

**2018 EXTENSION OF THE 2008 COLUMBIA BASIN FISH
ACCORDS MEMORANDUM OF AGREEMENT AMONG THE
SHOSHONE-BANNOCK TRIBES OF THE FORT HALL
RESERVATION, BONNEVILLE POWER ADMINISTRATION,
U.S. ARMY CORPS OF ENGINEERS, AND U.S. BUREAU OF
RECLAMATION**

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I. INTRODUCTION

This 2018 Extension and Restatement of the 2008 Columbia Basin Fish Accords Memorandum of Agreement (“**Extension**”) updates and extends the 2008 Columbia Basin Fish Accords Memorandum of Agreement (“**2008 Agreement**”) developed through good faith negotiations by the Bonneville Power Administration (“**Bonneville**”), the U.S. Army Corps of Engineers (“**Corps**”) and the U.S. Bureau of Reclamation (“**Reclamation**”) (together the “**Action Agencies**”) and the Shoshone-Bannock Tribes of the Fort Hall Reservation (“**the Tribes**”). Collectively, the Tribes and the Action Agencies are “**the Parties**” to this Extension.

This Extension continues to address direct and indirect effects of construction, inundation, operation, and maintenance of the fourteen federal multiple purpose dam and reservoir projects in the Federal Columbia River Power System that are operated by the Action Agencies as a coordinated water management system for multiple congressionally authorized public purposes and referred to as the **Columbia River System**,¹ as well as Reclamation’s Upper Snake River Projects on fish and some wildlife resources of the Columbia River Basin. The Action Agencies and the Tribes intend that the 2008 Agreement, as continued by this extension, will provide benefits to all the Parties.

The Parties’ purposes for this Extension, like the 2008 Agreement, include, among others:

¹ For purposes of this Accord extension, the Columbia River System is comprised of 14 Federal multipurpose dam and reservoir projects operated as a coordinated water management system, and the Upper Snake River Projects. The 12 projects operated and maintained by the Corps are: Bonneville Dam, The Dalles, John Day, McNary, Chief Joseph, Albeni Falls, Libby, Ice Harbor, Lower Monumental, Little Goose, Lower Granite, and Dworshak dams. Reclamation operates and maintains the Hungry Horse Project; the Columbia Basin Project, which includes Grand Coulee Dam; and the Upper Snake River Projects which are Minidoka, Palisades, Michaud Flats, Ririe, Little Wood River, Boise, Lucky Peak, Mann Creek, Owyhee, Vale, Burnt River and Baker.

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- To address the Parties’ mutual concerns for certainty and stability in the funding and implementation of projects for the benefit of fish and wildlife affected by the Columbia River System;
- To foster a cooperative relationship and partnership in implementation of the mutual commitments in the 2008 Agreement and this Extension; and
- To resolve issues between the Parties regarding the Action Agencies’ responsibilities under certain laws applicable to the Columbia River System for the duration of this Extension.

Accomplishments realized from the Parties’ pursuit of these purposes during the initial term of the 2008 Agreement are summarized in Section II, below. Based on those accomplishments and the purposes stated above, the Parties elect to extend the 2008 Agreement to continue the commitments they made to each other in 2008. This Extension updates and modernizes certain terms and conditions to reflect the evolution of the environmental, legal, and economic context of Columbia River System operations and impacts, and also the status and focus of the Tribes’ resource restoration, protection and enhancement projects, including the Tribes’ artificial production projects.

This Extension is intended to further the purposes of the Pacific Northwest Electric Power Planning and Conservation Act (“**Northwest Power Act**”), including its assurance to the Pacific Northwest of an adequate, efficient, economical, and reliable power supply as well as its commitments to protect, mitigate and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries that have been affected by the Columbia River System development and operations. This Extension helps provide a means to achieve the overall balance between fish and wildlife, power, and other project purposes for which the Northwest Power Act makes the Action Agencies responsible.

This Extension builds on the foundation of the partnership and mutual commitments developed by the Parties during the term of the 2008 Agreement. This Extension reflects the Parties’ intention to continue the productive and proven approach to alignment and project implementation for fish and wildlife mitigation while reasonably accounting for ongoing legal, financial, and operational uncertainties confronting the Action Agencies.

Due to developments in the energy market and increased spring spill operations such as those following the 2018 order of the U.S. District Court for the District of Oregon, Bonneville expects reductions in its near-term revenue. For Bonneville, this extension is part of its approach to improved cost management of the Bonneville Fish and Wildlife Program.

The provisions in the 2008 Agreement that are unchanged and remain effective under this Extension are listed in **Attachment B: Provisions of the 2008 Agreement that Remain in Effect**.

II. ACCOMPLISHMENTS UNDER THE 2008 AGREEMENT

The 2008 Agreement contains commitments related to Columbia River System operations and funding of certain tribally sponsored fish and wildlife habitat protection and enhancement projects and fish production facility construction and operation. The 2008 Agreement promotes meaningful tribal participation and alignment among the Parties in decision-making about system operations including spill, transport and flow management, biological performance, and adaptive management in a manner consistent with tribal sovereign interests in fisheries management and general federal trust obligations with respect to treaty resources.

On the strength of 2008 Agreement commitments, the Tribes have implemented projects throughout the Columbia River Basin that protect, restore, and improve tributary fish habitat to benefit Endangered Species Act (“ESA”) listed salmonids and other species. Tribal steelhead kelt reconditioning facilities have demonstrably improved the productivity of listed steelhead in the mid- and upper Columbia River. Furthermore, both the habitat projects and the tribal fish production facilities supported by the Agreement are addressing federal responsibilities and helping to develop management strategies for mitigation of the Columbia River System’s impacts to non-listed species, including lamprey, sturgeon, and wildlife.

A. RESULTS OF THE OVERHAUL OF THE COLUMBIA RIVER SYSTEM

The Action Agencies have overhauled the Columbia River System to protect, mitigate, and enhance fish and wildlife, to ensure system operations are not likely to jeopardize ESA-listed species or destroy or adversely modify their designated critical habitat, and to contribute to the conservation of listed species. System improvements also successfully addressed the broad anadromous fish mandates in the Northwest Power Act.² Together with changes to fisheries management pursuant to the *U.S. v. Oregon* Fisheries Management Plans, Pacific Salmon Treaty

² See 16 U.S.C. § 839b(h)(6)(E) (mandating “improved survival” at the Columbia River System dams and “flows of sufficient quality and quantity . . . to improve production, migration, and survival of such fish as necessary to meet sound biological objectives”). When Congress passed the Northwest Power Act the estimated average juvenile mortality at each dam was 15-20% with losses recorded as high as 30%. See *NW Res. Info. Center v. NW Power Planning Council*, 35 F.3 1371, 1374 (9th Cir. 1994) (citing the U.S. General Accounting Office, *Impacts and Implications of the Pacific Northwest Power Bill* at page 22 (Sept. 4, 1979)).

and other actions, the following improvements have contributed to a contemporary record of 2.4 million adult salmon and steelhead passing Bonneville Dam in 2014.³

- **Juvenile fish passage survival** at the Columbia River System dams for spring and summer migrants now meets or exceeds juvenile dam passage survival performance standards of 96% and 93%, respectively.⁴
- **Travel time improved** for yearling Chinook and juvenile steelhead through the system through the combination of spill and spillway weirs and other surface passage routes, even in low flow years such as 2015.⁵
- **Total In-River survival** has improved for migrating juvenile salmon and steelhead. Comparing two time periods reported in National Oceanic and Atmospheric Administration’s (“NOAA”) reach study⁶, (1997-2007 and 2008 – 2016), there has been a 10% survival increase for hatchery and wild sockeye salmon, a 2% increase in hatchery and wild Chinook (4% for wild), and a 25% survival increase for hatchery and wild steelhead (13% for wild).
- **For Pacific lamprey, the Corps accomplished the following during the last 10 years:**
 - Implemented fish ladder improvements at all eight lower Columbia and Snake River dams, including two ladder entrance modifications and two prototype bypass flumes that are still being evaluated
 - Modified juvenile bypass screen operations at McNary Dam and redesigned bypass collection raceway screens at transportation projects;
 - Developed juvenile lamprey tag criteria, tagging protocol, and a prototype acoustic tag that was field tested in 2017;

³ The 2014 returns were five times higher than the 471,119 salmonids that passed Bonneville Dam in 1938 when it was completed. Data for 1938 adult salmonid returns is available from the Fish Passage Center’s website http://www.fpc.org/environment/fcounts.asp?fr_cdy=1938&fr_cdm=1&fr_cdd=1&to_cdm=12&to_cdd=31&prj=BO&subbtn=salmon&op=runsum

Contemporary salmonid return numbers reported in *Endangered Species Act Federal Columbia River Power System 2016 Comprehensive Evaluation*—Section 1 at page 5 (Jan. 2017) (hereinafter “2016 Comprehensive Evaluation”).

⁴ 2016 Comprehensive Evaluation at page 4.

⁵ 2016 Comprehensive Evaluation at page 20.

⁶ James R. Faulkner, Daniel L. Widener, Steven G. Smith, Tiffani M. Marsh, and Richard W. Zabel. 2017. Survival Estimates for the Passage of Spring-Migrating Juvenile Salmonids through Snake and Columbia River Dams and Reservoirs, 2016. Report of research for Bonneville Power Administration, Contract 40735, Project 199302900.

- Identified potential future priorities to improve lamprey passage at Corps dams.
- **For Pacific lamprey, Reclamation accomplished the following during the last 10 years:**
 - Completed the "Assessment of U.S. Bureau of Reclamation Projects in the Columbia River Basin: Effects on Pacific Lamprey (*Lampetra tridentata*)."
 - Worked with and federal partners to implement actions in the Yakima and Umatilla basins where Reclamation project facilities affect lamprey. Installed adult passage structures in the Umatilla (Three Mile Falls, Maxwell, and Feed Diversion Dams) and Yakima (Prosser Diversion). Reclamation is also working with the Tribes on experimental solutions to reduce entrainment of juvenile lamprey into canals. Additionally, Reclamation participated in studies of screen materials and lamprey protection and conducted canal salvage operations.

B. ACTION AGENCY OFF-SITE MITIGATION ACCOMPLISHMENTS

- Bonneville and the Corps have worked with mitigation partners to protect and **restore tidal functions** to over 8,800 acres in the estuary as of 2016.
- Since 2007, Action Agency partnerships have made over 3,445 miles of **tributary habitat accessible to anadromous fish** and protected over 397,636 acre-feet of water for instream fish flows.
- **For wildlife** affected by dams and reservoirs that covered 378,000 acres, Bonneville has funded partners to protect, mitigate, and enhance over 1,000,000 acres.
- **Safety net and conservation hatcheries** increased the abundance of and reduced the extinction risk for Snake River spring/summer Chinook and Snake River sockeye.⁷

C. TRIBAL ACCOMPLISHMENTS UNDER THE 2008 AGREEMENT

- **For Tributary Habitat** the Tribes worked diligently to protect and enhance over five miles of the Yankee Fork Salmon River to promote anadromous and resident fish habitat in the Upper Salmon River. Furthermore, tributary habitat actions were taken in Panther

⁷ 2016 Comprehensive Evaluation at page 34.

Creek, Lemhi River, and the Upper Salmon River; while also implementing resident fish habitat actions on the Fort Hall Reservation.

- **For Hatchery Development** the Tribes developed a comprehensive Master Plan and design package for a conservation hatchery that includes anadromous and resident fish.
- **For Research** the Tribes developed a series of publications demonstrating the importance of marine derived nutrients and the survival/migration of natural origin Chinook salmon.
- **For Wildlife** the Tribes protected over 1,000 acres through acquisition under the Southern Idaho Wildlife Mitigation program.

III. EXTENSION OF THE 2008 AGREEMENT

This section sets forth the updates of the 2008 Agreement based on the key considerations that have emerged since its development. The Parties continue to take a comprehensive mitigation approach that includes the following components: Columbia River System configuration and operations; habitat protection and enhancement; hatchery management; and research, monitoring, and evaluation. Bonneville manages the costs of these separate components under a unified fish and wildlife mitigation budget, and the Action Agencies coordinate their mitigation funding and budgets. The comprehensive mitigation commitments adopted in this extension, particularly Bonneville’s commitments under its unified budget approach, reflect current financial conditions facing Bonneville and the region, and the Action Agencies’ efforts to address those conditions, while serving the Parties’ desire to provide equitable treatment to all purposes for which the Action Agencies operate the Columbia River System. The commitments in this Extension provide the Tribes and Bonneville greater budget flexibility and rate certainty by reducing solicitation, oversight, implementation and review costs and by providing a mechanism to find savings if necessary.

A. MANAGING AN EFFICIENT AND EFFECTIVE BIOLOGICAL INVESTMENT PORTFOLIO

The Parties are aligning around a new approach to mitigation cost management to more purposefully manage fish and wildlife mitigation projects and Columbia River System operations as a single effort incorporating legal compliance, best available science, and cost effectiveness.

The Parties are using this approach to better incorporate sound business principles into the Action Agencies’ efforts to address the effects of the Columbia River System on fish and wildlife. Managing the costs of fish and wildlife mitigation investments in a more unified manner will, for the term of this Extension, help address uncertainty in current biological, economic, and legal conditions directly affecting the Action Agencies. Bonneville will manage its mitigation costs as a single biological investment portfolio to better enable it to fulfill its strategic goals to “[h]old the sum of [its] program costs, by business line, at or below the rate of inflation through 2028,”⁸ and take “a more disciplined approach to managing the total cost of [its] Fish and Wildlife Program”⁹ by prioritizing its portfolio of mitigation investments “based on biological and cost-effectiveness and their connection to mitigation for the impacts of the Columbia River System.”¹⁰

By embracing these principles, the Parties—Bonneville and the Shoshone-Bannock Tribes in particular—are agreeing to use a biological investment portfolio model as a sound business approach to managing the costs of protecting, mitigating, and enhancing fish and wildlife, and providing them equitable treatment with the other purposes for which the Action Agencies operate the Columbia River System, while simultaneously ensuring that the Pacific Northwest an adequate, efficient, economical, and reliable power supply. The commitments in this Extension allow the Parties flexibility related to budget and rate certainty by reducing transaction costs and providing savings when called upon. Finding this biological, legal, and economic foundation sound and in support of the objectives of Bonneville’s 2018-2023 Strategic Plan, the Parties renew and extend their partnership as enumerated in greater detail below.

B. HIGH PRIORITY ACTIONS

1. During the term of this Extension, the Parties will work together and the Tribes will support the following time-sensitive and critical goals and milestones:
 - a. Issuance of NOAA Fisheries and U.S. Fish and Wildlife Service (“**USFWS**”) Biological Opinions covering the coordinated water management of the Columbia River System beginning in 2019, including operations, maintenance, and configuration of the dam and reservoir projects.
 - b. Agreeing on spring and summer spill and other fish operations for the 2019-2021 period.

⁸ Bonneville Strategic Plan at 12.

⁹ Bonneville Strategic Plan at 34.

¹⁰ Bonneville Strategic Plan at 39.

- c. Collaborating to seek alignment of regional sovereigns in support of the Columbia River System Biological Opinions, including fish operations, in appropriate forums.
 - d. Coordinating and submitting complementary recommendations for amendments to the Columbia Basin Fish and Wildlife Program.
 - e. Finding efficiencies in project implementation that reduce administrative obligations related to project contracting and reporting, and environmental compliance, where appropriate.
2. The Parties will meet annually during the term of this Extension to consider the results of their efforts to meet the milestones above and will report on their respective efforts, including specific actions taken and planned or revised strategies, for meeting these milestones.

C. FISH OPERATIONS IMPLEMENTATION ACTIONS

1. The Parties are currently collaborating on updated spill, transportation, avian predation, adult passage, and other fish operations that are identified in **Attachment C: Columbia River System Operations**. The Parties will work toward regional agreement on these matters. The Parties acknowledge that new biological information will be available during the term of this Extension, which will inform the operations of the Columbia River System for fish and wildlife species affected by this Extension. The Parties commit to make best efforts to collaboratively seek alignment on such actions, building on the Parties' analyses. Under this Extension, the Parties retain their ability under the 2008 Agreement to respond and adapt to relevant new information regarding survival, flow, spill, and other relevant indicators of fish and wildlife impacts; provided, all such new information is reviewed and discussed collaboratively amongst the Parties in advance of any response in an effort to support alignment.
2. The Action Agencies remain committed to continue coordinating and collaborating on Pacific Lamprey issues through participation in the Pacific Lamprey Conservation Agreement¹¹ activities and participation in interagency meetings and Pacific lamprey technical workgroup meetings. The Corps will continue counting adult lamprey that pass Lower Columbia and Snake River dams and operate and maintain existing lamprey

¹¹ <https://www.fws.gov/pacific/fisheries/sphabcon/lamprey/lampreyCA.html>

passage facilities. In addition, the Corps will integrate lamprey design considerations into future Columbia River Basin plans for adult and juvenile salmonid passage facilities and participate in the Lamprey Technical Workgroup and USFWS Pacific Lamprey Conservation teams.

Subject to existing and future authorities, the Parties will exercise best efforts to continue to implement the above actions. In the event that above actions are not implemented during this Extension, any Party may support listing Pacific lamprey under the ESA to overcome administrative barriers that forestall survival improvements.

D. BONNEVILLE’S BUDGET AND BUDGET MANAGEMENT

1. Bonneville’s funding commitments beginning in FY 2019 are set out in **Attachment A: Shoshone-Bannock Project Portfolio**, to this Extension. The funding commitments reflect joint discussions between the Tribes and Bonneville on the Tribes’ project portfolio as it has evolved through implementation of the 2008 Agreement, including consideration of (a) measures for improving the effectiveness of certain entity projects, (b) promoting mitigation that directly protects and mitigates fish and wildlife and deemphasizing redundant or unnecessary research, monitoring and evaluation as appropriate, and (c) the Tribes’ agreement to certain reductions in budgets during the term of the Extension.
2. The annual budgets shown in Attachment A reflect agreed upon reductions that apply during the term of this Extension. Attachment A budgets are not binding on the Parties beyond the term of this Extension.
3. For expense funding commitments by Bonneville in the 2008 Agreement, funds that remain unspent at the time of closeout of the FY 2017 intergovernmental contracts implementing the 2008 Agreement are carried forward to future years, with no further inflation adjustments and subject to the Budget Rules in Section III.D.4 below.
4. The total amount of funds that can be spent in a single fiscal year—including any unspent carry forward funds from any prior fiscal years—shall not exceed 120% of the budgeted amount for that year set forth in Attachment A, unless Bonneville and the Tribes agree otherwise. This cap governs request for changes in the timing of implementation and distribution of Accord dollars, through preschedules, reschedules, or budget transfers, as defined below.
 - a. **Out-year Pre/Reschedules** – Preschedule and reschedule are defined as the transfer of funds for a project) to an earlier or future period, respectively. Preschedules and

- reschedules of a project's working budget (e.g., changes to budget timing) will be allowed so long as the funds are not currently obligated in a contract and adjustment is consistent with the annual budget cap.
- b. **Budget-transfers** – Budget transfer means the transfer of funding from one project to another in the same or different years. Budget transfer may be allowed through mutual agreement so long as the funds are not currently obligated in a contract and the adjustment is consistent with the Tribe's budget cap.
 - c. **Obligated Funds** – Funds included in a currently open contract are considered obligated funds and may not be rescheduled or transferred until they are de-obligated. Upon completion of contract deliverables (including status and annual reports) and payment of final invoice, any savings (i.e., remaining contract balance) will be de-obligated from the contract and returned to the project budget and may at that point be moved to another contract or fiscal year. Project managers should expect a delay between the end of a contract and the return of excess funds to the project budget. Uncompleted work element deliverables and funds associated with them may be rescheduled from one year to the next via modification to the current contract and inclusion in the subsequent contract.
5. Capital budgets for hatchery facilities shall comply with budget commitments made in the 2008 Agreement, as adjusted per prior or future agreement between the Tribe and Bonneville. For any hatchery projects identified in the 2008 Agreement and in Section III.F.3 below that are not complete by the end of this Extension, Bonneville will extend the funding commitments for five years after this Extension expires.
 6. The Parties acknowledge that Bonneville's financial situation can vary from year to year. Consistent with past practice under the 2008 Agreements, in the case of deteriorating Bonneville financial circumstances due to events such as poor water conditions, depressed power marketing conditions, court orders, or similar conditions beyond Bonneville's control, Bonneville may call on the Tribes to voluntarily reduce expenditures under this Extension on an annual basis. Any additional savings would be selected by mutual agreement so as to not compromise and to preserve the Action Agencies' ability to comply with the ESA and other applicable laws, preserve the Tribes' staff and capacity, and reasonably reflect each affected entity's expertise, responsibilities and commitments. Funds called upon for savings in one year would be available in the following years consistent with existing budget rules above. The Parties will seek efficiencies in project management as noted in Section III.E below. Conversely, in the case of strengthening Bonneville financial circumstances and in recognition of budget reductions agreed to by the Tribes in this Extension, the Tribes may call on Bonneville to

voluntarily increase funding or expenditures under this Extension on an annual basis, including providing relief from the Budget Rules in Section III.D.4, above.

7. The Parties accept that failure to reach agreement on a party's requested increase or decrease in funding, under the circumstances described above, may under some circumstances meet the conditions of one or more off-ramps in Section IV.D below.

E. ATTACHMENT A PROJECT ADMINISTRATION AND EFFICIENCIES

1. In support of the purposes of this Agreement, the Parties intend to implement actions set forth in this Agreement recognizing their respective expertise, roles, and responsibilities. The Tribes, as long-term cultural stewards of their treaty resources and legal co-managers of treaty fisheries, have developed extensive and resource management expertise. The Action Agencies recognize the Tribes' substantial expertise regarding the biological, physical, cultural, and social environments within which they operate to implement projects. The Parties intend to implement and administer projects in a manner that:
 - Is consistent with the legal rights of the Treaty Tribes,
 - Complements the Tribes' current and future management actions,
 - Recognizes the Action Agencies' general trust responsibility to the Treaty Tribes and the Tribes' federally protected fishing rights and fisheries management authorities and responsibilities,
 - Fulfills or helps to fulfill Bonneville's legal compliance responsibilities, and
 - Is consistent with Bonneville's obligations to conduct its affairs, including its legal compliance responsibilities, in a sound and businesslike manner.
2. As partners in project implementation, the Parties will seek efficiencies in project administration that will:
 - Reduce delay in project implementation
 - Increase certainty in accomplishing project goals
 - Support coordination with project cosponsors
 - Comply with applicable federal acquisition regulations
 - Fulfill Action Agencies' environmental compliance responsibilities
 - Comply with applicable tribal financial policies
3. In addition, the Parties will seek efficiency in project management and implementation by working together to streamline requirements for contracting and reporting, and environmental compliance, where appropriate, and through project bundling, multi-year

contracting, and other actions, including pursuit and tracking of cost-sharing opportunities, particularly for habitat improvement (sometimes called enhancement or restoration) projects.

4. To the extent that differences of opinion arise in project implementation, the Parties will promptly seek resolution of those differences by elevating the matter to higher levels within their respective organizations. In so doing, the Parties will collaborate to pursue a mutually agreeable solution.
5. The Parties will work to find regular opportunities for in-person meetings between their staff and leadership to foster effective working relationships. Bonneville will also work with the Tribes to identify and implement appropriate measures for promoting effective working relationships between project and contract managers and other key staff. Such measures may include, for example: quarterly review meetings, on-site project review meetings, and attendance at Tribal cultural events as invited.

F. HATCHERY IMPLEMENTATION ACTIONS

1. The Parties acknowledge that hatcheries can provide important benefits to ESA-listed species, the region, and, in particular, to the Tribes in support of their treaty fishing rights. Bonneville and the Tribes seek to continue fulfilling their commitments under the 2008 Agreement. The Action Agencies intend to provide ongoing stability for hatchery operations and maintenance and monitoring required to fulfill federal mitigation obligations and ESA compliance responsibilities.
2. Hatchery funding will remain available as provided in the 2008 Agreement and discussed in Section III.D.5, above. Bonneville's funding will continue to be in addition to and not replace funding for hatcheries that are the legal responsibility of other entities, including but not limited to NOAA Fisheries' hatchery-related responsibilities for facilities established under the Mitchell Act or other appropriated programs, the mid-Columbia public utility districts Habitat Conservation Plans and other related agreements. The Tribes acknowledge their 2008 Agreement commitment to not seek any new or expanded hatchery actions until after May 2, 2038, except as may be provided in Section IV.B.2 of the 2008 Agreement.
3. The Crystal Springs Hatchery Project was developed under the 2008 Agreement, but due to circumstances beyond the Parties' control and the resulting need for further biological evaluation, the hatchery facilities have not been constructed yet. As such, Bonneville will continue to make funding for Crystal Springs Hatchery construction available for five years after the expiration of this extension, as provided in Section III.D.5, above.

Bonneville and the Tribes will continue to work together to address changed circumstances and additional project evaluation needs, including potential alternative solutions, related to Crystal Springs Hatchery for the duration of this extended funding commitment.

4. For hatchery projects, the Parties will collaboratively seek to identify a method to document the biological benefits associated with hatchery projects included in this Extension. The Parties will coordinate to ensure and incorporate each other's input before sharing draft or final ESA compliance documents with any regulatory agency when consulting on a proposed action, genetic and management plan, or tribal management plan for new or existing hatchery programs funded or proposed for funding by Bonneville. For such projects, the Tribe will:
 - a. Ensure that the hatchery project will not impede and, where possible, will contribute to recovery; and
 - b. Secure or assist in securing all permits required by law for hatchery construction or operation.

G. HABITAT PROJECT IDENTIFICATION AND IMPLEMENTATION ACTIONS

1. The Parties have developed an updated Tribal portfolio of habitat projects for this Extension as identified in Attachment A. These projects are supported by the Parties because they reflect and address the following criteria:
 - a. Preserving and building on past accomplishments and lessons learned;
 - b. Protecting fish and wildlife with a recognition of the importance of habitat as a means for the Action Agencies to both (1) carry out their responsibilities to protect, mitigate, and enhance ESA-listed and non-listed salmon and steelhead and aid in their conservation, and (2) protect and enhance treaty resources consistently with their Treaty and Trust obligations to the Tribes;
 - c. Addressing water temperature issues in a manner that is expected to promote resiliency in the face of climate change;
 - d. Fulfilling legal objectives;

- e. Complying with other applicable legal mandates, such as the prohibition against augmentation of appropriations, or the in lieu funding prohibition of the Northwest Power Act.

The Tribes will implement habitat project activities or actions within their respective portfolios pursuant to an intergovernmental contract with Bonneville, as further described in Section III.H below.

In addition, Reclamation will continue to provide technical assistance on tributary habitat projects in existing subbasins covered by its Tributary Habitat program.

2. The habitat projects in Attachment A are based on the best available science and have been reviewed and recommended for funding by the Northwest Power and Conservation Council (“**Council**”). The projects in Attachment A continue to support BiOp tributary habitat improvement metrics (such as miles of floodplain or side channel created or improved, miles of access opened, in-stream flow provided, etc.) for listed salmon and steelhead. In addition, any new or expanded habitat projects beyond what is included in Attachment A will provide or facilitate on-the-ground benefits through mitigation, enhancement, or protection, with a particular emphasis on projects that help the Action Agencies fulfill commitments under applicable biological opinions, and will address one or more of the following priorities:
 - a. Water transactions, leases, etc. to augment in-stream flows to benefit fish;
 - b. In-stream, riparian, and floodplain restoration;
 - c. Culvert or other fish passage improvements;
 - d. Protection and enhancement of habitat through land acquisitions and easements; and
 - e. Other habitat enhancement actions important for the survival and enhancement of listed species.
3. Bonneville and the Tribes will work together, and with other regional partners, to establish a regional understanding of the needs, priorities, and respective implementation responsibilities in addressing research, monitoring, and evaluation for the habitat actions set forth in this Agreement. For specific and cumulative habitat actions, the Tribes will continue to summarize and report implementation metrics and observed biological responses to assist the Action Agencies’ decision making and legal compliance processes.

H. INTERGOVERNMENTAL CONTRACT ADMINISTRATION

All of the 2008 Agreement projects currently rely on separate and discrete intergovernmental agreements for goods or services, and the Parties intend to handle all of the Tribes' Extension projects in the same manner. Bonneville shall enter into intergovernmental agreements for projects listed in Attachment A with the respective Tribes under terms consistent with this Extension and following the procedures in Bonneville Purchasing Instructions. Once Bonneville and a Tribe execute an intergovernmental agreement for a project, that agreement governs all activities under that project. In recognition of the bilateral nature of the commitments in such agreements, any decision to change project implementation, including termination, must follow the terms of the applicable intergovernmental agreement. Bonneville cannot and will not terminate project funding under an intergovernmental agreement without first complying with the procedures identified in the Bonneville Purchasing Instructions.

I. COLUMBIA BASIN FISH AND WILDLIFE PROGRAM

1. In developing this Extension, the Parties recognize that the Council's Fish and Wildlife Program ("**Program**") is over 35-years old and has an established framework for mitigating the impacts of hydroelectric development in the Columbia River Basin. Bonneville has relied on guidance in past Council Programs in making extensive funding commitments for long-term fish and wildlife mitigation projects. This Extension builds on those commitments. The Parties intend to ensure the benefits to fish and wildlife continue to accrue while maintaining cost stability.
2. The Parties agree that the Bonneville funding commitments in this Agreement are commitments of the Bonneville Fund¹² for implementation of projects that support protection, mitigation and enhancement of fish and wildlife. The Parties believe that this Agreement and the specific projects are consistent with the Northwest Power Act and the Council's current Program. The Parties will recommend that the Council amend its Program to incorporate the commitments in this Agreement.
3. The Parties will coordinate regarding the following actions relating to the Council, for efficiency and effectiveness:
 - a. Recommend that the Council largely retain the 2014 Program except as needed to incorporate this Agreement, including:
 - o Project Administration and Efficiencies

¹² 16 U.S.C. § 838i(a).

- Habitat Monitoring and Evaluation Efficiencies
 - b. Each Party shall share with the other Parties all draft recommendations for amendments, comments on recommendations, and comments on the draft amendments in a timely manner that upholds the commitments under the Agreement and this Extension to coordinate and avoid surprises.
4. Translocation of Anadromous Fish above Chief Joseph and Grand Coulee Dams. The Council’s 2014 Program included a three-phase approach for investigating passage and reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams. Passage and reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams are important to tribes and others in the region. The Action Agencies, however, have legal, economic, and policy concerns with specific proposals for passage and reintroduction above Chief Joseph and Grand Coulee dams. Consequently, the Parties agree that all aspects and stages of this issue require the greatest sensitivity and adherence to the no surprises protocol under the Extension.¹³

IV. GOOD FAITH, AFFIRMATIVE SUPPORT, AFFIRMATION OF ADEQUACY, AND TERM

A. GOOD FAITH IMPLEMENTATION and AFFIRMATIVE SUPPORT

The Parties reaffirm their commitments to the terms of Section IV.D of the 2008 Agreement.

B. AFFIRMATION of ADEQUACY

1. The Tribes will affirmatively support, in all appropriate forums (including legal, policy and technical) during the term of this agreement, the combined federal and tribal actions agreed to herein as an adequate response for compliance with the ESA, the Northwest Power Act, the Clean Water Act (“CWA”),¹⁴ and the National Environmental Policy Act (“NEPA”) with respect to the Columbia River System.

¹³ This provision applies only to federal dams of the Columbia River System and does not affect the Tribe’s efforts in other arenas.

¹⁴ Excepting the unpermitted releases of oil or toxic materials from Columbia River System projects or as a result of operations.

2. The Parties will collaborate in seeking to attract other regional sovereigns to support Columbia River System operations that preserve and enhance Bonneville’s ability to sustain its statutory obligations to continue providing competitive cost-based electric power and transmission services and fulfilling other valuable public services, including the protection, mitigation and enhancement of fish and wildlife affected by the development and operation of the Columbia River System.
3. With respect to the Columbia River System Operations Environmental Impact Statement (“EIS”), the Tribes support the Action Agencies’ approach to complying with the Court’s orders regarding NEPA. The relationship of the Action Agencies and the Tribes is described in the Cooperating Agency Memorandum of Understanding (“MOU”) signed by those parties. In accordance with the Cooperating Agency MOU, the Action Agencies agree to provide the Tribes with advance notice and copies of the draft and final EIS, including the identified preferred alternative.
4. The Tribes support the Action Agencies efforts to address their CWA responsibilities for the Columbia River System. The Parties’ understanding, as well as the nature, of these obligations has changed since 2008. The Action Agencies and Tribes will coordinate their efforts in addressing:
 - Hazardous waste clean-up and oil spills at Columbia River System dams
 - Actions to address water temperatures that are lethal to salmon
 - Total dissolved gas requirements, including state water quality standards
 - Harmful plant growth in Columbia River System reservoirs
5. Each Party will make best efforts to consult with the other Parties prior to taking any action that could reasonably be interpreted as inconsistent with any part of this Extension to assure its consistency with this Extension. The Parties agree that such discussions should be as informal and with the least amount of process necessary to ensure that the Parties are fulfilling the good-faith obligation to implement and support the Extension. Through these discussions, the Parties intend to continue collaborating and seeking each other’s input on strategic considerations regarding the Action Agencies’ compliance with the ESA, the NEPA, the Northwest Power Act, the CWA, and other regional compliance processes.

C. TERM OF EXTENSION

1. Unless otherwise decided by a Party pursuant to this Section IV, this Extension will be in force until the earlier of when the Action Agencies issue their final decisions on the

Columbia River System Operation EIS and any associated consultation under the ESA for the Columbia River System, or September 30, 2022.¹⁵

2. The Parties will meet to review further extensions during September 2021. Amendments, including further modification of the 2008 Agreement and this Extension, will be considered at least one-year prior to the expiration of this Extension.

D. OFF-RAMPS

1. Any Party may withdraw or seek to renegotiate this Extension or the operative provisions of the 2008 Agreement in the following circumstances:
 - a. The Parties enter into this Extension with the assumption that NOAA Fisheries will issue a new Biological Opinion for the operation of the Columbia River System in 2019 and beyond that, combined with this Extension, will meet the Action Agencies' obligations under the ESA, Northwest Power Act and NEPA for the term of this Extension. Should the Biological Opinion fail to meet any Party's expectations, the Party may exercise one of the off-ramps of this Extension.
 - In particular, if, as part of a biological opinion for the Columbia River System, NOAA Fisheries or USFWS recommends a Reasonable and Prudent Alternative ("RPA"), or includes Terms and Conditions in an Incidental Take Statement, Columbia River System where the RPA and/or Terms and Conditions specify additional or different actions from those proposed by the Action Agencies during the consultation process that are financially material to a Party or Parties.
 - b. If any court finds a Columbia River System biological opinion or related Action Agency decision document arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law, and the court orders additional or different actions that are either financially material to a Party or Parties or materially constrain the Action Agencies from meeting Columbia River System purposes.
 - c. In the event of material noncompliance with this agreement, or the initiation of litigation by one or more of the Parties challenging the sufficiency of the measures or actions included within the scope of the 2008 Agreement, as modified by this

¹⁵ This Extension may expire before the expirations of some individual project contracts between Bonneville and the Tribes. Bonneville and the Tribes intend that such individual project contracts continue through their terms, pursuant to Section III.F above, even if those terms extend beyond the expiration of this Extension.

Extension, to meet Federal obligations, including under the ESA, NEPA, Northwest Power Act, or the CWA.

- d. In the event of a material change, positive or negative, in Bonneville’s financial condition due to energy market, river flows, litigation, or other conditions outside of Bonneville’s reasonable control, from those conditions assumed by Bonneville as a matter of prudent business judgment in rate setting, and which materially affect Bonneville’s financial health and its associated ability to sustain the fulfillment of any of its multiple statutory responsibilities.
2. In such circumstances, the Parties will first seek to preserve this Extension and the operative provisions of the underlying 2008 Agreement and will meet promptly to determine the appropriate response. The affected Party or Parties will notify the other Parties immediately in writing, identifying why the event is considered material and potential options for resolution, including financial rebalancing through prioritization of fish and wildlife spending. Prior to withdrawing from this Extension, the Parties shall first make a 90-day good faith effort to renegotiate mutually agreeable modifications to this Extension, with a priority placed on establishing the funding levels for the projects listed in Attachment A. A Party may not withdraw from this Extension on the basis of its own noncompliance.
 3. If renegotiation is not successful, the affected Party may notify the other Parties in writing of its intent to withdraw by a date certain. At the time the withdrawal is effective, all funding commitments and covenants made by the withdrawing Party cease; however, the withdrawing Party’s liabilities and obligations under intergovernmental contracts effective on the date of withdrawal remain in effect until addressed as provided in the intergovernmental contract.
 - a. The withdrawing Party reserves any existing legal rights under applicable law, including all arguments and defenses. Other Parties also reserve all existing legal rights under applicable law, including all arguments and defenses. This includes the ability to advocate in all forums (e.g. judicial, administrative, in proceedings before the Council, and in rate-related proceedings) on any issue relating to the Action Agencies’ legal obligations in Section IV.B for additional, fewer or different fish and wildlife mitigation actions, greater or lesser fish and wildlife funding, or other mitigation actions.

E. EFFECTIVE DATE

This Extension will be in effect upon the signature of the last Party.

V. SIGNATURES

/s/ Elliot E. Mainzer

October 3, 2018

Elliot E. Mainzer
Administrator and Chief Executive Officer
Bonneville Power Administration

Date

/s/ D. Peter Helmlinger

September 28, 2018

D. Peter Helmlinger
Brigadier General, USA
Division Commander

Date

/s/ Lorri J. Gray

September 28, 2018

Lorri J. Gray
Regional Director
U.S. Bureau of Reclamation
Pacific Northwest Region

Date

/s/ Ladd Edmo

October 1, 2018

(for) Nathan Small
Chairman
Fort Hall Business Council
Shoshone-Bannock Tribes of the Fort Hall Reservation

Date

ATTACHMENT A: Shoshone-Bannock Tribes Project Portfolio

ATTACHMENT A

Shoshone-Bannock Tribe -- FISH and WILDLIFE PROJECTS

PROJECT No.*	PROJECT NAME	Base Value	2019	2020	2021	2022	TOTAL 2019-2022 (Base)	Comments
#	Expense							
1	199201000 Fort Hall Habitat Restoration	\$ 354,325	\$ 425,439	\$ 724,015	\$ 339,429	\$ 658,140	\$ 2,147,024	
2	199405000 Salmon River Habitat Enhancement	\$ 288,962	\$ 262,943	\$ 267,843	\$ 277,972	\$ 284,921	\$ 1,093,678	
3	199505702 Shoshone-Bannock Wildlife Mitigation Projects	\$ 724,341	\$ 500,000	\$ 500,000	\$ 506,250	\$ 506,250	\$ 2,012,500	
4	200740200 Snake River Sockeye Captive Propagation	\$ 530,767	\$ 561,372	\$ 489,990	\$ 508,518	\$ 521,231	\$ 2,081,111	
5	200890100 Crystal Springs Hatchery Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
6	200890300 ESA Habitat Restoration	\$ 499,545	\$ -	\$ -	\$ -	\$ -	\$ -	
7	200890400 Salmon River Basin Nutrient Enhancement	\$ 312,216	\$ 450,000	\$ 425,000	\$ 430,313	\$ 445,527	\$ 1,750,840	
8	200890500 Supplementation Projects	\$ 624,431	\$ 550,000	\$ 550,000	\$ 607,500	\$ 648,000	\$ 2,355,500	
9	200890600 Crystal Springs Planning and Operations/Maintenance	\$ 936,647	\$ 850,000	\$ 850,000	\$ 1,114,210	\$ 1,142,809	\$ 3,957,018	
10	201102100 Accord Administration - Shoshone-Bannock Tribes	\$ -	\$ 300,246	\$ 300,246	\$ 303,999	\$ 303,999	\$ 1,208,490	
11	200205900* Yankee Fork Salmon River Restoration	\$ 624,431	\$ 600,000	\$ 300,000	\$ 303,750	\$ 303,750	\$ 1,507,500	

YEARLY EXPENSE TOTAL: \$ 4,895,665 \$ 4,500,000 \$ 4,407,094 \$ 4,391,940 \$ 4,814,627 \$ 18,113,661

PROJECT No.*	PROJECT NAME	2019	2020	2021	2022	TOTAL 2019-2022 (Base)	
#	Capital						
1	199505702 Southern Idaho Wildlife Mitigation	\$ 1,600,000	\$ 1,600,000	\$ 1,600,000	\$ 1,600,000	\$ 6,400,000	
2	200890100 Crystal Springs Hatchery	\$ -	\$ -	\$ -	\$ -	\$ -	
3	201900300 Petit Lake Sockeye Weir	\$ -	\$ 750,000	\$ -	\$ -	\$ 750,000	

YEARLY CAPITAL TOTAL: \$ 1,600,000 \$ 2,350,000 \$ 1,600,000 \$ 1,600,000 \$ 7,150,000

* Note: BPA Project numbers may change over time

ATTACHMENT B: Provisions from the 2008 Agreement that Remain in Effect

The following provisions in the 2008 Agreement remain unchanged and in effect during the term of this Extension.

- II.I—Emergency Operations for Unlisted Fish
- III.D—Council and ISRP Review
- III.G—Compliance with the In Lieu Provision of the Northwest Power Act
- IV.D—Good Faith Implementation and Support
- V.B—Applicable Law
- V.C—Authority
- V.D—Consistency with Treaty Rights
- V.F—Binding Effect
- V.G—No Third Party Beneficiaries
- V.H—Prior Communications
- V.J—Notice

ATTACHMENT C: Columbia River System Operations

This 2018 Extension commits the Parties to collaborative engagement on the development of Columbia River System operations and to seek regional alignment on fish operations.

Attachment C describes considerations for updating spill, transportation, avian predation, adult passage, and other key fish operations for the Columbia River System that reflect the current status of the Action Agencies' ESA consultation process with NOAA. Attachment C serves as a working foundation for key components of fish operations beginning in 2019. The Parties' overarching commitments regarding fish operations are those described in Sections III.B-C and IV.B of this Extension. In the event that the Columbia River System operations resulting from these the Action Agencies' ESA consultation processes fail to meet any Party's expectations, the Party may exercise its rights under one of the extension off-ramps (Section IV.D.1.a). This 2018 Extension thus provides a roadmap and vehicle for the development of future system operations that have the Parties' support.

A. THE PARTIES ARE COLLABORATING ON SUPPORT OF THE FOLLOWING PROPOSED ACTIONS¹⁶ FOR OPERATION OF THE COLUMBIA RIVER SYSTEM

During the spring and summer juvenile fish migration, the Action Agencies will continue to provide spill to facilitate juvenile fish passage for ESA-listed salmon and steelhead species, while seeking to minimize any adverse effects on adult migrants. Juvenile dam passage survival performance standard test results from studies conducted under the 2008 BiOp will serve as the baseline for Columbia River System operations covered by this Extension Attachment C. See Table 1. The summarized results shown in Table 1 will also serve as a reference in future latent mortality studies.

B. SPRING SPILL

Spring spill operations are planned as follows:

- For the four lower Snake River dams, spill will begin on April 3 and continue through June 20.

¹⁶ This Attachment describes key fish operations the Parties are aligned around. A broader description of all Columbia River System operations, including further detail on fish operations, will be in the consultation package that the Action Agencies will submit to NOAA Fisheries.

- For the four lower Columbia River dams, spill will begin on April 10 and continue through June 15.

There are differing views among regional technical experts regarding the biological value of further increases in spring spill levels relative to those spill levels informed by the results of performance standard testing conducted under the 2008 BiOp. These divergent viewpoints are linked to differing interpretations of existing data regarding delayed mortality, the effects of exposure to high total dissolved gas (“**TDG**”) levels, and the use of smolt-to-adult return ratios (“**SARs**”) as a performance metric for evaluating Columbia River System operations. To address this uncertainty, beginning in 2019 the Action Agencies will conduct research to test the hypothesis that further increasing system-wide spill levels (up to the current applicable state water quality standards of 115/120% TDG) will have the effect of substantially increasing adult salmonid return rates (i.e., increased SARs due to decreased latent mortality). The most recent CSS 2017 Annual Report hypothesizes increases of 23 percent or more. The Action Agencies are planning to conduct research by alternating spill levels between the Base Operation (informed by performance standard test results 2008-2018) and the Test Operation (spill to meet but not exceed the 115 percent/120 percent TDG). Additional details on the study design for a spill operation will be developed with NOAA Fisheries based on the Independent Scientific Advisory Board (“**ISAB**”) review of the Columbia River latent mortality test power analysis that was completed in the spring of 2018. The Parties will discuss and seek alignment on any modifications to the study design.

C. SPRING JUVENILE TRANSPORTATION

Spring transportation will be initiated at Lower Granite, Little Goose, and Lower Monumental Dams no later than May 1; however, consistent with program implementation in 2018, the start of transport may begin as early as April 24 to provide data on earlier transported fish. These transport operations will continue to be coordinated with the Regional Implementation Oversight Group (“**RIOG**”) and Technical Management Team (“**TMT**”). Coordination and adaptive management between Parties and other regional sovereigns through the Regional Forum, as appropriate, during the migration season may result in modified transportation protocols, such as during atypical low flow years. Transportation protocols will be reviewed annually, taking into account new information concerning adult returns, in-river and transportation SARs, and model results. If new information indicates a modified transportation protocol is warranted, the Parties will use existing adaptive management procedures to make the appropriate adjustments in timing and criteria for spring spill and transportation.

In the adaptive management process, the Parties may consider the exposure of fish to TDG during transport (or lack of) versus in-river conditions experienced by control fish throughout the Columbia River System during increased spill operations.

D. SUMMER SPILL

Spill operations developed to facilitate safe passage of subyearling Chinook salmon will occur at the lower Snake River dams beginning on June 21 and at lower Columbia River dams on June 16, as shown in Tables 2 and 3 below. The Action Agencies will adjust summer spill timing at the lower Snake River projects according to when this species is actively migrating past those projects, as follows:

- Spill will continue at each project until the criteria below are met for that dam, or until August 31, whichever comes first.
- The Action Agencies will provide juvenile fish passage spill in August at Lower Granite Dam until subyearling fall Chinook collection counts at that dam fall below 300 fish per day for 4 consecutive days (with counting beginning on July 28).
- The Action Agencies will provide juvenile fish passage spill in August at Little Goose Dam until subyearling fall Chinook collection counts at that dam fall below 300 fish per day for 4 consecutive days (with counting beginning on July 28).
- The Action Agencies will provide spill in August at Lower Monumental and Ice Harbor Dams¹⁷ until subyearling fall Chinook collection counts at Lower Monumental Dam fall below 300 fish per day for 4 consecutive days (with counting beginning on July 28).
- In the event that fish collection counts increase above 500 fish for 2 consecutive days at a project where spill has ended prior to August 31, the Parties agree to work together to develop an adaptive strategy to assess options and determine if an alternative spill operation is warranted until the criteria above are met again.

The Parties will meet annually before March 1 to determine whether to increase the quantity of PIT-tagged natural production (or hatchery reared surrogates for) subyearling fall Chinook salmon required to examine run timing. Special emphasis may be applied to the Clearwater fall Chinook salmon subgroup, which present a split life history strategy and variability in run-timing.

The Parties will continue to discuss and explore other potential changes to summer spill focusing on spill during the month of August for each of the lower Columbia River dams. In particular,

¹⁷ Daily collection does not occur at Ice Harbor Dam, so spill at that project will follow criteria for Lower Monumental Dam and continue until the same day.

the decrease in PIT-tagged fall Chinook passing the lower Columbia River dams will be investigated with regards to run-timing and reductions in August spill. Proposals under consideration include:

- Subyearling fall Chinook salmon count criteria (e.g., less than 1,200-1,500 fish) for a minimum of three consecutive sampling dates (current sampling rate varies at each site by date and water temperature, but without water temperature restrictions, sample in August occurs every other day at McNary and Bonneville dams and every three to four days at John Day Dam, yielding a minimum of 6-12 consecutive days);
- Continue to spill during the first half of August (August 1-15) at a reduced rate of spill and then provide only day spill (also a reduced level of spill) between August 16-31; and,
- Combined fish count criteria with reduced levels of spill during August.

E. SUMMER TRANSPORTATION

Transport operations targeting fall Chinook will continue until approximately September 30 at Lower Monumental Dam and through October 31 at Lower Granite and Little Goose Dams, in accordance with all relevant Fish Passage Plan operating criteria. The Parties and other regional sovereigns, through the Regional Forum, will review the transportation protocols annually, taking into account new information concerning adult returns, in-river and transportation SARs, and model results. If new information indicates a modified transportation protocol is warranted, adaptive management will be used to make the appropriate adjustments in timing and criteria for summer transportation.

Test results of in-river versus transported subyearling fall Chinook salmon on the lower Snake River suggest the primary benefit of transportation, as it relates to increases in SARs, occurs in the months of August-October. One proposed consideration by the Action Agencies is to transport subyearling fall Chinook by trucks beginning August 1 and continue through the fall (with actual dates and criteria to be defined).

F. AVIAN PREDATION

The objective of avian predator deterrence is to reduce avian predation on juvenile salmonids. The Corps will continue to implement and improve, as needed, avian predator deterrent programs at lower Snake and Columbia River dams. This program will be coordinated through the Fish Passage Operations and Maintenance (“**FPOM**”) Team and included in the annual Fish Passage Plan (“**FPP**”). Avian monitoring and deterrence action plans are implemented annually

at lower Snake and Columbia River dams and are included in the FPP (see Appendix L in the 2018 FPP for an example). At each dam, bird numbers are monitored, feeding birds are hazed, and passive predation deterrents, such as irrigation sprinklers and bird wires are deployed. Hazing typically involves launching long-range pyrotechnics at concentrations of feeding birds and occurs primarily near the spillway and powerhouse discharge areas, and juvenile bypass outfall areas.

G. ADULT PASSAGE

The increase in proposed spring spill during the Spring Test Spill Operation may delay upstream migrating adult salmon and steelhead, specifically adult spring and summer Chinook salmon. If adult delay at any project is observed, existing adaptive management processes will be used to address the issue.

During low flow conditions, similar to the flows observed in 2015, with or without warm water temperatures, the Parties and other regional sovereigns, through the Regional Forum, will evaluate the appropriate balance between providing spill for juvenile passage, while not delaying upstream adult passage.

H. HYDRO OPERATIONS FLEXIBILITY

Increased flexibility in hydro operations is being discussed regionally, and several adjustments to operations are being considered, including:

1. The Action Agencies have proposed to increase the useable forebay range at lower Snake River projects by 6 inches (Minimum Operating Pool [“MOP”] +1.5-foot) to allow a full usable foot. Currently, project operators limit actual operations to the middle two-thirds of the MOP +1.0-foot range to avoid unintentionally going above or below the prescribed elevation. Beginning April 3, all lower Snake River projects (Ice Harbor, Lower Monumental, Little Goose, and Lower Granite projects) will be operated within the MOP +1.5-foot reservoir operations with very limited instances in which the pool would be within 0.25 feet of the bottom or top of the MOP range. The Lower Granite Reservoir may be raised as needed after September 1, in order to operate the adult fish holding facilities to support brood stock collection.
 - As with the 6-inch expansion of operating range described for the lower Snake River projects, the Action Agencies plan to operate John Day Dam forebay within 2 feet of MIP—the lowest elevation range. This action will allow full utilization of 1.5-foot operating range (262.5 to 264.5 feet) that will continue to allow irrigation withdrawals from April 10 through September 30. Slight deviations from these levels,

based on navigation needs, flood risk management, load following, and operation sensitivity, may be required on occasion. These reservoir operations may also have ancillary biological benefits that complement the avian predation reduction actions noted above.

2. The parties will work together to evaluate other emerging issues on an as needed, site-specific basis. Examples of emerging issues that may warrant additional site specific monitoring include new turbine testing at Ice Harbor and/or alternate methods of implementing spill programs (e.g. 24 hour spill averaging) while allowing for integration of intermittent power sources such as solar or wind which could also potentially be tested at a single project like Ice Harbor. Any of these types of RM&E efforts would need to be further developed and defined so that they could be integrated into and be complementary with the BiOp spill program.

Table 1. Juvenile dam passage survival estimates, passage times, and spill passage efficiency for yearling Chinook salmon and juvenile steelhead are derived from performance standard tests from 2010-2014. Spill passage efficiency is the percent of all downstream migrating juvenile salmon or steelhead that passed a dam through the spillway and other surface passage routes.

Dam	Year	Species	Dam Passage Survival (percent with Standard Error)	Median Forebay Passage Time (hours)	Spill Passage Efficiency (percent)	Spill Operation (Target / Actual)
Lower Columbia River						
Bonneville	2010	Yearling Chinook Salmon	95.69 (0.42)	n/a	n/a	100 kcfs / 100 kcfs (30 Apr – 13 May)
Bonneville	2011	Yearling Chinook Salmon	95.97 (1.76)	0.55	59.59	100 kcfs / 181 kcfs (season-wide)
Bonneville	2010	Steelhead	97.55 (1.80)	n/a	n/a	100 kcfs / 100 kcfs (30 Apr – 13 May)
Bonneville	2011	Steelhead	96.47 (2.12)	0.85	64.06	100 kcfs / 181 kcfs (season-wide)
Bonneville	2012	Subyearling Chinook Salmon	97.39 (0.69)	0.48	57.06	85 kcfs day 121 kcfs night / 149 kcfs 95 kcfs 24 hrs / 149 kcfs
The Dalles	2010	Yearling Chinook Salmon	96.41 (0.96)	1.28	94.66	40% / 39.9%
The Dalles	2010	Steelhead	95.34 (0.97)	1.28	95.36	40% / 39.9%
The Dalles	2010	Subyearling Chinook Salmon	94.04 (0.91)	1.20	82.98	40% / 39.8%
The Dalles	2011	Yearling Chinook Salmon	96.00 (0.72)	0.97	83.10	40% / 43.1%
The Dalles	2011	Steelhead	99.52 (0.83)	0.81	89.10	40% / 43.1%
The Dalles	2012	Subyearling Chinook Salmon	94.69 (0.59)	1.08	78.39	40% / 40.4%
John Day	2011	Yearling Chinook Salmon	96.66 (1.03) 97.84 (1.07) 96.76 (0.71)	2.00 1.50 1.42	61.20 66.40 63.68	30% / 30% 40% / 40% Season-wide
John Day	2011	Steelhead	98.36 (0.90) 98.97 (0.96) 98.67 (0.61)	4.30 3.20 2.91	61.20 66.40 62.78	30% / 30% 40% / 40% Season-wide

Table 1. (continued) Juvenile dam passage survival estimates, passage times, and spill passage efficiency for yearling Chinook salmon and juvenile steelhead are derived from performance standard tests from 2010-2014. Spill passage efficiency is the percent of all downstream migrating juvenile salmon or steelhead that passed a dam through the spillway and other surface passage routes.

Dam	Year	Species	Dam Passage Survival (percent with Standard Error)	Median Forebay Passage Time (hours)	Spill Passage Efficiency (percent)	Spill Operation (Target / Actual)
John Day	2012	Yearling Chinook Salmon	96.73 (0.65)	1.15	74.56	30% / 37.1% 40% / 37.1%
John Day	2012	Steelhead	97.44 (0.28)	2.39	74.52	30% / 37.1% 40% / 37.1%
John Day	2014	Subyearling Chinook Salmon	91.96 (0.74) 91.31 (0.77)	2.28 1.91	55.52 71.26	30% / 30% 40% / 40%
McNary	2012	Yearling Chinook Salmon	96.16 (1.40)	1.76	72.46	40% / 50.9%
McNary	2012	Steelhead	99.08 (1.83)	1.78	83.15	40% / 50.9%
McNary	2012	Subyearling Chinook Salmon	97.47 (1.14)	1.77	78.32	50% / 61.6%
McNary	2014	Yearling Chinook Salmon	96.10 (1.27)	1.73	71.40	40% / 52.6%
McNary	2014	Steelhead	96.98 (1.36)	2.57	84.33	40% / 52.6%
Lower Snake River						
Lower Monumental	2012	Yearling Chinook Salmon	98.68 (0.90)	2.35	78.89	Gas Cap (26 kcfs) / 29.7 kcfs
Lower Monumental	2012	Steelhead	98.26 (0.21)	2.17	65.85	Gas Cap (26 kcfs) / 29.7 kcfs
Lower Monumental	2012	Subyearling Chinook Salmon	97.89 (0.79)	2.60	83.56	17 kcfs / 25.2 kcfs
Lower Monumental	2013	Subyearling Chinook Salmon	92.97 (1.05)	2.99	89.10	17 kcfs / 19.8 kcfs
Little Goose	2012	Yearling Chinook Salmon	98.22 (0.76)	2.58	65.28	30% / 31.8%
Little Goose	2012	Steelhead	99.48 (0.81)	2.67	56.09	30% / 31.8%
Little Goose	2012	Subyearling Chinook Salmon	95.08 (0.97)	2.80	72.49	30% / 38.5%
Little Goose	2013	Subyearling Chinook Salmon	90.76 (1.39)	3.66	76.83	30% / 30%

Table 2. Initial juvenile fish passage spill operations at lower Snake River dams.

Project	Spring base spill operation ⁴	Spring test spill operation ^{18,19,20}	Spring dates	Summer operation	Summer dates ²¹
Lower Granite	20 kcfs	TDG Spill Cap	April 3 – June 20	18 kcfs	June 21 – Aug 31
Little Goose	30%	TDG Spill Cap	April 3 – June 20	30%	June 21 – Aug 31
Lower Monumental	TDG Spill Cap	TDG Spill Cap	April 3 – June 20	17 kcfs	June 21 – Aug 31
Ice Harbor	30%	TDG Spill Cap	April 3 – June 20	30%	June 21 – Aug 31

¹⁸ Spring spill levels will be systematically alternated between “base spill” and “test spill” as part of a latent mortality study.

¹⁹ If adult delay at any project is observed, existing adaptive management processes will be used to address the issue.

²⁰ The 120%/115% TDG spill cap refers to spill to the maximum level that meets, but does not exceed, the current TDG criteria allowed under state law (120% TDG in the project’s tailwater and 115% TDG in the next downstream forebay. Manage juvenile fish spill on an hourly basis to meet but not exceed the state water quality standards for WA and OR. Implementation of the daily spill averaging would include ± hourly variation in spill amounts within a day to facilitate integration of renewable power including solar and wind.

²¹ The Action Agencies will adjust the timing of August spill based on the timing of the juvenile fall Chinook migration according to the following criteria. Beginning August 1, the Action Agencies will adjust summer spill operations to juvenile outmigration at Lower Granite, Little Goose, or Lower Monumental, or Ice Harbor Dams if subyearling Chinook collection counts fall below 300 fish per day for four consecutive days (beginning July 28, 29, 30, and 31 for August 1 summer spill completion). Spill will continue at Ice Harbor until the same day as at Lower Monumental, since daily collection does not occur at that project. Additionally, in any year where natural-origin adult returns of Snake River fall Chinook salmon are equal to or less than 400 fish, summer spill in the following year would continue at Snake River projects through August 31, even in years where subyearling Chinook counts fall below the 300 fish per day for four consecutive days as stated above. In the event that fish collection counts increase above 500 fish for 2 consecutive days at a project where spill has ended prior to August 31, the Parties agree to work together to develop an adaptive strategy to assess options and determine if an alternative spill operation is warranted until the criteria above are met again.

Table 3. Initial juvenile fish passage spill operations at Columbia River dams.

Project	Spring base spill operation	Spring test spill operation^{22,23,24}	Spring dates	Summer spill operation	Summer dates
McNary	48%	TDG Spill Cap	April 10 – June 15	57%	June 16 – Aug 31
John Day	32%	TDG Spill Cap	April 10 – June 15	35%	June 16 – Aug 31
The Dalles	40%	TDG Spill Cap	April 10 – June 15	40%	June 16 – Aug 31
Bonneville	100 kcfs	TDG Spill Cap ²⁵	April 10 – June 15	95 kcfs	June 16 – Aug 31

²² Spring spill levels will be systematically alternated between “base spill” and “test spill” as part of the Action Agencies’ latent mortality research plan.

²³ If adult delay at any project is observed, existing adaptive management processes will be used to address the issue.

²⁴ The 120%/115% TDG spill cap refers to spill to the maximum level that meets, but does not exceed, the current TDG criteria allowed under state law (120% TDG in the project’s tailwater and 115% TDG in the next downstream forebay. Manage juvenile fish spill on an hourly basis to meet but not exceed the state water quality standards for WA and OR. Implementation of the daily spill averaging would include ± hourly variation in spill amounts within a day to facilitate integration of renewable power including solar and wind.

²⁵ Spill to the TDG Spill Cap, not to exceed 150 kcfs.