956, a foot survey of Cougar Creek noted 46 redds, 28 lives, 13 carcasses and 4 tags recovered. Observations of live untagged coho and redds were also reported from both the researchers and anglers in Smith, Muddy, Clear and Clearwater creeks. Reports of redds and tag recoveries were also observed in the mainstem Lewis River upstream of Pine Creek. No redds or salmon were observed downstream of the Pine Creek confluence; however, spawning was observed in Range Creek.

Table 1. Date, release location, release numbers, and tag recovery location of adult coho released upstream of Yale Dam in 1956.

Date	Release Location	Total Release Number	Released with tags	Recovery Location	No. of tags recovered
Sep 4 - 21, 1956	Lewis River above Swift Creek	618	156	Muddy	1
				Cougar Creek*	2
				Smith Creek	1
				LR upstream of Eagle Cliff	2
Sep 23 – Oct 8, 1956	Cougar Creek	589	108	Cougar Creek	2
Oct 9 - 22, 1956	Lewis River above Swift Creek	129	60	Cougar Creek*	1
Oct 22, 1956	Lewis River below Swift Cr.	50	50	Cougar Creek	1
		1,386	374		

* *NOTE: While Swift Dam had not been completed at the time of this evaluation (completed in 1958), the bypass tunnel was completed and in operation. Therefore, tag recoveries in Cougar Creek from coho released above Swift Creek passed downstream through the bypass tunnel to spawn in Cougar Creek (total = 3). No tagged coho released downstream of the bypass tunnel were recovered upstream of bypass tunnel.*

III. Objectives

The transportation of adult hatchery fish into Yale Reservoir is intended to prepare and till Yale tributary stream gravels (through redd construction) and provide marine derived nutrient enhancement to spawning and rearing areas. Under section 7.4, the HPP should be initiated 5-years prior to the expected completion of the Yale downstream fish passage facility.

IV. Stock Selection

In 2022, the habitat preparation program proposes to use early coho salmon for transport and release into Yale Reservoir to take advantage of ongoing bull trout monitoring in Cougar Creek (see Planned Monitoring section). Late or transitional coho salmon may also be used if insufficient early run coho are available for the Yale habitat preparation program. This will be an in-season decision by the ATS once early coho begin returning to the Lewis River traps in September 2022. Adult coho transport to Yale under this plan should be of high quality to facilitate distribution of released coho. Coho salmon showing external signs of trauma (e.g., puncture wounds, lacerations, fungus, etc.) should not be transported upstream whenever possible.

The availability of adults for the Yale Reservoir HPP is dependent on the extent of hatchery fish available beyond those required for hatchery production (broodstock) programs and existing

supplementation (reintroduction) activities to the Upper Lewis basin. Based on adult hatchery origin returns over the past 5 years, coho salmon are the only stock that consistently exceeds these needs (Figure 1). The 2022 preseason forecast for Lewis hatchery coho is over 78,000 adults including 53,000 early (Type S) and 25,000 late (Type N) coho. Therefore, this plan will rely on hatchery-origin trap returns of early coho salmon for transportation into Yale Reservoir.

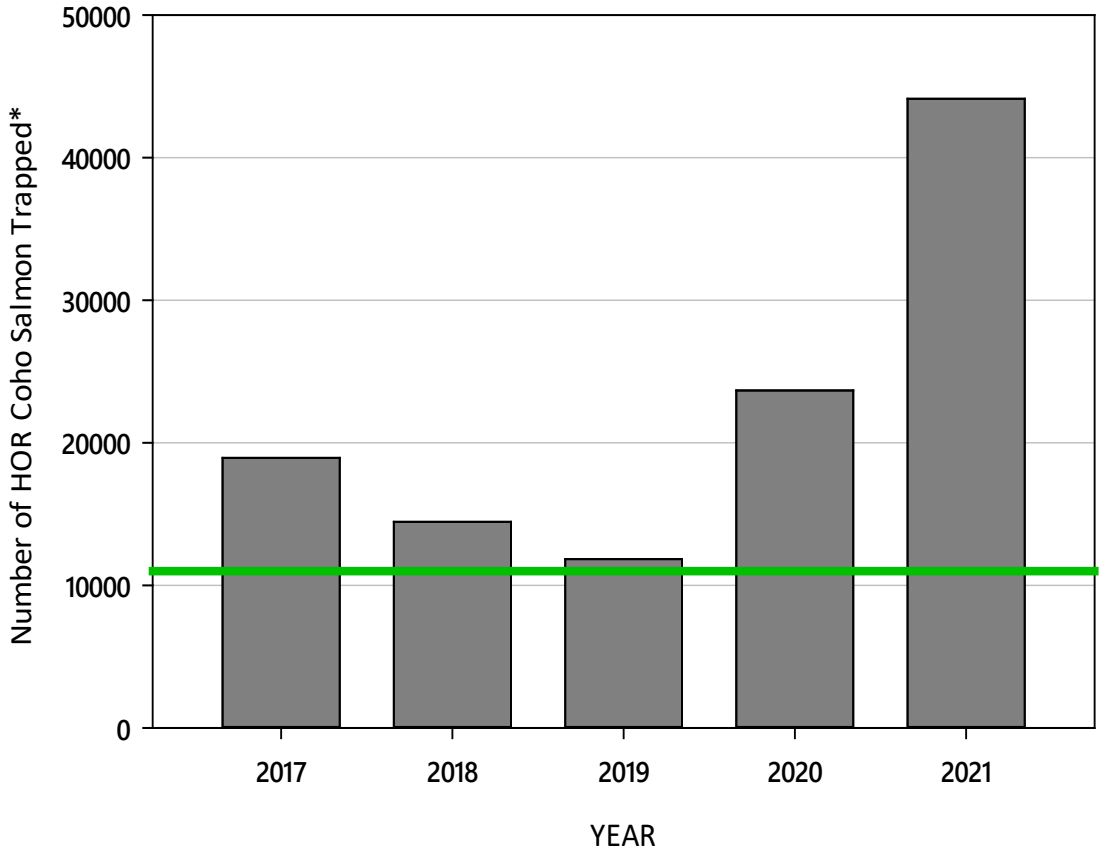


Figure 1. Total number of adult hatchery origin (HOR) coho collected at Lewis River trapping facilities by year: 2017 – 2021. Green line represents the total number of adults needed for existing hatchery broodstock and H&S program needs (green line = 11,000). Program needs are based on the number of adults needed to satisfy both hatchery production (broodstock) and supplementation (reintroduction) targets. *totals exclude jacks.

V. Transport Number

The proposed number of adult coho transported to the Yale basin is based on Ecosystem, Diagnostic and Treatment (EDT) modeling conducted in 2018 and as revised using model runs by NOAA in 2019.

EDT is a habitat-based model that is best used to assist planners in prioritizing restoration activities. However, the model does produce estimates of spawner capacity that can be used for course-level planning. For purposes of the Yale HPP, the Yale adult transport target relies on capacity estimates derived from EDT modeling.

"Capacity" represents the number of spawning adults the available habitat can support given the quantity and quality of that habitat for a specific reach or waterbody (e.g., Yale Reservoir). "Abundance" differs from capacity in that abundance represents the potential contribution (expressed as adult returns) of each waterbody. Unlike capacity, abundance estimates are influenced by factors such as overall downstream survival (ODS), harvest, predation, etc.

EDT modelling identified several Yale tributaries that support coho spawning (Figure 2). EDT estimates the current quality and quantity of available spawning habitat in Yale tributaries would support up to 1,842 spawning adults (Table 2). Thus, the maximum number of adult coho proposed for transport into Yale Reservoir each year is 1,840 adults (i.e., transport target).

The transport target represents the number of coho adults needed to fully seed available spawning habitat. However, factors such as predation, poaching, and transport survival may reduce the actual number of adults available to spawn. Therefore, the initial transport target may be modified during the term of the program.

Male to Female Ratio

The number of females and males transported should generally strive to achieve a 1 to 1 ratio to maximize potential spawning activity (redd construction). Using this ratio, a maximum 920 females and 920 males should be selected for transportation to Yale Reservoir.

VI. Collection Methods

Collection of adult coho will take place at both the Lewis River hatchery ladder and the Merwin Fish Collection Facility.

The timing and number of early coho available for release into Yale Reservoir depends first on satisfying priority adult targets for both the hatchery broodstock and Swift reintroduction programs. That is, early coho will only be available for Yale transport once these priority needs are met on a periodic basis throughout the run. As adult coho begin returning to the traps, in-season management decisions will be required. The ATS will provide recommended distribution protocols to trapping staff prior to the collection period. The ATS will modify these protocols as necessary to ensure that the priority goals of the hatchery broodstock and Swift

reintroduction programs are met first while also trying to achieve the adult release targets under this plan.

VII. Transport Vehicles

PacifiCorp and WDFW fish trucks will be used to transport adults to Yale Reservoir. The number of trips depends on the number of available coho during the transport period. That is, it is unlikely that fish trucks will be loaded to capacity (120 adults) for each trip.

VIII. Release Locations

The Yale Park and Saddle Dam boat ramps will be used as release locations for transported adults (Figure 2). The goal will be to release approximately half of all transported adults at each location and distributed equally throughout the transport window. All released coho will be PIT tagged into the dorsal sinus (see planned monitoring section).

IX. Schedule and Timing

2022 – 2023: September through early October (early coho). *Note: If late coho are needed to meet transport targets, the release period will be extended to December 31.*

2024 – The HPP begins transitioning to a reintroduction program. That is, progeny from adults transported in 2024 (as part of the HPP) will be available for collection at the completed Yale downstream collection facility in 2026. During this transition, adaptive management of transport protocols related to adult transport numbers and composition may be necessary beginning in 2024. Adaptive management recommendations will be developed by the ATS for approval by the ACC prior to 2024 HPP operations.

2026 - HPP program ends and is replaced by the reintroduction program.

X. Pathology Screening

All fish transported and released into Yale will be sourced from either the Lewis River hatchery ladder or Merwin Fish Collection Facility. In-basin transfers do not require additional pathogen screening, beyond the annual surveillance of adult stocks at the minimum 5% assumed pathogen prevalence level (APPL) as required by the Co-Managers Salmonid Disease Policy. In the event out of basin transfers are planned, any additional screening will conducted according to the disease policy requirements.

XI. Harvest Restrictions

To help ensure the goals of the HPP are met, sportfishing regulations will be reviewed and modified by WDFW through emergency rule changes in the first year. Harvest rules will be evaluated and modified annually, if necessary, by WDFW. Prior to transport activities, signage should be posted on the PacifiCorp website and at Yale Reservoir boat ramps providing current

regulations and program information. WDFW enforcement will be informed of the HPP actions and if necessary, may provide enhanced patrols to reduce the potential for poaching activities.

XII. Planned Monitoring

Coho transported and released into the Yale Reservoir will be allowed to self-sort and select tributaries in which to migrate into and spawn naturally. Based on previous fish distribution evaluations after construction of Merwin and Yale dams (Section II), it was shown that Cougar Creek is a preferred tributary stream for spawning coho salmon (Table 1). Based on these preliminary data, a potential exists for a large portion of the released coho to enter and spawn in Cougar Creek. To better define this potential and because Cougar Creek represents the only known Yale tributary that supports bull trout spawning, PacifiCorp proposes the following monitoring in 2022:

1. Estimate of the number of early coho that enter Cougar Creek

In July 2022, PacifiCorp installed a floating weir near the mouth of Cougar Creek as part of the company's ongoing bull trout monitoring program. To pass the weir, bull trout are directed through a narrow passage way and enumerated using an underwater camera in combination with a PIT tag array. PacifiCorp proposes using the weir to obtain estimates on the total number of early coho migrating into Cougar Creek. To facilitate accurate enumeration of early coho passing the weir, PacifiCorp will PIT tag (into the dorsal sinus) all adult coho released into Yale Reservoir. PIT tagged early coho will include the capture date, release date and release location. In addition to improving enumeration, PIT tag detections may show spatial or temporal patterns or differences between the two release locations and help validate redd survey observations upstream of the weir. The weir is scheduled for removal in early November, or sooner if justified by high flow event(s).

PacifiCorp will also conduct foot surveys in Cougar Creek as part of ongoing bull trout and kokanee surveys beginning in September and continuing into late October. Cougar Creek will be surveyed over its entire length to document the number and location (use of handheld GPS) of all new coho redds, lives and carcasses. All carcasses recovered will be scanned for PIT tags.

2. Estimate the relative use and spawning of coho salmon in Yale tributaries (other than Cougar Creek.

PacifiCorp and the WDFW will conduct informal foot surveys (as resources allow) of other potential Yale tributaries to document the number of lives, redds and carcasses observed. Potential spawning tributaries include the Swift bypass reaches, Siouxon Creek, Speelyai Creek and Dog Creek (Figure 2, Table 2). Surveys will be conducted during the peak spawning period for early coho. Specific methods of peak count surveys shall be developed by the ATS prior to implementation.

Foot surveys are intended to be a qualitative indicator of relative use by released coho into Yale Reservoir. Results from foot surveys should not be used as an indicator of spawning site preference. Variables such as weather and stream flows may increase or decrease the presence of coho observed on any given survey. Therefore, the presence or absence of coho should not be perceived as preference or avoidance by hatchery released coho into Yale Reservoir.

However, information obtained from these surveys could assist the ACC in determining whether the current transport target (1,840 adults) is appropriate or needs adjustment in future years.

Figure 2. Adult coho spawning capacity estimates for potential spawning tributaries of Yale Reservoir, including proposed release sites. Source: EDT modeling, 2019.

Table 2. Summary of adult coho capacity estimates for Yale Reservoir tributaries based on EDT modeling in 2019.

Tributary	Length (km)	Adult Capacity	Adult Capacity per km
Cougar and Panamaker creeks	3.08	114	38
Dog Creek	2.25	285	126
Bypass Reaches	3.21	318	99
Siouxon Creek	9.01	587	65
Speelyai Creek	9.89	537	54
TOTAL	**27.44**	**1,842**	**67**

XIII. Plan Modifications

Components of the plan may be modified annually by the Aquatics Coordination Committee (ACC) based on forecasted run sizes (after release by WDFW), hatchery and reintroduction needs, availability of excess hatchery coho and completion schedule of the Yale downstream collection facility. In-season modifications to the plan may also be required to address emergent issues (e.g., actual abundance vs. predicted run size). Proposed modifictions will be brought forward to the ATS and ACC as needed to initiate in-season modifications to this plan. Plan modifications shall be reflected and updated on the PacifiCorp website on an annual basis.

Merwin Habitat Preparation Plan

The Merwin downstream passage facility is scheduled for completion in 2028. According to Section 7.4 of the Settlement Agreement, transportation of adults into Merwin Reservoir should begin in 2023. Therefore, this plan will be modified to incorporate the transportation of adults into both Merwin and Yale reservoirs in 2023.

Other transport species

In 2022, only coho salmon are available for transportation (Figure 1). As run forecasts become available for the other transport species - spring Chinook and late winter steelhead, the habitat preparation program may include these species in annual planning to the extent that fish are available after hatchery broodstock and reintroduction targets are met.

XIV. References

Chambers, John. 1957. Report on the 1956 survey of the North Fork of the Lewi River above Yale Dam. State of Washington, Department of Fisheries, April 1957.

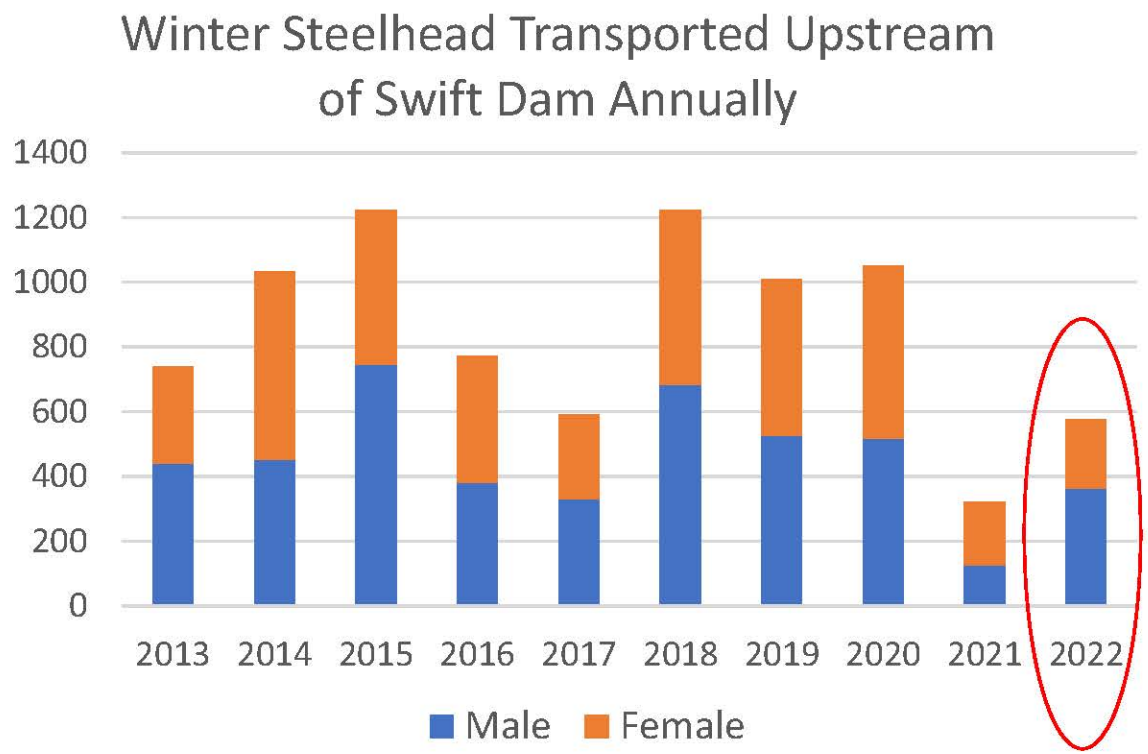
Smith, Richard, T. 1943. Report on the Lewis River Salmon Conservation Program.

Lewis River Fish Passage Program Mid-Season Summary 2022

Merwin Adult Fish Collection Facility

- Winter Steelhead
  - 641 Collected Overall (2021-2022 run yr)

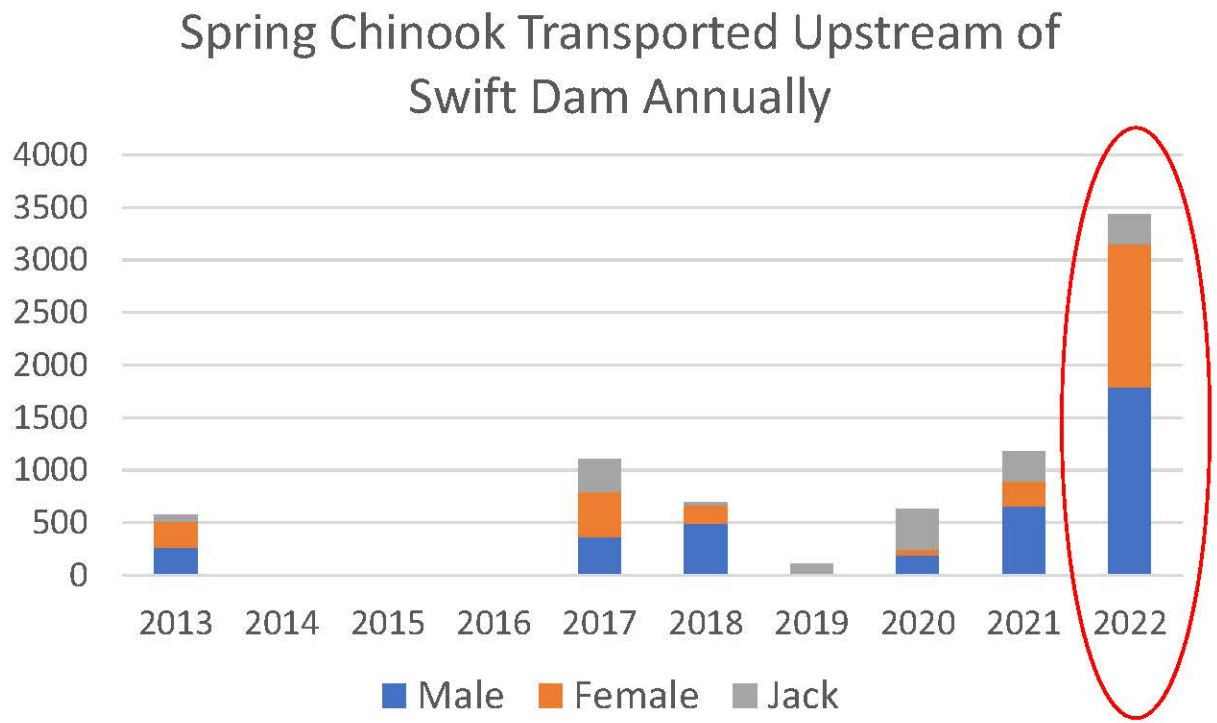
Gender	Brood	Upstream	Downstream	TOTAL
BWT-Female	1	146	0	147
BWT-Male	7	306	0	313
Female	23	70	1	94
Male	23	63	1	87
TOTAL	**54**	**585**	**2**	**641**



Merwin Adult Fish Collection Facility

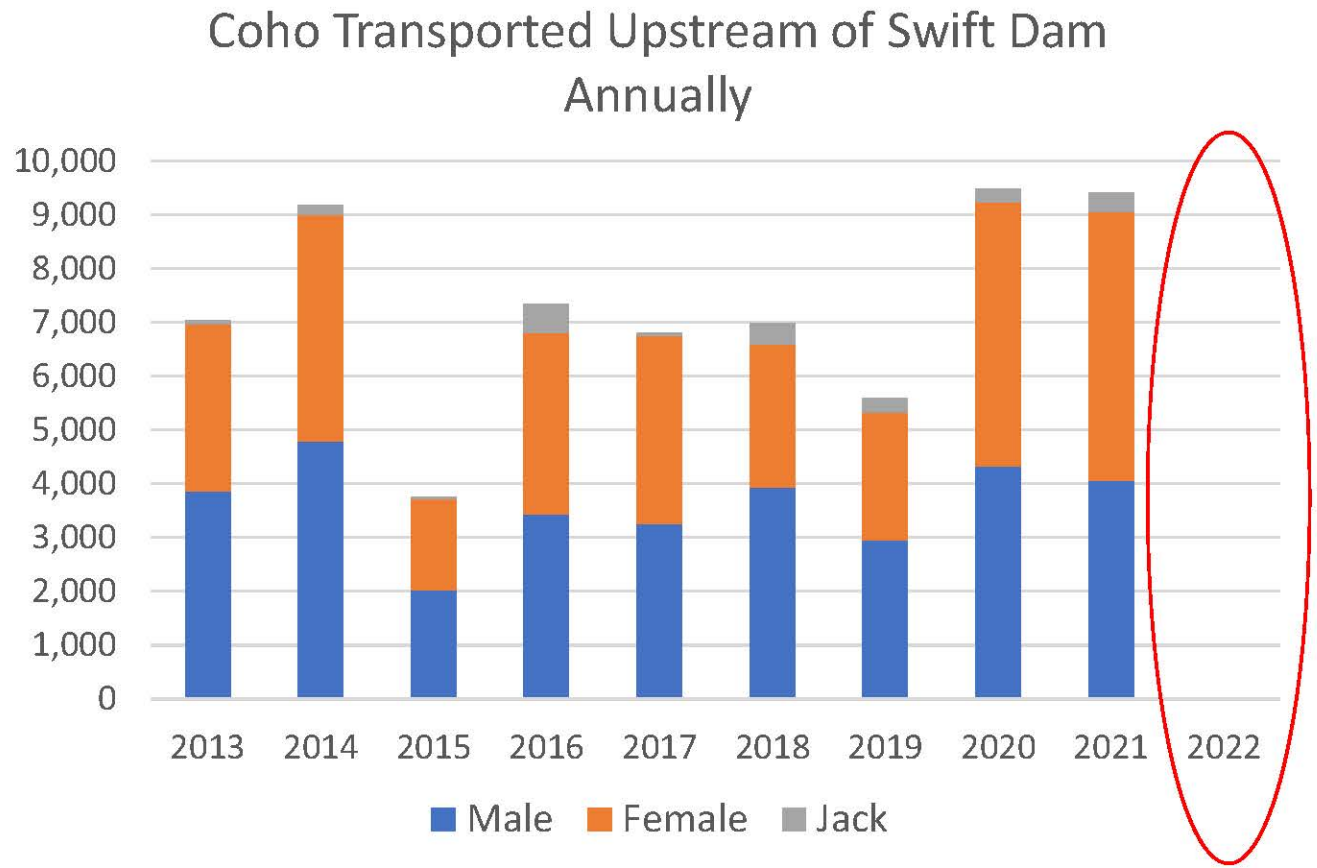
- Spring Chinook
  - Nearly 4,800 Collected Overall!

Gender	Brood/Surplus	Upstream
Female (HOR)	Brood Goal Met!	1,014
Male (HOR)		1,289
Jack (HOR)		251
Female (NOR)	0	198
Male (NOR)	0	309
Jack (NOR)	0	9
TOTAL	**1,300+**	**3,436**



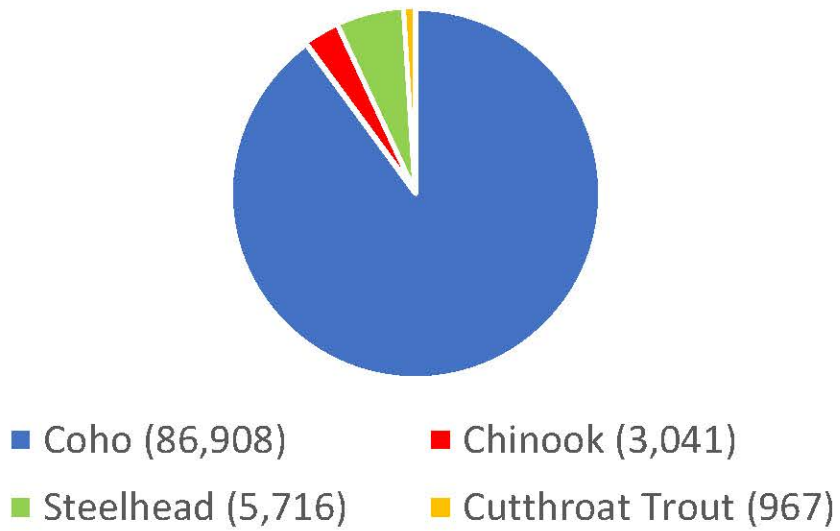
Merwin Adult Fish Collection Facility

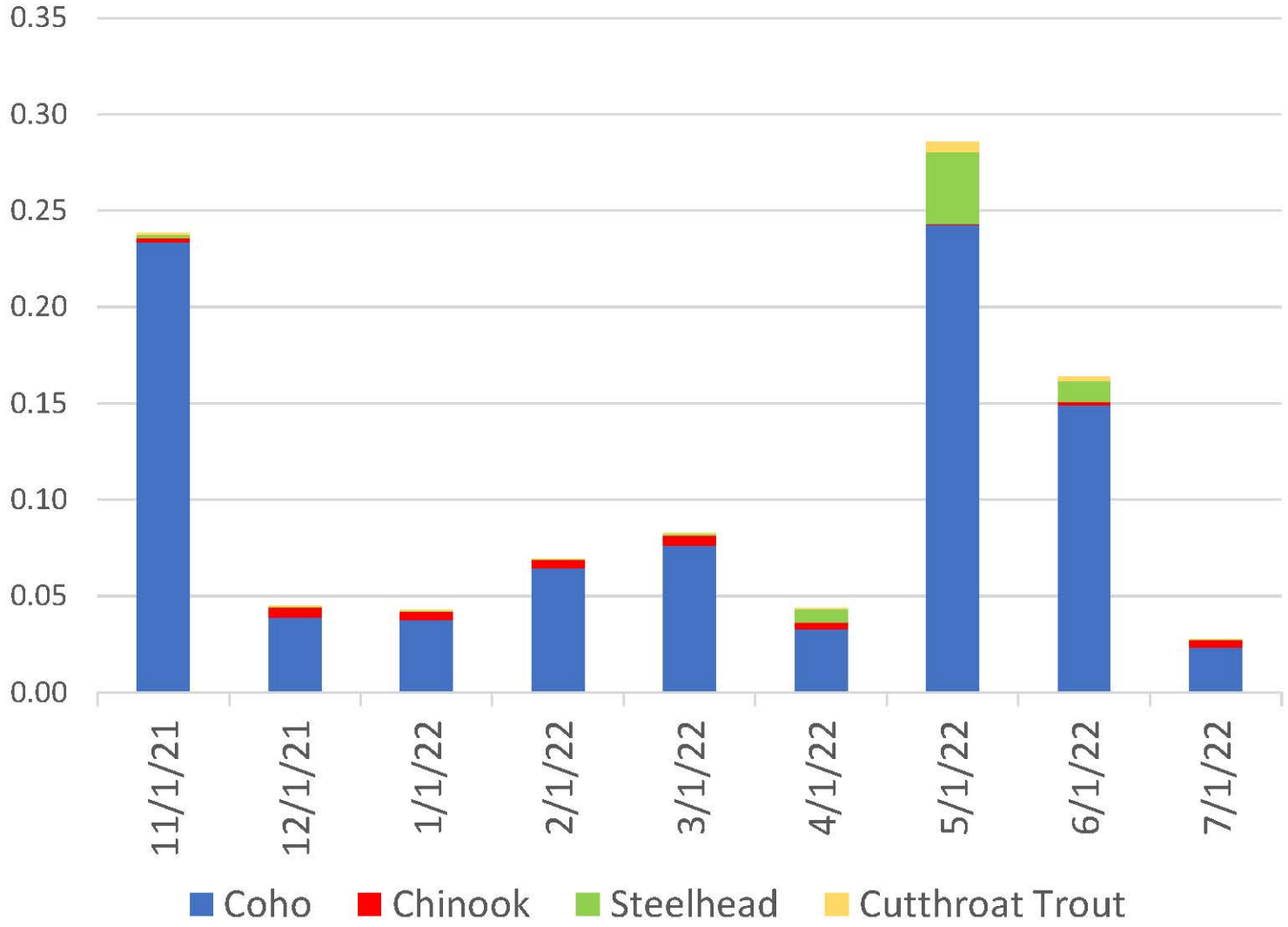
- Coho Salmon
  - 2022 Preseason Forecast:
    - ~53,000 Earlies
    - ~25,000 Lates
  - Targets:
    - Brood - ~1,300 Earlies/~800 Lates
    - Upstream - ~9,000 total - Earlies/Lates
    - Yale HPP - ~1,800 Earlies
    - Swift Nutrient Enhancement - carcasses

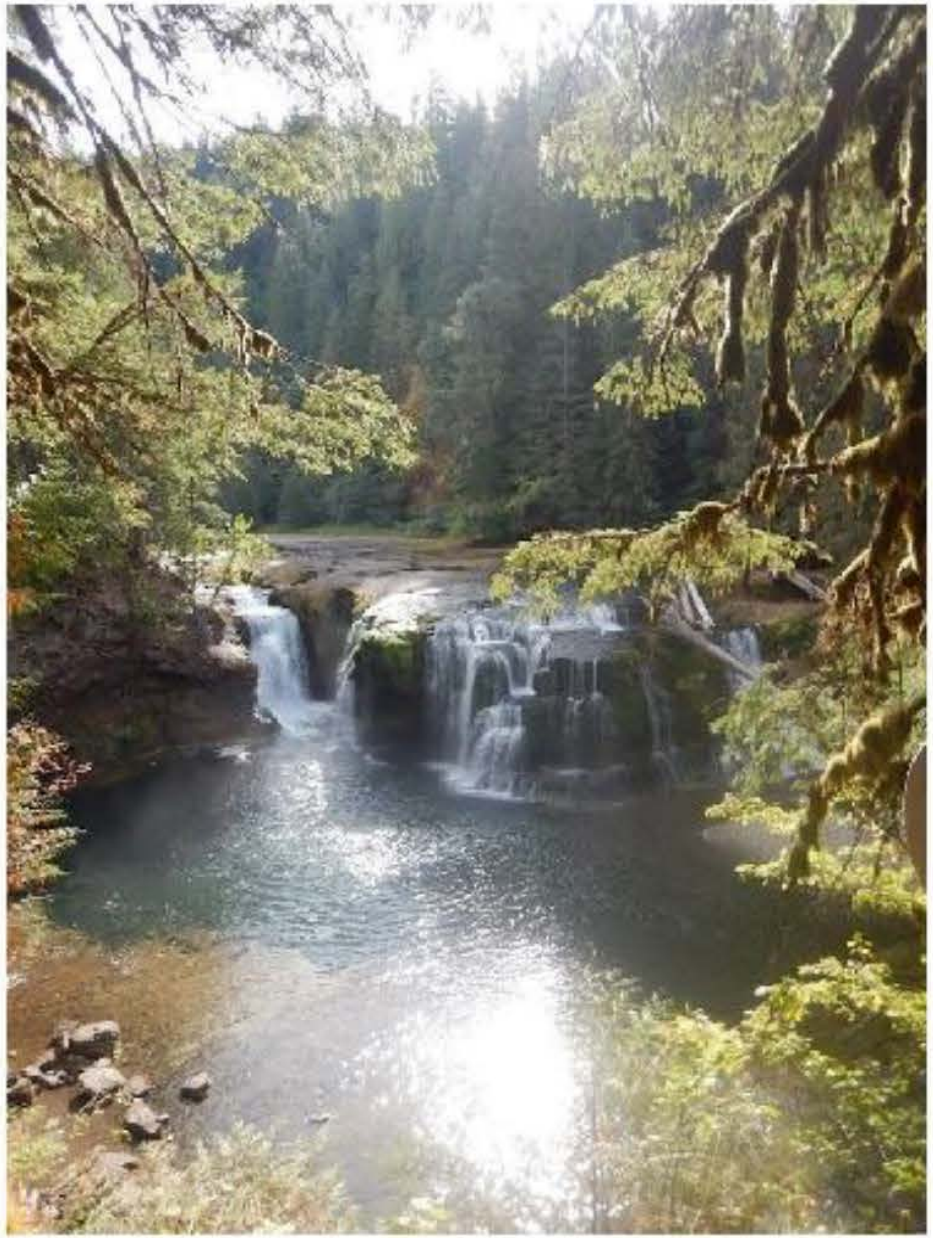


Swift Floating Surface Collector

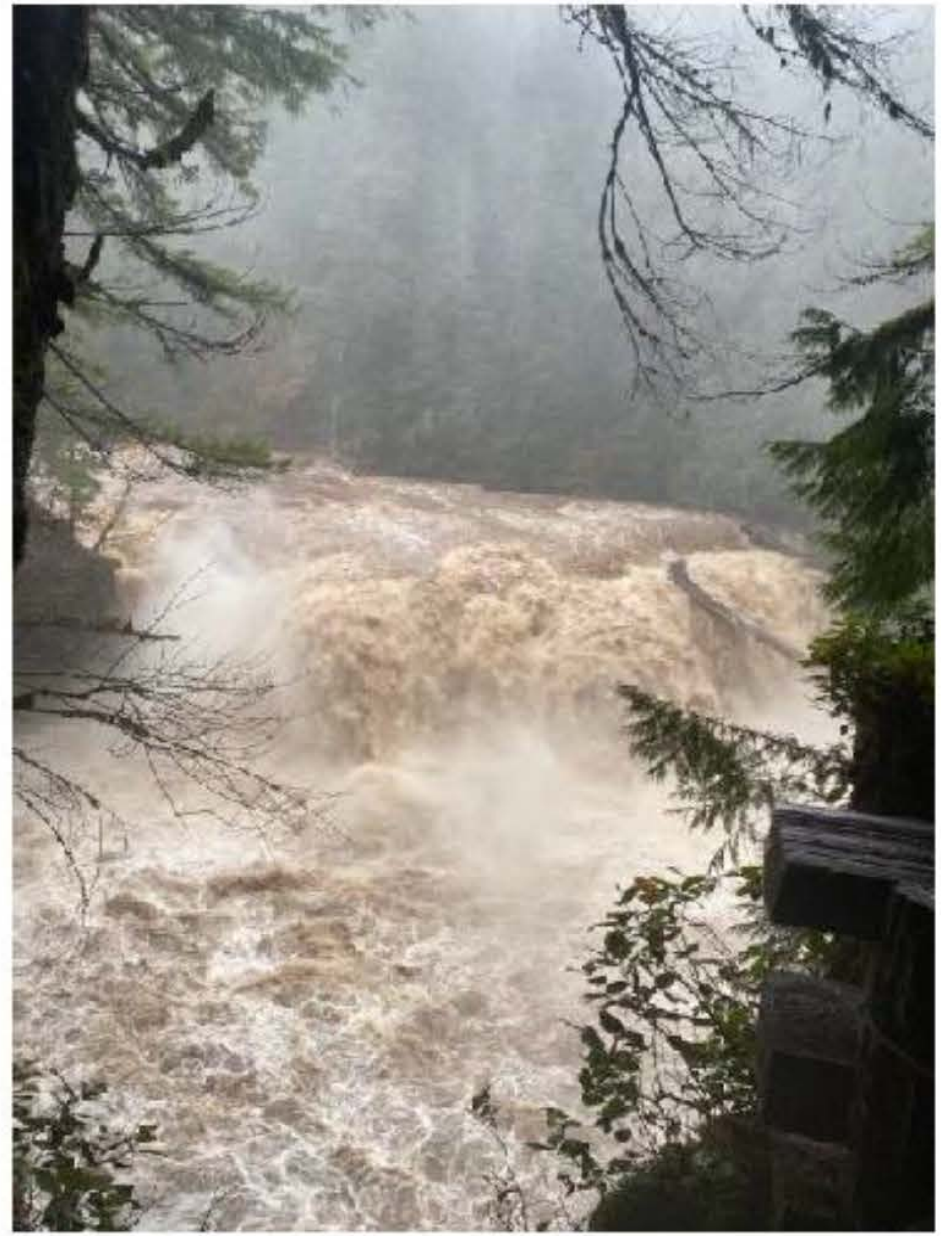
- 2021/2022 Season
  - Nov 8, 2021 – July 18, 2022
- ~97,000 out-migrants





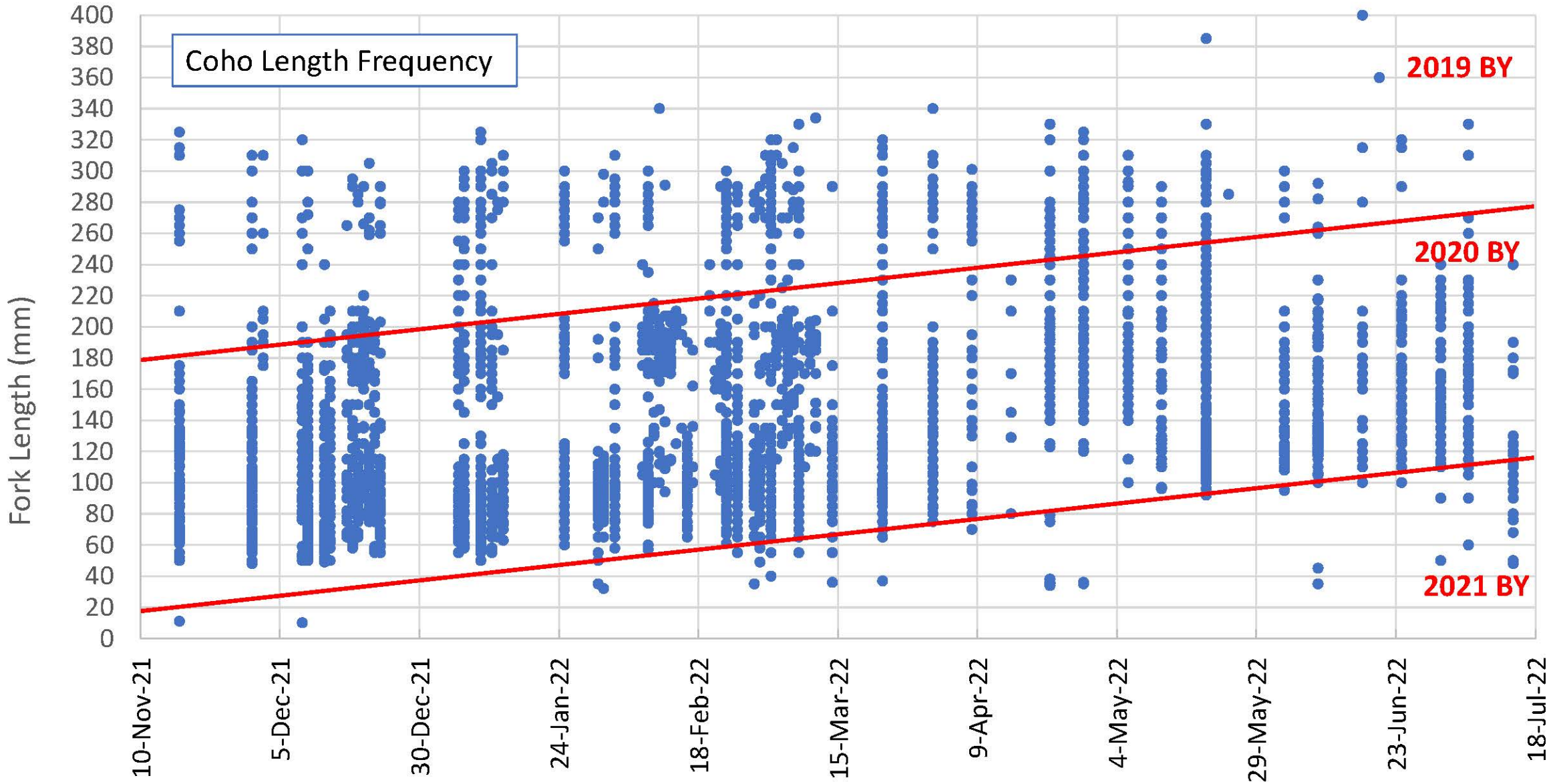


Lower Lewis River Falls *September 9, 2021*



November 12, 2021

Swift Floating Surface Collector



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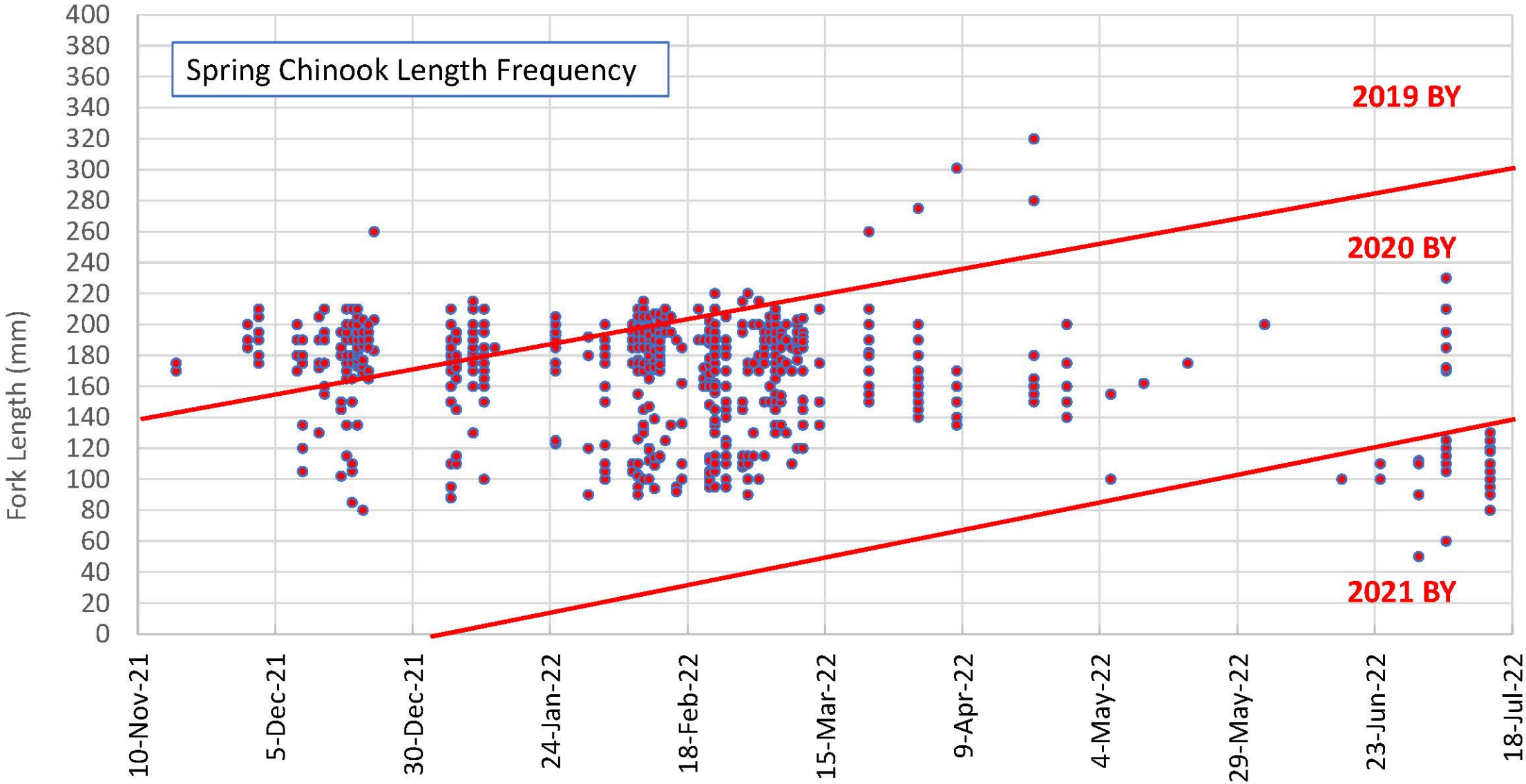

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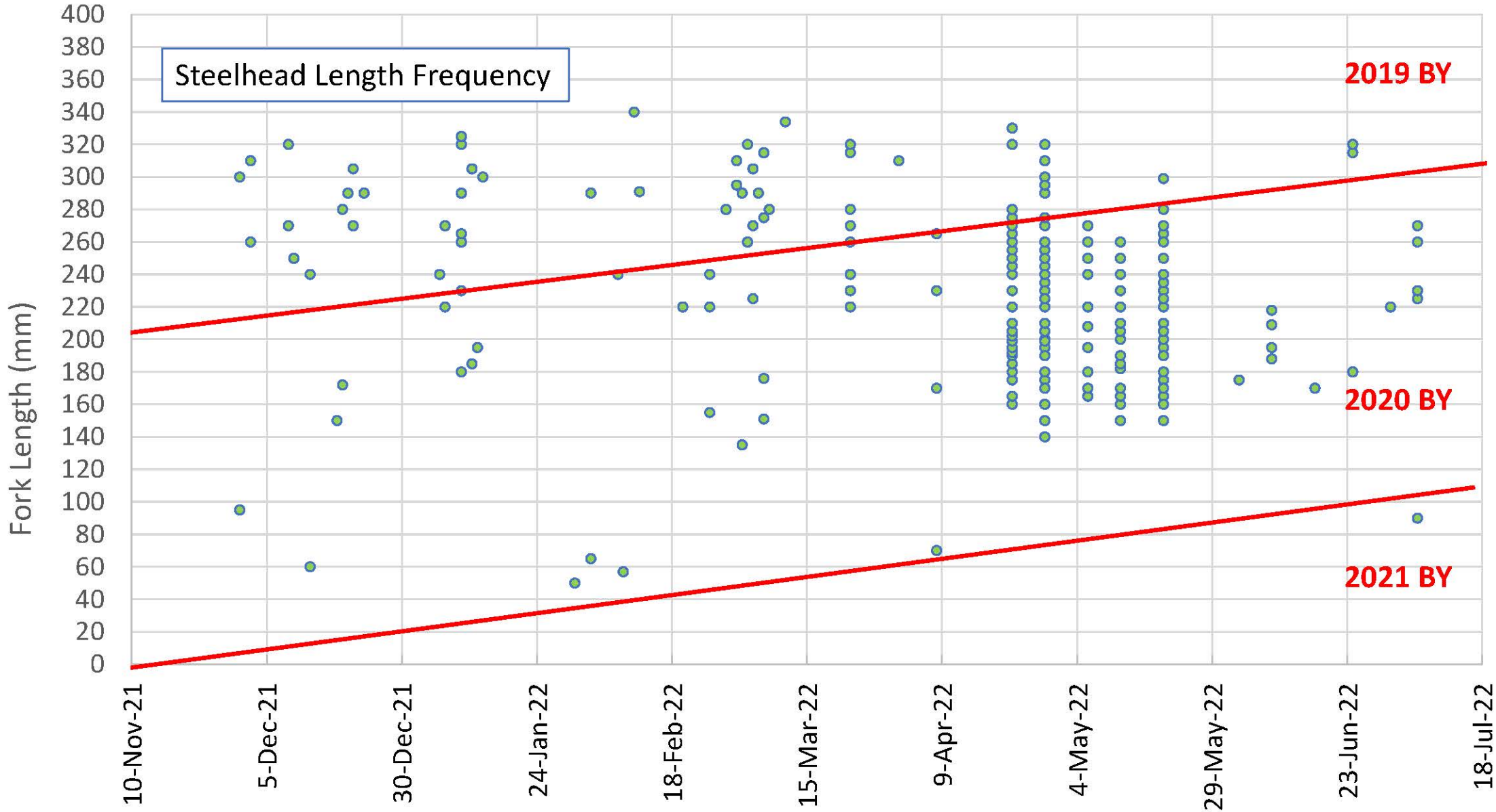

Swift Floating Surface Collector

- Collection Efficiency – Spring 2022 (UPDATE):

- 3D Acoustic Telemetry similar to previous years:
  - Focused on where and why fish turn around in fish channel

- 413 smolts tagged:
  - Coho: 231
  - Steelhead: 182

- Schedule:
  - Field work complete/demob (last week)
  - Data processing and analysis ongoing
  - ACC Presentation – December/January?
  - Report will be included with Annual Report
  - Next steps?

Swift Floating Surface Collector

- Feasibility Study – Year 1 (UPDATE):
- Two-year evaluation to assess whether tagging out-migrants collected at the FSC and transporting them back upstream can be used as a surrogate (or bolster) naïve-fish entering the reservoir to calculate overall downstream survival and abundance parameters.
- PIT Tag similarly sized groups of out-migrants from FSC and Eagle Cliff
- All fish released at head of reservoir to be eventually collected at the FSC.
- Comparing recapture probability between groups by size/age classes
- 2,669 smolts tagged since March 2022:

Species	FSC	Eagle Cliff ST
Coho	1,405	835
Steelhead	200	229

Lewis River Fish Passage Report

July 2022

Merwin Fish Collection Facility and General Operations

During the month of July, a total of 1,585 fish were captured at the Merwin Dam Adult Fish Collection Facility (MFCF), which is a decrease from the June total of 1,667. The majority of the adult fish collected in July were summer steelhead (n= 1389), followed by Spring Chinook (n= 183), sockeye, (n= 9), and cutthroat trout (n= 4). All hatchery summer steelhead were given to the Washington Department of Fish and Wildlife

The MFCF ran continuously for the month of July. Flows below Merwin Dam generally decreased throughout the month, and ranged from a high of approximately 2,800 cubic feet per second (cfs) to a low of approximately 1,250 cfs. (Figure 1).

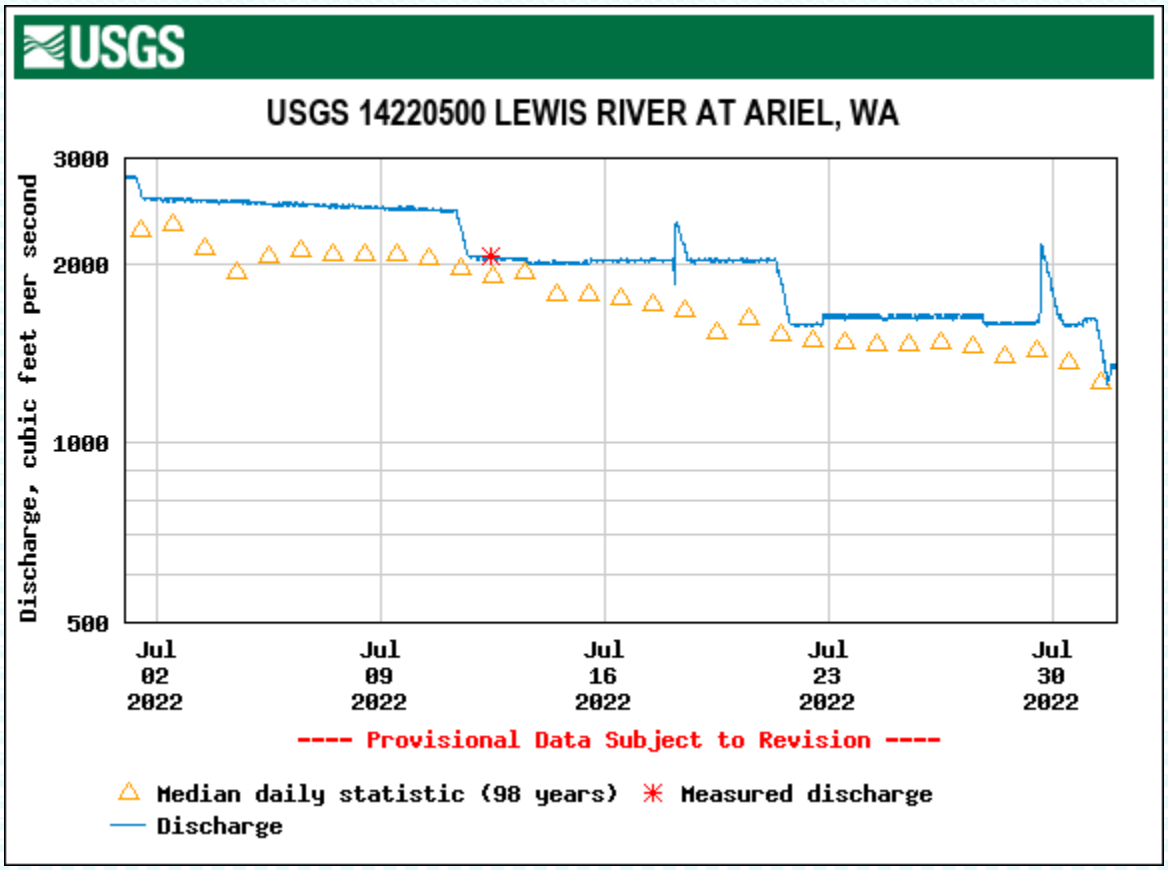

Figure 1. Discharge in cubic feet per second recorded at the USGS Ariel, WA gauge (14220500) located immediately downstream of Merwin Dam.

Four Spring Chinook, two cutthroat trout, and one summer steelhead collected at the MFCF in July had been previously PIT tagged. All Spring Chinook and cutthroat trout were tagged as juveniles in

the Lewis River Basin. The one summer steelhead was tagged on the Kalama River in May of 2021. This fish was returned to the lower Lewis River at Pekin ferry boat launch. Since January 1 2022, a total of fourteen Spring Chinook, nine wild winter steelhead, four cutthroat trout, and one summer steelhead captured at the Merwin Trap had been previously PIT tagged.

Upstream Transport

A total of 165 adult fish were transported above Swift Dam in July. Spring Chinook made up most of the transported fish (n= 161) followed by cutthroat trout (n= 4). No winter steelhead were transported upstream in July. All fish transported upstream were collected at the MFCF. For calendar year 2022 to-date, 3,421 Spring Chinook (2,896 HOR/ 525 NOR), 577 winter steelhead (449 BWT/ 128 NOR), 19 cutthroat trout, and eight NOR coho (transported in January 2022) have been transported upstream of Swift Dam.

Floating Surface Collector (FSC)

The Swift Reservoir Floating Surface Collector (FSC) was taken out of operation in July 18th for the scheduled summer maintenance period. It will return to service the week of October 18th, 2022. Fish collection totals had decreased considerably prior to taking the FSC offline, largely due to a elevating reservoir temperatures. A total of 2,711 fish were collected in July, of which the majority were juvenile coho (n= 2,276).

Table 1: Total number of out-migrating juvenile salmonids (by species) collected at the Swift FSC during the month of July since 2013.

Run Year	FSC Turned Off for Summer Maintenance	July Collection Numbers by Run Year at Swift FSC				
		Coho	Chinook	Steelhead	Cutthroat	TOTAL
2013	*NA*	190	17	1	16	224
2014	*NA*	383	95	20	10	508
2015	July 7	42	1	0	0	43
2016	July 14	340	0	30	4	374
2017	July 21	739	7	15	3	764
2018	July 16	429	52	18	6	505
2019	July 22	1,454	575	17	27	2,073
2020	July 17	641	80	90	2	813
2021	July 12	756	66	18	6	846
2022	July 18	2,276	379	28	12	2,695

Fish Facility Report

Merwin Adult Trap

July 2022

Reporting Date	Spring Chinook (1)									Early Coho												Late Coho												S. Steelhead						W. Steelhead								Fall Chinook									Sockeye		Chum		Pink		Cutthroat	Rainbow (< 20 inches)	Bull Trout	Daily Total
	AD-Clip			Wild			Recap			AD-Clip			CWT			Wild			Recap			AD-Clip			CWT			Wild			Recap			Fresh		Recap		Wild		AD-Clip		BWT		Recap		Wild		AD-Clip			Wild			Recap												
	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	JK	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	JK	M	F	JK	M	F	JK	M	F	M	F	M	F				
1-Jul	2	1	1	1																														12	42	1	6																												66
2-Jul		1		1	1																													27	40	5	16																												91
3-Jul	1	2	1	2																														14	29	6	7																												62
4-Jul				1																														2	8	1	7																												19
5-Jul	2	2	2																															8	18	7	28																												67
6-Jul	8	1		3																														13	35	1	12		1																			2									76
7-Jul	1	2	1																															19	59		5																						1					1			89
8-Jul	3	1	1																															16	32	5	11																												69
9-Jul	1																																	20	29	2	7		1																										60
10-Jul	5	1																																11	19	6	16																											1			59
11-Jul	10	3		3	1																													6	15	4	12																												54
12-Jul	8	6				1																												12	30	6	17																											1			81
13-Jul	1	2	1	1	1																													5	34	8	15																												68
14-Jul	2		8																															15	38	5	23																			2									93
15-Jul	1	1	1																															9	27	7	19																												65
16-Jul	8	1	8	4	1																													11	11	13	6																												63
17-Jul	1	1	1	1																														11	16	5	12																												48
18-Jul	1			2																														8	14	5	11																												41
19-Jul	2		5	1	1																													3	6	4	12																												34
20-Jul		2		1																														5	9	3	9																			1									30
21-Jul		1																																10	18	8	10		1																			1									49
22-Jul		1	1																															13	16	4	7		1																										43
23-Jul																																																																		
24-Jul																																																																		
25-Jul	4	3	6	4	4																													23	47	10	34																			2									137
26-Jul	2	2	7	3																														6	9	4	1																												34
27-Jul	1		1																															2	11	3	10																												28
28-Jul	1																																	11	16	1	4																											1			34
29-Jul						1																												5	11	3	5																												25
30-Jul																																																																		
31-Jul																																																																		
Monthly	65	34	45	28	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	297	639	127	322	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	4	0	0	1585
Annual	2003	1831	393	308	197	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	5	1	3	0	0	0	569	1101	178	397	0	4	377	290	310	147	3	0	85	89	0	0	0	5	2	0	0	0	0	9	1	0	0	0	0	19	0	0	8338

1 Only hatchery verses wild distinctions are currently being made. All hatchery fish are labeled as "AD-Clip".

2 Total counts do not include recaptured salmon.

Fish Facility Report

Swift Floating Surface Collector

July 2022

	Coho			Chinook			Steelhead				Cutthroat			Bull	Planted	
Day	**fry**	**parr**	**smolt**	**fry**	**parr**	**smolt**	**fry**	**parr**	**smolt**	**kelt**	**fry**	**<13 in**	**> 13 in**	**Trout**	**Rainbow**	**Total**
1			232		1	4			2	1				0	0	**240**
2			403			9			0					0	0	**412**
3			306		1	11			4				1	0	0	**323**
4			396			9			0					0	0	**405**
5			62			21			0			2	1	0	0	**86**
6			182		1	19			10					0	2	**214**
7		1	92		3	45			1					0	0	**142**
8			237			43			2			2		0	6	**290**
9		2	47		9	28			0					0	3	**89**
10		9	53		21	0			1					0	0	**84**
11		1	50		19	4			0					0	4	**78**
12		6	33			10			0			2		0	0	**51**
13			32			14			0					0	0	**46**
14	2		31			27			4					0	0	**64**
15		7	31			15			0			2		0	0	**55**
16		6	18			12			3			2		0	0	**41**
17	17		0	7		3			1					0	0	**28**
18			20			43			0					0	0	**63**
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
Monthly	19	32	2225	7	55	317	0	0	28	1	0	10	2	0	15	**2711**
Total	653	14180	45740	60	229	2023	5	22	5432	27	2	731	117	15	4333	**73569**