

Lewis River Hydroelectric Projects

FERC Project Nos. 935, 2071, 2111, 2213



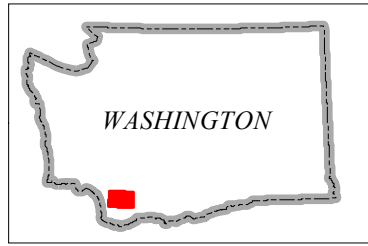
2022 Annual Report

*Annual Summary of License Implementation and Compliance:
Aquatic and Terrestrial Resources*



June 2023

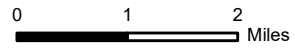
Lewis River Hydroelectric Project



- Legend**
- ★ City
 - Highway
 - Primary Road
 - Stream
 - County
 - Recreation Area
 - Water Body
 - PacifiCorp Land
 - WA DNR Property
 - National Forest

Data is projected in UTM Zone 10, NAD83, meters.

PacifiCorp GIS collects data from a variety of government and private sources. PacifiCorp makes no warranty as to the accuracy, reliability, or completeness of this data for individual or aggregate use with other data. For complete validation, the source organization should be contacted or source documents consulted to verify the findings of this product.



01/13/2021 U:\Corporate_Maps\Hydro\Lewis\Lewis_Project_Overview.mxd gisdept@pacifiCorp.com

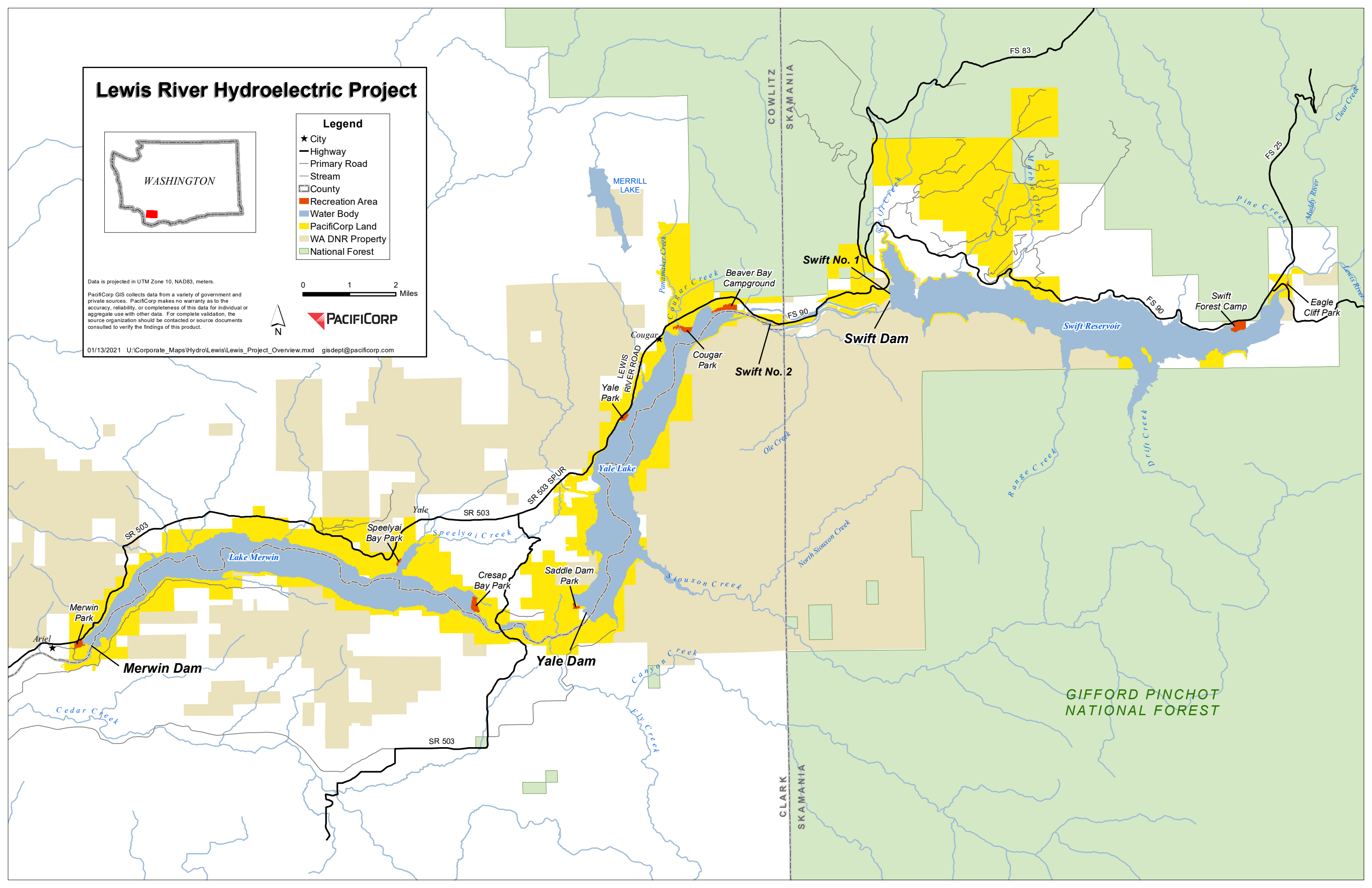


Table of Contents

1.0 INTRODUCTION.....	1
1.1 Background.....	1
1.1.1 Lewis River Settlement Agreement.....	1
1.1.2 Environmental Impact Statement	2
1.1.3 Agency Terms and Conditions	2
1.1.4 Endangered Species Act Consultations.....	2
1.1.5 Water Quality Certifications	2
1.1.6 New FERC Licenses.....	3
1.1.7 2022 Annual Report and Consultation.....	4
1.2 Annual Report Organization.....	4
2.0 AQUATIC AND TERRESTRIAL COORDINATION COMMITTEES	6
2.1 ACC and TCC Membership.....	7
3.0 AQUATIC RESOURCES.....	10
3.1 ACC Meetings	10
3.1.1 ACC Meetings and Conference Calls	10
3.1.2 ACC Meeting Notes	10
3.1.3 ACC Decision Documents.....	10
3.2 Aquatic Measures Implemented as of the End of 2022.....	10
3.2.1 SA Section 4.1 Common Provisions Regarding Fish Collection and Transport Facilities	11
3.2.2 SA Section 4.2 Original Merwin Trap	12
3.2.3 SA Section 4.3 Merwin Upstream Collection and Transport Facility	12
3.2.4 SA Section 4.4 Downstream Transport at Swift No. 1 Dam	15
3.2.5 SA Section 4.5 Downstream Passage at Yale Dam	16
3.2.6 SA Section 4.6 Downstream Passage at Merwin Dam.....	16
3.2.7 SA Section 4.7 Upstream Passage at Yale Dam	16
3.2.8 SA Section 4.8 Upstream Passage at Swift Projects	16
3.2.9 SA Section 4.9.1 Interim Bull Trout Collection and Transport Programs	17
3.2.10 SA Section 4.10 Bull Trout Passage in the Absence of Anadromous Fish Facilities	17
3.2.11 SA Section 5.1 Yale Spillway Modifications	17
3.2.12 SA Section 5.2 Bull Trout Habitat Enhancement Measures	18
3.2.13 SA Section 5.3 Reserved	18
3.2.14 SA Section 5.4 Reserved	18
3.2.15 SA Section 5.5 Bull Trout Limiting Factors Analysis.....	18
3.2.16 SA Section 5.6 Public Information Program to Protect Listed Anadromous Species.....	18
3.2.17 SA Section 5.7 Public Information Program to Protect Bull Trout.....	18
3.2.18 SA Section 6.1 Flow Releases in the Bypass Reach: Upper Release and Constructed Channel.....	19
3.2.19 SA Section 6.2 Flow Fluctuations, Ramp Rates below Merwin Dam and Plateau Operations at Merwin Dam	21
3.2.20 SA Section 7.1 Large Woody Debris Program.....	22
3.2.21 SA Section 7.2 Spawning Gravel Study and Gravel Monitoring and Augmentation Plan	22
3.2.22 SA Section 7.3 Predator Study	23
3.2.23 SA Section 7.4 Habitat Preparation Plan.....	23
3.2.24 SA Section 7.5 Aquatics Fund.....	23
3.2.25 SA Section 7.6 In Lieu Fund.....	24
3.2.26 SA Section 7.7 Management of Aquatics Fund and In Lieu Fund	27

3.2.27	SA Section 7.8 Execution of Projects and Mitigation Measures	28
3.2.28	SA Section 8.1 Hatchery and Supplementation Program	28
3.2.29	SA Section 8.2 Hatchery and Supplementation Plan and Report.....	28
3.2.30	SA Section 8.3 Anadromous Fish Hatchery Adult Ocean Recruit Target by Species.....	28
3.2.31	SA Section 8.4 Anadromous Fish Hatchery Juvenile Production.....	29
3.2.32	SA Section 8.5 Supplementation Program	29
3.2.33	SA Section 8.6 Resident Fish Production	30
3.2.34	SA Section 8.7 Hatchery and Supplementation Facilities, Upgrades, and Maintenance	30
3.2.35	SA Section 8.8 Juvenile Acclimation Sites.....	30
3.2.36	SA Section 9.1 Monitoring and Evaluation Plan	30
3.2.37	SA Section 9.2 Monitoring and Evaluation Related to Fish Passage.....	31
3.2.38	SA Section 9.3 Wild Fall Chinook and Chum	31
3.2.39	SA Section 9.4 Water Quality Monitoring.....	31
3.2.40	SA Section 9.5 Monitoring of Hatchery and Supplementation Program.....	31
3.2.41	SA Section 9.6 Bull Trout Monitoring	31
3.2.42	SA Section 9.7 Resident Fish Assessment.....	31
3.2.43	SA Section 9.8 Monitoring of Flows	32
3.3	Aquatic 2022 Annual Plan.....	32
3.3.1	SA Section 4.2 Merwin Trap	32
3.3.2	SA Section 4.3 Merwin Upstream Collection and Transport Facility	32
3.3.3	SA Section 4.4 Downstream Transport at Swift No. 1 Dam	32
3.3.4	SA Section 4.9 Interim Bull Trout Collection and Transport	33
3.3.5	SA Section 5.2 Bull Trout Habitat Enhancement Measures	33
3.3.6	SA Section 5.7 Public Information Program to Protect Bull Trout.....	33
3.3.7	SA Section 6.1 Flow Releases in the Bypass Reach; Constructed Channel	33
3.3.8	SA Section 6.2 Flow Fluctuations below Merwin Dam	33
3.3.9	SA Section 7.1 Large Woody Debris Project.....	33
3.3.10	SA Section 7.2 Spawning Gravel Study and Gravel Monitoring and Augmentation Plan	33
3.3.11	SA Section 7.4 Habitat Preparation Plan.....	33
3.3.12	SA Section 7.5 Aquatics Fund.....	34
3.3.13	SA Section 8.2 Hatchery and Supplementation Plan.....	34
3.3.14	SA Section 8.3 Anadromous Fish Hatchery Adult Ocean Recruit Target by Species.....	34
3.3.15	SA Section 8.4 Anadromous Fish Hatchery Juvenile Production.....	34
3.3.16	SA Section 8.6 Resident Fish Production	34
3.3.17	SA Section 8.7 Hatchery and Supplementation Facilities, Upgrades, and Maintenance	34
3.3.18	SA Section 8.8 Juvenile Acclimation Sites.....	34
3.3.19	SA Section 9.6 Bull Trout Monitoring	35
3.3.20	Monitoring and Evaluation Post-Season Incidental Take	35
4.0	WATER QUALITY.....	40
4.1	PacifiCorp Water Quality Measures Implemented in 2022	40
4.1.1	PacifiCorp Application for 401 Water Quality Certificate for Yale, Swift No. 1 and Merwin Hydroelectric Projects	40
4.1.2	SA Section 9.4 Water Quality Monitoring.....	40
4.2	PacifiCorp Water Quality 2023 Annual Plan	48
4.2.1	Water Quality Management Plan	48
4.2.2	Flow Monitoring.....	49
4.2.3	Bypass Reach Gravel Replacement.....	49

4.2.4	Lake Merwin Canyon Water Quality Attainment Plan	49
4.2.5	Swift and Merwin Spill TDG Attainment Plan	49
4.2.6	Lewis River Project Temperature Model	50
4.2.7	Yale-Swift Turbine TDG Corrective Action Plan	50
4.3	Cowlitz PUD Water Quality Measures Implemented as of the End of 2022.....	50
4.3.1	Swift No. 2 Project Water Temperature Monitoring	50
4.3.2	Swift No. 2 Project Tailrace Water Quality Monitoring.....	51
4.3.3	Swift No. 2 Tailrace Total Dissolved Gas (TDG) Monitoring (401) Certification Section 4.8.3	52
4.3.4	Swift No. 2 Surge Arresting Structure Total Dissolved Gas (TDG) Monitoring (401) Certification Section 4.3.5 as amended.....	52
4.3.5	SA Section 9.4 Water Quality Monitoring.....	53
4.4	Cowlitz PUD Water Quality 2023 Annual Plan	53
4.4.1	Water Quality Management Plan	53
5.0	TERRESTRIAL RESOURCES.....	54
5.1	TCC Meetings	54
5.1.1	Meetings and Conference Calls: Overview	54
5.1.2	Meeting Notes.....	55
5.2	PacifiCorp Terrestrial Measures Implemented as of the End of 2022	55
5.2.1	SA Section 10.1 Yale Land Acquisition and Habitat Protection Fund	55
5.2.2	SA Section 10.2 Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund	56
5.2.3	SA Section 10.3 Lewis River Land Acquisition and Habitat Protection Fund.....	56
5.2.4	SA Section 10.4 Transaction Costs	56
5.2.5	SA Section 10.5 Management of Funds	56
5.2.6	SA Section 10.6 Completed Implementation Advanced Purchases.....	57
5.2.7	SA Section 10.7 Conservation Easements	57
5.2.8	SA Section 10.8 Wildlife Habitat Management Plan	57
5.3	PacifiCorp Terrestrial 2023 Annual Plan	57
5.3.1	SA Section 10.2 Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund	57
5.3.2	SA Section 10.3 Lewis River Land Acquisition and Habitat Protection Fund.....	58
5.3.3	SA Section 10.4 Transaction Costs	58
5.3.4	SA Section 10.5 Management of Funds	58
5.3.5	SA Section 10.6 Completed Implementation Advanced Purchases.....	58
5.3.6	SA Section 10.7 Conservation Easements	58
5.3.7	SA Section 10.8 Wildlife Habitat Management Plans.....	58
5.3.8	SA Section 10.8.5.5 Mitigation for Impacts on Wildlife Habitat	58
5.4	Cowlitz PUD Terrestrial Measures Implemented in 2022.....	59
5.4.1	SA Section 10.6 Completed Implementation: Advance Purchases [Devil's Backbone Conservation Covenant].....	59
5.4.2	SA Section 10.8.1 Development of the Wildlife Habitat Management Plan (WHMP)	59
5.4.3	SA Section 10.8.2 WHMP Fund	59
5.4.4	SA Section 10.8.3 Management of the Plan [Implementation of the Annual Plan]	60
5.4.5	SA Section 10.8.4 Habitat Evaluation Procedures	70
5.4.6	SA Section 10.8.4.2 Review of Effectiveness of WHMP	70
5.4.7	SA Section 10.8.3 Cowlitz PUD 2022 Annual Plan	70

5.5	Cowlitz PUD Terrestrial 2022 Annual Plan	70
5.5.1	SA Section 10.6 Cowlitz PUD Completed Implementation: Advance Purchases [Devil’s Backbone Conservation Covenant]	70
5.5.2	SA Section 10.8.1 Cowlitz PUD Development of the Wildlife Habitat Management Plan (WHMP).....	70
5.5.3	SA Section 10.8.2 Cowlitz PUD WHMP Fund.....	70
5.5.4	SA Section 10.8.3 Management of the Plan [Annual Plan].....	70
6.0	LAW ENFORCEMENT.....	71
6.1	SA Section 13.2.1 Law Enforcement	71
7.0	FUNDING	72
8.0	LITERATURE CITED	75

Figures

Figure 1.	A large, natural-origin fall Chinook that was collected at the Merwin Trap in September 2022.	13
Figure 2.	Signs posted for public information.....	19
Figure 3.	Swift Upper Release Daily Average Flows (cfs) from January 1, 2022 to December 27, 2022.	20
Figure 4.	Swift Canal Drain Daily Average Flows (cfs) from January 1, 2022 to December 31, 2022.	21
Figure 5.	USGS Ariel Hourly Average Flows (cfs) for January 1, 2021 to December 31, 2022.	22
Figure 6.	Locations of water quality monitoring sites for Yale and Merwin Reservoirs.	42
Figure 7.	Locations of water quality monitoring sites for Swift Reservoir and Swift Bypass Reach.....	43
Figure 8.	Devil’s Backbone Management Unit Weed Survey and Treatment Areas	61
Figure 9.	Project Works Management Unit Weed Survey and Treatment Areas	62
Figure 10.	Devil’s Backbone Elk Forage Plot	66
Figure 11.	Devil’s Backbone Elk Forage Plot looking North, June 2022.....	67
Figure 12.	Devil’s Backbone Elk Forage Plot looking Southwest, June 2022.....	68
Figure 13.	Blowdown at the southeast end of the 7902 Road.	69

Tables

Table 1.	Representatives and Alternates for Membership on the ACC	8
Table 2.	Representatives and Alternates for Membership on the TCC	9
Table 3.	2022 Merwin Trap Capture Data.....	14
Table 4.	Summary of adult salmonids transport upstream of Swift Dam in 2022.....	15
Table 5.	Natural return thresholds to Merwin Dam required to trigger completion of Ocean Recruits Analysis.....	29
Table 6.	Aquatic Species Incidental Take form used for reporting in 2022.....	36
Table 7.	Water quality parameters to be monitored and the schedule of that monitoring according to the July 2013 WQMP.	41
Table 8.	Summary of 2022 spill data at each Project.	43
Table 9.	Total number of qualifying periods when the Swift No. 1 and Swift No. 2 projects were off-line for more than 48 consecutive hours during the 2007, 2008, 2009, 2010, 2011, and 2012 monitoring periods.	51
Table 10.	Cowlitz PUD WHMP Year 14 2022 Budget.....	59

Table 11. Cowlitz PUD WHMP Year 14 2022 Carry Forward.	59
Table 12. Cowlitz PUD WHMP Tracking Account.	60
Table 13. Non-native invasive plants classified as noxious weeds in Cowlitz or Skamania County that have been observed in the Swift No. 2 WMA as of 2022.....	63
Table 14. Survey areas, target species, distribution, and estimated cover in the Devil’s Backbone MU (2022).....	63
Table 15. Survey areas, target species, distribution, and estimated cover in the Project Works MU (2022).....	64
Table 16. WDFW fishing related citations/tickets – CY2022.....	71
Table 17. WDFW non-fishing related citations/tickets – CY2022	71
Table 18. WDFW total incidents by type – CY2022	71
Table 19. Lewis River Settlement Agreement 10.3.3 Contribution of Additional Matching Funds Total	74

Attachments

- Attachment A Section 14 of the Lewis River Settlement Agreement
- Attachment B Hatchery and Supplementation Program 2022 Annual Report
- Attachment C Aquatics Monitoring and Evaluation Program 2022 Annual Report
- Attachment D Yale Water Quality Graphs
- Attachment E Swift No. 1 Water Quality Graphs
- Attachment F Merwin Water Quality Graphs
- Attachment G Wildlife Habitat Management Plan 2023 Annual Plan
- Attachment H Wildlife Habitat Management Plan Annual Progress Report for Operation Phase 2022
- Attachment I Comment Matrix

1.0 INTRODUCTION

This 2022 annual report, prepared by PacifiCorp and the Public Utility District No. 1 of Cowlitz County, Washington (Cowlitz PUD), is provided to the Federal Energy Regulatory Commission (FERC) and the Lewis River Settlement Agreement (SA) Parties to fulfill the reporting requirements of project licenses, Articles 402 and 404, and Article 14.2.6 of the SA. It has been prepared in consultation with Terrestrial Coordination Committee (TCC) and Aquatic Coordination Committee (ACC) members. The period of record for this report is from January 1, 2022 through December 31, 2022.

To reflect the settlement Parties' interest in continuing coordination and communication of the implementation of SA and new FERC licenses, Article 14.2.6 of the SA requires PacifiCorp and Cowlitz PUD to prepare annual reports describing the activities of the TCC and the ACC. This SA Article stipulates that the Committee Coordinators for the TCC and ACC shall prepare and file with FERC detailed annual reports on the fish and wildlife Protection, Mitigation, and Enhancement (PM&E) measures occurring during the prior year as well as plans for the coming year. This annual report fulfills the requirements of Article 14.2.6.

This annual report is available on PacifiCorp's website at:

<https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>

1.1 Background

Located on the North Fork of the Lewis River in southwestern Washington, the Lewis River Hydroelectric System consists of four operationally coordinated projects. PacifiCorp owns Swift No. 1 (FERC No. 2111), Yale (FERC No. 2071), and Merwin (FERC No. 935) projects which together generate 536 MW of electricity at full capacity. Cowlitz PUD owns the 77 MW Swift No. 2 Project (FERC No. 2213) which lies between Swift No. 1 and Yale. Currently, PacifiCorp operates Swift No. 2 for Cowlitz PUD under contract.

The Lewis Hydroelectric System was developed over a period of approximately 30 years. The first development, the Merwin project, was completed in 1931. The Yale project was completed next in 1953. The Swift No. 1 and Swift No. 2 projects were both completed in 1958.

1.1.1 *Lewis River Settlement Agreement*

In response to the FERC relicensing of the hydroelectric projects, interested parties collaborated on establishing a settlement agreement concerning future operations and responsive protection, enhancement and mitigation measures. On November 30, 2004, (Effective Date) 26 Parties (including two Licensees, five federal agencies, two state agencies, eight local/county agencies, two tribes, two citizens-at-large, and five non-governmental organizations) signed the Lewis River Settlement Agreement (PacifiCorp and Cowlitz PUD 2004). In December 2004, the Licensees filed with the FERC the SA along with a Joint Explanatory Statement and Supplemental Preliminary Draft Environmental Assessment (PacifiCorp and Cowlitz PUD 2004). The SA reflects the interests of all Parties; provides significant investments in fish and aquatic resources, wildlife and recreation; includes monitoring and evaluation and adaptive management; and includes ongoing coordination with the Parties through the Aquatics and Terrestrial Coordination Committees. The SA included

support for 50-year licenses to allow the projects to continue to provide benefits to the Utilities customers. The Lewis River system allows PacifiCorp to maximize the value of its generation assets and power purchases to provide customer benefits. Cowlitz PUD uses its Swift No. 2 power in a similar fashion to provide benefits to its customers.

1.1.2 Environmental Impact Statement

In September 2005, the FERC released the Draft Environmental Impact Statement for the Lewis River Hydroelectric Projects (DEIS) (FERC 2005) for public comment. The DEIS was generally consistent with the SA in that it included most of the SA terms. In November 2005, the Parties filed comments on the DEIS. The FERC released the Final Environmental Impact Statement for the Lewis River Hydroelectric Projects March 24, 2006.

1.1.3 Agency Terms and Conditions

The USFS submitted modified Terms and Conditions in November 2005 (USDA FS 2005). The US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) filed fishway prescriptions February 22, 2006 and February 14, 2006, respectively.

1.1.4 Endangered Species Act Consultations

In January 2005, Cowlitz PUD and PacifiCorp filed with the FERC Biological Evaluations (BEs) covering federally listed fish and wildlife in the Lewis River basin (PacifiCorp and Cowlitz PUD 2005a, PacifiCorp and Cowlitz PUD 2005b). The FERC modified the BEs, included them in the Final EIS and submitted the documents to the Services. The Proposed Action in the BEs is the SA. On September 15, 2006, the USFWS issued a Biological Opinion covering bull trout, northern spotted owls and bald eagles. The National Marine Fisheries Service issued its Biological Opinion covering their respective listed species August 27, 2007.

1.1.5 Water Quality Certifications

Both Licensees applied to the Washington State Department of Ecology (Ecology) for Clean Water Act Section 401 Water Quality Certifications for their respective projects in February 2005. At Ecology's request, both Licensees withdrew and resubmitted those applications in December 2005. Ecology issued a Draft Certification Order for each of the Lewis River projects February 10, 2006. Section 401 Water Quality Certifications were issued to the Licensees and filed with the FERC October 9, 2006.

Subsequently, Ecology issued an Order Amendment for the Swift No. 2 project November 3, 2006 followed by a second Order Amendment (No. 4998) December 21, 2007, addressing Conditions 4.6.3.e, 4.6.4.a, and 4.6.5.a. in Administrative Order 3676. Order Amendment No. 3 (No. 5531), issued by DOE January 17, 2008 replaces Condition 3 of Amended Order 4998 (Condition 4.6.5.a of Order 3676). On November 7, 2011, Ecology issued Order Amendment 8832 which replaced conditions of Order No. 3676 relating to water quality standards as provided by RCW 90.48 and WAC 173-210A.

PacifiCorp filed with the FERC an Objection to Inconsistent 401 Certificates Pursuant to Section 15.2 of the Lewis River Settlement Agreement November 16, 2006 and conducted two Alternative Dispute Resolution meetings with SA parties December 11, 2006 and December 15, 2006. Parties reached a resolution at the December 15, 2006 meeting.

On December 21, 2007, the Washington Department of Ecology (Ecology) issued Amended Orders 5000, 4999 and 5001 for the Merwin (Order No. 3678), Yale (Order No. 3677) and Swift No. 1 (Order No. 3679) Certifications, respectively. These amendments replaced conditions 4.6.3e, 4.6.4a and 4.6.5a of the Merwin, Yale and Swift No. 1 Certifications, as well as condition 4.6.4e of the Swift No. 1 Certification.

On January 17, 2008, Ecology issued Amended Orders 5329, 5328 and 5330 which replaces condition 4.6.5a as provided in Amended Order 5000 for the Merwin Certification, Amended Order 5328 replacing condition 4.6.5a as provided in Amended Order 4999 for the Yale Certification and Amended Order 5330 replacing condition 4.6.5a as provided in Amended Order 5001 for the Swift No. 1 Certification.

On October 3, 2008, Ecology issued Amended Orders 5743, 5972 and 5974 which replaces condition 4.2(1) and portions of 4.8(3) Table 2 as provided for in Amended order 5329 for the Merwin Certification, Amended Order 5972 replaces portions of 4.8(3) Table 2 as provided in Amended Order 5328 for the Yale Certification and Amended Order 5974 replaces portions of 4.8(3) Table 2 as provided in Amended Order 5330 for the Swift No. 1 Certification.

On June 22, 2009, Ecology issued Amended Order 6811 which modified the mixing zone for turbidity as it relates to construction of the Upper Release and Constructed Channel implementation.

On February 1, 2010, Ecology issued Amended Order 7325 which modifies Order 3679. Specifically, this amendment extends the expiration dated listed in section D. Duration of Order of amendment 6811 from December 31, 2009, to March 31, 2010.

On November 7, 2011, Ecology issued Amended Orders 8833, 8834 and 8831 which replaced conditions of Administrative Orders 3677, 3678, and 3679, respectively, to comply with new water quality standard language modified by Washington Administrative Code (WAC 173-201A-600(1)(a)(ii)).

On November 5, 2021, Ecology reviewed and responded to an October 7, 2021 compliance schedule request from PacifiCorp. The request included a Compliance Schedule Workplan for the Merwin Hydroelectric Project. Ecology determined that the dam compliance schedule and workplan as written meets the intention of the Section 401 Water Quality Certification Amendment Order No. 8833 condition 4.1.19 (November 7, 2011) and the state rules regarding compliance schedules for dams. As such, Ecology approved the dam compliance schedule. The period of new compliance schedule is not to exceed ten years' time (November 5, 2031).

The Water Quality Certifications and associated amendments for the Swift No. 1, Swift No. 2, Yale and Merwin projects are available for viewing on PacifiCorp's website at <https://www.pacificorp.com/energy/hydro/lewis-river/relicensing-documents.html> (Lewis River relicensing documents).

1.1.6 New FERC Licenses

On June 26, 2008, the FERC provided the Utilities with new operating licenses for the Lewis River hydroelectric projects (Merwin Project No. 935, Yale Project No. 2071, Swift No. 1 Project No. 2111, and Swift No. 2 Project No. 2213). The license periods are each 50 years

starting June 1, 2008. Each license includes the respective conditions of the services biological opinions and respective conditions of the Washington Department of Ecology 401 certificates. In general, the licenses include terms of the Lewis River Settlement Agreement with few exceptions. Parties to the SA continue to abide by the SA terms including those terms outside the FERC requirements. As such this report may contain information not required by the FERC licenses.

1.1.7 2022 Annual Report and Consultation

PacifiCorp and Cowlitz PUD prepared this 2022 Lewis River Hydroelectric Projects Annual Report (Annual Report) in consultation with the ACC and TCC. A draft report was provided to the ACC and TCC May 10, 2023. Comments were received from Washington Department of Fish and Wildlife and Washington State Department of Ecology. These comments along with responses are provided in a comment matrix (**Attachment I**).

This report was provided to the FERC and the Settlement Agreement Parties on June 30, 2023 to fulfill the requirements of Section 14.2.6 of the Settlement Agreement.

The period for the 2022 Annual Report is January 1, 2022 through December 31, 2022.

The following Plans and Reports were completed in 2022:

- Aquatics Fund Projects Annual Report – April 2022
- Wildlife Habitat Management Plan (WHMP Annual Plan for Operation Phase 2023)
- WHMP Annual Progress Report Operations Phase 2022
- Aquatic Coordination Committee/Terrestrial Coordination Committee 2021 Annual Report
- Lewis River Hatchery & Supplementation Program Annual Operations Report 2022
- Lewis River Hatchery & Supplementation Program Annual Operations Plan 2022 (working draft)
- Lewis River Monitoring and Evaluation Program 2022 Annual Report
 - Lewis River 2022 Fish Passage Program Annual Report
 - Lewis River Bull Trout 2022 Annual Operations Report
 - Lewis River Bull Trout 2022 Annual Operations Plan
 - Yale Reservoir Kokanee 2022 Escapement Report

The water quality monitoring (Section 4) and terrestrial resources (Section 5) sections of this Annual Report have been prepared in cooperation with the Cowlitz PUD.

1.2 Annual Report Organization

The 2022 Lewis River Annual Report provides the following information as required under Section 14.2.6 of the SA and the 401 Water Quality Certifications:

Section 2.0 Aquatics and Terrestrial Coordination Committees (ACC, TCC)

Section 2.1 ACC and TCC Membership

Section 3.0 Aquatic Resources

- Section 3.1 ACC Meetings
- Section 3.2 Aquatic Measures Implemented in 2022
- Section 3.3 Aquatics 2023 Annual Plans

Section 4.0 Water Quality

- Section 4.1 PacifiCorp Water Quality Measures Implemented in 2022
- Section 4.2 PacifiCorp Water Quality 2023 Annual Plan
- Section 4.3 Cowlitz PUD Water Quality Measures Implemented in 2022
- Section 4.4 Cowlitz PUD Water Quality 2023 Annual Plan

Section 5.0 Terrestrial Resources

- Section 5.1 TCC Meetings
- Section 5.2 PacifiCorp Terrestrial Measures Implemented in 2022
- Section 5.3 PacifiCorp Terrestrial 2023 Annual Plan
- Section 5.4 Cowlitz PUD Terrestrial Measures Implemented in 2022
- Section 5.5 Cowlitz PUD Terrestrial 2023 Annual Plan

Section 6.0 Law Enforcement

- Section 6.1 Motorized Vehicle Issues, Vandalism and Malicious Mischief,
Security and Public Safety Support

Section 7.0 Funding Tables

Section 8.0 Literature Cited

2.0 AQUATIC AND TERRESTRIAL COORDINATION COMMITTEES

Section 14 of the Lewis River Settlement Agreement includes several measures that define the Parties' roles and obligations. The full text of Section 14 of the Settlement Agreement is provided in **Attachment A**. The structure and process of the ACC and TCC is intended to provide a forum to address time-sensitive matters, early warning of problems, and coordination of member organization actions, schedule, and decisions to save time and expense. The ACC and TCC make decisions based on consensus, while implementing the Settlement Agreement.

More specifically, Section 14:

- Establishes the Aquatic Coordination Committee (ACC) and Terrestrial Coordination Committee (TCC).
- Establishes the Licensees' ACC and TCC Coordinators (Coordinators).
- Describes the coordination and decision-making roles of the ACC and TCC.
- Requires the ACC and TCC to coordinate and Consult on development of plans by the Licensees.
- Requires the ACC and TCC to review information and oversee, guide, and make comments and recommendations on implementation and monitoring of the terrestrial and aquatic Protection, Mitigation and Enhancement (PM&E) Measures, including plans.
- Requires the ACC and TCC to establish, among other things:
 - i. Procedures and protocols for conducting committee meetings and deliberations to ensure efficient participation and decision making;
 - ii. Rules for quorum and decision making in the absence of any member;
 - iii. Alternative meeting formats as desired, including phone or teleconference; and
 - iv. The methods and procedures for updating committee members on interim progress of development and implementation of the terrestrial and aquatic PM&E Measures.
- Requires the ACC and TCC to establish subcommittees to carry out specified committee functions and responsibilities and establish the size of, membership of, and procedures for, any such subcommittees.
- Requires the Licensees' Coordinators to prepare and file with the FERC detailed annual reports on the TCC and ACC activities; monitoring and evaluations under the Monitoring and Evaluation Plan (M&E Plan) described in SA Section 9; implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year; and plans for the coming year, and water quality monitoring information.
- Requires the Licensees to consult with the ACC and TCC when preparing the Annual Report.

2.1 ACC and TCC Membership

In December 2004, the Licensees appointed their respective ACC and TCC Coordinators. At the same time, the Licensees established the ACC and TCC, and invited the Parties to designate representatives (and alternates) for membership on these committees. Current Party representation for each committee is shown in Table 1 and Table 2. Fourteen Parties have designated representatives to the ACC and twelve Parties designated representatives to the TCC.

Committee meetings were conducted in every month in 2022. During the year, the ACC met 12 times and the TCC met 10 times.

The purposes of the Coordination Committee meetings were to:

- Develop study and monitoring plans.
- Discuss implementation strategies for PM&E measures.
- Oversee implementation of the PM&E measures.

Sections 3.1, 3.2, and 5.1 of this report summarize major items discussed at the ACC and TCC meetings during the reporting period. Detailed meeting summaries are provided on the PacifiCorp website at: <https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>

Table 1. Representatives and Alternates for Membership on the ACC

ACC Representatives	Organization	Alternate
Bridget Moran	American Rivers	None designated
Public Works Director	City of Woodland	None designated
None designated	Clark County	None designated
None designated	Cowlitz County	None designated
Christina Donehower	Cowlitz Indian Tribe	Dalton Fry
None designated	Cowlitz-Skamania Fire District No. 7	None designated
Alex Maslov	Fish First	Janae Brock
None designated	Lewis River Citizens at-large	None designated
Mariah Stoll-Smith Reese	Lewis River Community Council	None designated
Steve Manlow	Lower Columbia River Fish Recovery Board	Steve West
Melissa Jundt	National Marine Fisheries Service (NOAA)	Bonnie Shorin
None designated	National Park Service	None designated
None designated	North County Emergency Medical	None designated
Erik Lesko	PacifiCorp (PacifiCorp Co-Chair)	Chris Karchesky
Amanda Farrar	PUD of Cowlitz County (PUD Co-Chair)	None designated
None designated	Rocky Mountain Elk Foundation	None designated
None designated	Skamania County	None designated
None designated	The Native Fish Society	None designated
Jim Byrne	Trout Unlimited	Jonathan Stumpf
None designated	US Bureau of Land Management	None designated
Jeffery Garnett	US Fish & Wildlife	None designated
Tyanna Blaschak	USDA Forest Service	Joshua (JD) Jones Kyle Wright
Bryce Glaser	Washington Dept. of Fish & Wildlife	Josua Holowatz, Peggy Miller, Aaron Roberts
Adam Cole	Washington State Recreation and Conservation Office, formerly known as Washington Interagency Committee for Outdoor Recreation	
None designated	Woodland Chamber of Commerce	None designated
Bill Sharp	Yakama Nation	Keely Murdoch

Table 2. Representatives and Alternates for Membership on the TCC

TCC Member	Organization	Alternate
None designated	American Rivers	None designated
Public Works Director	City of Woodland	None designated
None designated	Clark County	None designated
None designated	Cowlitz County	None designated
Eric White	Cowlitz Indian Tribe	None designated
None designated	Cowlitz-Skamania Fire District No. 7	None designated
None designated	Fish First	None designated
John Clapp	Lewis River Citizens at-large	None designated
Mariah Stoll-Smith Reese	Lewis River Community Council	None designated
	Lower Columbia River Fish Recovery Board	Amelia Johnson
Joshua Ashline	National Marine Fisheries Service	None designated
None designated	National Park Service	None designated
None designated	North County Emergency Medical	None designated
Kendel Emmerson	PacifiCorp (PacifiCorp Co-Chair)	Summer Peterman
Amanda Farrar	PUD of Cowlitz County (PUD Co-Chair)	None designated
Bill Richardson	Rocky Mountain Elk Foundation	Ray Crosswell
None designated	Skamania County	None designated
None designated	The Native Fish Society	None designated
None designated	Trout Unlimited	None designated
None designated	US Bureau of Land Management	None designated
Jeff Garnett	US Fish & Wildlife	None designated
Tyanna Blaschak	USDA Forest Service	Neil Chartier
Peggy Miller	Washington Dept. of Fish & Wildlife	Eric Holman
Adam Cole	Washington State Recreation and Conservation Office, formerly known as Washington Interagency Committee for Outdoor Recreation	To be named
None designated	Woodland Chamber of Commerce	None designated
Bill Sharp	Yakama Nation	None designated

3.0 AQUATIC RESOURCES

3.1 ACC Meetings

The purpose and role of the Aquatic Coordination Committee (ACC), as defined in Section 14.1 of the SA is to facilitate coordination and implementation of the aquatic PM&E measures.

The structure and process of the ACC is intended to provide a forum to address time-sensitive matters, early warning of problems, and coordination of member organization actions, schedule, and decisions to save time and expense. The ACC makes decisions based on consensus, while implementing the Settlement Agreement and the FERC license requirements.

3.1.1 ACC Meetings and Conference Calls

Detailed meeting summaries are provided on the PacifiCorp website at: <https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>.

3.1.2 ACC Meeting Notes

The Licensees prepared draft notes for ACC meetings and conference calls. These notes were distributed to ACC members for review and comment approximately one week after the subject meeting. After review, revision and approval by the ACC, the final notes were entered in the public record and posted on the PacifiCorp website at: [ACC and TCC Documents, Meetings & Reports \(pacificorp.com\)](https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html)

3.1.3 ACC Decision Documents

As part of the revised ACC/TCC ground rules adopted in May, 2020, the ACC established a process to formally document and record decisions by the ACC. This process includes submitting a decision document (template) for consideration and approval by the ACC. Final decision documents and record of decisions are posted on the PacifiCorp website at: <https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/hydro/lewis-river/license-implementation/acc/record-of-decision-matrix.pdf>

3.2 Aquatic Measures Implemented as of the End of 2022

This section presents the actions taken by the Utilities during January 2022 through December 2022 toward Aquatic requirements of the Lewis River Settlement Agreement and the FERC licenses. It also includes previously completed Settlement Agreement actions. The actions are identified by agreement Article number as the agreement is more specific in detailing the requirements than the license orders which in essence, incorporate agreement terms via agency regulatory authority. In some instances, previous actions are noted to provide a more comprehensive record.

A description of funding amounts deposited and disbursed during 2022 is provided in Section 7.0 – Funding.

3.2.1 SA Section 4.1 Common Provisions Regarding Fish Collection and Transport Facilities

3.2.1.1 Studies to Inform Design Decisions (SA 4.1.1)

PacifiCorp has completed the Merwin Tailrace Fish Behavior study to provide information that could assist the planning and design of the Merwin Upstream Collection and Transport Facility. The study plan was developed in coordination with the ACC and was finalized as a revised document June 30, 2005. In 2005 through 2006, the study was conducted, and a final report was issued in February 2007.

In March of 2022, PacifiCorp initiated a Yale Reservoir Fish Behavior Study to provide information that could assist the planning and design of the Yale Downstream Collection and Transport Facility. Monthly study updates were provided to the ACC throughout the study period and 2022 study results can be found in the monthly meeting notes throughout 2022. The Final Report for the 2022 Yale Reservoir Fish Behavior Study was distributed to the ACC as part of the 30% Design Package for the upcoming Yale Downstream Fish Collection Facility.

3.2.1.2 Adult Trap Efficiency for Salmonids (SA 4.1.4c)

The Adult Trap Efficiency (ATE) standard was first discussed by the ACC at the February 14, 2009 meeting. Bryan Nordlund of NMFS subsequently developed a proposal for the ATE standard along with a matrix for a phased fish trap implementation. This proposal was the topic of nearly every ACC and Engineering subgroup meeting for most of the year accompanied by several offline conversations. An ATE determination methodology and standard was finally accepted by the ACC at their December 11, 2009 meeting with the efficiency set at 98%. Detailed methodology and definitions were delegated to the Draft Monitoring and Evaluation Plan which was submitted to the FERC in June 2009 and approved in December 2010, and later revised and resubmitted to FERC in April 2017 and approved on May 15, 2017 (see Section 3.2.36 below). The Merwin Upstream Collection and Transport facility was not substantially completed until April 2014. Based on this, PacifiCorp proposed, and the ACC agreed to suspend the start date of the two year ATE evaluation until spring 2015. ATE evaluations were conducted over a five (5) year period (2013-2019). In review of these previous studies, the ACC determined that reliable operation of the facility's fish lift and conveyance system was the largest contributor to the success of fish being captured at Merwin Dam. At the December 12, 2019 ACC meeting, members agreed to postpone the ATE Evaluations in 2020 and requested PacifiCorp to develop a memorandum outlining the proposed steps for moving forward with the Merwin Trap for the ACC to review (reference November 10, 2022 ACC meeting notes, which discuss steps for moving forward with the Merwin trap). In early 2020, PacifiCorp began reviewing possible alternative designs to the current lift and conveyance system, particularly aimed toward modifying the system's crowder that automatically crowds adults from the head of the fish ladder into the lifting hopper. As of December 2020, PacifiCorp had begun the formal process of redesigning the facility's crowding mechanism. While it was originally anticipated that a final design would be reached by late-2021 with construction occurring sometime in 2022, delays in the process have occurred due to the COVID-19 pandemic and staffing. It is currently anticipated that construction will begin during the summer of 2023, with finalization of the upgrades being completed in 2024. Once the redesigned crowder is in place, it is intended that the ATE studies

will resume for the target transport species. Additional information regarding the results of previous ATE studies and the current status of the Merwin Trap can be found in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.2 SA Section 4.2 Original Merwin Trap

Original Merwin Trap suspended operation in June 2013.

3.2.3 SA Section 4.3 Merwin Upstream Collection and Transport Facility

The new Merwin Upstream Collection and Transport facility began operation in late December 2013 and was considered substantially complete in April 2014. The following information is a summary of the facility operations in 2022. Detailed results of the 2022 operations and associated M&E evaluations are included in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

In compliance with WDFW standards, all adult salmonids collected were identified to species and sorted based on the following characteristics: missing adipose fin with no coded wire tag detection (*AD CLIP ONLY*), adipose fin absent and present with a coded wire tag detection (*CWT*), adipose fin intact with no coded wire tag detection (*WILD*), and adipose fin intact with blank wire tag present (*WILD + BWT*). All fish were also identified as male (*M*), female (*F*), or jacks (*J*).

A total 47,729 fish were captured at the Merwin Trap in 2022, which is the greatest number of adults collected at the facility since it was commissioned in 2014 (Table 4.1-1). Among the species collected, early Coho accounted for the largest proportion of fish captured (n=21,685), followed by late Coho (n= 13,545), spring Chinook (n=4,919), summer Steelhead (n=4,377), winter Steelhead (n=2,656), fall Chinook (n=430), Cutthroat (n=102), sockeye salmon (n=12), and chum salmon (n=3). Of the 4,377 summer steelhead collected at Merwin trap in 2022, 1,239 of these fish had been recaptured as part of WDFW's Recreational Angler Recycle Program. No bull trout were captured at the Merwin Trap in 2022, or in any previous years.



Figure 1. A large, natural-origin fall Chinook that was collected at the Merwin Trap in September 2022.

Table 3. 2022 Merwin Trap Capture Data.

Characteristic Species	AD Clip			CWT			Wild			Wild Recap			Wild-BWT		Recap		Misc	Total	%
	M	F	J	M	F	J	M	F	J	M	F	J	M	F	M	F	Not sexed		
Spring Chinook ^a	1,704	1,518	290	389	368	108	322	210	10									4,919	10.3
Fall Chinook	108	129	36	6	1	5	53	45	47									430	0.9
Early Coho	6,906	7,702	1,395	1,527	1,837	218	920	939	241									21,685	45.4
Late Coho	4,359	5,441	631	723	845	184	622	598	142									13,545	28.4
Summer Steelhead	1,097	2,031					2	8							357	882		4,377	9.2
Winter Steelhead	978	1,026					90	96					316	150				2,656	5.6
Sockeye Salmon							11	1										12	0.0
Chum Salmon							3											3	0.0
Pink Salmon																		0	0.0
Cutthroat (>13 inches)																	102	102	0.2
Cutthroat (< 13 inches)																		0	0.0
Rainbow (< 20 inches)																		0	0.0
Bull Trout (> 13 inches)																		0	0.0
Bull Trout (< 13 inches)																		0	0.0
Total																	47,729	100	

A total of 5,102 early Coho, 4,443 late Coho, 3,600 spring Chinook, 594 wild winter Steelhead (blank wire tag and NOR combined), and 102 Cutthroat were transported upstream and released above Swift Dam as part of the reintroduction program in 2022 (**Table 4**).

Table 4. Summary of adult salmonids transport upstream of Swift Dam in 2022.

Species	Male	Female	Jack	Not sexed	Female:Male Ratio	Jack:Adult Ratio	Total
<i>Spring Chinook</i>	1,886	1,428	286	-	0.66	0.09	3,600
<i>Early Coho</i>	2,297	2,561	244	-	1.01	0.05	5,102
<i>Late Coho</i>	2,005	2,290	148	-	1.06	0.03	4,443
<i>Winter Steelhead</i>	374	220	-	-	0.59	-	594
<i>Cutthroat >13"</i>	-	-	-	102	-	-	102
<i>Bull Trout >13"</i>	-	-	-	-	-	-	0
						Total	13,841

3.2.4 SA Section 4.4 Downstream Transport at Swift No. 1 Dam

3.2.4.1 Modular Surface Collector (SA 4.4.1)

The Modular Surface Collector, referred to as the Swift Floating Surface Collector (FSC), operated for the majority of 2022 with a planned shutdown from approximately mid-July through mid-November 2022 for scheduled maintenance and modifications. Detailed results of the 2022 operations and M&E evaluations are included in the attached Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

A total of 78,373 salmonids were captured by the Swift FSC in 2022. Of these fish, approximately 72,684 were transported and released downstream of Merwin Dam (92.7 percent). Any transport species that were not transported downstream, were either used for various M&E evaluations in which fish were released back upstream, were a pre-spawn adult that was returned to the reservoir, or were recorded as a mortality. Coho accounted for the highest percentage of the overall estimated catch (82.9 percent), followed by Steelhead (7.1 percent), spring Chinook (3.2 percent), and Cutthroat Trout (1.1). A total of 3,697 hatchery Rainbow Trout and sixteen (16) Bull Trout were also collected in 2022 and returned to the reservoir. An additional estimated 639 hatchery Rainbow Trout were collected and passed downstream of Merwin Dam during the timeframe that fish were being subsampled. A full accounting of the required performance standards, such as injury rate, capture efficiency, Overall Downstream Survival (ODS), among others, is included in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.4.2 Release Ponds (SA 4.4.3)

The Woodland Release Pond began daily operation in March 2018. The facility's purpose is to allow for stress reduction and determination of transport survival for out-migrants transported downstream from the Swift Reservoir FSC before volitional release into the lower Lewis River.

The Woodland Release Pond facility was operated in concurrence with the Swift FSC operation, and no unscheduled outages were necessary in 2022. Nearly all out-migrants transported downstream from the Swift FSC in 2022 (72,684 fish) were released into the ponds.

When circumstances required an alternate release location, out-migrants were released directly into the lower Lewis River at the Washington Department of Fish and Wildlife (WDFW) boat ramp on Pekin Ferry Rd. at approximately river mile 3.0. Additional information regarding fish releases into the Woodland Release Ponds and related survival estimates can be found in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.5 SA Section 4.5 Downstream Passage at Yale Dam

On October 27, 2021, the NMFS and USFWS filed notice with the FERC that the Services had completed their final determination regarding fish passage into Yale Reservoir, and that fish passage remains appropriate in this reservoir. Services recommended that FERC grant an extension of the original deadline so that facility construction would be completed by June 26, 2026. The Utilities in December of 2022 provided a 30% Design Package of the Yale downstream, Yale upstream and Swift upstream fish passage facilities to the ACC and ACC Fish Passage Subcommittee for review. Passage will be designed for spring Chinook, coho, winter steelhead, and bull trout using agency criteria. In July 2022, the ACC approved the 2022 Yale Habitat Preparation Plan. This plan stipulated that 1,800 hatchery-origin adult coho be released into Yale Reservoir over a six week period beginning mid-September through late October 2022. The intent of transporting these fish into Yale Reservoir is to prepare and till Yale tributary stream gravels, as well as provide marine-derived nutrients to the spawning and rearing areas. Additional information on fish release into Yale Reservoir may be found in the Yale Habitat Preparation Plan, which is an appendix to the Lewis River Fish Passage Annual Report (**Appendix B**).

Additionally, and as noted in Section 3.2.1.1 of this report, PacifiCorp initiated a Yale Reservoir Fish Behavior study to provide information that could assist the planning and design of the Yale Downstream Collection and Transport Facility. Study updates were provided to the ACC and ACC Fish Passage Subcommittee throughout the study period. The final report for 2022 Yale Fish Behavior Study was included in the 30% Design Package provided to the ACC in December 2022.

3.2.6 SA Section 4.6 Downstream Passage at Merwin Dam

On December 23, 2021, the Services notified the Utilities that the Services had completed their final determination regarding fish passage into Merwin Reservoir and that fish passage into this reservoir remains appropriate.

3.2.7 SA Section 4.7 Upstream Passage at Yale Dam

On December 23, 2021, the Services notified the Utilities that the Services had completed their final determination regarding fish passage into Merwin Reservoir and that fish passage into this reservoir remains appropriate. The Utilities in December of 2022 provided a 30% Design Package of the Yale downstream, Yale upstream and Swift upstream fish passage facilities to the ACC and ACC Fish Passage Subcommittee for review. Passage will be designed for spring Chinook, coho, winter steelhead, and bull trout using agency criteria.

3.2.8 SA Section 4.8 Upstream Passage at Swift Projects

On October 27, 2021, the NMFS and USFWS filed notice with the FERC that the Services had completed their final determination regarding fish passage into Yale Reservoir, and that fish passage remains appropriate in this reservoir. The Utilities in December of 2022 provided a 30%

Design Package of the Yale downstream, Yale upstream and Swift upstream fish passage facilities to the ACC and ACC Fish Passage Subcommittee for review. Passage will be designed for spring Chinook, coho, winter steelhead, and bull trout using agency criteria.

3.2.9 SA Section 4.9.1 Interim Bull Trout Collection and Transport Programs

Per Article 402(a) in the FERC licenses and the Lewis River SA section 4.9.1, PacifiCorp annually captures and transports bull trout from the Yale powerhouse tailrace (upper Merwin Reservoir) to the mouth of Cougar Creek, a Yale Reservoir tributary. A total of 163 bull trout have been captured from the Yale tailrace since the program began in 1995.

For Methods, Materials, and Results concerning number of bull trout captured and transported during 2022 Yale Tailrace activities as well as pertinent biological information of individual bull trout captures, please see the *Bull Trout 2022 Annual Operations Report*, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.9.1 Investigation of Alternative Collection Methods (SA 4.9.2)

PacifiCorp continues to consider more effective and less intrusive methods to collect bull trout from the Yale tailrace until capital improvements and future fish passage is implemented in 2026. Past alternative methods investigated include; beach seines, purse seines, drifting tangle nets when the powerhouse is online, and angling.

In 2022, tangle nets and angling were the only methods used and, to date, remain the most effective. Annual Consultation concerning 2022 bull trout monitoring activities occurred between the Utilities and the USFWS in February 2022 at which time it was agreed that tangle nets would again be utilized in the upcoming field season to attempt to capture bull trout from within the Yale tailrace waters. Three bull trout collection events were completed within the Yale tailrace in 2022 during the months of June - August, per the Plan. One bull trout in total was captured during these surveys.

3.2.9.2 Yale and Merwin Bull Trout Entrainment Reduction (SA 4.9.3)

PacifiCorp completed and distributed a revised *Yale Project Entrainment Reduction Plan* to the ACC and the Services May 16, 2008. The plan is available on PacifiCorp's website: https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/hydro/lewis-river/license-implementation/acc/Yale_Hydro_Project_Bull_Trout_Entrainment_Final_Report_and_Bull_Trout_Reduction_Plan_January_2008.pdf

3.2.10 SA Section 4.10 Bull Trout Passage in the Absence of Anadromous Fish Facilities

If Yale Downstream Facility is not constructed, implement prior to 13th anniversary of Yale Project License. See section 3.2.5 above.

3.2.11 SA Section 5.1 Yale Spillway Modifications

The Yale spillway entrainment net was completed and placed into operation October 15, 2013.

3.2.12 SA Section 5.2 Bull Trout Habitat Enhancement Measures

PacifiCorp continued to manage the Cougar Creek Conservation Covenant to the benefit of bull trout. Unauthorized dispersed camping along Cougar Creek was located and law enforcement was contacted to request the campers to be removed. Following their departure, the campsite was cleaned up and the area was posted with “No Camping” signs.

Washington Department of Transportation (WSDOT) has a proposed bank stabilization and channel modification project to redirect Cougar Creek flow back into the State Route 503 culvert. In 2021 and as part of this project, a large down tree that was redirecting flow away from the culvert was moved to the east bank. PacifiCorp coordinated with WSDOT on the tree removal to minimize impacts to bull trout. PacifiCorp will continue to coordinate with WSDOT on the channel modification and bank stabilization project, which is scheduled for completion by July 31, 2023.

Per the SA, Cowlitz PUD managed the Devil’s Backbone Conservation Covenant to benefit bull trout.

3.2.13 SA Section 5.3 Reserved

3.2.14 SA Section 5.4 Reserved

3.2.15 SA Section 5.5 Bull Trout Limiting Factors Analysis

Contract was awarded to Meridian Environmental, Inc. (the Consultant). The Consultant completed the field work and provided a final report in May 2007. The report describes three potential streams that could support bull trout if improvements were made to the habitat. The improvements include shading to reduce stream temperatures and riparian habitat stabilization. An overriding limiting factor in two of the three streams was lack of water during the critical spawning period.

3.2.16 SA Section 5.6 Public Information Program to Protect Listed Anadromous Species

PacifiCorp maintains signage at the Eagle Cliff area to inform the public of specific angling regulations that are designed to protect both bull trout and reintroduced anadromous species (**Figure 1**). Additionally, WDFW has regulations on Swift Reservoir that prohibit the harvest of unclipped adipose fin salmonids or salmon over 15 inches in length. The area upstream of Eagle Cliff Bridge remains catch and release for all species. This effort will help protect transported adults and their progeny migrating through Swift Reservoir.

3.2.17 SA Section 5.7 Public Information Program to Protect Bull Trout

PacifiCorp maintains signage at most reservoir and river access sites that are owned by the company. The company also provides informational flyers to the public at all camping and day use areas the company owns. As of July 2018, **Figure 2** content was updated.



Figure 2. Signs posted for public information.

3.2.18 SA Section 6.1 Flow Releases in the Bypass Reach: Upper Release and Constructed Channel

3.2.18.1 Upper Release Point (SA 6.1.2)

Stream flow as measured at the upper release point was in excess of the required minimum flow for the duration of the year. In June, the release facility incurred signal interruptions which recorded low outflow, however water flow through the siphon did not vary, rather the data signal was erroneous. On one occasion from October 23 – 30, 2022, and related to a maintenance activity at the Swift No. 1 powerhouse (Swift 13 TIV bypass valve), the siphon flow was reduced to 30 cfs or less and the spill gate was opened to provide the bypass with a continuous flow of 150 – 160 cfs. High flow within the system resulted in two spill events at Swift Dam: June 11 – 13, 2022 having a maximum spill amount of 2511 cfs and on June 16 – 20, 2022 having a maximum spill amount of 2877 cfs. The flow release siphon was in operation during both periods.

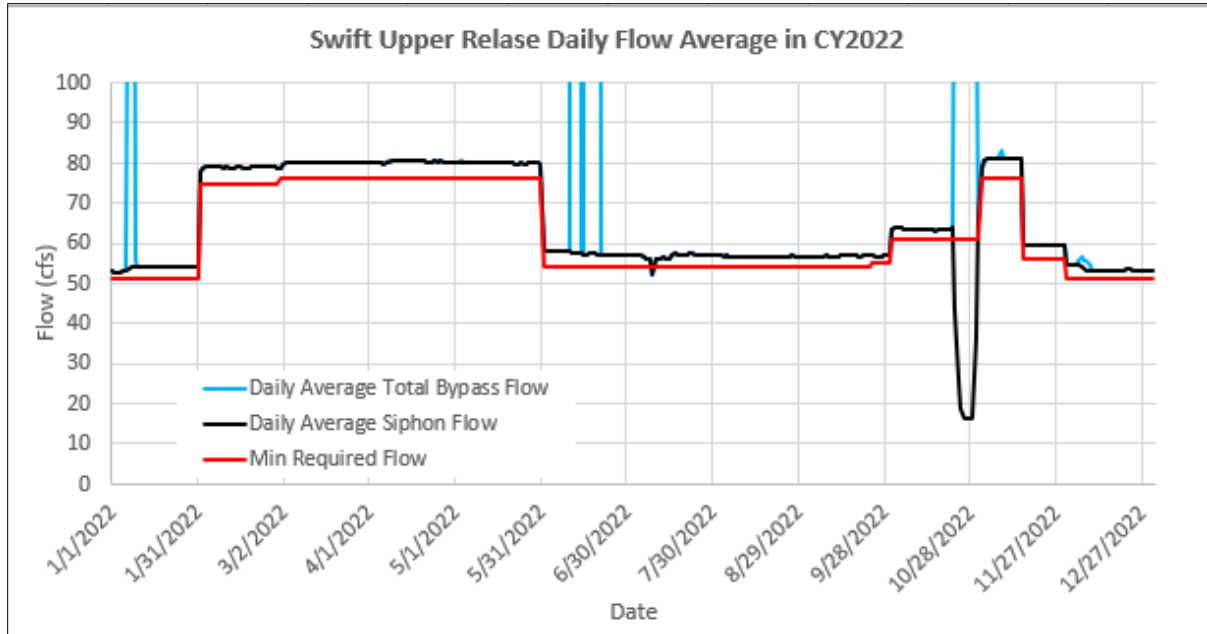


Figure 3. Swift Upper Release Daily Average Flows (cfs) from January 1, 2022 to December 27, 2022.

3.2.18.2 Constructed Channel (SA 6.1.3b)

Beginning in fall 2011, a flow monitoring gage was installed at the canal drain outlet to provide a minimum flow alarm system and enhanced flow measurement. Minimum flow from the canal drain is set at 14 cfs or greater year-round.

The system is performing well, and the gage recorded no less than minimum flow observations in 2022. On January 8 – 9, 2023 the nitrogen tank supporting the flow monitoring equipment was low resulting in recording of erroneous readings. During this time flow through the canal drain did not vary and was greater than the 14 cfs minimum.

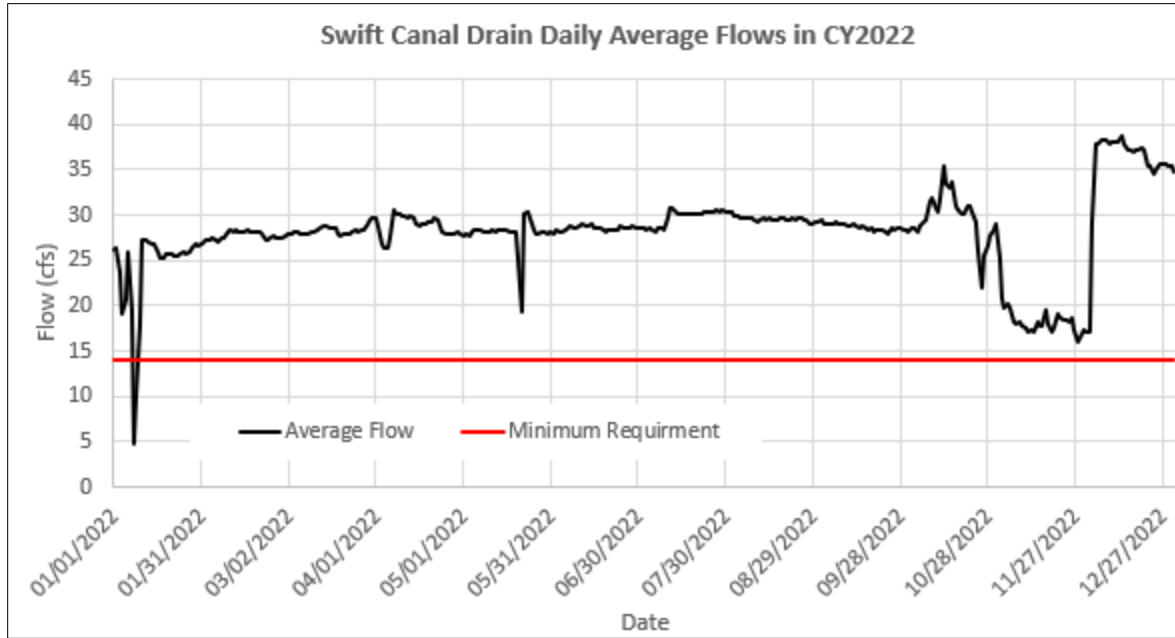


Figure 4. Swift Canal Drain Daily Average Flows (cfs) from January 1, 2022 to December 31, 2022.

3.2.18.3 Maintenance of the Constructed Channel (SA 6.1.3e)
As of December 31, 2022, all structures are in place and functioning.

3.2.19 SA Section 6.2 Flow Fluctuations, Ramp Rates below Merwin Dam and Plateau Operations at Merwin Dam

3.2.19.1 Minimum Flows

During calendar year 2022, flows for the Merwin Project were met or exceeded as stipulated in the June 26, 2008 FERC license.

As in years past, the Washington Department of Fish and Wildlife requested several days of Merwin Project flow reductions to facilitate fall Chinook fish and redd counts in the lower Lewis River. PacifiCorp and the Aquatic Coordination Committee agreed to the following 3.2.19.1 minimum streamflow reductions.

Date	FERC Minimum Flow	Modified Minimum Flow (0930 – 1430 hrs)
11/2/2022	4,200 cfs	1,200 cfs
11/9/2022	4,200 cfs	1,200 cfs
11/16/2022	4,200 cfs	1,200 cfs
11/23/2022	4,200 cfs	1,200 cfs
11/30/2022	4,200 cfs	1,200 cfs
12/7/2022	4,200 cfs	2,500 cfs
12/14/2022	4,200 cfs	2,500 cfs

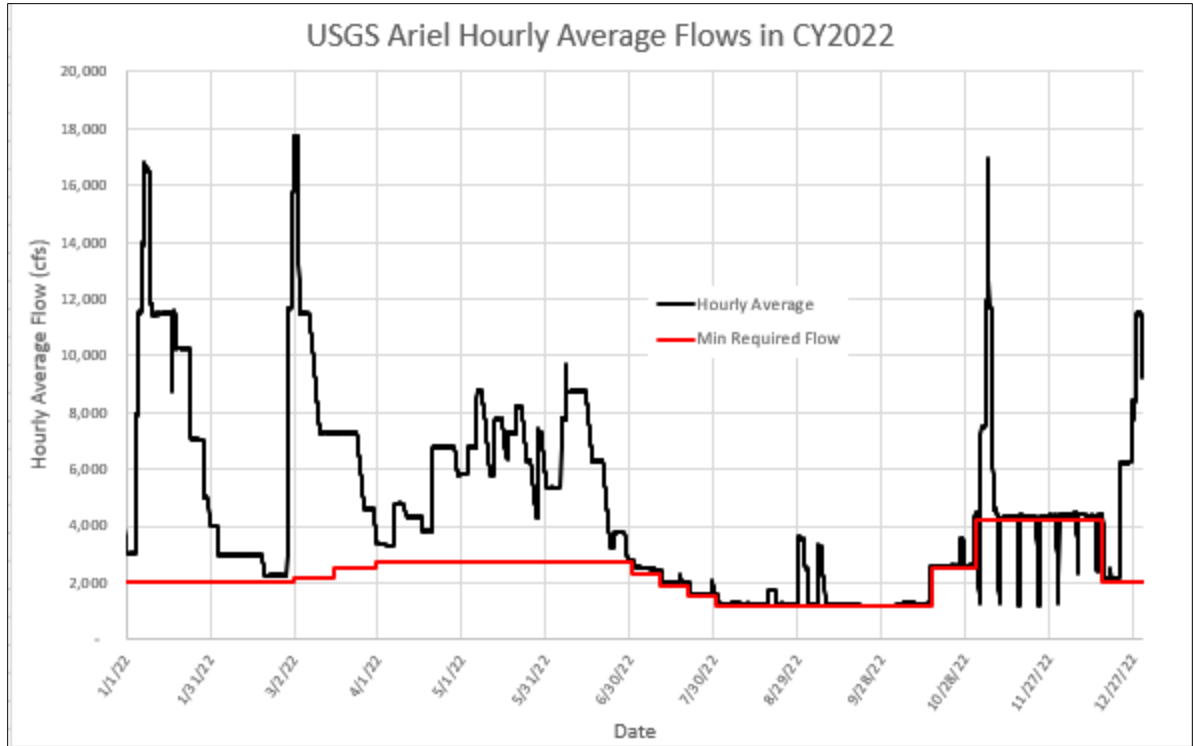


Figure 5. USGS Ariel Hourly Average Flows (cfs) for January 1, 2021 to December 31, 2022.

3.2.19.2 Ramp Rates

In review of 2022 USGS Ariel gage data, there was a short downramp event on December 27, 2022 related to a trip on the 115KV Lake Line which resulted in Merwin Unit 3 tripping off line. Flow at the time was 8,405 cfs which is greater than the limited ramping zone (at or less than flows of 8,000 cfs). With the unit trip, flow reduced down to 6,990 cfs before being corrected back to 8,170 cfs within 15 minutes. .

3.2.20 SA Section 7.1 Large Woody Debris Program

Swift Reservoir did require large wood debris removal in 2021. PacifiCorp coordinated with Cascade Forest Conservancy for delivering large wood debris to their Pine Creek location. Due to delays in schedule and weather, the two loads of logs will not be transported until 2022. Logs were transferred to the Pine Creek location in the summer of 2022.

3.2.21 SA Section 7.2 Spawning Gravel Study and Gravel Monitoring and Augmentation Plan

In 2006, PacifiCorp completed a Spawning Gravel Report for downstream of Merwin dam and proposed to monitor gravel movement for two years before making recommendations and developing a final gravel augmentation plan. A summary report was provided to the ACC December 20, 2007, regarding completion of two tasks for the Lewis River Spawning Gravel Evaluation. In 2008, the third year of mapping the spawning gravel areas and analyzing the accumulated data was completed. Some of the key findings were that spawning habitat is likely limiting to the local Chinook salmon population. Available spawning gravel does not appear to be diminished in the upper reach and the gravel appears to be stable. Adding more spawning

gravel would not necessarily increase the spawning area due to the effect of the confined canyon geomorphology.

PacifiCorp provided an annual report to the ACC and monitored the gravel sites in the fall of 2008 in order to provide more refinement to the model for gravel movement and an applicable trigger or gravel augmentation. A final report update and recommendations was submitted in January 2009. Per the assessment plan a recommended monitoring-trigger occurs when flows below Merwin exceed 42,000 cfs as measured at the Ariel gage. Since completion of the assessment report, flows of that magnitude have not occurred. The highest flow since the completion of this study occurred in January 2010 at just over 37,000 cfs. The highest flow recorded at the USGS Ariel gage in 2021 was 27,025 cfs recorded on November 14, 2021.

3.2.22 SA Section 7.3 Predator Study

A predator analysis was initiated as part of the New Information process and was reported in the document titled, *New Information Regarding Fish Transport into Lake Merwin and Yale Lake* which was provided by the USGS and University of Washington June 24, 2016 (PacifiCorp 2016).

3.2.23 SA Section 7.4 Habitat Preparation Plan

PacifiCorp's obligation under the Habitat Preparation Program for Swift Reservoir ended in 2012. Formal reintroduction of fish collected at Merwin Trap replaced the Habitat Preparation Program for all reintroduction species into Swift. In fall 2022, the utilities through coordination of the ACC drafted and implement year-one of the Yale Reservoir Habitat Preparation Plan in accordance with Section 7.4 of the Settlement Agreement. The plan called for 1,800 adult coho salmon to be released into Yale Reservoir beginning 1 September through October 31, 2022. Additional details concerning year-one of the Yale Reservoir Habitat Preparation Plan are included in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**). In the future, a Habitat Preparation Program will be initiated at Merwin Reservoir given the National Marine Fisheries Service (NMFS) and U.S. Fish & Wildlife Service (USFWS) (collectively the "Services") final decisions to reintroduce salmon and steelhead into those reservoirs.

3.2.24 SA Section 7.5 Aquatics Fund

PacifiCorp continues to annually make funds available for Aquatic resource projects in accordance with the *Aquatics Fund – Strategic Plan and Administrative Procedures*. The 2022 Annual Aquatics Fund Report can be found at the following link:

<https://www.pacificorp.com/energy/hydro/lewis-river/aquatic-fund-applications.html>

In August 2022, the Licensees notified Settlement Agreement Parties, ACC, TCC and interested parties of the availability of Funds for the 2022/2023 funding cycle. The total amount available was \$3,283,539 for Resource Projects and \$673,846 for bull trout enhancement projects. The Licensees will continue to provide additional funds to the Aquatic Fund on an annual basis as stipulated in the SA.

3.2.25 SA Section 7.6 In Lieu Fund

On October 27, 2021, the NMFS filed with the FERC notice that the Services had completed their final determination regarding fish passage into Yale Reservoir, and that fish passage remains appropriate in this reservoir. On December 23, 2021, the Services provided notification to the Utilities that the Services had completed their final determination regarding fish passage into Merwin Reservoir, and that fish passage into this reservoir remains appropriate.

In response to these notices, on March 8, 2022, the Utilities provided a draft letter to the Services outlining a draft fish passage proposal for the Lewis River Hydroelectric Projects to resolve disputes under the Lewis River Settlement Agreement. On March 9, 2022, the Services responded to the Utilities draft fish passage proposal noting the Services support many aspects of the proposed passage framework and provided comments to help guide discussion to occur with the ACC.

In 2022, a number of actions were taken by various parties in response to the Services aforementioned notices. The following information was provided to the FERC through quarterly reports submitted in 2022 (March 31, 2022, June 30, 2022, September 30, 2022 and December 31, 2022).

On March 16, 2022, PacifiCorp provide a verbal overview of the Utilities' draft fish passage proposal to the ACC Fish Passage Subgroup.

On April 14, 2022, the Utilities provided the ACC with a presentation identifying the key components and details of a fish passage schedule, design milestones and initial studies/actions contained in the March 8, 2022, Utilities Draft Fish Passage Proposal to NMFS and USFWS.

On April 20, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities briefed the participants on the initial data collection, modeling, and other efforts the Utilities had commenced to develop the designs for the Yale downstream fish passage facility. The Utilities provided an overview of the 2022 Yale Reservoir fish behavior study including objectives of establishing smolt reservoir transit time, behavior within the forebay, and relationships between environmental variables and powerhouse operation with fish behavior. PacifiCorp then provided an overview of the draft Yale Habitat Preparation Plan, a requirement of the Lewis River Settlement Agreement. The ACC Aquatic Technical Subcommittee will review and discuss the Yale Habitat Preparation Plan at an upcoming meeting.

On May 12, 2022, the Utilities provided the ACC with an update on initial fish passage design considerations for the new upstream and downstream facilities. Following this update, non-Utility members of the ACC then discussed the effects of schedule delays associated with the fish passage/in-lieu decision making process, and their interest in discussing mitigation options with the Utilities. The topic of mitigation options remains under discussion between the ACC and Utilities.

On May 18, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided an update on the Yale downstream fish passage facility design and related Yale Reservoir fish behavior study. The Utilities then introduced the new project manager for the Yale and Swift upstream fish passage facility designs. The ACC subgroup discussed the adult fish release/distribution of returning adults into the reservoirs.

On June 9, 2022, the Washington Department of Fish and Wildlife provided an ACC Fish Passage Subgroup update to the ACC. Of note was the subgroup's recommendation that collected juvenile fish should not be passed downstream from one reservoir to the next; rather, the subgroup recommended that all juvenile fish collected from Swift and Yale should be transported and released downstream of Merwin. Upstream adult fish release/distribution alternatives remain a topic of discussion for the ACC Fish Passage Subgroup. The Utilities provided an update on passage facility design and study status, and noted their intent to prepare a draft letter to the Commission regarding the status of ongoing discussions related to additional fish passage. The Utilities stated that a draft letter would be provided to the ACC representatives for review and comment prior to a submittal to the Commission.

On June 15, 2022, the Utilities distributed a draft letter to ACC representatives for review and comment updating the Commission on the status of ongoing fish passage discussions for the Lewis River Hydroelectric Projects. The Utilities also participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided updates on fish passage design work and the Yale Reservoir fish behavior study. ACC Fish Passage Subgroup members continued discussions on adult fish release/distribution following the availability of reservoir upstream fish passage.

On July 14, 2022, the Washington Department of Fish and Wildlife (WDFW) and Utilities provided the ACC a brief update on the status of the Utilities Draft Fish Passage Proposal. Discussions regarding the key elements of the fish passage proposal continue. The next ACC Fish Passage Subgroup meeting scheduled for that afternoon (July 14, 2022) 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 facility expansion capabilities).

On July 14, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided updates on design efforts of the Yale downstream, Yale upstream and Swift upstream facilities and ongoing Yale reservoir smolt behavior study. The majority of the meeting time was spent on discussing elements of the proposed future fish passage program. On July 15, 2022, the Utilities distributed the July 14, 2022 version of the Draft Fish Passage Proposal to the ACC Fish Passage Subgroup for review.

On August 8, 2022, the WDFW and the Cowlitz Indian Tribe commented on the July 14, 2022 version of the Draft Fish Passage Proposal.

On August 11, 2022, the WDFW and Utilities provided the ACC a brief update regarding the Fish Passage Subgroup's progress on the Draft Fish Passage Proposal. The Subgroup is working to identify and capture the approach to future fish passage, and to memorialize agreement on elements to be included in future fish passage and construction schedules. The document will provide guidance to the Utilities' engineering design team, and the Settlement Parties' fish passage team, and monitoring and evaluation teams.

On August 11, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided updates on design efforts of the Yale downstream, Yale upstream, and Swift upstream facilities and ongoing Yale reservoir smolt behavior study. Discussions regarding the elements of the proposed future fish passage program continued. Of interest to the Subgroup was preparation of an alternatives analysis for each new fish passage facility, timing of facility operation and future facility expansion.

On August 23, 2022, the Lower Columbia Fish Recovery Board submitted comments on the July 14, 2022 version of the Draft Fish Passage Proposal.

On September 8, 2022, the Utilities provided the ACC with a short update of the Utilities' Draft Fish Passage Proposal. The Utilities are revising the draft document in consideration of previous comments received, working on a related comment/response table, and putting together individual alternative analysis matrices for fish passage facilities.

On September 19, 2022, the Utilities provided the September 19, 2022 version of the Draft Fish Passage Proposal and individual fish passage facility alternatives analysis to the ACC Fish Passage Subgroup for review and comment.

On September 21, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided updates on design progress of the Yale downstream, Yale upstream, and Swift upstream facilities. The Utilities will present the 30% design set for each of these three new facilities to the Subgroup on December 14, 2022. Initial results of the 2022 Yale reservoir smolt behavior study were also provided. The majority of the meeting time was spent reviewing the Utilities revisions to the draft future fish passage program (draft document distributed to the Subgroup on September 19, 2022).

On October 13, 2022, the Washington Department of Fish and Wildlife (WDFW) and Utilities provided the ACC with a brief update on the status of the Utilities Draft Fish Passage Proposal. Discussions regarding the key elements of the fish passage proposal continued at the ACC Fish Passage Subgroup (FPS) meeting, scheduled for later that afternoon (October 13, 2022). In September, several ACC/Subgroup members provided suggested edits and comments on the current version of the draft proposal. At the October meeting, the FPS continued that process. It was also noted that on December 14, 2022, the Utilities will introduce the 30% design package for the Yale downstream passage, Yale upstream passage and Swift upstream passage facilities.

On October 13, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The Utilities provided updates on design efforts of the Yale downstream, Yale upstream and Swift upstream facilities noting the Utilities will present the 30% design packages for these facilities to interested parties on December 14, 2022. Invitations to that meeting were previously sent to all ACC and Subgroup members on September 22, 2022. Subgroup meeting topics for October included design updates, consideration of a facilities alternatives analysis, and a 2032 construction date for the Merwin downstream passage facility. The majority of the meeting was spent reviewing comments on the September 19, 2022 version of the Draft Fish Passage Proposal.

On November 10, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. Agenda items included a presentation on dam safety issues at Merwin Dam and timing of new fish passage construction at that site, a review of the remaining topics to discuss on the Draft Fish Passage Proposal, and Subgroup discussion on a fish passage facilities alternatives analysis including identifying key drivers for consideration such as dam safety. Settlement Agreement directives, and USFWS and NMFS fish passage criteria. The Utilities also gave a short preview of the 30% design review scheduled for the December 14, 2022 meeting. During the FPS meeting, everyone agreed that progress was being made by the Utilities and Subgroup towards a final fish passage proposal. However, additional time was needed to complete this process. Understanding that FERC is pressing for such completion, the Subgroup agreed that a letter to FERC acknowledging the status and the support of the ACC for ongoing proposal discussions would give the FERC reason to provide additional time. On December 2, 2022, and in regard to the collective agreement of the ACC Fish Passage Subgroup's November 10, 2022, discussion, the Utilities provided the ACC with a draft letter to FERC for review and comment.

On December 8, 2022, the WDFW and Utilities provided the ACC a brief update regarding the Fish Passage Subgroup's progress on the Draft Fish Passage Proposal and reviewed the draft letter to the FERC. The letter identifies that the Subgroup is making good progress, but certain issues remain, and parties hope to conclude the process by end of April 2023. ACC members noted the letter should have more details on the accomplishments of the Subgroup, and members needed additional time for their management to review.

On December 8, 2022, the Utilities participated in a meeting of the ACC Fish Passage Subgroup. The majority of meeting time was spent reviewing the November 17, 2022 language of the Draft Fish Passage Proposal and soliciting any additional edits. Focus was given to items that appeared to have agreement. The Subgroup continued discussions on developing a fish passage facility alternative analysis.

On December 14, 2022, the Utilities provided the ACC and Fish Passage Subgroup members an overview presentation of the proposed Yale downstream fish passage facility, Yale upstream fish passage facility and Swift upstream fish passage facility. Materials distributed for review included: a series of technical memorandums on various design aspects of each facility; the 30% design documents; and the respective PowerPoint presentations for each of the three projects that included the milestone schedules. All material is available to the ACC and was posted at <https://www.lewisriverfishpassage.com/> that same day. The Utilities requested review and comment of the materials by January 28, 2023.

3.2.26 SA Section 7.7 Management of Aquatics Fund and In Lieu Fund

At the end of 2022, PacifiCorp's total available fund amount was \$3,416,394.76 for Resource Projects and \$701,073.13 for Bull Trout Projects. Fund account information is provided in Section 7.0.

3.2.27 SA Section 7.8 Execution of Projects and Mitigation Measures

Following the November 16, 2021 aquatic fund presentations, the applicants below were requested to submit final full proposals for their respective projects by January 4, 2022.

Cramer Fish Sciences and Columbia Land Trust, Phil Roni	Pine Creek Restoration Design Project – \$214,236
USDA Forest Service	Clear Creek and Clearwater Creek Restoration Implementation – \$3,126,667

The 2022/2023 annual aquatic funds report is available at:

<https://www.pacificorp.com/energy/hydro/lewis-river/aquatic-fund-applications.html>

3.2.28 SA Section 8.1 Hatchery and Supplementation Program

On December 20, 2010, the FERC issued an order approving the Hatchery and Supplementation Plan, which was originally submitted December 23, 2009. On January 22, 2015, the FERC issued an order approving the updated Lewis River Hatchery and Supplementation Plan that was submitted December 16, 2014. On December 23, 2019, the Licensees filed an extension of time request to the FERC for submittal of an updated Hatchery and Supplementation Plan on or before December 31, 2020. This request was filed to allow results from the Comprehensive Period Review to be incorporated into the revised plan. On January 15, 2020, the FERC issued an order approving the extension of time request to December 31, 2020. The Utilities submitted the final H&S Plan to the FERC on December 29, 2020. On March 28, 2022, FERC approved the Licensees H&S Plan.

3.2.29 SA Section 8.2 Hatchery and Supplementation Plan and Report

The Licensees have completed the H&S Annual Report for 2022 (see **Attachment B**). The 2022 Annual Operations Plan is attached as Appendix B of the 2022 H&S Annual Report.

3.2.30 SA Section 8.3 Anadromous Fish Hatchery Adult Ocean Recruit Target by Species

An analysis of ocean recruitment is stipulated in the Settlement Agreement to determine when the hatchery and natural adult production targets established for the upstream passage program are met. For this analysis, the average number of ocean recruits over a five-year period will be evaluated (i.e., five consecutive brood years). These data will be evaluated to determine if and when hatchery production levels should be altered. A detailed description of the methodology for this analysis is outlined in Objective 12 of the current M&E Plan (2022).

During 2022, the second revision to the Lewis River Monitoring and Evaluation Plan (PacifiCorp and Cowlitz PUD 2022) was implemented. Based on the current M&E Plan (2022), estimates of ocean recruits will be developed for each brood year and species throughout the term of the licenses when NOR returns to Merwin. Analysis will be based on brood year recruitment for all three reintroduction species spawning upstream of Merwin Dam. The M&E Plan also stipulated that Ocean Recruitment analysis will begin once abundance triggers for returning natural origin adults have been met (**Table 5**). The triggers are calculated

using baseline total exploitation rates for each of the three species based on the harvest rate assumptions from recent analyses (Mitchell Act Final EIS and NPCC Master Plans) and assuming the only impacts of terminal harvest on natural origin adults would be due to incidental catch and release mortality. Recent returns of natural origin spring Chinook, Coho and winter Steelhead have been too low to meet the newly established triggers. Natural origin returns of Coho were as high as 5,395 in 2020, but have not generally come close to meeting the anticipated trigger of 8,372 adults. Similarly, natural origin returns of late winter steelhead have been as high as 456 in 2020, but have not met the established threshold of 2,210 adults. No Ocean Recruit analysis was conducted in 2022. For more information regarding ocean recruit analysis and threshold targets, see the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

Table 5. Natural return thresholds to Merwin Dam required to trigger completion of Ocean Recruits Analysis.

Threshold	Spring Chinook	Late Winter Steelhead	Coho (Type S and Type N)
1. Natural Production Threshold (Ocean Recruits)	2,977	3,070	13,953
2. Baseline Total Exploitation Rate – NORs (est. range)*	15-20%	5-10%	20-25%
3. Natural origin returns to Merwin Dam required to meet Natural Production Threshold	2,381-2,530	2,763-2,917	10,465-11,162
4. Natural origin returns to Merwin Dam required to trigger Ocean Recruits Analysis (80% of low threshold in 3.)	1,905	2,210	8,372

Note: Conservative (high range) estimates based on harvest rate data used in recent analyses (Mitchell Act Final EIS and NPCC Master Plans).

3.2.31 SA Section 8.4 Anadromous Fish Hatchery Juvenile Production

Juvenile production targets as provided in the H&S Plan have been met for 2022 with the exception of kokanee releases into Merwin Reservoir (10,663 actual pounds vs. target of 12,500 pounds). This small reduction in kokanee production was the result of higher than anticipated mortality from bacterial kidney disease (BKD).

3.2.32 SA Section 8.5 Supplementation Program

The Supplementation Program is described in the *Hatchery and Supplementation Plan* submitted to the FERC in December 2020. The Utilities have followed and met provisions of this plan during 2022 as adaptively managed by the Aquatic Technical Subgroup (ATS) formally the Hatchery and Supplementation Subgroup. Some monitoring strategies and their associated objectives remain in development by the ATS in 2023 and therefore are not reported as part of the H&S Annual Report (**Attachment B**).

3.2.33 SA Section 8.6 Resident Fish Production

PacifiCorp and Cowlitz PUD funded the operation of the Lewis River Hatchery Complex to meet current FERC license obligations for resident fish production.

3.2.34 SA Section 8.7 Hatchery and Supplementation Facilities, Upgrades, and Maintenance

The Licensees have fulfilled their obligation with respect to SA Section 8.7 hatchery upgrades. The Licensees will continue to implement hatchery facility upgrades in collaboration with the hatchery managers, hatchery engineers and in Consultation with the ACC. The completion schedule for SA 8.7 upgrades was provided in Attachment E of the 2015 ACC/TCC Annual Report and is also included in the 2021 Hatchery and Supplementation Program Annual Report (Objective 7).

3.2.35 SA Section 8.8 Juvenile Acclimation Sites

On June 14, 2018, The ACC agreed to suspend the spring Chinook acclimation program upstream of Swift (up to 100,000 juveniles) for a period of at least five years. This decision modified the release location of 100,000 juveniles from acclimation sites upstream of Swift Dam to in-river release sites downstream of Merwin Dam in an effort to improve future adult returns to traps at Merwin Dam or the Lewis River hatchery. Review of this modification will occur annually between the ACC and the ATS.

On December 5, 2017, PacifiCorp filed with the Federal Energy Regulatory Commission (FERC) a request for Commission approval to decommission the juvenile fish acclimation pond facilities located along the Muddy River, Clear Creek and upper Lewis River near Crab Creek within the Gifford Pinchot National Forest Service. On January 4, 2018, the Commission responded with an order approving the December 5, 2017 request. The acclimation site located on the Muddy River was decommissioned from August through October of 2018. The acclimation sites located along Clear Creek and in the upper Lewis River near Crab Creek were both decommissioned from August through November 2019. All sites were restored to pre-construction condition. The final decommissioning report was filed with FERC on December 13, 2019.

3.2.36 SA Section 9.1 Monitoring and Evaluation Plan

The Aquatic Monitoring and Evaluation Plan (M&E Plan) provides the framework for implementing activities associated with Section 9 (Aquatic Monitoring and Evaluation) of the Lewis River Settlement Agreement (Settlement Agreement). Section 9.1 of the Settlement Agreement directs Licensees to consult with the ACC as necessary, but no less often than every five years, to determine if modifications to the M&E Plan are warranted. The original M&E Plan was filed with FERC in June 2010. The first revision of the M&E Plan was completed in 2017, and was fully implemented that year (PacifiCorp and Cowlitz PUD 2017). In 2021, the Licensees began undergoing a second 5-year review and revision process of the M&E Plan in consultation with the Lewis River ACC ATS. In April 2022, the second revision of the M&E Plan was completed and approved by the ACC and FERC, and was fully implemented that year (PacifiCorp and Cowlitz PUD 2022).

3.2.37 SA Section 9.2 Monitoring and Evaluation Related to Fish Passage

Implementation of the M&E Plan as it relates to anadromous reintroduction continued in 2022 and included monitoring of upstream and downstream migrants. Details regarding all M&E Plan activities as they related to fish passage performance metrics outlined in Settlement Agreement sections 4.1.4 and 9.2.1 through 9.2.2. can be found in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.38 SA Section 9.3 Wild Fall Chinook and Chum

Implementation of the fall Chinook and chum salmon monitoring continued in 2022 per the revised H&S Plan approved by the FERC March 28, 2022, and related 2022 H&S Annual Operating Plan. NOTE: Fall Chinook and chum salmon monitoring activities and objectives in the lower Lewis River were part of the original M&E Plan but in 2015 were moved to the H&S Plan to better align with H&S objectives. Details and results regarding Chinook and chum salmon surveys downstream of Merwin Dam may be found in **Attachment B**.

3.2.39 SA Section 9.4 Water Quality Monitoring

See section 4.1.2 under Water Quality.

3.2.40 SA Section 9.5 Monitoring of Hatchery and Supplementation Program

The FERC approval of the updated *Hatchery and Supplementation Plan* was provided on March 28, 2022. This plan provides eight monitoring objectives developed by the ATS related to the H&S program. For each of these objectives, several key questions are provided to focus M&E activities in meeting each of the eight M&E objectives. Each of the key questions have associated metrics identified by the ATS and serve as the primary reporting focus in the Licensees annual reporting. Each year, the ATS adaptively manages components of the H&S program through development of annual operating plans (AOP). The 2022 AOP is located in Appendix B of the Hatchery and Supplementation Annual Report (**Attachment B**).

3.2.41 SA Section 9.6 Bull Trout Monitoring

PacifiCorp, on behalf of the Utilities, completed actions according to the *2022 Bull Trout Annual Operations Plan*. Results from activities performed and data obtained under SA Section 4.9.2 and 9.6 are provided in the *Bull Trout 2022 Annual Operations Report*, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.42 SA Section 9.7 Resident Fish Assessment

Given the spatial and temporal overlap of preferred spawning habitat and periodicity between coho and bull trout, there is concern that later spawning coho may superimpose redds over redds newly constructed by bull trout. To evaluate any superimposition, bull trout redd surveys were completed in Pine Creek, Pine Creek tributary P8, Rush Creek and Cougar Creek in September and October, 2022. All identified bull trout redds were labeled by Global Positioning Satellite, as well as physically marked within the stream for ease of identification at a later date. Coho redd surveys were subsequently performed of the same streams in October

and November to evaluate any redd superimposition by the two species. Two coho redds were observed to be superimposed over bull trout redds within Cougar Creek, and seven coho redds were observed to be superimposed over bull trout redds within P8 Creek, in 2022. No bull trout redd superimposition was observed in Rush Creek. In 2023, biologists will continue to watch for encroachment of coho into critical spawning streams for bull trout and assess their potential impacts.

Kokanee spawner abundance was evaluated within Yale Reservoir and estimates are included within the Yale Reservoir Kokanee 2022 Escapement Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.2.43 SA Section 9.8 Monitoring of Flows

Monitoring of Merwin flows and the Upper Release and the Constructed Channel flows has occurred on a continuous basis and will continue per the M&E Plan. See section 3.2.18 for additional information on the Upper Release and the Constructed Channel flows.

3.3 Aquatic 2022 Annual Plan

3.3.1 SA Section 4.2 Merwin Trap

Since the new trap was installed in December 2013 this section no longer applies.

3.3.2 SA Section 4.3 Merwin Upstream Collection and Transport Facility

The upstream collection and transport facility was considered substantially complete in April 2014, and has been in operation since. The new facility was designed to be modified in phases, offering the ability to incrementally improve fish passage performance (if needed) in the future to meet biological performance goals. Depending on the biological monitoring of the facility's performance (which began spring 2015 – reference Section 3.2.1.2 regarding the outcome of the biological monitoring and future modifications needed), there are up to four additional phases that will increase flow into the fishway attraction pools, and add a second fishway with additional attraction flow, if necessary. For more information regarding the Merwin Upstream Collection Facility, see the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

The intent of the modifications made to date to the collection facility were to enhance safe, timely, and effective passage of adult salmonids upstream.

3.3.3 SA Section 4.4 Downstream Transport at Swift No. 1 Dam

PacifiCorp completed and submitted the final design for the Swift Downstream Facility in December 2009 and the facility, referred to as the Swift Floating Surface Collector (FSC) was put into service December 26, 2012. PacifiCorp purchased the land needed for the downstream Release Pond and the pond facility was constructed in December 2017. The Release Pond facility began full operation in March 2018 and is operated in concurrence with the Swift FSC. For more information regarding the Swift Downstream Facility and Release Pond Facility, see the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.3.4 SA Section 4.9 Interim Bull Trout Collection and Transport

PacifiCorp and Cowlitz PUD are to investigate alternative Bull Trout collection methods in consultation with the ACC. The *2023 Bull Trout Annual Operations Plan* has been incorporated into this Annual Report and has been submitted to the ACC including USFWS and NMFS. This document can be found within the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.3.5 SA Section 5.2 Bull Trout Habitat Enhancement Measures

PacifiCorp will continue to manage the Cougar Creek Conservation Covenant and Cowlitz PUD will continue to manage the Devil's Backbone Conservation Covenant to benefit bull trout.

3.3.6 SA Section 5.7 Public Information Program to Protect Bull Trout

PacifiCorp will continue to provide flyers with the same information at recreation park entrance booths. The Utilities will also provide such flyers to enforcement personnel for distribution.

3.3.7 SA Section 6.1 Flow Releases in the Bypass Reach; Constructed Channel

PacifiCorp and Cowlitz PUD will continue to adhere to the Swift bypass reach and constructed channel flow release schedule specified in the 401 Water Quality certifications.

3.3.8 SA Section 6.2 Flow Fluctuations below Merwin Dam

PacifiCorp will continue to implement the operational flow regimes as identified in the SA and the Merwin FERC License.

3.3.9 SA Section 7.1 Large Woody Debris Project

PacifiCorp will continue to maintain the available funds in a Tracking Account per the SA to help defray the costs of LWD transport.

3.3.10 SA Section 7.2 Spawning Gravel Study and Gravel Monitoring and Augmentation Plan

Periodic monitoring will continue pursuant to determining the need for gravel supplementation if flows exceed 42,000 cfs.

3.3.11 SA Section 7.4 Habitat Preparation Plan

PacifiCorp's obligation under the Habitat Preparation Program for Swift Reservoir ended in 2012. Formal reintroduction of fish collected at Merwin Trap replaced the Habitat Preparation Program for all reintroduction species. The Habitat Preparation Program for Yale Reservoir, was implemented in 2022. The Licensees finalized the Yale Habitat Preparation Plan in July 2022 in consultation with the ACC.

3.3.12 SA Section 7.5 Aquatics Fund

On December 31, 2022, the Forest Service had a remaining balance of \$1,215.98 in unspent funds specific to Collection Agreement 17-CO-11060300-031 (Lewis River 21 Phase 1 project). These funds will be returned to PacifiCorp in 2023 to be applied toward future habitat improvement projects awarded by the ACC.

3.3.13 SA Section 8.2 Hatchery and Supplementation Plan

The Utilities submitted an updated H&S plan to the FERC on December 29, 2020. On March 28, 2022, FERC approved the 2020 H&S Plan. The next update of the H&S plan is scheduled to be completed on or before March 28, 2027.

3.3.14 SA Section 8.3 Anadromous Fish Hatchery Adult Ocean Recruit Target by Species

An analysis of ocean recruitment is stipulated in the Settlement Agreement to determine when the hatchery and natural adult production targets established for the upstream passage program are met. For this analysis, the average number of ocean recruits over a five-year period will be evaluated (i.e., five consecutive brood years). These data will be evaluated to determine if and when hatchery production levels should be altered. A detailed description of the methodology for this analysis is outlined in Objective 12 of the current M&E Plan (2022).

No Ocean Recruit analysis was conducted in 2022 (see Section 3.2.30 for additional information on Ocean Recruit analysis). For more information regarding Ocean Recruit analysis and threshold targets, see detailed information in Section 3.2.30 above, or in the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2021 Annual Report (**Attachment C**).

3.3.15 SA Section 8.4 Anadromous Fish Hatchery Juvenile Production

Per the SA and the *Hatchery and Supplementation Plan* and depending on the adult returns of spring Chinook, the Licensees will provide for the production of spring Chinook salmon smolts, steelhead smolts, and coho salmon smolts at levels specified (“Juvenile Production”) in the H&S plan.

3.3.16 SA Section 8.6 Resident Fish Production

Subject to Section 8.6.3, the Licensees will continue to provide for the production of 20,000 pounds of resident rainbow trout (to Swift reservoir) and 12,500 pounds of kokanee (to Merwin reservoir) each year following per the FERC licenses and H&S Plan.

3.3.17 SA Section 8.7 Hatchery and Supplementation Facilities, Upgrades, and Maintenance

The Licensees have fulfilled their obligation with respect to SA Section 8.7 hatchery upgrades.

3.3.18 SA Section 8.8 Juvenile Acclimation Sites

With damages that occurred to the acclimation facilities caused by flood flows in December 2015, the ACC agreed that acclimation releases would be suspended until further notice. On December 5, 2017, PacifiCorp filed with the FERC a request for Commission approval to decommission the juvenile fish acclimation pond facilities located along the Muddy River,

Clear Creek and upper Lewis River near Crab Creek within the Gifford Pinchot National Forest Service. On January 4, 2018, the Commission responded with an order approving the December 5, 2017 request. The acclimation site located on the Muddy River was decommissioned from August through October of 2018. The acclimation sites located along Clear Creek and in the upper Lewis River near Crab Creek were both decommissioned from August through November 2019. All sites were restored to pre-construction condition. The final decommissioning report was filed with FERC on December 12, 2019. Spring Chinook targeted for acclimation sites in 2019 were released downstream of Merwin Dam as part of rearing and release strategies being evaluated as part of the Hatchery and Supplementation program. This practice continued in 2022. It is expected that spring Chinook releases will continue to be released as part of the hatchery program downstream of Merwin Dam until the ACC recommends reinitiating the upstream acclimation program. For more information regarding the Juvenile Acclimation Sites and downstream releases of spring Chinook, see the Lewis River Fish Passage Program 2022 Annual Report, which is an appendix to the Lewis River Monitoring and Evaluation Program 2022 Annual Report (**Attachment C**).

3.3.19 SA Section 9.6 Bull Trout Monitoring

The Licensees will continue to monitor and evaluate bull trout populations in the Lewis River basin following approval of the Bull Trout Annual Operating Plan (AOP). Overarching long-term bull trout monitoring objectives are included within the M&E Plan. Specific monitoring tasks, including methods and locations, will continue to be developed and included within the bull trout AOP and submitted to the USFWS and ACC annually.

3.3.20 Monitoring and Evaluation Post-Season Incidental Take

Each year PacifiCorp handles and processes numerous ESA-listed fish species. As part of the NOAA Fisheries Biological Opinion, PacifiCorp is to use an Incidental Take Form provided by NOAA Fisheries to report on species taken during the previous year of scientific activity. The Incidental Take Form reporting the 2022 sampling year is provided in **Table 6**.

Table 6. Aquatic Species Incidental Take form used for reporting in 2022.

ESU Species	Life Stage	Origin	Take Activity	Number of Fish Authorized for Take	Actual Number of Listed Fish Taken	Authorized Unintentional Mortality	Actual Unintentional Mortality	Evaluation Location	Evaluation Period
LCR Chinook	J	NOR	Screwtrap, Mark, Release	N/A	163,605	–	–	NF Lewis River, WA	Mar 8 – July 11
LCR Chinook	J	HOR	Screwtrap, Mark, Release	N/A	47	–	–	NF Lewis River, WA	Mar 8 – July 11
Oregon Coast Coho	J	NOR	Screwtrap, Mark, Release	N/A	3,962	–	–	NF Lewis River, WA	Mar 8 – July 11
Oregon Coast Coho	J	HOR	Screwtrap, Mark, Release	N/A	21,359	–	–	NF Lewis River, WA	Mar 8 – July 11
LCR Steelhead	J	NOR	Screwtrap, Mark, Release	N/A	1,421	–	–	NF Lewis River, WA	Mar 8 – July 11
LCR Steelhead	J	HOR	Screwtrap, Mark, Release	N/A	2,235	–	–	NF Lewis River, WA	Mar 8 – July 11
LCR Chinook	A	HOR	Merwin Fish Trap, Mark, Release	N/A	4,662	N/A	–	NF Lewis River, WA	Jan 1 – Dec 31
LCR Chinook	A	NOR	Merwin Fish Trap, Mark, Release	N/A	687	N/A	–	NF Lewis River, WA	Jan 1 – Dec 31
LCR Steelhead	A	HOR	Merwin Fish Trap, Mark, Release	N/A	6,371	N/A	–	NF Lewis River, WA	Jan 1 – Dec 31
LCR Steelhead	A	NOR	Merwin Fish Trap, Mark, Release	N/A	662	N/A	–	NF Lewis River, WA	Jan 1 – Dec 31
Oregon Coast Coho	A	HOR	Merwin Fish Trap, Mark, Release	N/A	31,768	N/A	–	NF Lewis River, WA	Jan 1 – Dec 31
Oregon Coast Coho	A	NOR	Merwin Fish Trap, Mark, Release	N/A	3,462	N/A	14	NF Lewis River, WA	Jan 1 – Dec 31
LCR Chinook	J	NOR	Swift Surface Collector	N/A	2,534	N/A	73	NF Lewis River, WA	Jan 1 – Dec 31
LCR Steelhead	J	NOR	Swift Surface Collector	N/A	5,526	N/A	34	NF Lewis River, WA	Jan 1 – Dec 31
LCR Steelhead	A	NOR	Swift Surface Collector	N/A	70	N/A	3	NF Lewis River, WA	Jan 1 – Dec 31
Oregon Coast Coho	J	NOR	Swift Surface Collector	N/A	64,694	N/A	256	NF Lewis River, WA	Jan 1 – Dec 31

J = juvenile; A = adult







4.0 WATER QUALITY

4.1 PacifiCorp Water Quality Measures Implemented in 2022

4.1.1 *PacifiCorp Application for 401 Water Quality Certificate for Yale, Swift No. 1 and Merwin Hydroelectric Projects*

On October 9, 2006, Ecology provided 401 Water Quality certificates for the Merwin, Yale, and Swift No. 1 hydroelectric projects. These 401 Certifications have subsequently been amended several times. Until the FERC issued licenses for the Lewis River Hydroelectric Project June 26, 2008, PacifiCorp implemented those measures contained in the 401 Certifications that were not FERC license-specific and has implemented all the 401 requirements since June 26, 2008.

4.1.2 *SA Section 9.4 Water Quality Monitoring*

The following section covers water quality monitoring activities performed in accordance with Ecology's Lewis River 401 water quality certifications. More specifically this section covers the monitoring of Total Dissolved Gas (TDG), water temperature, and dissolved oxygen as prescribed in the Water Quality Management Plan submitted in July 2013 (WQMP) and approved by Ecology on September 20, 2013. Some monitoring parameters are ongoing from previous years, such as TDG monitoring in Swift No. 1 and Yale tailraces; while other activities such as Merwin, Yale, and Swift forebay temperature profiles were implemented for the first time in 2007 and continued in 2022. Water quality data collected in 2022 are summarized in this report; 2022 data tables are available per request.

Per the 401 water quality certificates, monitoring of projects' spillway TDG levels continued through 2022. Tailrace TDG monitoring has been ongoing since 1995 and will continue per the direction of the 401 requirement. Until it is shown that a water temperature issue does not exist, PacifiCorp will also continue to monitor water temperature in the forebays and tailraces of each project and, in cooperation with Cowlitz PUD, monitor water temperature in the Swift Bypass Reach. A summary of the water quality parameters associated with this section (TDG, Water Temperature and Dissolved Oxygen) to be monitored and the schedule of that monitoring, as taken from the WQMP, are summarized below in **Table 7**.

Table 7. Water quality parameters to be monitored and the schedule of that monitoring according to the July 2013 WQMP.

Parameter	Total Dissolved Gas	Dissolved Oxygen	Temperature
Merwin	During periods of spill, PacifiCorp shall monitor total dissolved gas concentrations just downstream of Merwin spillway. The current monitoring site is approximately ½ mile downstream of the Merwin spillway outlet. TDG concentrations must be <110% unless natural inflows to Merwin Reservoir are equal to or greater than the seven-day average flow of the 10-year probable maximum flood, which for Merwin has been calculated as 32,884 cfs.. If TDG exceeds 110% saturation when natural inflows are less than 32,884cfs, PacifiCorp must provide TDGWQAP with data.	PacifiCorp must monitor dissolved oxygen in Merwin forebay at the approximated turbine intake depth (~150 ft depth) and, congruently, in Merwin tailrace. Dissolved oxygen monitoring is required to be monitored hourly during the months of September and October.	PacifiCorp is required to monitor water temperatures in Merwin forebay at depths of 1, 5, 10, 20, 40, 60, 100, and 200 feet. The monitoring period is from May 1st through October 31st hourly each year. PacifiCorp also must monitor Merwin tailrace temperatures hourly all year and report the temperature data as 7DADMAX values. 7DADMAX values are not to exceed 16°C (13°C Sept.1-June 15).
Frequency/ Duration	PacifiCorp's requirement to monitor TDG levels below Merwin Dam, as it relates to spill, is ongoing indefinitely.	PacifiCorp is required to monitor dissolved oxygen levels below Merwin tailrace until the dissolved oxygen levels are found to not go below 8 mg/l for a period of 5 consecutive years.	PacifiCorp is required to monitor Merwin tailrace temperatures until the tailrace temperatures do not exceed 7DADMAX values of 16°C (13°C Sept. 1-June 15) for five consecutive years.
Yale	PacifiCorp must monitor turbine outlets to assure compliance with the maximum allowable TDG levels of 110%. During periods of spill, PacifiCorp shall monitor total dissolved gas concentrations just downstream of Yale spillway. The current monitoring site is approximately 1/4 mile downstream of the Yale spillway outlet. TDG concentrations must be <110% unless natural inflows into Yale Reservoir are equal to or greater than the seven-day average flow of the 10-year probable maximum flood, which for Yale has been calculated as 27,088 cfs. If TDG exceeds 110% saturation when natural inflows are less than 27,088 cfs, PacifiCorp must provide TDGWQAP with data.	N/A	PacifiCorp must monitor water temperatures in Yale forebay at depths of 1, 5, 10, 20, 40, 60, and 100 feet. The monitoring period is from May 1st through Oct. 31 st each year on an hourly interval. PacifiCorp must monitor Yale tailrace water temperatures at a depth of 15ft deep, hourly all year. Yale tailrace temperatures are reported as 7DADMAX values.
Frequency/ Duration	The monitoring of TDG levels at the Yale turbine outlets is ongoing if exceedances occur until 3 months after such exceedances are corrected. The monitoring of TDG levels, as it relates to spill, is ongoing indefinitely.	N/A	Yale forebay and tailrace temperature monitoring is ongoing until temp is shown to not increase the 7-DADMax temperature more than 0.3°C (0.54°F) above natural conditions.

Parameter	Total Dissolved Gas	Dissolved Oxygen	Temperature
Swift 1	PacifiCorp must monitor TDG levels in Swift No. 1 tailrace to assure compliance with maximum allowable TDG levels of 110%. During periods of spill, PacifiCorp must monitor TDG levels just downstream of the aeration zone. This monitoring site is ~½ mile downstream of the Swift No. 1 spillway. TDG concentrations must be <110% unless natural inflows into Swift Reservoir are equal to or greater than the seven-day average flow of the 10-year probable maximum flood, which for Swift No. 1 has been calculated as 21,322 cfs. If TDG exceeds 110% saturation when natural inflows are less than 21,322 cfs, PacifiCorp must provide TDGWQAP with data.	N/A	PacifiCorp must monitor Swift No. 1 forebay at depths of 1, 5, 10, 20, 40, 60, 80, 120, and 145 feet. The monitoring period is from May 1st - Oct. 31 st each year. PacifiCorp must monitor the Swift No. 1 tailrace power canal at a depth of 15 ft. hourly all year. PacifiCorp must monitor water temperatures in the Swift Bypass near the upper release, just upstream of the constructed channel confluence, 50 meters downstream of the constructed channel confluence, 50 meters both above and below Ole Creek confluence, in the constructed channel just downstream of Canal Drain, and in the Power Canal near the Canal Drain.
Frequency/ Duration	The monitoring of TDG levels at the Swift No. 1 turbine outlets is ongoing if exceedances occur until 3 months after such exceedances are corrected. The monitoring of TDG levels, as it relates to spill, is ongoing indefinitely.	N/A	PacifiCorp will continue to monitor water temperatures in Swift No.1 forebay, the Swift Power Canal, and the Swift Bypass Reach until the dynamics of the system are understood.

Locations of water quality monitoring sites are shown below in **Figures 6 and 7**.



Figure 6. Locations of water quality monitoring sites for Yale and Merwin Reservoirs.

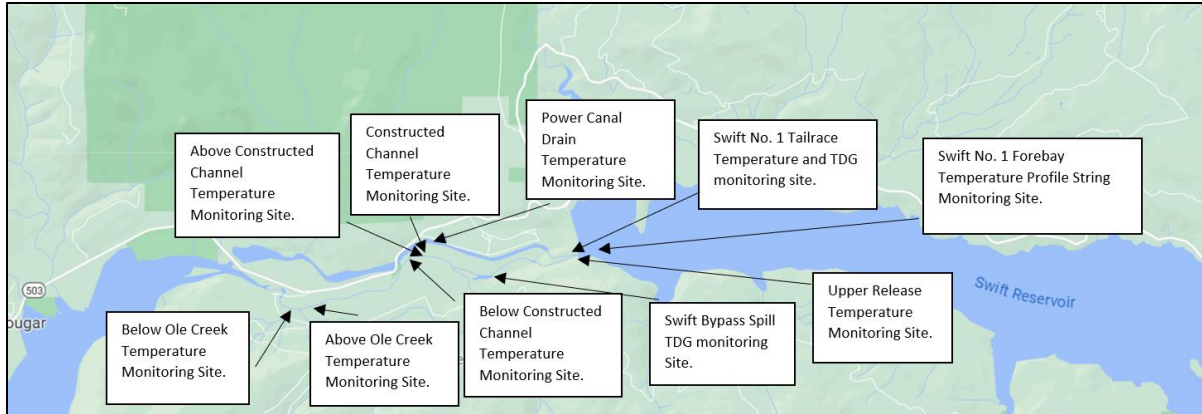


Figure 7. Locations of water quality monitoring sites for Swift Reservoir and Swift Bypass Reach.

4.1.2.1 2022 Total Dissolved Gas Analysis for Yale, Swift No. 1 and Merwin Hydroelectric Project Spills

Upon issuance of the 401 water quality certificates, PacifiCorp began monitoring of spillway TDG in the fall of 2006. Previous TDG monitoring sites near the Swift No. 1, Yale and Merwin spillways were reactivated at the beginning of the 2021/2022 high run-off period.

During 2022, four high flow events resulting in spill were experienced on the Lewis River Project. The first spill event occurred in early January at all Project spillways, followed by a spill only at Merwin in the beginning of March, a spill at Swift No. 1 and Yale in mid-June, and lastly a spill only at Merwin in early November. As a result of high spill volumes over the dam to manage the high flow events, TDG levels greater than 110% were observed downstream of the Merwin spillway during the March and November events. No TDG levels greater than 110% were observed downstream of both Swift No. 1 and Yale spillways. It is important to note that the seven-day average flow of the ten-year flood interval (7Q10) was reached for each event in which TDG values greater than 110% were observed. TDG levels greater than 110% are allowable when natural inflows to a project meet or exceed that project’s respective 7Q10 assignment. A summary of the 2022 spill events are shown below in **Table 8**. Graphs of each spill event are presented in Attachments D, E, and F for Yale, Swift, and Merwin, respectively. TDG monitoring downstream of Swift No. 1, Yale and Merwin spillways is ongoing and will continue as prescribed in the WQMP.

Table 8. Summary of 2022 spill data at each Project.

Project	Spill Date (2022)	TDG Exceedance Hours	Maximum TDG Level	Maximum Natural Inflow	7Q10 Flow
Swift 1	Jan 7 – Jan 8	0 hours	99.6%	17,273 cfs	21,322 cfs
Yale	Jan 7 – Jan 8	0 hours	100.6%	28,114 cfs	27,088 cfs
Merwin	Jan 7 – Jan 8	0 hours	108.2%	37,348 cfs	32,884 cfs
Merwin	March 1 – March 3	27 hours	112.3%	40,615 cfs	32,884 cfs
Swift	June 16 – June 20	0 hours	101.1%	8,280 cfs	21,322 cfs
Yale	June 16 – June 20	0 hours	105.1%	12,694 cfs	27,088 cfs
Merwin	Nov 4 – Nov 5	1 hour	110.8%	38,884 cfs	32,884 cfs

4.1.2.1.1 *Yale Tailrace TDG*

Total dissolved gas data in the Yale tailrace (**Attachment D**) were gathered hourly in 2022 using a HydroLab Series 5 miniSonde (MS5). A stainless-steel tube is permanently attached to the Yale powerhouse wall and submerged to a depth of 15 feet. The HydroLab is deployed within this tube to protect the probe and maintain consistent depth at 15 feet. In 2022, 8,627 hourly data points were recorded in the Yale tailrace, of which zero hourly data point exceeded the state standard of 110% (**Attachment D**). Total dissolved gas levels greater than 110% have been observed in the past and can be produced during times of motoring operations and at low generation levels. Motoring Operations involves spinning a turbine using grid power to have the unit ready to engage at a moment's notice in case of a power plant outage in another area of the Western Grid or in the case of a surge in power demand. During times of normal generation, elevated levels of tailrace TDG are not typically observed.

During 2022 PacifiCorp continued measures at the Yale tailrace to control TDG during motoring operations. These measures include automated "flushing" of the tailrace periodically. Flushing is defined as ramping one unit to 5 MW for ten minutes. The frequency of this event depends on real-time dissolved gas measured in the tailrace with the MS5 and is fully automated through the Programmable Logic Control (PLC). This measure was first implemented October 20, 2007 and continues to be an effective procedure in reducing TDG levels in the Yale tailwaters as demonstrated in the 2021 data.

In addition to flushing flows, automated air valves have been in place since 2009 to limit the volume of air entering the turbine throughout the operating range of each unit. This investment provides control of excessive TDG in the Yale tailwaters during normal operations of the units.

4.1.2.1.2 *Swift No. 1 Tailrace TDG*

TDG data (**Attachment E**) were gathered hourly in the Swift No. 1 tailrace using two HydroLab Series 5 minisondes (MS5). The second meter is used for comparison and quality control as well as determining if differences in TDG exist based on individual unit operation. Similar to the Yale tailrace, meters are deployed within steel tubes permanently attached to the powerhouse wall. Meter No. 1 is located between the draft tubes of Units 11 and 12 while Meter No. 2 is located between the draft tubes of Units 12 and 13. The meters gather data hourly from a water depth of 15 feet. Data between the two meters are averaged and provided in graphical form (**Attachment E**). Of the 8,723 data points collected in 2022, thirty-five (35) hourly data points exceeded the 110% state standard. Similar to Yale tailrace, data points greater than 110% can be produced during times of project motoring operation or prolonged periods of inefficient operation between 20 and 40 MW per unit. During times of normal generation, elevated levels of TDG are not typically observed.

To reduce TDG within Swift No. 1 tailrace during periods of normal generation and load following operations, air intake modifications and automation were made in 2005 that limit the volume of air entering the units over their generation range based on a predefined air volume curve. This measure, while effective at normal generation levels, is not effective during periods of motoring. Flushing procedures used at Yale have been demonstrated to be effective, and the same procedure has been implemented at Swift No. 1. Modifications were made in late October 2012, to ensure that air entrainment would not be possible during periods of motoring operation.

TDG monitoring of Swift No. 1 and Yale Tailraces are ongoing and will be continuously monitored as prescribed in the WQMP.

4.1.2.1.3 *Swift No. 1 Forebay TDG*

TDG data was gathered hourly in the Swift No. 1 forebay from February 7, 2008 to May 31, 2008 using a HydroLab Series 5 datasonde (DS5). The meter was deployed to a water depth of 15 feet from the dam intake deck via steel cable. During the period, 2,747 data points were recorded. Of those data points none were found to exceed 110% TDG saturation. Based on Table 2 in section 4.8 of the 401 water quality certification for the Swift No. 1 hydroelectric facility, TDG monitoring in the project forebay is “Ongoing if exceedances occur until three months after such exceedances are corrected”. No exceedances were recorded in the four-month monitoring period for the Swift No. 1 forebay, therefore monitoring activities were suspended as of May 31, 2008.

4.1.2.2 *2022 Temperature Profiles for Merwin, Yale, and Swift No. 1 Forebays and Corresponding Temperature Comparison between Forebay Intake Depth and Tailrace for Each Project*

Graphs representing forebay temperature profiles from the surface to reservoir bottom and graphs comparing forebay intake depth temperatures to the tailrace temperatures for Yale, Swift No. 1, and Merwin during 2022 are included in **Attachment D**, **Attachment E** and **Attachment F**, respectively. Data points for forebay temperature profiles are two-week averages of hourly temperature readings taken at each specified depth.

Data points for intake depth/tailrace comparison were taken hourly from a depth of 15 feet in project tailraces, and at specified intake depth in project forebays. This hourly data was then converted to seven-day averages of the daily maximum temperature (7DADmax). Temperature data were gathered using Onset HOB0 prov2 Temp Loggers[®]. Prior to deployment, each temperature thermograph was verified and calibrated using a National Institute of Standards and Technology (NIST) certified reference thermometer.

Due to global supply chain issues in 2022, PacifiCorp was unable to receive newly purchased Onset HOB0 prov2 Temp Loggers[®] in time for the scheduled deployment of May 1st for forebay temperature strings. The new temperature loggers were purchased in early March 2022 but were not received from the vendor until late-May. Because of this, in 2022 forebay temperature monitoring began on June 8th, May 28th, and June 2nd for Yale, Swift, and Merwin forebays, respectively.

4.1.2.2.1 *Yale*

Temperature stratification was observed in Yale forebay for the entire monitoring period of June through October 2022 (**Attachment D**). The warmest two-week average temperature, 22.8°C, was observed 1 foot below the surface in early August. The coldest observed temperature was 6.9°C and was recorded at a depth of 80 feet in the beginning of June. The Yale forebay temperatures and tailrace 7DADmax temperature graphs are presented in **Attachment D**. The tailrace temperatures are comparable to what has historically been observed.

4.1.2.2.2 *Swift No. 1*

The warmest two-week average temperature, 20.0°C, was observed 23 feet below the surface in early August. The coldest observed temperature was 5.9°C and was recorded at a depth of

122 feet in early May. In 2022 the Swift thermograph string was attached to a vertically fixed position. To assign logger depths, fluctuating reservoir levels were correlated to each temperature logger's fixed elevation. Bi-weekly average logger depths were calculated and assigned to corresponding bi-weekly average temperatures (**Attachment E**).

Hourly temperature readings were taken from the Swift No. 1 tailrace from a depth of 15 feet using HydroLab Series 5 miniSonde. Hourly temperatures were then converted to 7DADmax readings for an intake depth temperature to tailrace temperature comparison per the direction of the 401 certification (**Attachment E**). Many different environmental factors influenced the intake depth to tailrace water temperature comparison, namely; reservoir elevations, powerhouse operations, configuration of the water withdrawal system, and placement of the forebay thermistors.

The bathymetry of Swift Reservoir in the vicinity of the penstock intakes is unusual. Instead of the entrance of the intakes lying on the reservoir bottom, drawing water from all angles, they are at the downstream end of a deep and narrow trench notched into the hillside during construction of the dam. The intakes influence the mixing of stratified water columns as they draw water through the trench. It is difficult to deploy thermographs that spatially align and represent the temperature regime occurring near the intake (**Attachment E**) as it relates to the Swift No. 1 tailrace temperature.

4.1.2.2.3 *Merwin*

As in prior years, temperature stratification was observed in Merwin Reservoir during the entire monitoring period, with the reservoir getting progressively warmer until turn-over in the latter half of October (**Attachment F**). The coldest two-week temperature average, 9.2°C, was recorded at the beginning of June at intake depth of 178 feet. The warmest two-week average temperature was 22.5°C at the reservoir surface in mid-August. Since PacifiCorp considers the reservoir conditions as baseline, there were no observed temperature exceedances for Merwin Reservoir in 2022.

An Onset HOB0 Pro v2 Temp Logger[®] temperature recorder was positioned within the Merwin tailrace at a depth of approximately 15 feet and hourly temperature recordings were taken for the duration of 2022 (**Attachment F**). Hourly readings were converted to seven-day averages of the daily maximum temperature (7DADmax). During the June 15 through September 15 time period, 165 7DADmax data points were recorded and zero were observed to be greater than the state standard of 16° C. During the Jan 1 through June 14 and September 15 to December 31 time frames; 273 7DADmax data points were recorded. Of these, 67 were observed to be greater than the state standard of 13° C, all of which occurred between September 15 and November 20, 2022 (**Attachment F**). PacifiCorp will continue to monitor this condition as per the WQMP approved by Ecology in September 2013 and the Merwin Dam Compliance Schedule and Workplan approved by Ecology in November 2021.

Temperature monitoring of Swift No. 1, Yale and Merwin forebay's are ongoing and will continue as prescribed in the WQMP.

4.1.2.3 2022 Dissolved Oxygen Comparison between Merwin Forebay Intake Depth and Merwin Tailrace in September and October

Half-hourly dissolved oxygen levels in milligrams per liter (mg/l) were measured in the Merwin forebay at an approximate depth of 150 feet and in Merwin tailrace at an approximate depth of 15 feet from mid-August through mid-November 2022 (**Attachment F**). Measurements in the forebay and tailrace were recorded with a HydroLab Series 5 datasonde (DS5).

Both Merwin forebay and tailrace DO meters experienced a malfunction (dead batteries) from 9/10-9/15/22. Of the 3,433 data points collected in the tailrace, 2,641 of them were lower than the minimum state standard of 10 mg/L. The minimum dissolved oxygen level observed in Merwin forebay and tailrace were 6.8mg/L and 7.4mg/L, respectively. Merwin dissolved oxygen monitoring is ongoing and monitoring will continue as prescribed in the existing WQMP and the Merwin Dam Compliance Schedule and Workplan approved by Ecology in November 2021.

4.1.2.4 Lewis River Temperature and Dissolved Oxygen Water Quality Attainment Plan

PacifiCorp continues to implement the Ecology-approved Water Quality Management Plan (WQMP) (Approved by Ecology on September 20, 2013). As discussed above, PacifiCorp has continued to monitor temperature and dissolved oxygen in the Merwin forebay and tailrace, as required by the certification conditions as well as the WQMP. On November 5, 2021 Ecology approved the Merwin Dam Compliance Schedule and Workplan (October 2021). As described in section 4.2 below, PacifiCorp will follow the new compliance schedule requirements.

4.1.2.5 2022 Temperature Comparison in the Swift Bypass Reach between Waters Upstream and Downstream of the mouth of Ole Creek

Prior to 2021, to monitor Swift bypass temperature conditions, temperature loggers were put in Swift bypass reach 50 meters upstream and downstream of the Ole Creek confluence. Temperature data were then converted to 7DADmax values and compared to state standards. In review of Swift Bypass temperature data contained in past annual reports, it was revealed that 7DADmax temperatures in Swift Bypass came very close to exceeding state standards. PacifiCorp made the decision to expand monitoring efforts in 2021 of Swift bypass temperatures. PacifiCorp added four more temperature monitoring sites to aid in characterizing the Swift bypass temperatures. These new sites were added to collect temperature data on the inputs to Swift bypass reach and are located at the upper release point, the power canal at the siphon to the constructed channel, the constructed channel just downstream of siphon, and air temperature near the constructed channel. In 2022, two more additional sites were added in Swift Bypass just above and approximately 50 meters below the confluence of the constructed channel. Data from 2022 at all sites were converted to 7DADmax values and are presented in **Attachment D**. Temperatures were recorded using Onset HOBO pro v2 Temp Loggers®.

The temperature logger in the Bypass just above the confluence of the constructed channel experienced a malfunction during the entire monitoring period. Of the 7 sites monitoring the Swift Bypass water temperatures, only the monitoring station immediately downstream of Swift No. 1 turbines (tailrace site) experienced 7DADmax values above the state standard of 16°C. Out of the 364 7DADmax recorded in Swift No. 1 tailrace, 4 were above the state

standard of 16°C, with a maximum of 16.7°C recorded on 9/7/2022. A total of 2,042 7DADmax values were recorded for the remaining 6 sites, of which no exceedances of the state standard were observed.

Temperature monitoring of Swift bypass temperature upstream and downstream of the Ole Creek confluence is ongoing and will continue as prescribed in the WQMP.

4.1.2.6 2022 Redd and Biological Surveys of the Lewis River Bypass Reach, Upper Release Point and Canal Drain Constructed Channels

In compliance with section 4.2(10)(a) and 4.2(11) of the Washington Department of Ecology issued 401 Water Quality Certificate for Swift 1 Hydroelectric Project, PacifiCorp will conduct quarterly biological surveys and bi-weekly redd surveys (during Sept. 15th- Nov. 15th) of the Lewis River Bypass Reach, Upper Release Point and Canal Drain Constructed Channels on a set schedule as stipulated within Section 4.2(10)(a-e) of the 401 Water Quality Certificate.

According to the schedule defined within section 4.2(10)(a-e) of the 401 Water Quality Certificate, PacifiCorp was not required to perform any biological or redd surveys of the Lewis River Bypass Reach, Upper Release Point or Canal Drain Constructed Channels in 2022.

4.2 PacifiCorp Water Quality 2023 Annual Plan

PacifiCorp will implement the following water quality measures in 2023.

4.2.1 Water Quality Management Plan

PacifiCorp will continue to implement the Ecology-approved Water Quality Management Plan (WQMP) (Approved by Ecology on September 20, 2013). On November 5, 2021 Ecology approved the Merwin Dam Compliance Schedule and Workplan (October 2021). Accordingly, PacifiCorp shall follow the compliance schedules for dams [WAC 173-201A-510(5)(a-i)] not to exceed ten years' time (November 5, 2031); the following schedule shall be complied with:

- PacifiCorp shall submit to Ecology for review and approval a quality assurance project plan (QAPP) to include detailed sampling strategies and methodologies for lab and data analyses, by March 1, 2022 (completed and approved by Ecology in 2022); and
- PacifiCorp shall begin monitoring for data gaps to assess the existing conditions that support productivity and rearing habitat for salmonids June 1, 2022 through December 31, 2024 (BMI/productivity surveys will be completed during the growing season - ~ May - Oct)(completed in 2022 and will continue in 2023); and
- Water quality data collection related to temperature, dissolved oxygen, and nutrients will commence June 1, 2022 through December 31, 2024 (WQ surveys will be completed during the growing season - ~ May - Oct)(completed in 2022 and will continue in 2023); and
- Development of downstream temperature and dissolved oxygen modeling workplan will begin March 1, 2022. This includes:
 - Model development and data collection shall begin June 1, 2022, and
 - Model development and validation shall be completed by December 31, 2024
 - Data collection began in 2022 and a working model was also developed in 2022. Data collection will continue in 2023 and the model

adjusted/calibrated as more data/additional years are ran through the model. Model validation is on track to be completed by the end of 2024.

- PacifiCorp shall provide a detailed analysis of reasonable and feasible options, include the following:
 - Engineering evaluations (begin June 1, 2022)
 - Economic Analysis (begin November 5, 2023)
 - Detailed analysis of downstream effects (begin December 31, 2024)
 - Engineering, economic, and ecological analyses completed (December 1, 2025)
 - Draft recommendations on next steps (November 1, 2026)
- The following reporting schedule is required:
 - Annual report of activities and findings submitted (March 1, 2023 through submittal of next steps November 1, 2026)
 - The 2022 Merwin Compliance Annual Report was sent to Ecology on February 23, 2023.
 - Annual meetings (mid-March 2022 through October 2031) – first meeting will occur in December 2021 to set date and agenda (QAPP) for March 2022 meeting (Note: December 2021 meeting was conducted with PacifiCorp on January 10, 2022)

4.2.2 Flow Monitoring

PacifiCorp will continue to monitor flows in the Swift bypass reach (Upper Release flow and Constructed Channel flow) and flow/ramp rates downstream of Merwin dam.

4.2.3 Bypass Reach Gravel Replacement

PacifiCorp and Ecology met onsite at the Swift bypass reach to view gravel conditions following a December 2015 high flow event. That event resulted in spill exceeding 10,000 cfs that completely scoured the replaced spawning gravel out of the channel. Based on this occurrence and other spill events in the past, Ecology provided PacifiCorp a determination dated December 14, 2016 to cease gravel augmentation in the Swift bypass reach until further notice.

4.2.4 Lake Merwin Canyon Water Quality Attainment Plan

Implement the Lake Merwin Canyon (Yale Tailrace) Water Quality Attainment Plan per the final WQMP approved by Ecology in September 2013. On May 26, 2021 PacifiCorp requested Ecology's concurrence to cease temperature monitoring in the Yale tailrace. By letter on October 21, 2021 Ecology evaluated the supporting information and provided concurrence with PacifiCorp's request.

4.2.5 Swift and Merwin Spill TDG Attainment Plan

Implement Merwin Spill TDG Attainment Plan per the final WQMP approved by Ecology in September 2013. Implement the Swift Spill TDG Attainment Plan as approved by Ecology in February 2014.

4.2.6 Lewis River Project Temperature Model

A CE-QUAL-W2 model was completed, and a report was submitted to Ecology in 2015. This CE-QUAL-W2 model was improved upon (largely by improving bathymetry data/reducing bathymetry interval height, Δz) and used in creating the Merwin Dam Compliance Schedule and Workplan proposal submitted to Ecology in October 2021.

4.2.7 Yale-Swift Turbine TDG Corrective Action Plan

Continue implementation of corrective actions and monitoring for turbine TDG for the Yale and Swift projects. A copy of the corrective action plan is included in the final WQMP. However, since PacifiCorp has been able to demonstrate compliance with TDG standards related to turbine operation at the Yale and Swift plants, Ecology has removed these sites from the 303(d) list of sites requiring a Total Maximum Daily Load (TMDL) procedure. PacifiCorp continues to monitor Swift No. 1 and Yale turbine TDG and implement actions to maintain TDG in the tailraces to less than the state standard of 110%.

4.3 Cowlitz PUD Water Quality Measures Implemented as of the End of 2022

On October 9, 2006, Ecology issued a Clean Water Act Section 401 Certification (Order No. 3676) to Cowlitz PUD for the continued operation of the Swift No. 2 Hydroelectric Project under a new FERC license (Ecology 2006). The Section 401 Certification, as amended^{1,2,3,4,10}, includes a number of conditions and general requirements directing Cowlitz PUD to comply with applicable water quality standards codified in 173-201A WAC. As of December 31, 2022, Cowlitz PUD has completed all of the requirements in the 401 Certification.

This section of the 2022 Annual Report lists the completed measures. Additional Settlement Agreement and amended Section 401 Certification requirements relating to instream flows, the constructed channel, gravel augmentation, salmonid monitoring, and water temperature monitoring in the Lewis River bypass reach are implemented together with PacifiCorp.

4.3.1 Swift No. 2 Project Water Temperature Monitoring

The water temperature monitoring program in the Swift No. 2 canal and forebay was completed in 2012 and fully satisfied the requirement of the amended Section 401 Certification to monitor a total of 10 qualifying periods. Final results were included in the 2012 Annual Report (PacifiCorp and Cowlitz PUD 2013).

As illustrated in Table 4.3.1-1, during the 2007, 2008, 2009, 2010, 2011, and 2012 forebay and log boom water temperature monitoring periods, there were a total of ten qualifying periods when the Swift No. 1 and Swift No. 2 projects were off-line for more than 48 consecutive hours. As a result, the completion of the 2012 sampling season fully satisfies the requirement of the amended Section 401 Certification to monitor a total of 10 qualifying periods. There were no documented exceedances of the 16.0°C 7-DADMax water temperature criteria at any

¹ https://www.ezview.wa.gov/Portals/_1962/images/FERC%20401s/swiftno2cert3676.pdf

² https://www.ezview.wa.gov/Portals/_1962/images/FERC%20401s/swift2amend1.pdf

³ https://www.ezview.wa.gov/Portals/_1962/images/FERC%20401s/swift2amend2.pdf

⁴ https://www.ezview.wa.gov/Portals/_1962/images/FERC%20401s/swift2amend3.pdf

¹⁰ https://www.ezview.wa.gov/Portals/_1962/images/FERC%20401s/swift2amend4.pdf

depth interval at the log boom or forebay sites during the six summer monitoring periods between 2007 and 2012. Results of monitoring over the past six years have clearly shown that regular operating procedures at Swift No. 1 and No. 2 maintain water temperatures that protect Core Summer Salmonid Habitat (i.e., will not cause any violation of the state water temperature standards).

Based on these findings, and consistent with its amended Section 401 Certification, Cowlitz PUD discontinued the water temperature monitoring program at both the log boom and forebay sites in September 2012.

Table 9. Total number of qualifying periods when the Swift No. 1 and Swift No. 2 projects were off-line for more than 48 consecutive hours during the 2007, 2008, 2009, 2010, 2011, and 2012 monitoring periods.

Year	Qualifying Off-line Periods
2007	3
2008	0
2009	3
2010	3
2011	0
2012	1
Total	10

4.3.2 Swift No. 2 Project Tailrace Water Quality Monitoring

On August 15, 2013, with Ecology’s written approval, Cowlitz PUD discontinued water quality monitoring in the Swift No. 2 tailrace. Final results of this monitoring were included in the 2013 Annual Report (PacifiCorp and Cowlitz PUD 2014).

After four years of detailed water quality monitoring, it is clear that the Swift No. 2 Project has no negative effect on water quality in the Swift No. 2 Project’s tailrace or in the upper end of Yale Lake, and may actually improve water quality conditions in the project area during the summer months. During the summer, discharges from the Swift No. 2 Project function to cool the water in the upper end of Yale Lake, improving aquatic habitat conditions for salmonids and other native cold water fish species. However, during periods when the project is off-line, water temperatures in the tailrace can increase as warmer surface water in Yale Lake begins to enter the tailrace area. Based on these findings and on the conditions included in the amended Section 401 Certification, which do not require a long-term water quality monitoring program in the tailrace, Cowlitz PUD believes there is a reasonable assurance that Project operations do not violate applicable water quality standards.

If project operations change in any way that could adversely affect water quality, Cowlitz PUD will consult with Ecology staff to determine an appropriate level of monitoring needed to document any changes to existing conditions.

4.3.3 Swift No. 2 Tailrace Total Dissolved Gas (TDG) Monitoring (401) Certification Section 4.8.3

The initial Water Quality Certification Section 4.8.3 study was completed in 2008 and included in the 2008 Annual Report.

As stipulated in Ecology's amended Water Quality Certification, Cowlitz PUD was required to monitor TDG in the project tailrace to capture a minimum of one month of TDG data during normal Project operations (at tailrace elevations above 485 ft msl and with the air injection system operating automatically to reduce turbine cavitation). TDG concentrations did not exceed the 110 percent criteria at any time during the 2008 or 2006 monitoring periods and in general, TDG concentration associated with Project operations are protective of designated beneficial uses, including salmonid, spawning, rearing, and migration. Based on these findings, Cowlitz PUD requested to discontinue TDG monitoring at the Swift No. 2 Project. However, should Cowlitz PUD implement any operational or structural adjustments that could change the amount of air entrained at the powerhouse, it would implement additional TDG monitoring to fully meet the requirements of its Section 401 Certification.

In September 2014, Cowlitz PUD replaced the original (1956) air intake valves for both turbines (Unit 21 and Unit 22) with new automated air intake valves. This modification triggered additional monitoring in 2014. Consistent with 401 Water Quality Certification Sections 4.3.4 and 4.8.3, Cowlitz PUD monitored TDG in the Swift No. 2 forebay and tailrace from June 24 to November 20, 2014. Final results of this monitoring were included in the 2014 Annual Report (PacifiCorp and Cowlitz PUD 2015).

As expected, and as previously documented (PacifiCorp Energy and Cowlitz PUD 2013), the results of sampling during this period indicated that the overall water quality in the Swift No. 2 Project tailrace remains good. During 2014, TDG in the Swift No. 2 Project tailrace ranged from 92.6 percent saturation to 109.5 percent saturation. The highest TDG values were observed just prior to installation of the air intake valve when the project was not generating. These values were most likely due to warm Yale Lake surface water entering the tailrace sampling area but decreased to about 100 percent after the project returned to standard operations. Overall, the valve replacement at the Project did not have a significant effect on water quality in the tailrace or in the upper end of Yale Lake and TDG remained below 110 percent saturation during the entire 2014 monitoring period.

4.3.4 Swift No. 2 Surge Arresting Structure Total Dissolved Gas (TDG) Monitoring (401) Certification Section 4.3.5 as amended

The TDG study required in Certification Section 4.3.5, as amended, was completed in 2007 and included in the 2007 Annual Report.

Cowlitz PUD monitored TDG at two fixed stations in the Project area during a scheduled one hour-long Surge Arresting Structure (SAS) test on March 11, 2007. One station was located in the Swift No. 2 Project forebay at the SAS intake in an area approximately eight feet from the intakes' trash rack. The other was located approximately 100 feet downstream of the existing tailrace buoy line (just outside of the turbulent SAS release path bubble curtain).

Prior to opening the SAS valves, TDG levels in the release path were fairly constant, ranging from 100.2 to 100.8 percent. During the SAS test, TDG levels increased as the visible surge of water moved past the release path monitoring site, reaching a peak at 105.0 percent saturation, after which, TDG levels gradually decreased to pre-test levels (as the SAS valves were closed). TDG levels at the SAS intake were fairly constant throughout the entire SAS test ranging from 97.8 to 98.3 percent. Water temperatures at the release path site ranged from 4.2 to 5.9 °C and water temperatures at the intake ranged from 4.1 to 4.2 °C.

In conclusion, TDG levels remained well below the state standard of 110 percent saturation during the entire test.

4.3.5 SA Section 9.4 Water Quality Monitoring

Cowlitz PUD developed a Water Quality Management Plan, dated January 23, 2013, to address the water quality requirements of the Lewis River Settlement Agreement and Ecology's Section 401 Certification. This document described Cowlitz PUD's completed, ongoing, and future plans for water quality monitoring and management, including the results of water quality monitoring discussed above in Sections 4.3.1, 4.3.2, 4.3.3, and 4.3.4. The Water Quality Management Plan described Cowlitz PUD's plan to discontinue all water quality monitoring unless any operational or structural adjustments are implemented that could adversely affect water quality, in which case Cowlitz PUD will consult with Ecology staff to determine an appropriate level of monitoring needed to document any changes to existing conditions.

Ecology approved the Swift No. 2 Water Quality Management Plan on September 20, 2013.

4.4 Cowlitz PUD Water Quality 2023 Annual Plan

Cowlitz PUD will implement the following water quality measures in 2023.

4.4.1 Water Quality Management Plan

Cowlitz PUD has completed all monitoring required under the Water Quality Management Plan. No future monitoring is anticipated unless an operational change triggers additional monitoring as required in the 401 Certification Order as amended.

5.0 TERRESTRIAL RESOURCES

5.1 TCC Meetings

The purpose and role of the TCC, as defined in Section 14.1 of the Settlement Agreement, is to facilitate coordination and implementation of the Terrestrial PM&E measures.

The structure and process of the TCC is intended to provide a forum to address time-sensitive matters, early warning of problems, and coordination of member organization actions, schedule, and decisions to save time and expense. The TCC makes decisions based on consensus, while implementing the Settlement Agreement.

5.1.1 Meetings and Conference Calls: Overview

This section summarizes major items discussed at TCC meetings during the 12-month reporting period. Detailed meeting summaries are provided on the PacifiCorp website at: <https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>

- On February 9, 2022, the TCC reviewed proposed budgets and project overviews for PacifiCorp's 2021 Wildlife Habitat Management Plan (WHMP) Annual Report, PacifiCorp 2022 WHMP Annual Plan and the Cowlitz PUD WHMP 2021 Annual Plan and 2022 Annual Report.
- On March 9, 2022, the TCC discussed mitigation options for Yale Saddle Dam Seismic Remediation Project tree removal.
- On April 13, 2022, the TCC reviewed comments on the TCC reviewed proposed budgets and project overviews for PacifiCorp's 2021 Wildlife Habitat Management Plan (WHMP) Annual Report, PacifiCorp 2022 WHMP Annual Plan and the Cowlitz PUD WHMP 2021 Annual Plan and 2022 Annual Report.
- On April 13, 2022, the TCC discussed mitigation options for Yale Saddle Dam Seismic Remediation Project tree removal, temporary disturbance buffers, and permanent WHMP impacts
- The 2021 Draft ACC/TCC Annual Report was distributed to the TCC for its 30-day review and comment period on May 6, 2022.
- On May 11, 2022, the TCC approved a 10.3.3 funding for Washington Department of Fish and Wildlife Eagle Island
- On May 11, 2022, the TCC conducted a site visit to Yale Saddle Dam Seismic Remediation Project.
- On May 11, 2022, the TCC conducted a site visit to the 2021 timber harvest area in Management Unit 10 and the proposed 2022 timber harvest areas in the Management Unit 3.
- On June 8, 2022, the TCC reviewed and the cover:forage model and approved some modifications.
- On June 8, 2022, the TCC approved the proposed budget loss for permanent WHMP loss of acres due to the Yale Saddle Dam Seismic Remediation Project.

- On June 8, 2022, the TCC conducted a site visit to the 2022 proposed timber harvests in management unit 35, Ichabod Wetland, and the vine maple removal from management unit 36
- On July 13, 2022, the TCC conducted a site visit to the 2020 commercial thin harvest in management unit 2, the ROW 8/12 culvert replacement, and 2022 proposed timber harvests in management unit 3 and 6.
- On August 10, 2022, the TCC approved the mitigation for Speelyai Parking Expansion project.
- On August 10, 2022, the TCC attended a site visit to Washington Department of Fish and Wildlife Eagle Island restoration that has been partially funded with 10.3.3 funds.
- On September 14, 2022, the TCC were provided the Draft Lewis River Wildlife Conservation Plan for review.
- On October 12, 2022, the TCC reviewed the Habitat Evaluation Procedures boundaries and agreed to remove Eagle Island from the 2025 analysis.
- On October 12, 2022, the TCC were updated on the Saddle Dam (Management Unit 10) trails conceptual plan.
- On December 14, 2022, the TCC agreed on the Habitat Evaluation Procedures shoreline sampling.

5.1.2 Meeting Notes

The Licensees prepared draft notes for TCC meetings and conference calls. These notes were distributed to TCC members for review and comment approximately one week after the subject meeting. After review, revision and approval by the TCC, the final notes were entered in the public record and posted on the PacifiCorp web site at:

<https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>

5.2 PacifiCorp Terrestrial Measures Implemented as of the End of 2022

This section presents the actions taken during January 2022 through December 2022 toward PacifiCorp terrestrial requirements in the Lewis River Settlement Agreement. It also includes previously completed Settlement Agreement actions. **Attachment H** provides a copy of the *Lewis River Wildlife Habitat Management Plan Annual Report*, which provides a summary of the terrestrial protection, mitigation, and enhancement measures that were implemented during 2022.

A discussion of the activities associated with each of the measures is presented by SA Article for the report period. A description of funding amounts deposited and disbursed during 2022 is provided in Section 7.0 – Funding.

5.2.1 SA Section 10.1 Yale Land Acquisition and Habitat Protection Fund

PacifiCorp completed its Settlement Agreement and the FERC license commitment under the Yale Land Acquisition Fund for acquiring land in 2010 with the purchase of 490 acres (198.3 ha) of land near Saddle Dam.

5.2.2 SA Section 10.2 Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund

PacifiCorp completed the acquisition of 640 acres which includes the entire Section 14 in Township 7 North Range 5 on June 11, 2020. This expended most of these funds with \$31,532.90 remaining.

Because of confidentiality in acquiring other lands, specific discussion is not included in this annual report other than to indicate that opportunities continue to be discussed.

5.2.3 SA Section 10.3 Lewis River Land Acquisition and Habitat Protection Fund

- a) In April 2017 10.3 funds were used in their entirety, which was \$1,170,009.20, and there are no further contributions. In 2021, there was an error in how these funds were dispersed. This error will be corrected by reimbursing the amount (\$163,950 plus interest) to this account.
- b) The table below shows the funds dispersed between 2013 to 2022. In 2022, the TCC agreed to fund \$9,300 to WDFW for Eagle Island Restoration. Matching funds provided by PacifiCorp are not to exceed \$100,000 per year and not to exceed \$500,000 in any ten consecutive years. Fund account information is provided in Section 7.0.

Year	Organization	Project Manager	Project	Purpose	Amount
2013	PacifiCorp	Kirk Naylor	Swift Creek Forage Enhancements	Exclosures and seeding	\$15,000
2016	WDFW	Daren Hauswald	Eagle Island Restoration Project	Mow Scotch broom	\$16,500
2018	PacifiCorp	Summer Peterman	Marble Mountain Forage Enrichment and Effectiveness Monitoring project	Grass Seed Plots and shrub exclosures.	\$20,093
2019	Cowlitz PUD	Amanda Farrar	Devils Backbone Habitat Enhancement	Scarification and seeding	\$13,735
2021	WDFW	Daren Hauswald	Eagle Island Restoration Project	Five-person crew for one week of work and herbicides	\$12,000
	WDFW	Daren Hauswald	Eagle Island Restoration Project	Kubota KX0401-1 with Brush hound flail mower head	\$16,000
2022	WDFW	Daren Hauswald	Eagle Island Restoration Project	Five-person crew for one week of work and equipment	\$9,300
Total to date					\$102,628

5.2.4 SA Section 10.4 Transaction Costs

No transaction costs incurred in 2022.

5.2.5 SA Section 10.5 Management of Funds

PacifiCorp made interest contributions to Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Funds in 2022. The Funds continue to be tracked in an account and are inclusive of accrued interest pending any transactions (see Section 7.0).

5.2.6 SA Section 10.6 Completed Implementation Advanced Purchases

As identified in the Settlement Agreement article 10.6.2, PacifiCorp acquired 770 acres (in 2000) of wildlife habitat near Cougar and Panamaker Creeks and established a 213-acre conservation covenant on those lands for the protection of bull trout. Routine maintenance of culverts, existing road closures, forestry management assessments, and invasive plant species control continued in 2022.

5.2.7 SA Section 10.7 Conservation Easements

PacifiCorp continued management of the 16 acres of land managed under a conservation easement with the Cowlitz Indian Tribe. In the past PacifiCorp has treated (herbicide spraying) for invasive Scotch broom control in a meadow area and the Cowlitz Tribe also hand-pulled Scotch broom in the 2011 timber harvest area. The Scotch broom continues to be monitored.

PacifiCorp continued inspections of a vegetation exclosure established on this easement for purposes of monitoring forage establishment and use by wildlife. Ocular assessments of vegetation within the exclosures and the surrounding area will be conducted for another 5 years (2023) by PacifiCorp biologists to assist in determining the success of program treatments. Forage establishment as a result of the 2011 forest management actions and subsequent seeding has been successful especially in terms of releasing understory shrubs from excessive shade. Wildlife use in the conservation easement area is evidenced from browsing, grazing and deer or elk pellet groups throughout the easement.

5.2.8 SA Section 10.8 Wildlife Habitat Management Plan

Article 403 of the Merwin, Yale, and Swift No. 1 licenses and Section 14.2.6 of the Settlement Agreement directs PacifiCorp to prepare and file with the FERC a detailed Annual Report (Federal Energy Regulatory Commission 2008a, 2008b, and 2008c, PacifiCorp et al. 2004). PacifiCorp completed the WHMP and submitted it to the FERC on December 23, 2008. The Utilities each received FERC approval for their respective WHMP on May 29, 2009. **Attachment H** provides a copy of the *Lewis River Wildlife Habitat Management Plan 2022 Annual Report*.

5.3 PacifiCorp Terrestrial 2023 Annual Plan

This section presents PacifiCorp's Terrestrial Resources Annual plan which identifies planned 2023 activities as organized by the Settlement Agreement measures.

5.3.1 SA Section 10.2 Swift No. 1 and Swift No. 2 Land Acquisition and Habitat Protection Fund

PacifiCorp will work in coordination with the TCC regarding the future acquisition of interests in land in the vicinity of Swift Reservoir. Fund account information is provided in Section 7.0.

5.3.2 SA Section 10.3 Lewis River Land Acquisition and Habitat Protection Fund

PacifiCorp will work in coordination with the TCC regarding the future land acquisition or habitat enhancement projects in Lewis River basin. Fund account information is provided in Section 7.0.

5.3.3 SA Section 10.4 Transaction Costs

Any transaction costs incurred in 2023 will be managed in accordance with SA language and reported in the 2023 Annual Report.

5.3.4 SA Section 10.5 Management of Funds

Funds provided by PacifiCorp in 2023 will be managed in a tracking account and in accordance with SA language. Contribution amounts and interest gained will be identified in the 2023 Annual Report. See Fund account information provided in Section 7.0 for end of 2022 amounts.

5.3.5 SA Section 10.6 Completed Implementation Advanced Purchases

PacifiCorp will continue to manage the Cougar Creek Conservation Covenant lands and the company lands on the Swift Creek Arm for the long-term benefit of fish, wildlife, and native plants. These lands are managed under the WHMP as described in SA 10.8.

5.3.6 SA Section 10.7 Conservation Easements

Guidelines for the selection and acquisition of conservation easements will be considered in the acquisition of Interests in Lands to be purchased with Funds described in SA 10.1 through 10.3.

5.3.7 SA Section 10.8 Wildlife Habitat Management Plans

The 2023 Annual Plan fulfills PacifiCorp's obligations for the license's Article 403 and Settlement Agreement 10.8.3 and is provided in **Attachment G**. The plan details the terrestrial protection, mitigation, and enhancement measures to be implemented on PacifiCorp WHMP lands in the following year (i.e., January 1 to December 31, 2023).

5.3.8 SA Section 10.8.5.5 Mitigation for Impacts on Wildlife Habitat

Following consultation with the TCC, PacifiCorp received \$5,931.23 for mitigation funding dollars for proposed adverse impacts to WHMP lands from PacifiCorp Transmission & Distribution (T&D) operations due to the Cowlitz PUD Interconnect Project. This fund also received \$1,238.51 and \$603.58 from the Washington Department of Natural Resources for impacts from constructing temporary access roads across PacifiCorp lands in management units 11 and 16. Finally this fund received \$1,190.57 for a judgment payoff from a property trespass. This fund does not accrue interest, which PacifiCorp will account for in a separate funding account, See Section 7.0, Funding. These funds were used in their entirety to create pollinator seed test plots along the transmission line ROW. This is discussed in more detail in **Attachment H** which provides a copy of the *Lewis River Wildlife Habitat Management Plan 2022 Annual Report*.

5.4 Cowlitz PUD Terrestrial Measures Implemented in 2022

5.4.1 SA Section 10.6 Completed Implementation: Advance Purchases [Devil's Backbone Conservation Covenant]

Cowlitz PUD managed the Devil's Backbone Conservation Covenant to benefit bull trout.

5.4.2 SA Section 10.8.1 Development of the Wildlife Habitat Management Plan (WHMP)

Cowlitz PUD filed the Swift No. 2 WHMP with the FERC December 23, 2008. The FERC issued an Order Modifying and Approving the Habitat Management Plan March 31, 2009. The FERC's Order approved the WHMP and added the following requirements:

- file an Annual Habitat Management Report by April 30 of each year; and
- In the event changes are made to the WHMP, file these changes with the Commission and the TCC.

This Section 5.4 fulfills Cowlitz PUD's obligation to file the WHMP Annual Report.

5.4.3 SA Section 10.8.2 WHMP Fund

On December 26, 2021, Cowlitz PUD made \$20,134 available for Year 14 2022 WHMP activities, \$7,935 in carry forward, and \$258 in interest earned for a total of \$28,327. Table 2.1-1 in the March 18, 2022, Year 14 2022 WHMP Annual Plan included a list of proposed actions and estimated costs based on the 2022 budget. **Table 10** below illustrates the 2022 Budget, including estimated costs, year-end costs and the difference between the two. At year-end, \$24,978 remained in the budget, as itemized in **Table 11**. **Table 12** provides the WHMP Tracking Account summarizing the WHMP budget and expenditures for each year.

Table 10. Cowlitz PUD WHMP Year 14 2022 Budget.

WHMP Activity	2022 Budget	2022 Actual	Difference
Administration	\$5,000	\$144	\$4,856
Annual inspection to monitor and manage public access	\$0	\$0	\$0
Invasive plant surveys at high priority sites	\$5,000	\$2,484	\$2,516
Invasive Species Control	\$5,000	\$1,566	\$3,434
Reseeding Devil's Backbone	\$1,500	\$0	\$1,500
Estimated cost of management activities	\$16,500	\$4,194	\$12,306
Estimated amount remaining in 2022 Budget at year-end	\$11,827	\$24,133	\$(12,306)

Table 11. Cowlitz PUD WHMP Year 14 2022 Carry Forward.

Carry Forward		Running Total
2022 Carry Forward	\$24,978	\$24,978

Table 12. Cowlitz PUD WHMP Tracking Account.

Year	Year Beginning Date	WHMP Beginning Balance	WHMP Annual Payment at Year Beginning	WHMP Beginning Balance + Annual Payment	Grants Received During Year	WHMP Funds Dispersed at Year-End	Year-End WHMP Funds Remaining	Interest Accrued Year-End WHMP Funds	WHMP Ending Balance	Year-End Date	WSJ Prime Rate Apr 1
1	26-Dec-2008	\$-	\$16,321	\$16,321	\$-	\$18,855	\$(2,535)	\$-	\$(2,535)	26-Dec-2009	0.0325
2	26-Dec-2009	\$-	\$16,659	\$16,659	\$-	\$18,230	\$(1,571)	\$-	\$(1,571)	26-Dec-2010	0.0325
3	26-Dec-2010	\$-	\$16,773	\$16,773	\$-	\$12,822	\$3,951	\$128	\$4,080	26-Dec-2011	0.0325
4	26-Dec-2011	\$4,080	\$16,959	\$21,039	\$-	\$7,949	\$13,091	\$425	\$13,516	26-Dec-2012	0.0325
5	26-Dec-2012	\$13,516	\$17,408	\$30,924	\$-	\$31,094	\$(170)	\$-	\$(170)	26-Dec-2013	0.0325
6	26 Dec-2013	\$-	\$17,715	\$17,715	\$-	\$14,530	\$3,185	\$103	\$3,288	26 Dec-2014	0.0325
7	26 Dec-2014	\$3,288	\$17,971	\$21,259	\$-	\$7,078	\$14,181	\$461	\$14,642	26 Dec-2015	0.0325
8	26 Dec-2015	\$14,462	\$18,214	\$32,856	\$-	\$4,762	\$28,094	\$983	\$29,077	26 Dec-2016	0.0350
9	26 Dec-2016	\$29,077	\$18,488	\$47,565	\$-	\$8,033	\$39,532	\$1,581	\$41,114	26 Dec-2017	0.04
10	26 Dec-2017	\$41,144	\$18,814	\$59,928	\$-	\$18,153	\$41,775	\$1,984	\$43,759	26 Dec-2018	0.0475
11	26 Dec-2018	\$43,759	\$19,158	\$62,917	\$13,735	\$100,125	\$(23,473)	\$-	\$(23,473)	26 Dec-2019	0.055
12	26 Dec-2019	\$(23,473)	\$19,574	\$(3,899)	\$8,050	\$17,801	\$(13,650)	\$-	\$(13,650)	26 Dec-2020	0.0325
13	26 Dec-2020	\$(13,650)	\$19,900	\$6,250	\$5,685	\$4,000	\$7,935	\$258	\$8,193	26 Dec-2021	0.0325
14	26 Dec-2021	\$8,193	\$20,134	\$28,327	\$-	\$4,194	\$24,133	\$845	\$24,978	26 Dec-2022	0.035
15	26 Dec-2022	\$24,978	\$21,334	\$46,312							

In 2022, Cowlitz PUD completed the 2022 WHMP Annual Report without charge as an in-kind service. On December 26, 2022, the WHMP fund had a balance of \$24,133 in funds, which generated \$845 interest. On December 26, 2022, Cowlitz PUD made \$21,334 available for the Year 15 2023 WHMP activities. Therefore, the total available for the Year 15 2023 WHMP is \$46,312.

5.4.4 SA Section 10.8.3 Management of the Plan [Implementation of the Annual Plan]

After consultation with the TCC, Cowlitz PUD filed the Swift No. 2 Year 14 2022 WHMP Annual Plan with the FERC March 18, 2022. Specific wildlife management activities implemented under the Year 14 2022 Annual Plan are described in the following sections.

5.4.4.1 Invasive Plant Surveys

The invasive plant surveys are designed to focus on areas identified in the WHMP as high priority due to 1) known concentrations of invasive plants; 2) presence of ecologically sensitive resources, such as wetlands; or 3) soil disturbance or traffic that could pose a risk of introduction or spread of invasive plants. Surveys do not cover the transmission line right of way (ROW) or revegetated habitat south of the maintenance road, because these areas are treated under on-going operation and maintenance programs separate from the WHMP.

The surveys are conducted according to standard operating procedures (SOPs) outlined in the WHMP (Section 5.8, Invasive Plant Management SOPs). Survey routes are documented using a hand-held GPS unit, and the boundaries of new survey areas are flagged. GPS data points are transferred into the project GIS and used to prepare maps of areas surveyed or selected for weed treatment. **Figures 8 and 9** illustrate weed survey areas that have been delineated in the Devil's Backbone and Project Works management units (MUs) to date.

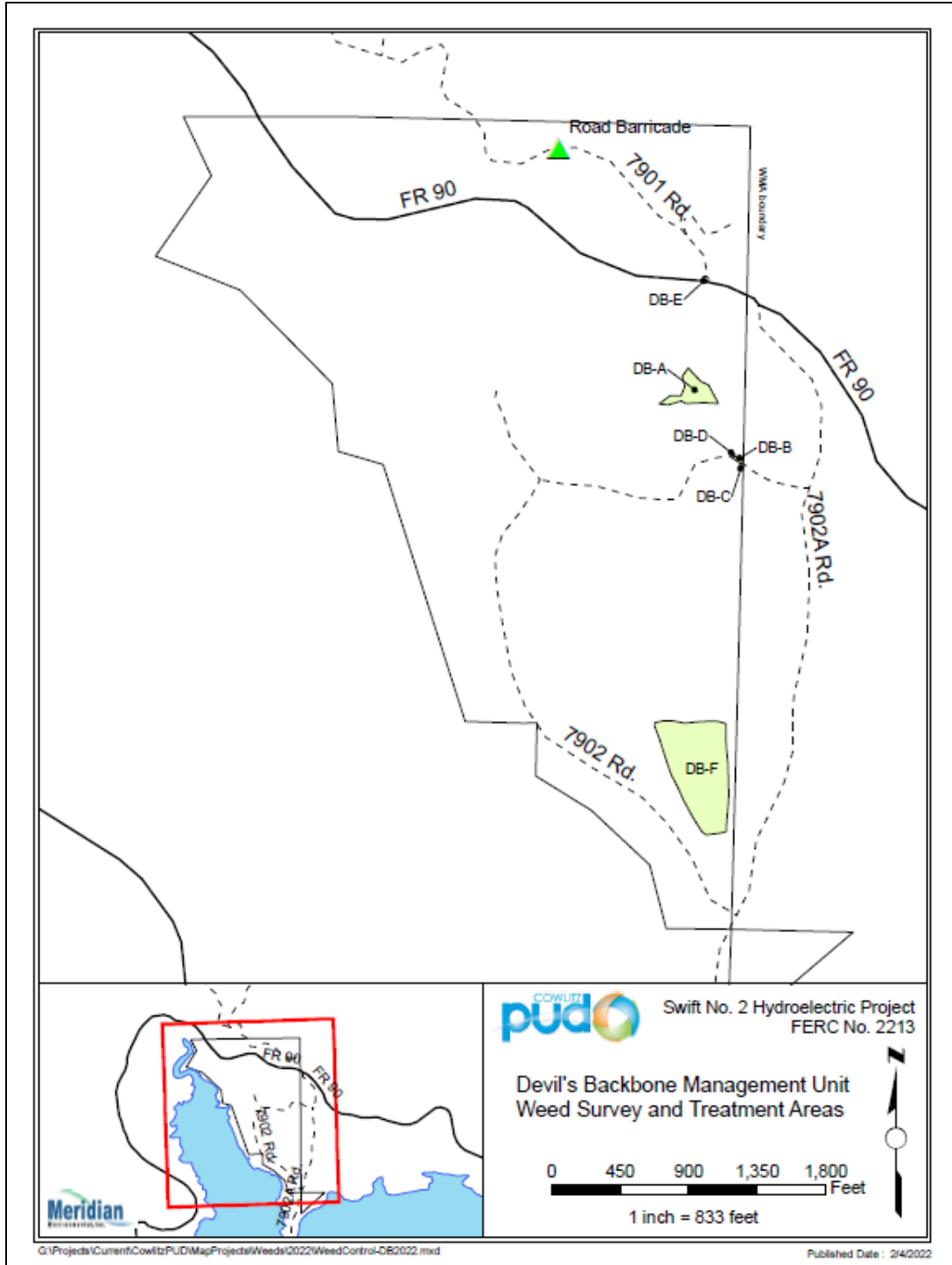


Figure 8. Devil's Backbone Management Unit Weed Survey and Treatment Areas

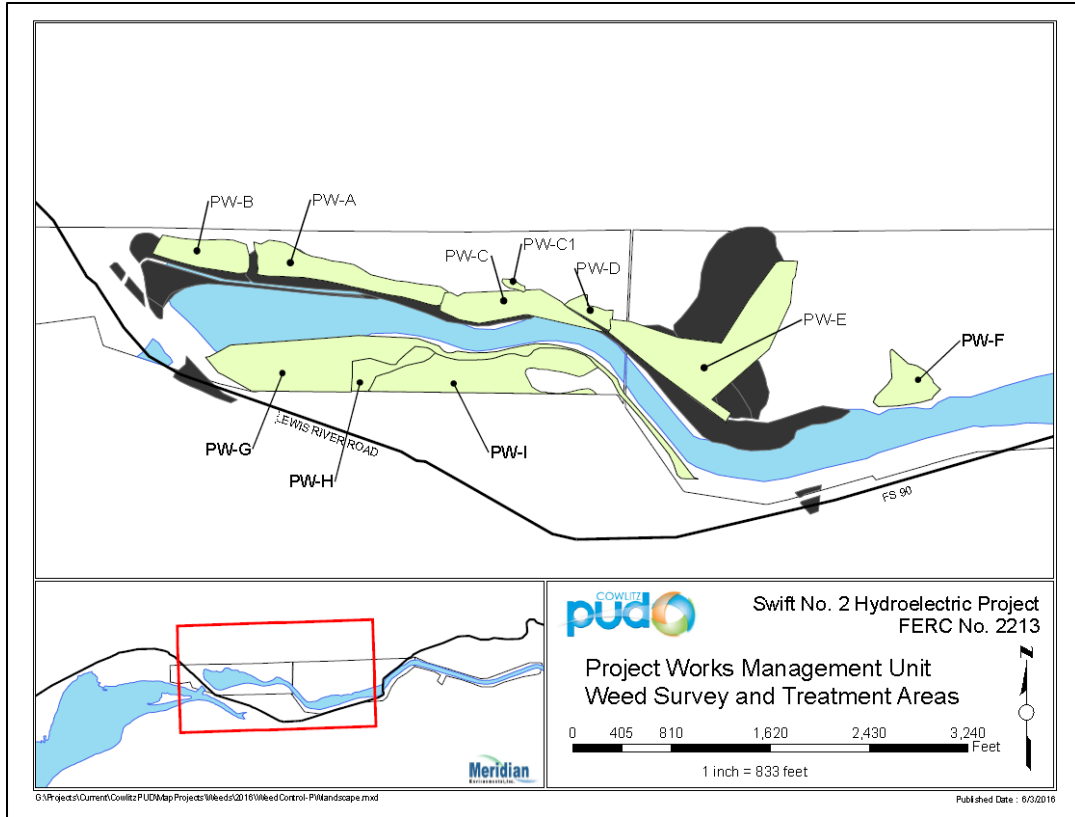


Figure 9. Project Works Management Unit Weed Survey and Treatment Areas

Updated noxious weed lists are obtained annually from the Cowlitz County and Washington State noxious weed control boards (Skamania County follows the state listings). The current classifications of target weed species observed in the Swift No. 2 Wildlife Management Area (WMA) as of 2022 are shown in **Table 13** below.

Class B Weeds: Non-native species presently limited to portions of the State. Species are designated for control in regions where they are not yet widespread. Preventing new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.

Class C Weeds: These are noxious weeds typically widespread in WA State or are of special interest to the state’s agricultural industry. The Class C status allows counties to require control if locally desired.

Table 13. Non-native invasive plants classified as noxious weeds in Cowlitz or Skamania County that have been observed in the Swift No. 2 WMA as of 2022.

Common Name (<i>Scientific Name</i>)	Cowlitz County	Skamania County (Washington State)
Bull thistle (<i>Cirsium vulgare</i>)	C	C
Canada thistle (<i>Cirsium arvense</i>)	C	C
Common catsear (<i>Hypochaeris radicata</i>)	C	C
Common groundsel (<i>Senecio vulgaris</i>)	C	C
Common St. Johnswort (<i>Hypericum perforatum</i>)	C	C
Evergreen blackberry (<i>Rubus laciniatus</i>)	C	C
Himalayan blackberry (<i>Rubus armeniacus</i>)	C	C
Oxeye daisy (<i>Leucanthemum vulgare</i>)	C	C
Perennial sowthistle (<i>Sonchus arvensis</i> ssp. <i>arvensis</i>)	C	C
Robert’s geranium (<i>Geranium robertianum</i>)	B	B
Scentless mayweed (<i>Matricaria perforata</i>)	C	C
Scotch broom (<i>Cytisus scoparius</i>)	B	B
Tansy ragwort (<i>Senecio jacobaea</i>)	B	B

Note: Weeds shown in **bold** are species Cowlitz County has selected as high priorities for control.

Other non-native invasive species that are not classified in either county as noxious weeds are also recorded when observed. These include foxglove (*Digitalis purpurea*), self-heal (*Prunella vulgaris*), brackenfern (*Pteridium aquilinum*), and common dandelion (*Taraxacum officinale*).

5.4.4.1.1 Initial Invasive Plant Surveys

Meridian Environmental, Inc. (Meridian) completed initial invasive plant surveys in all high priority areas of the Devil’s Backbone MU in 2009. These areas are shown in **Figure 6**, above.

Meridian completed initial invasive plant surveys of high priority areas in the Project Works MU in 2013. These areas are shown in **Figure 7**.

5.4.4.1.2 Invasive Plant Species Follow-up Surveys

Meridian conducted follow-up surveys June 17, 2022. The purpose of the surveys was to determine the effectiveness of herbicide applications and/or manual removal efforts to date and to identify future treatment needs. **Tables 14 and 15** list the target species observed during the follow-up surveys and summarize their distribution and estimated cover in the Devil’s Backbone and Project Works MUs.

Table 14. Survey areas, target species, distribution, and estimated cover in the Devil’s Backbone MU (2022).

Survey Area	Survey Acres	Target Species	2022 Distribution	2022 Estimated Cover
DB-A	0.9	Canada thistle	Scattered, patchy	0-5%
		Bracken fern	Scattered, patchy	0-5%
		Foxglove	Scattered	0-5%
		Common cat’s-ear	Scattered, patchy	0-5%
		Birdsfoot trefoil	Scattered, patchy	0-5%
		Himalayan blackberry	Clumped	0-5%
		Oxeye daisy	Clumped	0-5%
DB-B, C, D	0.06	Bracken fern	Scattered	0-5%
		Common cat’s-ear	Scattered, patchy	0-5%
		Foxglove	Scattered	0-5%
		Oxeye daisy	Clumped	0-5%
		Scotch broom	Clumped	0-5%

Survey Area	Survey Acres	Target Species	2022 Distribution	2022 Estimated Cover
DB-F	5.8	Bracken Fern	Scattered, patchy	0-5%
		Bull thistle	Scattered, patchy	0-5%
		Canada thistle	Scattered	0-5%
		Common cats-ear	Scattered, patchy	0-5%
		Scotch broom	Scattered, even	0-5%
		Tansy ragwort	Scattered	0-5%
		Foxglove	Scattered, even	0-5%
7902 Road		Common cat's-ear	Scattered	0-5%
		Tansy ragwort	Clumped	0-5%
		Bracken fern	Clumped	0-5%
		Oxeye daisy	Scattered	0-5%
		Scotch broom	Clumped	0-5%
7901 Road		Clumps of herb-robert at road entrance. Dominant species mixed grass, moss, sedges, sword fern, miner's lettuce, and bare ground.		

Table 15. Survey areas, target species, distribution, and estimated cover in the Project Works MU (2022).

Survey Area	Survey Acres	Target Species	2022 Distribution	2022 Estimated Cover
PW-A	6.5	Himalayan blackberry	Clumped	0-5%
		Foxglove	Scattered	0-5%
		Herb-Robert	Clumped	0-5%
		Common cat's-ear	Scattered, even	5-25%
		Scentless mayweed	Even	5-25%
		Tansy Ragwort	Clumped	0-5%
PW-B	3.8	Common cats-ear	Scattered, even	5-25%
PW-C	5.5	Himalayan blackberry	Clumped	0-5%
		Herb-Robert	Clumped	5-25%
		Common cat's-ear	Scattered, patchy	0-5%
		Tansy ragwort	Clumped	0-5%
		Canada thistle	Clumped	0-5%
PW-D	1.1	Foxglove	Scattered, Even	0-5%
		Common cat's-ear	Scattered, Even	5-25%
		Bracken fern	Scattered	0-5%
PW-G	14.96	Common cat's-ear	Scattered	0-5%
		Herb-Robert	Clumped	0-5%
		Himalayan blackberry	Scattered	0-5%
		Oxeye daisy	Clumped	0-5%
		Tansy ragwort	Scattered	0-5%
PW-H	2.1	Scotch broom	Scattered, Even	0-5%
		Common cat's-ear	Scattered, Even	0-5%
		Oxeye daisy	Clumped	0-5%
		Canada thistle	Clumped	0-5%
		Himalayan blackberry	Clumped	0-5%
PW-I	9.8	Scotch broom	Scattered, Even	0-5%
		Common cat's-ear	Scattered	0-5%
		Bracken fern	Clumped	0-5%
		Himalayan blackberry	Clumped	0-5%
		Oxeye daisy	Scattered, Even	0-5%

Devil's Backbone MU

During the 2022 follow-up survey in DB-A, it was determined that there has been good control of foxglove, tansy ragwort, and Canada thistle. Grass and forb cover is dense and healthy, snowberry has appeared to increase. Foxglove was hand-pulled and is now under good control, but still needs monitored. Continue treating Canada thistle, foxglove and the single Himalayan blackberry plant. During the follow-up survey in DB-B, C, and D, it was determined that there

has been great control of scotch broom, foxglove, and tansy ragwort. Foxglove rosettes and scotch broom were observed during the survey and hand-pulled. The initial survey was conducted at DB-F (Elk Forage Plot) on June 17, 2022 and the following invasive species were present; foxglove, scotch broom, tansy ragwort, common cats'-ear, Canada thistle, bull thistle, and bracken fern. The site was treated August 2022 and continued treatment is required to ensure that forage grasses are not outcompeted.

Project Works MU

The June 2022 follow-up surveys indicated great control of scotch broom in PW-A, no sprouts or flowering plants were present. Himalayan blackberry treatment has been partially successful but is still regenerating around the pond and continued treatment is needed. In PW-B, scotch broom is under good control, but common cats'-ear is now the dominate species and may be difficult to treat. In PW-C, Miner's lettuce and grasses have spread where Robert's geranium has been removed. There is bare ground around some treatment areas and only Robert's geranium is regenerating, continued treatment may be disruptive to other native plants. Himalayan blackberry treatment was mostly effective, but continued treatment is needed. In PW-D, Scotch broom control has been successful, no plants were found during the survey. During the 2018 survey, an Oxeye daisy clump was found, but not evident in 2022. Common cat's-ear appears stable, continue monitoring.

In PW-G, there has been good control of Himalayan blackberry along the road which has allowed the native shrubs to reestablish. Control of scotch broom has been effective but continued monitoring is warranted. In PW-H and PW-I, scotch broom control appears very effective, with only a few sprouts surviving. There is a patch of Canada thistle and Himalayan blackberry that requires treatment and continued monitoring.

5.4.4.2 Invasive Plant Species Control

In February 2022, under an interlocal agreement, Skamania County agreed to perform weed control in the WMA throughout 2022.

At various dates from June to September 2022, the Skamania County weed control crew applied Garlon 3A in DB-A, B, C, D and the F to control bull thistle, Canada thistle, common cat's-ear, Foxglove, Himalayan blackberry, tansy ragwort and scotch broom. During the same time period, the crew applied Garlon 3A in PW-A, B, C, C-1, D, and E to control invasive species including scotch broom, evergreen blackberry, Himalayan blackberry, and Robert's geranium.

5.4.4.3 PWMU-PUB Wetland Restoration

During a heavy rain event in January 2009, a landslide buried the PWMU-PUB wetland in mud and large woody debris. The following summer, Cowlitz PUD re-contoured the wetland, reseeded the area, and planted willow (*Salix spp.*) stakes. Crews planted additional willow and red osier dogwood (*Cornus sericia*) stakes and rooted stock of several species in 2010 to further increase the species and structural diversity of wildlife habitat around the wetland. A survey was completed in June 2022 and determined that Himalayan blackberry treatment has been partially successful, but it is still regenerating near the alder patch that borders the wetland pond.

5.4.4.4 Devil's Backbone Forest Management

The Timber Management Fund was expended in 2021. Currently, the TCC wishes that any monies that are carried forward be used towards future timber management actions.

5.4.4.4.1 Devil's Backbone Elk Forage Plot

In 2020, Cowlitz PUD completed the 5.8-acre patch cut in Devil's Backbone MU (DBMU-2). The patch cut was implemented in accordance with Forestland Management SOPs outlined in Section 5.7 of the WHMP, and in accordance with Invasive Plant Management SOPs (Section 5.8) and Raptor Management SOPs (Section 5.9). The initial invasive plant survey was completed in June 2022 and was subsequently treated for invasive species.

The 5.8-acre patch cut is illustrated in **Figures 10, 11, and 12.**

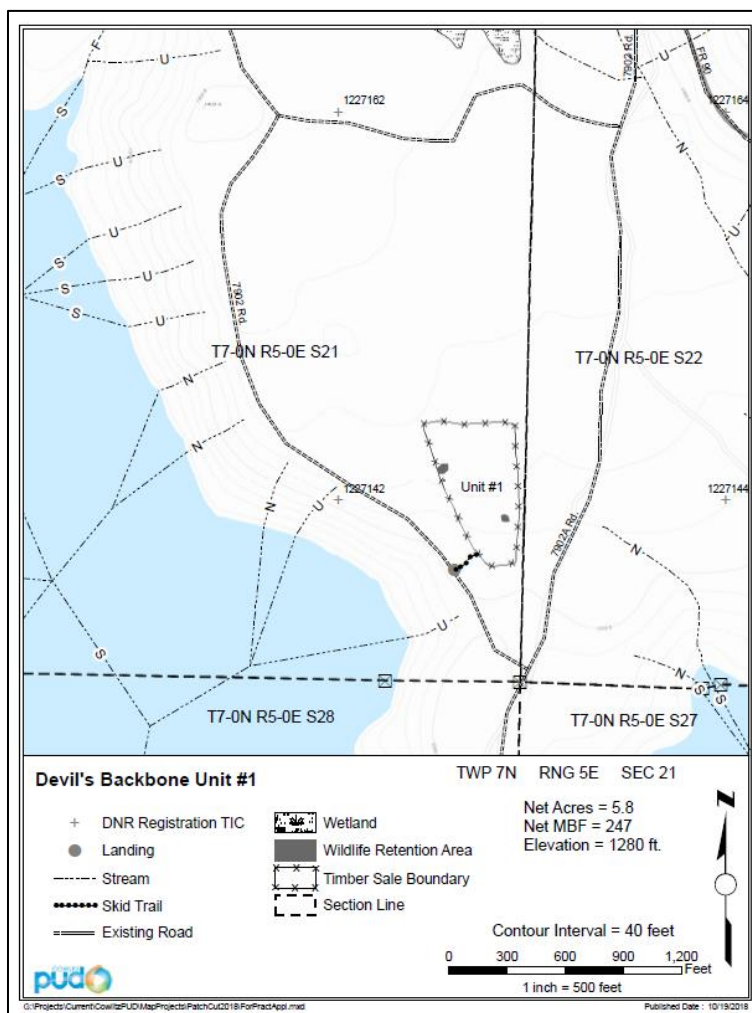


Figure 10. Devil's Backbone Elk Forage Plot



Figure 11. Devil's Backbone Elk Forage Plot looking North, June 2022.



Figure 12. Devil’s Backbone Elk Forage Plot looking Southwest, June 2022.

5.4.4.5 Public Access Monitoring

Public access surveys are conducted concurrently with invasive plant species surveys. The purpose of the surveys is to document the condition of roads, gates, and signs; evidence of authorized (i.e., non-motorized) or unauthorized (i.e., motorized) public access; and screening between the roads and adjacent habitat. The surveys included roads that lead into the Devil’s Backbone MU and the Project Works MU maintenance road, shown in **Figures 8 and 9**, respectively.

5.4.4.5.1 *Devil’s Backbone MU*

The 7901/01M Road leads north into the Devil’s Backbone MU from Forest Road 90 (FR 90). It traverses DBMU sites 7, 8, 9, 10 and 12, passing through riparian deciduous and mid-successional conifer stands with a sparse shrub layer. But because there is no traffic, visual screening is a low concern. The road condition remains fair except at the site of a shallow slope failure that occurred just south of the road barrier. The slope failure led to several trees falling across the road and blocking it. However, during the 2018 survey, it was found that the trees were cut, and the wood removed. The barrier constructed in July 2012 to block the 7901 Road to motorized traffic is in good repair as of 2022 and blowdown uphill of the barrier is still present, also there was no evidence of attempts to drive over or around it. Two campfires were present before barrier and target shooting structures along the road. There were truck tire tracks on the road along with beer cans and other trash, and fire pits.

The 01M Road is passable only to ATVs or motorcycles. Alders and bigleaf maple (*Acer macrophyllum*) are encroaching into the roadbed along its entire length. This road was not surveyed in 2022.

The 7902 Road leads south from FR 90, crossing adjacent property before turning west and entering the Devil's Backbone MU, where it passes through DBMU sites 2, 3, and 4. The adjacent property owner maintains a steel swing-gate near the intersection with FR 90 and keeps the gate locked. At the time of the June 2022 survey, the gate was closed and locked. There was no evidence of unauthorized motorized access or non-motorized access within the last year. No gates or signs have been installed on the 7902 Road at either the east or south entrances to the Devil's Backbone MU. Dense conifers crowd the east entrance to the property. The northern part of the road is in good condition, with no erosion or drainage concerns and only minor amounts of blowdown. At the southeast end, trees continue to encroach on the road. Mid-successional conifer stands and a sparse shrub layer provide little vegetative screening between the roadway and adjacent habitat. However, the risk of wildlife disturbance is low, due to the presence of the gate near the intersection of FR 90 and blowdown present along at the south end of the road assists in preventing public access. There was elk scat observed on the road.



Figure 13. Blowdown at the southeast end of the 7902 Road.

5.4.4.5.2 *Project Works MU*

The Project Works MU maintenance road was inspected June 17, 2022. This road is closed to public access, with locked gates at both the east and west ends. Both gates (chain link at the east end; steel swing gate at the west end) have padlocks which are in good condition. “No Trespassing” signs installed on the gates are also in good condition. No evidence of unauthorized entry or use of Project Works MU lands was observed during the public access surveys.

5.4.4.6 Fisher Candidate Conservation Agreement with Assurances

On May 6, 2016, Cowlitz PUD received confirmation from the Washington Department of Fish and Wildlife of enrollment of the Devil's Backbone and Project Works MU lands in the Candidate Conservation Agreement with Assurances (CCAA) for the Fisher in the State of Washington. This agreement is designed to promote fisher conservation while also addressing concerns about future regulatory restrictions if fishers were to ever become a listed species under the federal Endangered Species Act (ESA). As an enrolled landowner, Cowlitz PUD is entitled to regulatory assurances against future land-use restrictions on its enrolled lands.

5.4.5 SA Section 10.8.4 Habitat Evaluation Procedures

Implementation is scheduled for 2025 (Year 17) of the Swift No. 2 License.

5.4.6 SA Section 10.8.4.2 Review of Effectiveness of WHMP

Implementation is scheduled for 2025 (Year 17) of the Swift No. 2 License.

5.4.7 SA Section 10.8.3 Cowlitz PUD 2022 Annual Plan

Cowlitz PUD will begin preparation of the 2023 WHMP Annual Plan in February 2023.

5.5 Cowlitz PUD Terrestrial 2022 Annual Plan

5.5.1 SA Section 10.6 Cowlitz PUD Completed Implementation: Advance Purchases [Devil's Backbone Conservation Covenant]

These lands will be managed under the WHMP.

5.5.2 SA Section 10.8.1 Cowlitz PUD Development of the Wildlife Habitat Management Plan (WHMP)

The WHMP will be implemented via the 2023 Annual Plan upon the FERC approval.

5.5.3 SA Section 10.8.2 Cowlitz PUD WHMP Fund

The carry forward, interest, and the Year 15 2022 annual funding amount will be available in 2023. Cowlitz PUD will make approximately \$23,073 available for WHMP activities December 26, 2023.

5.5.4 SA Section 10.8.3 Management of the Plan [Annual Plan]

Following consultation with the TCC, Cowlitz PUD will file the 2023 Annual Plan with the FERC. Upon the FERC approval, Cowlitz PUD will implement the 2023 Annual Plan.

6.0 LAW ENFORCEMENT

6.1 SA Section 13.2.1 Law Enforcement

Throughout the year the Lewis River Basin was patrolled by a full time Washington Department of Fish and Wildlife officer, a full time Cowlitz County Deputy, a part time Skamania County Deputy (May through October) and Clark County Sheriff's Office Marine Patrol (May through October). During some periods, additional patrols were provided by other officers. For these officers, the focus is protection of fish and wildlife, cultural resources, and public safety and security.

The following table presents the WDFW Fish and Wildlife law enforcement actions taken during January through December 2022 toward fish and wildlife law enforcement requirements in the Lewis River Settlement Agreement:

Table 16. WDFW fishing related citations/tickets – CY2022

Incident Type	Criminal Nontraffic	Infraction Nontraffic	Grand Total
ESA – Columbia River Salmon/Steelhead Stamp	0	90	90
ESA/Protected Species Violation	0	0	0
Freshwater Fish Violation	0	23	23
Grand Total	0	113	113

Table 17. WDFW non-fishing related citations/tickets – CY2022

Incident Type	Criminal Nontraffic	Infraction Nontraffic	Grand Total
Big Game Violation	56	0	56
Boating Safety Insp./Violation	0	2	2
Snowmobile Violation/Investigation	0	11	11
Traffic Incident/Violation	0	0	0
Grand Total	56	13	69

Table 18. WDFW total incidents by type – CY2022

Incident Type	Total
Assist Other Agency	0
Big Game Violation	35
Boating Safety Insp./Violation	2
Commercial Fishing Investigation	0
ESA - COL. River Salmon/Steelhead Stamp	40
ESA/Protected Species Violation	1
Freshwater Fish Violation	23
General Authority Investigation	1
HPA Investigation - Non-Permitted	1
Traffic Incident/Violation	0
Grand Total	103

Lewis River Hydroelectric Project (FERC Nos. 935, 2071, 2111 & 2213)
Annual Report 2022

Lewis River License Implementation					Funding Start Date: 4/30/05
Lewis River Aquatics Fund - Resource Projects					
Sections 7.5, 7.5.1, 7.5.3.1, & 7.7					
Totals:					
	\$ 5,647,324.94	\$ (3,004,367.00)	\$ 1,213,570.03	\$ 3,856,527.97	
Release Date	Funds Received	Expense	Interest	Balance	Notes
12/31/21	\$ -	\$ -	\$ 66,911.18	\$ 2,996,761.47	
04/30/22	\$ 327,728.03	\$ -	\$ 34,353.63	\$ 3,358,843.13	
08/02/22	\$ -	\$ (74,390.00)	\$ -	\$ 3,284,453.13	2022 Swift Campground Creek Culvert Replacement
12/31/22	\$ -		\$ 131,941.63	\$ 3,416,394.76	
03/07/23	\$ 1,215.98		\$ -	\$ 3,417,610.74	2017 LR 21 Phase I; funds not used
04/30/23	\$ 350,227.76		\$ 88,689.47	\$ 3,856,527.97	
Total Spent to Date:				(\$3,004,367.00)	
Balance Remaining:				\$3,856,527.97	

Lewis River License Implementation					Funding Start Date: 4/30/05
Lewis River Aquatics Fund - Bull Trout					
Sections 7.5, 7.5.1, 7.5.3, 7.5.3.1, & 7.7					
Totals:					
	\$ 703,500.76	\$ (427,397.92)	\$ 443,151.35	\$ 719,254.19	
Release Date	Funds Received	Expense	Interest	Balance	Notes
7/20/21	\$ -	\$ (192,850.00)	\$ -	\$ 651,012.53	2021 Rush Creek Side Channel, USFS
12/31/21	\$ -	\$ -	\$ 15,735.08	\$ 666,747.61	
4/30/22	\$ -	\$ -	\$ 7,433.56	\$ 674,181.17	
12/31/22	\$ -	\$ -	\$ 26,891.96	\$ 701,073.13	
4/30/23	\$ -	\$ -	\$ 18,181.06	\$ 719,254.19	
	\$ -	\$ -			
	\$ -	\$ -			
	\$ -	\$ -			
	\$ -	\$ -			
	\$ -	\$ -			
	\$ -	\$ -			
Total Spent to Date:				\$ (427,397.92)	
Balance Remaining:				\$ 719,254.19	

Lewis River License Implementation					
Swift No. 1 & Swift No. 2 Land and Habitat Protection Fund					
Section 10.2, 10.2.1					
Totals:					
	\$ 9,103,356.40	\$ (10,054,970.43)	\$ 983,146.12	\$ 31,532.09	
Release Date	Funds Received	Expense	Interest	Balance	Notes
12/31/22	\$ -	\$ -	\$ 1,514.58	\$ 31,532.09	
Total Spent to Date:				\$ (10,054,970.43)	
Running Total:				\$ 31,532.09	

Table 19. Lewis River Settlement Agreement 10.3.3 Contribution of Additional Matching Funds Total

Year	Organization	Project Manager	Project	Purpose	Amount
2013	PacifiCorp	Kirk Naylor	Swift Creek Forage Enhancements	Exclosures and seeding	\$15,000
2016	WDFW	Daren Hauswald	Eagle Island Restoration Project	Mow Scotch broom	\$16,500
2018	PacifiCorp	Summer Peterman	Marble Mountain Forage Enrichment and Effectiveness Monitoring project	Grass Seed Plots and shrub exclosures.	\$20,093
2019	Cowlitz PUD	Amanda Farrar	Devils Backbone Habitat Enhancement	Scarification and seeding	\$13,735
2021	WDFW	Daren Hauswald	Eagle Island Restoration Project	Five-person crew for one week of work and herbicides	\$12,000
	WDFW	Daren Hauswald	Eagle Island Restoration Project	Kubota KX0401-1 with Brush hound flail mower head	\$16,000
2022	WDFW	Daren Hauswald	Eagle Island Restoration Project	Five-person crew for one week of work and equipment	\$9,300
Total to date					\$102,628

Lewis River License Implementation					Funding Start Date: 12/26/08				
Lewis River WHMP Fund (Conservation Easement Lands)					Contributions in 2003 dollars, Adjusted for Inflation				
Section 10.8.2									
Totals:					\$ 3,960.10	\$ (3,614.02)	\$ 79.98	\$ 426.06	
Release Date	Funds Received	Funds Expended	Interest	Balance	Notes				
12/31/21	\$ 320.58	\$ -	\$ -	\$ 320.58	8.2 WHMP Fund: 16 acres owned in conservation easement, adjusted for inflation				
12/31/22	\$ -	\$ (320.58)	\$ -	\$ (320.58)	Expenditure for 2022				

Lewis River License Implementation					Funding Start Date: 12/26/08				
Lewis River WHMP Fund (Fee Simple Lands)					Contributions in 2003 dollars, Adjusted for Inflation				
Section 10.8.2									
Totals:					\$ 7,169,666.90	\$ (6,545,693.75)	\$ 259,475.96	\$ 883,449.11	
Release Date	Funds Received	Expense	Interest	Balance	Notes				
12/31/21	\$ 626,853.37	\$ (488,788.31)	\$ 15,263.52	\$ 776,175.91					
3/31/22	\$ -	\$ -	\$ 6,259.29	\$ 782,435.20					
12/31/22	\$ 677,314.75	\$ (609,246.78)	\$ 32,945.94	\$ 883,449.11	As of 12/31/2022, current WHMP acreage total is 15,816.4; 2022 Expenses as of 12/31/2022, + \$196 for Old Growth				
	\$ -	\$ -							
Total Spent to Date:					\$ (6,545,693.75)				
Balance Remaining:					\$ 883,449.11				

Lewis River License Implementation					Funding Start Date: 11/1/2016				
Mitigation for Impacts on Wildlife					WO ILR-IMPWILD				
Section 10.8.5.5									
Totals:					\$ 19,135.89	\$ (19,135.89)	\$ -	\$ -	
Release Date	Funds Received	Expense	Interest	Balance	Notes				
12/31/21	\$ -	\$ -	\$ -	\$ -	No contributions or expenditures in 2021				
12/31/22	\$ -	\$ -	\$ -	\$ -	No contributions or expenditures in 2022.				

8.0 LITERATURE CITED

- Cowlitz PUD. 2004. License Application for new license for Swift No. 2 Hydroelectric Project, FERC Project No. 2213.
- Cowlitz PUD. 2005a. Cowlitz PUD comments. Federal Energy Regulatory Commission Draft Environmental Impact Statement Lewis River Hydroelectric Projects, Washington Swift No. 1 (Project No. 2111), Swift No. 2 (Project No. 2213), Yale (Project 2071), Merwin (Project 935). November 22, 2005.
- Cowlitz PUD. 2005b. Revised Draft License Articles for Swift No. 2 (Project No. 2213). Submitted as Supplemental Comments on the Federal Energy Regulatory Commission Draft Environmental Impact Statement. Lewis River Hydroelectric Projects, Washington Swift No. 1 (Project No. 2111), Swift No. 2 (Project No. 2213), Yale (Project 2071), Merwin (Project 935). December 19, 2005.
- Cowlitz PUD 2007. Draft Forebay Water Temperature Monitoring Plan for the Swift No. 2 Hydroelectric Project, FERC No. 2213. Prepared for: Public Utility District No. 1 of Cowlitz County. Prepared by: Meridian Environmental, Inc. January 2007.
- Cowlitz PUD 2009. Water Quality Management Plan for the Swift No. 2 Hydroelectric Project, FERC No. 2213. Prepared for: Public Utility District No. 1 of Cowlitz County. Prepared by: Meridian Environmental, Inc. February 2009.
- Cowlitz PUD 2011. Water Quality Management Plan for the Swift No. 2 Hydroelectric Project, FERC No. 2213. Prepared for: Public Utility District No. 1 of Cowlitz County. Prepared by: Meridian Environmental, Inc. March 2011.
- Cowlitz PUD 2013. Water Quality Management Plan for the Swift No. 2 Hydroelectric Project, FERC No. 2213. Prepared for: Public Utility District No. 1 of Cowlitz County. Prepared by: Meridian Environmental, Inc. January 2013.
- Cowlitz PUD 2013. Water Quality Management Plan for the Swift No. 2 Hydroelectric Project, FERC No. 2213. Prepared for: Public Utility District No. 1 of Cowlitz County. Prepared by: Meridian Environmental, Inc. February 2013.
- Ecology 2006. State of Washington Department of Ecology. Certification Order No. 3676. Licensing of the Swift No.2 Hydroelectric Project (FERC No.2213), Cowlitz, and Skamania Counties, Washington. October 9, 2006.
- Ecology 2008. Ecology Comments on the Cowlitz County PUD Draft Water Quality Management Plan. Dated October 21, 2008.
- FERC. 2005. Draft Environmental Impact Statement – Lewis River Hydroelectric Projects Washington, Swift No. 1 (Project No. 2111), Swift No. 2 (Project No. 2213), Yale (Project No. 2071), and Merwin (Project No. 935). September 2005.

- PacifiCorp Energy and Cowlitz PUD. 2005a. Biological Evaluation of USFWS Listed, Proposed, and Candidate species As Related to PacifiCorp Energy and Cowlitz PUD's Lewis River Hydroelectric Projects. January 15, 2005.
- PacifiCorp Energy and Cowlitz PUD. 2005b. Biological Evaluation of Listed, Proposed, and Candidate Salmon and Steelhead Species as Related to PacifiCorp Energy and Cowlitz PUD's Lewis River Hydroelectric Projects. January 15, 2005.
- PacifiCorp Energy and Cowlitz PUD 2004. Settlement Agreement, Joint Explanatory Statement and Supplemental Preliminary Draft Environmental Assessment for the Lewis River Hydroelectric Projects (Merwin FERC Project No. 935; Yale FERC Project No. 2071; Swift No. 1 FERC Project No. 2111; and Swift No. 2 FERC Project No. 2213). November 30, 2004
- PacifiCorp Energy and Cowlitz PUD 2004. Settlement Agreement for the Lewis River Hydroelectric Projects (Merwin FERC Project No. 935; Yale FERC Project No. 2071; Swift No. 1 FERC Project No. 2111; and Swift No. 2 FERC Project No. 2213).
- PacifiCorp Energy and Cowlitz PUD 2008. Lewis River Hydroelectric Projects (FERC Project Nos. 935, 2071, 2111, 2213). 2007 Annual Report. Annual Summary of License Implementation and Compliance: Aquatic and Terrestrial Resources. Prepared by PacifiCorp Energy and Cowlitz PUD.
- PacifiCorp Energy and Cowlitz PUD 2011. Lewis River Hydroelectric Projects (FERC Project Nos. 935, 2071, 2111, 2213). 2010 Annual Report. Annual Summary of License Implementation and Compliance: Aquatic and Terrestrial Resources. Prepared by PacifiCorp Energy and Cowlitz PUD.
- PacifiCorp Energy and Cowlitz PUD 2012. Lewis River Hydroelectric Projects (FERC Project Nos. 935, 2071, 2111, 2213). 2011 Annual Report. Annual Summary of License Implementation and Compliance: Aquatic and Terrestrial Resources. Prepared by PacifiCorp Energy and Cowlitz PUD
- PacifiCorp Energy and Cowlitz PUD 2013. Lewis River Hydroelectric Projects (FERC Project Nos. 935, 2071, 2111, 2213). 2012 Annual Report. Annual Summary of License Implementation and Compliance: Aquatic and Terrestrial Resources. Prepared by PacifiCorp Energy and Cowlitz PUD.
- PacifiCorp and Cowlitz PUD. 2017. Aquatic Monitoring and Evaluation Plan for the Lewis River. Prepared by PacifiCorp and the Public Utility District No.1 of Cowlitz County. Version 2. April 3, 2017.
- Ward, W. 2003. Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends Section. Washington Department of Ecology. Environmental Assessment Program Olympia, Washington. December 2003. Publication No. 03-03-052.

Attachment A
Section 14 of the Lewis River
Settlement Agreement

SECTION 14: COORDINATION AND DECISION MAKING

14.1 Coordination and Decision Making. The provisions of this Section 14 describe the processes for coordination and decision making among the Parties for the implementation of the terrestrial and aquatic PM&E Measures provided for in this Agreement. As provided for in Section 14.2 below, the Licensees shall convene a Terrestrial Coordination Committee (“TCC”) to coordinate implementation of the terrestrial PM&E Measures described in Section 10 (including any exhibits, schedules, and appendices related to Section 10), and shall accomplish the purposes set forth in Section 14.1.1 below. The Licensees shall convene an Aquatic Coordination Committee (“ACC”) to coordinate implementation of the aquatic PM&E Measures described in Sections 3 through 9 (including any exhibits, schedules, and appendices related to those Sections), referred to below as terrestrial and aquatic PM&E Measures.

14.1.1 Purposes of the TCC. The TCC is intended to accomplish the purposes set forth below:

- a. Provide a forum for coordination between the Licensees and the other Parties on terrestrial resources PM&E Measure implementation.
- b. Oversee the development by the Licensees of an objective oriented WHMP prior to the Issuance of the New Licenses.
- c. Monitor implementation of that WHMP.
- d. Oversee the HEP study in the 17th year after Issuance of the New Licenses, and modify the WHMP if necessary, based on the HEP’s results.
- e. Oversee and make decisions regarding the: (1) Yale Fund; (2) the Swift Fund; and (3) the Lewis River Fund.
- f. Oversee the annual budget for the WHMP.

14.2 Coordination Committees. Within 60 days after the Effective Date, PacifiCorp and Cowlitz PUD shall convene the TCC and the ACC.

14.2.1 Committee Coordinators. Within 30 days after the Effective Date, PacifiCorp Energy and Cowlitz PUD each shall designate one Committee Coordinator for the TCC and one Committee Coordinator for the ACC. PacifiCorp Energy and Cowlitz PUD shall make their designations by notice to the Parties in accordance with the notice provisions in Section 16.6. The PacifiCorp Energy Committee Coordinator(s) shall be employed or retained by PacifiCorp Energy and may represent PacifiCorp Energy on the TCC and the ACC. The Cowlitz Committee Coordinator(s) shall be employed or retained by Cowlitz PUD and may represent Cowlitz PUD on the TCC and the ACC. The PacifiCorp Energy Committee Coordinator(s) shall, as their primary responsibilities, oversee the coordination and implementation of the terrestrial and aquatic PM&E Measures that are the responsibility of PacifiCorp Energy as provided in this Agreement. The Cowlitz PUD Committee Coordinator(s)

shall oversee the coordination and implementation of the terrestrial and aquatic PM&E Measures that are the responsibility of Cowlitz PUD as provided in this Agreement. PacifiCorp Energy and Cowlitz PUD Committee Coordinators together shall oversee the coordination and implementation of terrestrial and aquatic PM&E Measures for which PacifiCorp Energy and Cowlitz PUD have joint responsibility as provided in this Agreement.

14.2.2 TCC and ACC Membership. Within 30 days after the Effective Date, or at any time thereafter with 30 days' notice to the Licensees, each Party, at its own discretion and cost, may designate one representative for membership on the TCC and may designate one representative for membership on the ACC and may designate one or more alternates. The Party shall make its designation(s) by notice to the Parties in accordance with Section 16.6. A Party not participating on the TCC, the ACC, or both may request, by notice to the Parties in accordance with Section 16.6, to be placed on a contact list to receive notices of committee meetings and releases of information, including annual reports and other interim reports that the TCC or the ACC may issue.

14.2.3 TCC and ACC Functions. The TCC and the ACC will:

- a. Coordinate and Consult on development of plans by the Licensees as provided in this Agreement;
- b. Review information and oversee, guide, and make comments and recommendations on implementation and monitoring of the terrestrial and aquatic PM&E Measures, including plans;
- c. Consult with the Licensees on their respective reports prepared under this Agreement regarding implementation of the terrestrial and aquatic PM&E Measures as referred to in Section 14.2.6 below;
- d. Make decisions, grant approvals, and undertake any additional duties and responsibilities expressly given to the TCC or the ACC with respect to the terrestrial and aquatic PM&E Measures;
- e. Establish, among other things, (i) procedures and protocols for conducting committee meetings and deliberations to ensure efficient participation and decision making; (ii) rules for quorum and decision making in the absence of any member; (iii) alternative meeting formats as desired, including phone or teleconference; and (iv) the methods and procedures for updating committee members on interim progress of development and implementation of the terrestrial and aquatic PM&E Measures;
- f. As deemed necessary and appropriate by the TCC or the ACC, establish subcommittees to carry out specified committee functions and responsibilities described in this Section 14.2.3, and establish the size of, membership of, and procedures for any such subcommittees; and
- g. Discuss the protocols and the content of public information releases; provided that each Party retains the right to release information to the public at any time without such discussion.

14.2.4 TCC and ACC Decision-Making Process and Limitations. The TCC and the ACC shall make comments, recommendations, and decisions in a timely manner as provided below:

- a. Each Party represented on the TCC and the ACC will have the authority to participate in all committee discussions relating to, and to provide input and advice on, decisions regarding implementation of the terrestrial or aquatic PM&E Measures;
- b. The TCC and the ACC shall strive to operate by Consensus. Whether or not the TCC or the ACC has final authority over decisions on terrestrial and aquatic PM&E Measures, the Licensees and other Parties may proceed with actions necessary to implement the New Licenses or this Agreement, even though Consensus is not achieved; provided that in such cases the responsible Licensee or Licensees shall notify the Commission of the comments of the ACC or TCC members and the areas of disagreement. If the TCC or ACC does not reach Consensus, then any member of the TCC or ACC, respectively, may initiate the ADR Procedures as provided in Section 15 below.
- c. Where one or more Parties have approval authority under this Agreement, Licensees shall notify the Commission of any approvals that were not obtained, include the relevant comments of the Parties with approval authority, describe the impact of the lack of approval on the schedule for implementation of PM&E Measures, and describe proposed steps to be taken to gain the approval, including dispute resolution.
- d. In no event shall the TCC or the ACC increase or decrease the monetary, resource, or other commitments made by PacifiCorp Energy and Cowlitz PUD in this Agreement; override any other limitations set forth in this Agreement; or otherwise require PacifiCorp Energy to modify its three Projects' facilities without PacifiCorp Energy's prior written consent or require Cowlitz PUD to modify its Project's facilities without Cowlitz PUD's prior written consent, which consent may be withheld in the applicable Licensee's discretion.
- e. At any juncture where discussion or other contact with the ACC or TCC is required by this Agreement, when requested by the Services or as required by the Agreement, the ACC or TCC Committee Coordinator, respectively, shall schedule an opportunity to discuss the relevant issue with the ACC or TCC. This event shall consist of a conference call, in-person meeting, or other appropriate forum to enable full consideration of the issue.

14.2.5 TCC and ACC Meetings. Commencing in the first year after the Effective Date and each year thereafter for the terms of the New Licenses, the TCC and ACC Committee Coordinators shall arrange and provide an agenda for an annual meeting of their respective committees. The TCC and ACC Committee Coordinators also shall arrange and provide an agenda for any additional meetings deemed necessary by either coordinator for a committee or at the request of any two Parties on that committee, which request shall be sent simultaneously to all members of that committee. Members of the TCC and the ACC shall be given a minimum of 30 days' notice prior to any meeting, unless otherwise agreed to by the members of the applicable committee.

14.2.6 TCC and ACC Reports

The Committee Coordinators for the TCC and the Committee Coordinators for the ACC shall prepare and file with the Commission detailed annual reports on the TCC and ACC activities, monitoring and evaluations under the M&E Plan, and implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year, as well as plans for the coming year as required in this Agreement. The annual reports may also include plans and reports required pursuant to Sections 4.9.1, 7.7.1, 8.2.3, 8.2.4, 10.5, and 10.8.3. Copies of such reports will be made available to each Party. The annual reports shall be prepared in Consultation with the TCC and ACC committee members and shall be submitted to the committees for review each year, commencing after the Effective Date. Committee members shall have a minimum of 30 days to review and provide comment on a draft report before a final report is prepared and filed with the Commission. The Licensees shall submit the final report to the Commission not later than 30 days after the close of the ACC and TCC comment periods. To the extent that comments are not incorporated into the final report, an explanation will be provided in writing, and such explanation shall be included in the report.

Attachment B includes the following appendices.

- Appendix A: Summary of monitoring objectives, key questions, metrics and status for 2022
- Appendix B: 2022 Annual Operating Plan, H&S Program
- Appendix C: Lewis River Hatchery TDG Evaluation Report - 2022
- Appendix D: Screw trapping results from lower river sampling 2022, North Fork Lewis River
- Appendix E: North Fork Lewis River Downstream of Merwin Dam – 2022 Coho salmon spawning survey results (October 2022 through January 2023)
- Appendix F: Estimates of abundance for adult Chinook downstream of Merwin Dam, 2022
- Appendix G: WDFW Lewis Hatchery Complex, Operations Program Report – 2022

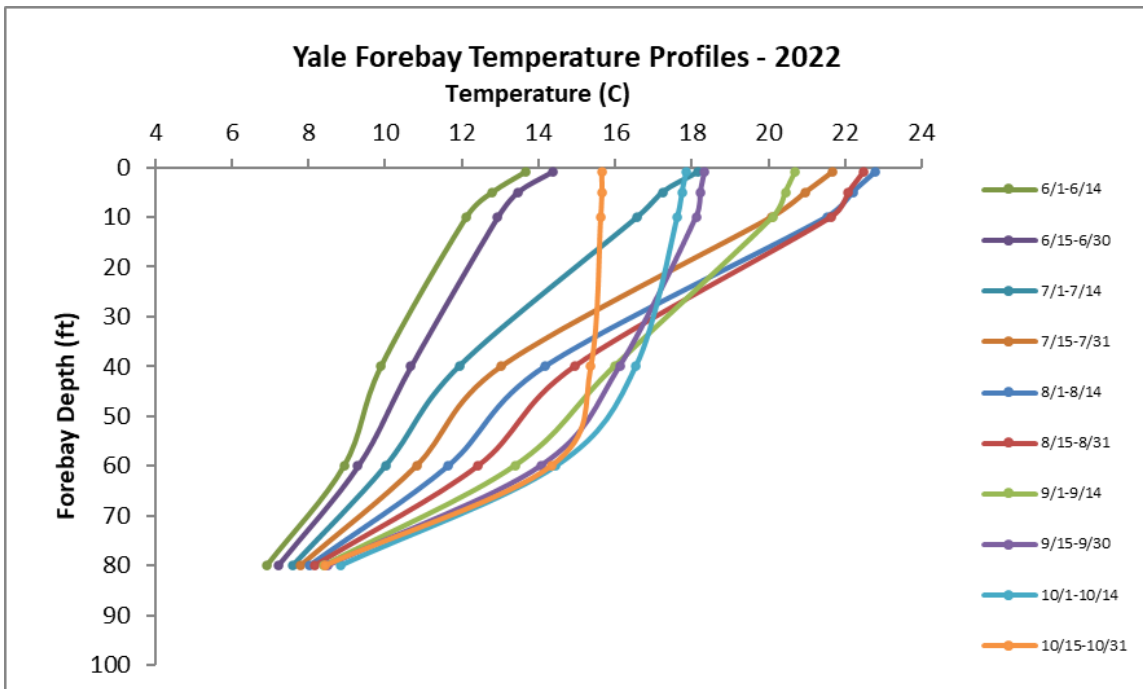
Attachment B
Hatchery and Supplementation Program
2022 Annual Report

Attachment C includes the following as separate files.

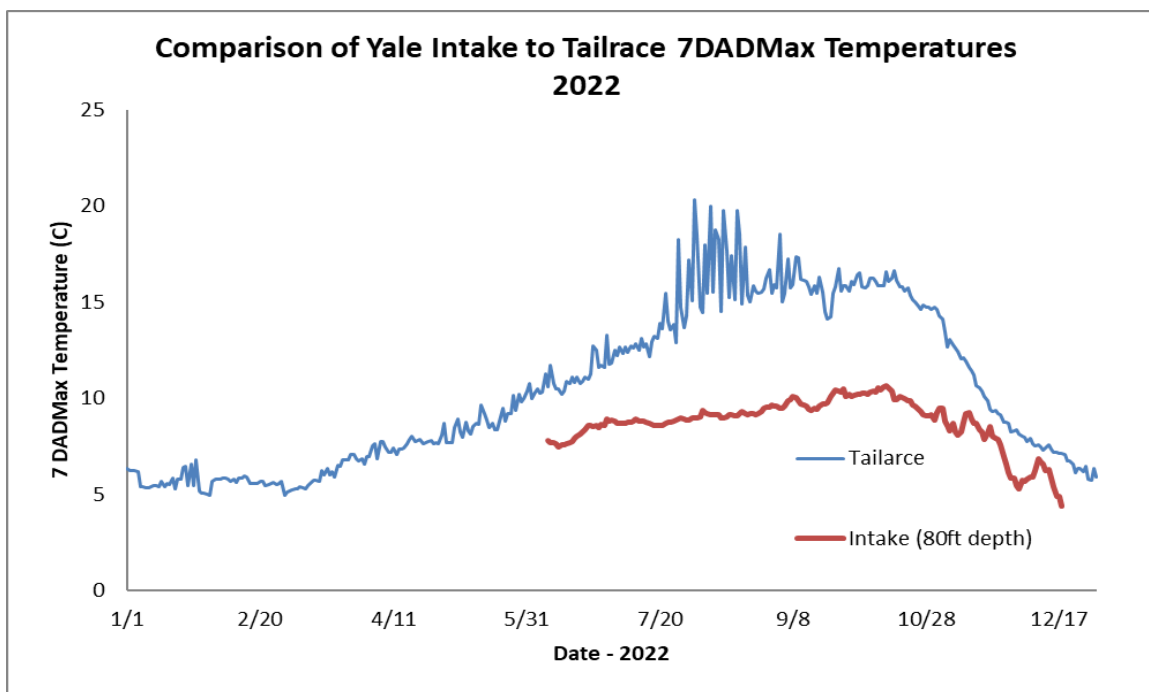
- 2022 Lewis River Fish Passage Program Annual Report
- 2022 Lewis River Bull Trout Annual Operations Report
- 2023 Lewis River Bull Trout Annual Operations Plan
- 2022 Yale Reservoir Kokanee Escapement Report

Attachment C
**Aquatics Monitoring and Evaluation
Program 2022 Annual Report**

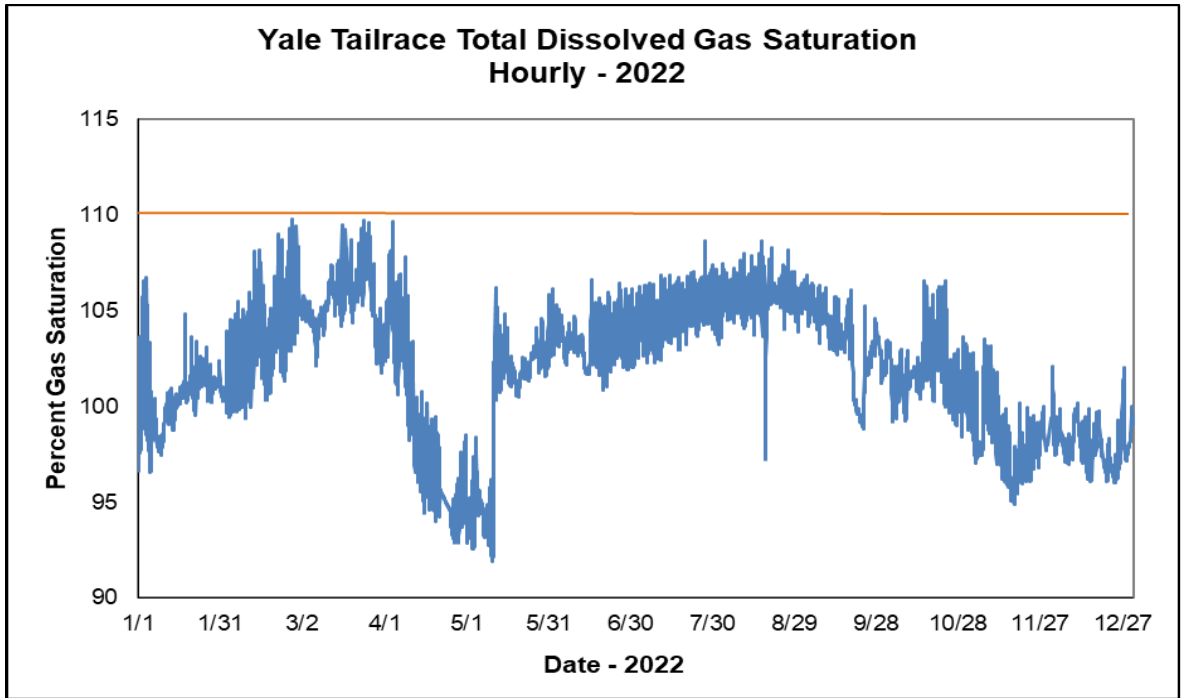
Attachment D
Yale Water Quality Graphs



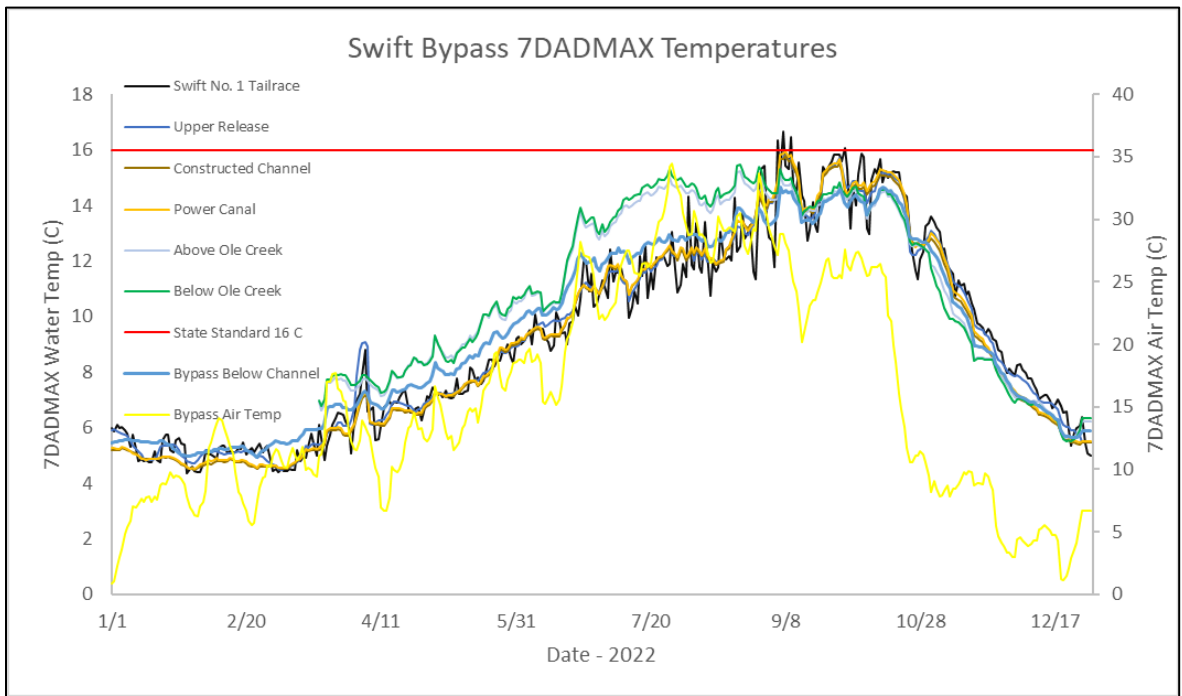
Shown above are bi-weekly averaged temperatures of Yale Forebay at specific depths. The Yale Forebay string is attached to a floating log boom. These depths are constant with respect to the water surface.



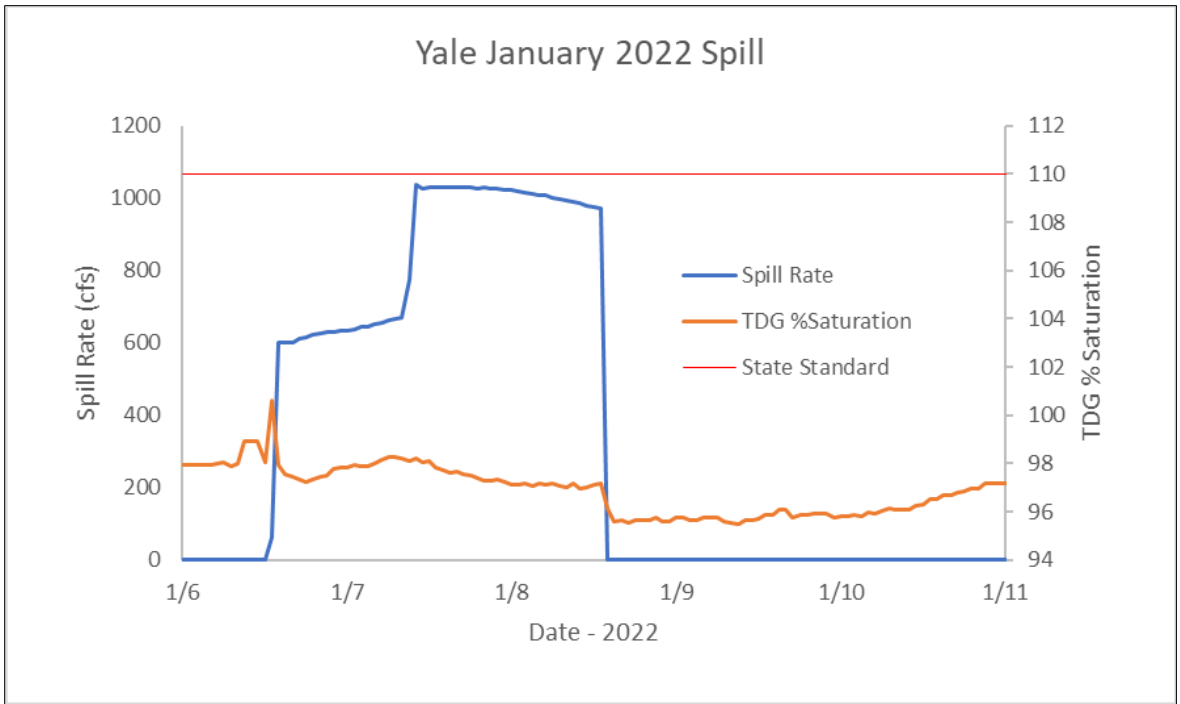
Shown above are 7DADMAX temperature values of Yale Forebay at 80 foot depth compared to that of Yale Tailrace temperatures immediately downstream of the turbines.



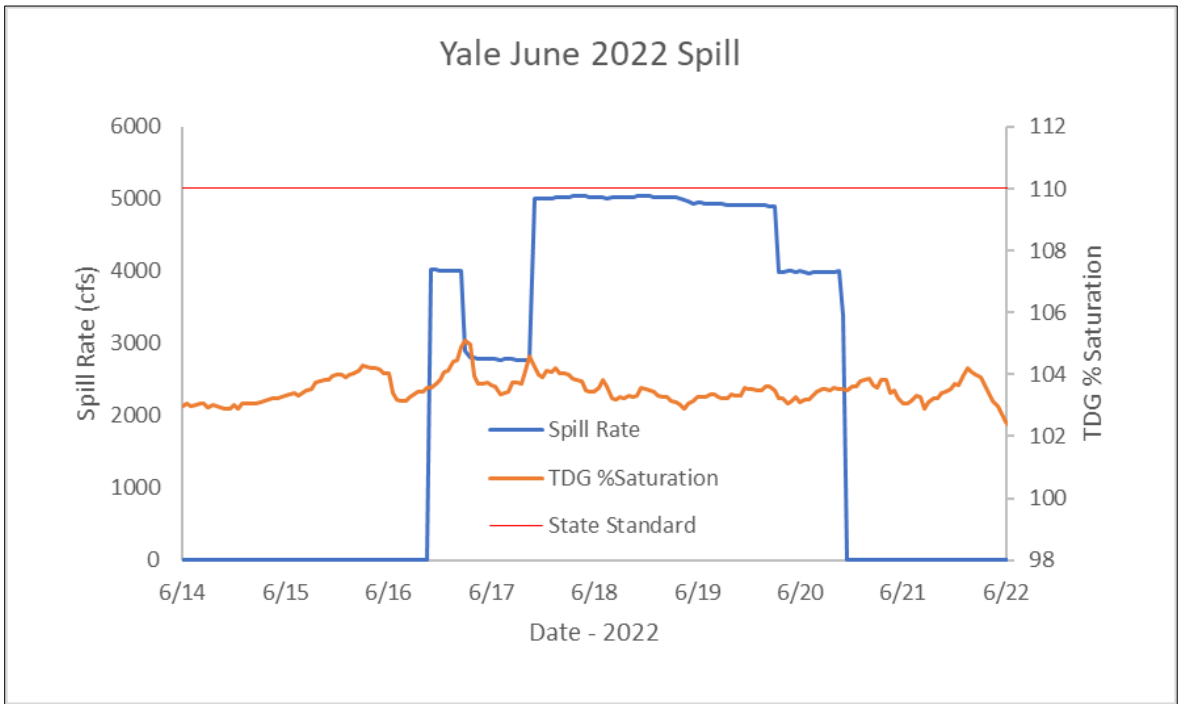
Shown above are hourly TDG readings taken from Yale Tailrace for the entirety of 2022. No TDG over 110% saturation were observed.



Shown above are 7DADMAX temperature values for the Swift Bypass Reach monitoring ‘complex’. 7DADMAX temperatures exceeded the 16 degrees Celsius state standard at the Swift No. 1 tailrace monitoring site briefly in early September and early October 2022. Interestingly, the Power Canal monitoring site downstream from the Swift No. 1 site did not exceed state standards.

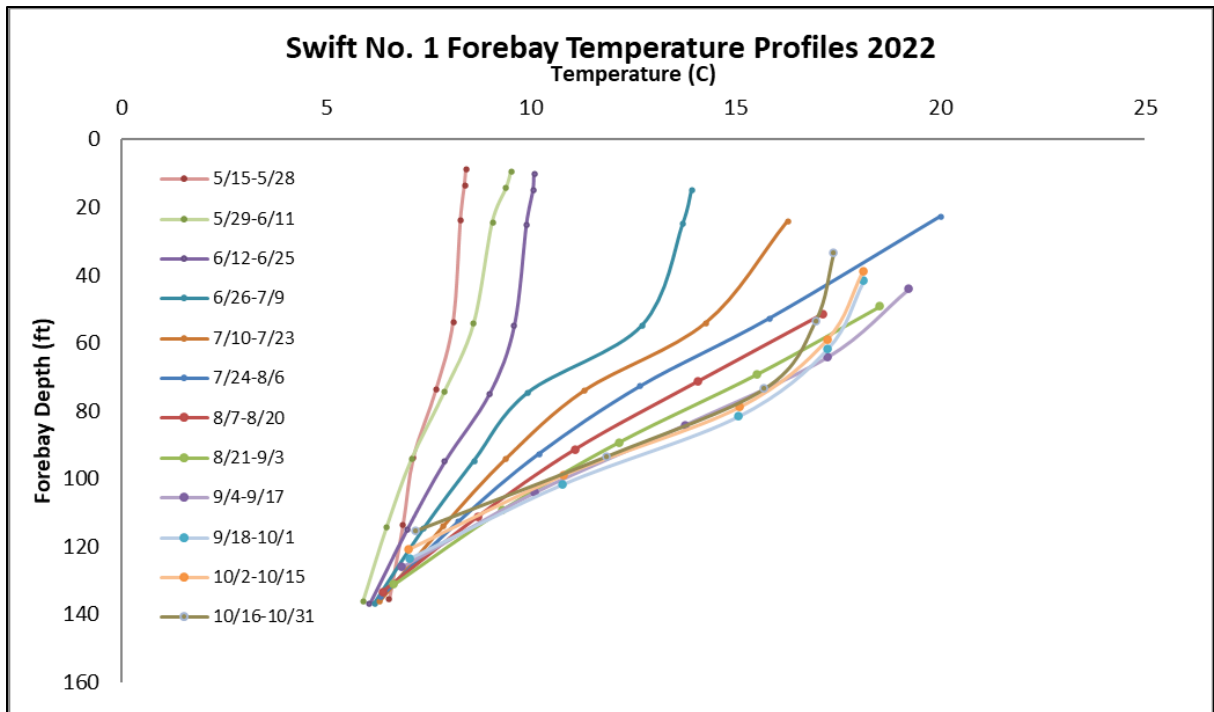


Shown above are measured TDG levels downstream of Yale Dam for a spill event in January 2022. No TDG levels above 110% were observed. Peak natural inflows for this event were 28,114 cfs. The 7Q10 for Yale is 27,088 cfs.

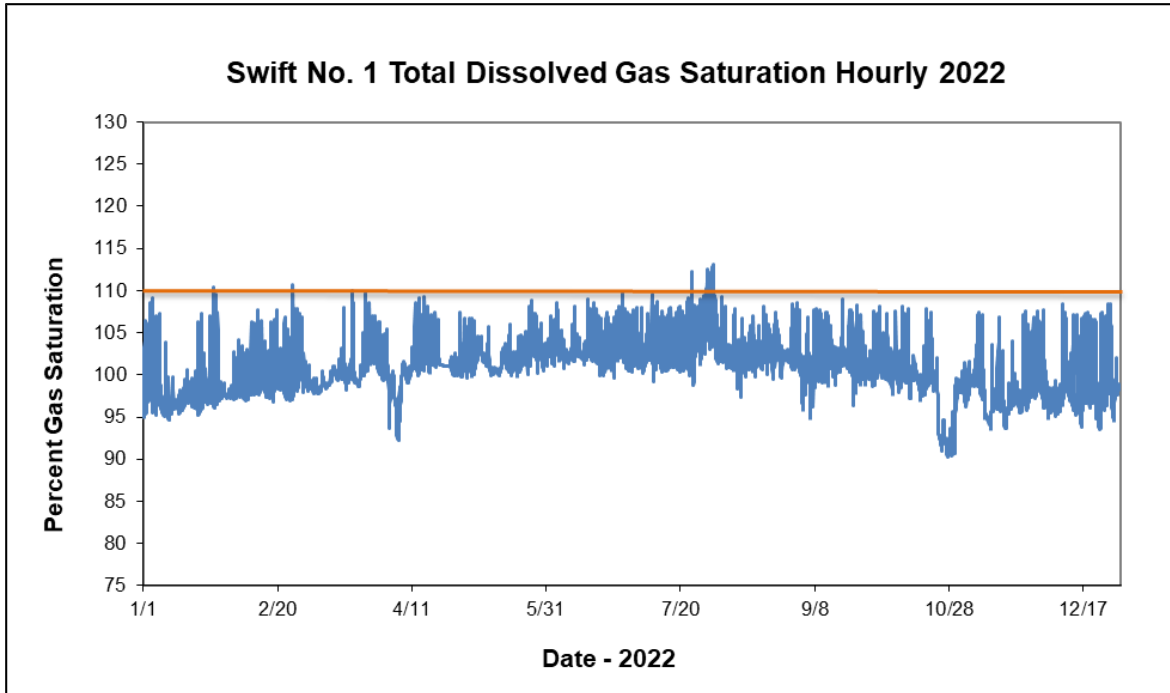


Shown above are measured TDG levels downstream of Yale Dam for a spill event in June 2022. No TDG levels above 110% were observed. Peak natural inflows for this event were 12,694 cfs. The 7Q10 for Yale is 27,088 cfs.

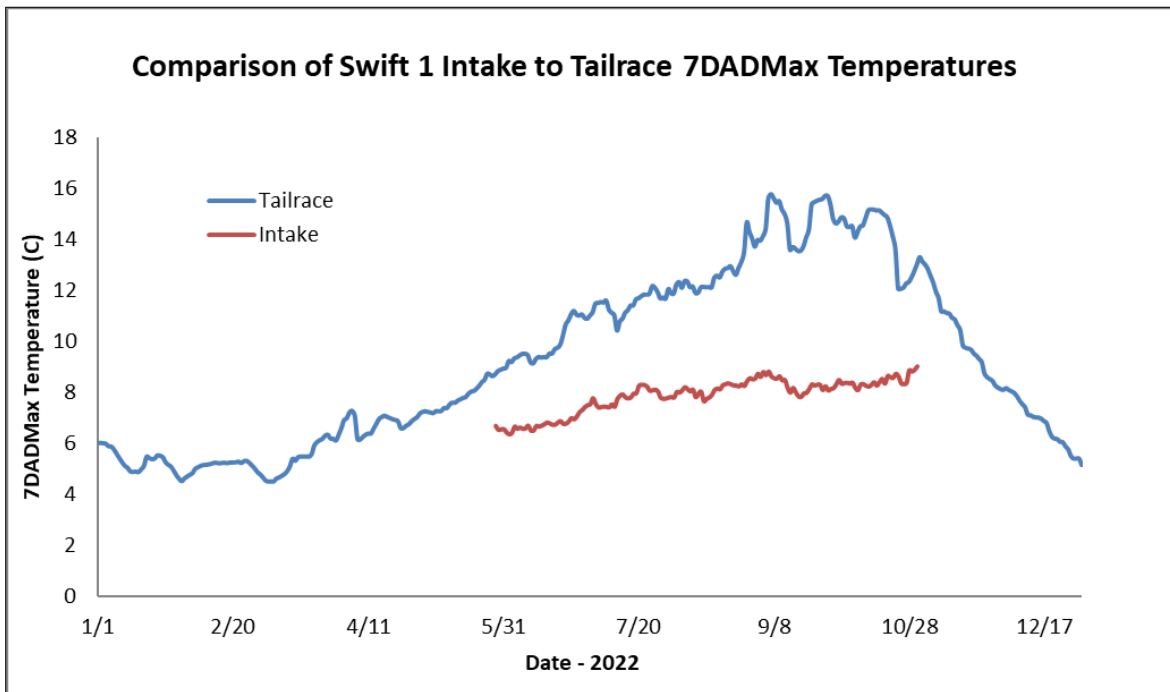
Attachment E
Swift No. 1 Water Quality Graphs



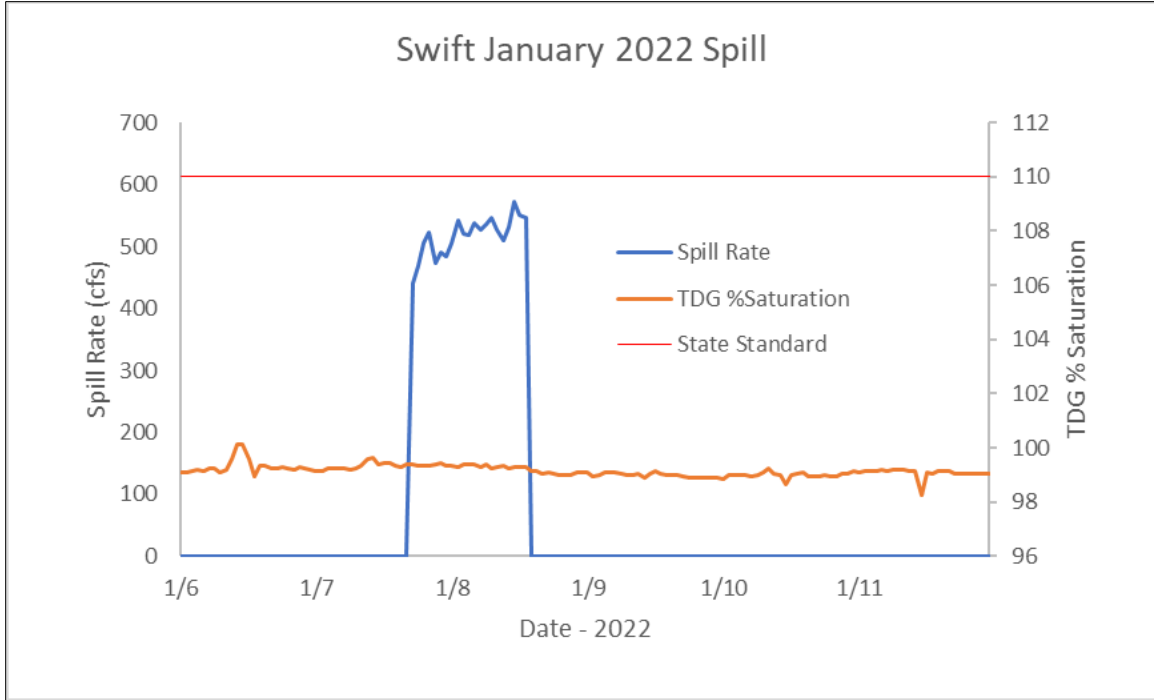
Shown above are bi-weekly averaged temperatures in Swift No. 1 Forebay at bi-weekly averaged depths. This thermostring was attached to a vertically fixed position (hung from the stairwell to the Swift Floating Surface Collector), hence, bi-weekly averaged depths were calculated to account for fluctuating reservoir levels. Each dot on the thermograph lines represents a temperature logger position. For reference the 'one foot logger' is at a fixed elevation of 993 feet above sea level.



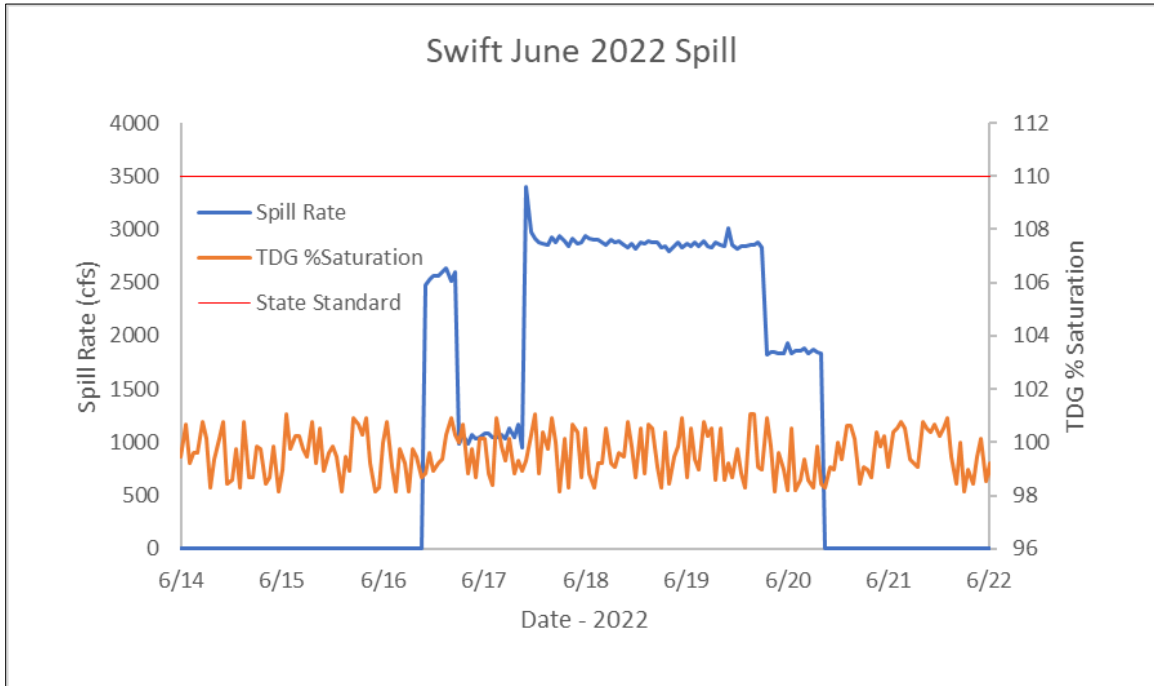
Shown above are Swift No. 1 Tailrace TDG levels. Thirty-five hourly TDG levels were observed to be above the 110% state standard.



Shown above are 7DADMAX water temperatures of Swift No. 1 Forebay at intake dept compared to Swift No. 1 Tailrace. Swift No. 1 forebay is dynamic (the intakes are in a narrow-underwater canyon), making comparing forebay to tailrace temperatures difficult.

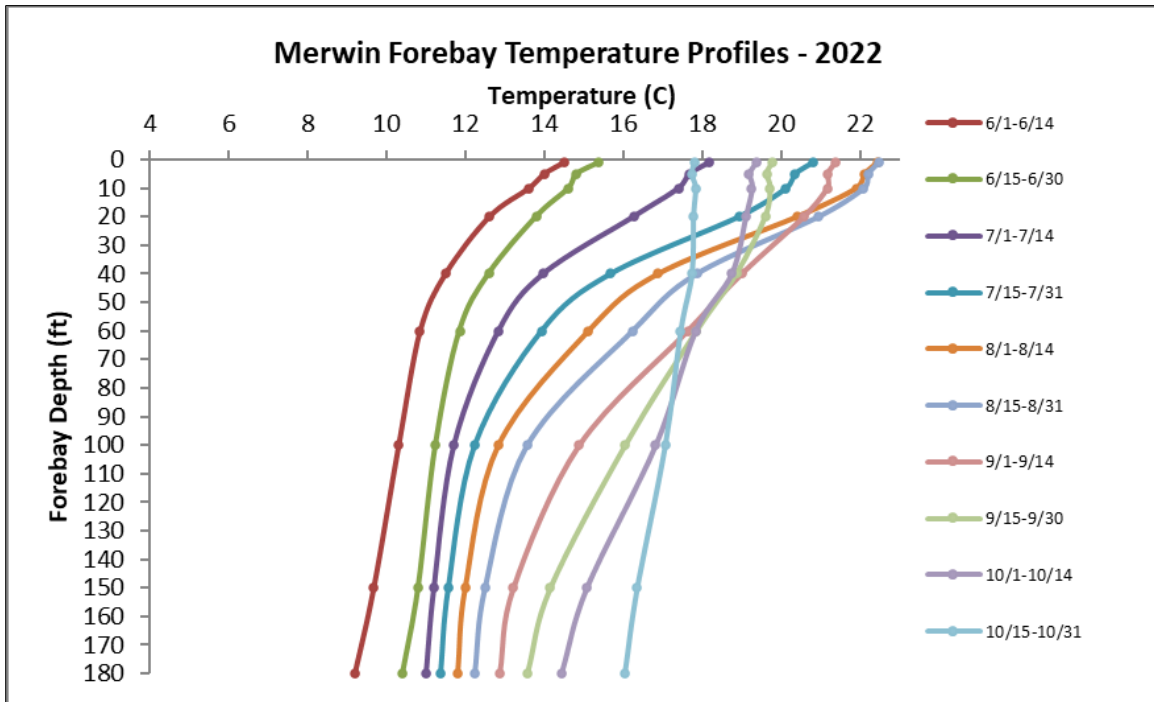


Shown above are recorded tailrace TDG levels in Swift No. 1 Bypass Reach for a spill event occurring in January of 2022. No TDG levels over 110% were observed. Peak natural inflows for this event were 17,273 cfs. The 7Q10 for Swift is 21,322 cfs.

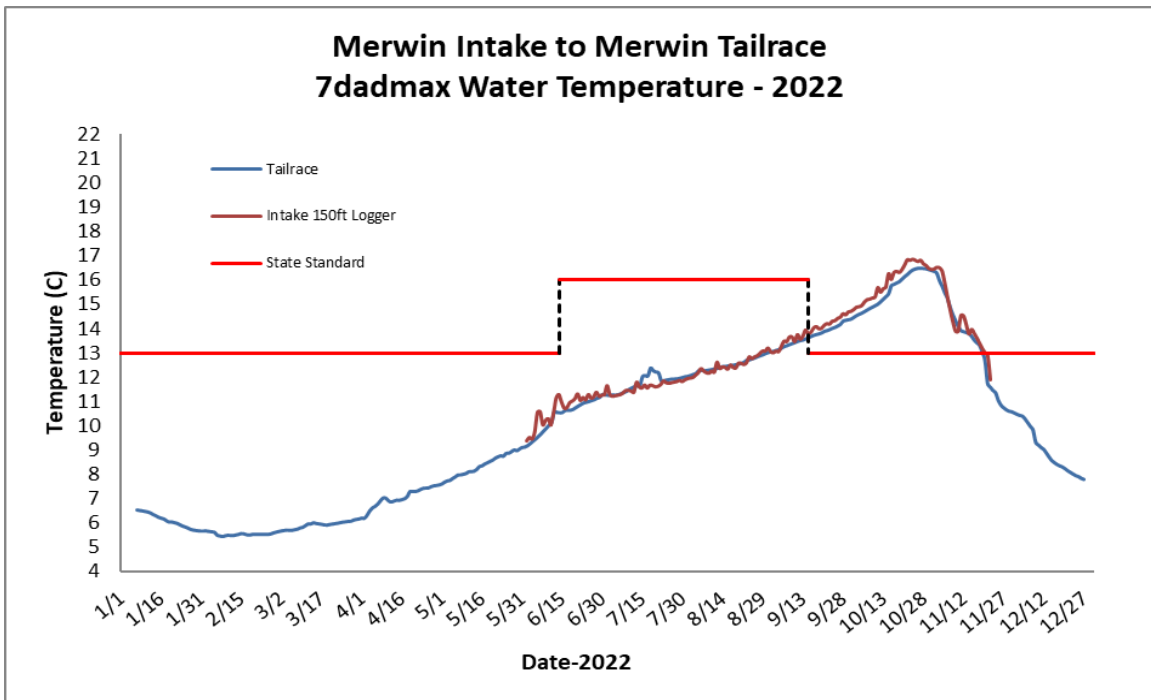


Shown above are recorded tailrace TDG levels in Swift No. 1 Bypass Reach for a spill event occurring in June of 2022. No TDG levels over 110% were observed. Peak natural inflows for this event were 8,280 cfs. The 7Q10 for Swift is 21,322 cfs.

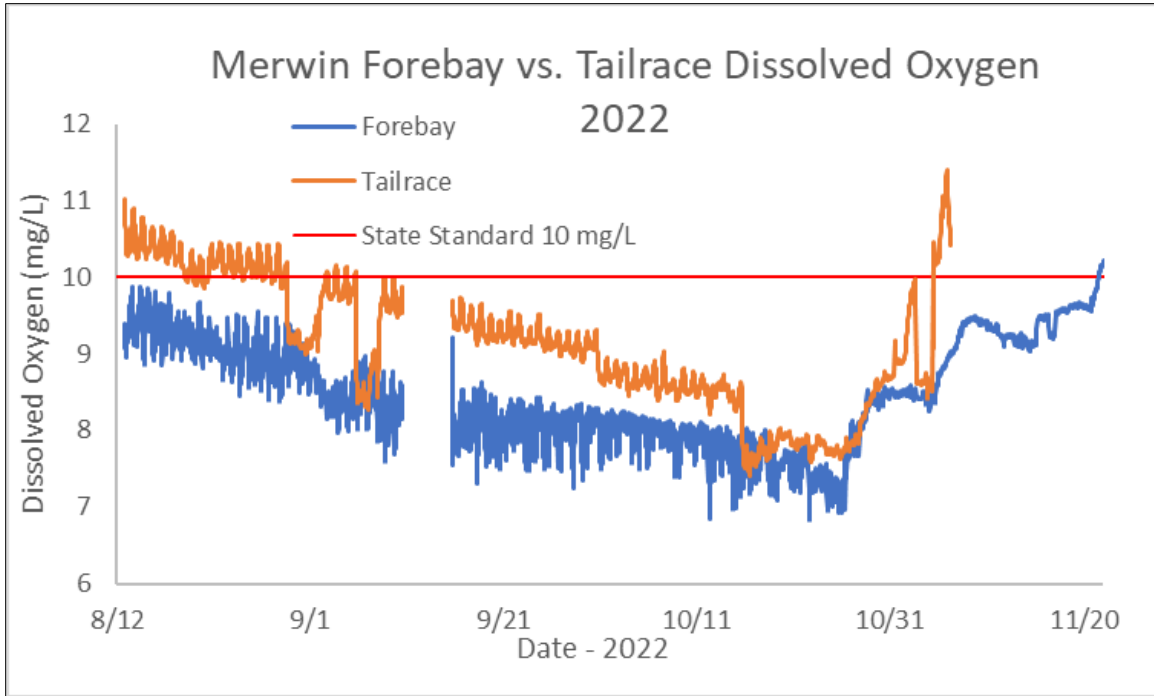
Attachment F
Merwin Water Quality Graphs



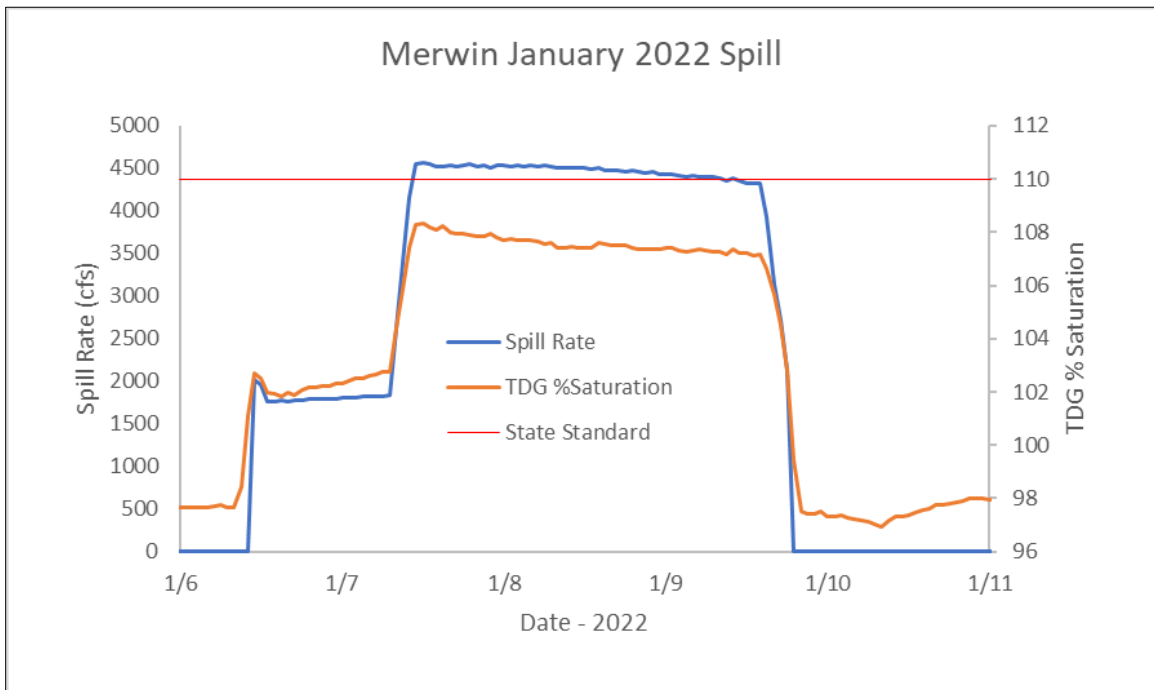
Shown above are bi-weekly average temperatures in Merwin forebay at bi-weekly averaged depths. The Merwin forebay temperature string was attached fixed to Merwin dam, hence, bi-weekly averaged depths had to be calculated to account for fluctuating reservoir levels.



Shown above are 7DADMAX values of Merwin forebay versus Merwin tailrace.



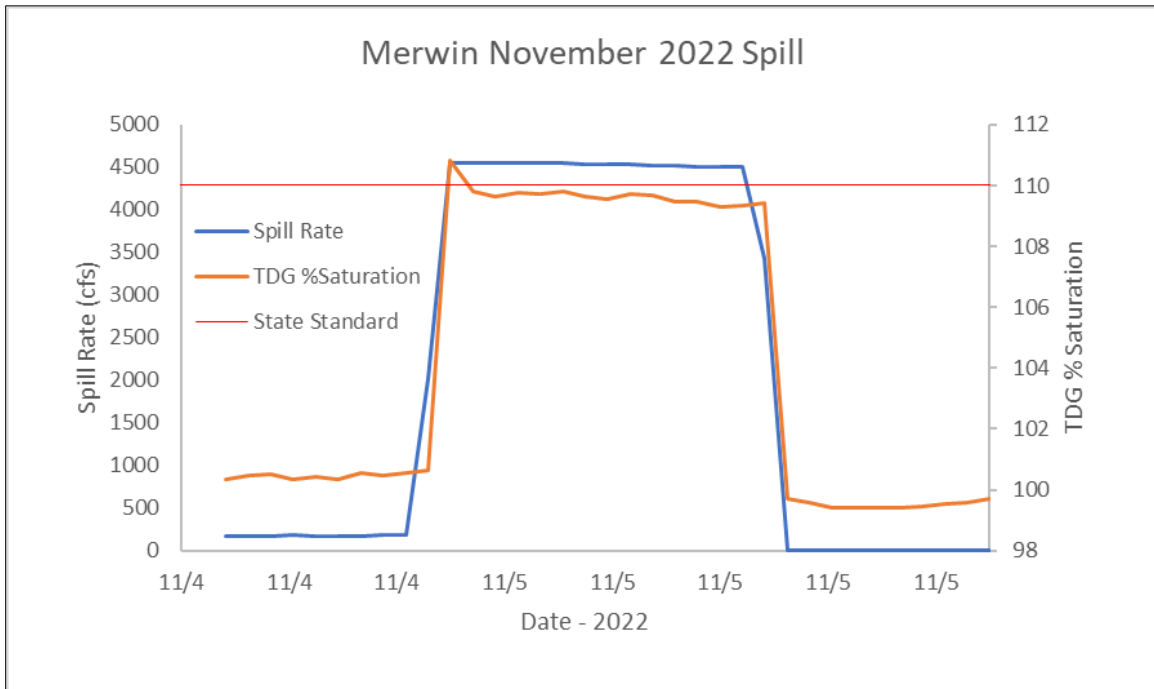
Shown above are dissolved oxygen recordings in mg/L of Merwin forebay (at 150 ft depth) and Merwin tailrace.



Shown above are TDG levels of Merwin Tailrace for a spill event in January of 2022. No TDG levels over the state standard of 110% were observed. Peak natural inflows for this event were 37,348 cfs. The 7Q10 for Merwin is 32,884 cfs.



Shown above are TDG levels of Merwin tailrace for a spill event in March of 2022. TDG levels over 110% were observed, however, the 7Q10 for natural inflows into Merwin Reservoir were met. Peak natural inflows for this event were 40,615 cfs. The 7Q10 for Merwin is 32,884 cfs.



Shown above are TDG levels of Merwin tailrace for a spill event in November of 2022. TDG levels over 110% were observed, however, the 7Q10 for natural inflows into Merwin Reservoir were met. Peak natural inflows for this event were 38,884 cfs. The 7Q10 for Merwin is 32,884 cfs.

Attachment G is a separate file.

Attachment G
Lewis River Wildlife Habitat Management Plan
2023 Annual Plan

Attachment H is a separate file.

Attachment H
Wildlife Habitat Management Plan Annual
Progress Report for Operation Phase 2022

Attachment I
Comment Matrix

From: Bendickson, Beth (PacifiCorp)

Sent: Wednesday, May 10, 2023 6:57 PM

To: Aaron Roberts <Aaron.Roberts@dfw.wa.gov>; Adam Cole <adam.cole@rco.wa.gov>; Alex Maslov <alex.maslov@northforkcomposites.com>; Amanda Farrar <afarrar@cowlitzpud.org>; Bill Sharp <shab@yakamafish-nsn.gov>; Bonnie Shorin <Bonnie.Shorin@noaa.gov>; Bridget Moran <bmoran@americanrivers.org>; Bryce Glaser <glasebgg@dfw.wa.gov>; Christina E Donehower <cdonehower@cowlitz.org>; Dalton Fry <dfry@cowlitz.org>; James Byrne <byrnejim7@gmail.com>; Janae Brock <janae@edgerods.com>; Jeffrey Garnett <jeffrey_garnett@fws.gov>; Jonathan Stumpf <Jonathan.Stumpf@tu.org>; Joshua Jones <joshua.d.jones@usda.gov>; Josua Holowatz <Josua.Holowatz@dfw.wa.gov>; Karchesky, Chris (PacifiCorp) <Chris.Karchesky@pacificorp.com>; Keely Murdoch <murk@yakamafish-nsn.gov>; Kyle Wright <kyle.wright2@usda.gov>; Lesko, Erik (PacifiCorp) <Erik.Lesko@pacificorp.com>; Mariah Stoll-Smith Reese <mariah@lelooska.org>; Melissa Jundt <melissa.jundt@noaa.gov>; Peggy Miller <peggy.miller@dfw.wa.gov>; Steve Manlow <smanlow@lcfwb.gen.wa.us>; Steve West <swest@lcfwb.gen.wa.us>; Tyanna Blaschak <tyanna.blaschak@usda.gov>; Adam Cole <adam.cole@rco.wa.gov>; Amanda Farrar <afarrar@cowlitzpud.org>; Amelia Johnson (LCFRB <ajohnson@lcfwb.gen.wa.us>; Bill Richardson (RMEF <brichardson@RMEF.org>; Bill Sharp (Yakama <shab@yakamafish-nsn.gov>; Erik White (Cowlitz Indian Tribe <ewhite@cowlitz.org>; Holman, Eric W (WDFW <Eric.Holman@dfw.wa.gov>; Jeffrey Garnett (USFWS <jeffrey_garnett@fws.gov>; John Clapp (Citizen at Large <jmcmacle@gmail.com>; Emmerson, Kendel (PacifiCorp) <Kendel.Emmerson@pacificorp.com>; Mariah Stoll-Smith Reese (Citizen at Large <mariah@lelooska.org>; Neil Chartier (USFS <neil.chartier@usda.gov>; Peggy Miller (WDFW <peggy.miller@dfw.wa.gov>; Ray Crosswell (RMEF <shedhunt@aol.com>; mvandam@anchorqea.com; Peterman, Summer (PacifiCorp) <Summer.Peterman@pacificorp.com>; Olson, Todd (PacifiCorp) <Todd.Olson@pacificorp.com>; nmass@anchorqea.com

Subject: FOR 30-Day REVIEW: DRAFT 2022 Lewis River ACC-TCC Annual Report

Hello ACC and TCC Members,

This is your notification that the *Draft 2022 Lewis River ACC-TCC Annual Report* is ready for 30-day review. The report and its attachments are posted on the Lewis River website at this link: <https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html> (Reports tab).

There are a few formatting issues but they will be fixed in the final report. Additional photos will also be added to the final report.

Please provide comments (if any) by Friday, June 9, 2023.

Thank you,
~ Beth

P.S. Some of you will receive this twice (one for ACC, one for TCC). I will work on getting a combined list for these such notifications. ☺

Beth Bendickson

Senior Business Administrator | PacifiCorp Renewable Resources
beth.bendickson@pacificorp.com | o: 503.553.4650
825 NE Multnomah, Suite 1800 | Portland, OR 97232

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
2022 ACC/TCC Annual Report (including Attachments A, D, E, & F)				
1	WDFW	Page 11; Section 3.2.1	Many of the conditions for the Yale upstream and downstream and Swift upstream fish passage are required under SA 401. The SA information here is very limited. Please reference where additional information on what occurred in 2022 such as Yale downstream fish behavioral study and ACC/FPS/Utilities collaboration can be found. Some of the information is in SA 7.6 In Lieu but is required under SA 401. Please reference SA 7.6 and add any additional information not covered in SA 7.6 to the appropriate section.	Text has been added to 3.2.1.1 noting the 2022 Yale Reservoir Fish Behavior Study.
2	WDFW	Page 11; Section 3.2.1.2	Please provide the link to the memorandum or identify the location.	Link to additional information added.
3	WDFW	Page 13; Table 3	Does CWT mean CWT only? So these were the DIT group fish? The Ad clip fish are a combo of AD+CWT and Ad only?	CWT only indicates that the fish contained a wire, irrespective of their adipose status.
4	WDFW	Page 14; Section 3.2.3	Might include a statement about the ~1800 early coho transported into Yale Res. As part of the habitat prep. plan	Added.
5	WDFW	Page 15; Section 3.2.5	Please identify where additional information for the activities associated with SA 401, 4.5, 4.6, 4.7 and 4.8 are located. Some of the information is in SA 7.6 In Lieu but is required under SA 401. Please reference SA 7.6 in these sections and add any additional information not covered in SA 7.6 to the appropriate section.	Text has been added to 3.2.5 noting the 2022 Yale Reservoir Fish Behavior Study
6	WDFW	Page 16; Section 3.2.10	Section 3.2.5 does not identify bull trout and that the facilities (all, not just Yale downstream) will be constructed to pass all transport species. Some of the information is in SA 7.6 In Lieu but is required under other SA articles. Please reference SA 7.6 to these sections and add any additional information not covered in SA 7.6 to the appropriate section.	Text has been added to 3.2.5, 3.2.7 and 3.2.8 noting that Utilities prepared and submitted the 30% design package to the ACC and ACC Fish Passage Subcommittee for review.
7	WDFW	Page 16; Section 3.2.12	Please consider adding "Unauthorized" dispersed camping give there are other areas that allow for dispersed camping.	Edits completed.
8	WDFW	Page 16; Section 3.2.12	Please update the potential construction date.	Edits completed.
9	WDFW	Page 20; Section 3.2.20	Please update this section: Provide if logs were removed and transported in 2022 and if logs were transported to CFC Pine Creek location in 2022?	Edits completed.
10	WDFW	Page 21; Section 3.2.21	Please consider adding 2022 peak flows.	Comment Noted. The Utilities will consider adding peak flows to the 2023 Annual Report.
11	WDFW	Page 21; Section 3.2.22	SA 7.3 states "PacifiCorp shall consult with the ACC regarding the findings of the final study report, and if the study determines that predation is likely to be a limiting factor to successful reintroduction of anadromous salmonids, PacifiCorp may identify steps that could be undertaken to control predation." PacifiCorp identified that smolts migrating through Merwin would be impacted by predation. Please identify if the ACC was consulted for steps that could be undertaken to control predation.	Results from this study were shared with the ACC in consideration of article 4.1.9 of the Settlement Agreement Review of New Information Regarding Fis Transport into Lake Merwin and Yale Lake as well as 7.6 In Lieu Fund. No modifications made
12	WDFW	Page 21; Section 3.2.24	Please reference 2022 Aquatics Fund report and SA 7.8 below for additional information regarding AF proposal submittals and decisions to award made in 2022. SA 7.5 describes the process and criteria to apply for funding, 7.7 identifies reporting and 7.8 states the Utilities will "provide funds through a grant or other means to another entity to implement Resource Projects developed under Section 7.5.3.2, in accordance with the approved plan and schedules for such Resource Projects." It's difficult to know where information will be found so please reference the location of the information in 7.5 and 7.7.	Added Link to aquatics fund site.
13	WDFW	Page 28; Section 3.2.25	Please consider adding when the review between the ACC and ATS occurred in 2022.	Comment noted.
14	WDFW	Page 28; Section 3.2.36	Please provide if the M&E Plan was submitted to FERC and if the approval of the 2022 Plan was approval by the ACC or by FERC.	Language was added.
15	WDFW	Page 29; Section 3.2.40	Please consider referencing the 2022 AOP attachment/appendix in this section.	Completed.
16	WDFW	Page 30; Section 3.2.43	Please consider referencing section 3.2.18 here for additional information.	Reference added.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
17	WDFW	Page 30; Section 3.3	Although 8.2.3 Annual Operating Plan provides “The Annual Operating Plan may be included as part of the detailed annual reports of the ACC activities required by Section 14.2.6”, 14.2.6 TCC and ACC Reports provides "The Committee Coordinators for the TCC and the Committee Coordinators for the ACC shall prepare and file with the Commission detailed annual reports on the TCC and ACC activities, monitoring and evaluations under the M&E Plan, and implementation of the terrestrial and aquatic PM&E Measures occurring during the prior year, as well as plans for the coming year as required in this Agreement” (emphasis added). It is my understanding that the 2023 AOP is complete (2022 AOP with date changes). Although not specifically required, please consider attaching the 2023 AOP as well as the 2022 AOP to satisfy 14.6.2 for including plans for the coming year, similar to the 2023 Bull Trout AOP and 2023 WHMP Annual Plan attachments included in this report. The 2023 annual report could then include the 2024 AOP.	Attached to the H&S Report
18	WDFW	Page 30; Section 3.3	A lot of the information in this section, 3.3 Aquatic 2022 Annual Plan, is duplicate information found in 3.2 Aquatic Measures Implemented as of the End of 2022. Is it necessary to repeat information? Please consider changing 3.3 to 2023 Annual Plan and identify what you intend to do in 2023 even if it’s to say we are repeating activities from 2022 with modifications when necessary. Some of the subsections already reference 2023 activities.	Comment noted. The Utilities are working to streamline the reporting process for 2023 to reduce this type of redundancy
19	WDFW	Page 30; Section 3.3.2	This seems to conflict with 3.2.1.2 Adult Trap Efficiency for Salmonids (SA 4.1.4c) and deferring the ATE studies while the crowder is being modified. Is the crowder not considered a “major” modification?	Language in Section 3.3.2 updated to reflect Section 3.2.1.2.
20	WDFW	Page 31; Section 3.3.11	Example for suggested content: 2023 activities...continue to release coho into Yale reservoir...	2023 HPP activities have not been presented to the ACC. Adding text proposing activities in 2023 would be inappropriate
21	WDFW	Page 31; Section 3.3.12	Example: PacifiCorp with solicit for proposal and complete evaluation for potential funding...	Comment Noted
22	WDFW	Page 32; Section 3.3.13	Example: An update is not scheduled for 2023...	Added text - The next update of the H&S plan is scheduled to be completed by March 28, 2027.
23	WDFW	Page 32; Section 3.3.14	Please consider adding what you plan to do in 2023. Will you conduct an Ocean Recruit analysis?	Additional language added.
24	WDFW	Page 33; Section 3.3.18	There’s a lot of duplicate information that’s already in section 3.2.35 SA Section 8.8 Juvenile Acclimation Sites. Please consider starting the paragraph at: It is expected that spring Chinook releases will continue to be released as part of the hatchery program downstream of Merwin Dam until the ACC recommends reinitiating the upstream acclimation program.” Also include: “Review of this modification will occur annually between the ACC and the ATS” found in section 3.2.35.	Comment noted. The Utilities are working to streamline the reporting process for 2023 to reduce this type of redundancy
25	WDFW	Page 33; Section 3.3.20	Please consider adding this information to 3.2 Aquatic Measures Implemented as of the End of 2022 and indicating here that you will provide the Incidental Take Form for ESA-listed fish species for 2023 activities.	Comment noted. The Utilities are working to streamline the reporting process for 2023 to reduce this type of redundancy
26	WDFW	Page 34; Table 6	Please verify Oregon Coast Coho reflects the stock that returns to the Lewis River.	Lewis River coho salmon (both type S and N) are listed in the Lower Columbia River ESU
27	WDFW	Page 40; Section 4.1.2.2.3	Merwin forebay and tailrace 7DADmax temperatures are nearly identical. What is the depth and location of the intake at Merwin?	The temperature logger string was hung off of Merwin Dam itself in 2022, compared to being hung from the forebay logboom in past years (logboom is about 200 meters upstream of the intakes). This made for much tighter correlations between forebay and tailrace 7DADMAX values. Merwin intakes are approximately 150 feet deep, there are three intakes.
28	WDFW	Page 40; Section 4.1.2.2.3	Attachment F?	Corrected.
29	WDFW	Page 50; Section 5.2.6	2002?	It is unclear what the commenter is addressing. The property was purchased in 2000, so this date was unchanged. The section did, mistakenly, refer to 2021 as the date the routing maintenance occurred. This date was corrected to 2022.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
30	WDFW	Page 57; Table 13	Please consider adding a footnote to the table indicating why some are bolded. Are these the invasive plants that have been observed?	Moved sentence from Page 56 and added to the title for Table 13. "Weeds shows in bold are species Cowlitz County has selected as high priorities for control."
31	WDFW	Page 66, Section 7.0 Funding	Please provide the beginning balances (carryover) moving into 2022 (Dec 31, 2021?) for all the spreadsheets/tables so that funds can be tracked through the year. Without the beginning balance you can't verify the accounting.	Agreed. Fund spreadsheets have been updated to show the 2021 carryover balances where possible. Steps will be taken in 2023 to provide all carryover balances where applicable.
32	WDFW	Page 66, Large Woody Debris Fund-Haul (Section 7.1)	Was this account over spent in 2021? No funds were dispersed in 2022 yet balance is less than funds received.	The negative balance is due to a duplicate 2018 funds received entry which was recently discovered and removed from the fund.
33	WDFW	Page 66, 7.1.1 LWD Fund-Resource (Section 7.1.1)	Was the beginning balance (carryover) \$121,500?	Yes.
34	WDFW	Page 66, Aquatics Fund-Resource Projects (Sections 7.5, 7.5.1, 7.5.3.1 & 7.7)	Was the beginning balance (carryover) \$2,996,761.47?	Yes.
35	WDFW	Page 67, Additional Matching Funds (Section 10.3.3)	Please provide a footnote to help explain this table. It's hard to follow. The goal was to track if we were getting close to the \$500,000 in 10 consecutive years. I'm not sure why there would be a negative balance. Is the expense column the total amount approved for a proposal and the Funds Received column funds that have been distributed? Or are the values in the Funds Received column money that was paid back to PacifiCorp? Using the information in the table for 2013-2022, has \$135,613.25 (Expense column) been awarded in the last 10 years? Rather than using this format consider providing the project, the amount approved by the TCC for funding and the date.	The previous table has been replaced with the table that Terrestrial Coordination Committee reviewed and approved at the March 8, 2023 meeting.
36	WDFW	Page 68, WHMP Fund (Conservation Easement Lands, Section 10.8.2)	Is ending balance \$0, a deficit of (\$320.56) or \$426.06 (blue box above the Balance column)?	Noted. Steps will be taken in 2023 to provide a more understandable format. Refer to Attachment H, Appendix A.
37	WDFW	Page 68, WHMP Fund (Fee Simple Lands, Section 10.8.2)	What is the carryover from 2021? Is it \$776,175.91 dated 12/31/21? Or is it \$622,847.33 (back calculating using release date 12/31/21: Balance – Funds Received + Expenses - Interest)	Noted. Steps will be taken in 2023 to provide a more understandable format. Refer to Attachment H, Appendix A.
38	WDFW	Attachment D-1	Please consider inserting figures into the text so that applicable information to interpret the figures is available or provide figure titles and information to interpret the figures here as well. For example: "Data points for forebay temperature profiles are two-week averages of hourly temperature readings taken at each specified depth." "Data points for intake depth/tailrace comparison were taken hourly from a depth of 15 feet in project tailraces, and at specified intake depth in project forebays."	This can be done in future reports.
39	WDFW	Attachment D-2	Please provide a map of temperature locations.	A map of monitoring locations has been added to the body of the report.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
40	WDFW	Attachment E-1	Please provide explanation here as well as in the text on how to interpret this figure since the Swift thermograph string was attached to a vertically fixed position and the strings in the other reservoirs are not. Is 0 normal full pool and the first point in every line 15 ft below the surface? Does each circle represent a logger? Also, if the string is fixed why are the lowest point on the lines not at the same depth? Please provide and explanation for why some of the circles in the other figures line up horizontally and some don't.	More explanation has been added below the figure in the attachment. The loggers are fixed in elevation, the graph is presented in temperature relative to water depth. Once reservoir levels rise or fall the water depth above the temperature loggers are subject to change.
41	WDFW	Attachment F-2	For the following figures the Maximum Natural Inflow is above the 7Q10 so the values above the 110% TDG thresholds are not considered an exceedance. Please consider finding a way to identify when Maximum Natural Inflow is above the 7Q10. If someone looks at the figures without reading the text, they would not know that these are not exceedances.	Text has been added beneath each spill graph in the attachments to address this.
42	WDOE	Section 4.1.2, Table 7	There are incomplete/truncated sentences. Please update the table to reflect all of the conditions stated in the associated 401 Certification.	It appears there were formatting issues, the necessary corrections have been made.
43	WDOE	Sections 4.1.2.1.1 - 4.1.2.2.3, Text and Figures in the associated attachments	Incorporate 7DADmax data summaries into the text and incorporate 7DADmax data into figures in the associated attachments (or incorporate figures into the text).	There's not a feasible way to incorporate that amount of data (hourly measurements for 365 days) into the text of the report. The raw data contained in the water quality report will be provided to Ecology in a separate Excel file, the 7DADMAX data will be included.
44	WDOE	Sections 4.1.2.1.1 - 4.1.2.2.3, Figures in Attachments	Please include a Map or maps showing the locations of the associated TDG/DO/Temp monitoring locations.	Maps showing all of the monitoring locations have been added into the body of the report.
45	WDOE	Sections 4.1.2.1.1 - 4.1.2.2.3, Figures in Attachments	Please either incorporate the figures into the text of the document or provide descriptive text associated with each graph in the Attachments. For example, describe what each data series shown represents below or above figure/graph.	Brief descriptions have been added to each graph located in the appendices.
46	WDOE	Section 4.1.2.2.3, Paragraph 1	I think you meant to refer to Attachment F.	Corrected.
47	WDOE	Section 4.1.2.5, Paragraph 1	Thank you for the description of the 7DADmax temperatures at the various Bypass reach locations. Please provide citations to support your statements and, if possible characterize the data from the new temperature monitoring locations as they relate to the downstream Swift bypass temperatures.	The statement has been re-written to make obvious that we are referring to data contained in past reporting of PacifiCorp's Lewis River annual reports.
48	WDOE	Section 4.1.2.5, Figures in Attachments	Provide a map that shows the locations of the temperature monitoring locations.	Maps showing all of the monitoring locations have been added into the body of the report.
49	WDOE	Section 4.2.6, Paragraph 1	Please cite the report associated with the temperature data used in the model.	This should be the '2022 Annual Report: Compliance Schedule Water Quality Monitoring and Modeling' that was provided by 4Peaks Environmental. The report will be added to the PacifiCorp's website.
Attachment B - 2022 Hatchery and Supplementation Program				
50	WDFW	Page 1, Objective 1.0	Please confirm, weren't these [HGMP's] submitted in 2015 they just had not been consulted on?	Changed 'submitted' to 'consulted' on
51	WDFW	Page 4, Figure 4	Does this plot represent steelhead that were collected for brood or collected and retained. Without verifying, these two metrics (which are technically different) may have been the same in 2022. Regardless, the text should reflect the actual data that were summarized here.	Figure 4 represents the actual number of brood retained as a function of the brood retention curve provided in the 2022 Annual Operating Plan. So, this represents those collected and retained. Figure title modified to be clearer.
52	WDFW	Page 5, Figure 5	I didn't realize our actual brood collection was approximately a month ahead of our proposed collection. The ATS clearly needs to circle back on this in prep for next year's (spring 2024) collection plan. I realize this topic is related to several items we (WDFW, PacifiCorp) discussed during our phone call last week regarding spring Chinook brood collection and the need to evaluate strategy/priorities/implementation moving forward.	Figure title modified to be clearer (consistent with Figure 4). Agree that the actual and proposed brood collection curves are off significantly and should be revisited in the AOP and modified accordingly by the ATS.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/ Figure	Review Comment	Response
53	WDFW	Table 3, Page 6	Why doesn't the format of this table match the winter steelhead table? Put another way, this table does not contain spawning matrices and timing information as the key question 3b1 indications above.	These data were not provided in a format consistent with those for steelhead. That is, spawning crosses are pooled unlike steelhead that have very detailed spawning records. Something that needs further discussion by the ATS for future reporting.
54	WDFW	3B.3 Feeding Rations and delivery methods	KB - Can we not report on what was done in 2022 even if it wasn't a formalized "evaluation study"? I'm not certain what this summary would entail but interested in what others (hatchery staff) think would be useful to report here. SG - this could represent a significant amount of work depending on the detail level required and without a framework to measure against I'm not sure how much utility it would provide. General rates are provided in draft HGMPs if needed. KB - makes sense re: what do we report without a framework? But this is a key question that was added to the H&S Plan so we need to start thinking about how it'll be addressed and, more importantly, provide useful information. I suggest we add this our ATS task list to discuss.	As agreed to by the ATS, not all metrics are evaluated every year. Yes, this is a key question of the H&S plan and should be evaluated prior to the next iteration of the H&S plan.
55	WDFW	3B.6 Total Dissolved Gas at Lewis River Hatchery	Would be helpful if a short (2-4 sentence) summary was provided here.	Completed.
56	WDFW	3C.1 Size of returning HOR and NOR adults, Page 8	Missing HOR data so unable to evaluate. Also, would be more useful to display as a (box) plot.	These data were unavailable at the time of this reporting. ATS needs to review data management protocols and include data sets with annual hatchery reporting.
57	WDFW	3C.1 Size of returning HOR and NOR adults, Page 8	Why are FL data not available for coho and winter steelhead? At least provide an explanation.	These data have not been provided by WDFW at the time of the reporting.
58	WDFW	3C.2. Age of returning HOR and NOR adults	I don't think these are actual scale samples but rather estimates of abundance by age. For instance, there's no way 20,542 age-4 bright-run Chinook were scale aged in 2020.	This was an error, thank you. Table has been replaced by 3 new figures (see next comment).
59	WDFW	3C.2. Table 6. Age of returning HOR and NOR adults	If these data/results are supposed to be helpful in evaluating age structure of HORs vs. NORs, I would argue this table is not very helpful. Rather, I would at minimum provide plots of relative proportion that could be visualized better.	Table has been modified into 3 figures illustrating the proportional differences between HOR and NOR by stock
60	WDFW	3C.2. Table 6. Age of returning HOR and NOR adults	The other tables go from historic to present, this table should follow same format to be consistent	Completed.
61	WDFW	3C.2, coho and late winter steelhead age data	Why are age data for coho and winter steelhead not available? At least provide an explanation.	As noted in the report, these age data were not available in time to be included in the 2022 report. WDFW has provided age data for several years of late winter steelhead returns and these, along with coho (when available) will be reported in the 2023 report.
62	WDFW	Table 7, Page 9	Please include fall Chinook to MFCF/ Lewis H. collection tables	This was included, but this is redundant with the fish passage report and Appendix G Annual hatchery report. The H&S report focuses on the three transport species (coho, spring Chinook and late winter steelhead).
63	WDFW	Table 9, Page 9	Would be helpful if a sentence or two was added here to explain why the brood collection target was exceeded by >30%.	Footnote provided indicating that total brood includes tribal needs (U.S. v. Oregon). Existing data set doesn't separate total brood into program and tribal needs, but should be in future reporting.
64	WDFW	Table 11, Page 10	Mortalities are fish that died while in a facility? Carcasses are surplus? Why was there 106 NOR coho distributed and not transported to the upper basin? Please clarify	Correct. Mortalities represent fish that died while at the facilities (traps, hatcheries). Carcass distribution represents fish that are used for nutrient enhancement, food banks, tribal, landfill and commercial buyers. Footnotes added to define these terms. The 106 NOR coho was an error and has been corrected to zero (thank you).
65	WDFW	3D. Rearing and Release, Page 10	Does this include residualism?	Not directly, as this key question relates specifically to SAR's, which residualism would affect. There is no current ATS strategy to quantify residualism.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
66	WDFW	3E. Fish health strategy, Page 11	Could just reference Strategy D in which all prevention and monitoring is outlined. At a minimum, need an explanation of who should be collecting and summarizing this information and why nothing is reported here. Figures could be added to inform on percent mortality over rearing cycle, or at relevant life stage.	Referenced Strategy D of the AOP. Future reporting of mortality should be included as WDFW pathology has these data for reporting. Include as part of data management strategy development.
67	WDFW	Table 13, Volitional Release Schedule, Page 12	This is the schedule, correct? Would be good to report what the actual volitional release periods were since I know they don't always match plans. Does not include summer steelhead	Noted. The actual release periods may not line up exactly, but they are very close. Will include actual release period in 2023 report. Release locations updated to include island boat launch and Pekins Ferry. Martin access is at the county bridge and not Pekin's Ferry
68	WDFW	Table 13, Page 12	As it pertains to actual release periods (not scheduled), would this be for spring 2023? If not, would this mean you are splitting brood years?	This applies annually to each broodyear. That is, the timing is the same each year.
69	WDFW	4B. Migration Timing	Do we know if HOR and NOR smolts even have the same capture probability at the screw traps?	Larger hatchery coho consistently result in lower trap efficiency than their NOR (smaller) counterparts (.0125 vs .0168 in 2022). This specific metric is not an total abundance metric, it defines peak migration timing.
70	WDFW	Figure 6, Page 13, screwtrap captures	Does this plot represent raw captures of juveniles at the smolt trap or expanded estimates? Update the figure caption to clarify. Also, would be helpful to add vertical bars representing actual release period (i.e., first date release gates opened and date of final force out).	Represents total maiden captures - unexpanded. Edit accepted. Included volitional release timing for coho at LRH. Please refer to Appendix D which provides additional details of the screwtrapping effort.
71	WDFW	Figure 7, Page 13 screwtrap captures	Sample sizes are helpful. Please add to coho plot.	Updated caption to include sample sizes
72	WDFW	4B, chinook, Page 13	How many Chinook were captured? Collection timing would be good to see. You could create a plot that shows Chinook catch at the trap and the various release timings of hatchery-origin smolts.	This metric is specific to HOR vs. NOR migration timing to assess overlap. No hatchery Chinook were released during trap deployment. Specific timing data are available in Appendix D with respect to wild fall Chinook outmigration.
73	WDFW	Table 14, Page 14, smolt releases	Should this be the number of fish or the poundage of fish? 1,350,000 is a lot of pounds of spring chinook...	Mitigation has specific targets using both number of smolts and pounds released. For example, the target for kokanee, is 12,500 pounds (no number is provided in the license. Therefore, pounds are denoted with ()).
74	WDFW	Table 14, Page 14, smolt releases	This is the first reference to Summer steelhead. Would be good to include in the previous tables as well.	Summer steelhead are included here because there is a license requirement for production of summer steelhead. Summer steelhead are not a transport species and do not have specific monitoring obligations - with respect to the H&S plan.
75	WDFW	Table 15, Page 15, smolt length and weight	Is there a target CV? If so, list it. If not, state that there isn't a CV target.	Clarification added
76	WDFW	Table 16, precocity, Page 15	Please add a column showing release size	This is provided in the previous table
77	WDFW	Table 17, steelhead smolt length, K-factor, Page 16	Please define what is K Factor and what this metric means	Added note
78	WDFW	5B. Page 17 Spawner Abundance	The reporting period for data/estimates below is of varying lengths. It would be good to consistent or justify the reporting timeline.	Noted. Modified chart to clarify. Spring Chinook are the only species of shorter duration. Clarified table caption to note this.
79	WDFW	Figure 9, Page 17	Clarify in the figure caption whether this plot represents total spawners or just natural-origin spawners? If it is supposed to be NOS, the spring Chinook number looks incorrect (~150 NOS; ~1K total spawners).	Represents spawner abundance of natural spawners that includes both HOR and NOR. Objective 8 addresses pHOS. Added note to caption for clarification.
80	WDFW	Table 18, Page 17	Again, is this trend assessment supposed to be for all spawners or just the natural-origin sub-component?	Added clarification to caption
81	WDFW	Table 18, Page 17	Add a sentence describing how the observed trend was generated. Was it visual or based on some sort of statistical analysis?	Clarification added that this is a visual observation
82	WDFW	Page 18, Late Winter Steelhead	Sex ratios at the trap may be representative of ratios in the lower river, but we don't know that for sure.	Agree, so estimates are provided assuming 1:1 ratio and the trap ratio is provided for reference.
83	WDFW	Table 19, Page 19	Update caption to clarify that these estimates are for total spawners (HOS + NOS) and that current methods cannot differentiate the origin.	Updated

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
84	WDFW	Table 19, Page 19	There was a M-R estimate generated in 2018, correct?	Yes, that is correct. Table has been updated with 2018 pHOS model data
85	WDFW	Table 20, Page 20	Same as above, I would clarify that these are total abundance estimates (NOS + HOS) but highlight that origin-specific estimates are generated (and point to where in the report these estimates can be found).	Updated
86	WDFW	Table 21, Page 21	Same comment regarding origin - I'm not certain if estimates of abundance are generated by origin. Either way, update the caption to accurately represent what estimates are reported here and what's available for composition.	Updated, pHOS is part of Objective 8
87	WDFW	Section 5.1A. Key Question, Page 21	Same as above - The reporting period for data/estimates below is of varying lengths. It would be good to consistent or justify the reporting timeline.	Text added to the start of this section indicating that not all species have 5-year trend data. The 5-year period was selected by the ATS as it coincides with the 5-year rotation of the H&S plan update.
88	WDFW	Table 22, Page 21	Same comment as above - Add a sentence describing how the observed trend was generated. Was it visual or based on some sort of statistical analysis?	Updated Table caption
89	WDFW	Table 22, Page 21	We explained in our annual Chinook report why this information was not generated. That said, we could obviously "check the box" by generating a summary table similar to what's reported for steelhead and coho. If this is valuable to the group, we could easily generate this summary for this year's report.	This would be helpful to provide a summary of spatial and temporal distribution over a 5 year period as part of your annual reporting for lower river Chinook
90	WDFW	Figure 13, Page 23	Add "observed" - makes it more clear that these are not expanded estimates that would in theory account for observer efficiency/missed periods.	Added 'observed'. Figure 13 provides the weekly proportion of redds observed over time to document temporal distribution. There are no statistical tools used to estimate missed weeks as the surveys are completed every 10 days.
91	WDFW	Figure 13, Page 24	Table 19 indicates no estimate was generated because of poor visibility. Do you think it's appropriate to include data from this year (guessing it might not be)?	Edited caption to include the year 2015. You are correct that 2016 and 2017 were high turbidity years and no redd surveys occurred. The figure uses year 2015 and years 2018-2022 (6 years of data)
92	WDFW	Figure 13, Page 25	This seems critically important to meeting this objective. Based on previous ATS discussions and evaluation of the trapping data/estimates, my default assumption until shown otherwise is that these estimates are biased because the assumptions of the estimator(s) are violated. This needs to either be clearly stated or provide supporting information to suggest otherwise.	As stated, monitoring assumptions have not been tested. The strategy documents in the AOP discuss the well documented assumptions of the estimator. Whether the assumptions are tested or not, the estimate of abundance will always have bias due to the inability, for example, to ensure equal probability of capture or random mixing of marks on an annual basis. The ATS has discussed this issue at length, but we have yet to develop a strategy to address bias in the juvenile abundance estimator.
93	WDFW	Figure 13, Page 26	Until these estimates can be evaluated for bias, these estimates of precision are not informative.	These are provided by the consultant and are included here for reference.
94	WDFW	Figure 13, Page 27	Until we get to the point where the entire suite of juvenile estimates are critically evaluated every year, I don't support reporting these estimates without a clear caveat. As the report states currently, the assumptions of the estimators haven't been evaluated thus we don't know if the estimates are unbiased. If we don't know if the estimates are unbiased, we need to be crystal clear that they may in fact be biased.	Estimates of abundance are reported to meet requirements of Key Question 6B. The decision to terminate juvenile trapping until assumptions can be tested for bias is a recommendation that the ATS would need to make.
95	WDFW	Figure 13, Page 28	As stated above, I do not support reporting these numbers as "estimates" without clearly caveating what they represent.	See response above
96	WDFW	Figure 13, Page 29	What do these data tell us?	Length differences between NOR and HOR smolts are identified as metrics in Objective 7 under domestication risks using phenotypic differences (among others) to assess. This table is in objective 6 because that is where the trapping occurs, but is anticipated to be used as part of evaluating genetic risks.
97	WDFW	Figure 13, Page 30	Is it appropriate to pool across the entire season given changes in composition and recovery probability of carcasses? Was this even evaluated?	Please refer to Strategy in AOP that discusses the methodology of coho spawner surveys and carcass tagging.
98	WDFW		Table is missing objective 8; ultimately, will be listed as incomplete	Yes, this was inadvertently left out. Has been updated to include Objective 8
99	WDFW		- 3B.5/4A.2 - should be incomplete; tables show schedule releases but not the actual release timing	Disagree, these data are available just not reported. Will be for 2023.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
100	WDFW	Appendix A	- 5.0B - should be incomplete; no details regarding approach (plotting abundance and visually assessing trend is not adequate to label this as complete)	Disagree. Results are provided following the strategies outlined in the AOP. Trend data for Chinook was not available, but based on previous comments this is something that will be reported on in 2023.
101	WDFW		- 5.1A - should be incomplete. Same as above - lacks description of trend analysis (visual assessment is not adequate to be classified as complete)	Disagree. See response above.
102	WDFW		- 6A - should be red/not addressed. Summary states this wasn't complete. Listing CVs for estimates that were assessed for accuracy doesn't elevate this object from not addressed to incomplete.	Agree. This has been changed to red.
103	WDFW		- 6B - incomplete or not addressed; no information on trend analysis; can't assess trend if estimates are of unknown quality	Disagree. Results are provided following strategies outlined in the AOP.
104	WDFW		- 7D; should be incomplete; some data has been collected lacks a formal assessment.	Agree. Not all data are available for reporting, updated to incomplete
105	WDFW	Appendix B, Strategies	Various comments and edits were made to these strategies	Comments have been noted for referral to the ATS for updating. Due to the number of comments, strategies will be removed from the report filing as updates are needed.
106	WDFW	Appendix C, Page 6	How do we know that a carcass was only resighted once or multiple times?	Carcasses are uniquely marked upon initial capture
107	WDFW	Appendix G	Various comments and edits were made to the WDFW hatchery annual report	These edits will be referred to hatchery staff for updates in future reporting.
Attachment C - Aquatics Monitoring and Evaluation Program 2022 Annual Report				
108	WDFW	Section 2.0, Table 2.0-1, Pg 7	As I've detailed in the Fish Passage Report, it appears as though you have preliminary results on the dual mark release study that could be reported here as it pertains to S1 (for naïve and non-naïve fish). I strongly suggest that these prelim estimates are reported here.	Work conducted as part of the two-year feasibility study is still on-going. There are no preliminary results to provide; only a summary of data collected to date. As stated in the table, additional fish will be tagged and released as part of this ongoing study in 2023. See additional responses to comments on this topic below.
109	WDFW	Section 2.0, Table 2.0-1, Pg 12	Regarding total fish captured at the MFCF- Please add the number of fish that were transported into Swift either here (and follows the summary table structure in Fish Passage Report) or down in the row corresponding to Objective 15. Realizing now that we should have specifically called this out as a specific reporting metric in one of the two objectives. Also, would be good to report on the proportion of transported adults that were adults (vs. jacks) and hatchery origin (vs. natural-origin). Again, a bit of a miss on the ATS as we updated the M&E Plan but in my mind these metrics are some of the most important.	A summary of adults transported upstream was included. All other information mentioned is provided in the body of the Annual Fish Passage Report.
110	WDFW	Section 2.0, Table 2.0-1, Pg 13	Regarding SARs - I highly recommend you do not report these estimates given the methods used (and assumptions that would be needed for these to be accurate).	Summary data removed.
111	WDFW	Section 2.0, Table 2.0-1, Pg 13	Regarding NOR vs HOR recruitment - I think it's more important to highlight the low observed productivity of spawners in the upper basin (i.e., observed smolt per spawner MUCH lower than levels needed for replacement). Please update this summary to highlight these results, which will be critical to track and evaluate as reintroduction effort continue.	Summary data removed.
112	WDFW	Section 2.0, Table 2.0-1, Pg 13	Regarding smolts per spawner - These results appear to be misleading. Based on my interpretation of Table 6.2-1 of the Fish Passage Report, the observed smolt per spawner for coho and steelhead was 8.6 and 3.3, respectively. These are the smolts per spawner needed for replacement (assuming the reported SARs, which are likely not accurate).	Summary data removed.
113	WDFW	Section 2.0, Table 2.0-1, Pg 13	minor grammatical changes	Accepted
114	WDFW	Section 2.0, Table 2.0-1, Pg 19	Regarding cross walk between H&S and M&E Plans - Need to get this on the ATS task list and at least a preliminary version developed so it can be reported next year.	Agreed. Should include on ATS task list so it can be prioritized along with other ongoing work actions.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
Attachment C, Appendix A - 2022 Lewis River Fish Passage Program Annual Report				
115	WDFW	Executive Summary, Pg viii, Summary Table	I don't see the utility of this table given that another, more complete version is included in Aquatics Monitoring and Evaluation Program 2022 Annual Report document (that is 34 pages long). If you want to keep the table, it should include every objective including those yet to be completed (e.g., Objective 12 - ocean recruits)	The intent of his summary table is to provide a quick reference to the M&E metrics outlined in the Fish Passage Report and was included at the request of the Aquatics Coordination Committee from comments received on the annual report in prior years. Have added a footnote, which states: <i>Summary table only references M&E metrics relevant to the fish passage program and that are contained in this report. For a comprehensive summary of all M&E Plan objectives and associated metrics reported on in 2022, see the Aquatic Monitoring and Evaluation Program 2022 Annual Report.</i>
116	WDFW	Executive Summary, Pg viii, Summary Table	Overall, this report would be easier to follow if it used the same format and order of Objectives as outlined in the AM&E Plan (and as they presented in the summary report highlighted in my first comment above). I agree that lumping juvenile and adult collection results together makes sense, but the Objectives in the AM&E already do that. If the thought was to order the results by "relevance" then I wouldn't put Eagle Cliff trapping at the top. Please re-order the results/objectives in the report.	Comment noted, but will not be re-ordering the report at this time. The intent of this document is to report M&E metrics relevant to the Lewis River Fish Passage and Reintroduction Program. Reference the Aquatic Monitoring and Evaluation Program 2022 Annual Report for a comprehensive annual summary of all M&E Plan Objectives in order and where that information is contained.
117	WDFW	Executive Summary, Pg ix, Summary Table	Add results that are shown in Table 3.1-5. Even if the data analysis is preliminary, previewing the results very important. I've provided more comments in Section 3.1.2 but would be good to contextualize these prelim results (i.e., almost all study fish used to evaluate Swift FSC collection efficiency were collected at Swift i.e., were trap non-naïve).	Work conducted as part of the two-year feasibility study is still on-going. There are no preliminary results to provide; only a summary of data collected to date. As stated in the table, additional fish will be tagged and released as part of this ongoing study in 2023. See additional responses to comments on this topic below.
118	WDFW	Executive Summary, Pg xii, Summary Table	Please provide the best available estimate of "S1" (i.e., collection efficiency X reservoir survival) as measured in 2022 here. These are your number of marks released by capture location. Now report the number of recaptures and relative percentage. I believe this is what is currently reported in Table 3.1-5. It is worth highlighting in the summary that ODS includes three subcomponents, S1, collection survival, and transport survival. Given the relative importance of S1, I think it's appropriate to highlight the results related to this metric. But of course, you could report each individual sub-component along with the combination of the three (ODS). But, to be clear, estimates of S1 should be highlighted in this summary.	As stated in the summary table, additional fish will be tagged and released as part of this ongoing study in 2023 and it is very likely that fish released in 2022 will continue to be recaptured at least through 2023 at the FSC. There are no preliminary results to provide. It would be inappropriate to provide estimates derived from data that is incomplete here. The additional comment regarded ODS and the importance of S1 has been noted. See additional responses on this topic below in further comments below.
119	WDFW	Executive Summary, Pg xii, Summary Table	I get that the objective is literally [report] the number of adults collected at Merwin FCF. Certainly you've done that here and could leave it be. But for context, it would be helpful to highlight the number or percentage of adults that were captured at Merwin FCF relative to Lewis Hatchery. For instance, >40K coho were captured at Lewis hatchery in 2022. Your call but just brainstorming was to make the results in this report useful.	Comment noted.
120	WDFW	Section 3.1.1, Pg 16	Please reword this to clarify the goal of the study. The way this is written could be interpreted as "alternatives that would allow PIT tagging more fish" where the goal is to PIT tag more fish, but it could also be read as "alternatives to PIT tagging more fish," as in alternatives where fewer fish are PIT tagged.	Sentence reworded to provide clarity here.
121	WDFW	Section 3.1.1, Table 3.1-1, Pg 18	Regarding use of "NA" - Is this value supposed to be zero?	Yes. Replaced NA with zero.
122	WDFW	Section 3.1.2, Pg 19	Based on the plots below, it looks like some trapping days were missed due to high flows. Would be good to highlight this in the summary and briefly describe how these missed periods were accounted for in the analysis.	Comment noted. No effort was made to estimate fish that passed the trap during these outages. Additional information on this and the rational as to why no effort was made is provided in the complete reported provided as Appendix C to the Annual 2022 Fish Passage Report.
123	WDFW	Section 3.1.2, Pg 19	Why are these estimates an index of abundance during the trapping period?	Sentence modified to: <i>These estimates should only be viewed as an index of the total fish that entered Swift Reservoir during the trapping period (~late-March through August) and not total species out-migration abundance for the year as the Eagle Cliff screw trap does not collect fish from other tributaries that enter the reservoir, such as Swift, Drift, and Range creeks.</i>

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/ Figure	Review Comment	Response
124	WDFW	Section 3.1.2, Table 3.1-4, Pg 25	Are the values given for the 95% confidence intervals the width of the interval? It might be more clear to provide the lower and upper values for the confidence intervals, though of course this would make the table more cluttered. Maybe a plot would be helpful here?	Added ± to all of the 95% CI values listed in the table.
125	WDFW	Section 3.1.2, Pg 26	Move these results down to fourth paragraph (that I added and needs a little more work)	Paragraph updated to reflect that data collection is ongoing and data provided in the current report only represents tagging and recapture data collected at the Swift FSC to date.
126	WDFW	Section 3.1.2, Pg 26	Are the plans for the statistical analysis available? We would appreciate the opportunity to review these plans before they are complete, and may be able to assist with more advanced methods that we are currently developing that allow for recaptures over extended time periods, time-varying capture probabilities, and differences between naïve and non-naïve individuals. We understand that this report may not be the most appropriate place to present these plans, but it would be helpful to add a reference to these plans even if they are only available elsewhere.	Testing of these data is described in more detail in Section 2.1.1.1 of the current M&E Plan (2022).
127	WDFW	Section 3.1.2, Pg 26	Add a paragraph: Need one more summary paragraph summarizing preliminary results related to “feasibility” study. Expand on the results from Table 3.1-5, which based on the summarized data, suggest that collection efficiency for non-naïve fish is higher (2X) than naïve fish. Add a sentence or two contextualizing these results by summarizing the primary source of tagged fish have come from over the years to estimate S1 and its subcomponents (reservoir survival and collection efficiency).	Comment noted. As referenced above, work conducted as part of the two-year feasibility study is still on-going. As stated in the M&E Plan, <i>upon completion</i> of the two-year feasibility study, data will be evaluated to: 1) determine if there is a significant difference in recapture rates between fish PIT tagged at the Swift FSC and returned to the head of the reservoir for release (non-naïve) and fish captured, PIT tagged, and released at the Eagle Cliff Park screw trap (naïve) by species size/age class; 2) If no significant difference is found, then use only Swift FSC PIT tagged fish to measure the S1 parameter for estimating ODS; and 3) If there is a significant difference found in the recapture rates between the screw trap and Swift FSC PIT tagged fish, then determine which method or combination of methods is most efficient to meet the ODS sample size recommendations and revise ODS estimator as warranted to account for the difference. At the end of the feasibility study, the alternative methods will be presented to the ATS and evaluated to determine which method or combination of methods best meets the PIT tag sample size requirements for calculating ODS, and most accurately represents the abundance of juvenile fish entering the reservoir. At that time, a long-term methodology will be developed and proposed in consultation with the ATS, and/or additional recommendations will be made to further refine a selected methodology. It is inappropriate here to provide any further conjecture on these data beyond an annual summary of what has been collected to date.
128	WDFW	Section 3.1.2, Pg. 26	Reference Table 1 of Appendix D - almost all fish used to evaluate collection efficiency over the years have been collected at Swift FSC.	Comment noted.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
129	WDFW	Section 3.1.2, Table 3.1-5, Pg 26	<p>It would be helpful to reconcile the results shown here with the results summarized from 2022 in Appendix D - specifically the stage specific estimates of survival/collection efficiency broken down in Figure 15 for coho and steelhead. It would be helpful to reconcile the results shown here with the results summarized from 2022 in Appendix D - specifically the stage specific estimates of survival/collection efficiency broken down in Figure 15 for coho and steelhead.</p> <p>For instance, steelhead have a reported Pres of ~67% and Pce of ~48% (Penc is ~100%). If you combine these two estimates, which is S1, you get ~29%, which matches the results shown in Table 3.1-5 for non-naïve fish (which makes sense given that acoustic fish were captured and tagged from Swift FSC).</p> <p>However, the results don't match up for coho the same way. Based on Figure 15 of Appendix D, Pres was ~83% and Pce was ~62% resulting in an S1 estimate of ~51%. However, in table 3.1-5, the estimate of S1 for non-naïve fish was 29%. Why the difference?</p> <p>Further explanation/exploration of these results would be extremely valuable.</p>	<p>See response above, data collection as part of the two-year feasibility study is still on-going. It would be inappropriate at this time to provide any further conjecture on these data beyond an annual summary of what has been collected to date. Note however, your comment is true only if you aggregate fish of all sizes (cohorts), if you compare apples to apples (fish of the same size class, i.e., larger active migrants), at this point there appears to be little if any difference for both species for similar sized fish – but again, it is too early to draw many conclusions at this point.</p>
130	WDFW	Section 3.1.2, Table 3.1-5, Pg 26	<p>I added these two columns summarizing the percentage of maiden fish that were recaptured for each release group. This makes it much easier to assess the results (which very early indications suggest naïve fish have lower capture efficiencies).</p>	<p>Comment noted. Updated Table 3.1-5 accordingly.</p>
131	WDFW	Section 3.1.2, Table 3.1-5, Pg 26	<p>Feel free to edit as you see fit but adding language to link data/results to study questions is helpful</p>	<p>Comment noted.</p>
132	WDFW	Section 3.2.1, Pg 32	<p>Based on the location of the PIT tag antenna(s) inside the Swift FSC, it would interesting to estimate/verify the sub-sample rate using PIT tagged fish. Here, if the antenna is "upstream" of the sub-sample tank, then you'd know the total number of fish that entered Swift FSC (denominator) and then the number that were handled in the sub-sample tank (numerator).</p> <p>Given the relative importance of these results (i.e., juveniles collected at Swift FSC), I think that this should be a reported metric. Could be a table of results by week and/or collection period for each planned sample rate.</p>	<p>Comment noted. Good suggestion.</p>
133	WDFW	Section 3.2.1, Pg 32	<p>Regarding incrementally adjusting subsample rate at FSC - Great! I was under the impression that the sample rate was either 100% or 10% (and nothing in between). When did the change occur?</p>	<p>No change occurred. Incremental sampling rates are used to balance data collection needs with space limitations of the sampling tanks. Too many fish in the sample tanks can lead to increase mortality.</p>
134	WDFW	Section 3.3.1, Pg 37	<p>Was this determined visually? Were any scales collected to verify the age calls?</p> <p>Overall, I can largely buy the classifications but undoubtedly there's going to be some error for certain timing and size classes (especially for steelhead).</p> <p>We need to add a topic to our ATS list related to "juvenile outmigrant age determine" and loop in USGS folks (Russ, John, Dalton) who are starting to build the IPM. I'd like to get their feedback on the topic as I imagine we'll need to partition juvenile outmigrant abundance into age classes/brood years.</p>	<p>Brood year assignments were determined based on length frequency data as currently described in Sections 3.1 and 3.3 of the report. Further discussion on this topic at the ATS would be appropriate.</p>
135	WDFW	Section 3.4.2, Table 3.4-1, Pg 54	<p>This footnote isn't used anywhere in this table, it should be removed if it is not required.</p>	<p>Footnote removed.</p>
136	WDFW	Section 3.5.1, Table 3.5-2, Pg 55	<p>Spelling correction</p>	<p>Table updated.</p>

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
137	WDFW	Section 3.5.1, Pg 57	Please link this to the specific performance standards. Is there a performance standard for collective injury rate versus species-specific injury rates? The low collective rate of injury is primarily a consequence of the large numbers of Coho.	The Settlement Agreement establishes a Swift FSC design performance objective for injury of less than or equal to 2% for all fish examined. The phrase " <i>...as stipulated in the Settlement Agreement</i> " was added.
138	WDFW	Section 3.7.1, Pg 62	"alternatives to PIT tagging more fish" - See comment on this wording in Section 3.1.1.	Sentence reworded to provide clarity here.
139	WDFW	Section 3.7.2, Pg 63	spelling correction	Accepted
140	WDFW	Section 4.2.2, Pg 69	minor grammatical change	Accepted
141	WDFW	Section 4.4.2, Pg 73	Regarding Chinook redd detection probability - How was this estimated? Can you reference the methods used to generate these numbers?	This was estimated based on redd visibility analysis in 2022 and best professional judgement.
142	WDFW	Section 4.4.2, Pg 73	Are these unique redds (i.e., only enumerating new redds) or total redds (new plus still visible)? Update language to clarify.	Total unique redds enumerated by surveyors. Sentence reworded to provide clarity here.
143	WDFW	Section 4.4.2, Pg 73	Again, what are these redds? How was this expanded (estimate) generated? Does this estimate assume you had 100% detection of redds across all potential spawning areas and time? I looked back at the methods in the M&E Plan (Objective 15) and looks like the method assumes these counts are censuses. Regardless, it would helpful to add a few sentence describing the methods and/or assumptions used to generate the estimates.	These are estimates of total unique redds. All information being requested here can be found in the complete report provided in Appendix E.
144	WDFW	Section 4.4.2, Pg 74	Estimating number of redds as a proxy for number of spawning females is certainly important. But redd superimposition can cause substantial egg mortality in the original redd, so the bias in juvenile productivity will be lower than the bias in number of redds. This will be important when we integrate these data into a full lifecycle model later on.	Agreed
145	WDFW	Section 4.4.2, Pg 74	Perhaps...see John's comment above. The most important thing is that data collection methods are implemented in a consistent manner. I think what you are trying to highlight here is that redd-based data are susceptible to observation error, which isn't unique but may be more or less problematic depending on the species. I would couch the narrative here in these terms instead of speculating about whether the number of redds was underestimated.	Added additional information about June spill event at Swift Dam that likely contributed to fewer female spawners in 2022.
146	WDFW	Section 6.2, Pg 78	Regarding smolts per spawner - Whoa! This is crazy low. Using regional estimates of productivity and capacity for winter steelhead, we should be seeing closer to 20 smolts/spawner when spawner abundance is around 1,200 (assuming max productivity of 110 smolts/female and capacity in the upper basin of 40K smolts). Even factoring in relative reproductive success of hatchery-origin spawners, we should be seeing much higher realized productivity (see next comments). It would be worth you reviewing the information report here and the handful comments I've provided as it relates to productivity in the upper basin and their estimates of collection efficiency	Comment noted.
147	WDFW	Section 6.2, Pg 78	Regarding collection efficiency bottleneck for R/S values - Agreed!	Comment noted.
148	WDFW	Section 6.2, Pg 78	Based on results in table 3.1-5, which is a pooled estimate of S1, the combination of collection efficiency and reservoir survival is much lower than 42% in 2022 (it was ~14% based on the data/results presented). I get that you are reporting 2020 outmigration data to be paired with 2022 adult returns (assuming all age-2s) but my larger point is that this estimate is a sub-component of "overall" survival and may be overestimated based on the use of non-naïve fish.	Correct. Comment is referring to collection efficiency as calculated per Objective 2 of the M&E Plan for the Swift FSC. It is not appropriate to include incomplete data collected in year-1 of the feasibility study here. Once the feasibility study has been completed, the S1 parameter derived from that study can be used as a reference point.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
149	WDFW	Section 6.2, Pg 78	<p>Appreciate the summary of "performance metrics" provided in this section but the potential mechanisms for the poor performance probably warrants more thought.</p> <p>I think explanations that warrant further evaluation are: 1) residualism (mykiss that adopt resident life history due to the presence of reservoir), detracting from smolt production, 2) poor spatial distribution of adults means that much of the productive capacity of the watershed isn't being used, 3) predation in reservoir... 4) collection efficiency is overestimated (see next comment)</p> <p>Please update this narrative to include more plausible explanations for the observed low productivity.</p> <p>Overall, I think the smolts per spawner is a metric we should track closely. Obviously, the main goal of improving downstream capture efficiencies at Swift FSC is still priority number one. Continuing to evaluate the assumptions associated with those capture efficiencies is crucial (e.g., paired releases of PIT tags). However, if low realize productivity remains, we will likely want to investigate the mechanisms further.</p>	Comment noted. Added additional explanations to text.
150	WDFW	Section 6.2, Pg 78	Based on the results in table 3.1-5, the estimated "S1" metric (i.e., collection efficiency X reservoir survival) for winter steelhead in 2022 (I think) was ~14%. So the potential productivity, as measured in smolts per spawner, was really closer to 21 for winter steelhead (i.e., 3 smolts per spawner)/0.14). Again, this is much closer to the productivity we would expect to see for winter steelhead in the upper Lewis Basin based on spawner-recruit relationships.	Comment noted, however would advise not relying to heavily on the S1 parameter derived from the ongoing feasibility study here, as collection of tagged fish is still ongoing and data is incomplete.
151	WDFW	Section 6.2, Table 6.2-1, Pg 79	Regarding SAR% - The assumptions needed to be met for these estimates to be accurate are likely unachievable. Nonetheless, it would be worth listing as a footnote similar to what's done here for the other metrics.	Footnote added
152	WDFW	Section 8.0, Pg 80	Minor grammatical change	Accepted
153	WDFW	Appendix D - Swift FSC Collection Efficiency Report, Figure 13	At first glance, it looks like the acoustic tags deployed and detected in the ZOI are weighted quite heavily toward the early portion of the outmigration period. If there are systematic, within-season changes in collection efficiency, this will bias the estimates of collection efficiency. Am I misunderstanding what this plot is representing?	No, you are not misunderstanding this plot. See further description of why this occurred and analysis of within season changes of collection efficiency in the body of the report.
Attachment C, Appendix B - 2022 Bull Trout Report				
154	WDFW	Section 3.1.1, pg 5	Comment to whether specified 2016 data is available. "Are these data available somewhere?"	Yes, 2016 data is available on the PacifiCorp website under Hydro Resources, ACC/TCC Annual Report tab, 2016 ACC/TCC Annual Report.
155	WDFW	Section 3.1.1 pg5	What is the release location of FSC captured bull trout?	Per the USFWS, FSC captured bull trout are released back to Swift Reservoir on the upstream side of the intake net.
156	WDFW	Section 3.1.3 pg8	Comment to juvenile electrofishing surveys. "What was the timing of the electrofishing surveys?"	Survey date is stipulated by stream in each preceding paragraph from the comment location.
157	WDFW	Section 3.1.3 pg8	It might be helpful to create a figure that shows a general timeline of when various bull trout sampling events occur; you can use symbols and footnotes or just parenthesis to indicate how often each activity occurs. But the annual plan might be a better place for such a figure.	Comment noted.
158	WDFW	Section 3.1.3 pg11	Comment to juvenile electrofishing survey sites. "Were these sampling sites evenly spaced?"	No, sampling locations within map are a representation of locations sampled. Protocol does not state that sampling locations need be evenly spaced, just that samples are gathered from as much as possible a representation of the juvenile population available. Wording to help clarify will be added to the document.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/ Figure	Review Comment	Response
159	WDFW	Section 3.2.1 pg17	Comment to description of PIT antennas in Cougar Creek. "Are these six PIT antennas separate from your wagon wheels? This is a little confusing"	No, as stated in the sentence prior to sentence that is commented on, these six PIT antennas were the six wagon wheel PIT antennas in Cougar Creek in 2022.
160	WDFW	Section 3.2.1 pg17	This is the first mention of the weir. Where is this located? More info is needed.	Discussion of the Cougar Creek weir is in Section 3.4 of the Report as well as Section 4 of the 2022 Plan. More detailed discussion of the data collected and data analysis of the Cougar weir is forthcoming and will be provided by the USFWS at a later date, after completion of their Report.
161	WDFW	Section 3.2.1 pg18	"Antennae" and "antennas" have both been used throughout the document. Pick one form and remain consistent	Comment noted. Revisions made to document to reflect such.
162	WDFW	Section 3.2.1 pg18	So spawning frequency here is based only on observed PIT detections and not scales?	Yes, only PIT detections. Bull trout scales are notoriously hard to read and ageing fish by this method, or using to determine spawning runs, is generally accepted as inaccurate.
163	WDFW	Section 3.2.1 pg18	It is my understanding that all of these fish are tagged during the tangle-netting that now only occurs every three years. Therefore, maiden detection does not necessarily equal maiden spawners, because there are two years in between sampling events in which it would be impossible to detect first-time spawners because they would not be tagged. I think that is what you are getting at here but it might help to clarify that the spawning frequency you have observed is not necessarily the same as how many times the fish has actually spawned in its life.	Nowhere in the Report is maiden spawner utilized or worded, and nowhere in the Report is maiden detection made to be synonymous with maiden spawner. Regardless of when an adult-sized fish is tagged, there is no way to know exactly how many times, or if any, that fish has spawned prior to being tagged. Language in the Report does not suggest that is what is being conveyed. The Report simply states the first time a tagged fish is detected (maiden detection), and subsequent detections that occur thereafter.
164	WDFW	Section 3.2.1 pg20	Double pit-tagged bull trout. This fish contains two PIT tags? Don't these tags collide resulting in detection issues? Why was it retagged?	Yes, prior to the switch over to Biomark wagon wheel antennas in 2020, antennas from 2010-2019 could only read half-duplex PIT tags. Fish captured from 2000-2009 were tagged with full-duplex PIT tags. Thus, in order to detect previously FDX tagged fish at in-stream antennas from 2010-2019, all recaptured fish with an FDX tag were also tagged with a 23mm HDX tag. Research by USGS in Wyoming assessed tag collision when in close proximity (Compton 2007). They found that as long as the coils from the two differing tag technologies were not closer than 1cm to one another then there was no collision. Care was taken during double-tagging to orient coil of second tag away from likely location of first tag. Methodology has been highly successful as double-tagged fish are routinely captured at Eagle Cliffs and both tags are read, and double-tagged fish are routinely detected at wagon wheel PIT antennas and both HDX and FDX tag is read.
165	WDFW	Section 3.2.1 pg21	"Swift Bypass Reach in June of 2012" Was fish released into Swift res? Or back into Yale? If so it must have spilled back into Yale right?	The Swift Bypass Reach is located in Yale Reservoir... Thus, the fish never left Yale.
166	WDFW	Section 3.3.1 pg27	In question to Swift Bypass Reach captures. "Were these fish sampled for genetics and not analyzed, or not even sampled prior to being released into Swift?"	All maiden captured bull trout anywhere in the Lewis basin are sampled for genetic material as part of SOP. Again, since the Swift Bypass Reach is connected to and part of Yale Reservoir, no fish were transported to or released into Swift Reservoir. We recognize the name of the Swift Bypass Reach may be confusing especially as it relates to its location in relation to its corresponding reservoir (Yale).
167	WDFW	Section 3.3.1 pg27	In question to net left unattended. "Sounds like the net was deployed and the staff left... may try to reword a bit"	Rewording is unnecessary. In the sentence preceding statement of net could be left unattended, it is stated that maximum soak time of a passively set unattended net is 10 minutes, a very short time and well within accepted protocols. All methods for collecting bull trout are vetted through the LRBTRT as well as USFWS prior to implementing.
168	WDFW	Section 3.3.1 pg27	In question to eligible fish during times of fish transport. "Eligible based on genetics?"	Yes, based on genetics, but this was only during times of rapid response genetic work during times when fish could be transported. Fish were not eligible to be transported in 2022 as the LRBTRT decided during the planning process to not implement. It was decided in 2022 to only tag and release to help with identification at the Cougar weir.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/ Figure	Review Comment	Response
169	WDFW	Section 3.3.1 pg28	Comment to usage of Rapid Response genetic analysis for Yale tailrace captures. "I don't see a description of these methods in this section. How long does this analysis take, how much tissue it taken for the analysis, and what are the baselines that determine whether the fish belongs in Yale or Swift? Who does the analysis?"	Inclusion in this Report of this methodology at this location for 2022 was not intended, thus this portion of the text has been removed. No fish were held for rapid response genetic ID in 2022 per the direction of the LRBTRT. Captured fish in the Yale tailrace were simply transported upstream to Yale Reservoir. Revision to the document stating such has been made.
170	WDFW	Section 3.3.1 pg28	Comment to leaving passively set nets unattended to soak. "Again unattended... may want to reword."	Rewording is unnecessary. In the sentence preceding statement of net could be left unattended, it is stated that maximum soak time of a passively set unattended net is 10 minutes, a very short time and well within accepted protocols. All methods for collecting bull trout are vetted through the LRBTRT as well as USFWS prior to implementing.
171	WDFW	Section 3.5 pg30	Comment to systems utilizing multiple different observers. "Do you mean sampling events?"	No. Meaning is exactly as what is stated, multiple different observers to do surveys.
172	WDFW	Section 3.5 pg30	Comment to citation needed for two separate statements in last paragraph on pg 30.	Citations are already within paragraph, just not in location comment asks for. Citation was moved and document revised.
173	WDFW	Section 3.5 pg32	Comment to how long redd life is in Cougar Creek. "How long?"	Length of redd persistence in this creek is addressed in the very next sentence in the document, "most if not all redds remain visible during the entire time-frame of surveys."
174	WDFW	Section 3.5 pg32	Are redd life tracked? For example each survey the redd is flagged then on subsequent surveys recorded as "still Visible" or "Not Visible"?	Yes, this is basic redd survey methodology and is performed during each survey, as stipulated at the bottom of pg 32 in the Report.
175	WDFW	Section 3.5 pg32	Comment to salmon/steelhead reintroduction date into Yale Reservoir. "Check date. 2026?"	Correct. Revision made to the document.
176	WDFW	Section 3.5 pg32	It sounds like index surveys are not used in Cougar Creek? If that is the case, remove all references to index surveys because it is confusing.	Comment noted.
177	WDFW	Section 3.5 pg32	Need additional citations.	Additional citations added to body of document at indicated areas.
178	WDFW	Section 3.5 pg32	Comment to redd survey methodology. "This is good info. Might move it to the beginning of this section"	Comment noted.
179	WDFW	Section 3.5 pg35	Comment regarding need for citation concerning bull trout and coho observation of occupying same habitat for redd construction.	No citation needed as this statement was made based on direct observations from Utility surveyors and from the author of this Report. Clarifying text stating such was added to the body of the Report.
180	WDFW	Section 3.5 pg41	Comment to statement bull trout redds have been observed just meters below where upper Pine Creek comes out of the ground and establishes surficial flow. "approximately how many meters?"	The stated wording of just meters below lends to the reader that the redds have been observed very close, within 5m. Additional detail has been added to the body of the Report.
181	WDFW	Section 3.5 pg43	Comment to Figure 3.5.2-3. "Are these new redds?"	Yes, new redds.
182	WDFW	Section 3.5 pg44	Comment to length of Smith Creek to Muddy River confluence with the Lewis River. "How far is this?"	Appr. 8 river miles.
Attachment C, Appendix C - 2023 Bull Trout Annual Operating Plan				
183	WDFW	Section 1. pg3	Comment to acronym LRBTRT. "Who are the organizations that make up this group?"	All of the member organizations of the Lewis River Bull Trout Recovery Team are already listed, preceding the acronym, within the same sentence in the Plan.
184	WDFW	Section 1. pg3	Comment to list of programs for proposed action. "Should the Swift res. Drafting/drawdown salvage work be included here?"	No, the drawdown salvage project is a standalone project, pertinent to all species in Swift Reservoir. This AOP is pertinent to bull trout specific work in the basin.
185	WDFW	Section 1. pg3	Comment to list of programs for proposed action. "It might also be helpful to add a few sentences explaining how the projects being done this year are different than in years past (not running the weir, etc.)"	Comment noted.
186	WDFW	Section 2.1 pg5	Comment to inclusion of description of Swift mark/recapture. "If this is not being done in 2023, it should not be included here"	Disagree. Description of this work gives context to the 3-year cycle the Group put this task on.
187	WDFW	Section 2.1 pg6	Comment to timing of lab analysis of juvenile bull trout genetic samples. "Does this mean that samples are collected every year, and then three years-worth of samples are sent to the lab every third year, or are only the samples collected every third year sent to the lab?"	Only the samples from every third year are analyzed. The sentence in the text from which you make your comment states "have samples on hand to retroactively analyze if the need arises" from other years when samples are simply taken but not sent to the lab for analysis.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
188	WDFW	Section 2.1 pg6	Comment to statement that a sub-sample of captured coho will be measured. "What is the sub-sampling rate? Or is there a target number of FLs you will record?"	Sub-sample rate will be dependent on capture rate in the field. Some years very few coho are captured, at which there'd be no sub-sample and all would be measured. Other years there is an over abundance of coho captured, which would lead to sub-sampling of no more than every fifth fish.
189	WDFW	Section 2.2 pg8	Comment to annual collection of bull trout from within Yale tailrace. "I am a bit confused as to why tangle netting takes place in the Yale tailrace every year, but only every three years above Swift? Was there something about the methods being used at Swift that caused concerns?"	The last two sentences of the first paragraph on pg 5 of this Plan succinctly state why tangle netting in Swift Reservoir at Eagle Cliffs was put on every three-year cycle by the LRBTRT. Given the few bull trout encountered in Yale tailrace on an annual basis, the Group did not think that collection activities in this location posed same severity of risk to the population, and thus this task was kept as on an annual basis.
190	WDFW	Section 2.5 pg12	Comment to Cougar Creek historical spawners since conception of monitoring activities of this population. "Does this refer to the range of estimated from 1979-present, or 1979-2006 (the last year before the redd based estimator was introduced)?"	1979-2006.
191	WDFW	Section 2.5 pg12	Comment to assessment of redd superimposition at a later date. "If superimposition occurs, how do you determine if it was done by a coho or another bull trout?"	Multiple factors come into play when assessing a superimposed redd and labeling of species to redds. Timing of the second redd: Bull trout typically finish spawning around the 2 nd /3 rd week of October, while coho will go well into November and sometimes longer. Size of redd: Bull trout redds tend to run .5-1m narrower and 1-1.5m shorter than coho redds (direct measurements in the field within the Lewis River basin). Shape: Bull trout redds tend to be more linear and narrower and consistent in shape, while coho redds are more horseshoe shape in nature and consistently irregular (direct observations in the field within the Lewis River basin). All of these things then lead to an informed decision by the surveyor to make a call based on the available information and multiple years of professional judgement. Assessment is never error or bias free. Only way to be empirically certain and call one species over the other would be to pump the redds in question for eggs. This level of impact to the species would be unacceptable.
192	WDFW	Section 2.6 pg15	Comment to Cougar Creek Screw Trapping. "Might want to clarify that this is a new project, and whether or not you plan on doing it every year from now on"	This AOP is developed on an annual basis by the LRBTRT using the best available information and can be adaptively managed and changed from one year to the next. Screw trapping in Cougar Creek for 2024 will be assessed by the Group after data from 2023 is analyzed and presented. At that time the Group will then decide if this project will continue or not. Saying otherwise now, within this document, is premature to the process.
193	WDFW	Section 2.6 pg15	Comment to screw trap marked fish upstream release site. "100 meters may too close and may result in a biased estimate... "	Agreed. 100 meters was used as a placeholder and intended to convey that marked fish would be released upstream of the trap. Actual release location in the field is much greater than 100m. Revision to the document was made to reflect such.
Attachment C, Appendix D - 2022 Yale Reservoir Kokanee Report				
194	WDFW	Section 3.0 pg3	In this paper, please as add a section for next steps and recommendations including the need to evaluate the kokanee fishery in both Merwin and Yale reservoirs. There is also a need to evaluate the kokanee population in Merwin. This would also address the contribution by both natural production and entrainment from Yale as well as which hatchery program contributes the most to the Merwin fishery. I foresee this as a Lewis basin kokanee report not only Yale escapement. This is an ever increasingly popular fishery that holds a great opportunity to showcase the fishery and resource. A fishery assessment prior to passage and reintroduction in both reservoirs would help to show how the reintroduction of anadromy affects this resource.	The Lewis River Settlement Agreement (SA) Section 9.7 states, <u>Resident Fish Assessment.</u> PacifiCorp shall include in the M&E Plan elements to monitor the following with respect to resident fish:... and (2) <u>kokanee spawner population size in Yale Lake in the fall of each year.</u> This document pertains to that which is identified in the SA, kokanee spawner population size in Yale Lake. Next steps and recommendations as well as evaluation of the kokanee fishery in Merwin and Yale and the population in Merwin is outside the purview of this Report.
195	WDFW	Section 3.0 pg3	While Yale may have more kokanee spawning habitat, it would be good to mention that as part of the SA, there is a kokanee hatchery program in the Merwin basin, and that the Merwin population is not monitored and why.	Again, this Report is provided as part of the Lewis River SA Section 9.7 which pertains only to monitoring the Yale Lake spawner population size, any and all other information is outside the purview of this document.
196	WDFW	Section 3.0 pg3	Comment to flow in Constructed Channel. "Is this flow rate a SA requirement? How was it established?"	14cfs in the Constructed Channel is indeed a SA requirement and was established during SA negotiations.

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/ Figure	Review Comment	Response
197	WDFW	Section 3.0 pg3	A map of cougar creek showing the reaches would be helpful	Comment noted. Map of reaches within Cougar Creek will be provided in subsequent Reports.
198	WDFW	Section 4.0 pg4	So is this peak count applied to a AUC methodology? May want to speak to how the estimate is made using the peak count.	No, the peak count is not applied to an AUC methodology. Table 1 on pg 5 gives a description and citation for the historical multiplier utilized to derive the expanded peak.
199	WDFW	Section 4.2 pg5	Comment to method of peak count expansion. "As this methodology is over 40 years old, it may be time to reevaluate."	Comment noted. Requested change to the methodology would be better served as a discussion piece within the Lewis River Aquatic Technical Subcommittee.
200	WDFW	Section 4.2 pg5	This estimate of abundance is much lower than historic levels. Has there been any thoughts as to why this there has been so much variability. It would be good to add a line to the figure showing when the full reservoir level reduction was imposed. The reduction may have affected the productivity of the entire reservoir impacting all fish populations.	Comment noted. The why of variable population abundance is outside the purview of this document. This document is provided simply as a reporting tool for annual Yale Lake kokanee population abundance trend. Discussion of variability and reasoning behind reported trend numbers would be better suited for the Lewis River Aquatic Technical Subcommittee.
Attachment G - Lewis River Wildlife Habitat Management Plan 2023 Annual Plan				
201	WDFW	Page 14: 13.0 Forested Habitat Management	<p>PacifiCorp and the Terrestrial Coordinating Committee (TCC) recently conducted an exercise to identify the area available for active management in each Management Unit (MU). This excluded wetlands, streams, and associated buffers as well as areas that were too steep and/or unsafe for harvest activities. This exercise reduced the lands available for harvest in each unit and potentially the ability to meet the recommended cover:forage ratios.</p> <p>PacifiCorp 2008 Lewis River Wildlife Habitat Management Plan (WHMP) provides: “Forest harvests are designed to meet specific size and distribution criteria that would provide a mosaic of cover and forage over the license planning period. Scheduling forest management on a Management Unit basis is intended to meet overall distribution and diversity of age class objectives for wildlife across the Wildlife Habitat Management Plan lands. The schedule for forest management will be developed using the planning criteria established in the Wildlife Habitat Management Plan and reviewed with the TCC so that the long-term distribution of forage and cover can be developed and maintained along with managing for late successional habitat characteristics. ... [E]ach Management Unit... includes ... proposed management (indicating cover:forage ratios or late successional habitat)...” (Page 12-18).</p> <p>The proposed cover:forage ratio objectives/goals for each MU may no longer be appropriate given new information and the lands available for potential harvest activities. In addition, the WHMP provides: “The remaining upland forest areas consist of previously managed areas (within the previous 35 years) and un-managed areas that have been initially subdivided into areas of priority or a phased management approach. Three phases are proposed in approximately 16-year periods over the 50-year license period. The first phase would cover the period 2009 through 2024. Forest practices in the first phase would prioritize management based on priority wildlife habitat needs (e.g., improving cover:forage ratios) and targeting vegetation types where forest management would do the most good for the specific objective desired” (Page 12-6). The first phase prioritizing forest practices to improve priority wildlife habitat needs will end in 2024. Although the intent for the following two phases is unclear, WDFW suggests evaluating the established cover:forage ratios for elk and adjusting the ratios as needed.</p>	No changes to the document. PacifiCorp agrees and several revisions to the C:F goals to more align with manageable acres were completed in July 2022. In 2025 the forestry management priorities may focus on diversity and use C:F goals more as a tool.
202	WDFW	Page 14: 13.0 Forested Habitat Management	MU 28 is 153.8 acres in total with 75.4 manageable acres. The recommended cover:forage ratio is 50:50 (+5%). In order for this MU to reach the cover:forage objective, all manageable acres would need to meet the forage requirement. This may not be practicable and likely the cover:forage objective will not be achievable. We suggest flagging MU 28 cover:forage ratio as one of the MUs identified for evaluation in the second phase starting 2025.	The following language has been added to Section 13.2 below table 6 "This MU cannot meet the recommended C:F goal. This MU will be reevaluated in 2025 for a more applicable C:F goal. "

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
203	WDFW	Page 16: 13.2 2023 Forestland Planning	<p>“MU 5 and 8 will be evaluated for future proposed timber harvest. Currently 2025 will focus on commercial thin priorities instead of C:F priorities. The MU to be harvested will be determined.”</p> <p>Instead of “future proposed timber harvest”, please consider: MU 5 and 8 will be evaluated in 2023 for consideration of timber harvest in 2024. In addition, please consider changing the second sentence to: Planning for harvest in 2025 will focus on evaluating commercial thin priorities instead of C:F priorities; and the last sentence to: Evaluation will determine the MU to be harvested. This should clarify the year for planning and evaluation and the potential year for harvest.</p>	<p>This section was revised to the following: "Table 7 provides a list of the MUs that will be considered for timber harvest in the next year. These MUs are selected by their current C:F ratio compared to the C:F goal for that MU, years since last harvest, and whether or not some current THAs are ready for commercial thinning. MU 5 and 8 will be evaluated in 2023 for consideration of timber harvest in 2024. Planning for harvest in 2025 will focus on evaluating commercial thin priorities instead of C:F priorities."</p>
204	WDFW	Page 16: Planting and Maintenance, Table 7	<p>Please consider planting deciduous trees in MU 6 clearcuts as well as Douglas fir, western red cedar, noble fir and western white pine.</p>	<p>This refers to Table 8. The 220687CC line has been revised from Plant 2500 THPL, 1200 PIMO to Plant 2500 THPL, 1200 PIMO and best available decisions trees in the fall.</p>
Attachment H - Wildlife Habitat Management Plan Annual Progress Report for Operation Phase 2022				
205	WDFW	Page 4: 4.2 Management Actions	<p>The 2023 Plan 6.2 Management Actions (Page 3) states: “Bullfrog monitoring and management will continue this year, with Visual Encounter Surveys (VES) at Frasier Creek wetlands (Cedar Grove, Chestnut, Road, Banker’s, Cross Road, Borrow Area, and Pumphouse Ponds) (Muths 2011). The objectives will be to learn more about the population and development of bullfrog larva in these ponds to ensure that draining the wetlands is not selecting for a rapidly developing genotype (Adams and Pearl 2007).”</p> <p>Please consider providing VES results for 2022 in the Report and if draining the wetlands appears to select for a rapidly developing genotype. If the VES indicates draining the wetlands is selecting for a rapidly developing genotype or if the action is not effective for reducing population numbers, please consider a discussion with the TCC to determine if alternative methods for reducing the population should be considered.</p>	<p>Stoplogs were reinstalled on March 25th and all boards pulled for bullfrog (<i>Rana catesbeiana</i>) on August 8th. Half of the boards were reinstalled on October 25th for and water flow control. Stop logs have two purposes identified in the WHMP (PacifiCorp 2008). One of the objectives are to reduce the effectiveness of bullfrog tadpole survival. The other is to have the ability to control the flow of water into the Frasier Wetlands. PacifiCorp has been surveying for bullfrogs in the Frasier creek wetlands since 2014. In 2014, one adult bullfrog was detected in Frasier Pond. In 2022, 5+ adult bullfrogs were detected in Frasier and at least three were detected in Cedar Grove. No other ponds in the Frasier creek wetlands have detected adults. Cedar Grove and Chestnut both had tadpoles in late June. Both ponds were dry by end of August, no dead tadpoles were detected. PacifiCorp will reevaluate this management practice to minimize bullfrogs over the next several years.</p>
206	WDFW	Page 4: 4.2 Management Actions	<p>“Frasier Pond’s dam was replaced in summer 2019. The dam continues to be effective. The opening required cleaning out occasionally throughout 2022 and will need to continue in 2023. PacifiCorp is considering installing a log boom at Frasier Pond to reduce the lily pads clogging the dam leading into Frasier Creek.”</p> <p>Please describe how the “opening” relates to the dam. For instance, a pipe, notch or spillway that allows water to continue flowing into Frasier Creek. This type of description will also help with understanding “lily pads clogging the dam” or opening. Also, please consider indicating the phase of the lily pads, (e.g., growing near the dam or free-floating lily pads being transported downstream). A log boom would likely be more effective for free-floating lily pads (not attached to the bed).</p>	<p>Frasier Wetland’s dam was replaced in summer 2019. The dam continues to be effective, requiring removal of lily pads, branches, and other pond debris clogging the beaver deceiver fencing. The opening required cleaning out occasionally throughout 2022 and will need to continue in 2023 (figure 2). PacifiCorp is considering installing a log boom at in Frasier Wetland to reduce the lily pads clogging around the fencing the dam leading into Frasier Creek.</p>
207	WDFW	Page 5: 4.2 Management Actions	<p>“...replacement of culvert 600C2...”</p> <p>The original culvert design included a beaver deceiver. Was a different type of beaver control installed during replacement? If not, is there concern that beavers may block the culvert?</p>	<p>Beaver's had blocked the previous culvert several years before. Recent evaluation determined that there is only small portion of the stream that provides beaver habitat, there is no evidence of recent beaver activity, and the is no stream with beaver habitat in proximity. As a result no beaver deceiver was installed.</p>
208	WDFW	Page 7: 4.2 Management Actions	<p>“...Palustrine Forested Wetland (PFO)...Swift Canal Ponds...”</p> <p>Ponds along the Power Canal may hinder Cowlitz County PUD’s ability to inspect the Power Canal. Please coordinate with Cowlitz County PUD to determine if there may be conflicting goals and needs for managing these ponds and how this might be resolved.</p>	<p>PacifiCorp will coordinate with Cowlitz County PUD for future management goals in MU 24 to determine if there may be conflicting goals and needs for managing the ponds.</p>
209	WDFW	Page 19 20: Planting and Maintenance, Table 6	<p>Please explain in the Reason for Difference column why you were not able to plant bitter cherry and black cottonwood in 211011 CC, 211012 CC and 211012 CC.</p>	<p>These trees were not available at the time of planting, so bigleaf maple was used as a substitute.</p>

2022 ACC/TCC Report Comment Matrix

Comment No.	Agency	Page/Section/Table/Figure	Review Comment	Response
210	WDFW	Page 32: 7.1.1 Access Control and Disturbance Reduction	<p>“The gate accessing Saddle Dam is closed and locked annually on Memorial Day weekend and reopen on Labor Day weekend.”</p> <p>Please consider expanding on gate access system and how motorized vehicles are prevented from accessing the farm from Labor Day weekend to Memorial Day weekend. This was explained at the May TCC meeting and the Report would benefit from including the explanation. For example, when the recreation area is closed to the public and the main gate to the Saddle Dam farm and recreation area is locked, the gate accessing Saddle Dam farm may be left open.</p>	Saddle Dam Park is open to the public Memorial Day Weekend through Labor Day. The gate accessing Saddle Dam Farms within the Park is closed and locked annually during this time to restrict vehicle access.
211	WDFW	Page 18: 6.2 Forest Land Planning First Precut Surveys, Page 42: 14.1 Monitoring, Page 44, 45: 14.1 Monitoring Broadcast Acoustical Surveys for Northern Goshawks	See First Precut Surveys comment above. MU 18 is listed in several sections. It is not part of the 2022 activities and is not listed as a 2023 action or a 2024 first pre-cut survey. Please provide explanation for why it is included here and other sections.	MU 18 was considered for 2023 harvest. After further evaluation of the access it was determined it could not be access from PacifiCorp lands due to topography. Access would require building new roads on Washington Department of Natural Resources land or private lands to the north. As it was deferred from the 2023 timber harvest.
212	WDFW	Page 45: 14.1 Monitoring Broadcast Acoustical Surveys for Northern Goshawks	Unit 3 has two timber harvest units for 2023. The area was surveyed for the second year of two consecutive years. The surveys were conducted on June 1st and July 12, 2022. An eagle was detected on both surveys noting a nest that was not detected during either helicopter surveys. Are these the two CTs that were deferred from 2022?	One of the two units in MU 3 was deferred to 2023. That unit was 220328CC (Calamity Jane).