NORTH UMPQUA HYDROELECTRIC PROJECT

FERC No. P-1927

Protection, Mitigation, and Enhancement Measures



2021 Annual Report



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On the cover: The famous columnar basalt formation across the river from Soda Springs Powerhouse is shrouded in smoke wafting upriver from the Jack Fire, July 2021. *(Photo by Rich Grost).*

1.0 INTRODUCTION

Located on the west side of the Cascade mountain range in southern Oregon, the North Umpqua Hydroelectric Project (FERC No. P-1927; Project) consists of eight dams and power plants that have a combined capacity to generate 194 megawatts of power. The project was constructed between 1947 and 1956.

In the early 1990s, as the expiration of the first Federal Energy Regulatory Commission (FERC) license approached, PacifiCorp initiated the relicensing process with FERC. In June 2001, the relicensing process resulted in the development and signing of the North Umpqua Hydroelectric Project Settlement Agreement (Settlement Agreement, SA). The Settlement Agreement identifies annual reporting requirements ranging from fiduciary reporting to narrative descriptions of actions. This annual report documents a calendar year (January 2021 through December 2021) and fulfills reporting requirements of the following Settlement Agreement sections:

- SA Section 7.2.3 (amended) Gravel Augmentation Program Funding and Accounting— Written annual report describing the amounts deposited and disbursed;
- SA Section 8.3.5 (amended) North Umpqua River Habitat Restoration/Creation Project Funding and Accounting—Written annual report describing the amounts deposited and disbursed;
- SA Section 19.1.1.3 Tributary Enhancement Program Funding and Accounting—Written annual report describing the amounts deposited and disbursed;
- SA Section 19.3.1 Mitigation Fund Annual Reporting—Written annual report describing the amounts deposited and disbursed; and
- SA Section 21.4.2 Environmental Coordinator Reports—Written annual report on the activities of the RCC and on the implementation of the PM&E Measures.

1.1 Background

On June 13, 2001, PacifiCorp filed a Settlement Agreement pursuant to FERC Rule 602 (Title 18 Code of Federal Regulations § 385.602) to resolve issues concerning the relicensing of the North Umpqua Hydroelectric Project. Parties to the Settlement Agreement include PacifiCorp, the USDA Forest Service (USDA-FS), the USDI Fish and Wildlife Service (USFWS), the USDI Bureau of Land Management (BLM), the National Marine Fisheries Service (NMFS; now known as National Oceanic and Atmospheric Administration (NOAA) Fisheries), the Oregon Department of Environmental Quality (ODEQ), the Oregon Department of Fish and Wildlife (ODFW), and the Oregon Water Resources Department (OWRD), collectively referred to as the "Parties." As required by statute, FERC conducted a National Environmental Policy Act (NEPA) process that concluded with a Final Environmental Impact Statement (FEIS) issued in March 2003. Based on the findings of the FEIS, FERC developed new license articles for the Project. FERC formally issued the new license on November 18, 2003, designating a license term of 35 years.

Under the provisions of the Settlement Agreement, the license is not final until all administrative and judicial appeals are exhausted. The license was appealed to the Ninth U.S. Circuit Court of Appeals on May 21, 2004. On September 1, 2005, the Court ruled the case in favor of FERC, USDA-FS, and PacifiCorp. The license was considered final on October 18, 2005.

Copies of the Settlement Agreement and the FERC license are available from FERC upon request or on the PacifiCorp Web site at: <u>https://www.pacificorp.com/energy/hydro/north-umpqua-river.html</u>.

1.2 Resource Coordination Committee

SA Section 21 establishes a process to facilitate coordination and decision-making concerning implementation of Settlement Agreement measures. To accomplish this objective, SA Section 21.1 provides for the creation of the Resource Coordination Committee (RCC) consisting of representatives from the signing Parties. The purposes of the RCC, discussed in detail in SA Section 2.0, are to: (1) facilitate coordination and consultation on plans developed by PacifiCorp for the implementation of protection, mitigation, and enhancement measures (PM&E Measures); (2) coordinate the implementation of PM&E Measures and ongoing monitoring requirements by PacifiCorp; (3) establish appropriate procedures for conducting activities; and (4) establish subcommittees to accomplish these objectives.

1.3 Report Organization and Review

The 2021 North Umpqua Hydroelectric Project Annual Report provides information on RCC roles, responsibilities, members, and meetings; PM&E Measure implementation; FERC license actions; and fiduciary reporting.

2.0 RESOURCE COORDINATION COMMITTEE

This section provides an overview of RCC roles and responsibilities according to the Settlement Agreement and as subsequently implemented. It also presents a summary of RCC meetings held during the reporting period, including major discussion points, decisions, and action items associated with each meeting.

2.1 RCC Roles and Responsibilities

The purpose and role of the RCC, as defined in SA Section 21.1, is to facilitate coordination and implementation of PM&E Measures. The RCC also looks at implementation requirements, and through collaboration and sharing of information, works to achieve desired results. Specifically excluded from RCC responsibility and authority is the administration of SA Section 19.1 Tributary Enhancement Program and SA Section 19.3 Mitigation Fund, administered by ODFW and USDA-FS, respectively. However, responsible Parties may consult with the RCC concerning measures conducted pursuant to the program and fund.

The structure and process of the RCC is intended to provide a forum to address time-sensitive matters, give early warning of problems, and coordinate member organization actions, schedules, and decisions to save time and expense. As described in the Settlement Agreement, the RCC must endeavor to conduct its business by consensus. However, in the event of disagreements, the Parties may refer disagreements to appropriate policy-level decision-makers. Decisions of the RCC may not usurp the authority of individual Parties or specific governmental agencies identified in the Settlement Agreement as having approval authority regarding specific PM&E Measures.

The RCC is responsible for the following measures pursuant to the Settlement Agreement:

- coordinating implementation of the Resource Coordination Plan (RCP), including ongoing operations and maintenance (SA Section 21.1);
- coordinating implementation of PM&E Measures and ongoing monitoring requirements by PacifiCorp (SA Section 21.1);
- coordinating responses and evaluations specifically assigned to the RCC (SA Sections 8.2.2, 8.3.3, 12.2, 14.3.3, 14.5, 17.8, 19.2.1 and 22.5.2, and SA Amendment Section 7.2);
- coordinating and consulting on plans developed by PacifiCorp (SA Section 21.1);
- reviewing and commenting on the draft annual report of RCC activities and implementation of PM&E Measures (SA Section 21.4.2); and
- serving as a common point of contact for public information regarding Settlement Agreement implementation.

The following measures are specifically excluded from RCC responsibility:

- administration of the Tributary Enhancement Program through ODFW's Memorandum of Understanding (SA Section 19.1);
- administration of the Mitigation Fund through USDA-FS (SA Section 19.3); and
- approval of plans and actions regarding specific PM&E Measures assigned to individual organizations for resource protection (SA Section 21.2).

The RCC defined discrete goals and functional responsibilities to enhance its effectiveness, including the following:

- interpreting the Settlement Agreement through provisions to on-the-ground planning and implementation;
- monitoring implementation of the Settlement Agreement as a whole to provide a wider view than one agency's perspective;
- avoiding surprises and errors through effective communication;
- tracking progress as the interface for the Parties during implementation;
- identifying policy issues by working collectively to define and clarify the issues and options for transmittal to the executive members of the Parties;
- providing public information regarding Settlement Agreement implementation with a collective voice;
- promoting efficiency through sharing of information among organizations; communicating changes in policy, procedure, or regulation; consulting before decision-making; and sharing technical resources;
- implementing the Settlement Agreement collaboratively to ensure that all Parties' interests continue to be valued throughout the new license term; and
- communicating its progress through the development of a website at: <u>https://www.pacificorp.com/energy/hydro/north-umpqua-river.html</u>.

2.2 RCC Members

The Parties have each appointed a member and an alternate to the RCC. The members are shown in Table 1. The RCC members work with a designated caucus within their respective organizations.

RCC Member	Organization
Pam Sichting	USDA Forest Service, Umpqua National Forest, Roseburg, Oregon
Frank Weaver	USDI Fish and Wildlife Service, Roseburg, Oregon
Michael Korn	USDI Bureau of Land Management - Roseburg District, Roseburg, Oregon
Logan Negherbon	NOAA Fisheries West Coast Region, Roseburg, Oregon
Jason Brandt	Oregon Department of Fish and Wildlife, Roseburg, Oregon
Chris Stine	Oregon Department of Environmental Quality, Eugene, Oregon
Craig Kohanek	Oregon Water Resources Department, Salem, Oregon
Steve Albertelli	PacifiCorp, Medford, Oregon

Table 1. 2021 Resource Coordination Committee Members

2.3 RCC Meetings

During the reporting period, the RCC conducted four meetings to review work plans, discuss implementation objectives for current and future PM&E Measures, and facilitate the overall Settlement Agreement implementation. The formal ground rules established and adopted by the RCC provide the functional framework for this collaborative approach. These ground rules are provided on the PacifiCorp website at:

https://www.pacificorp.com/energy/hydro/north-umpqua-river.html

Meeting summaries are drafted and distributed to the RCC members for review and comment. After corrections have been made as appropriate, the RCC approves the summaries by consensus. Meetings are open to the public for comment, and any comments received are added to the meeting summaries.

This section provides highlights of items discussed at RCC meetings during the reporting period. Detailed meeting summaries are provided on the PacifiCorp website at: <u>https://www.pacificorp.com/energy/hydro/north-umpqua-river.html</u>.

- The RCC approved the following expenditures, funding proposals, and other requests:
 - ODFW and PacifiCorp concurred that PacifiCorp shall continue to annually pay ODFW the amount of \$162,000 (in 2001 dollars) for the purposes of 1) monitoring tasks associated with the Tributary Enhancement Program, and 2) oversight of on-site mitigation measures performed by PacifiCorp or other entities during the remaining License term. The amount will be escalated annually pursuant to SA Section 22.4.4. PacifiCorp and ODFW consulted with and received concurrence from the other Parties regarding the necessity and level of SA 19.4 Monitoring and Oversight funding.
 - 2021 SA 19.2 Long Term Monitoring and Predator Control Program budget of \$136,000.
 - 2022 SA 19.2 Long Term Monitoring and Predator Control Program budget of \$139,500.
 - USDA-FS request to divert up to one cubic foot per second (cfs) of water from Fish Creek to the Fish Creek Forebay for potential wildland firefighting efforts during the 2021 fire season.
 - 2022 RCC meeting schedule change to the months of January, April, August, and October.

3.0 PROTECTION, MITIGATION, AND ENHANCEMENT MEASURES

This section presents a progress report of PM&E Measures defined in the North Umpqua Settlement Agreement and FERC License implemented during calendar year 2021. A summary and status report of all License and Settlement Agreement related documents submitted to FERC is also presented.

3.1 Implementation of PM&E Measures

The implementation schedule for remaining PM&E Measures is presented in Table 2. PM&E measures that are not ongoing and/or were completed in prior years have been removed from the table. The current status of the PM&E Measures is presented in Table 3.

During 2021, Settlement Agreement and license actions focused on implementing management and monitoring plans and operating and maintaining existing PM&E Measures. All Parties have worked cooperatively toward meeting Settlement Agreement schedule commitments.



Figure 1. Slide Creek Tailrace Barrier on the North Umpqua River.

Key



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							YE	AR					
SA Section	PM&E	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 +
	Slide Creek Ramping Monitoring	6.() RAM	IPING	Ĵ								
6.2.1	Plan Implementation		•	•	•	•	•	•	•	•	•		
6.4	Wild & Scenic Ramping Restrictions	•	•	•	•	•	•	•	•	•	•		
6.5	Bypass Reach Ramping Restrictions	•	•	•	•	•	•	•	•	•	•		
6.6	Project Maintenance - Appendix D Schedule	•	•	•	•	•	•	•	•	•	•		
6.7	Emergency Shutdown Ramp Restrictions	•	•	•	•	•	•	•	•	•	•		
	7.0 RESTORA	ATION	N OF I	FLUV	IAL P	ROCI	ESSES						
7.2	Gravel Augmentation Program	•	•	•	•	•	•	•	•	•	•		
7.3	Passage of Woody Debris	•	•	•	•	•	•	•	•	•	•		
7.4	Passage of Sediment (if high flows present)	•	•	•	•	•	•	•	•	•	•		
	8.0 MAINST	EM H	IABIT	AT E	NHAN	ICEM	ENT						
8.3.5	Soda Springs Funding and Accounting	•	•	•	•	•	•	•	•	•	•		
0.1	9.0 RESERVOI	R AN	D FOI	REBA	Y MA	NAG	2MEN	T					
9.1	Management of Lemolo Lake	•	•	•	•	•	•	•	•	•	•		
9.3	Reservoir	•	•	•	•	•	•	•	•	•	•		
9.5	Fish Salvage during Shutdowns	•	•	•	•	•	•	•	•	•	•		
	12.0 VE	GETA	TION	MAN	AGE	MENT	[
12.1	Vegetation Management Plan Development and Implementation	•	•	•	•	•	•	•	•	•	•		
12.2	Noxious Weed Control	•	•	•	•	•	•	•	•	•	•		
	13.	0 AVL	AN PF	ROTE	CTIO	N							
13.4	Records & Database Management System	•	•	•	•	•	•	•	•	•	•		
	14.0 EROS	SION a	& SED	DIME	NT CC	NTR	OL						
14.5	Erosion Monitoring	•	•	•	•	•	•	•	•	•	•		
	15 Transportation Management Plan	.0 TR	ANSP	ORTA	TION	I							
15.1	Implementation	•	•	•	•	•	•	•	•	•	•		
15.2	PPL Roads to USDA-FS Standards	•	•	•	•	•	•	•	•	•	•		
15.3	Cost Sharing for Joint Roads and Maintenance	•	•	•	•	•	•	•	•	•	•		
15.5	Bridges - Inspections/Maintenance	•	•	•	•	•	•	•	•	•	•		
15.5.1	Bridge Maintenance Cost Sharing	•	•	•	•	•	•	•	•	•	•		
15.6	Culvert Maintenance - PPL Use Roads	•	•	•	•	•	•	•	•	•	•		
L	100000												

Key						
Due Date						
• Complete						

							YE	AR					
SA Section	РМ&Е	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 +
		16.0	AEST	HETI	CS								
16.1	Aesthetics Management Plan Implementation	•	•	•	•	•	•	•	•	•	•		
	17.0 RECREATION												
17.2	Recreation O&M Funding	•	•	•	•	•	•	•	•	•	•		
17.7	Law Enforcement Funding	•	•	•	•	•	•	•	•	•	•		
17.8	Recreation - Capital Improvements	•	•	•	•	•	•	•	•	•	•		
17.9	Public Information Funding	•	•	•	•	•	•	•	•	•	•		
17.10	Annual Monitoring Funding	•	•	•	•	•	•	•	•	•	•		
		18.0	CUL	TURA	L								
18.1	Historic Properties Management Plan Implementation	•	•	•	•	•	•	•	•	•	•		
18.3/18.6	Site Discovery/Monitoring	•	•	•	•	•	•	•	•	•	•		
18.4	Protection, Restoration, and Recovery	•	•	•	•	•	•	•	•	•	•		
		19.0	MITI	GATI	ON								
19.1.1	Tributary Enhancement Account - Use of Funds	•	•	•	•	•	•	•	•	•	•		
19.2	Long-Term Monitoring/Predator Control Funding	•	•	•	•	•	•	•	•	•	•		
19.2.1	Long-Term Monitoring/Predator Control Disbursements	•	•	•	•	•	•	•	•	•	•		
19.3.3	Federal Mitigation Funding	•	•	•	•	•	•	•	•	•	•		
19.4.1	Monitoring and Oversight	•	•	•	•	•	•	•	•	•	•		
21.0 COORDINATION & DECISION-MAKING													
21.1	Resource Coordination Committee	•	•	•	•	•	•	•	•	•	•		
21.1	Resource Coordination Plan - Developed and Implemented	•	•	•	•	•	•	•	•	•	•		
21.4.2	Annual Report	•	•	•	•	•	•	•	•	•	•		
21.5	Site Specific Plan Development	•	•	•	•	•	•	•	•	•	•		

Table 3. PM&E Measures Status

SA Section	PM&E Measure	Due Date	Current Status
4.1	Fish Passage at Soda Springs Dam Operations and Maintenance	2012-2038	The fish passage facilities were operated as designed and intended. The agencies reviewed the annual O&M report and it was filed with FERC in January 2021. Fish passage continued to be monitored and reported annually as part of the SA 19.2 Long-term Monitoring Program.
5.1	Instream Flow Increases in Project Bypass Reaches	2005-2038	License-required minimum flows continued being provided and managed within required ramp rate allowances to the greatest extent possible.
5.5	Instream Flow Monitoring	2002-2038	Monitoring and reporting continued as required in the Flow Monitoring Plan, with the USGS contracted to manage the stream gages and related data. Water year reports were produced and provided based on the provision of publication-grade data from the USGS to PacifiCorp.
6.2.1	Slide Creek Ramping Monitoring Plan Implementation	2013-2020	An interim final monitoring report was produced by the technical working group (TWG) and filed with the FERC in 2021. The report indicated that salmon and steelhead do use the Slide Creek Full-flow Reach of the North Umpqua River for spawning, hence any resumption of daily load shaping operations will follow the flow regulation of changing load no more than 510 cfs per hour (equivalent to one-unit flow at Toketee powerhouse) as specified within the Settlement Agreement. If PacifiCorp resumes daily load-shaping releases PacifiCorp will consult with the TWG to monitor the effects of ramping on fish use within the Full-flow Reach.
6.4	Wild and Scenic Ramping Restrictions	2001-2038	Ramping restrictions and reporting requirements were followed per the Flow Monitoring Plan.
6.5-6.6	Bypass Reach Ramping Restrictions	2001-2038	Ramping restrictions and reporting requirements were followed per the Flow Monitoring Plan.
7.2 (and SA Amendment No. 1)	Gravel Augmentation Program	2002-2038	Monitoring of augmentation sites continued per the Gravel Augmentation Plan, with reports planned at 5-year intervals.
7.3	Passage of Woody Debris at Soda Springs and Slide Creek Dams	2002-2038	Passage of woody debris continued according to the Plan.
8.2.1-8.2.2	Slide Creek Bypass Reach Habitat Project Implementation/ Monitoring	2002-2038	Monitoring continued according to the Plan, with reports planned at 5-year intervals.

SA Section	PM&E Measure	Due Date	Current Status
8.3.2-8.3.3	North Umpqua River Habitat Restoration/ Creation Implementation/ Monitoring	2004-2038	Annual monitoring occurred according to the Plan, with an annual report submitted to the RCC.
9.1	Funding for Production of Rainbow Trout for Stocking	2004-2038	PacifiCorp provided \$21,806 to ODFW in 2021 for the production of rainbow trout.
9.3	Lemolo Reservoir Management Plan and Limits on Drawdown Rate and Elevations	2001-2038	Reservoir management, consultation, and reporting occurred according to the Lemolo Reservoir Management Plan. Water levels and drawdown rates were managed and monitored according to the Flow Monitoring Plan.
9.5	Salvage of Fish During Maintenance Shutdowns	2001-2038	Advance notice of planned maintenance shutdowns was made to the appropriate agencies, and salvage and liberation of fish was permitted and implemented as required.
12.1	Vegetation Management Plan Implementation	2004-2038	The Vegetation Management Plan (VMP) continues to undergo implementation. Noxious weed treatments were conducted on USDA-FS lands in 2021, and noxious weed surveys, conducted every three years, were completed in 2021. Noxious weed training occurred per the Plan, and implementation of the horticultural invasive species program continued as necessary to satisfy VMP requirements. The 5-year rolling action plan (RAP) was developed in consultation with the USDA-FS and BLM in December 2021.
13.1	Power Pole Modification	2001-2038	Five transmission structures damaged by the Jack Fire and one other deteriorating transmission structure were replaced with avian-safe construction on transmission lines within the FERC boundary in 2021.
13.4	Records Database Management System	2001-2038	The database for management of birds on power lines was maintained. An annual report summarizing avian-power line interactions occurring within the Project area was submitted to the USDA-FS in January 2021.
14.2	Canal Shutoff and Drainage Systems (CSDS) Operation and Maintenance	2007-2038	The CSDS on the Clearwater 2, Fish Creek, and Lemolo 2 waterways continue to be operated and maintained consistent with SA requirements.
14.5	Erosion Control Monitoring	2001-2038	Erosion sites were monitored, and an annual report was produced and distributed to the agencies in September 2021.

SA Section	PM&E Measure	Due Date	Current Status
15.1–15.4	Transportation Management Plan Implementation Cost Sharing	2004-2038 2007-2038	The Transportation Management Plan continues to undergo implementation. The 5-year RAP was developed in consultation with the USDA-FS and BLM. The total cost of road maintenance on roads jointly maintained by the USDA- FS and PacifiCorp in 2021 was \$40,937, of which PacifiCorp's share was \$21,551.
15.5, 15.5.1	Bridge Inspections, Maintenance Cost Sharing	Annual & Biennial Inspections 2005-2038	Cost-sharing continued for bridges on jointly-maintained hydro roads. Fracture-critical bridges are inspected annually as part of the annual inspection program. A biennial bridge inspection was completed for 34 bridges in 2021.
16.1, 16.3, 16.4	Visual Resources (Aesthetics) Management Plan	2005-2038	The Aesthetics Management Plan continued to undergo implementation. The 5-year RAP was provided to the USDA-FS and BLM in December 2021.
17.1	Recreation Resources Management Plan Implementation	2004-2038	The Recreation Resource Management Plan continued to undergo implementation. The 5-year RAP was developed and updated in consultation with the USDA-FS. Identified actions were completed.
17.2	Campground Operations and Maintenance	2004-2038	PacifiCorp provided \$96,141 to the USDA-FS in 2021 for campground operations and maintenance.
17.7	Law Enforcement	2004-2038	PacifiCorp provided \$11,630 to the USDA-FS in 2021 for law enforcement service.
17.8	Capital Improvements	2002-2015; future years' funding will be monitoring- dependent	No funding was provided to the USDA-FS in 2021 for capital improvements to recreation facilities.
17.9	Public Information	2004-2038	PacifiCorp provided \$9,769 to the USDA-FS in 2021 for public information projects.
17.10	Recreation Monitoring Recreation Monitoring (Periodic Surveys)	2004-2038 2007, 2012, 2017, 2022, 2027, and 2032	PacifiCorp provided \$9,769 to the USDA-FS in 2021 for routine recreation monitoring. PacifiCorp provided \$17,910 to the USDA-FS in 2021 for periodic routine recreation monitoring.
18.1	Cultural Resources (Historic Properties) Management Plan Implementation	2006-2038	The Historic Properties Management Plan and Historic Structures Plan continue to undergo implementation. The 5- year RAP was updated in consultation with the USDA-FS, BLM, and SHPO.

SA Section	PM&E Measure	Due Date	Current Status
18.6	Cultural Resources Monitoring	2001-2038	PacifiCorp coordinated ground-disturbing activities with the USDA-FS, BLM, and SHPO to assure ongoing monitoring and protection of historic properties.
19.1	Tributary Enhancement Program	2004-2038	Per the ODFW Memorandum of Understanding, work continued on fish habitat enhancements and fish passage improvements.
19.2	Long-Term Monitoring and Predator Control	2004-2038	PacifiCorp deposited \$145,372.82 into the designated fund in 2021. The RCC continued to manage expenses from this fund. Long-term monitoring and predator control study work proceeded according to the Long-Term Monitoring and Predator Control Study Plan, refined as necessary by the TWG.
19.3	Mitigation Fund	2004-2038	PacifiCorp deposited \$363,432.04 into the USDA-FS-administered mitigation fund account in 2021. A USDA-FS Mitigation Fund Board of Directors (BOD) annually evaluates proposals and selects mitigation projects to be implemented with this funding. Project rankings are completed by the USDA-FS hydropower project review group and final recommendations are made by the BOD. The Forest Supervisor of the Umpqua National Forest makes the final decision on project selections.
19.4	Oversight Costs	2005-2038	PacifiCorp provided \$235,503.97 in 2021 to ODFW for the funding of ODFW personnel to monitor the SA 19.1 program and oversee on-site PM&Es. The necessity and level of funding were reviewed by PacifiCorp and ODFW as required in Year 15 of the License. Both parties agreed to the ongoing need for the funding and to continue the funding level of \$162,000, escalated per SA 22.4.4.
21.4.1	RCC	2001-2038	The RCC continued to facilitate the implementation of PM&Es. It held remote quarterly meetings in 2021. The TWGs continued to convene, when necessary, to address detailed consultation issues. The annual public tour was canceled this year due to COVID-19 restrictions.

3.1.1 Noteworthy Accomplishments

During the reporting period, PacifiCorp continued implementing PM&E Measures in compliance with the Settlement Agreement. Noteworthy accomplishments are described below by Settlement Agreement section.

Tributary Enhancement Program (SA Section 19.1)

Implementation of habitat enhancements and other program work by ODFW's hydropower staff continued in 2021 and included:

• *Rock Creek Mainstem and Tributaries Enhancement* – ODFW hydropower staff started summer hazard tree removal and passive stream habitat supplementation throughout the basin. Cooperation between private/industrial landowners and ODFW hydropower staff resulted in landowners marking hundreds of hazard trees for removal and ODFW offering to remove those marked trees at ODFW's cost so they can be used for instream restoration. In lieu of "no-touch" areas where hazard trees would have been cut, felled, and left alongside the stream by the landowners, the agreement allowed ODFW and their contractors to push, cut, and/or place the hazard trees along miles of mainstem Rock Creek and its tributaries to benefit instream fish habitat at minimal cost. Full trees with root-wads were either mechanically pushed over or cut from the riparian area into the stream from the bank. The passive placement of large wood occurred at four tributary reaches and two mainstem reaches. Pushed-over and cut trees were allowed to be naturally sorted by winter flows, and if needed, will be arranged by mechanical means in summer 2022. (Figures 2 and 3).



Figure 2. Mainstem Rock Creek showing pushed-over hazard trees producing pool cover in adult and juvenile rearing habitat while retaining depositional spawning gravel. (1 of 2)



Figure 3. Mainstem Rock Creek showing pushed-over hazard trees producing pool cover in adult and juvenile rearing habitat while retaining depositional spawning gravel. (2 of 2)

ODFW also conducted passive hazard tree supplementation using over 80 trees within four reaches of East Fork Rock Creek. The trees, with full root-wads attached, were pushed instream by mechanical means and placed either on existing structures or in new areas to slow and capture the large debris flows expected from winter freshets. (Figures 4, 5, and 6).



Figure 4. Middle East Fork of Rock Creek showing pushed-over hazard trees reducing flow and encouraging secondary channel formation.



Figure 5. Lower East Fork Rock Creek with pushed-in, entire trees with root-wads to reduce flows and erosion, provide cover, and promote adult spawning gravel. The photo was taken during typical flow conditions.



Figure 6. Lower East Fork Rock Creek with pushed-in, entire trees with root-wads to reduce flows and erosion, provide cover, and promote adult spawning gravel. The photo was taken during storm flow conditions.

• *Harrington Creek Restoration Monitoring Report* – ODFW hydropower staff mechanically pushed approximately 85 hazard trees, with root-wads attached, into the creek. In the future, additional marked hazard trees will be cut or pushed over if they avoid wood beetle infestation or if they do not retain their green needles. The water quality station in lower Harrington Creek continues to produce erratic data. ODFW has deployed different problem solving and collection methods to capture stream water quality information until the Archie Creek Fire insurance replacement funds arrive. (Figure 7).



Figure 7. Harrington Creek water quality site during high water. It remains but only works intermittently.

Spawning Surveys in Rock Creek Mainstem, Rock Creek Tributaries (McComas, Kelly, Taylor, Lil' Conley, Shoup, Miller, Harrington, and Woodstock Creeks), and East Fork Rock Creek and Tributaries (North Fork of East Fork, Wapiti Creek) - Winter steelhead (STW), adult Pacific Lamprey, spring Chinook Salmon (CHS), and Coho Salmon (CO) spawning surveys continued throughout the basin. In Rock Creek, CHS pre-spawn mortality increased as summer water temperatures approached or exceeded 80 degrees Fahrenheit. For STW, surveys yielded a count of 47 redds in Rock Creek and tributaries and 6 redds in East Fork Rock Creek. Only 3 adult Pacific Lamprey redds were observed in 2021 surveys, but it was still one more than the 2 redds observed in 2020. One of the lamprey redds was found a significant distance up mainstream Rock Creek at the 9-mile hole tail-out. For CHS, ODFW observed 48 dead fish, which were more than the number documented in 2020 (33) and 2019 (9), and 99 redds, which were less than the number observed in 2020 (154) but more than the number documented in 2019 (31). For CO, ODFW observed a total of 394 redds, which was a record and significantly more than what was documented in 2020 (54) and 2019 (104). The CO redds were scattered throughout the basin, with 138 redds in mainstem Rock Creek, 130 redds in Rock Creek tributaries, and 126 redds in East Fork Rock Creek and its tributaries.

- Adult Salmonid Snorkel Surveys in Rock Creek Mainstem Snorkel surveys for holding adult salmonids were only performed above Rock Creek Diversion Dam. Because of the high stream temperatures, an unknown number of adults perished for lack of oxygen, and fish that would usually hold below the diversion dam in Rock Creek stayed in the North Umpqua River. Since the Archie Creek Fire destroyed the video recorder at the Rock Creek fish ladder, ODFW was unable to determine how many mortalities of adult salmonids may have occurred. In total, 64 units were snorkeled with 174 adult CHS documented, which were less than the 181 CHS observed in the 25 units snorkeled in 2020. As in years past, hatchery fish outnumbered wild fish in the counts; 98 percent of observed CHS were hatchery fish. In addition, only 3 summer steelhead (all hatchery origin) were seen in the snorkel surveys, which were much less than the 43 documented in 2020.
- Monitoring ODFW Hydropower Program's basin-wide monitoring continues to document the changes in structure movement and effectiveness after big winter freshets, especially following the Archie Creek Fire. The addition of hazard trees pushed into streams throughout the basin has enhanced habitat complexity of the streams for both juvenile and adult fish while also promoting channel sinuosity and deposition of gravel. Habitat improvements are continuing to keep more spawning gravel in Rock Creek compared to pre-restoration conditions when Rock Creek was more of a transport system. Small volitional movements of wood have redirected portions of stream energy and reconnected these stream segments to their floodplains, thereby facilitating access to the floodplain's historical gravel deposits. In other areas, Phase II restoration, in conjunction with hazard log placements, provided juvenile salmonids with new scour pool habitat after Phase I boulder/log structures aggraded gravel. (Figure 8).



Figure 8. Phase II restoration log jam created by pushing hazard trees with root-wads in the stream to scour out gravel accumulation deposited because of boulder structures during Phase I restoration.

ODFW Hydropower Program's water quality stations are still damaged but managing to occasionally provide water quality data. A drone equipped with a forward-looking infrared (FLIR) camera was deployed in the summer and was able to show water surface temperature variations. Lower Rock Creek, with its very wide floodplain and limited shade, was the first area surveyed, and collected temperature data show that cool water refugia areas exist in that stretch. Corvallis Research personnel undertook the initial processing of the data, and the ODFW Hydropower Program is working on the next stage of data processing to assign temperature layers. Once drone flight data from Upper and Middle Rock Creek and East Fork Rock Creek is available, ODFW will work to develop a water temperature baseline to compare with data from future scheduled flights. Drone flights will provide valuable temperature data and stream depictions to demonstrate the effectiveness of ODFW's initial efforts to help cool stream temperatures through restoration activities and guide future activities to enhance or sustain other cold water refugia.

Figure 9 below depicts the Lower Rock Creek (RC) Drone Flight with Forward Looking InfraRed (FLIR) camera flown from mile markers two to four over non-industrial, private lands. Lower RC exhibits 80' to 100' of wetted channel width with very little riparian canopy. The Riparian Management Area (RMA) and floodplain are indicated in red, while the cold water refugia areas are indicated in blue. This lower RC RMA area is the target for new, multi-story, diverse plantings to treat the fire damaged RMA.



Figure 9. Data from the Lower Rock Creek drone flight using Forward Looking InfraRed (FLIR) camera.

- ODFW parlayed grants for \$25,000 from the Umpqua Fish Enhancement Derby into an additional \$10,000 grant from Bass Pro Shops and Cabela's Outdoor World. Furthermore, Douglas Timber Operators received an \$85,000 grant from the Oregon Watershed Enhancement Board for non-industrial landowner efforts in the Glide Revitalization program, which includes Lower Rock Creek. Portions of the Douglas Timber Operators grant, along with the grant from Umpqua Fish Enhancement Derby, will go towards replanting and maintenance of seedlings, trees, and groundcover in lower Rock Creek.
- *Restoration Resources* Restoration efforts in the Rock Creek watershed wouldn't be possible at the scale ODFW is enhancing if it weren't for non-industrial and industrial landowners who granted access and contributed resources. Additionally, ODFW will assess whether certain trees are going to live or die in spring 2022, thus providing additional hazard trees along the mainstem and tributaries to be potentially felled or pushed into the stream with root wads attached. Forest Investment Associates, Roseburg Resources, Seneca Jones, and Lone Rock have all partnered with the ODFW Hydropower Program to ensure these hazard trees can benefit as much stream area as possible for Rock Creek watershed's fish and wildlife.

Long-Term Monitoring and Predator Control Study Program (SA Section 19.2)

Long-term monitoring of fish movement and populations affected by Soda Springs fish passage is currently in the "interim period" and continues with a limited scope per the Study Plan. Efforts this year concentrated on routine monitoring of fish use of the fish passage facilities, with a secondary focus on predator control and redd surveys. Upstream passage of adult salmonids was monitored continuously via the video system at the Soda Springs fish ladder, where fish numbers were lower in 2021 than the recent annual average of about 1,500 adult salmon and steelhead. Downstream passage of juvenile fish through the fish screen was monitored one to three nights per week at the Soda Springs Fish Evaluation Building, where more than 50,000 fish were sampled in 2021, the most yet. (Figures 10 and 11) Redd surveys helped describe the distribution of fish and the relative use of the available spawning habitats, which were similar in 2021 and 2020. The predator control effort focused on predator removal. The goal was to remove 100 brown trout, but only approximately 30 brown trout were removed due to wildfire closures and COVID-19 restrictions preventing the safe use of the electrofishing boat. PacifiCorp and ODFW plan to continue all of these activities in the next year.



Figure 10. Chinook (top) and coho salmon parr while anesthetized for sampling at the Soda Springs Fish Evaluation Building.



Figure 11. An adult coastal cutthroat trout lies anesthetized among the salmon and trout juveniles that are its usual prey.



Figure 12. Soda Springs Dam while spilling during the powerhouse shutdown forced by the Jack Fire.



Figure 13. Rich Grost piloting the cataraft and aquatic plant survey crew on Stump Lake during the intersection of COVID-19 restrictions and wildfire smoke inhalation protocols.



Figure 14. Sampling aquatic plants along the bottom of Lemolo Reservoir.



Figure 15. Launching into Lemolo Reservoir at the Poole Creek boat ramp, constructed pursuant to the Recreation Resources Management Plan for the Project.



Figure 16. Lemolo Reservoir at summer water surface elevation.

3.1.2 Plans and Reports

The following plans and reports were completed and/or revised during 2021:

Table 4. Plans and Reports Status

Plan/Report	SA Section, License Article, or FERC Order	Month Completed
Soda Springs Spawning Habitat Annual Report	SA 8.3	January
Lemolo Reservoir Management Annual Report	SA 9.0	January
Soda Springs Fish Passage Operation and Maintenance Annual Report	SA 4.1.1	January
Annual Avian Protection Report	SA 13.4	January
Annual Threatened and Endangered Species and Bald Eagle Monitoring Report	License Articles 411 & 412	February
Resource Coordination Committee Annual Report	SA 21.4.2	June
Long-term Monitoring and Predator Control Study Annual Report	SA 19.2	July
Erosion Control Plan Annual Report	SA 14.5	September
Historic Properties Annual Report	License Article 414	December
Flow Monitoring Plan Annual Report – by Water Year	SA 5.5, 6.6	May
Soda Springs Water Quality Annual Report – by Water Year	401 WQ Certification	June
Monitoring the Effects of Daily Ramping on Anadromous Fish in the Slide Creek Full-Flow Reach	SA 6.2	February

3.2 FERC License Actions

The FERC license contains actions that are required in addition to those actions in the Settlement Agreement. Table 5 summarizes the FERC License requirements that were fulfilled during this reporting period.

Table 5. FERC License Actions Status	Table 5.	FERC	License	Actions	Status
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Date Filed	License Article(s)	Settlement Agreement Section(s)	Description	Status/ Comments
1/27/21	401	4.1	2020 Soda Springs Fish Passage Facility Operations and Maintenance Annual Report	Acknowledged 1/27/21
2/16/21	401(a)	6.2.1	Slide Creek Ramping Monitoring Plan Implementation - Interim Final Monitoring Report	Acknowledged 9/22/21
2/23/21	411 & 412	USDA-FS 4(e) Condition 16	2020 Threatened and Endangered Species and Bald Eagle Monitoring Report	Acknowledged 2/23/21
6/2/21	401	21.4.2	2020 Resource Coordination Committee Annual Report	Acknowledged 6/2/21
12/15/21	414	18.1 & 18.2	2021 Historic Properties Annual Report/Action Plan	Acknowledged 12/15/21

4.0 FIDUCIARY REPORTING

Consistent with Settlement Agreement fiduciary reporting requirements, this section provides account information for the following actions and fulfills the requirement to annually report the amounts deposited into and disbursed from each of the following accounts:

- SA Section 8.3.5 (amended) North Umpqua River Habitat Restoration/Creation Project;
- SA Section 19.1.1.3 Tributary Enhancement Program; and
- SA Section 19.3.1 Mitigation Fund.

The SA 7.2.3 (amended) Gravel Augmentation Program account, previously reported herein, was fully expended in 2020 and will no longer be reported.

The Settlement Agreement does not require annual reporting for SA Section 19.2 Long-Term Monitoring and Predator Control Fund. Since this was likely an oversight, the account information for this fund is also provided in this section.

Date	Item	Expenditures	Funding	Balance
2021	Opening Balance			\$6,471.91
2021	Annual Escalation (per SA 22.4.4)		\$75.28	\$6,547.19
2021	Expenditures			
	PacifiCorp			
	• Staff labor	(\$1,212.00)		
	Total Expenditures	(\$1,212.00)		\$5,335.19
2021	Ending Balance			\$5,335.19

Table 6. SA 8.3 North Umpqua River Habitat Restoration/Creation Project

Date	Item	Expenditures	Funding	Balance
2021	Opening Balance			\$738,042.28
2021	Expenditures			
	Kevin Saylor			
	 Burnt tree salvage at Rock Creek Hatchery for fish logs Rock Creek hazard tree removal 	(\$25,905.00)		
	Bosco Logging			
	Rock Creek tree and log placement	(\$9,860.00)		
	ODFW			
	Labor on Rock Creek Basin restoration activities	(\$18,388.00)		
	Total Expenditures	(\$54,153.00)		\$683,889.28
2021	Investment Earnings		\$44.00	\$683,933.28
2021	Ending Balance			\$683,933.28

Table 7. SA 19.1 Tributary Enhancement Program Fund

Table 8. SA 19.2 Long Term Monitoring/Predator Control Fund

Date	Item	Expenditures	Funding	Balance
2021	Opening Balance			\$48,015.76
2021	Annual Funding (\$100K escalated)		\$145,372.82	\$193,388.58
2021	Expenditures			
	ODFW			
	Experimental Biological Aides (EBAs)	(\$120,000.00)		
	PacifiCorp			
	Staff Labor and Expenses	(\$9,386.84)		
	Stillwater Sciences			
	Soda Springs Predator Control Study	(\$1,948.50)		
	Total Expenditures	(\$131,335.34)		\$62,053.24
2021	Investment Earnings		\$6.23	\$62,059.47
2021	Ending Balance			\$62,059.47

Table 9. SA 19.3 Mitigation Fund

Date	Item	Expenditures	Funding	Balance
2021	Opening Balance			\$3,095,294.53
2021	Annual Funding (\$250,000 escalated)		\$363,432.04	\$3,458,726.57
2021	Expenditures			
	Mitigation Projects			
	Rock Creek - Archie Fire Stream Restoration - Phase II			
	Habitat Gate Repair			
	Right-of-Way Mowing			
	Wildlife Crossing/Habitat Monitoring: Fish Creek Canal			
	Collaborative Post Fire Recovery			
	2022 Upper Steamboat/Lower Horse Heaven LWM			
	Calf Copeland Wetlands Restoration			
	Cooperative Stream Gage Program			
	GRAIP 2022			
	Harmful Algae Bloom Surveillance & Water Quality Monitoring of Lemolo Reservoir and Diamond Lake			
	Stream Temperature Monitoring			
	Upper Cavitt Creek Road Decommissioning - Phase l			
	Turtle Nesting and Access Improvements			
	Winter Range Closures and Timeliness			
	NFF Umpqua Restoration Coordinator - 2 years			
	Modification and Overruns			
	Total Expenditures	(\$1,113,032.09)		\$2,345,694.48
2021	Interest Earned		\$155.94	\$2,345,850.42
2021	Ending Balance			\$2,345,850.42

5.0 CONCLUSION

Despite the ongoing global challenges of the COVID-19 pandemic and the local challenges of another difficult fire season, 2021 was another successful year of PM&E implementation and RCC coordination. The Parties collaboratively adapted to these historic upheavals to facilitate ongoing operation and maintenance of the Project and implementation of PM&E measures. PacifiCorp expresses their sincere thanks to the Parties for their nimble response and close cooperation, often at a distance and through novel technologies, on behalf of PacifiCorp's customers and the natural resources of the North Umpqua Basin.

The full suite of date-certain PM&E Measures are in place on the Project and will continue to be operated and maintained throughout the License term for the benefit of natural resources in the Project area and beyond. Of particular note is the on-going, successful operation and maintenance of the Soda Springs fish passage facilities. Hundreds of steelhead and salmon were observed using the fish ladder during the year.

Other major accomplishments during the reporting period included implementation of the long-term monitoring and predator control study plan and completion of annual Rolling Action Plans for ongoing programs to manage vegetation, erosion, transportation, aesthetics, recreation, and cultural resources in the North Umpqua Project area.

The RCC ground rules and protocols for interagency teamwork and communication have provided an effective framework for watershed management consistent with the goals of the Settlement Agreement. Parties worked cooperatively toward meeting Settlement Agreement commitments during the report period and projects were completed on schedule.

In 2021, the Parties utilized the RCC framework to initiate consultation on PacifiCorp's proposal to amend the FERC Project license to develop pumped storage capabilities at the Project. PacifiCorp will continue to consult with the Parties on pumped storage development on the Project. The energy storage provided by pumped storage hydropower is a priority for PacifiCorp and its customers as the region transitions to an electrical grid increasingly powered by the variable fuel supply of renewable resources.

In 2022, emphasis will be placed on the continued successful operation, evaluation, and maintenance of PM&E Measures, including the Soda Springs fish passage facilities, pursuant to the intent of the Settlement Agreement. As in past years, long-term monitoring and off-site mitigation will continue in the North Umpqua Basin as part of the implementation program to protect, mitigate, and enhance natural resources in this highly valued watershed.