

# LEWIS RIVER AQUATIC COORDINATION COMMITTEE

Facilitator: ERIK LESKO  
503-412-8401

Location: TEAMS MEETING ONLY

Date: July 14, 2022

Time: 9:30 AM – 12:00 PM

## AGENDA ITEMS

---

- |          |  |
|----------|--|
| 9:30 AM  | Welcome <ul style="list-style-type: none"><li>➤ Review and Accept 7/14/2022 Agenda</li><li>➤ Review and Accept 6/9/2022 Meeting Notes</li></ul>  |
| 9:45 AM  | Public Comment Opportunity   |
| 9:55 AM  | Approval of Swift Reservoir Stranding Surveys 2022 Plan – <i>Erik Lesko</i>  |
| 10:00 AM | Yale Habitat Preparation Plan (tentative) – <i>Erik Lesko</i>  |
| 10:30 AM | Doodle Poll Results – Field visit to USFS Restoration Projects (Early August)  |
| 10:40 AM | Study/Work Product Updates <ul style="list-style-type: none"><li>➤ Flows/Reservoir Conditions Update</li><li>➤ Aquatic Fund Announcement Update</li><li>➤ Reservoir Shoreline Development Projects</li><li>➤ ATS Update</li><li>➤ FPS Update</li><li>➤ Compensatory Mitigation Discussions Update (tentative)</li><li>➤ Fish Passage Update</li><li>➤ USFWS update on fish stranding above Swift (tentative)</li></ul> |
| 11:15 AM | Next Meeting's Agenda <ul style="list-style-type: none"><li>• Approval of Yale Habitat Preparation Plan (tentative)</li></ul>  |
|          | 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>

**Join on your computer or mobile app**

[Click here to join the meeting](#)

**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**  
**July 14, 2022**  
**TEAMS Meeting Only**

**ACC Representatives and Affiliates Present (19)**

Sarah Montgomery, Anchor QEA  
Bridget Moran, American Rivers  
Christina E. Donehower, Cowlitz Indian Tribe  
Eli Asher, Cowlitz Indian Tribe  
Amanda Froberg, Cowlitz PUD  
Steve West, LCFRB  
Jim Byrne, Trout Unlimited  
Chris Karchesky, PacifiCorp  
Erik Lesko, PacifiCorp  
Todd Olson, PacifiCorp  
Jeremiah Doyle, PacifiCorp  
Aaron Roberts, WDFW  
Peggy Miller, WDFW  
Josua Holowatz, WDFW  
Sam Gibbons, WDFW  
Bryce Glaser, WDFW  
Kate Day, USFS  
Jeff Garnett, USFWS  
Bill Sharp, Yakama Nation

**Guests (0)**

None

**Calendar:**

July 14, 2022	ACC Meeting	TEAMS Meeting
---------------	-------------	---------------

Assignments from July 14, 2022	Status
Erik Lesko: Update Teams meeting invitation to add and remove staff as needed.	<b>Ongoing.</b>
Erik Lesko: Provide the final approved Swift Stranding Plan to the ACC.	<b>Complete. July 14, 2022</b>
Erik Lesko: Provide the revised Yale Habitat Preparation Plan to the ACC for review and approval.	<b>Ongoing.</b>

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.	<b>Ongoing. Need to discuss at FPS.</b>

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 9:31 a.m. and reviewed the agenda.

Lesko reviewed the June 9, 2022 meeting notes. Revisions were reviewed and approved at 9:42 a.m.

### Public Comment Opportunity

None.

### Approval of Swift Reservoir Fish Stranding Proposed Monitoring 2022

Lesko shared the draft plan, Swift Reservoir Fish Stranding Monitoring 2022 (Attachment A), for which the Aquatic Technical Subgroup (ATS) has recommended for approval by the ACC. Lesko asked if the ACC has any further questions or comments before voting to approve the plan. Jeff Garnett asked if there are plans to monitor temperature outside of the old river channel or if there is continuous monitoring nearby. Lesko said there is ongoing temperature monitoring in the reservoir (Mark Ferraiolo's work) and a thermograph has also been installed at Eagle Cliff. He said he will also install a thermograph and water level monitor in the old Lewis River channel to collect data for the duration of the survey. Garnett said it would be helpful to be able to compare the temperatures in different parts of the reservoir throughout the season and he asked where those data are or will be reported. Jeremiah Doyle said the Eagle Cliff temperature data will provide a good comparison for the reservoir data, and said the Eagle Cliff data will be collected hourly from June 15 to October 31. The data will be reported in the report that will be available in January. Garnett said that sounds like a good monitoring approach. Lesko noted that the thermographs have not been installed yet this season because the reservoir is still very full, but he will install them when elevations allow.

Lesko said one update he made in the plan was to add the Swift Campground area as part of the surveyed area. There is a swimming area here that cannot be electroshocked, but it will become isolated from the reservoir and will need to be checked. This site in particular will require some planning as the campground will remain open and the swimming area will likely be in use by campers.

Lesko said another update he added to the plan is an attachment that compares available satellite imagery at various reservoir elevations using Google Earth's historian function. Although limited, the available imagery does help to illustrate the effect of reservoir elevations on the three proposed survey sites. PacifiCorp staff (Summer Peterman) will be conducting drone flights throughout the summer to collect imagery of the survey areas over a broad range of reservoir elevations to better analyze when the areas become isolated and go dry. Lesko said that if for some reason the drone imagery does not provide the resolution needed, PacifiCorp will look into obtaining additional satellite imagery to provide information needed to understand how reservoir elevations are affecting the survey areas.

Lesko asked if there are any further questions or comments on the plan, and none were identified by ACC representatives present. Bryce Glaser noted that the ATS was able to review and provide comments on the plan, and he appreciates that the comments were incorporated into this final version. He said he agrees with Garnett's comments earlier about making the temperature data available and comparable.

### **ACC Decision**

**All ACC representatives present were asked for their confirmation of the plan, and Glaser, Byrne, Asher, Garnett, Day, and Lesko supported implementation of the plan.**

Lesko said he will continue monitoring the reservoir elevations and start planning field work. He will coordinate with interested ACC representatives. He thanked the ACC and ATS for the comments and input, which improved the final study plan.

### **Yale Habitat Preparation Plan**

Erik Lesko said the ATS has been reviewing the Yale Habitat Preparation Plan (Attachment B) and he received additional comments on the plan yesterday. He said the goal for today will be to share some of the updates that have been made with the ACC and get some initial feedback. He reviewed the updates as follows:

- A section has been added to summarize past evaluations of habitat. Lesko reviewed the material he added here, including previous reports and studies.
- Early HOR coho will be the species used for habitat preparation (unless sufficient fish are not available) in 2022 due to the opportunistic monitoring occurring in Cougar Creek.
- In Section 5, the transport number for coho is 1,100 adults, which was derived through EDT analysis. Jacks were removed from the transport group because they do not provide as much value as adults for meeting objectives of the Habitat Preparation Plan.
- A figure was added, showing the release locations, Yale Park and Saddle Dam, and the intent is to release equal numbers of fish from both locations.
- Lesko noted that the implementation of the plan will be modified as the downstream collection facility in Yale Reservoir becomes operational. The composition of fish (e.g., hatchery-origin vs natural-origin) used for the plan could change in 2024.
- The biggest change to the draft is the new section on planned monitoring. Section 7.4 of the Settlement Agreements states that the purpose of the Habitat Preparation Plan is to prepare gravels for future fish use, but the ACC and ATS provided comments on monitoring options. PacifiCorp recognizes the opportunity to conduct monitoring on the fish that are placed in the basin and the plan has been updated with two monitoring components: the Cougar Creek weir will be in place and additional observations on coho (enumeration using a passive integrated transponder [PIT] array and camera) will be taken in addition to ongoing bull trout work. One reason early coho were chosen is that the weir will not be in place after late October, depending on flows, so a higher proportion of the run can be enumerated using the weir if early coho are used. Next, coho released into Yale Reservoir will be PIT-tagged (in the dorsal sinus) to allow for detection in recovered carcasses, and as live coho pass the Cougar Creek weir. Scanning carcasses for PIT tags will allow for better data analysis, as biotic data (carcass recovery location and time collected, release location and time, size, length) will be available. There are also some concerns about the number of coho that could move into Cougar Creek, so having these fish PIT-tagged will help understand those risks. Ongoing foot surveys for bull trout and kokanee will also occur in the basin and any opportunistic/qualitative observations about coho distribution and behavior will be noted.

- Glaser thanked Lesko for adding these monitoring components to the plan.
- Lesko made additional minor revisions to tables and figures as were requested.
- Lesko noted that Merwin fish passage will become operational in 2028, so a habitat preparation program will need to be implemented starting in 2023. Lesko anticipated that the plans might be combined, and coho would also likely be used for that habitat preparation effort.

Lesko said he will clean up this version of the plan and provide it for ACC approval in August. The ACC discussed which plans require a formal vote of approval. Lesko said he will review the protocols to confirm, but he thinks a decision document is not needed as long as what is being approved is consistent with the Settlement Agreement. So, any plans related to the Settlement Agreement will require a vote of approval, but a decision document is not needed. Glaser confirmed that if a plan is fulfilling an action of the Settlement Agreement, then a decision document is not required. A consensus vote suffices.

### **USFS Site Visit**

Kate Day said USFS staff are planning a site visit for the ACC to the Lewis River restoration projects (Swift Campground culvert on Forest Service Road 90, Lewis River Reach 21, and Rush Creek). It is scheduled for August 5 at 9 am (leaving from Pine Creek Information Center). Kyle Wright will send an agenda for the site visit and he asked that everyone please respond if they plan to attend. Day noted that the site visit to Rush Creek will have to be flexible as the project is currently undergoing construction. The group may or may not be able to go to the mouth of the channel but at a minimum will visit the site and observe from a distance.

Jim Byrne and Erik Lesko coordinated on potential carpooling from Merwin Fish Hatchery, for which more information will be provided by email if others would prefer to carpool from Merwin to the Pine Creek station.

Day also noted that the Clearwater Creek project, which was funded in 2021, has progressed through geomorphic assessment. It would be helpful to share an update on preliminary design ideas with the ACC in September. Lesko said this will be tentatively added to the September agenda.

Lastly, Day noted that she is switching roles in the USFS and will no longer be the representative for the ACC. She said will coordinate on USFS representation on the committee. The ACC wished Day well in her new role in Arizona.

### **Study/Work Product Updates**

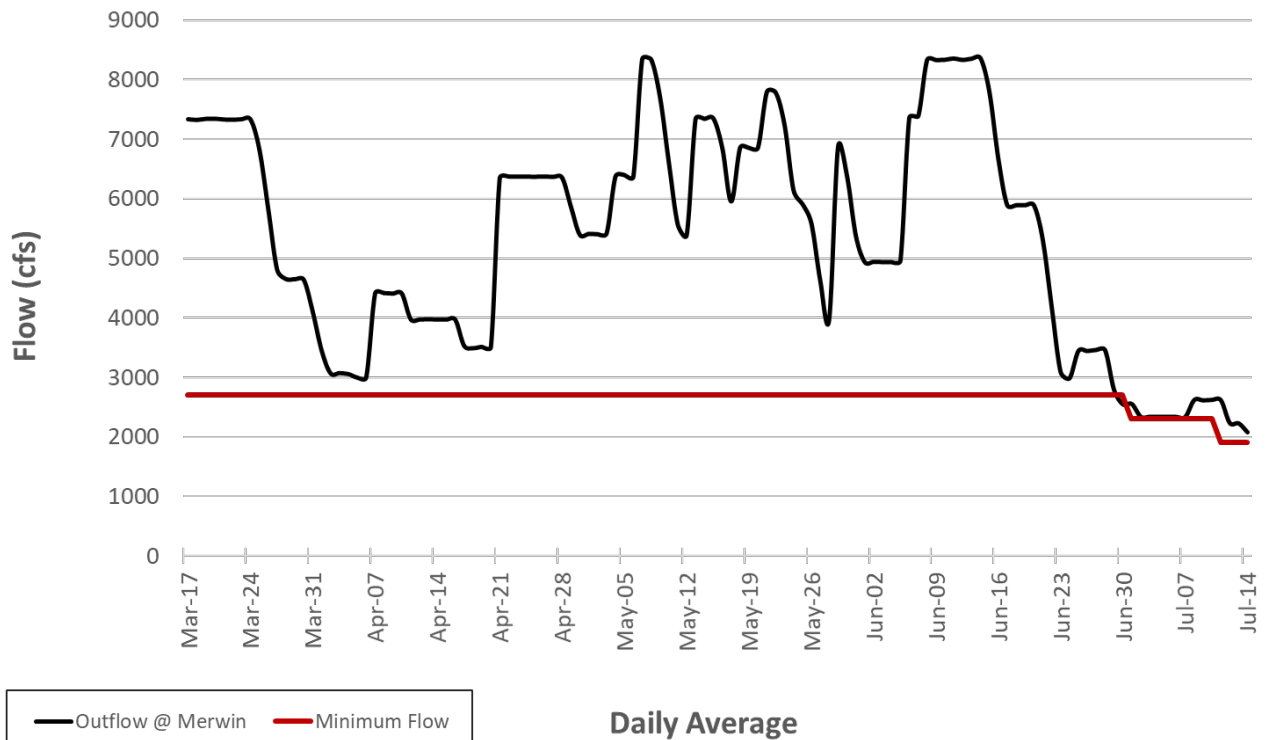
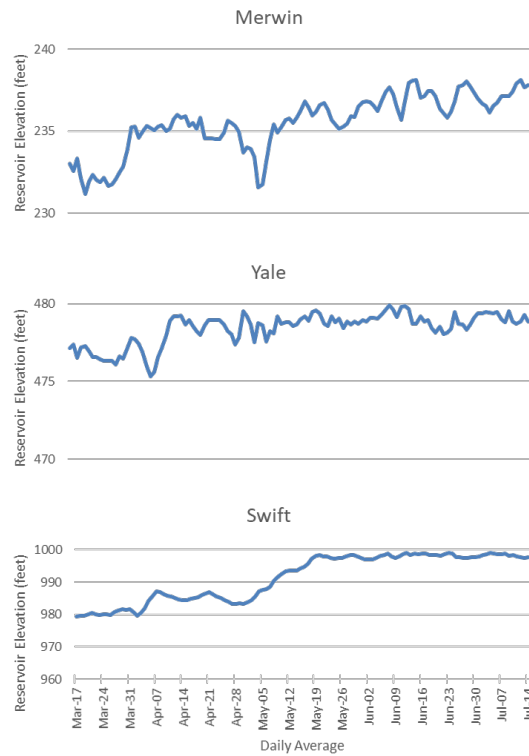
#### **Flows/Reservoir Conditions Update**

Lesko shared the flows and reservoir conditions update.

Reservoirs are still quite full, as follows:

*Daily Average  
Reservoir  
Elevations –  
past 120 days*

**Total Reservoir draft  
-15.10 feet  
(-5.10 with Yale restriction)**



Lesko said he is closely watching the reservoir elevations in Swift to inform survey efforts in the Swift Stranding Plan.

He noted that in the Lewis River downstream of Merwin Dam, flows have decreased and he pointed out that the graph appears to show a dip in flows that drop below the minimum flow level, but assured the ACC that this was a function of averaging data for the Figure and that flows were in compliance with our FERC license.

### **Aquatic Fund Announcement**

Lesko said he is working on the announcement for Aquatic Fund application process. He said the announcement has been slightly delayed due to needing to update the available funds, but the announcement will be sent out soon, and the website will be updated accordingly.

### **Shoreline Development Update**

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

- FERC approved the Camper's Hideaway project (PacifiCorp will issue the Shoreline Management Permit)
- Lesko inquired within PacifiCorp about the Northshore seawall renovation project but has not heard back
  - o Josua Holowatz noted that the ACC discussed this project briefly in June. Holowatz discussed this project with the regional habitat biologist and reviewed the project plans. He confirmed with the habitat biologist that there will be no net loss in habitat because the wall is being rebuilt in its current alignment and there will be no fill. The proposed dock is moveable, and it will be removed from the water during the offseason. The designers are evaluating the potential use of a light permeable surface. Lesko thanked Holowatz for the update and said the project has not been issued a Shoreline Management Permit yet by PacifiCorp.
- The Cougar Creek culvert project has been delayed to 2023

### **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. Lesko noted that the ATS had a good discussion in their June meeting about the process for including decision points in the AOP. This content has now been moved to the Adaptive Management section of the document because it would involve both the ACC and the ATS when decisions about managing the programs are needed.

Lesko said the ATS is also planning on putting together an annual summary meeting that highlights the results from the previous year's monitoring efforts, which will be presented to the ACC before the annual report is provided for review. This will be a high-level presentation/data summary for both the Hatchery and Supplementation Program and Aquatic Monitoring and Evaluation Program. This will be added to the ACC's agenda around May 2023 and will help kick off review of the annual report. Glaser added that it will be very helpful to have a concise executive summary or PowerPoint slide showing the highlights of the monitoring program that year. He said he appreciates this effort and thinks this meeting and summary will be very helpful to keep the ACC engaged and help kick off a productive review of the annual report.

Karchesky noted no major updates to the monitoring and evaluation program activities. He said the revised AMEP (which was completed in 2021) is being implemented this year. Looking forward, some of the facilities involved in the M&E program will have summer outages, and the operational aspects of fish passage are wrapping up. A preliminary summary of data collected this spring will be available in August.



### **FPS Update**

Bryce Glaser said at the last Fish Passage Subgroup (FPS) meeting, the FPS received an update on scheduling from the design team and they discussed ongoing studies. He said Todd Olson presented a draft letter to FERC and the FPS discussed various elements of the letter and identified and discussed issues. More work is needed to finalize the letter, and the FPS will continue discussing.

In the near term, Glaser said the FPS will continue discussing passage configurations for both upstream and downstream passage and formulate recommendations for the ACC. The FPS meeting this afternoon will include discussions of logistical details, long-term plans, and how to develop a pathway to potentially document the process/pathway for making decisions over the long term (such as for future expansion capabilities). Olson agreed and said PacifiCorp will plan to share ideas on how to continue making progress on the longer-term decision items. Eli Asher agreed with the update.

### **Compensatory Mitigation Discussions**

Todd Olson said he has been meeting with other members of the FPS to discuss the process of potentially providing a financial contribution to the Aquatic Fund to resolve outstanding issues on future fish passage and refocus the group on implementation. Olson said the current plan is to work through agreements on the fish passage plan, and then resume discussions about compensatory mitigation. The fish passage plans are the highest priority but this discussion is still ongoing.

### **Merwin Fish Passage Update (see also Attachment C)**

Karchesky reviewed the fish passage report. He said Merwin Dam has seen a very high number of spring Chinook, consistent with other rivers in the area. So far, 3,000 adult spring Chinook have been transported upstream which meets the target of the upstream supplementation program. Karchesky said passive integrated transponder data has been added to the monthly report and summarized. He noted that in June a natural-origin-spring Chinook, that was collected and PIT tagged in the Hood River, was subsequently collected at the Merwin Trap four to five days later and passed upstream. This highlights the interesting information that becomes available from the PIT-tag network in different basins and across different studies. He noted that the spring Chinook run is slowing down and there are only a few fish per day arriving now.

For winter steelhead, Karchesky said returns were lower than average. Right now, summer steelhead are arriving at the facility. Summer steelhead arriving for the first time at the Merwin Trap are released back downstream, then if they come back to the facility, they are surplus.

### **Swift Floating Surface Collector (see also Attachment D)**

Chris Karchesky reported that the Swift Reservoir FSC was currently in operation. Numbers are decreasing quickly now as water temperatures increase. The facility is on target to be turned off next week for the start of the summer outage. He said there are no major construction activities this year so the facility will not require deballasting. It will likely be back in service in October and will only undergo standard maintenance.

### **Lewis River Fish Passage**

See Attachment E.

### **Services Update on Fish Stranding Above Swift Dam**

No update was available. Jeff Garnett said the USFWS is looking forward to learning more about stranding risks in the Swift Reservoir from the Swift Reservoir Fish Stranding Plan.

Bryce Glaser asked what is the path forward for amending the Biological Opinion? Jeff Garnett said the Services are indeed planning on amending the Biological Opinion and updating the take statement to account for stranding in Swift Reservoir. In order to update the take statement, a better understanding of the action is needed so that terms and conditions can be developed. Survey efforts being conducted this year will help inform that effort.

### **Public Comment Opportunity**

None present.

### **Agenda Items for August 11, 2022**

- Review July 14, 2022, Meeting Notes
- Yale Habitat Preparation Plan approval
- ADA Access at Haapa
- AMEP Data Update (as part of Study/Work Product Updates) – Chris Karchesky
- Compensatory Mitigation Discussion (tentative)
- Study/Work Product Updates

*Adjourn 11:15 am*

### **Next Scheduled Meeting**

August 11, 2022
Teams Call
9:30 a.m. – 12:00 p.m.

### **Meeting Handouts & Attachments**

- Meeting Notes from 6/9/2022
- Agenda from 7/14/2022
- **Attachment A** – Swift Reservoir Fish Stranding Proposed Monitoring Plan
- **Attachment B** – Yale Habitat Preparation Plan
- **Attachment C** – Merwin Adult Trap Collection Report (June 2022)
- **Attachment D** – Swift FSC Facility Collection Report (June 2022)
- **Attachment E** – Lewis River Fish Passage Report (June 2022)

July 6, 2022

To: Aquatic Coordination Committee (ACC)

From: Erik Lesko, PacifiCorp

Subject: Proposed Swift Reservoir fish surveys - 2022

## **I. Purpose**

The purpose of ongoing Swift Reservoir surveys in 2022 is improve our understanding of the extent of fish stranding and isolated pool formation and duration relative to natural drafting of Swift Reservoir during the summer. Data from these surveys are intended to assist the Services in determining risks of Swift Reservoir fish stranding on listed populations.

Specific Objectives in 2022 include:

- 1) Capture, sample and release stranded fish from isolated pools in the Northwoods area into Swift Reservoir (fish recovery)
- 2) Identify and document the spatial and temporal characteristics of isolated pool formation compared to specific reservoir elevations in the Northwoods area.
- 3) Identify additional potential stranding areas in Swift Reservoir.
- 4) Seasonal and continuous water temperature and pool elevation monitoring in the Northwoods 'old' Lewis River channel

## **II. Background**

Four investigative fish surveys were completed in the Northwoods area of Swift Reservoir between 2020 and 2021. The purpose of these surveys was to collect, identify and document fish species present in isolated pools that form in the Northwoods area at various reservoir elevations (Figure 1).

The predominant salmonid species captured during both years were coho salmon (408) followed by rainbow or cutthroat trout (13) and bull trout (10). Most of these captures occurred in what is referred to as the 'old river channel'. This channel is visible at reservoir elevations of at least 989 feet (Figures 2 - 4). The channel is fed through hyporheic flows (Figure 3) from the North Fork Lewis River and maintains a stable water temperature (64° F on August 5, 2021) relative to isolated pools that form during summer drafting of the reservoir. Currently, there are questions as to whether this channel (when or what parts of it) becomes dewatered as the reservoir continues to draft and flows in the North Fork Lewis River naturally decrease to summer minimum flow levels.

A number of pools also begin to form and become isolated (from the reservoir) in the Northwoods area at various reservoir elevations (generally between reservoir elevations between 980 and 990) during the summer months. Reservoir elevations in Swift are influenced by turbine outflow, natural inflows into Swift and compliance with minimum stream flow

requirements downstream of Merwin Dam (See FERC license and Section 6.2.4 of the Lewis River Settlement Agreement).



Figure 1. General location of fish recovery surveys 2020 and 2021.

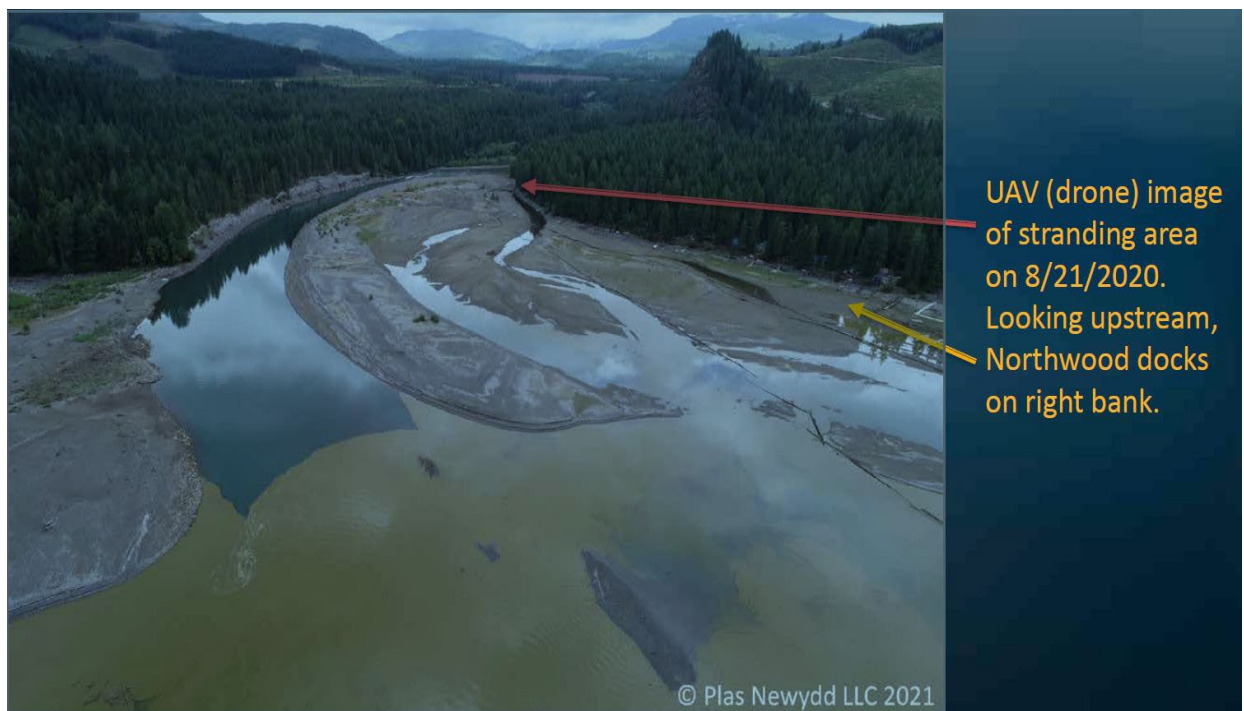


Figure 2. Northwoods area showing location and condition of 'old river channel' at reservoir elevation 987 feet, August 21, 2020.





Figure 3. Start of old river channel fed by hyporheic flows from the North Fork Lewis River, July 12, 2021 at reservoir elevation of 988.5 feet.





Figure 4. Lower end of old river channel showing puddled portions of the old river channel, August 5, 2021 at reservoir elevation of 980.5 feet.

### III. Proposed Activities in 2022

The Utilities propose the following evaluations in 2022 to develop a more complete understanding of observed and potential fish stranding in Swift Reservoir.

- 1) The use of drones or satellite imagery to determine the relationship between reservoir elevation and pool formation at the Northwoods area
- 2) Northwoods fish recovery surveys
- 3) Assessment of potential stranding area near the Drift Creek Island
- 4) Monitoring of water temperature and pool elevation in the old Lewis River Channel (Northwoods)

#### 1. Relationship between reservoir elevation and pool formation at Northwoods area in Swift Reservoir

The ability of survey crews to define when pools begin to form and when those pools become dewatered has been an ongoing challenge. To assist in understanding this dynamic between reservoir elevations and pool formation, PacifiCorp proposes the use of multiple drone surveys

of the Northwoods area in 2022. Drone surveys will provide time lapse imagery to evaluate spatial and temporal attributes of pool formation, distribution and dewatering over the course of about 8 months and over a broad range of reservoir elevations in the Northwoods area. This information will assist survey crews in scheduling fish surveys at times when pools first become isolated rather than when pools have been isolated and subject to predation for prolonged periods. Note: this information will not be available until 2023.

#### Potential Alternative:

If drone surveys do not provide adequate resolution (i.e., not frequent enough) we will explore the availability of satellite imagery of Swift Reservoir at an appropriate frequency to fully describe the influence of reservoir elevations on pool formation and isolation. Please see Attachment A for an example of existing satellite imagery from Google Earth using the historian function to capture an incomplete set of imagery over time.

Drone surveys will be performed by PacifiCorp Wildlife Biologist and certified drone pilot Summer Peterman.

#### Frequency and duration

Drone surveys will occur throughout the spring, summer and fall of 2022. While there is no set flight schedule, it is anticipated that by conducting as many flights as possible during the remainder of 2022, a robust collection of drone images and videos will be available over a broad range of reservoir elevations as Swift Reservoir fills (spring and summer) and drafts (summer and fall) over the survey period.

## **2. Northwoods Fish Recovery Surveys**

In 2022, the Utilities propose continuing the fish recovery surveys in the Northwoods area to expand existing databases from the 2020 and 2021 surveys (Figure 5). Surveys will follow the same methodology as previous surveys using electrofisher(s) and documenting the number, species and lengths of all species captured from isolated pools, including the old river channel.

#### *Fish Collection*

Fish collection will rely primarily on backpack electrofishers in combination with stick seines to concentrate fish present in each isolated pool observed. Seines may also be used exclusively for fish collection in certain pools that have specific or favorable characteristics (e.g., smooth substrate without large wood or boulders).

All fish collected will be enumerated by species and up to 30 individuals of each salmonid species will be measured for fork length. All captured fish will be moved to the edge of the open reservoir using 5-gallon pails for sampling and release. Photographs will be taken from a subsample of fish collected from each observed pool to determine life stage of captures (e.g., fry, parr, smolt).

#### *Pool identification and information*

The number of isolated pools observed during each survey will be counted and location marked with handheld GPS unit. Survey crews will also record average depth, water temperature and surface area (using laser range finder) of each pool observed at the time of each survey.

### *Frequency and Duration*

Based on past surveys (Table 1), it is known that isolated pools in the Northwoods area begin to form at reservoir elevations less than 990. It is also known that the old river channel becomes puddled at the lower end at reservoir elevations of 980.5 or less. Drone footage and installation of water level pressure transducer should help define whether the old river channel becomes dewatered at elevations less than 980.

Table 1 Previous fish surveys conducted in 2020 and 2021 in the Northwoods area

Survey Date	Reservoir Elevation (feet, msl)
July 31, 2020	989.3
August 21, 2020	987.0
July 12, 2021	988.5
August 5, 2021	980.5

A minimum of two Northwoods fish recovery surveys will be conducted in 2022 to complement existing fish recovery data documented in 2020 and 2021. Target elevations to conduct these surveys will include a high reservoir elevation to remove fish from isolated pools between 985 and 989 and a lower reservoir elevation similar to 2021 of between 980 and 985. This lower elevation survey is intended to remove all fish from the old river channel.

Table 2. Proposed surveys in Swift Reservoir at desired reservoir elevations during 2022.

Survey No.	Survey Area	Survey Type	Desired Reservoir Elevation (ft, msl)	Anticipated Survey Time
1	Northwoods	Fish Recovery	985-989	July 20 – July 30
2	Northwoods	Fish Recovery	980-985	Aug 15 – Aug 30

### **3. Assessment of potential stranding area near Drift Creek Island and Swift Swimming area**

#### **Drift Creek Island**

A visual survey will be conducted near the island just outside of the Drift Creek Bay area (Figure 5 and 6). The purpose of this survey is to inspect and assess whether this area represents an observed or potential stranding area for juveniles. This will be determined by documenting the presence and GPS location of any isolated pooling and an inspection of all low elevation areas within the survey area (Figure 6). Potential stranding areas will be identified by comparing observed topography with existing bathymetry data. Identified potential stranding areas will be inspected for the documented using the same procedure described for documenting pool information at the Northwoods area.

#### **Swift Swimming Area**

Based on existing satellite imagery (Attachment 1), the swimming area near the Swift Boat Launch (Figure 5) is isolated from the reservoir at elevation 981 feet. We propose surveying the swimming area at reservoir elevations between 981 and 985 feet. Surveys will include the use of electrofisher (if swimming area is closed) or stick seines to capture and evaluate whether fish



are present in the pool once isolated from the reservoir. All fish will be enumerated, identified to species, measured and released to the reservoir.

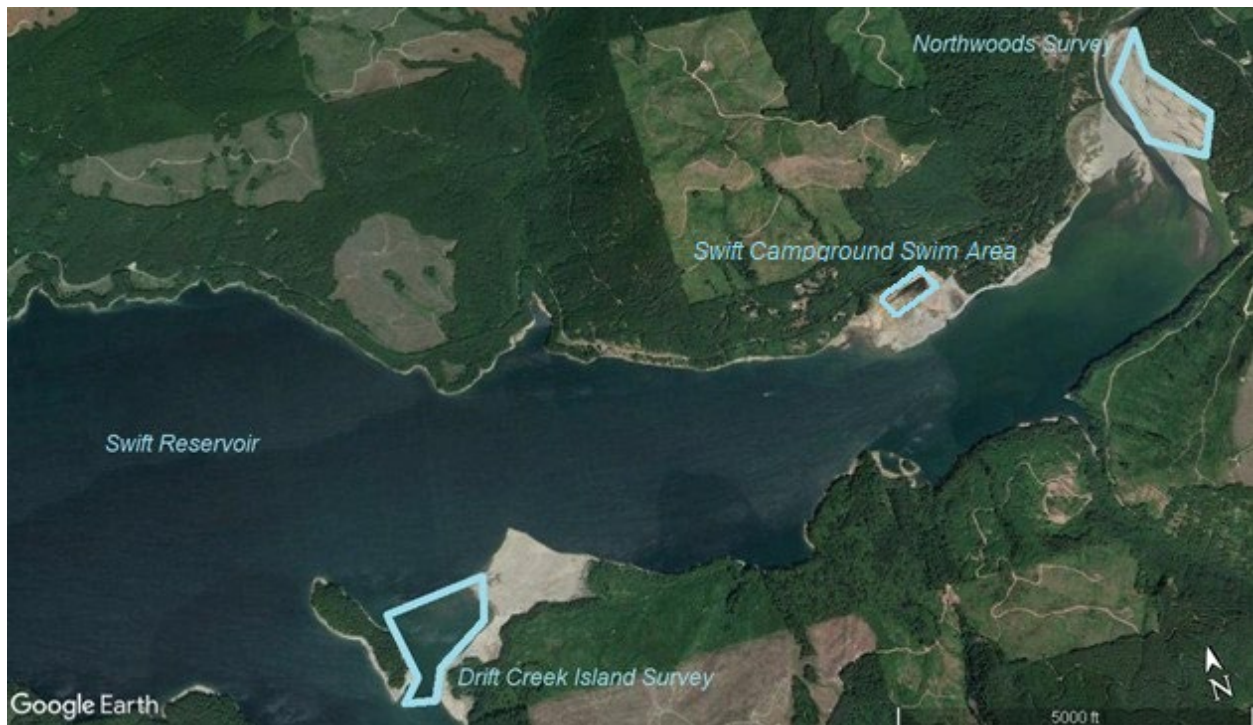


Figure 5. General location of additional survey areas including Drift Creek Island and Swift campground swimming area relative to Northwoods survey area in Swift Reservoir

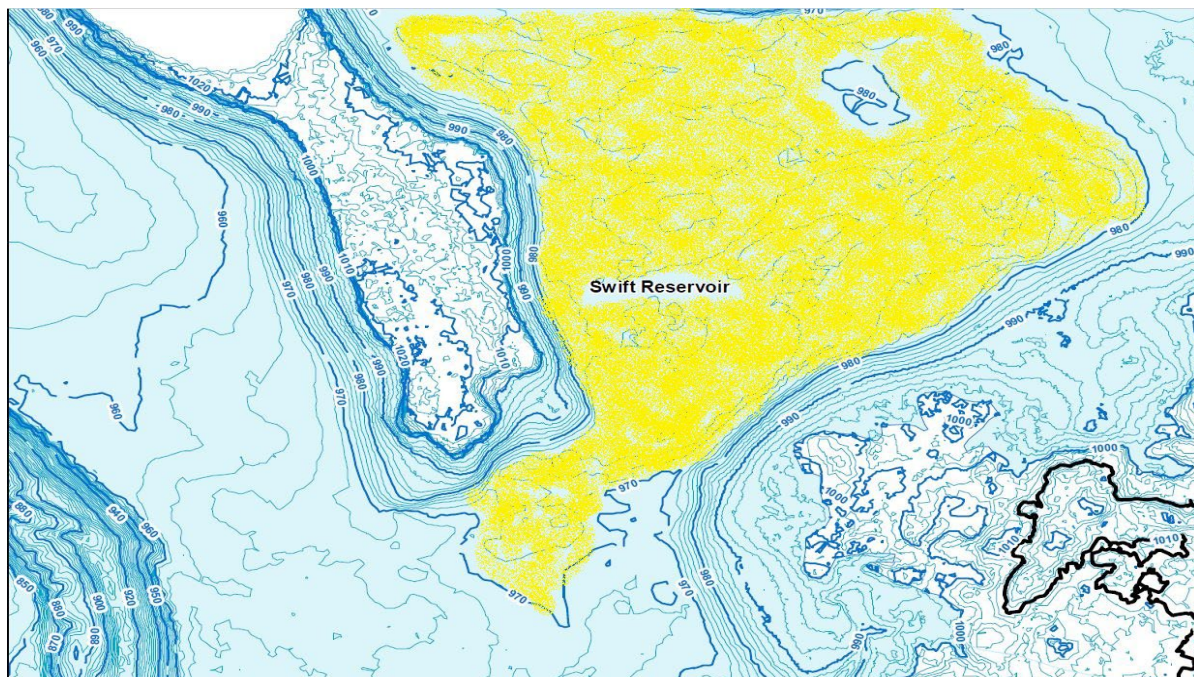


Figure 6. Detailed location of proposed Drift Creek Island inspection area

### *Frequency and Duration*

Based on bathymetry data, the survey of the Drift Creek Island area will occur at reservoir elevation of approximately 975 feet. The swimming area will be surveyed between reservoir elevation 981 and 885.

Table 3. Proposed survey time of Drift Creek Island Area and Swift campground swimming area

Survey No.	Survey Area	Survey Type	Desired Reservoir Elevation (ft, msl)	Anticipated Survey Time
1	Drift Creek Island Area	Inspection	975	Sep 1 -Sep 30
2	Swift Campground Swim area	Fish Recovery	981 - 985	Aug 15 – Aug 30

## **4. Water Temperature and water level monitoring in the old Lewis River channel**

During surveys in 2021, a channel was identified that receives hyporheic flows from the North Fork Lewis River. This channel supports most fish captures during each survey conducted in 2020 and 2021. Installing a temperature monitor in this channel provides information on whether the temperatures in the channel remain stable and supportive of fish life until reservoir levels inundate this channel.

Water temperature and pool elevations in the old Lewis River channel in the Northwoods area will be continuously monitored using Onset data loggers for temperature and water pressure. The loggers will be placed within the main pool identified during the August 5, 2021 survey (Figure 7). The loggers will be set to record every hour for the period of the evaluation.



Figure 7. Proposed placement location (red circle) of temperature and water level loggers in the old Lewis River channel (Northwoods Area).



#### *Frequency and Duration*

<b>Survey Area</b>	<b>Survey Type</b>	<b>Anticipated Survey Time</b>
Old Lewis River Channel	Temperature Monitoring	Continuous, Aug 1 - Nov 1

#### **IV. Deliverables**

A report will be prepared and made available to the ACC in January 2023. The report will provide the following:

- 1) All time stamped and geolocated drone imagery available including the corresponding reservoir elevation (hourly average) for each image provided in the report.
- 2) Summary and raw data from fish rescue efforts in the Northwoods area and Swift Campground Swim Area including total number of captures by survey, location and species, fork lengths (up to 30) for each species captured on each survey date, images of fish sampled.
- 3) A description of all pools identified during foot surveys at Northwoods including measured physical characteristics
- 4) Description and discussion of observed and potential stranding area within the Drift Creek Island area including physical measurements of observed and potential pools and images.
- 5) Chart(s) illustrating hourly water temperature and pool elevation recorded in the old Lewis River channel

## ATTACHMENT A – A summary of available satellite imagery from Google Earth using the historian function at the upper end of Swift Reservoir

### Reservoir Elevations Figures:

1. 997.60
2. 996.86
3. 994.07
4. 991.62
5. 981.44

1. September 25, 2011 at Reservoir Elevation 997.60 feet msl



2. July 25, 2017 at Reservoir Elevation 996.86 feet msl





3. August 14, 2012 at Reservoir Elevation 994.07 feet msl



4. April 19, 2009 at Reservoir Elevation 991.62 feet msl



5. July 25, 2018 at Reservoir Elevation 981.44 feet msl





**DRAFT**

## **Yale Habitat Preparation Plan**

*Yale Reservoir, North Fork Lewis River*

June 22, 2022

### **I. Introduction**

The purpose of this plan is to provide the necessary logistics and methods necessary to collect, transport, and distribute excess hatchery fish 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, 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 Siouxeon Creek and smaller numbers were observed in Speelyai Creek and the

**Commented [E1]:** Comment from Logan Negherbon: This should probably include a survey component to determine that fish are seeding intended habitats. Also, not being familiar with the EDT modeling, I assume there is some loss to the reservoir (fishing, predation, random mort) and if that is not accounted for, this could mean underestimating the required transport numbers to fully seed the tributaries.

**Commented [CP2R1]:** Following on to Logan's comments – there is no mention of any M&E associated with the plantings. How will the ACC know if the introductions are successfully meeting performance targets or goals?

To begin with, at the very least there should spawning ground surveys in likely spawning habitat (EDT should be able to provide that info). This will allow the agencies to understand the percentage of fish that were released that made it to the spawning grounds. Another, more expensive option would be PIT tagging the adults that are released and installing remote sensing systems.

I agree with Logan that there could (eventually) be a modification to the number of adults moved to the reservoir. This should be evaluated once the amount of pre-spawning mortality (PSM) is estimated over, say, three years so an average can be used.

If PSM seems excessive (defined by the ACC), then it might make sense to increase monitoring to determine where the mortality is occurring. For example, if they see PSM of 50%, they may want to monitor fishing more, in addition to monitoring habitat variables that could affect PSM (like temperature).

In section 7.4 of the SA (to the left of this comment), there is no mention of M&E, but I don't know if other sections in the SA mention it or not, but not monitoring the fish after release is a waste of money and other resources.

**Commented [LE(3R1)]:** The SA is specific in that no M&E objectives are obligated under the HPP, which is why there are none presented here.



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, 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 untagged coho were reported from both the researchers and anglers which observed live coho and redds 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.**

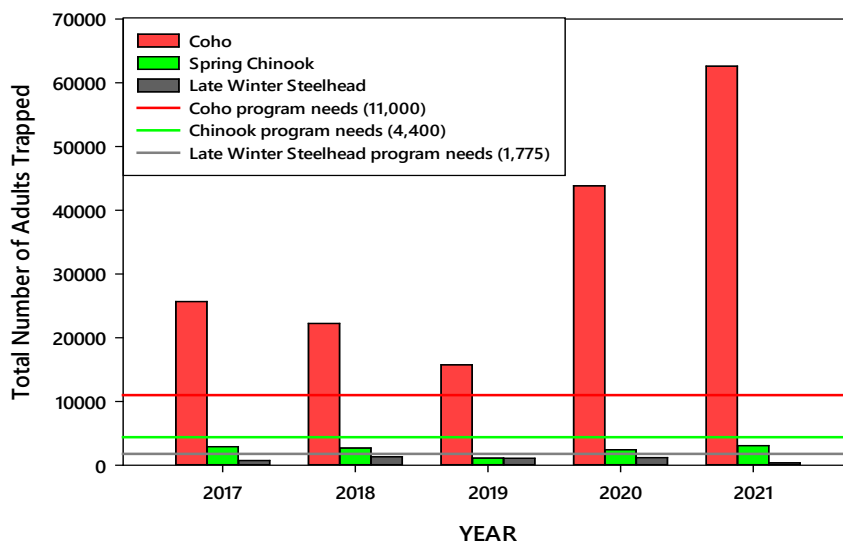
Date	Release Location	Release Number	Number released with tags	Recovery Location	No. of tags recovered
Sep 4 - 21, 1956	Lewis River above Swift Creek	618	156	Muddy	1
				Cougar Creek	2
				Smith Creek	1
				LR upstream of Eagle Cliff	2
Sep 23 -Oct 8, 1956	Cougar Creek	589	108	Cougar Creek	2
Oct 9 - 22, 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		

### 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 prior to initiation of Yale reintroduction efforts.

### IV. Stock Selection

The availability of adults for the Yale Reservoir HPP depends on the extent there are excess hatchery fish available beyond those required for existing supplementation (reintroduction) and hatchery production (broodstock) programs. Based on adult returns over the past 5 years, coho salmon are the only stock that consistently exceeds these needs (Table 1). Therefore, this plan will rely on hatchery-origin trap returns of coho salmon for transportation into Yale Reservoir.



*Note – program needs are based on the number of adults needed to satisfy both hatchery production (broodstock) and supplementation (reintroduction) targets.*

**Figure 1. Total number of adults trapped by species and year compared to the number of adults needed for hatchery broodstock and H&S program needs.**

## V. Transport Number

Based on Ecosystem, Diagnostic and Treatment (EDT) modeling in 2019, Yale tributaries can support a maximum of 1,080 spawning adults. Therefore, the maximum number of adult coho that should be transported into Yale each year is 1,080 adults (including jacks).

The EDT value represents the number of coho adults that use the available habitat for spawning. Therefore, other factors that may limit the number of spawners available, such as predation, poaching and transport survival should be considered when determining the total number of coho released upstream of Yale Dam each year.

### 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 540 females and 540 males should be selected for transportation to Yale Reservoir. The use of jacks (age 2) should be limited to no more than 10 percent of the total males transported upstream.

## VI. Collection Methods and Location

Collection of adult coho will take place at both the Lewis River hatchery ladder and Merwin Fish Collection Facility. In selecting adult fish for transportation, fish should be as bright as possible to help ensure maximum geographic distribution of redds and eventual carcasses. Fish with external signs of trauma (e.g., puncture wounds, lacerations, fungus, etc.) should not be transported upstream when possible.

## VII. Transport Vehicles

PacifiCorp fish trucks will be used primarily to transport adults to Yale Reservoir. Hatchery planting trucks may also be used to assist during peak transport periods. Each 1,500-gallon fish truck can transport up to 120 adult coho. A total of 9 trips are anticipated to meet the transport goal of 1,085 adult coho over the period from September through December.

## VIII. Release Locations

The Yale Park boat ramp will be used as the primary release point to release transported adults. This site is located at approximately the half-way point of the reservoir, which allows fish to distribute either upstream or downstream from the release point. The Saddle Dam boat ramp may also be used as an alternate release site if the Yale boat ramp is unavailable.

## IX. Schedule and Timing

2022 – 2025: September through December

2026 – HPP program ends and is replaced by reintroduction program

### **Commented [LE(4): From Logan Negherbon (NOAA)**

The seeding transport number is based on the EDT modeling for the tributaries. The transport number seems to omit any impact from sportfishing or predation or transport/travel mortality. This may be a fine assumption but it should be stated and described why this is valid (sportfishing management, known lack of predation, experience with truck transport and reservoir transit, etc).

With the objectives in mind to prepare substrate and deliver marine derived nutrients, the proposal to collect, transport and release adults at Yale Boat park may result in some distributions that do not reflect the EDT modeling and some preference toward some subset of tributaries. This may be due to a number of things including the release location in the absence of homing toward natal streams. I suggest that redd and carcass surveys be included to assess where fish are going and, to some degree, at what densities. This will be invaluable in any plan modifications such as changes to the release location or adjustments to the transport numbers.

**Commented [E5]:** Do we have any reason to think that fish coming in at different times may select certain areas to spawn? E.g., earlier coming coho may seek cooler waters to hold, then spawn there? If so, it seems like we may want to collect them to be as representative of the run as possible.

**Commented [CP6R5]:** It's a good question, and WDFW's work in the Wenatchee spring Chinook relative reproductive success study could be insightful in answering if there are behavioral differences of fish depending on when they migrate.

**Commented [LE(7R5):** This is observed between early and late coho in that early coho tend to migrate farther than late coho. This is also seen with other stock such as spring and fall Chinook. However, the objective of this plan is to prepare the gravels and provide nutrients to the system prior to reintroduction and completion of the Yale downstream collector.

**Commented [CP8]:** Not clear to me how brightness relates to distribution. I assume fish are placed in the reservoir will stage there for some number of weeks (months?) before migrating to spawning areas.

**Commented [LE(9R8):** unlike spring Chinook or steelhead that reside in fresh water for long periods prior to spawning, coho degrade and spawn relatively quickly upon entering fresh water. Therefore, to achieve the best possible distribution of fish, we select for the freshest fish possible.

## 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 pathogen screening and therefore no fish will be screened for pathogens prior to release. In the event out of basin transfers are planned, fish will be screened following WDFW protocols.

## XI. Harvest Restrictions

To help ensure the goals of the HPP are met, sportfishing regulations should be reviewed and modified through emergency rule changes (if necessary) to prohibit harvest loss of adults released into Yale Reservoir. Prior to transport activities, signage should be posted at boat ramps providing current regulations and program information. WDFW enforcement may also provide enhanced patrols to reduce the potential for poaching activities.

## XII. Plan Modifications

It is anticipated that the components of the plan may be modified by the ACC from year to year based on the predicted and actual availability of adult returns and completion schedule of the Yale downstream collection facility.

This plan shall be reviewed annually by the Aquatic Technical Subgroup (ATS) and, if necessary, recommended modifications will be presented to the Aquatics Coordination Committee (ACC) after final run projection are estimated by the Washington Department of Fish and Wildlife (WDFW). PacifiCorp, in consultation with the ACC, will update and post this plan to the PacifiCorp website to reflect any ACC approved modifications.

## XIII. 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.

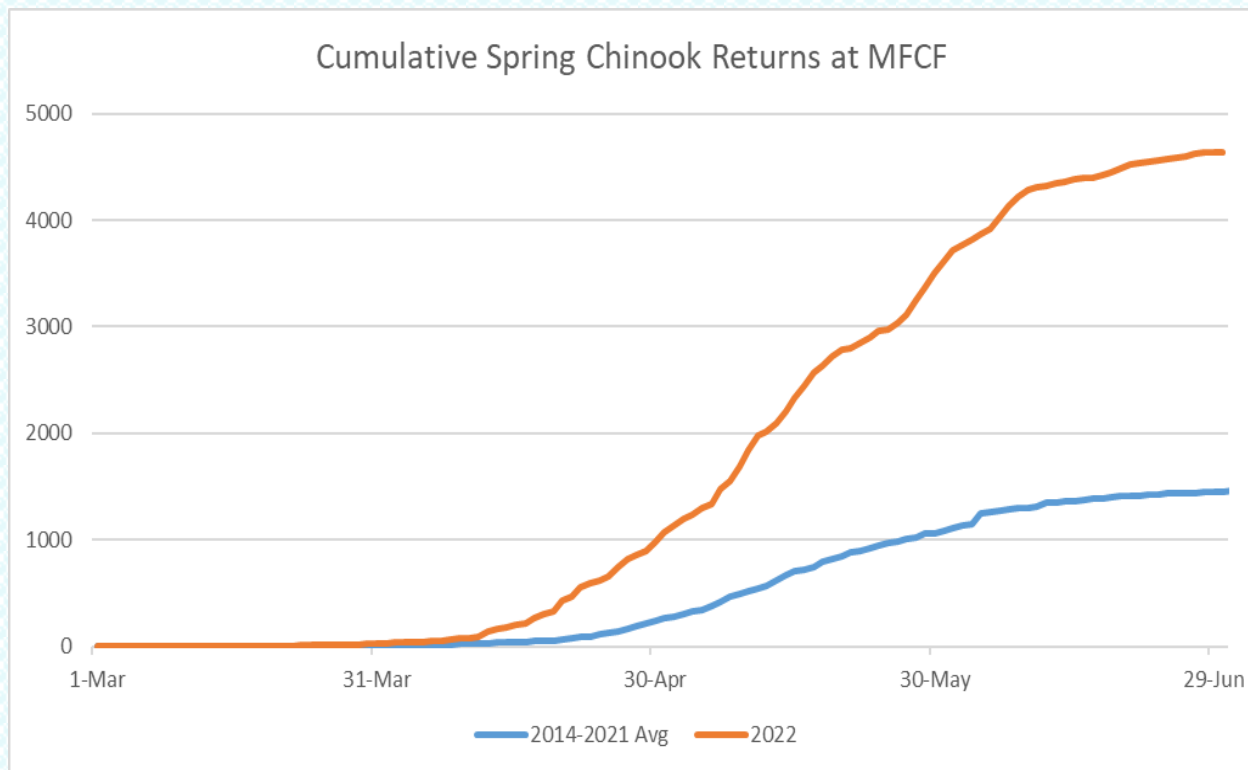
Smith, Richard, T. 1943. Report on the Lewis River Salmon Conservation Program.

# Lewis River Fish Passage Report

## June 2022

### Merwin Fish Collection Facility and General Operations

During the month of June, a total of 1,667 fish were captured at the Merwin Dam Adult Fish Collection Facility (MFCF), which is a decrease from the May total of 2,861. The majority of the fish collected in June were Spring Chinook (n= 923) and summer steelhead (n= 731), followed by a few winter steelhead, (n= 10), cutthroat trout (n= 3), and sockeye (n= 1). The 2022 Spring Chinook run that was considerably higher than the 2014 – 2021 average began slow down by the end of the month (Figure 1). This year marks the first year since the Lewis River Reintroduction Program began (2012) that both brood stock and upstream supplementation needs have been met.



**Figure 1. Cumulative Spring Chinook returns to the Merwin Dam Adult Fish Collection Facility, 2022.**

The MFCF ran continuously for the month of June. Flows below Merwin Dam varied throughout the month, and ranged from approximately 2,800 cfs. to approximately 8,500 cfs. (Figure 2).

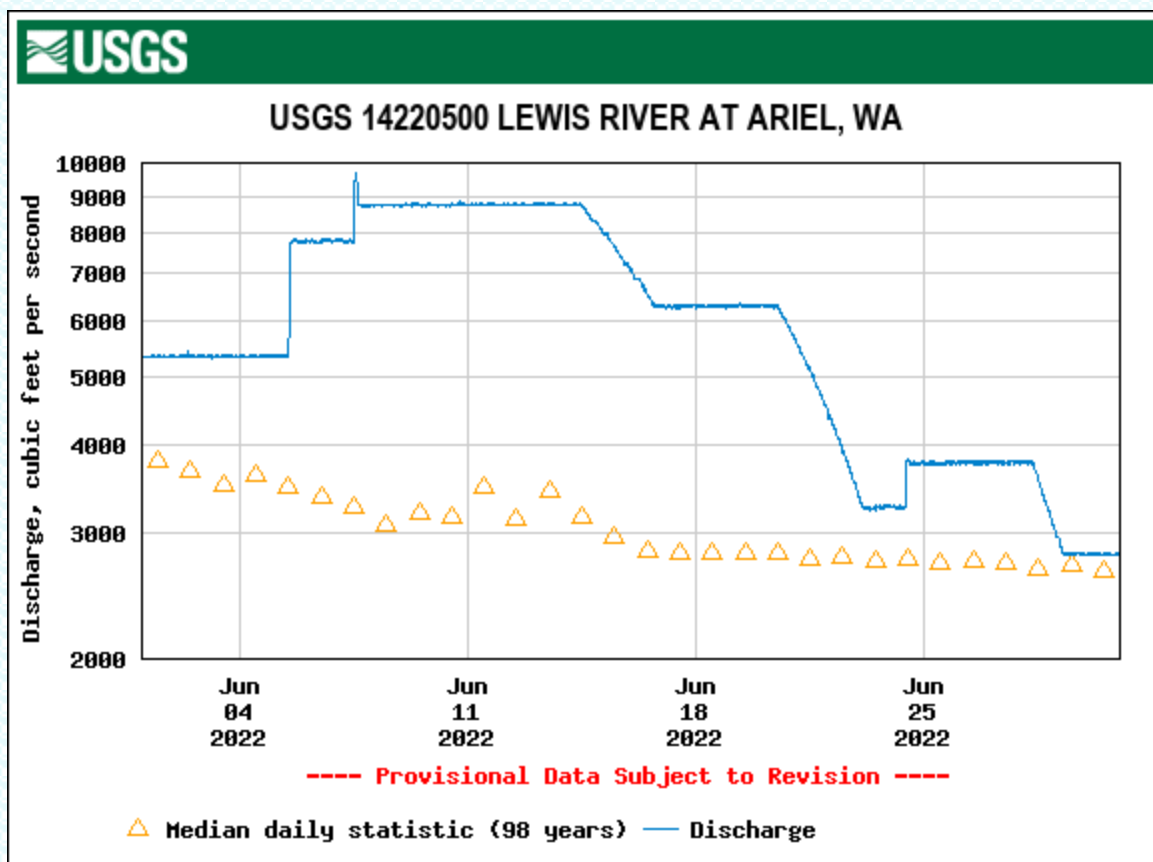


Figure 2. Discharge in cubic feet per second recorded at the USGS Ariel, WA gauge (14220500) located immediately downstream of Merwin Dam.

Three Spring Chinook and one winter steelhead collected at the MFCF in June had been previously PIT tagged. Of the Spring Chinook that were collected in June, two were tagged as juveniles at the Swift FSC in 2019, while the other was tagged as an adult at the Moving Falls Acclimation site on the West Fork of Hood River in early 2022. Since January 1 2022, a total of ten spring Chinook, nine wild winter steelhead, and two cutthroat trout captured at the Merwin Trap had been previously PIT tagged.

### Upstream Transport

A total of 801 adult fish were transported above Swift Dam in June. Spring Chinook made up most of the transported fish ( $n=761$ ) followed by NOR winter steelhead ( $n=5$ ), Blank Wire Tag steelhead ( $n=3$ ), and cutthroat trout ( $n=2$ ). Of the fish transported upstream in June, 771 were collected at the MFCF, while 30 were supplied by Lewis River Hatchery. For calendar year 2022 to-date, 3,229 Spring Chinook (2,746 HOR/ 483 NOR), 577 winter steelhead (449 BWT/ 128 NOR), 15 cutthroat trout, and eight NOR coho have been transported upstream of Swift Dam.

### **Floating Surface Collector (FSC)**

The Swift Reservoir Floating Surface Collector (FSC) was operated continuously throughout the month of June. A total of 16,206 fish were collected this month. Coho were the most numerous species collected in June (n= 14,113), followed by juvenile steelhead (n= 1,009), hatchery rainbow trout (n= 687), cutthroat trout (n= 212), spring Chinook (n= 166), steelhead kelts (n= 16), and Bull Trout (n= 3; Table 1). All Bull Trout were returned to Swift Reservoir.

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

<b>Run Year</b>	<b>June Collection Numbers by Run Year at Swift FSC</b>				
	<b>Coho</b>	<b>Chinook</b>	<b>Steelhead</b>	<b>Cutthroat</b>	<b>TOTAL</b>
<b>2013</b>	5,415	297	52	3	<b>5,767</b>
<b>2014</b>	2,353	419	117	108	<b>2,997</b>
<b>2015</b>	7,192	300	152	68	<b>7,712</b>
<b>2016</b>	10,118	75	131	89	<b>10,413</b>
<b>2017</b>	6,947	44	467	149	<b>7,607</b>
<b>2018</b>	13,844	365	306	184	<b>14,699</b>
<b>2019</b>	30,603	2,064	341	214	<b>33,222</b>
<b>2020</b>	11,125	678	355	53	<b>12,211</b>
<b>2021</b>	19,278	503	390	75	<b>20,246</b>
<b>2022</b>	14,113	166	1,009	212	<b>15,500</b>

Fish Facility Report  
Merwin Adult Trap  
June 2022

Reporting Date	June 2022																																																												Sockeye	Chum	Pink	Cutthroat	Rainbow (< 20 inch)	Bull Trout	Daily Total																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
	Spring Chinook (1)									Early Coho									Late Coho									S. Steelhead						W. Steelhead						Fall Chinook																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	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	M	F	M	F	M	F	M	F	M	F	M	F	JK	M	F	JK	M	F	JK																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
1-Jun	38	34	16	6	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	



**Fish Facility Report**  
**Swift Floating Surface Collector**  
**June 2022**

Day	Coho			Chinook			Steelhead				Cutthroat			Bull Trout	Planted Rainbow	Total
	fry	parr	smolt	fry	parr	smolt	fry	parr	smolt	kelt	fry	<13 in	> 13 in			
1	4		890			0			93			1		0	102	1090
2	1		783			0			62	2		20	4	0	67	939
3			379			2			12	2		2		0	7	404
4	3		868			0			58			13		0	28	970
5	1		497			45			90	1		2		0	7	643
6			488			10			125			22		0	79	724
7	4		1526			1		1	163			22	4	1	55	1777
8	3	1	387	1		0			34			26		0	53	505
9	2		505			0			43			10	1	0	14	575
10			475		1	0			23			30	1	0	6	536
11			429			1			45	2		4		0	37	518
12			360			0			47	1		15		0	31	454
13			387			0			59			3		0	61	510
14	2		241		1	0			22			1		0	34	301
15			231	10		0			14	1		3		0	22	281
16			182	2		21			40	1				0	14	260
17			160			1			10	2		10		1	5	189
18			477		1	0			26	1		1	1	0	17	524
19			267			0			15			1		0	11	294
20			415			2			7	1				1	13	439
21			326			8			3			6		0	0	343
22			223			1			5			7		0	6	242
23			546			4			4	2		1		0	3	560
24			806			2			4					0	0	812
25			200		3	2			0			1		0	1	207
26			369		5	0			0					0	0	374
27			348			0			0					0	2	350
28			452			4			4					0	0	460
29			383			27			0					0	5	415
30			492			11			0					0	7	510
<b>Monthly</b>	20	1	14092	13	11	142	0	1	1008	16	0	201	11	3	687	16206
<b>Total</b>	634	14148	43215	53	174	1686	5	22	5404	26	2	721	115	15	4318	70538